Toward Sound Management of End-of-Life Vehicles in New Zealand

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Abstract

New Zealand has a problem with an increasing number of motor vehicles being abandoned at the end of their useful life. The environmental and associated social costs created by this problem are expected to increase with the rising number of vehicles entering the country. In addition, there are environmental concerns regarding some aspects of the legal disposal of end-of-life vehicles (ELVs). The exact magnitude of both problems is unknown and attempts made to address them have been ad hoc and success limited. This thesis sets out to quantify the problems and provide policy makers with tools to improve the overall management of motor vehicle disposal in New Zealand.

To assess the extent and cost of the abandoned vehicle problem, local authorities are surveyed. The legislation dealing with car ownership, transferral and disposal and its implementation are scrutinised for weaknesses that allow ELVs to be abandoned without penalty. The automobile recycling industry is surveyed to determine the environmental impact from the industry's activities. Using semi-structured surveys, policies and practices used in other countries for the management of ELVs are investigated and assessed for effectiveness. Their application to the New Zealand situation is ascertained.

Of the vehicles which are deregistered each year, one in five is dumped. The direct cost to local authorities, to deal with the 25,500 vehicles abandoned each year, is more than six million dollars. In addition, practices and standards for the removal and disposal of hazardous substances from ELVs vary nationwide, adding to the environmental burden caused by vehicle disposal.

Recommendations for the improved management of ELVs target four areas, legislation, institutional practices, entry into the recycling system and dismantling operations. Minor changes to legislation and institutional practices combined with rigorous enforcement will close the data gaps and overcome free-rider problems. A disposal charge added to the registration fee of vehicles entering the country will allow ELV owners to dispose of their vehicles free-of-charge. Improved environmental performance by automotive dismantlers can be achieved through licensing and consistent monitoring from within the industry. Implementation of these recommendations will lead to better management of ELVs, through changed behaviour by private individuals and dismantling operations, and a reduction in the environmental costs associated with vehicle disposal.

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"Society has come to realise that the term 'throwaway' is misleading: in practice there is no 'away'."

Fishbein (1994, 4)

Photograph 1: Vehicles abandoned on the Akatarawa Road

Chapter One

Introduction

"Economists argue that all the world lacks is
a suitable system of effluent taxes
They forget that if people pollute with impunity
this must be a lack of community"
Kenneth Boulding

1.1 Background

Beginning in 1986, the New Zealand motor vehicle industry was deregulated. Sales taxes and tariffs were removed, and import licences were abolished, allowing for the influx of used vehicle imports. The effect of these actions was to make cars in New Zealand more affordable. As a result, the number of passenger cars and vans in the New Zealand motor vehicle fleet increased 61 percent from 1.5 million in 1986 to over 2.4 million by June 2003. The number of vehicles entering the country increased on average 9.6 percent per year over the last decade, giving New Zealand a mobility level greater than that of Germany. New Zealand's four million people own 2.4 million cars (this represents 1.2 cars for each economically active New Zealander). New Zealand is unique in that nearly 70 percent of new registrations each year are for used imports which are, on average seven years old when entering the country.[1] After their useful life these vehicles need disposal and an increasing number of them are being abandoned, imposing costs on society both directly, in terms of actual cost of removal and disposal, and indirectly through environmental degradation. In addition, many vehicles are abandoned in rugged terrain, where they tend to remain as it is too costly to retrieve them.

Motor vehicles contain hazardous fluids, gases, and heavy metals, posing a potential risk to the environment at disposal, irrespective of whether they are disposed of legitimately or illegally. When a vehicle is abandoned in the public domain, or deteriorates on private land, it has a negative impact on the environment. Negative environmental impact also occurs through poor depollution practices during recycling, limited materials recycling (implying greater use of resources), or by landfill contamination. Currently, approximately 128,000 passenger cars are removed from the New Zealand Motor Vehicle Register annually and these vehicles, if not correctly disposed of, have the potential to leak some 2.4 million litres of operating fluids into the environment. The environmental impacts at the various stages of disposal are termed negative environmental externalities, since they are costs that are not considered in the decision-making process of those involved in the disposal of end-of-life vehicles (ELVs) and for which society is not compensated, hence they become a cost to society as a whole.

[1] Figures in this paragraph are sourced from the Transport Registry Centre of the Land Transport Safety Authority (LTSA).

The Ministry for the Environment and Local Government New Zealand are committed to improving the management of waste disposal in New Zealand and reducing the associated externalities borne by society. Jointly they have compiled the New Zealand Waste Strategy, which is "a vision and an action plan for reducing and better managing waste . . . It sets out to solve the waste problem – rather than just transferring it to another place or another person" (Ministry for the Environment (MfE) 2002b, 2, 3). The Waste Strategy states that

> "Reducing New Zealand's waste is a cornerstone of government's commitment to sustainable development. ...This strategy covers solid, liquid and gaseous waste, and recognises that moving *towards zero waste and a sustainable New Zealand* is a long-term challenge. It has three core goals:
> - lowering the social costs and risks of waste
> - reducing the damage to the environment from waste generation and disposal
> - increasing economic benefit by more efficient use of materials" (MfE 2002a, 3).

The New Zealand Waste Strategy holds to "a sound legislative basis for waste minimisation and management, efficient pricing, high environmental standards, adequate and accessible information and efficient use of materials" (MfE 2002a, 3). It is in this context that recommendations to improve the management of motor vehicle disposal will be developed.

1.2 Problem Statement

The disposal of vehicles at the end of their useful life has raised important waste management issues in New Zealand. Firstly, the abandonment of an increasing number of ELVs on public and private property imposes major environmental and other costs on society. At issue here is a situation of institutional failure leading to vehicle abandonment. Secondly, for those vehicles brought in for recycling, there are environmental concerns regarding some of the current practices within the industry. The existence of these waste management issues leads to the conclusion that there are deficiencies in the current management of motor vehicle disposal in New Zealand. The substantially increasing number of vehicles entering the country combined with poor management of ELVs, will inevitably lead to an increase in the problems identified. It is timely, therefore, to address the weaknesses in the current

management of ELVs to avoid rising environmental and social costs to society from motor vehicle disposal.

1.3 Aim and Objectives

The aim of this research is to determine the economic and institutional factors that contribute to the ELV disposal problem in New Zealand in order to suggest policy changes that will reduce the environmental cost to society from motor vehicle disposal. The objectives required to achieve this aim are as follows:

1. To provide an outline of the current recycling and disposal practices for ELVs in New Zealand, including the environmental impacts associated with these and an estimate of the level of recycling achieved.
2. To quantify the number of vehicles abandoned each year in New Zealand and the associated cost imposed on local authorities.
3. To determine the factors contributing to vehicles being abandoned.
4. To evaluate the policy instruments that have been employed in New Zealand to reduce abandoned vehicle numbers.
5. To investigate ELV disposal policies and practices used in other countries.
6. To assess the lessons learned from policies and practices used overseas, in light of their compatibility with New Zealand's regulative tradition.
7. To make recommendations that will contribute to the management of motor vehicle disposal in New Zealand.

1.4 Importance of the Research

There has been no comprehensive study undertaken to examine the extent of the abandoned vehicle problem in New Zealand. At the micro level local authorities have implemented a variety of initiatives in an attempt to address the problem. At the macro level the Ministry for the Environment, the Land Transport Safety Authority, and the Ministry of Transport have expressed interest in a cohesive solution to the abandoned vehicle problem and to improve the management of New Zealand's ELVs. Suggestions to date have been piecemeal at best, and have failed to improve the overall management of ELVs.

This research will quantify the abandoned vehicle problem and identify shortfalls in the management of motor vehicle disposal in New Zealand. Assessment of the

policy instruments and practices used in some other countries will be carried out in terms of their effectiveness and their potential use in the New Zealand situation. From this, recommendations will be put forward to give policy makers tools to improve the management of ELV disposal and reduce the environmental cost to New Zealand society from motor vehicle disposal.

This research, in particular the evaluation of policy instruments and practices used in the management of ELVs, has relevance for other countries also wishing to reduce the externalities resulting from motor vehicle disposal. In addition, the analysis may have application for the management of the disposal of other waste streams.

1.5 Thesis Outline

An outline of this thesis is as follows. An overview of the literature on the economics of waste management is presented in Chapter Two. This includes a discussion of the failure of the economic system to deal with some waste in an optimal way, giving rise to the need for government intervention in waste management. Policy instruments used in the management of waste disposal are detailed.

In Chapter Three attention moves to the specific waste management issue which is the focus of this thesis, that of end-of-life vehicles. Presented here are the current practices for ELV disposal and the environmental and economic issues surrounding motor vehicle disposal.

The New Zealand context regarding ELVs is proffered in Chapter Four, as is a detailed description of the methodology undertaken in this investigation. The next three chapters (Chapters Five, Six, and Seven) present the results of the research. Current practices and the level of recycling undertaken in the New Zealand automobile recycling industry are discussed in Chapter Five. The magnitude of the abandoned vehicle problem in New Zealand is ascertained in Chapter Six along with the initiatives used to address the problem. An investigation is made into the factors which contribute to vehicles being abandoned with impunity. Presented in Chapter Seven are the current overseas management practices regarding ELV recycling and disposal, with the focus on four Western European countries.

In Chapter Eight there is a discussion of the policy options and institutional practices used overseas for the management of ELV disposal. These are examined in light of their effectiveness and their application to the New Zealand situation. The thesis is concluded in Chapter Nine, with recommendations made for the improved management of motor vehicle disposal in New Zealand.

Chapter Two

Economics of Waste Management

"Our economy is such that we "cannot afford" to take care of things: Labor is expensive, time is expensive, money is expensive, but materials – the stuff of creation – are so cheap that we cannot afford to take care of them."

Wendell Berry

2.1 Introduction

Waste, whether energy or matter, is a residual which requires disposal. It comes as a by-product of production or as redundant consumer goods, discarded by their end users (Turner 1995; Edward-Jones, Davies, and Hussain 2000). Economic growth in developed countries has led to a significant rise in per capita wealth and as a consequence, a rise in the use of consumer goods. After World War II, western economies, led by the United States, increasingly measured their economic well-being in terms of the production and sale of goods. With consumerism as the driver of an economy, the trend was toward planned obsolescence, both in design, and in durability. As durability declined, and as repairs became relatively more expensive and less convenient, consumers tended to replace goods, rather than repair them (Young 1991). The growing quantity of redundant consumer goods requiring disposal places increasing pressure on an environment whose capacity to assimilate waste is finite (Turner 1995). For this reason policy makers have become increasingly involved in waste management options from both an economic and environmental viewpoint.

Post-use motor vehicles are consumer goods for which disposal requires some management, since the market does not automatically dispose of vehicles in such as way as to internalise all costs. While some issues regarding waste management may be specific to the disposal of a particular redundant consumer good, many are common to all. In this chapter a review is presented of some of the literature concerning the economics of waste management and the cost to society associated with waste disposal. Key waste management options are waste minimisation (or source reduction), reuse, materials recycling, energy recovery, disposal by incineration (without energy recovery), and disposal to landfill (Edward-Jones, Davies, and Hussain 2000; [United Kingdom] Department of the Environment 1991). These options impose different financial costs and have varying environmental impact. It is necessary, therefore, for each society to determine the socially acceptable composition and overall quantity of waste for disposal, and then find the balance between waste reduction at source, recycling, and final disposal (Turner 1995). To achieve this balance, government intervention is often required. This review will set the context for the focus and discussion of the management alternatives for the disposal of motor vehicles.

The chapter is presented as follows. In Section 2.2 the externalities and social cost frequently resulting from waste disposal are outlined, with specific reference to motor vehicle disposal in Section 2.3. The concept of property rights to provide a framework for liabilities is introduced in Section 2.4. The role of the government in the management of externalities when property rights alone are insufficient is considered in Section 2.5. The optimum level of recycling in waste management decisions is discussed in Section 2.6 and in Section 2.7 the use of policy instruments in the management of waste disposal is examined.

2.2 Externalities and Social Cost

Environmental damage that results as a by-product of consumption or production, but the cost of which is not borne by the consumer or producer, is called an externality. "An externality exists whenever the welfare of some agent, either a firm or household, depends not only on his or her activities, but also on activities under the control of some other agent. . . . [This] occurs when an agent making a decision does not bear all of the consequences of his or her action" (Tietenberg 2000, 66). These effects can be positive or negative. A negative externality is an uncompensated harm to the welfare of others, or to the environment. Littering is one such example, which is virtually costless to the individual but imposes a cost on society in terms of environmental externalities and in clean-up costs (*ibid.*). There is potential for externalities to be present with all final waste disposal options, whether it is incineration, disposing to landfill, composting, chemical treatment or, illegal dumping. These externalities are negative, imposing social costs in the form of air pollution, surface and groundwater contamination from landfill leachate, health impacts, and disamenities like noise, smell, unsightliness (Turner 1995).

Many externalities related to waste disposal exhibit the non-rival, non-excludable characteristics of public goods or 'bads'.[1] The presence of air pollution in a city means that the air is polluted for all city dwellers and one resident's intake of that polluted air does not affect the availability or quality of the air inhaled by others in the city (Baumol and Oates 1988). Dumped household waste which affects others in

[1] The use of a good or resource is described as rival, when use of it by someone, excludes use by someone else. Non-exclusivity refers to the inability to prevent others from using the resource. Resources that are non-rival and non-exclusive, are known as public goods (Devlin and Grafton 1998).

terms of unsightliness, offensive odour, and health risk is also a public 'bad,' with the cost to one affected individual to clean up and dispose of it, likely being greater than the benefit they receive. The reduction of such externalities is itself a non-rival, non-excludable good. Both theory and reality concur that the market system does not yield a socially optimal level of waste (*ibid.*).[2]

When a negative externality occurs, the true social cost of producing the good is not borne by the producer.[3] Hence the market supply curve, based only on private costs, is too low. The result is artificially low commodity prices and over-production, compared to price and production levels that would occur if supply were based on social costs (Hackett 1998). This also applies to the production of waste. As long as the cost to dispose of waste remains an external cost, it provides an incentive to produce and consume wastefully. This outcome is inefficient with waste disposal levels too high and waste reduction and possibly recycling levels too low as the artificially cheap wasteful option is more attractive (Tietenberg 2000; Hackett 1998).

Traditionally, waste disposal has not reflected the true social cost. Landfill disposal of municipal solid waste (MSW) underestimates the cost of the environment's ability to assimilate waste. Neither has the cost of siting a replacement landfill been factored into MSW disposal costs. Most often households are charged only for the cost of the collection of MSW and the operating cost of the landfill. Furthermore, in many places the charge is not the marginal cost of each unit of waste disposed of, but rather a flat fee estimate of the average cost of all units of MSW generated in an area (Turner 1995). Without having to pay for each unit of waste generated therefore, a household has no financial incentive to reduce waste generation. This is beginning to change as industrial nations face increased difficulty in disposing of their waste. In the Netherlands, Germany, and the United States (either regionally or nationally) there is a physical shortage of environmentally acceptable sites for landfills, which is driving up the cost of waste disposal. In other countries the 'shortage' of waste disposal sites is the result of intense public opposition to the siting of new landfills or incinerators. This has become known as the NIMBY (Not-In-My-Back-Yard)

[2] Perman, Ma, and McGilvray (1996, 9) use "the phrase 'social optimality' to mean a situation in which social welfare is at its maximum value. . ." Optimality requires ethical judgement to be made.
[3] The social cost accounts for the cost to the producer and any cost borne by others,
i.e. social cost = private financial costs + full external costs.

syndrome (Turner 1995; Turner and Pearce 1994; Fishbein 1994) and it is also pushing up waste disposal costs.[4] As Field and Clark (1994, 21) say "the price of landfill increasingly is a reflection of scarcity, usually as a consequence of local and national policies." In Europe there is also the increasing pressure for countries and regions to adopt the 'proximity principle' disposing of their own waste rather than exporting it elsewhere (Turner 1995).[5] "Refuse can no longer be burned and dumped without intense scrutiny of the resulting environmental effects" (Fishbein 1994, 4).

External costs generated by waste disposal are a function of the composition of the waste stream, and the age, location, physical attributes, and scale of engineering of the disposal site. As information has increased there has been a heightened awareness by society of the external costs relating to waste disposal. In addition, there is sometimes a large divide between lay perception and expert opinion, particularly when it relates to health risk perceptions. For example, public opinion polls rank chemical waste concerns highly, whereas experts, when applying a relative-risk approach suggest that toxic chemical exposure is a low risk to health when compared with road accidents, poor diet, alcohol consumption, and smoking. These perceptions may be due to misinformation and the deeper social concern that the close proximity of waste disposal sites infringes on an individual's control of their immediate environment, lifestyle, and privacy (Turner 1995). Even if these perceptions are somewhat ill-perceived, they raise the social cost of waste disposal.

In summary, externalities frequently occur with waste disposal, as neither the producer nor the end-user is faced with the full cost of disposal of the consumer good. Whether it is through environmental degradation or the subsidised cost of collection and disposal, there is an increasing cost to society arising from the growing quantity of consumer goods requiring disposal.

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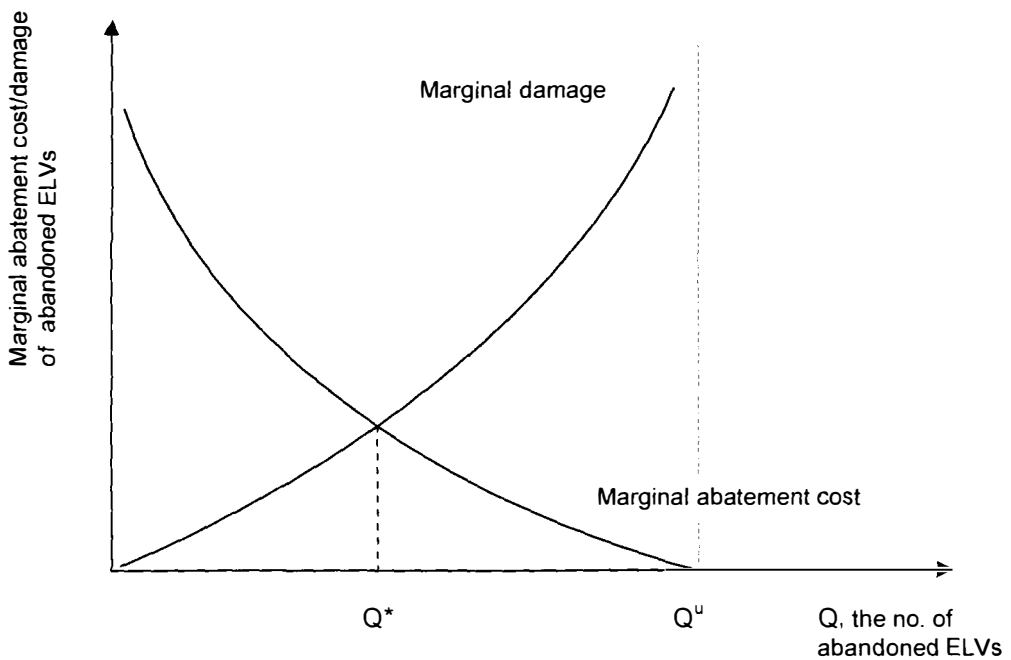
[4] Opposition to the siting of new landfills and incinerators is such that those who would hold local body office are unlikely to be voted in if they are in favour of proposed landfill sites. In Baden-Würtemburg, Germany, a proposal for an incinerator prompted 100,000 complaints and lawsuits (Fishbein 1994).

[5] Turner (1995) suggests that the reasoning comes from politically motivated concern that the communities receiving waste from elsewhere would have to endure excessive environmental costs. Turner maintains that the proximity principle should only be applied to materials for which there are no market opportunities, if economic efficiency is to be achieved.

2.3 Motor Vehicle Disposal and the Issue of Externalities

Consider the externalities arising from the disposal of end-of-life vehicles (ELVs). In New Zealand vehicles at the end of their useful life are brought in for recycling or are left abandoned on public and private property. Abandoned vehicles impose external costs on society. These costs take the form of visual pollution, concentrations of heavy metals in the environment, the release of hazardous fluids and gases into the environment, disturbed river water flows and the likely dumping of other waste at the same site. Hence the cost to society increases as more vehicles are abandoned. The cost to society today is the present value of the damage incurred now and in the future by vehicle abandonment, since the damage has both a flow and stock effect.[6] The disposal of ELVs through the recycling system can be considered in terms of damage alleviation. The number of ELVs not entering the recycling system can be thought of as pollution units and as such a basic pollution abatement model can be applied to the issue of ELV disposal. This is shown in Figure 2.1.

Figure 2.1: The Efficient Level of Vehicle Abandonment



Q^u = Uncontrolled level of ELVs abandoned on public/private property

Q^* = Optimal number of ELVs abandoned on public/private property

$Q^* - Q^u$ = Efficient level of abandoned vehicle abatement

[6] Abandoned vehicles are stock pollutants, which endure through time so that each additional abandoned vehicle adds to current and future stock levels causing on-going future damage for as long as it remains abandoned.

As shown in Figure 2.1, the marginal damage rises as the number of abandoned vehicles increases. Assume that Q^u is the uncontrolled level of ELVs abandoned on public and private property. As one moves left of Q^u, increasing abatement (i.e. reducing the number of abandoned vehicles), the marginal cost of abatement increases. The optimal number of abandoned vehicles is Q* where the marginal abatement cost equals the marginal damage incurred, with the efficient level of abandoned vehicle reduction being $Q^u - Q^*$.

Determination of an optimal level of abandoned vehicle reduction requires information on marginal costs of abatement (education and enforcement) and on the marginal benefits to society of reducing the number of abandoned vehicles. Obtaining this information, in particular the marginal abatement benefits is very difficult. The abatement benefits consist of different physical and visual pollution avoided, making too complex the task of calculating robust estimates of society's evaluation of the marginal abatement benefits.[7] In addition, the estimation of abatement benefits is dynamic and is likely to be increasing as it appears that society's tolerance for abandoned vehicles is decreasing. Without these estimates the socially optimal number of abandoned vehicles, Q* cannot be determined with any degree of accuracy.

For this research, rather than pursuing the path of determining the optimal level of abatement and policies to achieve this level, the starting point taken is that the current situation is sub-optimal, where the number of abandoned vehicles lies to the right of Q* (Figure 2.1), with society looking for ways to reduce the number of abandoned vehicles. This assumption is based on the rising number of vehicles being abandoned, the public outcry about the problem,[8] and the creative efforts of

[7] There are complications which make difficult the application of the contingent valuation method in estimating marginal abatement benefits. If people were asked how much they would be willing to pay to have an abandoned vehicle removed from their road they may well reply 'nothing' as currently when they see an abandoned vehicle they can notify the local authority and the vehicle is removed (if it is reasonably accessible), without the person necessarily realising that they as a ratepayer, are already paying for the vehicle's removal and disposal. Therefore the 'willingness to pay' question could only be applied to vehicles dumped in inaccessible places or on some private property, which would distort the abatement benefits.

[8] "Car-dumping on the rise" (Dominion Post 14 May 2004); "Abandoned cars left littering roadsides are costing ratepayers thousands of dollars a year" (New Zealand Herald 13 July 2004); "A car dumped on the bank of Ngaruroro River near Clive last week represents the tip of the iceberg for a problem plaguing Hawke's Bay" (Dominion Post 2 October 2004).

local authorities to deal with and reduce the number of abandoned vehicles. Given this starting point, an institutional approach will be used in the research to explore policies to reduce vehicle abandonment, and reduce pollution associated with the collection, dismantling and recycling of motor vehicles.

2.4 Property Rights

Underlying the issue of externalities is the concept of property rights. One way of dealing with externalities and ensuring consideration of external costs is through creation of, or clarification and enforcement of existing property rights. Property rights are "the rights or entitlements that accompany the ownership or control of assets . . . together with the associated duties that may be imposed by tradition, resource and environmental laws, planning restrictions, international agreements and licensing or leasing conditions" (Gilpin 2000, 94). In addition to property rights, societies usually adhere to norms of good behaviour. These are informal conventions which are widely practised within a community, for which active enforcement is not usually required. There is no clear demarcation between property rights and norms of good behaviour, but as attitudes change with regard to the environment, what may previously have been a norm may now be a defined and enforced property right (Wills 1997).[9]

There are three main characteristics of well-defined property rights. The first is exclusivity, in which all benefits and costs resulting from ownership of the good or resource reside with the owner. The second is transferability, the ability to transfer ownership of the right through voluntary exchange. The third is the enforceability of that right of ownership, to preclude encroachment by others. When property rights are clearly defined there is increased incentive for efficient use or trade of that resource, since failure to do so would translate into direct personal loss (Tietenberg 2000; Wills 1997).

A property right can be owned by an individual, a community, or by society, providing benefit to the owner or user, and necessitating respect of that right by

[9] Wills (1997) gives the example of lighting a backyard incinerator, which may have been the subject of a norm, but now comes under local authority regulations concerning fire lighting and household waste disposal.

others. How clearly this right is specified affects the use of that property, as does the cultural and institutional setting in which the property right resides (Devlin and Grafton 1998; Kuuluvainen and Tahvonen 1995).

Clearly defined property rights set the framework for liabilities. Coase (1960) suggested that if property rights are clearly defined it is possible to eliminate externalities through negotiation or bargaining, and arrive at an efficient resource allocation, regardless of who owns the property right.[10] The proviso being that transaction costs are zero (Turner and Opschoor 1994). Negotiation obviously necessitates a limited number of players (Baumol and Oates 1988). In reality, however, other factors work to stymie this process, like high transaction costs, difficulties in identifying all polluters and all sufferers, imperfect competition and threatening behaviour (Turner and Opschoor 1994; Edward-Jones, Davies, and Hussain 2000; US EPA 2001).

Consider two main liability approaches, negligence and strict liability. Under the first, the individual or firm is liable for all damage caused by their own negligence. As long as individuals (or firms) are taking the appropriate level of precautions they are not liable for any harm caused to the environment. While negligence-based rules do not adhere to the Polluter-Pays Principle (PPP), they focus on the trade-off between pollution and technology (or best practices), providing the incentive for the polluter to adopt less polluting practices. Under the second approach, the individual (or firm) is liable for all damage caused to others, regardless of the precautions taken (Sterner 2003; Devlin and Grafton 1998; Barde 1995). Here the individual or firm is required to pay the full social cost of pollution, which means that the "firms [and individuals] will take precautions to balance the cost of the last 'unit' of precaution with its expected liability" (Devlin and Grafton 1998, 115). Strict liability follows the PPP and encourages the use of practices and technologies that are least harmful to the environment.[11] In addition, it transfers from the regulator to individuals some

[10] "An outcome (a particular allocation of resources) is Pareto efficient if it is not possible to make anyone better off without making at least one other person worse off. In other words no transaction possibilities exist that are mutually beneficial to all parties affected by the transaction" (Perman, Ma, and McGilvray 1996, 8).

[11] Under the Comprehensive Environmental Response, Compensation, and Liability Act in the US, liability is retroactive, so that a company or individual can be held liable for past actions, including those that were legal at the time they occurred (US EPA 2001).

of the burden of monitoring compliance (*ibid.*). Sterner (2003, 116) suggests that "strict liability could be viewed as the ultimate policy instrument because it should lead to the internalization of all environmental damages and risks." He is, however, quick to point out that "its main drawbacks are that it increases the number of cases of litigation in the courts and perhaps generally hampers all economic activities that entail any risk" (Sterner 2003, 116). Barde (1995) and US EPA (2001) also warn of the difficulties inherent in the approach of compensation for damage caused. These include the identification of the direct cause of damage[12] of both victims and polluters, accurate estimation of damage costs, and enforcement that is straightforward and lacks excessive costs.

Economic theory suggests that well-defined rights and responsibilities for waste would result in waste disposal decisions being determined by market prices or by court settlement of differences. If rights were clearly defined illegal dumpers would be identified and penalised accordingly and those adversely affected by the dumping would be adequately compensated. Landfill and incinerator managers would be required to pay those in close proximity to bear possible negative externalities,[13] or be liable for compensation after the event, as determined by the legal system (Wills 1997). In many instances, however, the cost to write precise property laws, and monitor and enforce them, is just too high, as the difficulties are numerous. To measure the exact extent of environmental damage and harm to human health can be very difficult. To precisely determine the cause and to isolate the injurer can be problematic. Furthermore, the damage caused may only be evident years later, by which time the responsible party may no longer be in existence, and enforcement may not be possible. In addition, the cost to identify the offending party may be prohibitive, as may be the cost to compensate where there are many victims. Institutional barriers may also hinder property rights solutions via compensation payments.[14] Victims may be disadvantaged through an activity imposing relatively low costs on a very large number, so that litigation by an individual is uneconomic. Furthermore, using the legal system is an extremely costly method of inducing

[12] The 'burden of proof' required by law, is often interpreted as being more than 50 percent likely to have been the cause of the damage, which can be difficult to substantiate (US EPA 2001).
[13] For example, damage from landfill leachate, odour, and air pollution from an incinerator smokestack.
[14] For example, under bankruptcy law a firm that is declared bankrupt is likely to be unable to meet compensation payments (Wills 1997).

environmentally acceptable practices.[15] For these reasons liability rules are not usually recommended, however, they are useful when there is a small number of victims and injurers, and it is relatively uncomplicated to settle in court (Wills 1997; Devlin and Grafton 1998).

2.5 Role of Government

As outlined in Section 2.2 externalities can occur with all waste disposal decisions. Such situations arise because of the difficulty ensuring that the full cost of disposal is borne by the party disposing of the waste. In many instances these externalities inflict uncompensated harm on many. Since producers and consumers are not required to face the full cost of the disposal decision, the market produces too much waste. Market failure gives rise to the need for government intervention, and where waste disposal is concerned this has long been recognised by central and local government. City governing authorities have taken on the responsibility of solid waste disposal since the Industrial Revolution increased urbanisation, because with poor solid waste disposal practices, the health of the increasing urban community was threatened (Wills 1997).

Not all inefficiencies, however, are caused by market failure.

> "Institutional arrangements have historically treated solid waste management activities as a special category of resource use and disposal, reflecting close historical links with government. These arrangements have treated government waste management activities quite differently from equivalent private sector activities, sheltering them from market checks and balances on the efficiency of operation. This has enabled them to further political agendas besides providing a waste management service" (McNeill 1995, 5).

There is often a lack of transparency with the costs and benefits of local waste management activities and frequently households and firms are not required to face the marginal cost of waste disposal. This results in the private costs of waste disposal being borne by the community (McNeill 1995). In addition, political policy

[15] Davis (1988) refers to a study of the Love Canal toxic contamination disaster (near Buffalo, New York) which estimated that a cost of around $US4 million would have avoided the problem, alternatively clean-up costs would have been an estimated $US125 million, instead the cost through the courts for personal injury compensation exceeded $US2.5 billion.

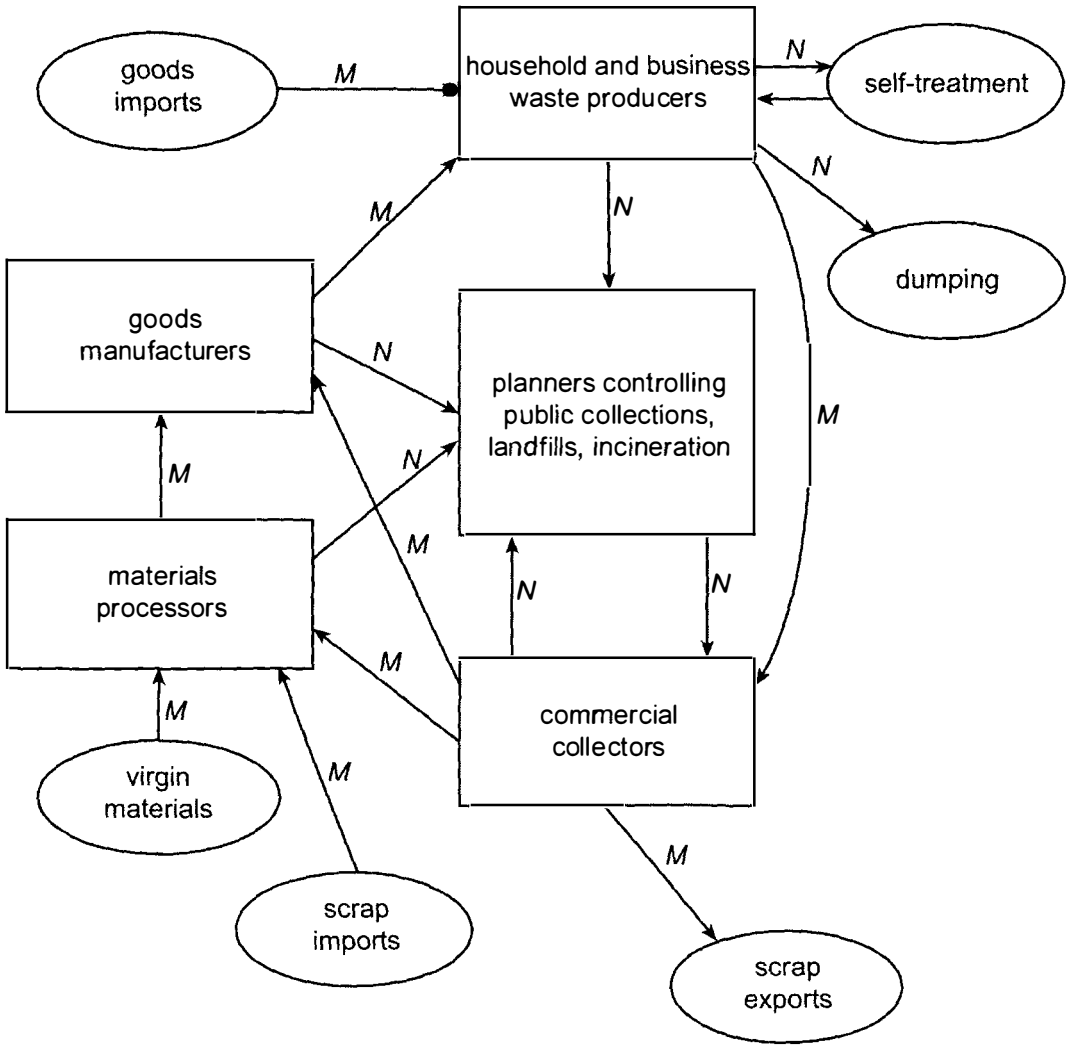
can be motivated by improper incentives.[16] Policy can be manipulated by special interest groups in order to increase the net benefit received by that group, with the outcome being that society as a whole experiences a net loss in welfare (Tietenberg 2000).

While it is acknowledged that there is a role for government in waste management, Turner (1995, 440) states that "what the policy makers should be searching for is the socially acceptable balance between waste minimization, . . . recycling and final disposal of waste. Policy makers then have a set of consequential decisions to make about the recycling or disposal of the waste that continues to arise." He advocates the use of an economic cost-benefit appraisal in the waste management decision-making process. To consider a recycling scheme for example, the total cost of such a scheme must be weighed against the least-cost disposal option. To implement the recycling option, the net social cost of the least-cost disposal option must be greater than the combined net social costs of the recycling and final disposal (*ibid.*).

One of the main decisions to be made with regard to solid waste disposal is whether it is to go into the recycling stream or directly into the waste management stream. There are a number of players that together will make that decision. Wills (1997) shows the interaction of these decision makers in Figure 2.2.[17] For the most part the decision makers are private individuals and firms making decisions based on price or on satisfaction gained from the use or disposal of a good. The other player is usually the local authority or regional waste management authority managing publicly-owned landfills, incinerators, and the collection of both waste and recyclables. With the non-market activities, decisions on waste disposal are frequently made by central and local government via collection availability, access to public landfills and incinerators, taxes for waste production, subsidies for recycling, rules, enforcement, and penalties regarding private incinerators and illegal dumping (*ibid.*). The level of recycling undertaken has most often been determined by market forces, and will be discussed more fully in the following section.

[16] Future reelection could be the primary motivation for policy makers keeping MSW collection charges artificially low.
[17] Wills' (1997) diagram is for Australia, however, these interactions could also apply for New Zealand.

Figure 2.2: The Solid Waste Network



Source: Wills (1997, 177).

M represents mainly market exchanges.
N depicts transfers determined primarily by non-market forces.

2.6 Recycling

Recycling refers to the reuse of a good or the reprocessing of it for further use. The priorities in terms of dismantling and recycling are reuse (product recycling), material recycling, and energy recovery. From an environmental viewpoint reuse is the best, since all the resources that went into the product during its manufacture are salvaged. Reuse provides economic advantages, though if it necessitates costly, non-destructive disassembly, these advantages can be questionable. Material recycling is the most common form of recycling, with only the materials being preserved, allowing for more inexpensive destructive disassembly. There are several different

levels of material recycling, the highest level being 'closed loop recycling.' In this instance a product is remanufactured into the same type of product without the addition of virgin material. Steel recycling is an example of this, however, completely closed loops are uncommon. If a product or substance cannot be contained in a closed loop it may be remanufactured into a lower grade substance (Altshuller, 1997). Using recycled materials in production reduces the overall demand for virgin materials. The last form of recycling is energy recovery, in which only the energy in the materials is salvaged, usually through incineration, methane extraction from landfills, and sometimes through pyrolysis.[18]

[United Kingdom] Department of the Environment (1991) identifies four inter-related activities that together constitute the recycling process. These are the collection and transportation of the waste for recycling, separation and clean-up prior to reprocessing, reprocessing into materials and products of some value, and lastly the marketing of these materials and products. The viability and success of recycling schemes are dependent on the economics and interaction of these four activities. Transportation costs may be significant, so too may separation and reprocessing costs. Recycling has also become complex with the increasing use of synthetic materials. Whereas once most products were made from a small number of materials, now goods frequently exhibit a combination of natural and synthetic, recyclable and nonrecyclable materials (Young 1991). Even if components are individually recyclable, often the cost to separate them is prohibitive. There is also the level of negative environmental impact from the recycling processes themselves (Turner and Opschoor 1994). Also vital to the long-term viability of recycling operations is the existence of secure and stable markets, however, in reality many markets for recyclable materials seem to be volatile and prone to failure (McNeill 1995; [United Kingdom] Department of the Environment 1991). This is primarily because these markets are in competition with the markets for virgin materials that supply substitutes, often of superior quality (for example, glass and plastics) (Field and Clark 1994). In comparison with recycling technology, the technology for extracting raw materials is well advanced. In addition, "these extraction processes deliver a product of high purity and known characteristics. These characteristics

[18] Pyrolysis is the thermal decomposition of organic materials at very high temperatures in an oxygen-free chamber (Seidl, 1995).

simplify the producer's task" (Bellmann and Khare 2000, 688). The tendency therefore, is to choose recycled materials in order to reduce costs, rather than as perfect substitute. Thus recycling is more likely to be profitable when the waste for recycling is "high mass, relatively low contamination, good homogeneity, [and in a] concentrated location" (Turner 1995, 449).

The extent of recycling, therefore, will be determined primarily by weighing the cost of recycling against the cost of not recycling. The cost to recycle includes the cost of collection (both in time and money), transportation, sorting and dismantling, reprocessing, use of virgin materials to improve quality, and environmental costs in reprocessing. The decision not to recycle implies cost to transport wastes, landfill costs[19] or other disposal costs,[20] associated environmental costs and the cost of virgin materials both in extraction and resource depletion (Wills 1997; Turner 1995). Some of these costs are underestimated or at worst ignored (Bellmann and Khare 1999). Also critical to the level of recycling that takes place is the attitude of both households and planners toward recycling, and the way waste collection and disposal is financed. Positive household attitudes and laws that may make recycling a requirement can result in an oversupply of recycled materials and a fall in price for those materials. Decisions by local authority planners regarding the availability and frequency of collection, the charge for waste disposal, and the collection of recyclables also impact on the level of recycling undertaken (Tietenberg 2000; Wills 1997).

While private sector participation in recycling is to make a profit, government involvement in recycling is concerned with achieving broader social outcomes associated with waste management. These are ostensibly to slow the depletion of scarce resources, reduce the quantity of waste requiring disposal in order to lessen the environmental and economic costs of waste disposal, and for job creation (McNeill 1995). Recycling, however, has become fashionable in developed countries with many individuals viewing recycling as a way of caring for the environment without having to commit to any real change in lifestyle (Young 1991).

[19] Including the cost of siting new landfills.
[20] Including illegal dumping with follow-up and ultimate disposal of the dumped waste.

This makes recycling a vote winner for those in public office and it can also be a vehicle for environmental groups to promote themselves.

McNeill (1995) looks at the ability of governments to achieve the broader social outcomes aspired to with regard to waste management. Municipal recycling schemes usually collect glass, aluminium, steel, paper, and plastics, none of which are scarce. Therefore it would seem that governments are no more targeting scarce resources than the market typically does. In terms of lessening environmental costs the materials mentioned above are all inert when disposed of in landfills, so that recycling of these materials will not improve the environmental impact from contaminating substances. Increasingly there is the collection of used oil for reuse,[21] though hazardous substances like cadmium and mercury (which are found in batteries) are not routinely included in municipal recycling collections. In countries where landfill space is at a premium an increased quantity of waste for recycling does extend the life of a landfill. Municipal recycling schemes though tend to target the recyclable part of the domestic waste stream, which is only a very small part of the total waste stream. In countries like New Zealand where there is no landfill crisis to defend diversion,[22] the cost of recycling is invariably higher than the alternative cost of landfilling that waste.[23] Municipal recycling schemes are generally regarded as an expensive way of increasing the life of landfills.[24] The job creation objective again is a costly one. In developed countries even unskilled labour is not cheap and is unlikely to be efficient to use for the collection of recyclables of marginal value.

Sterner (2003, 363) states that "a major problem with recycling in high-income countries is the lack of demand for recycled goods; without demand, this market mechanism does not work. . . .a government that insists on recycling may have to not only promote recycling but also establish and maintain a market for recycled

[21] Though this is not always available to individuals for their used oil.
[22] Except that of fighting public pressure for the location of new landfill sites.
[23] In 1993, recycling costs for five New Zealand cities ranged from $70 - $240 per tonne, while landfill costs for those five cities varied from $7.50 to $48 per tonne (McNeill 1995). In 2002 landfill disposal costs throughout New Zealand ranged from zero cost to $100 per tonne (MfE 2003).
[24] In the 1990s recycling in the US became an expected local government service along with water, sewerage, police and fire protection. In the earlier days of the recycling schemes, some were guaranteed subsidy for the first ten years by a state surcharge on income tax paid by businesses. Now that this has run its course, some local authorities are struggling to sustain the recycling programmes they have put in place (Arrandale 2000).

goods. Recycling should not be based on a preconception that resources are becoming scarce and that all resources have some inherent value that the market does not understand."

2.7 Policy Instruments

2.7.1 Introduction

It was acknowledged in Sections 2.2 and 2.5 that without intervention, waste disposal is likely to give rise to externalities. For decades policy makers in developed countries have searched for tools to slow environmental degradation and internalise externalities. In 1972 the Organisation for Economic Co-operation and Development (OECD) adopted the Polluter-Pays Principle (PPP) as a cornerstone economic principle on which to base environmental policy. The underlying axiom of the PPP is that the price of a good or service should reflect its full cost, including the cost to the environment and the cost to society. Consistent with the PPP are the use of both economic instruments, and regulations and standards which aim to eliminate the cost to society resulting from economic activity and from waste disposal (Turner and Opschoor 1994).

Historically environmental policy took the 'command-and-control' approach using direct regulation in the form of standards, bans, permits, and zoning. Economic theory, however, from as early as the 1920s has recognised that environmental degradation caused by negative externalities can be internalised using economic instruments. The first of these was a centrally imposed taxation system advocated by Pigou in 1920. The decentralised approach was introduced in the 1960s using property rights (Dales 1968) and bargaining between polluters and those suffering the effects of the pollution (Coase 1960). Since the late 1960s a range of economic instruments have been advocated and implemented. Initial focus was on the mitigation of harmful environmental effects (for example reducing emissions or discharges per unit of output), but slowly the emphasis has shifted to preventative approaches through technical innovation at the outset of the production process, which minimises the use of depletable resources, waste and pollution (Turner and Opschoor 1994).

In addition to regulatory and economic instruments, Turner and Opschoor (1994) identify suasive instruments as policy tools which can be used to influence decisions that impact the environment. Suasive instruments aim to encourage change in the attitudes and behaviour of the agents (both consumers and producers). Assuming that a 'rational' approach is taken, policy makers will choose instruments whose outcome is optimal in effectiveness (achieving the present environmental objectives), and in efficiency (in terms of current administrative costs and the ability to induce technological innovation). Instruments will also be chosen in the context of appropriateness for the economy in which they will operate. These three types of policy instruments are detailed in the following sections.

2.7.2 Regulatory instruments

Historically, the environment has had to rely on the instigation and enforcement of direct regulations for its protection (Gilpin 2000; Barde 1995; OECD 1993). This has meant the use of regulatory instruments (RIs) to change the set of options open to agents by prohibiting, restricting or, licensing activities carried out that impact the environment (Turner and Opschoor 1994). RIs include bans, permits, quotas, zonings, restrictions, and environmental standards. Gilpin (2000) and Barde (1995) identify four categories of environmental standards. The first are ambient quality standards which aim to protect the receiving environment (like the maximum allowable concentrates of nitrates in drinking water), and the second are emission standards which set maximum allowable discharge of pollutants from a point source into the air or water. Thirdly, there are process standards governing production processes and restricting emissions from that process, and fourthly are the product standards, specifying the properties of potentially polluting products like chemicals, fertilizers, fuels and motor vehicles. RIs can be used where the source of pollution is identifiable and can be measured relatively easily. US EPA (2001) testifies that RIs have achieved a great deal in the US and as a result, despite increased population and economic growth, ambient air and water quality has measurably improved over the last thirty years.

An advantage of using RIs is that societies have usually had long-standing experience using direct regulations in other areas that cause public concern, such as health and safety. Thus they are more readily understood and accepted. In addition.

if RIs are effectively enforced, hazards and irreversible environmental effects can be avoided (Barde 1995). RIs are also a useful tool where the parties adversely affected by the polluting activity are numerous. For an environmental policy approach policy makers often prefer RIs, however, this may not be for the best reasons. Instigating this type of approach can be a source of influence and power. Environmental pressure groups and the public themselves often exert pressure for regulations as they are perceived as more likely to ensure environmental protection. Labour unions often prefer them over economic instruments as with the latter there is a greater possibility of more directly leading to job losses (OECD 1993).

Critics of RIs have cited a number of weaknesses in the direct regulatory approach. Firstly, one of the main weaknesses of RIs cited by environmental economists, is that they do not lead to economically efficient pollution abatement. There is no dynamic efficiency as technology or process standards can often mean that firms will stay with the approved method of compliance, stifling technological advance and innovation (US EPA 2001). Secondly, once standards are in place there is no flexibility for the polluter, they must comply or face the penalty (Edward-Jones, Davies, and Hussain 2000; Opschoor and Vos 1989). Thirdly, the 'command-and-control' approach is often complex and costly to administer and enforcement is hampered by a lack of resources (Repetto, Dower, Jenkins, and Geoghegan 1992). Fourthly, non-compliance fees are often low, so that risking non-compliance is preferred over paying the marginal cost of pollution abatement. Fifthly, because regulations and standards are static and negotiations are usually painstaking and slow, regulations are not likely to change quickly (Barde 1995).[25] Lastly, as mentioned above, RIs may be subject to bargaining and lobbying by pressure groups and industry.

In the area of waste management some manufactured goods must meet a minimum requirement of secondary materials as a proportion of total materials used. These goods have an imposed recycled content standard.[26] Palmer and Walls (1997)

[25] Gilpin (2000) states that environmental regulatory reform is taking place in OECD countries to simplify administrative procedures and offer increased flexibility in achieving the standards set.
[26] In the United States 13 states have recycled contents standards for the production of newsprint, varying from 23 to 50 percent. In another example, the federal government along with many states

develop a theoretical model to examine the efficiency of recycled contents standards, finding that the standard in isolation will not generate the optimal level of output and waste, and can result in inefficient use of other factors of production (for example labour).

More commonly used in the regulatory approach to waste management are recycling standards (targets) or specific waste-reduction to landfill targets. France has set a 50 percent recycling target (undated), by either materials recycling or energy recovery (Turner and Pearce 1994), the Netherlands has a goal of 42 percent of plastics to be recycled (Kinnaman and Fullerton 1999). Many states in the United States also set targets for recycling of MSW, fourteen of which had targets of 50 percent of MSW to be reused or recycled by 2000 or 2001. California had a 50 percent mandate for 2000, with the law including a fine of $US10,000 per day for a local authority failing to recycle, reuse, or divert from landfilling 50 percent of the waste stream. As a consequence local authorities and private waste management firms collectively invested hundreds of millions of dollars in recycling systems, diverting millions of tons of MSW from landfills, but failed to meet the recycling target. Many criticised the seemingly arbitrary targets which were not necessarily backed up by cost-benefit or other economic analysis (Arrandale 2000). These 50 percent targets are far in excess of Alter's (1991) belief that recycling targets much above 25 percent of MSW cannot be achieved.[27] In some American states local authorities have made it illegal to dispose of recyclable waste in their garbage, but Kinnaman and Fullerton (1997) found that due to a lack of enforcement, mandatory recycling ordinances had little effect on recycling quantities or on the volume of MSW.[28] The social cost of MSW is decided by both product choice and the disposal decision, therefore the mandatory separation of household waste for recycling is not going to achieve an efficient outcome (Turner 1995), as RIs distort the incentives underlying consumer and producer behaviour (Menell 1990). For example, a directive to consumers to separate glass containers for recycling, may encourage consumers to choose goods

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have stipulated that government agencies buy products which have recycled contents standards (Palmer and Walls 1997).

[27] "Once it is mandated that materials are separated, there is no assurance that they can be sold, hence recycled" (Alter 1991, 11).

[28] Violators are often just issued a written warning, and even for those local authorities whose violators are fined, the quantity of recycling achieved is no greater than in areas where the local authority does not fine.

packaged in materials other than glass to avoid having to separate their waste stream. Disposal of the alternative packaging, however, may incur a greater cost to society than glass disposal (*ibid.*).

Extended producer responsibility (EPR) as a response to waste management, is gaining popularity in Europe, Korea, Taiwan, and Japan. Field and Clark (1994, 18) describe EPR as "the idea that the producer's environmental consciousness should extend beyond the factory walls and into a stewardship of the product throughout its life cycle." As such EPR shifts the responsibility of the recycling and disposal of products at the end of their useful life away from the consumer and local government back upstream to producers, thus internalising disposal costs and providing incentive to design with recycling and disposal in mind (Fishbein 1998). EPR was initiated in Germany through the Packaging Ordinance of 1991, which mandated that producers be responsible for managing packaging waste, and that no public money be used for this purpose. With pressure on landfill capacity, packaging was the initial target for implementation of EPR as packaging constituted roughly one-third by weight and one-half by volume of MSW. In response, industry in Germany established a non-profit company Duales System Deutschland (DSD). DSD licenses its green dot logo for a fee, and packaging displaying the green dot is collected, separated, and directed to recyclers by the DSD. Fees paid to the DSD by the producer using the packaging are based on the packaging material and the weight. The DSD runs free household collections for packaging. As a result of the green dot scheme, green dot packaging decreased by 14 percent from 1991 to 1995, and total packaging in Germany decreased 7 percent, while packaging in the United States continued to increase during the same period (*ibid.*). The DSD, however, was widely criticised for its very high operating cost (Turner 1995).[29]

In 1994 the European Union (EU) adopted the EPR approach passing a Packaging Directive to coordinate the policies of the Member States. By 1998, twenty-eight countries had take-back laws for packaging. The concept of producer take-back has now been extended to include electric and electronic equipment, and end-of-life

[29] In 1996 the scheme cost $US2.2 billion for the 5.5 million metric tons ($US400 per metric ton) which meant that on a per capita basis, each person in Germany was paying around $US28 per year for the system (Fishbein 1998).

vehicles (Fishbein 1998). EPR policies extend producer responsibility to the post-consumer stage, either physically taking back their product or, paying a third party to do so. There is usually government involvement to the extent of setting recycling rates, defining what is acceptable as recycling, and requiring reporting. Proponents of EPR promote it as a powerful incentive to design less wastefully, and increase the potential for reuse and recycling as it internalises waste management costs and encourages innovation (*ibid.*).

In North America extended product responsibility or product stewardship is preferred over EPR. Product stewardship is a product-focused approach to environmental protection, which makes waste disposal the shared responsibility of the government, and of all those connected with the product over its life cycle (US EPA n.d.). Whereas EPR puts all the responsibility on the manufacturer, product stewardship relies also on retailers, consumers, and the existing waste management infrastructure to contribute to the most cost-effective disposal solution (*ibid.*). Further, the responsibility may not be fiscal responsibility, but instead may take the form of providing information and education (Fishbein 1998).

To a large extent the magnitude of the environmental impact of a product lies with the producer in terms of the nature of the inputs used, design to aid reuse and recyclability, and possibly the instigation of take-back schemes. The retailer is the link between the producer and the consumer, and has some responsibility in supporting the more environmentally responsible producer, educating the consumer on environmentally preferable products, and accepting the return of products for recycling. Responsibility lies with the consumer to choose the environmentally preferable product and to recycle or dispose of it in a way that is least harmful to the environment. Therefore it is the responsibility of the consumer to close the loop. Product stewardship objectives have been integrated into the solid waste management plans of some American states. The United States EPA's product stewardship programme has supported extended product responsibility projects for carpet, packaging, building products, electronics, tyres, batteries, and mercury (US EPA n.d.).

British Columbia has implemented product stewardship programmes for waste reduction, and environmentally sound disposal of scrap tyres, lead-acid batteries, used oil, paint, pharmaceuticals, solvents, fuels, pesticides, and beverage containers (Galimberti 2002). Under the Post Consumer Residual Stewardship Program Regulation, annual reporting is required as is an advertising and education programme, and penalties are imposed for non-compliance. Galimberti (2002, 21) provides "seven key principles for developing stewardship programs:

1. Province-wide program.
2. Industry funded and operated.
3. Clear goals and targets.
4. Government audits for proof of performance.
5. Uses a pollution prevention approach.
6. Industry ensures public convenience.
7. Public information and consumer education."

The British Columbia product stewardship programmes have been popular with the public and highly successful. The programmes have eliminated entry into the environment of the most toxic household product streams, and they have contributed to job creation.

2.7.3 Economic instruments

Another way to influence decisions that impact the environment is to use economic incentives to alter the cost and/or benefits faced by agents. Behaviour can be manipulated to arrive at an improved environmental outcome by making options more or less financially rewarding by granting subsidies, applying charges or taxes or, implementing deposit-refund systems. These are referred to as economic instruments (EIs), and to some degree they internalise environmental costs (Opschoor and Vos 1989). Where environmental costs have been borne by society, the market faces price distortions which can be corrected through the use of EIs (Turner and Opschoor 1994). EIs also give producers and consumers a certain freedom as to the ways in which they will reduce negative environmental impact (Repetto *et al.* 1992). Up until the mid 1970's very little use was made of EIs, however, since that time they have gained popularity. In a 1987-88 OECD survey throughout fourteen countries, observation was made of 150 instances of EIs being

used. In a second survey conducted five years later the incidence of EIs used had doubled (Barde 1995).[30]

EIs have appeal for use in waste management because altering the cost of one disposal route (namely recycling, incineration or, landfilling) will affect the quantity taken by that route, while also affecting the other options (Turner 1995). This can stimulate desired behaviour, such as increased recycling, source reduction, and waste minimisation. In addition, the use of EIs can generate income to finance collection, storage, and processing of waste, and clean-up of hazardous waste sites. EIs used in waste management are waste disposal taxes or user charges, product charges, administrative charges, subsidies, deposit-refund systems, marketable permits, and materials levies (Turner and Pearce 1994).

Many studies, both theoretical and quantitative, have investigated the effect of EIs on solid waste disposal. The implementation of a user fee (or tax) is the most direct approach to internalising any external costs incurred disposing of a bag of household waste. In many communities, however, households pay for waste collection through a flat fee as part of their property taxes or utility bills. Where this is the case the household faces a zero cost for each additional bag of waste collected even though the marginal cost of collection and disposal of a bag of refuse is positive. This means that there is no financial incentive for a household to reduce the quantity of waste generated or to increase the volume of materials recycled. Thus a flat fee for household waste results in the volume of waste generated being greater than the social optimum (Dinan 1993; Palmer and Walls 1997). Furthermore, the producer's decisions regarding waste production and use of recycled materials are unaffected by this policy. In essence a flat-fee for waste disposal indirectly subsidises the use of virgin materials since the true cost of the virgin material is not being imposed on the producer (Dinan 1993).

It is clearly better to charge households (and firms) for the volume of waste they generate, and increasingly local authorities in the United States are using unit-based

[30] The second survey found that about 40 percent of these EIs were product taxes, 35 percent were emissions taxes or charges, 20 percent were deposit-refund systems, and the remaining 5 percent were tradable permits and other EIs (Barde 1995).

pricing for their garbage collection to help reduce waste disposal.[31] When households face the full social cost of their disposal decisions, theory shows that they will choose efficient levels of recycling, composting, source-reduction of waste, and waste disposal. Further, the full social cost of a bag of garbage is the only estimate required to set the policy (Kinnaman and Fullerton 1999).

A tax is the least-cost route to achieving total waste reduction, since households for whom waste reduction is less costly will reduce waste by a greater amount than households for whom it is more costly. Empirical studies show that unit pricing on household waste collection is effective in reducing the quantity of waste for disposal (Kinnaman and Fullerton 2000; Palmer and Walls 1999; Van Houtven and Morris 1999; Hong 1999; Miranda and Aldy 1998; Fullerton and Kinnaman 1996). Estimates of the extent of this waste reduction vary.[32] Miranda and Aldy (1998) note that in response to unit pricing, households modify their behaviour regarding waste, in two stages. Initial behaviour is concentrated on diverting waste to recycling and other waste management options, and it is not until the unit-pricing programme has been operating for several years that there is growing evidence of source reduction behaviour. If the desired outcome of the per unit charge on waste is aimed at increasing recycling, studies by Jenkins, Martinez, Palmer, and Podolsky (2003) and by Reschovsky and Stone (1994) found that curb-side recycling collection provides a stronger incentive to recycle than does unit-based pricing of household refuse.[33] Kinnaman and Fullerton's (2000) study did establish a positive cross-price effect of

[31] A study by Miranda and Bynym (1999) is cited in Kinnaman and Fullerton (1999) stating that approximately 4,000 communities in the US operate some form of unit-based pricing for disposal of garbage.

[32] Kinnaman and Fullerton's (2000) study using data from 114 communities observed that the imposition of a $US1.00 fee per bag of household garbage can reduce the quantity of garbage collected from households by 44 percent (412 lbs per person per year). Palmer and Walls (1999) provide a rough estimate of a typical cost introduction of $US1.00 per 32-gallon bag of garbage (to all single-unit dwellers in the United States), to yield a reduction of household waste in the United States by about 21.6 percent and a decrease in total MSW by about 13 percent. Miranda and Aldy (1998) observed that the largest waste reduction occurred where unit pricing was higher and minimum waste collection containers were smaller. If the waste collection cans were too large, quantities of waste for disposal actually increased (Nestor and Podolsky 1998). Hong (1999) observed that in Korea the adoption of a unit-pricing system (based on volume) led to a 17.8 percent fall in solid waste generation, and an increase in recycling of 26.8 percent. This result needs qualification as an aggressive recycling programme accompanied the unit-pricing system. When the price-incentive effects were separated out they made only a small impact on the amount of waste generated. This finding was repeated in Hong and Adams (1999).

[33] Jenkins *et al.* (2003) also found that curbside recycling provides a stronger incentive to recycle than do 'drop-off' programmes. In addition, recycling by households tends to increase over time, suggesting that there is no loss of enthusiasm for recycling, but rather it becomes a habit.

unit-priced waste collection on recycling, but of the 412 lbs per person per year reduction in garbage the observed increase in the quantity of recycled materials was only 30 lbs per person per year.

Unit pricing of waste disposal does result in undesirable waste diversion to commercial dumpsters, charitable organisations' drop-off locations,[34] and littering or dumping (Miranda and Aldy 1998).[35] Miranda and Aldy (1998), in their study of unit pricing of household solid waste, observed that in one community since the introduction of unit pricing, the quantity of illegally dumped waste had doubled. In this community, however, in addition to the unit pricing for waste collection, households also faced a charge for their recycling collection. Further, there had been no collection service for yard waste for some years and education regarding waste reduction was minimal.[36]

Illegal dumping of bulky items too large for the usual household garbage collection service does occur. In response many communities provide households with an opportunity to dispose of these bulk waste items (like appliances, tyres, furniture, Christmas trees) periodically, requiring households to attach a city waste sticker to such items (Miranda and Aldy 1998). As long as it is reasonably easy to illegally dispose of waste, user charges may not be the best solution for bulky or hazardous waste disposal. In these instances the disadvantage of a user tax is that non-compliance could induce a significant social cost. To counter illegal disposal, strict enforcement and hefty fines could be used to raise the cost of illegal dumping and so increase the success of a user tax for waste disposal (*ibid.*). Enforcement is, however, very costly and onerous (Palmer and Walls 1999). The literature highlights several other problems that can arise with the enforcing of a direct tax. It may transpire that the administrative costs of implementing the scheme actually exceed the social

[34] Some organisations estimate that they dispose of 25 to 50 percent of goods donated (Miranda and Aldy 1998).

[35] Waste diversion in the first two instances transfers the collection costs from households to commercial and charitable institutions. and are less costly to society than dumping which incurs aesthetic and clean-up costs.

[36] Fullerton and Kinnaman's 1996 study estimated that of the total reduction in curb side waste disposal about 38 percent was additional curb side recycling, between 28 and 43 percent was likely to have been illegally dumped. and the remainder was likely to be explained by increased composting.

benefits.[37] Wills (1997) points out that a direct charge for household waste can be relatively costly to implement for small quantities of solid waste, and so its worth may be debatable where landfill and transport costs are low. Furthermore, MSW disposal fees have a regressive effect on income groups, and public opposition could make policy makers with re-election in mind reluctant to choose such a policy instrument (Barde 1995).

Landfill levies are another form of user charge for waste disposal, and should reflect the external costs associated with the landfill.[38] Most OECD countries impose a levy for waste disposal at landfills (Gilpin 2000). This is usually to encourage the reduction of waste for disposal.[39] Levies are also imposed to generate income which is often used to fund efforts to reduce and manage solid waste disposal. The imposition of levies may also induce other outcomes like the transporting of waste to another site with lower fees, and the increase in illegal dumping of waste (US EPA 2001; Gilpin 2000).

In some instances a charge is included in the price of a good for which an organised system of disposal is in place. This product charge is an output tax or charge on the end-product and should be priced to reflect the potential pollution and waste disposal impact on the environment. There can be partial or complete exemption for goods produced partially or solely from recycled materials (Turner and Pearce 1994; Opschoor and Vos 1989). Product charges in relation to waste management are numerous. Various countries have product taxes on beverage containers, industrial

[37] Kinnaman and Fullerton (1999) illustrate this using an example from their own previous study (Fullerton and Kinnaman 1996) and comparing it with the findings of Jenkins (1993). Jenkins (1993) found that pricing garbage at its marginal social cost could reduce the quantity of household waste. With data from twelve cities using direct pricing for garbage collection, he calculated that reduced household waste disposal could increase welfare by as much as $US650 million annually, around $US3 per person per year. In Fullerton and Kinnaman's (1996) study into the household garbage collection system in Charlottesville, Virginia, where only bags displaying a sticker would be collected, they estimated that the administrative costs of the sticker (printing, distributing, and accounting), could be greater than the $US 3 per person per year.

[38] Hazardous waste landfill fees are usually significantly higher than non-hazardous waste and US EPA (2001) states that the quantity of hazardous waste to landfills has fallen in the last 10 to 20 years. They state that this may not be due solely to the landfill fees as hazardous waste generation is also taxed.

[39] Though the evidence does not clearly show a significant incentive effect US EPA (2001). The reason for this is that most landfill charges are subsidised by rates and are therefore artificially low, making waste reduction more expensive than disposal (Office of the Parliamentary Commissioner for the Environment 1993).

packaging, plastic shopping bags,[40] pesticides, pharmaceutical products, paper, throwaway razors and cameras, batteries (Gilpin 2000), lubricant oil (Opschoor and Vos 1989), and tyres (US EPA 2001; Smith and Vos 1997). A final waste management charge comes in the form of administrative charges, such as disposal site licences. These charges are payment for authorisation or registration and for on-going monitoring of the facility (Turner and Pearce 1994; Opschoor and Vos 1989).

US EPA (2001, 31) suggests that charges and taxes tend to encourage technological innovation, and are "effective when sources are numerous and damage per unit of pollution varies little with the quantity of pollution." They also raise revenue and product charges are usually administratively straightforward. With charges and taxes, however, environmental effects are uncertain, also user charges require monitoring data, and there is the potential for distributional effects.

Dobbs (1991) addresses the incentive for the illegal dumping of solid waste when legitimate disposal is taxed. He identifies two separate social costs incurred with waste disposal. One occurs with the correct disposal of solid waste and the other arises from illegal dumping in the form of pollution, visual disamenity, clean up, and disposal. In theory a 'pigovian tax' should be employed for each, but this is not practical for dumped waste. Dobbs' preference is for a disposal tax (on the product), in conjunction with a subsidy (or negative user charge) provided when the used product is returned into the collection system for the appropriate recycling or disposal. The disposal tax should be set at the social cost of dumping less the social cost of legitimate disposal. A disposal tax combined with a lesser subsidy to the end-user is in essence a deposit-refund where the refund is only partial.[41] The deposit-refund system is used to stimulate recycling or reuse, and environmentally sound disposal. Consequently it leads to a reduction of the waste stream, of resource use, and of littering and dumping. It can be a more cost-effective way of reducing waste than regulations or recycling subsidies, but if the deposit-refund scheme is costly to operate in terms of handling, storage, transportation and administrative costs, it may impose net costs on society. Therefore it is important to estimate these

[40] Implementation of this product charge in Italy reduced the consumption of plastic shopping bags by 20 to 30 percent almost immediately (Opschoor, de Savornin Lohman, and Vos 1994).
[41] The true deposit-refund where the subsidy equals the tax. is just a special case.

costs before considering a deposit-refund system (US EPA 2001; Barde 1995; Turner and Pearce 1994; Opschoor and Vos 1989).[42] The performance of the deposit-refund system is usually measured by the percentage return of a good (Opschoor and Vos 1989).

Deposit-refund systems may be market-generated or government-initiated systems.[43] When such a system is market-generated, businesses offer a refund because either the reuse value of the good is higher than the refund plus the expected handling costs or, because the offer of a refund stimulates an increase in demand for the product which generates revenue to offset the cost of disposal. For government-initiated schemes the deposit needs to be related to the environmental damage from product disposal, and the consumer receives the refund plus the net reuse value of the scrap good. If the good is being returned to the producer and the net reuse value is very low or negative, then there is incentive for businesses to make returning of the used good inconvenient so that the firm can retain the income from the deposit. This would require government intervention with the deposit being paid to the government and then the government paying the refund (including the reuse value) to the consumer (Turner and Pearce 1994). Deposit-refund systems have been applied in different countries to car hulks,[44] car batteries, refrigerators, glass bottles, plastic containers, pesticide containers,[45] metal cans,[46] and beverage containers[47] (Barde 1995; Tietenberg 2000). It is interesting to note the evidence presented by Turner and Pearce (1994) from actual deposit-refund schemes (usually for beverage containers), shows only a small decrease in both littering and in the volume of waste for disposal. In addition, return rates bear no relationship with the size of the deposit, but seem rather to relate to the number of collection points, how widely

[42] Though Dobbs (1991) argues that if the environment is an increasingly scarce resource, then marginal social costs must be rising over time. The gains from his proposed solution must, therefore, increase relative to the administrative costs associated with it.
[43] In the US, examples of deposit-refund schemes operated by industry are those for beer kegs, large paper drums, propane gas containers, and in some areas pesticide containers and beer bottles (US EPA 2001).
[44] In Sweden and Norway. Sweden's approach will be examined in detail in Chapter Seven of this thesis.
[45] These contain contaminating residues, therefore offering a refund provides incentive for returning them for reuse which also reduces contamination of soil and water (Tietenberg 2000).
[46] Over 50 percent of aluminium drink cans in the US are now being recycled. The high demand for aluminium scrap has been a major contributing factor, but so also have deposit-refund systems (Tietenberg 2000).
[47] In Australia, Canada, France, Germany, and Switzerland (Kinnaman and Fullerton 1999).

known, and how convenient they are. Some schemes are very costly to operate and cast doubt on their net benefit to society. The US EPA (2001, 19) suggest that the deposit-refund approach is "best suited for products whose disposal is difficult to monitor and potentially harmful to the environment."

Subsidies are another economic instrument used to encourage good environmental practices and are usually provided in the form of grants, soft loans or, tax allowances. Grants are direct financial payments for specified measures taken by polluters to reduce levels of pollution or avoid it altogether, and are sometimes financed by environmental charges or ecotaxes (US EPA 2001; Smith and Vos 1997; Opschoor and Vos 1989). Soft loans are loans offered at interest rates set below the market rate and tax allowances are usually in the form of tax exemptions, rebates, or accelerated depreciation. Subsidies are often limited to transitional periods and are intended to "create better conditions for market penetration of new technology" (Smith and Vos 1997, 17).

In some countries the recycling industry has been the recipient of grants, loans, and tax allowances. In Europe, in order to encourage the recycling of waste oil, virgin lubricating oils are taxed, which provides both a disincentive for the use of virgin oil, and the revenue to subsidise the recycling of waste oil. The outcome has been the collection of up to 65 percent of used oil in many European countries. In contrast, only about 15 percent of used oil is collected in the United States where there is no subsidy for collection and recycling (Tietenberg 2000). In the United States grant or loan programmes operate with regard to recycling in at least twenty-four states. Some go to municipalities to fund recycling activities while others are directed toward businesses that recycle used products.[48] Loans are provided for clean-up of hazardous waste sites, and in the United States where state or local governments provide debt financing for waste disposal facilities, the Federal Government allows interest earned from the debt issued, to be tax-free (US EPA 2001). Subsidies like those to municipalities for recycling activities are politically popular but may have high budgetary cost, uncertain environmental effects, and subsidising the activity

[48] For example, tyres used for new products, road base, and energy recovery; waste gypsum used in new wallboard; shipping boxes used in custom packaging (US EPA 2001).

may result in an oversupply of recycled materials (US EPA 2001; Kinnaman and Fullerton 1999).

Another EI used is the marketable or tradable permit, such as a waste disposal permit distributed or sold by the government to interested parties who can then trade them among themselves. A firm (or household) buys or receives its waste-disposal permits, and if it can reduce its waste to less than the quantity allowed by the permits or coupons, it is left with marketable waste-disposal permits (Barde 1995). Development of a permit market requires compliance with the scheme by the parties involved, certainty surrounding the scheme so that parties are willing to trade in permits, transaction costs low enough to allow permit transactions, and a competitive permits market (Turner and Pearce 1994). US EPA (2001) adds that the monitoring of pollution or waste must be well implemented and the commodity to be traded must be quantifiable. Theory indicates that this approach provides flexibility and is potentially economically efficient, but this is not necessarily the case in reality with trades fewer and cost savings smaller than theory would suggest (*ibid.*).

EIs have the potential to be effective, efficient, flexible, and provide incentives for innovation. Furthermore, the enforcement required should be less than for RIs. EIs may directly affect cost and price levels through instruments like deposit-refund systems, charges levied on production processes (emissions and discharge charges, input charges) or, on the products themselves (product charges). Alternatively EIs may indirectly affect costs and benefits through subsidies, soft loans, tax incentives, or compliance incentives for environmentally clean technologies or sustainable resource-use practices. Some EIs also have the ability to come in behind regulations to create markets through tradable permits, and quota auctioning (Turner and Opschoor 1994).

2.7.4 Suasive instruments

The third policy tool used to influence decision making that impacts the environment, is the use of suasive instruments. Suasive instruments (SIs) seek to alter the perceptions, priorities, and preferences of the agent, so that the agent voluntarily internalises the environmental costs of the decision s/he makes. SIs take the form of education and training, information sharing (for example, labelling,

public disclosure, or rating and certification (Sterner 2003)), social pressure, negotiation, and other forms of 'moral suasion'. There is flexibility with this type of instrument which is often used in conjunction with RIs and EIs (Turner and Opschoor 1994; Opschoor and Vos 1989).

Melosi (2000) says that in the early 1900s juvenile street cleaning leagues were organised in cities in the United States to teach their parents and others about sanitation and to inspire a new personal commitment and pride in keeping the city streets clean. In developed countries in the last decade many resources have been directed into education programmes promoting waste reduction and recycling. In New Zealand, this education begins with primary schools teaching on the environment, pollution, waste, and recycling, and is seen as an integral part of learning.[49] Regional, city, and district councils produce resources providing information for the general public on recycling, waste reduction, and correct waste disposal. Their material also targets specific groups like secondary and primary schools, homeowners, farmers, businesses, industries, recreational and sports groups, and can be found on the Environmental Education Directory of New Zealand web site (EEDNZ 2003). Miranda and Aldy (1998) report that in coordination with the introduction of their unit-priced waste collection schemes, most communities conducted education programmes (advertising through the local media, informational brochures mailed to all residents and presentation of the scheme at public meetings). The success of unit-pricing (particularly in urban areas) has been attributed both to education programmes and the availability of diversion alternatives (Miranda and Aldy 1998).

Negotiations seeking 'voluntary' agreements between industry and government generally provide increased flexibility, and because of the self-commitment of industry lead to a greater level of compliance than for RIs without negotiation and agreement (Opschoor and Vos 1989). Voluntary agreements are contracts between industry and government usually setting environmental goals within a stated time-frame.[50] Industry sometimes takes voluntary action in preference to government

[49] There is a wealth of reading material on these topics for primary school children.
[50] For example, a French industrial consortium of automobile manufacturers, dismantlers and scrapping firms signed an agreement with the French Ministry of the Environment in 1993

intervention, and transparency between the negotiating parties means that there is less uncertainty for industry. From the government's standpoint, however, it has less control over the industry than with direct regulation (Barde 1995).

There are a large number of voluntary programmes in the United States to motivate firms and individuals to increase recycling, reduce waste, and promote conservation. Participation in voluntary programmes often stems from the perception that because participation is voluntary, these programmes are low cost, and there is also the 'feel good' aspect of participation. US EPA (2001, 195) states that "voluntary agreements appear to contribute constructive dialogue among groups that normally act as adversaries. Voluntary agreements also provide for more opportunity for stakeholder participation than the status quo does." At the firm level there can also be pressure from shareholders, and sometimes firms may receive access to information, technical assistance, or be used to trial new approaches to reduce pollution or waste without cost. Voluntary programmes can lead to favourable public relations, with public acknowledgement of their actions. Gaining a reputation as being environmentally responsible can lead to increased product sales and market share,[51] a rise in those wishing to invest in the company, and increased access to quality staff. There is also likely to be reduced public pressure to regulate these industries (US EPA 2001). Firms may be motivated to be leaders in an environmentally sound approach to production or practices, hoping that the government will make this level of performance mandatory. This would effectively create barriers to entry for newcomers to the industry.[52]

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committing to reduce the amount of waste to at most 15 percent of a motor vehicle by weight from 2002. This was the culmination of a four-year process and was prompted by a strict German bill in relation to ELV disposal, and the likelihood of reasonably rigid legislation required by an EU Directive (Lévêque and Nadaï 1995).

[51] Polls in the US provide evidence that consumers are willing to pay more for goods which have environmental benefit (US EPA 2001).

[52] An example of this is the use of the catalytic converter to reduce exhaust fumes and pollution. The German automobile industry had mastered the catalytic exhaust technology (developed in the United States) in order to meet the vehicle standards required to maintain their export of cars to the United States. Furthermore, Bosch had a monopoly on the mechanical component of the electronic injection system which was required for the catalytic technology (Hourcade, Salles and Théry 1992). The German regulatory authorities supported by the country's automobile industry, implemented stringent national regulations on exhaust emissions and so put pressure on EU regulators to adopt exhaust emission standards that would require the catalytic technology. These standards were opposed by France (and also Italy and the United Kingdom) as the catalytic converter was not compatible with their lean-burn technologies. The emission standards were adopted, however, thus the market for Bosch technology expanded, and German auto manufacturers, already experienced in catalytic technology, gained a competitive advantage (*ibid.*; Lévêque and Nadaï 1995).

Dissemination of information on environmental effects of production processes, product inputs, and disposal of the final good can influence the behaviour of consumers and producers. Information disclosure provides consumers with the opportunity to gain utility from knowledge about the content of a product, and the way it has been manufactured. Decisions on where to live and work can be informed decisions. Requirements regarding information disclosure can encourage producers to voluntarily improve environmental practices, technologies, and inputs. The use of information disclosure as a tool is expanding. This is due firstly to the falling costs of collecting, processing, and disseminating information, and secondly, with higher incomes and better education, consumers, employees and shareholders are increasing their demand for environmental information (US EPA 2001).

2.7.5 Evaluation criteria for environmental policy instruments

Sterner (2003, 134) states that "although the facts in any one case may be highly uncertain, there is a great need for stability and credibility in policymaking. Any policy instrument that lacks credible, long-run commitment will be resisted by both judicial and political means. . ." When evaluating a policy instrument it is necessary to be able to assess it in terms of environmental impact, cost of implementation, any other unintended effects, and the likelihood of acceptance within the community in which it will reside (Smith and Vos 1997).

The first evaluation criterion has to be environmental effectiveness. Since the goal of these policy instruments is to reduce damage to the environment, the first assessment must be to determine the extent to which the instrument will achieve the environmental objectives. Smith and Vos (1997) suggest that environmental effectiveness can be assessed at different levels. If for example a policy is aimed at reducing waste for landfill disposal, assessment would include the actual measure of waste reduction, the impact of this reduction on the local environment,[53] and the economic value of reduced waste disposal to the landfill. Assessment would also have to include secondary environmental effects (a policy aimed at waste reduction is also likely to increase recycling levels). Where several complementary policy

[53] This would need to be net of any effects resulting from illegal dumping as a consequence of the policy.

instruments are used in tandem it can be difficult to separate the environmental effects attributable to each instrument.

The second criterion for evaluation is that of economic efficiency. The policy instrument should achieve the environmental objectives at least cost to society. The criterion of economic efficiency should be central to the appraisal of the relative costs and benefits of any competing policy instruments (Smith and Vos 1997; Opschoor and Vos 1989).

A third evaluation criterion is that of administrative efficiency and practicability. The implementation and enforcement of policy instruments needs to be assessed in terms of the costs to administer the policy and the level of information required (Opschoor and Vos 1989). Smith and Vos (1997, 92) define administration costs as "costs incurred by the public sector (government departments and regulatory agencies) in operating regulatory and market-based systems, including measurement, monitoring and other information costs, the costs of collecting charges or taxes, and costs of enforcement activities" and compliance costs as "the administrative and managerial costs incurred by the taxpayer in complying with the environmental policy measures." These are a dead-weight cost to the economy, irrespective of whether borne by government or in part by the private sector. Efficiency goals are at risk when administrative costs are high (Opschoor and Vos 1989). Sometimes it may be possible to combine the information gathering and monitoring with other activities, or some of it may have been carried out for commercial or research and development purposes. In these instances administrative and compliance costs are reduced (Smith and Vos 1997). In terms of practicability the policy instrument needs to be simple and transparent (Turner and Pearce 1994).

A fourth criterion for evaluation of an environmental policy is its concordance with the institutional framework (Opschoor and Vos 1989). Turner and Opschoor (1994, 11) say it must be consistent "with policy developments such as deregulation, policy integration, [and] international harmonisation." Smith and Vos (1997) separate the overall institutional framework into three parts, political, administrative, and economic institutions. Political institutions refer to the legislation and also the political structures of central government and local authorities, and whether the

power for policy-making is centralised or decentralised. Administrative institutions include government departments, local authorities, existence of specific jurisdictions for environmental management, and the distribution of administrative tasks and responsibilities between public or private institutions. There are also the existing traditions, ideology, culture, and the framework of property rights within that society that are referred to as economic institutions.

Institutional considerations affect both policy-making and implementation. At the policy-making level acceptance is likely to be influenced by past effectiveness of similar policies within that society. Choice of instrument will be influenced by the 'regulative tradition,' so that countries which have preferred the use of RIs to protect their environment may be less open to the introduction of EIs. In a climate of deregulation, moral suasion (through industry agreements) can be preferred over EIs (Opschoor and Vos 1989).[54] There is also the transitional phase as policy measures move from cure to prevention, which could lead to a shift in policy instruments used (*ibid.*).[55] Choice of instrument is also likely to be influenced by the legal and administrative structures already in place, and by the prevailing ideology. Change takes time and is often viewed with scepticism. For this reason incremental reform of policy may be more acceptable than wholesale reform. Acceptance can also be swayed by stakeholders and interest groups[56] (Smith and Vos 1997). Implementation of the policy instrument is also affected by the type of governance and its backing of the policy. A confrontational style is acceptable in some cultural settings, while in others it is counterproductive, and an initially lenient approach that works toward cooperation has greater success. The level of resourcing available is a principal determinant in the level of implementation possible and in the ultimate performance of the policy. So too is the availability of information, which often has to come from those who will ultimately come under the regulation or economic instrument. The degree of cooperation between the two groups (the regulators and the regulated) is likely to determine the level of information provided. Due to the asymmetry of information it could negate the objectivity in the design and implementation of the policy instrument (*ibid.*).

[54] This has been the case in both Germany and the Netherlands (Opschoor and Vos 1989).
[55] In Sweden there has been a shift from the use of both regulations and financial assistance to regulations and charges (Opschoor and Vos 1989).
[56] This is mentioned also in sections 2.5, 2.6 and 2.7.2.

With these various influences it is difficult to determine the degree to which institutional factors affect the choice and success of an environmental policy instrument. Therefore Smith and Vos (1997) suggest that while we can assess the relative strengths and weaknesses of an existing policy instrument, we cannot necessarily assume that it would have been the ideal choice.

Another consideration when evaluating policy instruments is the dynamic effects. Although sometimes difficult to measure, consideration should be taken of whether a policy instrument is stimulating or stifling innovation within the industry. With the global market place, innovative technologies are not determined by one country's policy instruments, therefore that country will not wish to have innovation and change impeded by the use of domestic policy instruments (Smith and Vos 1997). In addition, the passage of time can increase estimates of damage caused. For example, a rise in population and/or wealth increases the quantity of waste for disposal, and growth in knowledge leads to an increased awareness of social costs causing the estimation of them to move closer to their true value. For these reasons flexibility is important for a reasonable outcome toward efficiency (Sterner 2003).

When considering policy instruments, consideration must be taken of distributional and equity concerns. The desire for efficiency tends to lead a society toward a market solution but this may not be socially acceptable (Sterner 2003). "Whether the polluter or society should bear the costs of pollution is a question with aspects of efficiency, welfare, and ethics" (Sterner 2003, 182). To illustrate, closures of polluting industrial plants can result in widespread job losses, beyond the confines of those plants. A policy that results in collective urban waste disposal has a progressive distribution effect since it is the poor who are most affected by accumulating waste and the associated risks of sickness and disease, as they are less able to afford medical care.

In addition to equity effects, there is the potential for other unintended or secondary impacts on the wider economy. Included in these are effects on prices (possibly even inflation), trade patterns and competitiveness, and economic growth (Smith and Vos 1997).

In this chapter presentation has been made of some of the literature concerning the economics of recycling and waste management and the externalities associated with waste disposal. Since many of these externalities are public 'bads,' reducing them usually requires some level of government involvement in the management of waste disposal. This involvement is most often at the local government level and involves the collection and final disposal of waste. Where consumers are not required to face the full social cost of their disposal decisions, they are unlikely to reduce the volume of waste they generate to the socially optimal level. Market-driven and government-driven recycling schemes were reviewed, leading to an observation that too much government intervention in recycling has at times led to an adverse outcome. Finally, examination was made of the role of regulatory, economic and suasive instruments in the management of waste. This included assessing the strengths and weaknesses of the policy instruments that have been used and where possible commenting on their effectiveness. This review of the literature has set the context for the thesis so that the focus can now centre on the specific issue of the disposal of redundant motor vehicles.

Chapter Three

Recycling and Disposal of End-of-Life Vehicles

"There is no other mass-market product of such complexity that can boast a recycling quota as high as that of the car."
BMW Group (2001b, 2)

3.1 Introduction

The issues regarding waste management discussed in the previous chapter apply to the disposal of post-use motor vehicles. Compared with many consumer goods, motor vehicles have a high level of recyclability. The American Automobile Manufacturers Association estimates that in the United States approximately 94 percent of retired cars are recycled (Staudinger and Keoleian (2001).[1] Due to their complexity they do not fit the closed loop recycling criteria, but at least 75 percent of a vehicle (by weight) can be profitably recycled. The recycling and disposal of motor vehicles does, however, result in externalities that impose a cost on society, and it is contributing to policy for the management of ELV disposal to minimise these externalities that is the aim of this thesis. Before this can be attempted it is necessary to have detailed knowledge of the automobile recycling process and the specific environmental impact from motor vehicle disposal, which is the focus of this chapter.

This chapter will first provide a brief account of the evolution of automobile recycling in Section 3.2. Current practices in motor vehicle recycling are presented in Section 3.3 along with the changes that are taking place to accommodate dynamics in vehicle design and changing regulations and standards. The economic issues with regard to the automobile recycling industry are discussed in Section 3.4, and Section 3.5 outlines the environmental impacts from vehicle disposal both within the recycling industry and outside it.

3.2 The Evolution of ELV Recycling

When the owner of a vehicle determines that its value is such that it is too costly to keep it licensed and roadworthy, the vehicle is deemed by the owner to be an end-of-life vehicle (ELV). ELVs are either of negligible value after a lifetime of use, or are premature ELVs, having been 'written off' after involvement in a major accident (den Hond 1996).

[1] This compares with the recycling of approximately 61 percent of aluminium beverage cans, 58 percent of newspapers, 48 percent of steel cans, and 35 percent of glass containers (Bellmann and Khare 1999). In Sweden the recovery of glass soft drink bottles is a habit that has become ingrained, so that the recovery rate consistently reaches 98 percent (Sterner 2003).

The makers of automobiles have been recycling at least part of their product since Henry Ford began making motorcars early last century. In the United States during the 1940s and 1950s most ELVs were acquired by salvage yards for the removal of valuable parts and metals. Once the valuable parts were removed for resale car bodies were usually incinerated to remove all the worthless, combustible material. After this process the metal components of iron, heavy and light steel, and aluminium were removed and sorted for scrap. Light steel was the most valuable, and was manufactured in open-hearth steel furnaces (Seidl 1995).

In the 1960s several changes took place. There was a noticeable increase in the number of new vehicles being manufactured which ultimately led to an increase in the number of vehicles being discarded, putting pressure on the ELV recycling industry. The most serious threat to ELV disposal, however, was the change in steel-making technology, away from the open-hearth furnace to the basic oxygen furnace. While greatly improving efficiency in steel production, this change in technology utilised much less scrap steel than was previously the case in the open-hearth process (den Hond 1996). The large decrease in demand for steel scrap reduced the economic viability of automobile recycling. Businesses that had once bought car bodies from their owners began instead to charge owners for the disposal of their ELVs. Consequently, rather than being recycled via the appropriate channels, thousands of automobiles were abandoned to rust on roadsides or in makeshift junkyards.

The number of abandoned vehicles was reaching crisis point, with policy makers looking for a legislative solution, however, a solution came through technical innovation. The electric arc furnace was the first of these innovations. These furnaces were superior to the basic oxygen furnace, particularly in specialised areas of the market, like those producing reinforcing bar and wire. Set-up costs were relatively low, metal impurities less critical, and as a result electric arc furnaces were quickly adopted. The electric arc furnaces used steel scrap almost exclusively, therefore with the increase in the number of electric arc furnaces, the price of steel scrap soared. The other innovation was the metal shredder and its associated separation mechanisms. The shredding technique was patented in 1920, but it was not until the late 1960s that it was utilised on an industrial scale (Seidl 1995). The

metal shredder takes a whole automobile shell and hammers it into fist-sized chunks. It then separates out the ferrous and nonferrous metals, leaving the automobile shredder residue (ASR) to be disposed of in landfills. Once separated, the resulting ferrous product is easily used by the steel industry. The shredding and separation technology reduces the level of contamination in the steel scrap and provides a way to recover the nonferrous metal content, thus adding value to the post-use motor vehicle.

With these two innovations (the shredder in particular), the automobile recycling industry was reborn. The ELV became a valuable commodity, and market forces saved an environmental and aesthetic problem. Germany began using metal shredders in the early 1970s, and within twenty years about two hundred shredders were operating in the twelve Member States of the European Union, shredding some 80 to 90 percent of all ELVs (den Hond 1996). By the beginning of 2000, more than 220 European shredder facilities and over forty media separation plants were processing more than nine million cars each year, over 90 percent of all European ELVs (Recycling International 2000). In North America by 1992 there were approximately two hundred shredding operations (Staudinger and Keoleian 2001).

3.3 Current Recycling Process for ELVs

Motor vehicles are a complex good made up of a wide variety of materials, some of which are hazardous in nature. This makes the recycling of them a complex process. Prior to recycling, hazardous components and substances must be removed, the first of which is the battery containing lead and sulphuric acid. Once drained and decontaminated the acid can be reused for metal electrolysis. The plastic from the battery case can be reused to produce the next generation of battery cases. Tyres are removed for recycling or disposal[2] and LPG tanks must be removed. If suitable, LPG tanks can be reused, otherwise the gas is removed and they are melted down for scrap metal. Pyrotechnical devices (airbags and seat-belt tensioners) are defused, and the chlorofluorocarbons (CFCs) and hydro chlorofluorocarbons (HCFCs) are removed from air-conditioning units by a trained technician, and the refrigerant is

[2] Used tyres can be retreaded, however, the demand for retreads has fallen with the drop in the price of new tyres and the reduction in the age of tyres permitted to be used for retreads. Used tyres can also be shredded and crumbed to produce a variety of rubber products, but with more discarded tyres than demand for the recycled rubber products, many waste tyres are used in energy recovery.

sold for reuse. Operating fluids must be drained and collected. The average volume of operating fluids in an ELV is approximately nineteen litres,[3] much of which can be reused. The ethylene glycol in coolant can be separated from the water by distillation to be reused for coolant or, alternatively as a solvent in the paint industry. Oils and greases are often reused by the automotive dismantler, or collected and refined for alternative use. All that has been described in this paragraph is termed the depollution of an ELV and once it has occurred, recycling of the ELV can proceed (Auto Recycling Nederland BV 2002; Fletcher n.d.). Depollution is usually carried out in compliance with environmentally driven regulatory requirements (Staudinger and Keoleian 2001).

The first step in the recycling process of the ELV is the high-value recycling which is the removal of complete, serviceable parts for resale. These are most often the electromechanical parts (engines, transmissions, alternators, clutches, water pumps, and motors for power windows), whole front and rear ends, body panels, wheels, and glass, depending on the condition of the parts and their sales potential (Fletcher n.d.; Staudinger and Keoleian 2001). Automotive dismantlers carry out the high-value recycling. They usually use an electronic system to inventory, locate, and sell their spare parts, and reference to this system also helps in deciding which parts to remove for resale (BMW Group 2001b).

The second step is materials recycling, where car parts are removed and sorted according to their composition, whether plastic, aluminium, copper, glass, foam, and etcetera. Dismantlers also carry out this second step in the recycling process, the separation of materials. The materials in these parts are then processed ready to be used for the manufacture of new parts and products. BMW has been at the cutting edge of materials recycling and has created closed material cycles for many parts.[4] Currently on BMW model lines the proportion of recycled plastics has reached 15 percent (BMW Group 2001b). The Netherlands also achieves a high amount of materials recycling. For example, the polyurethane foam in car seating is used to

[3] This is, on average, 2.6 litres of engine oil, 1.3 litres of transmission oil, 1.1 litres of final drive oil, 0.8 litres of steering gear oil, 2.8 litres of radiator coolant, and 10.4 litres of fuel (Fletcher n.d.).

[4] For example, the rear window shelf in a BMW is made of 90 percent recycled plastic, the wheel arch liners protecting the inside of the fenders are made almost entirely from recycled plastic material, and the plastics for the BMW 3 Series rear-light are chosen for compatibility so that they can be recycled together.

make the rebonded foam in mattresses, sports mats, and furniture. Plastic bumpers and all types of glass can be collected for recycling (Auto Recycling Nederland BV 2002).

Step three in the automobile recycling process is the recovery of metals, both ferrous and nonferrous. This occurs at the shredding stage, which is the capital-intensive part of the recycling operation (den Hond 1996).[5] Most often shredders are integrated with a ferrous-metal separation and recovery unit, to increase efficiency and save on transportation costs. Once the metal pieces leave the shredder, induction magnets are used to separate out the iron and steel, enabling the recovery of at least 95 percent of the ferrous metal content of a car hulk. Several different techniques are used to separate nonferrous metals from the remaining materials. These methods, like magnetism, induction, and relative density, are based on the physical properties of the various metals being separated (*ibid.*).[6]

The quantity of materials recovered from motor vehicles varies depending on the composition of the vehicle and the extraction processes used to recover them. An estimate of the materials recycling of an ELV (after the removal of parts) is between 65 and 75 percent ferrous scrap, 2 to 4 percent nonferrous metals, and the remainder is ASR.

ASR is the unprocessed residual produced during the shredding and material recovery process. It is typically a conglomeration of different types of plastics, metal fines, glass, textiles, rubber, oils and dirt,[7] and it is the indefinite composition of the shredder waste that makes the recycling of it so difficult. To date most countries landfill their ASR. In the United States there is between three and five million tons of ASR produced each year (DeGaspari 1999). In addition, due to contamination with oil, concentrations of heavy metals, and an undefined mixture of organic substances, ASR can be classified as hazardous waste. (Seidl 1995).

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[5] "The largest shredders in Europe have a destructive power equivalent to 6,000 horsepower" (den Hond 1996, 75).

[6] Over 90 percent of the aluminium content can be recovered.

[7] Bellmann and Khare (1999) give the approximate composition of the ASR as 33 percent plastics, 25 percent elastomers and tyres, 16 percent inert materials, 13 percent glass, 4 percent wood fibres, 4 percent under seal coating, and 2 percent metal fines.

In the last forty years there has been an on-going change in the material composition of automobiles, which impacts on the recycling and disposal of them. These changes have come about in response to both customer and producer demands. Over the decades consumers have looked for improved car performance in terms of fuel efficiency, reliability, comfort, safety, and durability. Automobile producers' requirements then are for materials that are lightweight, high-strength, corrosion-resistant, efficient to process, and in response to legislation, recyclable (Bellmann and Khare 2000; den Hond 1996; Seidl 1995). Manufacturers have to try and balance the conflicting pressures on them to produce a vehicle that is fuel-efficient, so as to minimise energy consumption and carbon emissions, while being as recyclable as possible. Table 3.1 shows the changing composition of European passenger cars since 1960 with the substitution of ferrous metals by plastics and lightweight metals.[8]

Table 3.1: Estimated Material Composition of an Average European Passenger Car (as a percentage of total weight)

	1960	1965	1975	1985	1990	1999
Steel and Iron	85	76	77.5	68	67	66.5
Plastics	0.9	2	3.5	10	11	15.5
Aluminium	1.4	2	2.9	4.5		
Lead, Copper, Zinc	3	4	2.5	3	6 (incl. Al)	4.9 (incl. Al)
Other (primarily glass, rubber, and paint)	9.7	16	13.6	14.5	16	13.1

Source: For years 1965, 1985, den Hond (1996) (where the figures are cited from Menges, Von Eysmondt, Feldhaus, and Offergeld (1988)).
For years 1960, 1975, and 1990, Seidl (1995).
For 1999, percentages given are the average material composition of current Opel cars (Zoboli, Barbiroli, Leoncini, Mazzanti, and Montresor 2000).

The increasing use of lightweight materials in automobile manufacture has led to an increase in ASR for disposal. Motivated by extreme pressure on landfill capacity in some Western European countries, and the threat of stringent regulations, many resources have been directed into research initiatives to increase recycling from ELVs. Much has been achieved through the voluntary actions of those in the automobile industry, as they have made product design optimised for recycling, a

[8] Examples of this are plastic bumpers, and increased use of plastics in the car interior. In addition, new components such as impact absorbers, heat and sound insulating plates, and under-body coverings are often made of plastics (den Hond 1996). In fact 7.5 percent of all plastics produced are used in car manufacturing (Collins, Fanning, Crowe, and Meaney 2002).

priority. Areas targeted have been the ease of drainage and dismantling of hazardous substances, the ease of dismantling of components, materials composition and identification, and the use of recyclable materials (Beck 2001).

The BMW Group has been a pioneer in developing recycling concepts and methods since 1990, well before being required to do so by law. From the outset of vehicle design, consideration is taken of "the use of recyclable plastics and/or composite materials, a reduction in the number of different grades of plastic in use, the choice of suitable joining techniques, the use of recycled plastics, and the making of parts to enable a separation to pure materials" (BMW Group 2001a, 7). Since 1993 BMW has required all design engineers to include notes on the recyclability of every component they develop. This obligation influences the choice of materials used and the ease of disassembly. A relatively straightforward design change can initiate a significant improvement in the recycling process (BMW Group 2001b). The research emphasis of the BMW Group's Recycling and Disassembly Centre is on low-cost techniques that can be used by small firms without having to install costly, high-tech equipment (BMW Group 2001b).[9]

To facilitate dissemination of information from the car manufacturers to the dismantlers, the Internationale Dismantling Information System (IDIS) was created. IDIS is an international database compiled by more than twenty automobile manufacturers, through which up-to-date disassembly information is supplied to the car recycling industry. Although initially developed at the European level under the leadership of BMW,[10] it now includes Japanese and American automobile manufacturing partners, providing detailed materials information and disassembly recommendations for 364 vehicle models and more than twenty thousand components (ARGE-Altauto 2000; BMW Group 2001b). IDIS encourages the dismantling of a growing volume of plastic types so that more plastic components are able to be recycled.[11] It is technically feasible for 40 percent of the total plastic

[9] An example of this is a compact device that allows a raised vehicle to be tilted, enabling the lubrication oil in shock absorbers to be drawn off efficiently.

[10] By the end of 1999, an IDIS CD-Rom in eight languages had been circulated free-of-charge to 2.500 dismantlers throughout Europe.

[11] To illustrate: The BMW 3 Series recyclable plastic parts for the first generation (1975-1982) amounted to 4 kg; for the second generation (1982-1990) it was 9 kg; for the third generation (1990-1998) it was 26 kg; and the fourth generation (since 1998) it was as high as 43 kg.

content in an automobile to be mechanically recycled, however, whether this is economic depends on the purity of the materials recovered.

Considerable effort (in Western Europe in particular) has been directed into increasing the recycling rate of ELVs. It is therefore interesting to note the findings of a sub-project of the Environmental Car Recycling in Scandinavia project (ECRIS), which was undertaken from 1994 to 1998. The sub-project was the Life-Cycle Assessment (LCA) that monitored, measured, and aggregated the environmental impacts of a motor vehicle from 'cradle to grave.' This included emissions generated during the extraction of raw materials, the production process, the useful lifetime of the vehicle and its final disposal. If the motivation for increasing ELV recycling rates is to reduce the environmental impact from ELV disposal, then the findings of the LCA are interesting. The LCA found that increasing the ELV recycling rate from 75 percent to 85 percent reduced the total environmental impact from the recycling phase by only 2 percent (ECRIS 1998).

3.4 Economic Issues Within the Automobile Recycling Industry

It is the demand for used car parts, along with the steel industry's demand for ferrous scrap that have driven the automobile recycling industry, and in most countries both the automobile dismantlers and the metal recyclers operate under open market conditions. In the mid-1990s the North American automobile recycling industry employed approximately eighty thousand people doing almost four billion dollars in gross annual sales attesting to the fact that automobile recycling is an economically profitable business (Altshuller 1997). The North American industry boasts some twelve thousand automotive dismantlers and approximately 185 shredding operations, with a total of more than two hundred shredders (DeGaspari 1999). In the United States in 2001, enough steel was collected for recycling from post-use automobiles to produce more than fifteen million new vehicles (Steel Recycling Institute n.d.).

The future economic viability of the recycling industry is dependent on a number of factors, which include crude oil and other energy prices, labour costs, disposal fees, and public pressure and government action regarding environmental standards (Bellmann and Khare 1999). Also affecting the proportion of scrap to waste are

changes in the material content of vehicles, technological advances in separation and recycling techniques, transportation costs, quantity streams for materials recycling and landfill capacity (Energetics, Incorporated 2001).

In most industrialised countries the market structure of the dismantling industry has been one of a large number of operators, each operating labour-intensive, and low-technology facilities with limited geographical scale. Since most processes are labour-intensive, dismantling operations do not exhibit increasing returns to scale. Large-scale operations therefore, are not required for this step of the recycling process (Bellmann and Khare 2000; den Hond 1996). "In some countries, dismantling is still subject to uncertain or disregarded legislative frameworks, as well as limited technical and environmental requirements" (Bellmann and Khare 2000, 679). As countries adopt increasingly stringent environmental regulations regarding the removal and disposal of hazardous substances at the dismantling stage of the automobile recycling process, the dismantling industry is undergoing restructuring. Where automotive dismantlers are subject to licensing and monitoring, the increased compliance costs are forcing the closure of some dismantling facilities while those efficient operators meeting environmental standards are increasing their market share.[12]

With the automobile recycling industry dependent on the sale of scrap metal, viability is linked to world scrap steel prices and the changing composition of the motor vehicle away from metal toward plastics. Directly affected are the shredding operations as the quantity of steel recovered for recycling decreases and the quantity of ASR for disposal increases. In parts of Western Europe it is the extreme pressure on landfills that has led to the extensive recycling of nonmetal materials from ELVs. Landfill fees in the US have been relatively low, which means the burden for American automobile shredding companies has not been too great. In Japan and the EU, however, where landfill fees can be between two and ten times their United States counterparts, ASR disposal is costly (Altschuller 1997). In addition, where countries or states have given ASR 'hazardous waste' status, the costs of ASR disposal have increased.

[12] This has happened in Germany and the Netherlands, resulting in an improvement in the quality of vehicle depollution and a reduction in the environmental impact of the recycling industry.

Dismantlers too are affected by the rising nonmetal composition of the motor vehicle. They face additional cost increases where there is increasing pressure (or a government mandate) to collect from ELVs the nonmetallic recyclable materials for which there are currently very few markets. For some recyclable materials the cost of collection, separation and recovery is greater than the cost of the virgin material and the performance of the recycled material is inferior (Energetics, Incorporated 2001). As den Hond (1996) points out the cost of additional recycling must take this into account and should be weighed against the cost of alternative waste management options for these materials, like incineration and landfilling.

3.5 Environmental Impacts of ELV Disposal

Motor vehicles contain hazardous fluids, gases, and heavy metals; consequently the disposal of ELVs has the potential to impact negatively on the environment. This is the case whether an ELV is abandoned or whether it enters the recycling system. A summary of these environmental impacts are presented in Table 3.2.

Table 3.2: Negative Environmental Impacts from ELV Disposal

Key Issue	Releases to Environment	Resource Loss/Waste
Abandoned vehicles	Release of hazardous fluids, disturbed water flows, visual pollution, vermin habitat etc.	Some abandoned ELVs not entering the recycling stream, so loss of metal scrap.
Poor practices at dismantlers and ELV recyclers	Release of hazardous fluids, air-conditioning gases etc.	ELV fluids not recycled.
Limited materials recycling	Use of land for waste disposal.	Limited recycling of nonmetal materials in ELVs. More virgin materials required.
Landfill contamination	Potential leaching of hazardous fluids and heavy metals from ASR at landfill sites.	ELV fluids and a small proportion of metals not recycled.
Fires at tyre stockpiles	Emit toxic pollutants into atmosphere.	Energy not recovered nor rubber recycled.

Adapted from Environment Australia 2002

As seen in Table 3.2 abandoned vehicles impact on the environment in a number of ways. The vehicle can leak hazardous fluids into soils and groundwater, and when dumped in waterways can disturb water flows (Environment Australia 2002; Staudinger and Keoleian 2001). A dumped vehicle causes visual pollution, provides

a habitat for vermin, and can encourage the illegal dumping of other waste at the same site. An ELV that does not enter the recycling system is an unused source of ferrous and nonferrous scrap metal. In addition the recycling of steel when compared to the production of virgin steel uses 74 percent less energy, 40 percent less water, and reduces air and water pollution by 86 percent and 76 percent respectively (Environment Australia 2002).

Depollution at automobile dismantling facilities can be carried out in such a way as to have no detrimental effect on the environment. This would usually be in jurisdictions where the facility must hold a consent to handle and dispose of hazardous substances, and where operations are regularly monitored. However, for the worst-case scenario, air conditioning units may not be removed and hazardous fluids may not be drained into storage containers, but just left to leak out of car hulk's ruptured tanks and broken pipes as ELV hulks are left stacked in piles awaiting transportation to the shredder (refer to Table 3.2).

Most often, to reduce cost, car hulks are crushed prior to transportation to the shredding facility. This makes it difficult to check that fluids and toxic compounds have been correctly removed, consequently the shredder operator has limited control over the feedstock for the shredder (Beck 2001). The shredding process creates intense heat that vaporises some of the hazardous fluids and residues still present in the ELV polluting the surrounding atmosphere ([British Columbia] Automotive Retailers Association 2002). In addition the ASR is often contaminated with oil, coolant, and the heavy metals mercury, lead, zinc cadmium, and hexavalent chromium. There is potential for these to be released into the environment when the ASR is disposed of in the landfill (see Table 3.2).

Whole discarded tyres are an environmental hazard in a landfill as they trap air and moisture, and the build up of oxygen and methane gases causes them to work to the top, breaking the landfill surface and making aftercare expensive. Finally, the stockpiling of tyres provides another environmental hazard with the outbreak of fire being a relatively common occurrence. These fires are difficult to extinguish and emit toxic pollutants into the atmosphere.

Other environmental impacts relate to energy use. These are the energy burdens of transportation, the shredding operation, material separation, and the recycling operations, including the remanufacture of removed electro-mechanical parts and the smelting of scrap iron and steel (Staudinger and Keoleian 2001). It is evident therefore that ELVs have the potential to impact negatively on the environment in a number of ways during their recycling and disposal.

To conclude, in terms of the waste management hierarchy motor vehicle disposal is a success story with ELVs having the highest level of recycling of any mass-market product. Since vehicles contain hazardous substances, however, their disposal does have a negative impact on the environment. In this research examination will be made of the situation in New Zealand regarding the disposal of ELVs, with the following questions being addressed. What level of automobile recycling is currently being achieved in New Zealand? Should more resources be employed to improve this level of recycling? Can the negative environmental impacts from ELV disposal in New Zealand be reduced? What is the extent of the abandoned vehicle problem in New Zealand and what steps can be taken to reduce this problem? In Chapter Four the New Zealand context for this research is presented, and the research method is outlined.

Chapter Four

Context and Research Methodology

"Extremism with respect to garbage solutions is ideologically satisfying, and some of the nation's most prominent extremists on garbage issues have played a valuable educational role. In the real world, however, an insistence on utopia always causes trouble."

Rathje and Murphy (1992, 239)

4.1 Introduction

Presented in this chapter is the New Zealand context for the discussion of ELV management. Outlined here are the changes that have taken place in recent years regarding the size and age of New Zealand's light motor vehicle fleet. Following this, presentation is made of the methodology that will be undertaken in order to fulfil the objectives of this research. Briefly restated from Chapter One these objectives are firstly, to outline the current practices and the level of recycling achieved by the automobile recycling industry in New Zealand, including the environmental impact from the industry. Secondly, to quantify the annual number of vehicles abandoned in New Zealand and the cost to local authorities to remove and dispose of them. Thirdly, to identify the factors contributing to vehicles being abandoned without penalty and fourthly, to ascertain the policy instruments that have been employed to reduce abandoned vehicle numbers, and evaluate their success. Fifthly, to investigate policies and practices used in other countries for the management of ELV disposal, and to assess their effectiveness and their application for the New Zealand situation. The final objective is to put forward recommendations to improve the management of motor vehicle disposal in New Zealand.

The chapter is presented as follows. An overview of the deregulation of the New Zealand motor vehicle industry and its subsequent effect on the size and age of the light motor vehicle fleet is proffered in Section 4.2. The research methodology is presented in Section 4.3, beginning with an introduction, followed by the survey methods to be used to survey the New Zealand automobile recycling industry and the local and regional authorities. The approach to the analysis of the motor vehicle legislative framework and the institutional practices relevant to that framework are outlined, and finally, the survey method used for the international case studies regarding the management of ELVs is presented.

4.2 Recent Changes in the New Zealand Motor Vehicle Fleet

In the last seventeen years there has been a notable change in the size and age of the New Zealand motor vehicle fleet. The catalyst for this change was the deregulation of the motor vehicle industry, which began in late 1986. The industry had previously been regulated through sales tax, import tariffs, and import licensing. The removal

of these regulations resulted in a considerable increase in the supply of motor vehicles into New Zealand. Motor vehicle prices plummeted, particularly in the used car market, and as Nicholls (chairman of the Independent Motor Vehicle Dealers Association (IMVDA)) said "almost everyone, from students onwards, eventually began to afford a decent set of wheels" (Curtis 1999a, 41). In 1986 there were 1.5 million passenger cars and vans in New Zealand, and by June 2003 there were more than 2.4 million passenger cars and vans, an increase of 61 percent (Land Transport Safety Authority (LTSA) 2004).

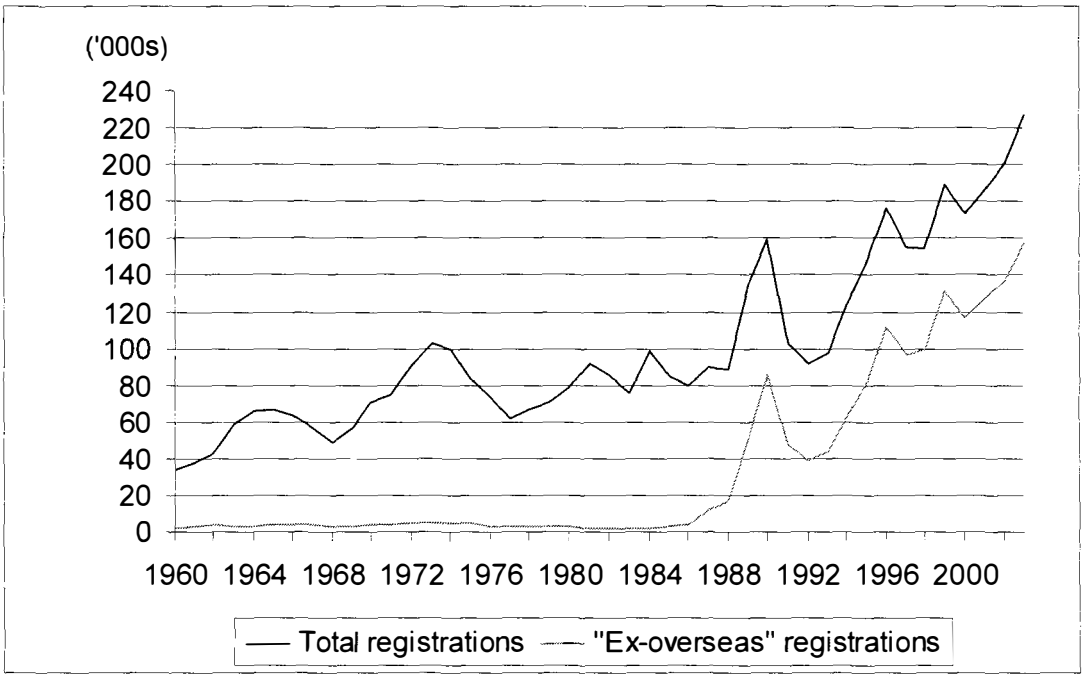
The deregulation of the industry began in October 1986 with the removal of the 30 percent sales tax on new vehicles. The sales tax was replaced by the goods and services tax (GST) of 10 percent. The effect was an immediate decrease in the price of new cars, and prices continued to fall through 1987. This had a flow-on effect on the value of used cars in New Zealand, with their prices falling some six to nine months later (Bilton 1997). Up until 1984 importers were required to have an import licence and any fully assembled imported car (with the exception of those from the United Kingdom and Australia) also incurred a 45 percent tariff (*ibid.*).[1] In addition, an import licence was needed. By the early 1990s Australian imports were tariff-free, vehicles imported from the United Kingdom still carried a 20 percent tariff, and those sourced from elsewhere carried a 35 percent tariff. From 1992 the tariff on all vehicles, other than those from the United Kingdom, was reduced at a rate of 2.5 percent each year. By July 1997 the tariff on these vehicles had fallen to 22.5 percent, while it remained at 20 percent for the vehicles sourced from the United Kingdom (Johnston 1997a). In May 1998 all the remaining tariffs on vehicles coming into the country were lifted (Curtis 1999b).

The abolition of import licensing in the late 1980s opened the way for unexpected competition in the form of used car imports. The importing of used vehicles began slowly, but by 1992 Japanese used imports were flooding the market (Bilton 1997). The average number of used imports coming into New Zealand each month rose from 330 in 1986, to more than 9,300 by 1996.[2] At the same time the number of

[1] Fully assembled cars from the United Kingdom faced a 20 percent tariff and from Australia a 15 percent tariff.
[2] In 2002 an average of 11,370 used imports arrived in New Zealand each month.

new vehicles sold fell from 76,000 in 1986, to 64,400 in 1996, indicating that some consumers were switching preferences from new to used imports (LTSA 2003a). The increase in the number of vehicles entering New Zealand each year since 1960 is shown in Figure 4.1.

Figure 4.1: Annual Registrations for Passenger Cars Entering New Zealand

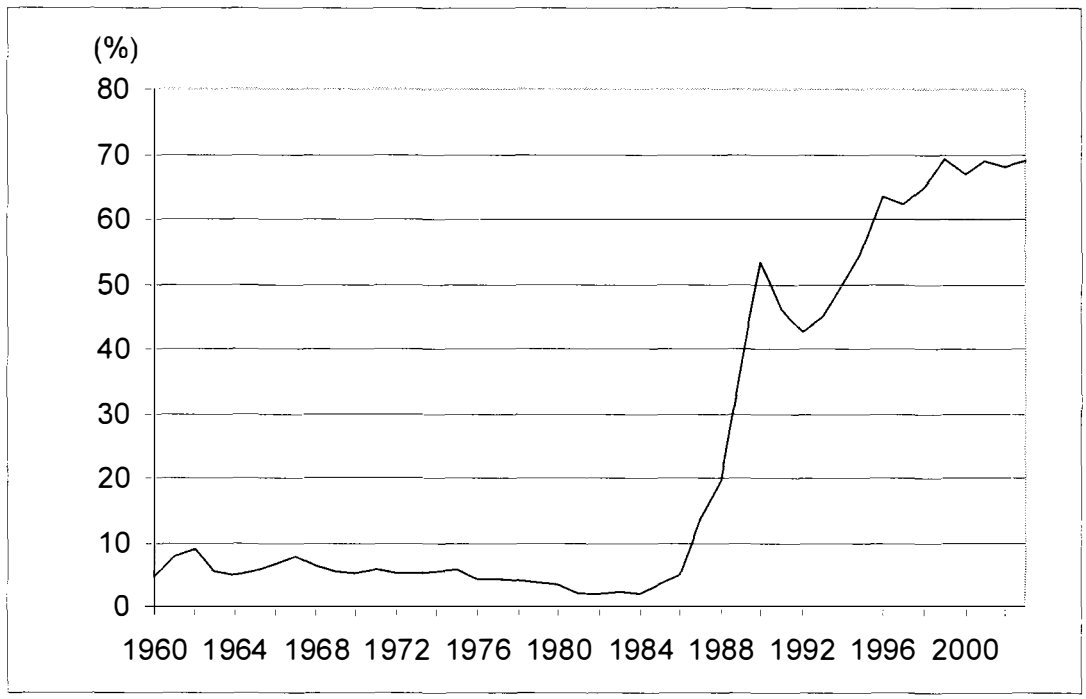


Source of data: Tables 1 and 5, LTSA 2004

The effect of the deregulation of the industry can be seen in Figure 4.1, with a marked increase in the number of vehicles entering New Zealand after 1986. By 1998 the annual number of cars entering the country had increased 74 percent from that of ten years previous. In the decade from 1987 to 1996, 53 percent more cars came into the country than in the decade prior to deregulation of the industry. More noticeable, however, is the shift from new to used vehicle imports (which the LTSA refers to as "ex-overseas" registrations). The number of used imports arriving in New Zealand the decade following the beginning of the deregulation of the motor industry, was a 2088 percent increase on the number of used imports arriving in the decade prior to the industry's deregulation.

The changing proportion of vehicles entering the country that are used vehicles, is shown in Figure 4.2.

Figure 4.2: Used Imports ("Ex-overseas" Registrations) as Percentage of Total Passenger Cars Imports



Source of data: Table 1, LTSA 2004

In Figure 4.2 it can be seen that as few as 5 percent of the cars registered for the first time in New Zealand during 1986 were used imports. By 1999 this figure had risen to 69 percent, therefore only approximately 30 percent of the passenger cars coming into the country are new.

The impact of this influx of used imports on the New Zealand motor vehicle fleet was to increase the age of the fleet.[3] In 1988 16 percent of vehicles were less than three years old, but in contrast, by January 1998 only 7 percent of vehicles were this age (Tipping 1998).[4] Looking at the age of used imports entering New Zealand, Johnston (1997c) observed that in 1996 less than 3 percent were under two years old and over 88 percent were more than four years old with 98 percent of used imports being sourced from Japan. By 1998, however, other countries were also demanding used Japanese cars and as a result used-car prices strengthened at the auctions in Japan. The effect of this on the New Zealand market was reported by the LTSA who

[3] Initially the average age of vehicles reduced as people traded their old car for a newer used import, but slowly the average age of vehicles increased as people chose used imports over new vehicles (Johnston 1997b). Eighty percent of all new car sales are to companies and businesses, leaving only 20 percent being bought by individual motorists (Curtis 1999a).

[4] The proportion of the vehicle fleet that was less than three years old in 2002 was 7.6 percent (LTSA 2003a).

noted that New Zealand dealers were now importing older cars than previously (Gill 1999). The age of incoming vehicles in 2002 was slightly lower than those for 2001 and 2000, as can be seen in Figure 4.3. However, the average age of incoming used cars in 2002 remained at seven years old. The ages of used car imports for the years 2000 to 2002 is presented in Figure 4.3.

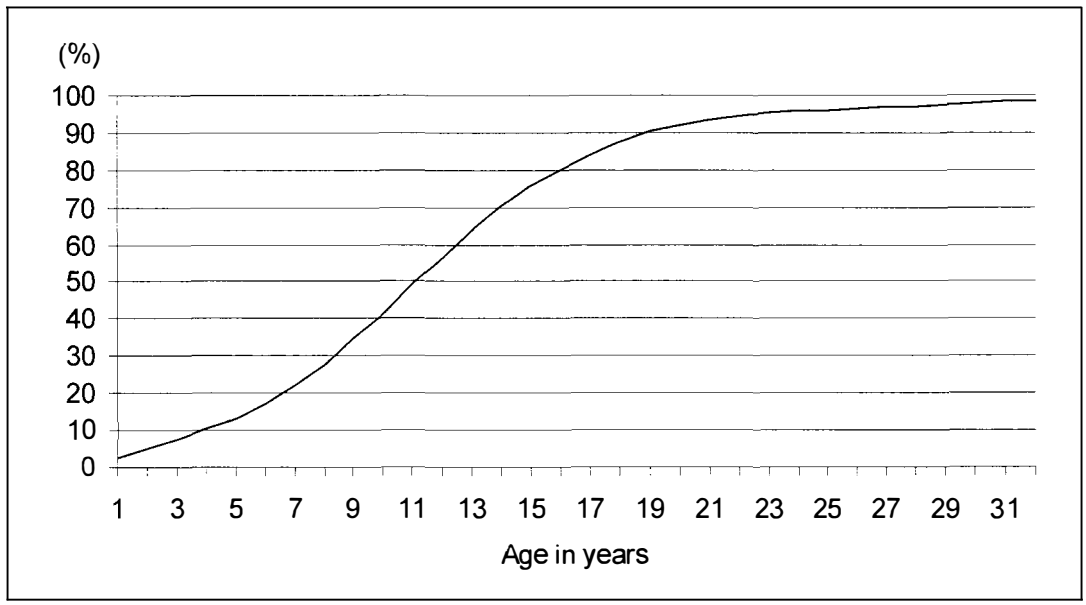
Figure 4.3: Age of Used Passenger Cars Entering New Zealand, 2000-2002[5]

Source of data: Transport Registry Centre, LTSA

It is shown in Figure 4.3 that of the used cars imported in 2002, only 0.74 percent were less than two years old. In 2002 over 91 percent of used imports were more than four years old.[6] Some 55.5 percent were between five and seven years old (inclusive). Forty-one percent of used imports in 2002 were less than seven years old, as compared with 30 percent in 2001 and 33 percent in 2000. However, 13 percent of used imports were at least ten years old when they arrived in the country in 2002, which was an increase on the 8.6 percent in 2000. Therefore, while a greater proportion of used imports in 2002 were newer than in 2000, the proportion of very old imports had also increased. The impact this has on the overall age of the New Zealand passenger car fleet (in 2002) is shown in Figure 4.4.

[5] The figures for 2003 were not available at the time of writing this thesis.
[6] This figure is obtained by summing the percentages of incoming cars that were five or more years old (15.2%+17.0%+23.3%+12.7%+9.8%+7.6%+3.6%+1.5%+0.3%+0.1%). This figure is similar for 2001 and 2000.

Figure 4.4: Cumulative Age of New Zealand Passenger Car Fleet in 2002



Source of data: Transport Registry Centre, LTSA

It can be seen in Figure 4.4 that only 5 percent of cars on the New Zealand Motor Vehicle Register in 2002 were less than two years old. Approximately 10 percent were less than four years old, which meant that 90 percent of all cars were at least four years old. Only about one-third of passenger cars were less than nine years old making two-thirds at least nine years old, and more than half of all registered cars were at least eleven years old.

The average age of the passenger car fleet from 1998 to 2002 is shown in Table 4.1.

Table 4.1: Average Age of the New Zealand Passenger Car Fleet

	1998	1999	2000	2001	2002
Average age of passenger car fleet (years)	9.83	9.90	10.97	11.08	11.16

Source of data: Transport Registry Centre, LTSA

The average age of passenger cars has continued to increase, with the average car on New Zealand roads in 2002 being 1.33 years older than the average car in 1998. In addition, the standards for vehicle roadworthiness have risen (particularly with regard to rust checks), so that the combined effect has seen a measurable decrease in the value of old cars in the last few years (Tipping 1998).

It is these changes in New Zealand's motor vehicle fleet that have prompted concern regarding the management of ELVs in New Zealand. Key issues are the number of vehicles not being handed in for recycling, the number of vehicles being abandoned without penalty, and the potential risk to the environment through poor disposal practices for ELVs. Externalities arise from vehicles being abandoned on public and private property, and from poor recycling practices, since costs are incurred that are not considered in the decision-making process of those involved in these disposal practices. When not taken into account by those causing them, the externalities become a cost to society. The aim of this research is to provide recommendations for the improved management of ELVs that will reduce the environmental cost to New Zealand society from motor vehicle disposal. The remainder of this chapter is devoted to the research methodology used to achieve this aim.

4.3 Research Methodology

To meet the research objectives restated in Section 4.1 the following approach will be taken. Firstly, a survey of the New Zealand automobile recycling industry will be undertaken using interviews and secondary data to determine current practices, environmental impacts and the level of recycling being achieved. Secondly, surveys will be conducted of all local authorities in New Zealand in order to establish the extent of the abandoned vehicle problem and the role of local government in dealing with this problem. The role of local authorities in the collection of ELVs for recycling will also be ascertained. Thirdly, examination will be made of the legislative framework pertaining to motor vehicles, and interviews and secondary data will be used to analyse the institutional practices related to the framework. Fourthly, case studies will be undertaken to examine overseas experience in the recycling and disposal of ELVs and in dealing with abandoned vehicles. The case studies will be carried out through interviews and the collection of secondary data. Finally, examination will be made of the New Zealand situation in the light of lessons learned from overseas experience, which will give rise to recommendations for the improved management of motor vehicle disposal in New Zealand.

4.3.1 Survey of the New Zealand automobile recycling industry

A survey will be conducted of the key participants in the New Zealand automobile recycling industry, and those responsible for monitoring the performance of industry

participants with respect to environmental compliance. Information will be sought on practices regarding the depollution of ELVs, the level of recycling undertaken, and the environmental impact of each process in the automobile recycling chain. Included in the survey will be several automotive dismantlers, interviewed regarding licensing requirements, depollution practices, and the separating of materials and parts for recycling or reuse. To provide information on the recycling and disposal of hazardous substances from automotive dismantlers and the level of external monitoring of the industry, local and regional authority officers will be interviewed. For information regarding the crushing and transportation of ELVs headed for the metal shredder, an interview will be conducted with the Director of Gamma Corporation, which is a company operating a crushing and transportation service. An interview and site visit will be undertaken at the metal shredder in Auckland owned and operated by Sims Pacific Metals Limited, and at Redvale Landfill which disposes of all automobile shredder residual (ASR) from that metal shredder. The scrap steel from the shredder is recycled at Pacific Steel, a division of Fletcher Challenge Steel and Wire Limited, therefore an interview will conducted with the Communication Manager of Fletcher Challenge Building, Steel Group. With regard to the recycling and disposal of tyres, information will be sought from tyre shredding services J & J Laughton Shredding Services Limited, and from a site visit of Rubber Technologies Limited, a producer of crumb rubber for reuse. Secondary data will also be gathered from Exide Technologies regarding the recycling of lead-acid batteries, and from the Ministry for the Environment regarding the recycling of used oil.

4.3.2 Local authority surveys regarding the disposal of ELVs

There are seventy-four local authorities throughout New Zealand of which fifteen are city councils and fifty-nine are district councils. The Local Government Act (1974)[7] charges local authorities with responsibility for the removal, storage, and disposal of vehicles abandoned on roads within their area of jurisdiction. In order to determine the magnitude and cost of the abandoned vehicle problem nationwide, a survey will be conducted of 73 of New Zealand's local authorities and the data will be

[7] And subsequently the Local Government Amendment Act (No. 3) 1992.

aggregated.[8] The survey will also seek to establish the extent of local authority involvement in the collection of ELVs for recycling.

The questionnaire entitled Abandoned Vehicle Survey (a copy of which can be found in Appendix One) is designed to ascertain the magnitude of the abandoned vehicle problem and the approach taken by local authorities to address the problem. The survey will provide a good estimate of the annual number of vehicles abandoned nationwide in recent years, and the annual cost to local authorities to remove and dispose of these abandoned ELVs. It will also provide information on the destination of these abandoned vehicles, and will help determine the destination of specific components of ELVs separated before the hulk is shredded. The survey will also quantify the number of local authorities providing a collection site for ELVs waiting to be recycled, and will establish the cost to leave a vehicle stripped or unstripped at this collection site. ELVs crushed and transported to the shredding operation are required to be stripped, which means they have undergone depollution and have had the wheels, seat foam, and vinyl removed. To make the distinction that more is required than just the depollution of the ELV, the term stripped has been used in preference to 'undergone depollution.'

Since little is known about the response and/or concerns of local authorities to the issue of abandoned vehicles in their area of jurisdiction, the latter part of the questionnaire includes some open-ended questions in order to gather this information. The purpose of these is firstly to find out about any approaches taken by local authorities to reduce the number of vehicles being abandoned in their city or district, and to encourage the responsible disposal of ELVs. Secondly, to identify the main areas of concern regarding environmental damage resulting from vehicles being abandoned. Thirdly, to provide an opportunity to local authorities, as stakeholders in the issue of ELV disposal, to suggest possible measures that could be implemented to reduce the number of vehicles abandoned each year.

[8] The Chatham Islands District Council is not on the two main islands of New Zealand and is not included in the survey. A point to note is that the shredding company Sims Pacific Metals Ltd. does organise for the periodic removal of ELVs from the Chatham Islands, shipping them to their shredding plant (pers. comm. Sims Pacific Metals Ltd. 2000).

As the research developed it became clear that more information was needed from local authorities. After consultation with the appropriate council officer at three different councils, a second survey was developed. The second survey uses the questionnaire entitled Abandoned Vehicle Survey II (see Appendix One). This second questionnaire is divided into two parts, the first part (Part A) relates to abandoned vehicles, and the second (Part B) deals with local government facilitation of ELVs into the recycling system.

The first two questions of Part A ask for the number of abandoned vehicles, and the estimated cost of removal and disposal of these vehicles for 2000 and 2001. The aim of the next set of questions is firstly, to establish an estimate of the rate of success in tracing the owners of abandoned vehicles, and secondly to identify key hindrances to tracing abandoned vehicle owners. This second part will be achieved using a Likert scale.[9] A number of suggested hindrances will be put forward, to which each respondent is to indicate on the Likert scale the extent to which they agree or disagree with that suggested hindrance.[10] For the next question the respondent is asked to provide an estimate of the number of abandoned vehicle owners prosecuted annually. Following on from this, respondents are asked to provide reasons for not enforcing liability on the owner of the abandoned vehicle. Possible reasons are suggested, accompanied by a Likert scale on which respondents are required to indicate the extent to which they agree or disagree with the reason given. The last three questions in Part A of the questionnaire asks respondents to give their opinion on policy alternatives (suggested by council respondents in the first survey) as possible options to reduce the number of vehicles being abandoned throughout New Zealand.

Part B asks for the annual number of ELVs left at the collection site for the city or district, and the cost (stripped and unstripped) to do so. Where owners are permitted to leave an unstripped vehicle for the crusher, the council respondent is asked to provide the cost to the council to have a vehicle stripped. Respondents are then

[9] A Likert scale provides a statement for which those surveyed are required to respond by rating that statement on a one-dimensional response scale. The survey writer provides the options on the response scale.
[10] 1 = totally agree, through to 5 = totally disagree, see question five of Abandoned Vehicles Survey II.

asked if local authorities have imposed fines on owners of abandoned vehicles, and also if local authorities have offered incentives (other than amnesties) to encourage the disposal of ELVs into the recycling system. For those local authorities that offer amnesties for the collection of unwanted ELVs, respondents are asked to provide details on the nature and duration of the amnesty. They are also requested to provide figures on the numbers of vehicles brought in under the amnesty, and the number of vehicles abandoned during the amnesty period.

The intention from these two surveys is to take the responses from all the local authorities and aggregate the data in order to provide an estimate of the extent of the abandoned vehicle problem nationwide. The surveys will provide an insight into hindrances in tracing the owners of abandoned vehicles, and also give a complete picture of policy instruments already used for a trial period or currently in place throughout the country.

The local authorities have been targeted for these surveys, as they are the authorities primarily responsible for the removal and disposal of abandoned vehicles. The regional councils can also be involved in abandoned vehicle disposal where the vehicle is abandoned near or in water so that there is the threat of discharge into water. For this reason all the regional councils will be surveyed by telephone and questioned as to their involvement in the removal and disposal of abandoned vehicles. Vehicles abandoned in the country's national parks become the responsibility of the Department of Conservation (DOC). The DOC officer at one of the more accessible national parks will be contacted and questioned regarding the magnitude of the abandoned vehicle problem in that national park. From this interview it will be decided whether it is necessary to survey the DOC officers in all of New Zealand's national parks. This will only be undertaken if it is decided that the number of vehicles abandoned in the national parks will add to the overall reporting of the extent of the abandoned vehicle problem.

4.3.3 Analysis of New Zealand's motor vehicle legislative framework and the institutional practices supporting it

Does the problem of abandoned vehicles arise simply from a lack of resources to enforce the laws? Is it possible to improve the existing laws and the institutional

practices supporting those laws so as to reduce the opportunities for an individual to abandon a vehicle without penalty? In order to answer these questions it will be necessary to examine the sections of New Zealand law relevant to the issue, determining whether they are in any way unclear so as to lead to difficulty in enforcement. The relevant laws to be considered are:

- Local Government Amendment Act (No. 3) 1992, Section 2 which empowers local authorities to remove abandoned vehicles from New Zealand roads.
- National Park Act 1980, Section 71, relating to the removal and disposal of vehicles abandoned in national parks.
- Reserves Act 1977, Section 110, relating to the removal and disposal of vehicles abandoned in a reserve.
- Public Works Act 1981, Section 239 and Public Works Amendment Act 1988, Section 81, relating to the removal and disposal of vehicles abandoned on public works land.
- Transport (Vehicle and Driver Registration and Licensing) Act 1986, Sections 5, and 20 – 26, Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1992, Sections 13, 14, and 16, and Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1997, Sections 7 and 8, which relate to continuous vehicle licensing and the change of vehicle ownership.

In addition, an examination will be made of the institutional practices regarding the motor vehicle licensing and ownership, which are the responsibility of the LTSA. The investigation will be carried out through interviews with the Manager of Motor Vehicle Operations at the Transport Registry Centre (TRC) of the LTSA. Use will also be made of the written processes as outlined on LTSA's web site and the printed fact sheets produced for public education. From the information gathered, flowcharts will be created to follow through the steps taken to process, record (and where necessary enforce) vehicle ownership, payment of taxes via continuous licensing, and final disposal of a light motor vehicle.[11] The flowcharts will be used

[11] An employee of the TRC will check through the flowcharts for accuracy.

to help identify areas of weakness in the institutional practices that allow ELV owners to abandon their vehicles with impunity.

4.3.4 International case studies regarding the management of ELVs

Western Europe leads the world in the active management of the disposal of its ELVs, therefore it is from here that lessons are likely to be learned through the different approaches taken regarding automobile recycling and the problem of abandoned vehicles. A detailed study will be made of four Western European countries: the Netherlands, Germany, Sweden, and the United Kingdom. These countries are chosen for a number of different reasons.

The Netherlands and Germany are chosen because they are world leaders in the recycling of motor vehicles. In addition, each has taken a different approach to ensure that nearly all retired vehicles in their respective countries enter the recycling system. The Netherlands uses an economic instrument to facilitate a system that has vastly improved both the quantity and quality of automobile recycling, and has reduced the amount of ASR requiring disposal. In addition, the Netherlands is like New Zealand, importing nearly all its motor vehicles, so that it does not have a local automobile industry in which it can utilise recovered components and materials, yet it has achieved a recycling rate of 86 percent of each ELV, by weight, in an environmentally acceptable manner.

Germany's approach is one of co-operation and shared responsibility, successfully balancing regulatory and voluntary action. On the voluntary side, market-driven interaction exists between materials providers and car manufacturers, and between the collection, dismantling, shredding and disposal industries for ELVs. On the regulatory side, government regulation controls the final deregistration of ELVs, the licensing and operation of all vehicle dismantling facilities, and sets the standards and procedures to ensure that environmentally sound practises occur (Zoboli, Barbiroli, Leoncini, Mazzanti, and Montresor 2000).

Sweden is included as it is a world leader in the use of a disposal charge and refund (similar to a deposit-refund system) for automobiles, introduced to reduce the number of vehicles being abandoned each year. Since 1975, Sweden has provided a

financial incentive to encourage the delivery of ELVs into the recycling system. In addition Sweden, like New Zealand, does not have the same landfill constraints as the Netherlands and Germany, and as in New Zealand, its car fleet is relatively old, with 55 percent of the fleet being at least ten years old in 1999 (Zoboli *et al.* 2000).

The United Kingdom automobile recycling industry has always been market-driven, but as a Member State of the EU, the United Kingdom will have to increase the recycling rate of its ELVs and will be required to improve the depollution practices in its management of ELV recycling and disposal. The United Kingdom also has a serious problem with abandoned vehicles. How the United Kingdom attempts to solve this problem and improve its recycling rates and depollution practices with regard to ELVs, is of interest to New Zealand.

In order to be able to provide a detailed overview of the ELV recycling and waste disposal practices in these four countries, interviews are to be conducted with representatives from both government and industry. The purpose of these interviews is firstly, to provide details of the level of recycling being achieved and the level of government intervention or the cost to industry to accomplish this. Secondly, to outline the use and relative success of policy instruments in the management of ELVs. Thirdly, to provide information on the institutional practices and law enforcement that impact on the number of vehicles being abandoned.

In Germany, it is planned to interview a representative from the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. For the industry perspective, the BMW Group has been chosen as BMW has been at the forefront of research and development for the dismantling and recycling of ELVs. In the United Kingdom interviews will be conducted with representatives from the Environmental Division of the Department of Trade and Industry, the Department for Transport, Local Government and the Regions (DTLR), and from the recycling division of the Society of Motor Manufacturers and Traders (SMMT). In the Netherlands oversight of the management of ELVs rests with an organisation set up from the stakeholders within the automobile importing and vehicle recycling industries, called Auto Recycling Nederlands BV (ARN). It is ARN that contracts and monitors the majority of the automobile dismantling, collection and recycling companies in the

Netherlands and liaises closely with the Dutch Government. Therefore in the Netherlands it is the intention to interview a representative from ARN. It is planned to collect information from Sweden using interviews via e-mail with a representative from each of the Ministry for the Environment, the Swedish Environmental Protection Agency, the foundation Håll Sveridge Rent (HSR) which deals with abandoned vehicles, and Bilindustriföreningen (BIL Sweden), the Association of Swedish Automobile Manufacturers and Wholesalers.

The results of the research undertaken will be presented in the following three chapters. An outline of the current practices in each section of the New Zealand automobile recycling industry will be provided in Chapter Five. This will include environmental impacts from the operations and an estimate of the level of recycling achieved. Chapter Six is to be divided into three sections following the introduction. Presented in the first section will be the results from the two surveys carried out on the local authorities in New Zealand. The second section will be devoted to the examination of the institutional practices concerning ownership, licensing, registration cancellation and disposal of motor vehicles in New Zealand. Outlined in the third section will be the areas of weakness in the New Zealand legislation pertaining to abandoned vehicles. Presented in Chapter Seven will be the international findings from the study of the ELV recycling and disposal practices in the Netherlands, Germany, Sweden and the United Kingdom.

Chapter Five

End-of-Life Vehicle Recycling and Disposal in New Zealand

"We abuse land because we regard it as a commodity belonging to us. When we see the land as a community to which we belong, we may begin to use it with love and respect."

Aldo Leopold

5.1 Introduction

In this chapter the results of the survey of the New Zealand automobile recycling industry are presented. The activities of each of the participants in the recycling industry are outlined, and where possible the extent of the recycling undertaken is given, along with the environmental standards and degree of monitoring in those sections of the recycling chain most likely to impact negatively on the environment.

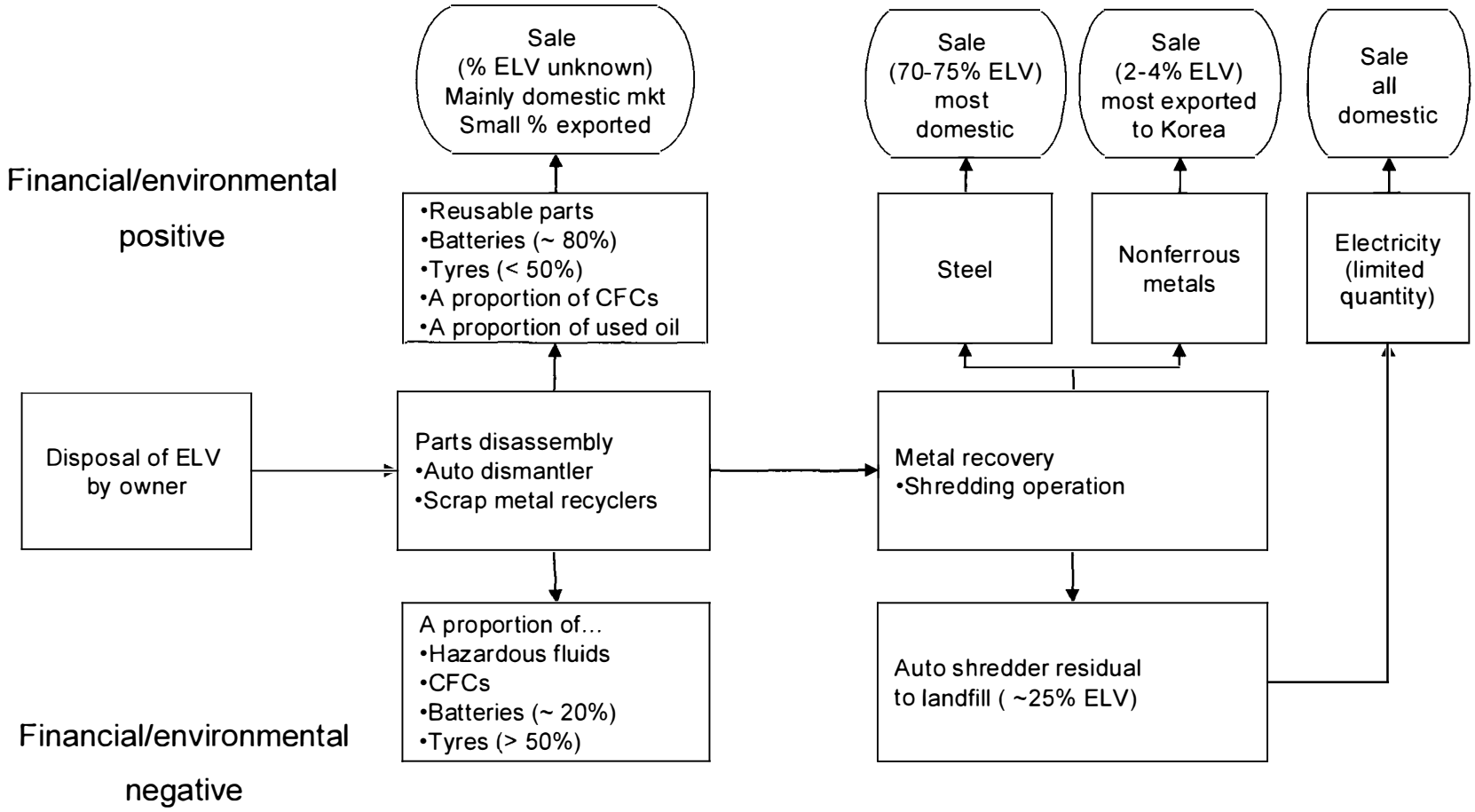
An overview of the recycling process in New Zealand is given in Section 5.2 and the five sections that follow provide details of the activities of each participant, namely the automotive dismantlers, the mobile crushers, the metal shredding operations, the steel recycling, and the landfill disposal of automobile shredder residual (ASR). A brief summary of the recycling and disposal of some of the hazardous materials in ELVs is also presented here. Outlined in Section 5.8 is the recycling and disposal of tyres, in Section 5.9, used oil and in Section 5.10, lead-acid batteries. The chapter is concluded in Section 5.11.

5.2 Overview of the ELV Recycling Process in New Zealand

The New Zealand automobile recycling industry is market-driven, sustained by the value of used car parts and recycled metals, all of which account for approximately 75 percent of a vehicle by weight. An overview of the ELV recycling process in New Zealand is presented in Figure 5.1 (see following page).[1] Figure 5.1 shows the main recycling activities undertaken and the positive and negative financial and environmental outcomes from these activities. The process begins with ELVs of value being sold by their owners to automotive dismantlers. Some ELVs of negative value are also taken to dismantlers, while others are taken to scrap metal dealers, and some are left at local authority collection sites to be crushed and transported directly to the shredding operation. Once the vehicle is at the dismantling facility, parts of value are removed for resale. Depollution is undertaken, but without adequate monitoring and enforcement it is not carried out on all ELVs.

[1] Figure 5.1 is adapted from the American Iron and Steel Institute (1992), reproduced in Recycling Council of Ontario (1999).

Figure 5.1: The New Zealand ELV Recycling Process and Balance Sheet



Therefore not all batteries, chlorofluorocarbons (CFCs) from air-conditioning units, tyres, and used oils are reused or recycled. As a result hazardous substances enter the environment with the effect of both an environmental burden and also a financial burden in terms of the eventual cost of clean-up, and also the cost of replacing substances and materials that could otherwise have been reused. From the dismantler, scrap metal recycler or local collection point, the ELVs are crushed and transported to the metal shredder. Here the steel is extracted and at the steel mill is recycled into a number of different marketable products, most of which are sold in New Zealand. The nonferrous metal is also separated, some for the domestic market but most is exported to Korea and the Republic of China. The ASR is disposed of in landfills. The bulk of New Zealand's ASR is disposed of at Redvale Landfill where there is minimal contamination into the environment and where the methane gas is extracted and converted to electricity.

5.3 Automotive Dismantling Facilities[2]

There is no record of the number of vehicles passing through car dismantling facilities in New Zealand and there is little organisation within the industry. The industry has open entry, and while individual operators must hold a second-hand dealers licence they are not legally required to hold an operating licence specific to vehicle dismantling or, belong to an association. There are around 350 to 400 automotive dismantlers operating in New Zealand, of which approximately 180 are members of the Motor Trade Association (MTA). While there are some high-quality, high-cost operations, there are also a large number of small low-cost dismantling operations (pers. comm. Motor Trade Association (MTA) 2002).[3]

Typically, when a vehicle is brought in to a dismantling facility it is assessed to determine how much the dismantler will pay for it. Vehicles that are more than ten

[2] The information in this section has been obtained through interviews with the Manager of Motex Partsworld, Lower Hutt (winner of the industry award for Good Practice Operator in 2002); a representative from the Motor Trade Association; the Trade Waste Officer at the Hutt City Council; and the Team Leader Compliance Monitoring at the Manawatu-Wanganui Regional Council.
[3] All references to personal communication by the author (as denoted by pers. comm.), can be found directly following the bibliography.

years old are usually of little or no value. Electro-mechanical parts are removed for reuse, so are structural body parts, in particular front-end parts that are in demand by panel beaters. Most dismantlers have their inventory of saleable parts computerised and sell nationwide. When a customer phones in for a particular part, if the dismantler does not have that part, s/he puts out a request on the nationwide computer network of automotive dismantlers,[4] and within hours replies will come in with the part and its price. The part is couriered to the dismantler and the costs are passed on to the customer. Motex Partsworld, Lower Hutt also exports car parts to Samoa, Fiji, Papua New Guinea, and sometimes Nigeria and Jamaica. There is a market for catalytic converters due to the value of precious metals contained within them. Catalytic converters are collected and bought from automotive dismantlers, and are usually exported to the United States (pers. comm. Motex Partsworld 2002).

Some dismantlers accept ELVs of zero or negative value, free-of-charge. If the vehicle is to be collected, it is done so at the owner's expense. Motex Partsworld has an arrangement with a neighbouring scrap metal recycling firm that accepts ELVs. Motex Partsworld arranges for the ELV to be delivered to the scrap recycler and in return may request a couple of vehicle parts. The scrap recycler will remove the hazardous substances and any parts or materials of value to sell for scrap, and then stores the car hulk for collection by the mobile crusher.

With regard to the removal and disposal of hazardous fluids, gases and components from vehicles, practices and standards are variable with some ELVs not undergoing depollution prior to recycling. Many dismantling facilities were in operation a long time before environmental standards were introduced that would require improved practices with regard to the removal and disposal of hazardous substances from ELVs. Since that time many dismantlers have provided a suitable area for the depollution of incoming vehicles. This area would typically have cover from the weather, an impermeable floor, a collection facility for hazardous fluids, plus an action plan and clean-up equipment in the event of a spillage. This they have done either on their own initiative, with encouragement from the MTA, or as a requirement from their local authority. As a service to their members, the MTA

[4] Partslink is a computer network linking most automotive dismantlers, and has been in operation for around ten years.

provide plans, specifications, and guidelines for the depollution area of a dismantling facility. The MTA also have nine regional managers who audit compliance with the Code of Practice it has for all members of the association, and with guidelines provided for the handling of used oil etc. (pers. comm. MTA 2002). The Ministry for the Environment has also published a document entitled "What's in Your Waste? A resource for trade businesses" (MfE 2002c), which identifies for automotive dismantlers the hazardous fluids, gases, and parts of an ELV to be removed, giving their New Zealand Waste List Code. Also provided are the current and best management practices. With limited resources in city, district, and regional councils, regular monitoring of dismantling facilities does not always take place so that a number of automotive dismantlers will not be in compliance with the environmental standards, giving them an economic advantage over compliant operators.

The automotive dismantler is subject to the same waste management practices as any business operating within the jurisdiction of that particular local authority. A model bylaw exists regarding trade waste management, which is then tailored to suit each region. An example of this is The Hutt Valley Trade Waste Bylaw 1997, which sets standards for trade wastes and facilitates the disposal of such wastes, on behalf of both the Hutt City, and the Upper Hutt City Councils. The Hutt City Council requires businesses to hold a trade waste consent, and monitors trade waste disposal. A business has three options regarding trade waste. The first option is to contain all waste, so that there is no discharge into the environment at all. In this case everything gets passed to a waste handling company for disposal. The second option is to meet the criteria for authorisation from the local authority to connect to the trade waste disposal system. The final option is to discontinue the activity, where that activity is not in compliance with the Resource Management Act (RMA) 1991. Alternatively it could be declared a contaminated site and go on the contamination register. Many dismantling facilities will choose the second option. Dismantlers and others in the automotive industry require a Trade Wastes Discharge Consent in order to discharge into the sewer those wastes which comply with the Bylaw.

The Hutt City Council puts out two guidelines for those in the automotive industry within their jurisdiction. The first of these[5] lists those waste products from the automotive industry which are prohibited entry into the sewer system, and provides an alternative disposal method for such products. Waste oil is one such substance which must be separated from other waste, and can be collected by one of a number of companies offering such a service.[6] Antifreeze must not be discharged into the sewer or storm water system. It must be separated from other wastes to be recycled by workshops operating antifreeze-recycling machinery, or to be collected by a waste disposal company. Battery acid contains high levels of metallic contaminants and is also corrosive to the sewer. It must be stored and collected by a recycler or waste recycling company, who must also collect chlorinated solvents, oil-based paint residues or waste thinners. Acidic or alkaline waste cleaning solutions may be acceptable for the sewer system after pre-treatment to bylaw acceptance standards. This is the same for radiator repair wastewater, which can contain high levels of zinc, lead and copper.[7] Diesel, petrol, kerosene, degreasers, and solvents are prohibited from entering the sewer system. Any discharge likely to be contaminated by these substances must be effectively trapped by a pretreatment system. The second guideline distributed by the Hutt City Council[8] provides a suggested pre-treatment system for a wash pad, steam-cleaning bay or depollution area, and includes the regular maintenance requirements of such systems by a waste disposal contractor. ELVs containing an air-conditioning unit require a trained person to come and extract the gases from that unit (pers. comm. Hutt City Council 2002).

Discharge into a reticulated system is the responsibility of city and district councils, but where there is a discharge into the environment (either directly or from that reticulated system) it becomes the responsibility of the regional council.[9] Section 15 of the RMA (1991, 164) prohibits the discharge of contaminants

> "into water; or . . . onto or into land in circumstances which may result in that contaminant . . . entering water; or . . . from any industrial or trade premises

[5] "The Automotive Industry and the Trade Wastes Bylaw – A guide for local businesses." See Appendix Two.
[6] Dismantlers pay to have their waste oil collected.
[7] Settlement and/or filtration in the pre-treatment system will enable the removal of heavy metals.
[8] "The Automotive Industry and the Trade Wastes Bylaw – A guide to Wash pads, Radiator Repair Waste and Storm water Diversion Valves." See Appendix Two.
[9] Refer to Section 30 of the RMA (1991).

into air; or . . . onto or into land – unless the discharge is expressly allowed by a rule in a regional plan…"

In addition "open burning of . . . materials and metals that are components of motor vehicles . . . is a prohibited activity" (Manawatu-Wanganui Regional Council 1998, 41). Regional councils do not have the resources to monitor all industrial or trade premises on a regular basis. For this reason the Manawatu-Wanganui Regional Council concentrates when monitoring for compliance, on one type of industry at a time, but will also investigate another in response to a complaint. Where a dismantling operation is unable to control the destination of its contaminants, a resource consent is required (RMA 1991). The Manawatu-Wanganui Regional Council prefers to take an educatory approach with poor operators giving advice and presenting the different options available to control and capture hazardous substances from the ELVs received. It is then up to the operators to choose the preferred method for controlling the removal, collection and disposal of hazardous substances at their facility. When these are controlled and collected a resource consent is no longer required (pers. comm. Manawatu-Wanganui Regional Council 2003).

Photograph 2: Car hulks piled up at an automotive dismantling facility

5.4 Mobile Crushers[10]

Car hulks are stockpiled at collection sites throughout the country, usually at dismantling facilities, or at the local authority landfill, and sometimes on private property. There are seven mobile bailers or crushers operating in New Zealand, some of which are owned by Sims Pacific Metals Limited (the metal shredding company) and the others are owned by contractors. They travel to the collection sites throughout the country, crushing and removing the car bodies. One such contractor is Gamma Corporation, which operates throughout the North Island as a crushing and transporting service for scrap metal, and crushes and transports approximately twenty-five thousand tonnes of ELVs per year. Gamma Corporation collects car hulks free-of-charge, crushing and baling them.[11] The process of crushing a car hulk involves putting the car body into the back of a mobile bailer where the lid folds down, a ram pushes the car forward, and it is squashed into a cube. If a crusher is used it simply flattens the car body. Sims Pacific Metals Ltd. and Gamma Corporation contract out the freighting of the bailed or crushed car hulks which are transported by truck and trailer units or by car carriers to the metal shredding facility. Car carriers transport thirty to forty car bodies at a time to the shredder in Auckland or Christchurch. The frequency with which the mobile crushers clear the collection sites of car hulks varies around the country. For the East Cape ELV removal can be as infrequent as once a year, for the Far North, every six months and for most other areas it would be closer to three-monthly intervals. Around the greater Auckland area ELV removal can be as often as once a week.[12]

From both the safety and the contamination aspect, vehicles are required to have undergone depollution and be stripped prior to being crushed. Hazardous fluids such as lubricating oils, diesel, petroleum, antifreeze, must have been drained. It is also a requirement that air-conditioning units have had the CFCs removed. Batteries, tyres, and loose rubbish must be removed before crushing.[13] The crusher operator does not monitor this but takes it on trust that depollution has been carried out. In addition,

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[10] The information in this section has been obtained through interviews with the Director of Gamma Corporation.

[11] Along with ELVs, Gamma also collects and crushes other feedstock for the metal shredder, namely, tin cans, white ware, roofing iron, old bikes, etc.

[12] Some tow companies in the Auckland area, dealing with ELVs, tow them directly to Sims Pacific Metals Ltd in Otahuhu.

[13] Seats are supposed to have had the foam and vinyl removed, but this is not always the case.

Photograph 3: Car hulk entering ELV Flattener

Gough Engineering, Christchurch

Photograph 4: Car hulk emerging from ELV Flattener

Gough Engineering, Christchurch

closed containers act like bombs in the crushing process, and so for this reason drained petrol tanks must be punctured and LPG/CNG tanks removed. Glass remaining after the car hulks have been crushed and removed is disposed of in landfills (pers. comm. Gamma Corporation 2002a).

Photograph 5: Crushed car hulks being transported to the Metal Shredder

5.5 Metal Shredding Operations[14]

New Zealand has two metal shredders which take car bodies, household white ware, and other metal goods, shreds them and separates the steel and nonferrous metals for recycling. Sims Pacific Metals Limited, employing approximately sixty people, owns both shredders. One of the metal shredders has been operating in Auckland since 1980. Due to the increasingly high costs associated with transporting the car bodies and other metal goods from the South Island up to Auckland, Sims Pacific Metals Ltd. located a second shredding plant in Christchurch, which has been operational since 1994. Sims Pacific Metals Ltd. is a fifty-fifty joint venture with Sims Metals and Pacific Steel Ltd., with the metal shredding operation in Auckland being situated on Pacific Steel's premises in Otahuhu.

[14] Information was gathered from an interview with the Ferrous Trading Manager for Sims Pacific Metals Ltd. and an on-site visit to the metal shredding plant.

The two metal shredding operations process more than 10,000 tonnes of metal feedstock each month, with the total estimate of nearly 180,000 tonnes of metal goods shredded each year. Roughly half of the tonnage shredded is motor vehicle hulks and Sims Pacific Metals Ltd. estimate that on average each tonne represents two car shells. In this way the metal shredding company estimates that it could be recycling up to 180,000 vehicles per year.[15] The biggest cost for Sims Pacific Metals Ltd is that of crushing and transporting the car bodies to the shredders. It is the only recycler of automobile metals in New Zealand and the company states that they are not operating at capacity. They would be able to recycle more car bodies if the number of post-use motor vehicles in New Zealand increased.

Photograph 6: Car hulks piled up for the Metal Shredder

Once at the shredding plant, a crane is used to turn the car hulk over, where it is then checked to see whether the fuel tank is intact. If the petrol tank is intact, it is spiked, and if the vehicle ran on LPG, the tank is removed in order to avoid an explosion once it is inside the shredder. The car hulk is then fed down a chute which leads into the shredder. The metal shredder takes a whole car body and hammers it into fist-sized chunks. The shredder has a high-speed rotating shaft, which revolves at seven

[15] Others estimate the weight of a car hulk to be 600 to 800 kilograms (Collins, Fanning, Crowe and Meaney 2002). Using these figures would put the number of car hulks shredded annually at nearly 150,000 (at 600 kg/hulk) or 112,500 (if the weight is 800kg).

Photograph 7: Metal Shredder at Sims Pacific Metals Ltd., Auckland

Photograph 8: Metal going down the chute into the shredder

hundred revolutions per minute. Attached to the shaft are fifteen flailing hammers, which strike the car hulk either as it falls or, as it rests on the stationary plates ('grates') that line the inside of the mill housing. The car body begins to break up on direct contact with the hammerhead or as it is pummelled against the fixed surfaces by the moving hammers. Four-inch perforated grates make up the fixed surfaces. These allow fragments of the car body of an acceptable size to fall through onto the first transfer belt. This transfer belt conveys the car fragments from the mill house to a magnetic drum. They pass through the magnetic drum, which separates the ferrous metal (all the iron and steel, with the exception of stainless steel) from the rest of the material. This technique recovers approximately 95 percent of the ferrous metal content of an automobile. Sims Pacific Metals Ltd recycles about five hundred tonnes of steel[16] on an average operating day. The scrap steel is stock piled ready to go to Pacific Steel's steel mill to be melted down and reused. When there is more steel than Pacific Steel can use, the excess is exported to Indonesia, Korea, China, and occasionally Japan.

After passing through the magnetic drum, the nonferrous material moves along a conveyor belt to the eddy-current separator. This uses electromagnetic induction to separate the nonferrous metals from the remaining material, which will become waste. The nonferrous metals recovered are aluminium, zinc, brass, bronze, copper, lead, magnesium, nickel and stainless steel. They move along another conveyor belt where workers manually extract the copper, bronze and brass for the domestic market. The remaining mixture of nonferrous metals is exported to the Republic of China and Korea where it is manually sorted and then recycled.

Approximately 75 percent of the input into a shredder is steel and 2 to 4 percent is nonferrous metals. All of the metal content is extracted and either recycled in New Zealand or exported for recycling. The remainder, referred to as ASR or 'fluff' is destined for the landfill. In Auckland all the ASR from the metal shredder is disposed of in the Redvale landfill. During the shredding process there is no further contamination of the materials that will ultimately be disposed of in landfills (pers. comm. Sims Pacific Metals Limited 2000).

[16] This steel is sourced, not just from automobiles, but also from white ware, and other metal goods.

Photograph 9: Shredded cars being conveyed to the magnetic drum

Photograph 10: Separated ferrous metal ready for the Steel Mill

5.6 The Steel Mill[17]

Pacific Steel is a division of Fletcher Challenge Steel and Wire Limited and is solely a recycling plant. The only producer of wire rod, reinforcing bar and merchant bar products in New Zealand, Pacific Steel produces for the domestic market and increasingly exports to niche markets in the Pacific Island and Pacific rim countries. Nearly all the scrap used in steel production is sourced from Sims Pacific Metals Ltd.

At the steel mill the carefully controlled blend of iron and steel scrap is lifted by overhead magnetic and hydraulic cranes into charging baskets, carrying on average fifty-five tonnes of scrap, from which is produced some forty-five to fifty tonnes of liquid steel. The charging baskets transport the scrap into Pacific Steel's electric arc furnace. The furnace powered by a transformer, transfers electrical energy in the form of an electric arc to the scrap via three 500mm graphite electrodes. The process is aided by an injection of oxygen into the furnace, and as a consequence the scrap blend is melted. The addition of burnt lime produces a slag with the purpose of removing impurities from the liquid steel. Fumes are extracted at a rate of three hundred thousand cubic metres per hour and are collected in the steel plant's fume plant bag house. This is done in order to meet environmental regulations and as a result environmental impact from the steel mill is minimal. Once the liquid steel has reached both the correct temperature and the acceptable level of purity, it is ready for casting in water-cooled billet moulds. The steel is now in a semi-finished form in rectangular billets.

The billets are supplied to the rolling mill from the steel plant where they are reheated to rolling temperature in a gas-fired furnace. The malleable billets are passed through rollers to shape them into a variety of sizes. The finished product is cooled before it is cut into specified lengths and bundled ready for dispatch. Fletcher Challenge has a second, smaller rolling mill in Suva, Fiji, which sources billet from Pacific Steel as well as from elsewhere. The Suva mill supplies markets throughout the Pacific Islands and is also geared to meet orders of small or specialist product for the New Zealand and Australian markets.

[17] Information in this section was obtained through an interview with the Communication Manager, Fletcher Challenge Building, Steel Group.

A large amount of the recycled steel is made into reinforcing bar. The remainder goes to the rod mill, which produces flat steel. Some rod is exported to the United States and Canada (primarily for roofing), some supplies Pacific Wire and other wire plants, while the rest is made into angles, flats, and channels. The Pacific Wire plant produces both bright wire for reinforcing mesh, nails, and annealed wires, and galvanised wire for fencing, roping wires, and staple manufacture. Pacific Wire produced forty thousand tonnes of wire in 1999 (pers. comm. Fletcher Challenge Building, Steel Group 2000).

5.7 Redvale Landfill[18]

All of the ASR recovered from the Auckland shredding operation[19] is transported for disposal to Redvale Landfill in Rodney District, thirty kilometres north of Auckland's central business district. Owned by Waste Management NZ Ltd., Redvale landfill was opened in August 1993 and is New Zealand's most comprehensively engineered land disposal facility, and can boast full compliance with the RMA (1991). It is the first privately owned landfill in New Zealand permitted to accept municipal waste. It has a staff of thirty, and a design life of thirty years, based on a daily estimated input of one thousand tonnes of waste. The landfill operation has an area of sixty-nine hectares, and airspace of 20.4 million cubic metres, which equates to a total refuse capacity of approximately fifteen million tonnes.[20] Redvale accepts only non-hazardous solid wastes and special wastes (Waste Management NZ Ltd. 2000).

Redvale Landfill is sited on an old lime quarry, which is an extremely suitable site for a landfill. The underlying bentonitic mudstone and lime rock extend to depths in excess of one hundred metres and have a permeability of not more than 1×10^{-9} metres per second.[21] There are no aquifers of regional significance in the vicinity, and this, along with the low permeability means that risk of groundwater contamination has been virtually eliminated. Rainwater combined with other liquids

[18] Information was obtained through an interview with the Landfill Manager at Redvale Landfill and an on-site visit to the landfill.
[19] This is the majority of New Zealand's ASR.
[20] Approximately four million cubic metres in total will be used for daily and intermediate cover of mudstone, lime rock, and soils.
[21] This rate is stipulated by the US Environmental Protection Agency (US EPA) for non-hazardous landfill facilities.

from the compacted refuse, called leachate, collects at the base of the landfill and is contained by the liner.[22] To prevent build-up of the leachate, it is drained into one of four sumps, each of which contains a submersible pump. The leachate is pumped into storage tanks, and then on to a low-temperature evaporator, where it is transformed into water vapour and then destroyed by a large ground flare. Any residual solids from the leachate are conveyed back to the landfill (Waste Management NZ Ltd. 2000). As a consequence the environmental impact from the Redvale Landfill is minimal.

The natural decomposition of organic solids in a closed, oxygen-free, environment like the Redvale sanitary landfill produces methane gas. Gas collection wells are installed progressively during the development of the landfill. Header pipes transfer the gas to a main, which feeds the gas processing facility. Some of the gas is used in the evaporator and the flare, but as the volume of methane increases, more can be used to generate electricity. The gas-powered engine drives a generator, providing electricity, with a potential generating capacity of fifteen megawatts (Waste Management NZ Ltd. 2000). The Redvale Landfill will continue to provide power for about twenty years after the landfill is at capacity.

The Redvale Landfill accepts only "non-hazardous residential, commercial, and industrial solid waste, demolition debris and sludges. . . . [Some is deemed 'special waste' as it has been] generated by a special waste generator from a commercial or industrial activity that requires special handling, burial, pre-treatment or testing before it can be accepted for land filling" (Waste Management NZ Ltd. 2000, 3.12 and 3.16). ASR comes under this 'special waste' category. ASR is regularly tested for nonferrous metal compounds (mostly zinc and lead) to check that it satisfies compliance limits.

At Redvale, on-site water is channelled into relatively large sedimentation ponds, where the suspended solids sediment is reduced to an acceptable level before being discharged into a stream. There is continuous monitoring of the water entering the sedimentation ponds for potential leachate contamination.

[22] The liner consists of a 900mm layer of recompacted bentonitic mudstone on top of which is a layer of lime rock rubble for a depth of 150mm.

The destination of the bulk of New Zealand's ASR, Redvale Landfill, is an engineered land disposal facility which has minimal negative impact on the environment and uses the methane gas it produces to generate electricity (pers. comm. Waste Management NZ Ltd. 2000).

5.8 Tyre Recycling[23]

Traditionally old tyres were used by farmers to weigh down silage heaps, but a far greater number are now being discarded than are required by farmers. It is estimated that between 2.5 and 3 million tyres are discarded annually, with up to 1.2 million of those coming from the Auckland region alone. More vehicles on the roads and relaxed import restrictions on used tyres from Japan have increased the number of tyres requiring disposal (J. & J. Laughton Shredding Services Ltd. 1997). In addition many landfills no longer accept whole discarded tyres thus there is greater demand for tyre shredding.

Most end-of-life tyres in the greater Auckland area are collected for recycling by J. & J. Laughton Shredding Services Ltd, which was established in 1996. Collecting around five thousand tyres each week J. & J. Laughton carries out scheduled runs collecting from tyre shops and mechanical shops and work with some councils collecting tyres from transfer stations.[24] In addition, the firm has a contract with Manukau City Council for the annual collection of tyres from households (pers. comm. J. & J. Laughton Shredding Services Ltd. 2003). Once at J. & J. Laughton the tyres pass through the initial shredding machine, which reduces them to one quarter of their original size. A second shredder reduces the tyre chip to a size of at most 16mm. The chips are passed through a magnetic extractor which leaves them 99% steel free.[25] The tyre chips are non-toxic and are used to surface equestrian arenas and children's play areas (J. & J. Laughton Shredding Services Ltd 1997). J. & J. Laughton also supplies Burgess Matting and Servicing Ltd. based in Wanganui. Here the recycled rubber is used to make mats, carpet underlay, hoses, and pipes.

[23] The information in this section was obtained through an interview with J. & J. Laughton Shredding Services Ltd. and through an interview with the owner and an on-site visit to Rubber Technologies Ltd.

[24] J. & J. Laughton charges $1.65 plus GST to collect and dispose of a car tyre (pers. comm. J. & J. Laughton Shredding Services Ltd.2003).

[25] An 8-kilogram tyre is made up of 5.5 kilograms of rubber, over 1.5 kilograms steel and less than 1 kilogram of fibre. The separated steel goes to Pacific Steel for recycling. The fibre is not separated out but left in the rubber that is shredded for horse arenas and children's play areas.

Tyres disposed of in landfills by J. & J. Laughton undergo the initial shredding process only (pers. comm. J. & J. Laughton Shredding Services Ltd. 2003).

Rubber Technologies (NZ) Limited (Hamilton) began operating in September 2000 bringing new technology into New Zealand which reduced used tyres to fine rubber crumb. Crumb rubber has many potential uses including industrial flooring, acoustic barriers, wharf buffers, floating docks, athletic tracks, tennis courts, non-slip flooring and swimming pool tiles. It can also be used mixed with hot bitumen for roading as it increases the life of the road and reduces noise and road fatigue. Rubber Technologies (NZ) Ltd. planned to expand the domestic market into many of these areas and also to export crumb rubber (pers. comm. Rubber Technologies (NZ) Ltd. 2000). The firm had a contract with Bridgestone/Firestone Direct for all post-use tyres from their company-owned stores to be recycled by Rubber Technologies (NZ) Ltd. In spite of this Rubber Technologies (NZ) Ltd. went into liquidation in June 2002 leaving stockpiles on two sites of collectively more than one hundred thousand tyres and a potential environmental disaster (Waikato Times 19 June 2002).[26]

J. & J. Laughton has investigated the possibility of expanding into refined granulated or crumbed rubber but consider the current market in New Zealand to be limited, as has been borne out by the fate of Rubber Technologies (NZ) Ltd. (pers. comm. J. & J. Laughton Shredding Services Ltd. 2003). For this reason there are not more tyres recycled in New Zealand.[27]

5.9 Waste Oil Recovery

There is a core collection network for used oil currently operating in New Zealand. The major oil companies provide a collection service for large workshops and some service stations to which they supply new oil. In some areas refuse transfer stations, landfills, and some oil retailers provide public collection sites for used oil (Ministry for the Environment and Occupational Safety & Health Service 2000). Those generating small quantities of used oil, however, are not always catered for and some small towns and districts do not have access to public collection sites.

[26] The stockpiled tyres became the problem of the landowners and became news again in June 2003 when more than 80,000 of them were illegally dumped in a rural community in Waikato District in a night time drop (TV One News 26 June 2003).
[27] The percentage of used tyres that are recycled is unknown.

Until 1998 the Dominion Oil Company was re-refining oil for reuse as a vehicle lubricant. A lack of economic viability and continued difficulty in meeting environmental standards, however, brought the plant to a close in mid-1998. Re-refining of used oil is carried out on a small scale with specialist industrial oils, but is unlikely to be a viable proposition for the bulk of used oil under current conditions in New Zealand (Ministry for the Environment, MfE 2000). Without full nationwide collection, and with the market unable to reuse all New Zealand's used oil, it is likely that some used oil is discarded into the environment.

A number of processors reprocess used oil for use as a fuel in several types of burners. Contaminants are removed from the used oil by filtering or gravity separation. Reprocessed oil is used as a supplementary fuel in the high temperature burning in cement and process kilns, with much of it being used by Milburn Cement Ltd. Low temperature atomising burners and vaporising burners are also fuelled by used oil. Boilers, water heaters, and some space heaters are the main users of atomising burners. Large atomising burners are used in asphalt manufacture. Vaporising burners are frequently used as heaters in workshops but are less efficient than atomising burners (MfE 2000).

5.10 Recycling Car Batteries

Lead-acid batteries are the most recyclable of any consumer product, with 98 percent of a battery able to be recycled. Over 600,000 replacement automotive batteries are sold annually in New Zealand, and of these, approximately 500,000 are recycled. All of these are recycled at the battery manufacturer, Exide Technologies' Recycling Centre in Petone.[28] In the last few years the company has expanded the Recycling Centre doubling its recycling capacity, and has carried out environmental upgrades, including the installation of a top-quality air filtration system (Exide Batteries New Zealand Ltd. 1999).

The company, in an arrangement with the Dominion Trading Co. of Christchurch set up a nation-wide battery collection and delivery service (to the centre in Petone). At the Recycling Centre a mechanical saw is used to cut through the base of the used

[28] Of the five lead-acid battery recycling plants operated by Exide Technologies worldwide, the Petone plant is the only one situated outside the United States.

battery, in order to drain off the sulphuric acid, and any lead suspended in the acid. A hammer mill is used to crush the drained battery, after which components of the scrap battery are floated off through a series of flotation ponds. The crushed plastic pieces from the battery case are re-granulated to be used for the next generation of battery cases. The lead and lead oxide which remain are smelted in a rotary furnace along with additives used to aid the purifying process. The refined lead (with a purity of up to 99.97 percent), is used to manufacture new batteries at the nearby Exide Technologies factory in Lower Hutt (Exide Batteries New Zealand Ltd. 1999).

5.11 Conclusion

Recycling of ELVs in New Zealand is market-driven. Automotive dismantlers remove mechanical and structural body parts for resale but the percentage of an ELV recovered by dismantlers for reuse is not measured, and is therefore unknown. At the shredding facility all the ferrous metal in ELVs is recovered for recycling and this accounts for 70 to 75 percent of an ELV by weight. Most of the nonferrous metals are also recovered for recycling, adding a further 2 to 4 percent of an ELV being recycled. Some tyres are recycled, as is some used oil, with 83 percent of car batteries being recycled into new batteries. In total at least 75 percent of each ELV (by weight) that enters the recycling system is recycled.

Many dismantling facilities carry out depollution of ELVs in a manner compliant with both local authority bylaws and the RMA (1991). Where local authority resources are limited and monitoring is not a regular occurrence, hazardous waste disposal practices may not be up to standard and in some cases ELVs may not undergo depollution. This provides opportunity for the leaking of hazardous fluids into the environment either at the dismantling operation, when the vehicles are stacked waiting for the crusher, during the crushing or the shredding process or, when the ASR is contaminated prior to disposal in the landfill. The steel mill is monitored to ensure it meets environmental regulations. The permeability of Redvale landfill meets the standards required, further any leachate is drained off, vaporised and destroyed. On-site water is channelled into sedimentation ponds and monitored for potential leachate contamination, thus the landfill also is compliant with the RMA (1991). From these results it can be concluded that the main area of concern regarding environmental impact from the automobile recycling industry is

the level of depollution of ELVs undertaken by dismantlers (either at their own facility or at the local authority collection site) and the quality of the removal and capture of these hazardous substances. Tyres remain a disposal problem in New Zealand, as they do elsewhere. The domestic market for recycled rubber products is limited so that a large proportion of used tyres are not required for recycling. Many used tyres are shredded to go to landfills, some are landfilled whole, and some remain stockpiled.

The functioning of the market in New Zealand does not ensure that all ELVs are collected and enter the recycling system. Many ELVs are illegally abandoned, creating an environmental and financial burden for society. The extent of this problem is presented in the next chapter, as are factors that contribute to it, and local authority initiatives aimed at reducing the abandoned vehicle problem.

Chapter Six

The Abandoned Vehicle Problem in New Zealand

"Increasingly, the world around us looks as if we hated it."
Alan Watts

6.1 Introduction

The New Zealand automobile recycling system is well established and able to deal with all ELVs. Not all ELVs, however, go directly into the recycling system, with some ELV owners choosing to dump their vehicles on private or public land, on roadsides, in rivers, down gullies or, in coastal areas. This has become a problem in New Zealand and presented in this chapter are the results of an investigation into the extent of the abandoned vehicle problem in New Zealand. The findings provide an estimate of the annual number of vehicles abandoned on public land nationwide, and an assessment of the cost incurred by local authorities to remove and dispose of them. Environmental externalities associated with this problem are outlined. In addition, factors that exacerbate the abandoned vehicle problem are identified, and policy instruments used by local authorities aimed at reducing the problem, are examined.

An outline is given of the regulatory framework established by the New Zealand Government with regard to motor vehicles. The law concerning abandoned vehicles is examined, as are the institutional practices concerning motor vehicle registration, licensing, change of ownership, and cancellation of registration.

This chapter is presented as follows. The extent of the abandoned vehicle problem and the factors that contribute to it are presented in Section 6.2. The focus of Section 6.3 is the current institutional practices regarding the motor vehicle ownership, licensing, and registration cancellation and in particular the areas of weakness in these practices which result in the loss of record of a vehicle's ownership and whereabouts on the Motor Vehicle Register. In Section 6.4 the laws relating to abandoned vehicles are scrutinised for changes that can be made to reduce the cost to society imposed through vehicles being abandoned. Section 6.5 concludes the chapter.

6.2 The Abandoned Vehicle Problem in New Zealand

This section provides an overview of the abandoned vehicle problem ascertained from the results of the two surveys (discussed in Chapter Four) of all the local authorities in New Zealand. The overview includes the magnitude of the problem, factors that contribute to it, and the local authority initiatives aimed at reducing the

problem. Concerning the validity of the results, the first survey of local authorities regarding abandoned vehicles achieved a 90 percent response rate, and the second survey an 88 percent response rate.[1] With the exception of one district council, all seventy-three local authorities surveyed took part in at least one of the two surveys.[2]

6.2.1 The extent of the abandoned vehicle problem

The responses to the first survey of local authorities indicated that dealing with abandoned vehicles might not have been too much of a burden in the first half of the 1990's. In 1995, only twenty-one local authorities recorded the actual number of vehicles abandoned within their jurisdiction, and the cost to the local authority to remove and dispose of them. By 1997 this was beginning to change, with thirty-eight local authorities recording both the number of vehicles abandoned and the cost incurred by that authority to remove, notify, and dispose of the vehicles. In 1999, sixty-three local authorities recorded the number of abandoned vehicles dealt with, and an additional nine councils provided an estimate of this number.

The regional councils have varied involvement in the retrieval and disposal of abandoned vehicles. Several regional councils have an understanding with the district and city councils in their region that all abandoned vehicles, regardless of where they have been dumped will be dealt with by the district and city councils. Some regional councils take sole responsibility for vehicles dumped in (or alongside) rivers and beaches, while others have shared responsibility and costs with the appropriate district and city councils. Regional councils collectively retrieve and dispose of around nine hundred vehicles dumped in or beside waterways each year, the rest by agreement remain the responsibility of the district and city councils.[3] The number of motor vehicles dumped in New Zealand's national parks each year is very small, as is the cost to remove and dispose of them. For this reason they have not been included in the overall accounting.

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[1] Of those local authorities who responded to the second survey, twelve provided responses to only the first two questions, supplying the figures on the number of abandoned vehicles and the associated costs.

[2] Most local authorities took part in both surveys. Survey I was conducted late in 2000, and Survey II, late in 2002.

[3] This figure was obtained from telephone interviews with the officer responsible in each of the regional councils.

In order to obtain an estimate of the annual number of vehicles abandoned nationwide in New Zealand, data supplied by the local authorities (including the regional councils) was aggregated. The total estimated numbers of vehicles abandoned throughout New Zealand during the years 1999 to 2001 are given in Table 6.1.[4] Also presented in Table 6.1 are estimates of the total cost to local authorities to deal with abandoned vehicles during the same period.

Table 6.1: Estimates of the Number of Vehicles Abandoned Nationwide, and the Resulting Costs Incurred by Local Authorities

	1999	2000	2001
Number of abandoned vehicles	24,300	27,700	25,200
Cost estimate to ratepayers, net of revenue (lower) [a]	$3,047,800	$2,740,300	$2,741,000
Cost estimate to rate-payers, assuming no costs recovered (higher) [b]	$9,234,000	$10,526,000	$9,576,000
Cost, if owners of 35% of abandoned vehicles are traced & costs recovered [c]	$6,002,100	$6,841,900	$6,224,400

[a] Most councils provided the actual net costs recorded in the council's accounts, stating that officer time was not included in these figures (most often this was simply actual tow fees and sometimes a storage fee arrangement). Councils were then asked to provide an estimate of officer time devoted to dealing with abandoned vehicles in their area. These estimates varied from between the equivalent of one full time person in the large cities (or in areas with the greater problem), to two and three hours per week. Where city councils had contracted out the service, the estimate of in-house time spent on contract management and call centre services was twelve to twenty-four hours per week. Net costs plus estimated officer time was used to calculate the lower yearly estimates. These costs have not usually included vehicle stripping costs.

[b] Some councils also gave their costs as an estimate of the average cost incurred to the council for each abandoned vehicle. Again these varied from $100 per vehicle (excluding stripping costs), to $380 per vehicle. (A breakdown of the $380 cost was as follows: $60 investigation, two tows at a minimum cost of $40 each, storage at $12 per day for 25 of the 28 days, and $40 fee to strip the vehicle).[5] The higher cost estimates were calculated at $380 per vehicle, with no costs recovered. These costs are exclusive of any costs recovered from traced vehicle owners.

[c] Here, the higher cost estimates have been used, and the assumption has been made that of these abandoned vehicles, 35 percent of the owners have been traced and council costs have been recovered, for each of the three years. The origin of the figure of 35 percent of owners will be explained in the final paragraph of Section 6.2.1.

The number of vehicles abandoned nationwide from 1999 to 2001 is between 24,300 and 27,700. Although the first survey requested abandoned vehicle figures from 1995, an insufficient number of local authorities were able to furnish these data to be able to provide a meaningful aggregate figure until 1999. Also given in Table 6.1 is an annual estimate of the aggregated cost to local authorities to remove, notify, and

[4] These are estimates because as stated, nine councils estimated the number of vehicles abandoned in their area. Also nine councils did not respond to Survey II, but where these councils had provided abandoned vehicle numbers in 1999, this figure was used as an estimate for 2000 and 2001. In addition, whereas most councils gave their figures for a calendar year, nine councils gave their annual figures from the period 1 July to 30 June. For the annual figures for these councils, in order to approximate for the calendar year 2001 for example, the vehicle numbers and costs were used from the period 1 July 2001 to 30 June 2002.

[5] One council gave $670 as the cost per vehicle for investigation, towing, storage, advertising and finally stripping the vehicle. When compared with the other estimates, however, this figure was considered an outlier.

frequently dispose of these abandoned vehicles. Since local authorities nearly always only had record of the actual costs paid out to tow operators, newspapers for advertising, and possibly storage providers, cost estimates were calculated in two different ways. These are explained in notes 'a' and 'b' for Table 6.1. The estimates were then adjusted to take account of those costs recovered from the owners of some abandoned vehicles.

From Table 6.1 it can be concluded that on average approximately 25,500 vehicles nationwide, are abandoned each year, and the annual cost to ratepayers to process and dispose of these vehicles is just over six million dollars. This estimate requires qualification, as the cost estimates do not include environmental clean-up costs when recovering vehicles from places like rivers and coastline, or social costs resulting from environmental externalities. In addition, some vehicles dumped in rugged terrain (for example, parts of the Coromandel Peninsular) are never retrieved, as it is too costly to do so. These vehicles number in the thousands nationwide.

As required by law nearly all local authorities attempt to trace the owners of abandoned vehicles, with varying degrees of success. Fifty-two local authorities provided actual figures or an estimate of the proportion of abandoned vehicle owners they were able to trace in 2001. The results are presented in Table 6.2, which shows the success of local authorities in tracing the owners of abandoned vehicles and recovering costs.

Table 6.2: Success of Local Authorities in Tracing Owners of Abandoned Vehicles and Recovering Costs

Proportion of abandoned vehicle owners traced:	Number of local authorities
Fraction traced ≤ ¼	33 [a]
¼ < Fraction traced ≤ ½	9
½ < Fraction traced ≤ ¾	6
Fraction traced > ¾	4

[a] Fourteen of these thirty-three local authorities traced less than 5 percent of the abandoned vehicle owners.

From Table 6.2 it can be seen that thirty-three of the fifty-two local authorities (63 percent) traced at most one-quarter of abandoned vehicle owners. The fourteen local authorities which traced less than 5 percent of the owners, represents 27 percent of the total number of local authorities that responded to the question. Only ten local

authorities (19 percent) traced more than one-half of the abandoned vehicle owners and recovered their costs. Assuming that those local authorities that did not answer this question traced less than 5 percent of the owners, it is estimated that approximately 35 percent of abandoned vehicle owners nationwide are traced and costs recovered.[6] It is interesting to note that the large city councils which provided annual figures for the number of abandoned vehicle owners traced, recorded an increase in the percentage of owners traced from 1999 to 2001.[7]

6.2.2 Factors hindering the tracing of abandoned vehicle owners

In the questionnaire for Survey II local authorities were provided with a list of suggested hindrances to tracing abandoned vehicle owners.[8] Council officers were asked to respond to the suggested hindrance based on their experience.[9] The suggested hindrances provided in the questionnaire are given in Table 6.3 along with the percentage of respondents who agreed or disagreed with that suggested hindrance.

Table 6.3: Hindrances to Tracing Owners of Abandoned Vehicles

Suggested hindrance:	Agreed [a] (%)	Disagreed (%)	Indifferent (%)
Lack of vehicle identification	89 [b]	9	2
LTSA database information inadequate	31	42	27
Cost of follow-up on abandoned vehicle owners	54	26	20
Inadequate resources for follow-up	36	42 [c]	22
Not a priority for the local authority	34	55	11

[a] The percentage who agreed were those who circled 1 or 2, and those who disagreed circled 4 or 5. Those labelled 'indifferent' had circled 3.
[b] Of the 89 percent in agreement, 79 percent were in total agreement.
[c] This indicates that many councils do have the staff to follow up on abandoned vehicle owners.

It can be seen in Table 6.3 that 89 percent of local authority respondents agreed that it was a lack of vehicle identification that provided a hindrance to tracing the owner of an abandoned vehicle. For more than one-half of the local authorities the cost of

[6] This was calculated using the actual figures or the estimates provided by the council officers, and as stated, for the other councils it was assumed that they had a less than five percent success rate in tracing owners.
[7] For example one council gave figures for tracing owners as 57 percent in 1999, 63 percent in 2000 and 76 percent in 2001. This council contracts out the service, so it may be that the contractor has put more resources into recovering costs.
[8] These hindrances were considered individually so that choosing them was not mutually exclusive.
[9] They were asked to rate their agreement or disagreement on a scale of 1 to 5, where 1 = totally agree through to 5 = totally disagree (see Survey II questionnaire, Appendix One).

follow-up on abandoned vehicle owners also provided a hindrance to the tracing of an abandoned vehicle owner. Around one-third of the respondents agreed with each of the remaining suggested hindrances (inadequate resources for follow-up, not a priority for the local authority, and inadequate Land Transport Safety Authority (LTSA) database information).

Most local authorities did not prosecute owners of abandoned vehicles, though occasionally they did prosecute for littering under Section 15 of the Litter Act (1979), and some councils fined the abandoned vehicle owner for having a vehicle in a public place that did not display a current license or warrant of fitness. Council officers were asked to respond to suggested hindrances to prosecuting abandoned vehicle owners[10]. The suggested hindrances to prosecution are given in Table 6.4 along with the percentage of respondents who agreed or disagreed with that suggested hindrance.

Table 6.4: Hindrances to Prosecuting Owners of Abandoned Vehicles

Suggested hindrance:	Agreed [a] (%)	Disagreed (%)	Indifferent (%)
Last registered owner denied being current owner	79 [b]	9	12
Council lacked evidence to prosecute	62 [c]	13	25
Council lacks the funding to follow through	49	37	14
Too much of an administrative hassle to follow through	59	18	23
Too low on the council's priorities	42	23	35
Council lacks the legal expertise	21	64	15
Council lacks support from the Police	29	59	12

[a] The percentage who agreed were those who circled 1 or 2, and those who disagreed circled 4 or 5. Those labelled 'indifferent' had circled 3.
[b] Of the 79 percent in agreement, 78 percent were in total agreement.
[c] Of the 62 percent in agreement, 71 percent were in total agreement.

The responses from local authorities shown in Table 6.4 suggest that the hindrance to the prosecution of abandoned vehicle owners most often agreed with was that the last registered owner denied being the current owner of the vehicle. The second most agreed with hindrance was a lack of evidence to prosecute, the third was the view that it was not worth the hassle to pursue prosecution, and a lack of funding was

[10] As with the previous question, responses were on a Likert Scale with the same range of values, from 1 = totally agree through to 5 = totally disagree (see Survey II questionnaire, Appendix One).

considered the least important hindrance to the prosecution of abandoned vehicle owners. These results reinforce the need for an in-depth examination of the legislative and institutional framework regarding vehicle ownership and abandoned vehicles, to see where changes could be made to reduce the ability of ELV owners to abandon their vehicle with impunity.

In Survey II when questioned about the overall issue of abandoned vehicles in their city or district, 57 percent of respondents agreed that it was a serious problem.[11] In the first survey, local authority officers were asked about the local authority's environmental concerns regarding dumped vehicles. Two concerns were voiced most often. The first was the leaking of hazardous fluids into soils and groundwater, and into water races and streams. The second was visual pollution, particularly where vehicles were dumped along riversides and coastal areas. One district council had more than four hundred old vehicles dumped in coastal sand dunes, causing visual pollution and posing a health and safety hazard to children playing on the rusting car bodies. Furthermore, abandoned vehicles encouraged the illegal dumping of other waste at the same site. Other environmental concerns included the hazard caused by vehicles being dumped in rivers where there was a danger of the river channel becoming blocked. Car bodies could also become lodged around bridge pylons causing a build-up of debris; at worst this could cause the bridge to collapse when the river was in flood.[12] There was also a potential fire risk when dumped ELVs were torched in forested areas or on peat land.

The remaining questions of the two survey questionnaires focus on the involvement of local authorities in facilitating ELV access into the automobile recycling system and reducing the abandoned vehicle problem. The results will be presented in the two sub-sections that follow.

[11] Fifteen percent of respondents disagreed and 28 percent were indifferent (no respondent totally disagreed).

[12] In a clean-up operation in early May 2000, thirty car bodies, along with other rubbish, were removed from a stretch of the Rangitikei river (Manawatu Evening Standard 12 May 2000).

6.2.3 Local authority provision of collection sites for ELVs

The New Zealand automobile recycling industry relies on ELVs being accumulated at collection sites throughout the country, whether at automotive dismantlers, scrap metal yards or, at local authority collection sites. The metal shredding company does not pay for the car hulks, but removes them from the collection sites free-of-charge and transports them to the shredding facility. Throughout much of the country, local authorities are involved in the provision of temporary storage for ELVs waiting to be recycled. The number of local authorities that provide collection sites for ELVs entering the recycling system is given in Table 6.5.

Table 6.5: Availability of ELV Collection Sites by Local Authorities

Total number of local authorities responding to at least one of the two surveys	72
Local authorities providing a collection site for ELVs	52
Local authorities without a collection site for ELVs, but in close proximity to either metal shredder	5
Local authorities without a collection site for ELVs	15

It can be seen from Table 6.5 that the majority of local authorities in New Zealand provide a collection site (usually at the local landfill) for ELVs waiting to go to the shredding facility. Of those that do not provide a collection site for ELVs, some have a designated dismantler who accepts ELVs of negative value and to whom the council also takes abandoned vehicles. Five cities (Christchurch and four in the greater Auckland area) are in close proximity to the country's two shredding plants so do not provide a collection site for ELVs. ELVs in these cities are taken to dismantlers who carry out depollution and transport the car hulk directly to the shredding facility. At the beginning of 2001, seven local authorities were still landfilling all of their ELVs and several more were landfilling some of them.

The majority of the local authorities that provide a collection site for ELVs, impose a user charge for this service. There is quite a variation between local authorities in the size of the user charge, and most often a distinction is made between stripped and unstripped vehicles. A stripped vehicle is one which has been stripped of the wheels, tyres, batteries, LPG/CNG tanks, seat foam and vinyl, and hazardous fluids. It is a

requirement of the shredder company that ELVs be stripped of these items prior to being crushed and shredded, however, strict enforcement does not always take place (pers comm. Gamma Corporation 2002a). The charges levied by local authorities for the acceptance of ELVs at the collection site are presented in Table 6.6.

Table 6.6: Local Authority Levies for ELVs Left at Collection Site

Levy [a]	Stripped	Unstripped [b]
Free-of-charge	18	6
Levy of up to and including $20	17	8
Levy of $25	8	6
Levy of $26 - $50 (incl.)	8	16
Levy of $51 - $100 (incl.)	1	5
Levy of more than $100	0	2
Not accepted at collection site	0	4

[a] Council levies at October 2002.
[b] Five councils did not respond to the question regarding unstripped vehicles.

It can be seen in Table 6.6 that thirty-four (two-thirds) of the local authorities that accept stripped ELVs at their collection site charge a fee to do so. Seventeen (nearly one-third) charge at least $25 and one local authority charges $90 to leave a stripped vehicle at the collection site. Of the forty-seven local authorities which responded to the question concerning the acceptance of ELVs which have not been previously stripped (shown in Table 6.6), four did not accept ELVs that had not been stripped. Six local authorities accept unstripped ELVs free-of-charge and seven local authorities charge more than $50 to accept an unstripped ELV at the collection site.

Many local authorities do not keep a record of the annual number of ELVs left at the collection site. Sixteen local authorities did, however, provide annual figures for the number of ELVs brought to the collection site. These local authorities represent areas of varying demographics, therefore this information is insufficient to establish a definite relationship between the number of abandoned vehicles and the cost to leave a vehicle at the collection site.

Local authorities who accept unstripped vehicles at their collection site were asked to provide an estimate of the cost to have these vehicles stripped in preparation for the crusher. These figures are presented in Table 6.7.

Table 6.7: Local Authority Estimates of Cost to Strip ELVs

Cost quoted by councils to have an ELV stripped [a]	Number of local authorities quoting
$0 - $25	23
$26 - $50	16
$51 - $75	2
$76 - $100	4
$100 -	2

[a] Council costs at October 2002.

As can be seen in Table 6.7 there was considerable variation in the cost estimate provided, which ranged from $14 to $235.[13] Some of this variation is due to the arrangements the local authority has with local dismantlers who carry out the vehicle stripping.[14] Often an unstripped vehicle is also full of rubbish, which increases the cost of preparing the ELV for crushing.

Local authority respondents were asked to provide information regarding the disposal of items stripped from the car hulks. Three percent of local authorities consign car batteries to the landfill, 30 percent dispose of all whole tyres in their landfill, 17 percent dispose of LPG/CNG tanks in the landfill, and 14 percent of local authorities dispose of hazardous fluids in their landfill. The remainder of the local authorities responded that these parts or substances are collected either for recycling, reuse or, special disposal. Most car seat foam and vinyl is consigned to the landfill.

6.2.4 Initiatives aimed at reducing the abandoned vehicle problem

In the latter half of the 1990s local authorities acknowledged that there was a growing problem regarding abandoned vehicles, and many actively sought ways to try and reduce the problem. Half of the local authorities have offered incentives to encourage the responsible disposal of ELVs either, by providing a place to dispose of them free-of-charge or, periodically offering an amnesty to do so. One-third of local authorities accept stripped ELVs at the collection site free-of-charge. These local authorities, however, continue to have a problem with vehicles being illegally abandoned in their area. One city council offered a free 'unwanted vehicle' removal

[13] Only two of the costs given were above $100, the first was $140 and the second $235.
[14] Several councils said they had contractors who had not been charging for this service, but were losing money, so these arrangements were now under review.

service for some years, but after a continually discouraging response the city council abandoned this free service and has reverted to a removal service with a minimal charge of $20.[15]

Amnesty periods offered by local authorities for the acceptance of unstripped ELVs ranged from one week per year, to one month per year, to one week every three months.[16] For some local authorities the amnesty offered free disposal for vehicles brought to the designated collection site, while other local authorities (fifteen in all), offered removal of unwanted vehicles from private residences or sites. Of the latter, eleven provided the service free-of-charge. Charges by the other four local authorities varied, two charged ELV owners $20, one charged $40, and the remaining local authority required the ELV owner to pay the tow operator the actual removal cost.[17] These councils were pleased with the number of vehicles brought in or collected for recycling during the amnesty period, but at least one council felt that it was too costly to offer a free removal service and would not be repeating this offer. During amnesties vehicles were collected from private properties and it could not be assumed that these vehicles were likely to have been illegally dumped on public land, had the council not provided the collection service. In fact local authorities said that amnesties did not noticeably reduce the abandoned vehicle problem, they still had to deal with a large number of illegally dumped cars. Seven local authorities kept a record of the number of vehicles abandoned in their city or district during the amnesty period. This number can be compared with the expected number of abandoned vehicles for that amnesty period and is shown in Table 6.8.

[15] Only about thirty ELV-owners made use of the free removal service on an annual basis, and yet there were still around twelve hundred vehicles being illegally dumped each year.
[16] Three councils had their week-long amnesty during 'Clean up New Zealand week'. Also one council offered a one-off, year-long, district-wide amnesty period.
[17] One city council had an arrangement with a local tow-truck operator who charged the council $30 plus GST to remove ELVs during the amnesty period, and the same for abandoned vehicles all year. This council charged $10 for the removal of an ELV during their amnesty in 2000, $15 per vehicle in 2001, and $20 per vehicle in 2002, thus reducing the council's subsidy for this service, year by year.

Table 6.8: Amnesty Period: Number of Abandoned Vehicles Compared with Expected Number of Abandoned Vehicles

	Vehicles abandoned during amnesty period	Expected number of abandoned vehicles for the amnesty period [a]
Council A	0	9.8
Council B	0	8.6
Council C	2	14.5
Council D	4	12.3
Council E	20	22.7
Council F	6	3.3
Council G	4	0.8

[a] To calculate this expected number of abandoned vehicles, consider Council E, for example. The number of vehicles abandoned during the amnesty was subtracted from the total number of abandoned vehicles in Council E's area, for that year. Suppose the amnesty period was one month, then the figure obtained was divided by eleven to give the average number of vehicles abandoned per month for the remainder of that year. Had the amnesty month been like any other month that year, then this average is the number of abandoned vehicles that would have been expected during the amnesty month.

Of the seven local authorities shown in Table 6.8, five observed a reduction in the number of abandoned vehicles during the amnesty period, with four observing many fewer abandoned vehicles than expected.[18] For the remaining two local authorities, there were more vehicles abandoned during the amnesty period than would have been expected based on the average figures for that year.

Late in 2002 the Manawatu District Council conducted a trial for a refund system offering a $10 petrol voucher to residents delivering stripped ELVs to the local landfill.[19] The refund was financed by the council and aimed to reduce the number of vehicles abandoned in the district and the associated cost to the council (Manawatu Evening Standard 2 September 2002; Dominion Post 2 November 2002). Residents were informed of the scheme through a pamphlet which was distributed via a mail drop. Seventy-nine petrol vouchers were issued during the three-month trial (prior to this roughly twenty cars per month were brought to the landfill for recycling. At the end of the trial period the scheme was declared a success and the refund system made permanent. This was based on the observed reduction in the

[18] Two of these local authority collection sites normally charge at least $100 for the acceptance of an unstripped ELV.

[19] The vehicle had to be deregistered, and stripped of seats. LPG/CNG tanks, petrol and rubbish. Tyres could be removed at the landfill. Vehicles were first inspected at the transfer station, a car disposal form completed, and an entry token for the landfill provided (Manawatu Evening Standard 2 September 2002). The vehicle was then taken to the landfill, the token and disposal form received and checked, and then the $10 petrol voucher was sent to the ELV owner.

number of vehicles abandoned in the district from nineteen vehicles for the same period in 2001, to only seven abandoned vehicles in the three-month trial period in 2002. (Manawatu Evening Standard 13 February 2003). The conclusion that the reduction in the number of abandoned vehicles was a direct result of the refund scheme must be questioned in the light of the abandoned vehicle figures for that district for 2002.[20] Fourteen months on from the beginning of the trial a total of 212 stripped vehicles had been brought in to the landfill collection site, which is just over fifteen per month (no more than pre-trial figures), and eighty-seven vehicles have been abandoned, 6.2 abandoned vehicles per month (no less than the pre-trial figures given).[21] Furthermore, in May 2004 the Manawatu District Council complained of a rise in the number of vehicles being abandoned in their district despite the continued petrol voucher incentive (Dominion Post 14 May 2004).

Photograph 11: Car abandoned on Cliff Road, Palmerston North

[20] In the three months prior to the trial period (from June to August 2002) only five vehicles were abandoned, and for the period from March to May 2002, four vehicles were abandoned. In fact the number of vehicles abandoned in the district during 2002 prior to the trial period was well down on 2001 figures for the same period. For the first eight months of 2002, seventeen vehicles had been dumped, as compared to forty-five vehicles for the first eight months of 2001 (These figures were supplied by the district council). In addition, the cost comparisons for the three months of the trial and the same three months for the previous year did not include officer time in setting up the scheme, pamphlet design, printing and mail drop, which was used to inform residents of the scheme.

[21] Figures supplied by the Manawatu District Council.

Late in 2003 two other local authorities declared their intention to introduce trial periods for similar schemes offering a $10 petrol voucher for stripped ELVs brought to the local authority collection site for recycling (Dominion Post 18 August 2003; Dominion Post 13 December 2003). One of these, the Palmerston North City Council, postponed the introduction of the scheme until mid-April 2004 (Palmerston North City Council 2004). In May 2004, despite the petrol voucher scheme being in operation for a month, the city council reported that there had been an increase in the number of abandoned vehicles within the city boundaries from around forty vehicles per month to up to eight vehicles per day (Dominion Post 14 May 2004).[22]

A joint initiative between the New Zealand Air Force, the Department of Conservation, and the district councils of the Far North and Whangarei, undertook to provide a free collection service for ELVs in the Far North region late in 2002.[23] The Air Force removed 307 ELVs (including a few tractors and mid-weight trucks) in a two-week period (pers. comm. Gamma Corporation 2002b).[24] After removal, the vehicles were crushed and transported by Gamma Corporation to the metal shredder for recycling.

In May 2004 the Far North District Council initiated another scheme to remove derelict and abandoned car hulks from properties and roadsides in the district. For one month the Far North District Council collected and disposed of car hulks free-of-charge. In addition, $20 petrol vouchers were given to district residents who brought their ELVs to any of the district's ten transfer stations (New Zealand Herald 5 May 2004; TV One News 9 May 2004).[25]

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[22] The Palmerston North City Council confirmed that it was more frequently that 2-3 vehicles were abandoned daily.

[23] The Air Force was on exercise in the Rawhiti – Russell area and offered to remove some of the hundreds of ELVs littering the side roads, fields, and gullies of the Far North. The Air Force used the service as an exercise for procedures in recovery. Punaruku School was involved mapping the location of vehicles, and marking them for collection (TV 3 News 3 December 2002).

[24] Between 17 November and 6 December 2002.

[25] To be eligible for free removal and disposal the vehicle had to be accessible by road. drained of petrol and fuel and have had the tyres removed. Results from this initiative were not available at the time of the writing of this thesis.

Few councils have used fines as a disincentive for abandoning vehicles. Most local authorities when they identify and locate the person responsible for abandoning a vehicle require that person to cover the costs incurred by the council in removal, storage, investigation, advertising and possibly disposal of the vehicle, but three councils had also imposed $100 fines under the Litter Act (1979).[26]

Photograph 12: Vehicles abandoned on the Akatarawa Road

Local authorities have been dealing with abandoned vehicles for some years and do not see a solution to the problem without some form of intervention. In Survey I conducted in late 2000, local authority officers were asked for suggestions as to how to minimise the problem, and to that end they came up with quite a wide variety of suggestions, which are listed in Table 6.9.

[26] Under Section 15 of the Litter Act (1979), an individual can be fined at most $500 for depositing litter "(whether inadvertently or otherwise) ...on any public place, or on any private land without the consent of its occupier," and under Section 21 the offender may also be ordered to pay the cost of removal of the litter.

Table 6.9: Local Authority Suggestions to Address Abandoned Vehicle Problem

	Suggestions from local authority respondents to Survey I
1.	Provide a local facility with free access for the disposal of unwanted vehicles.
2.	Offer subsidised collection of ELVs from private properties (suggested fee of $10).
3.	Levy a purchase surcharge on all motor vehicles to be used to subsidise increased recycling of ELVs.
4.	Levy a purchase surcharge on all motor vehicles to provide a refund for the ELV owner and cover the cost of disposal of abandoned vehicles.
5.	Increase the annual vehicle licence fee by $10 to $20 in order to provide a refund for the ELV owner and cover the cost of disposal of abandoned vehicles.
6.	Impose responsibility on automobile importers to take back ELVs for disposal.
7.	Implement a 'producer responsibility programme' through the motor vehicle industry, setting up a national network of disassembly plants.
8.	Reduce the number of second-hand Japanese imports coming into the country.
9.	Provide incentives for recyclable products (perhaps in the form of a tax rebate).
10.	Make use of periodic detention labour to strip vehicles ready for recycling.
11.	Provide greater investment in, and promotion of public transportation.
12.	Provide an education programme to encourage the responsible disposal of ELVs.
13.	Increase compliance on the legislative requirements for the change of ownership of vehicles.
14.	Remove the transaction fee for vehicle change of ownership but enforce a high penalty for noncompliance.

The most frequent suggestion was to provide a local facility with free access for the disposal of unwanted vehicles. One-third of the local authorities do offer free access, but only for stripped vehicles. Fourteen percent of local authorities accept unstripped vehicles free-of-charge. The second suggestion was to offer subsidised collection of ELVs from private properties for a suggested fee of $10. This is unlikely to solve the problem, however, as it has not been solved by a free removal service. There are two suggestions given in Table 6.9 which levy a purchase surcharge on all motor vehicles. With one of these, the levy was to fund increased recycling of materials from ELVs and the other was essentially a deposit-refund scheme. The interest earned by the fund would cover administrative costs and also the cost of disposal of abandoned ELVs. Increasing the annual vehicle registration fee by an additional $10 to $20 was another suggestion made to provide a refund for ELV owners and to cover the disposal costs of abandoned vehicles. It was suggested that the additional registration fee could be imposed on all vehicles or, alternatively on only those vehicles over a certain age. The sixth suggestion given in Table 6.9 is

an extended producer responsibility approach, legislating to require car importers to take back their ELVs of negative value at their own cost, and the next also followed the producer responsibility theme. Another suggestion targeted the number of used vehicles coming into the country and another, the promotion of a substitute form of travel. In addition there were suggestions for an economic incentive for recycling and the use of education aimed at changing behaviour. The final two suggestions related to changes in the institutional practices concerning vehicle change of ownership.

A few of these suggestions were included in the questionnaire for the second survey and local authority officers were asked to respond to them. These results from Survey II are given in Table 6.10.

Table 6.10: Responses to Local Authority Suggestions to Address Abandoned Vehicle Problem

Suggestion:	Agreed (%)	Disagreed (%)	Indifferent (%)
ELV disposal should not be paid by ratepayers [a]	66 [b]	11	23
Cost of cars should include disposal fee [a]	65	24	11
ELV owners should pay disposal fee [c]	79	21	N/A
Abandoned vehicle owners should be fined (in addition to covering costs) [a]	85 [d]	11	4
ELV owners should receive refund for disposal of vehicle	17.5	67.5	15 (unsure)

[a] The percentage who agreed were those who circled 1 or 2, and those who disagreed circled 4 or 5. Those labelled 'indifferent' had circled 3.
[b] Of the 66 percent in agreement, 77 percent were in total agreement.
[c] This question had only a Yes/No response.
[d] Of the 85 percent in agreement, 68 percent were in total agreement.

As shown in Table 6.10, two-thirds of local authority respondents agreed that vehicle disposal should not be paid for by ratepayers, and a similar proportion would like to see an up-front disposal fee included in the cost of a car. Nearly 80 percent, however, favour ELV owners paying for the disposal of their vehicles.[27] Furthermore 85 percent of respondents agreed that abandoned vehicle owners should

[27] Eighty-six percent of local authorities currently do charge for unstripped vehicles and two-thirds also charge for stripped vehicles.

receive a hefty fine in addition to meeting the expenses incurred by the local authority in removing and disposing of the vehicle. Finally, in response to the suggested alternative of an incentive in the form of a refund for correct disposal of an ELV, two-thirds of respondents disagreed with the suggestion, 17.5 percent agreed and the remainder were unsure. The 17.5 percent of respondents who were in favour of a refund as an incentive suggested amounts ranging from $10 to $100.

This concludes the overview of the extent of the abandoned vehicle problem in New Zealand. It included an estimate of the magnitude of the problem and the identification by local authorities of factors which hamper them when dealing with abandoned vehicles. In addition, the policy instruments that have been used by local authorities to further encourage the appropriate disposal of ELVs, have been outlined. Presented in the next section is the regulatory framework instituted by the New Zealand Government relating to motor vehicles. The remainder of the section then focuses on the institutional practices within the regulatory framework which concern the ownership, licensing, and deregistration of motor vehicles.

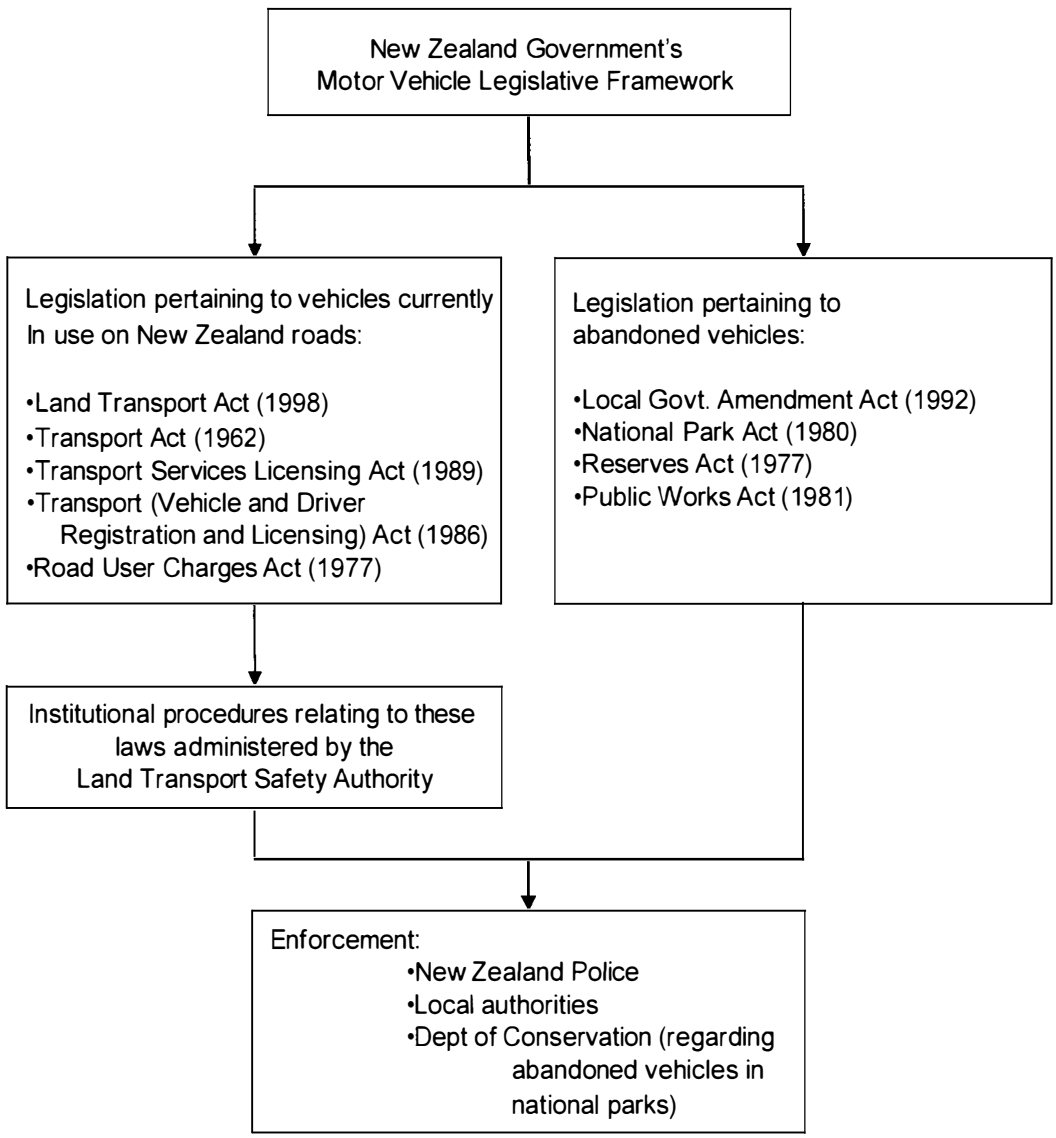
6.3 New Zealand's Motor Vehicle Regulatory Framework[28]

The New Zealand Government's motor vehicle legislative framework is presented in Figure 6.1. As shown in Figure 6.1 there are a number of Acts which contain laws relating to motor vehicles that are currently in use on New Zealand roads. In addition, the New Zealand Government charged the Land Transport Safety Authority (LTSA) with the responsibility of setting up an institutional framework to keep a record of motor vehicles from the point of entry into New Zealand, through registration, relicensing, changes of ownership, and finally deregistration. The LTSA is responsible for operating this system and must do so under the core Acts shown on the left hand side in Figure 6.1.

[28] Information on the institutional practices was collected through interviews with the Manager, Motor Vehicle Operations. Transport Registry Centre, Land Transport Safety Authority (LTSA) and from both printed and LTSA web site material provided for public information.

As part of the motor vehicle legislative framework there are other Acts that pertain to abandoned vehicles. These Acts (shown on the right hand side in Figure 6.1) empower certain administering bodies to remove abandoned vehicles in the public domain. They also provide specific instruction on the requirements for notification of vehicle owners, storage of the abandoned vehicles and where necessary, final disposal. Enforcement of the legislation specific to motor vehicles is the responsibility of the New Zealand Police and the local authorities.[29]

Figure 6.1: New Zealand Motor Vehicle Legislative Framework



[29] In some instances enforcement regarding abandoned vehicles is also entrusted to the Department of Conservation, a ranger or person employed by the administering body of any reserve, and any person authorised by a Minister of the Crown responsible for public works.

In this section the institutional practices are examined. These are administered by the LTSA and pertain to motor vehicle ownership, licensing, and deregistration. In the final section of this chapter (Section 6.4), the legislation dealing with abandoned vehicles and with motor vehicle licensing and ownership is scrutinised for weaknesses that allow ELVs to be abandoned without penalty.

6.3.1 Responsibilities and functions of the Land Transport Safety Authority (LTSA)[30]

The LTSA, which was established in August 1993 is a Crown entity,[31] whose principal objective is to "undertake activities that promote safety in land transport at a reasonable cost" (Land Transport Act 1998, Section 189).[32] In order to meet this objective the LTSA is charged with a number of functions under Section 190 of the Land Transport Act (1998), one of which is to maintain the Land Transport Register.[33]

The Directorate of Land Transport Safety (the LTSA's Chief Executive) is ultimately accountable for the daily running of the LTSA, and for the large registry operation system that is responsible for the oversight and recording of motor vehicle registration and licensing, driver licensing, and road user charges. LANDATA is the centralised supporting system which assists the management and processing of this information, providing the LTSA with the age and condition of the nationwide vehicle fleet and also driver demographics (LTSA 2000).

The Motor Registration Centre and the Central Register of Driver Licensing were combined in December 1997 to form the Transport Registry Centre (TRC). The TRC manages a centralised recording system incorporating vehicle inspection, vehicle licensing (including road user charges), and driver licensing.[34] An internet-based Motochek service was introduced so that the motor vehicle industry and also

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[30] Information on the institutional practices administered by the LTSA was collected through interviews with the Manager, Motor Vehicle Operations, Transport Registry Centre, LTSA and from both printed and LTSA web site material provided for public information.

[31] A Crown entity is "a body established by law in which the Government has a controlling interest through ownership mechanisms but is not liable for any debt" (LTSA 2001, 11).

[32] Reasonable cost as defined by the Land Transport Act 1998 is "where the value of the cost to the nation is exceeded by the value of the resulting benefit to the nation" (LTSA 2001, 12).

[33] The legislative functions of the LTSA are given in Appendix Three.

[34] "The TRC provides services for 2.5 million road users who carry out more than 13 million transactions a year" (LTSA 2000, 26).

the public can check vehicle and ownership details. Later a Driver Check Internet service was added to assist companies wishing to check the licence status of those employed to drive their vehicles.

Two e-business systems were developed. The first was WoF online, which links 3,500 agents nationwide who carry out Warrant of Fitness (WoF) inspections.[35] When a vehicle undergoes and passes a WoF inspection, the agent enters this information on WoF online, including the expiry date of this new WoF. If the vehicle requires work to meet the WoF standards, the agent specifies on WoF online the date of the inspection and the work required. Thus when the vehicle is brought back to that, or any other agent within the thirty-day time-frame, inspection of just the specified work required can be carried out, without incurring additional fees. The second e-business system is VinDirect, which makes provision for importers of new vehicles to preload new vehicle information onto LANDATA before the vehicle is registered and licensed (LTSA 2000). The Vehicles Standards Compliance Rule was introduced in March 1999 and provided the foundation to ensure compliance with international safety standards by the New Zealand vehicle fleet.

Responsibilities of the LTSA include revenue gathering,[36] providing consumer information (through Motochek and Driver Check), law enforcement, and safety information. The LTSA is particularly interested in systems or procedures to encourage compliance. In matters of enforcement, it is reliant on the New Zealand Police and the local authorities.

Funding for the LTSA is primarily sourced from road users. Forty-one percent of its funding comes from the National Roads Fund, which is sourced from motor vehicle registrations and licensing fees, road user charges, and a portion of the excise duties levied on the sale of petrol, LPG and CNG. Users of the transport system provide 55

[35] "A Warrant of Fitness (WoF) is a periodic safety inspection for light vehicles (i.e. most cars, vans, utes and many 4WDs). . . . Some vehicles (e.g. heavy vehicles, trucks, taxis, buses) have a tougher safety check – a Certificate of Fitness (CoF) inspection. . . . Vehicles first registered anywhere less than six years ago must have a WoF inspection every 12 months. All other vehicles have WoF inspections every six (6) months" (LTSA 2003b, 1). A vehicle must have a current WoF or CoF to be legally driven on New Zealand roads. Agents authorised to carry out WoF inspections are the Automobile Association (AA), On Road New Zealand, Vehicle Inspection New Zealand (VINZ), Vehicle Testing New Zealand (VTNZ), and independent agents (LTSA 2003b).

[36] This is expanded on in Section 6.3.3.

percent of LTSA's funding through driver licence fees, transport licence fees, safety standards levies and fees (for example Warrants or Certificates of Fitness), sale of Road Codes and other road safety materials, and rail fees. The remaining 4 percent of the funding comes from the Crown (LTSA 2000).

Attention turns now to the processes and recording procedures for all light motor vehicles[37] during their lifetime in New Zealand. The following sub-sections detail those processes. The first outlines vehicle registration, followed by vehicle licensing, vehicle change of ownership, cancellation of registration, and reregistration of vehicles. This section concludes with the identification of areas of weakness in the institutional processes which lead to gaps in the data on the Motor Vehicle Register, and increase the opportunity to abandon a vehicle with impunity.

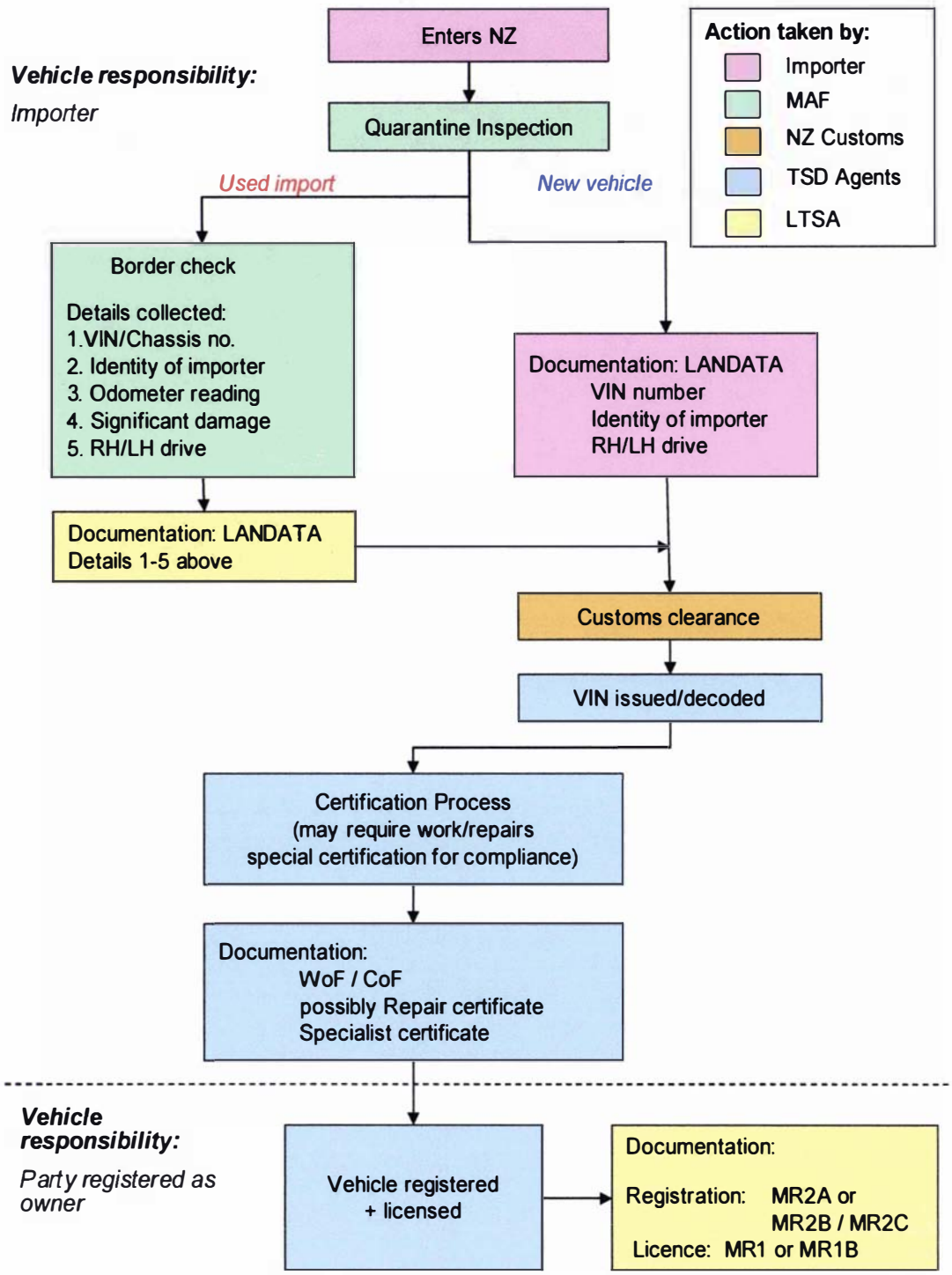
6.3.2 Vehicle registration

The New Zealand motor registration system requires that all motor vehicles be registered and licensed.[38] In general a vehicle is registered once only, when it is first entered on the Motor Vehicle Register. It is then that the vehicle is issued with its registration plates, which remain with the vehicle for the duration of its lifetime on New Zealand roads. If, however, registration has been cancelled for a period of time or, the vehicle has been rebuilt or significantly modified, the vehicle must be reregistered and issued with new registration plates (LTSA 2002c).

In order to comply with New Zealand legal requirements, any light motor vehicle entering the country must undergo a series of inspections before it can be registered for New Zealand roads. Figure 6.2 is a flowchart demonstrating the process undertaken in order to gain vehicle registration.

[37] A light vehicle is a car, van, or utility vehicle that weighs at most 3,500 kilograms.
[38] Refer to in Appendix Three for a list of those vehicles exempt from registering and licensing.

Figure 6.2: Vehicle Registration



MR1/MR1B	Application for Motor Vehicle Licence
MR2A	Application for Registration of a Motor Vehicle
MR2B	Application for Registration of a VIN Exempt Motor Vehicle
MR2C	Application for Registration of an Overseas Visitors Vehicle

The first requirement is the Ministry of Agriculture and Forestry (MAF) quarantine inspection and border check. The MAF border check includes recording the identity of the importer, the Vehicle Identification Number (VIN),[39] the odometer reading, any critical deterioration or damage, and whether it is right-hand or left-hand drive. This information is sent by MAF to the TRC, where it is recorded on the LANDATA database, contributing to the permanent record of the vehicle. A new vehicle that has never previously been registered or operated is not required to undergo the border check, however, it must have the quarantine inspection and its VIN recorded.[40] Some vehicles undergo the MAF border check at facilities in Japan prior to leaving for New Zealand. Any vehicle that has been recorded as having structural damage will be labelled by MAF, and at that point the importer will decide whether to go ahead with the vehicle registration procedure or, find alternative uses for it (for example, sale for parts).[41]

Following the border check, the vehicle must gain clearance from the New Zealand Customs Service, after which time it is released to the importer for transportation to a Transport Services Delivery (TSD) agent. There are four TSD agents, the New Zealand Automobile Association (AA), On Road New Zealand, Vehicle Inspection New Zealand (VINZ), and Vehicle Testing New Zealand (VTNZ). The second inspection step requires the TSD agent to decode the VIN using manufacturer information provided by the importer. A vehicle without a VIN will be identified by the chassis number and will be issued a VIN.

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[39] The VIN is an internationally recognised seventeen-character code, and is preferred over chassis numbering systems which vary across different makes of vehicle, and may be duplicated. The VIN can be stamped into the vehicle structure when manufactured, etched into the rear window, or stamped onto a metal plate, which is then fixed onto the car body. Vehicles registered in New Zealand prior to 1 April 1994 (and those which came into or were manufactured in New Zealand before 1 February 1994), which have a chassis or frame number, are not, however, required to have a VIN (LTSA 1999b). The vehicle registration form used for these vehicles is form MR2B (see Appendix Three for this, and any other form mentioned).

[40] Also exempt from the border check are temporary imports which will not be in New Zealand longer than 18 months, and those in the light motor vehicle classification which are not designed for carrying passengers (LTSA 2002e). Temporary imports are required to register in New Zealand for the duration of their stay. using registration form MR2C.

[41] MAF inspectors are also requested to 'flag' all water-damaged vehicles on LTSA's vehicle database. The LTSA then issues instructions to certifiers to ensure these vehicles undergo detailed inspection by a repair certifier. Repair certifiers have clear guidelines and criteria for assessing these flood-damaged vehicles.

The third inspection step is the certification process (see Figure 6.2), which is also carried out by the TSD agent. It involves checking documentation, followed by a thorough check of the vehicle to ensure compliance with the current legally required vehicle standards. The TSD agent must confirm that the vehicle meets the required manufacturing standards and is still in good condition. The agent must determine whether the vehicle meets New Zealand's legal safety standards or, requires repairs and/or specialist certification first.[42] Once the certification process is complete, and the vehicle is validated for registration, it will be issued with a WoF or a CoF and form MR2A.[43] On completion of form MR2A (or MR2B, if it is VIN-exempt), the vehicle may be registered, and may now be legally driven on New Zealand roads (LTSA 2002e).[44] If a vehicle is not registered within two years of being granted certification for registration, certification will lapse and the vehicle will require reinspection and recertification before it can be registered. The total cost of the inspection process and registration of a vehicle is estimated to be between $800 and $1,000, exclusive of New Zealand's Goods and Services Tax (GST), the cost of any repairs or, specialist certification (March 2004 prices). In addition vehicles imported into New Zealand are subject to GST of 12.5 percent.[45]

6.3.3 Continuous vehicle licensing

Continuous vehicle licensing (CVL) has been in place in New Zealand since 1997. The majority of vehicles are required by law to have a current vehicle licence at all times, irrespective of the frequency with which the vehicle is used on the road.[46] This means that vehicle owners who are late paying their licence fee will be charged

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[42] A very small number of vehicles do not make it through this certification process. A few of these are sent back to their country of origin, and the others are broken down for parts.

[43] The importer is required to cover the cost of certification. TSD agents can charge different rates, but typically this would be around $350.00. Any repair or modification work would be an additional cost.

[44] Registration and a 12-month license for a passenger car with a 1301–2600 cc engine costs $357.25 (petrol-driven), $424.60 (non-petrol), and for a car with a 2601–4000 cc engine, $387.60 (petrol-driven), $454.95 (non-petrol) (March 2004 prices).

[45] The only exemption is for the vehicle of first time immigrants into New Zealand, provided the immigrants satisfy Customs that they are taking up permanent residence, have owned and used the vehicle for no less than one year, and they agree not to dispose of the vehicle for at least two years (LTSA 2002e). Application for registration of a vehicle in this category is completed using form MR2C.

[46] Vehicles exempt from being "continuously licensed [though they must be licensed when in use on the road]:

- Vehicles currently not required to register or licence
- Vehicles more than 40 years old
- Any agricultural machinery, tractors and mobile machines

a backdated amount.[47] Licence-fee collection is outsourced by the LTSA to the four TSD agents, AA, VINZ, VTNZ, On Road New Zealand, and to AMI Insurance (AMI), Post Shops, and a range of independent agencies (LTSA 2002b).

The motor vehicle licensing fee collected by the LTSA contributes to a number of different funds. These are the National Road Fund for road construction, and the Accident Compensation Corporation (ACC) Motor Vehicle Account Premium, which covers medical costs related to injuries resulting from accidents occurring on public roads. The other funds include funds for safety programmes run by the LTSA and New Zealand Police, the Safety Standards Levy, the Audit and Standards Levy, and the Transport Licence Fee (contribution to these levies is dependent on the type of vehicle and its use). The operating costs of the Transport Registry Centre are funded through an administration and licence label fee. The final contribution is that of GST, since GST is added to all fees and levies (LTSA 2002b).[48]

The procedures carried out by the LTSA regarding the relicensing of a motor vehicle are shown in Figure 6.3. Four weeks prior to the date a vehicle licence fee is due, the LTSA send out a licence account (form MR1) to the party registered as owner of the vehicle.[49]

- Class EA and EB vehicles [Exempt Class A and B vehicles (see Appendix Three)]
- Trailer and trailer-type caravans weighing (when laden) less than 3,500 kilograms
- All terrain vehicles (ATVs)

These vehicles can be unlicensed while they are off the road (e.g. for repairs or restoration) and do not require exemptions to remain unlicensed" (LTSA 2002b, 3).

[47] Under CVL, vehicles "have their new licences backdated to the most recent of:

- The expiry date of the previous licence
- The expiry date of the last exemption from licensing
- The date of the last change of ownership" (LTSA 2002b, 1).

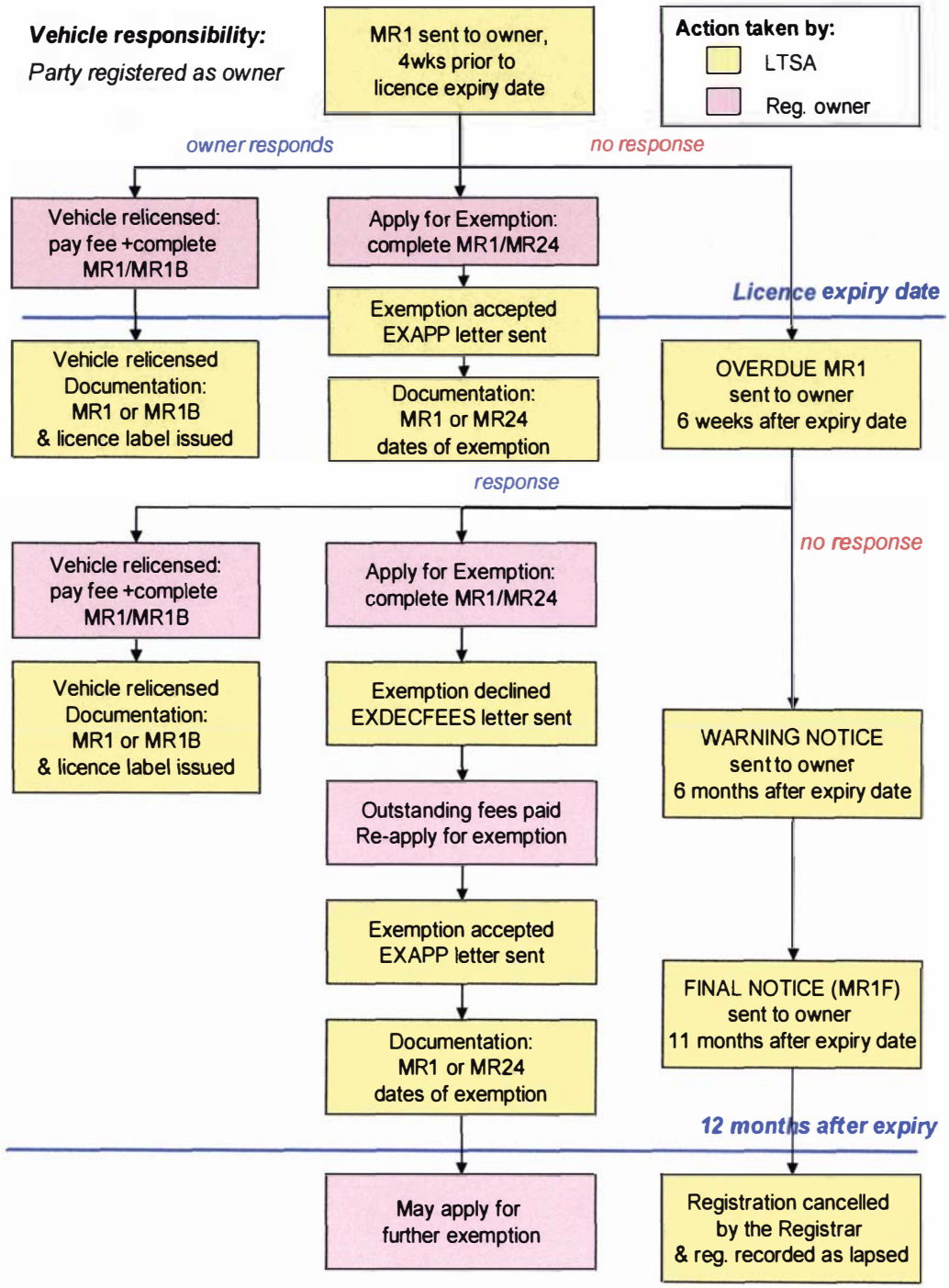
[48] The licence fee for a private light motor vehicle is $217.05 (petrol-driven) and $284.40 (non-petrol), inclusive of GST. For the petrol-driven, private light motor vehicle the breakdown of the licence fee is as follows: $141.10 is the ACC levy, $43.50 is the licence fee, $6.72 is the administration fee, $1.64 goes on other levies and $24.12 is for GST (March 2004 prices).

[49] Any person (or company) "who complies with the following criteria can become a registered owner of a motor vehicle:

- a private individual aged 15 or over; or
- a limited liability company; or
- a government department, local authority or official board; or
- an incorporated society, club or trust" (LTSA 2002d, 3).

Henceforth, they will be referred to as 'the owner.'

Figure 6.3: Vehicle Relicensing



MR1/MR1B	Application for Motor Vehicle Licence
MR1F	Vehicle Licence Final Notice
MR24	Application for Exemption from Continuous Licensing
EXAPP	Exemption Approved
EXDECFEES	Exemption Declined. Outstanding fees owing

The owner then presents form MR1 (or alternatively completes a licensing form MR1B) at one of the agents contracted by LTSA to deal with vehicle licensing. The owner pays the licence fee (for a specified period of up to twelve months) and receives a licence label which must be displayed on the windscreen of the vehicle. The vehicle must have a current WoF/CoF in order to be licensed.

Alternatively, the owner of a vehicle may not wish to use the vehicle on the road for a period of time. In this case the owner is expected to apply in advance for an exemption from licensing. At any point in time approximately 4.5-4.7 percent of the passenger vehicle fleet (around 110,000 cars) has temporary exemption from licensing (LTSA 2004). As shown in Figure 6.3 exemption can be applied for on the licence account (form MR1) or, by completing an exemption application form MR24 (available from LTSA agents).[50] The LTSA grants exemption from licensing for three to twelve months, after which a further exemption period can be requested.[51] If the licence fees have already been paid for some of the exemption period now being requested, no refund is provided. If the owner later licenses the vehicle within the first three months of the exemption period, the licence will be backdated to the expiry date of the licence or the end date of the previous exemption.

Responsibility for ensuring a vehicle is licensed lies with the owner of the vehicle. If no action has been taken by the owner and the licence expiry date has passed, the vehicle is now unlicensed and if caught on the road by the New Zealand Police or by local authorities, a fine is imposed. An average of 79,000 infringements are issued each year for vehicles being used on the roads without possession of a current

[50] Confirmation of the licence exemption is received with a letter (coded EXAPP in the letter's header), this letter, and subsequent letters referred to in the body of the text, can be found in Appendix Three.

[51] Where the current licence has expired, if the owner applies for exemption from licensing within two months of the licence expiry date, exemption is taken from the expiry date and no fee is considered to be outstanding. If the application for exemption takes place longer than two months after the expiry date, exemption is declined until the outstanding licence fees are paid. The owner is informed of this on receipt of the letter coded EXDECFEES. The owner must then pay the outstanding licence fees after which the exemption will be granted from the date of application (LTSA 2002b).

licence and 2,000 infringements are issued for vehicles on the road that are unregistered.[52]

The remainder of Figure 6.3 follows the procedures taken by the LTSA in the event that the owner does not respond by renewing the vehicle licence. Six weeks after the licence expiry date has passed the LTSA sends out the first overdue reminder notice, form OVERDUE MR1. Six months after the licence expiry date a 'WARNING NOTICE' is sent to the owner, informing them that they are liable for the outstanding licence fees which are increasing in two-monthly increments. If no response is forthcoming, two to four weeks before the twelve-month period (after the licence expiry date) is up, the 'FINAL NOTICE' (form MR1F) is sent, informing the vehicle owner of the date on which the vehicle's registration will expire, and the total fees owing. The owner is urged to respond in one of three ways. If the vehicle is being used on the road, they must relicense the vehicle before the twelve-month period is up. Fees due are backdated to the licence expiry date. Alternatively, an exemption can be requested, however, outstanding fees must be paid. The third option is to remove the vehicle permanently from New Zealand roads, which requires cancelling the vehicle's registration and surrendering the registration plates.[53] If this is done the outstanding debt is cancelled. The owner is further notified that if they do nothing the outstanding fees will be referred to the LTSA's debt collection agency where standard collection processes are carried out. Once the debt on the vehicle has been forwarded to the collection agency, it has no effect on any further vehicles that owner may buy (pers. comm. Transport Registry Centre, LTSA (TRC) 2002). After the vehicle has remained unlicensed for twelve months the Registrar cancels registration and the LTSA records the registration of this vehicle as 'lapsed'. If at some time the owner wishes to have the vehicle back

[52] These figures are the averages of the annual figures from July 1997 to June 2002 (Source: New Zealand Police). This does not include those infringements issued by local authorities.
[53] Completion of form MR15 is necessary for this to occur.

on the road, the vehicle will need to go through the certification process in order to be reregistered with new registration plates at the owner's expense.[54]

In the situation where the LTSA sends out a licence account, MR1, and it is returned to them with 'address unknown,' the record for that vehicle is 'flagged' with GNA ('Gone, No Address') and no further notices are sent. Nothing can be done until the owner comes to relicense the vehicle or completes a form for change of name and address details (form MR28).[55] In the event that the owner does not contact the LTSA the vehicle will go unlicensed for twelve months, at which time the Registrar will cancel the vehicle registration, recording it as 'lapsed' and outstanding fees will be referred to the debt collection agency. For a stolen vehicle with an expired licence, the registered owner will not have to pay licence fees as long as the owner can provide a copy of the Police report to the TRC (pers. comm. TRC 2002).

6.3.4 Vehicle change of ownership

Prior to selling a vehicle the owner must ensure that it has passed a WoF inspection in the month before the buyer takes possession of the vehicle.[56] The vehicle must also have a current licence and the seller is liable for all outstanding licence fees. A flowchart is presented in Figure 6.4 demonstrating the procedures required by the LTSA, which are to be carried out by the parties involved in the exchange. The forms to be completed vary depending on whether the vehicle has been purchased (by the current seller) prior to or, since November 1995. Procedures will be described in the following paragraphs.

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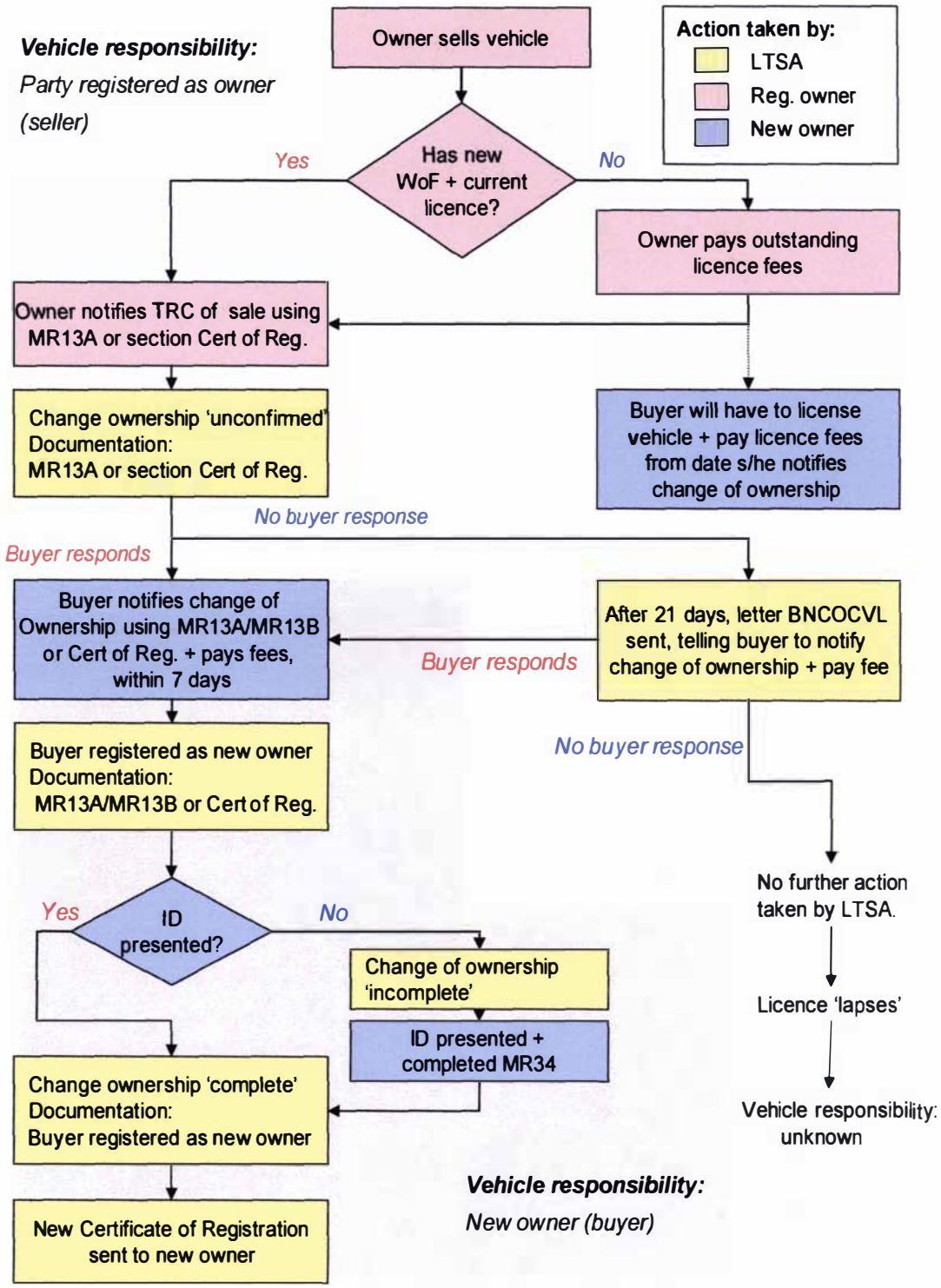
[54] Vehicles exempt from CVL will have their registration cancelled if they remain unlicensed beyond the maximum two-year period allowable for such vehicles. Prior to cancellation the LTSA sends a letter (coded NCLV-LAPSE in the letter's header) to the registered owner informing them that the vehicle must either be licensed. application for further exemption sought or, registration cancelled and the registration plates surrendered before the due date.

[55] Sometimes the owner can be traced through the registration of another vehicle they own.

[56] If the vehicle does not have a current WoF it must be advertised for sale 'as is, where is' (LTSA 2002d). Also the seller should obtain as protection from the purchaser. a written guarantee that the purchaser will initially only use the vehicle on the road to take it for a WoF inspection.

Figure 6.4: Change of Vehicle Ownership



MR13A	Notice by Person Selling/Disposing of Motor Vehicle
MR13B	Notice of Change of Ownership of Motor Vehicle
MR34	Application to complete owner identification
BNCOCVL	Letter to buyer to lodge Notice of Change of Ownership

When selling a vehicle purchased since November 1995, the seller must complete the tear-off section of the Certificate of Registration, giving the buyer's name and contact details. This must be posted to the TRC within seven days of sale. When received by the TRC the information is recorded, and at this point the change of ownership status is recorded as 'unconfirmed' (see Figure 6.4). The remaining section of the Certificate of Registration is given to the buyer (by the seller at the time of sale), to complete and present to an LTSA agent with the change of ownership fee,[57] within seven days of purchase.[58]

The Certificate of Registration for vehicles purchased earlier than November 1995 does not have the tear-off section. In this case (or where the certificate has been lost), the seller is required to complete and mail to the TRC a notification of sale form, MR13A.[59] The seller also hands over the Certificate of Registration to the buyer. The LTSA recommends that the seller should not hand over the vehicle until the buyer presents to the seller the change of ownership card given by the LTSA agent as proof of legal change-over (LTSA 2002d). The buyer, as the new owner must complete the notification of change of ownership using form MR13B[60] and present it, along with the fee and proof of identity,[61] within seven days of purchase (see Figure 6.4). The new owner's updated Certificate of Registration will arrive by mail within ten days.[62]

In the event of the buyer presenting form MR13B without acceptable identification, the LTSA accepts the application and at this point liability now rests with the buyer, however, the change of ownership is recorded as 'incomplete'. A follow-up letter (coded MVRNOID) is sent to the buyer (approximately three weeks after the MR13B date), stating that change of ownership has been lodged and in order for the

[57] The 2002 change-of-ownership fee is $9.20 (including GST).
[58] This seven-day period is not currently enforced (pers. comm. TRC 2002).
[59] A vehicle can be sold on behalf of the owner. In this case the person selling signs the MR13A form as the 'disposer.'
[60] A car dealer, purchasing vehicles from the public, must complete form MR13C, usually on a weekly basis.
[61] This would usually be a driver's licence or alternative identification that verifies identity, date of birth, and signature. Corporate organisations must quote their LTSA customer number. If the company or organisation has not applied for an LTSA customer number, it is acceptable to present the Certificate of Incorporation issued by the Justice Department (LTSA 2002d).
[62] For a fee of $2.25 a check can be made by the LTSA agent, to ensure the vehicle has not been reported stolen and is correctly registered and licensed.

transfer of ownership to be 'completed' the buyer is required to complete form MR34 (owner identification) and validate identification. Only then will the Certificate of Registration be sent out to the new owner. 'Incomplete' registrations are nearly always completed either in a matter of days or, at the time of relicensing (pers. comm. TRC 2002).[63]

As recorded in Figure 6.4, if the seller notifies the TRC of the vehicle sale but the buyer does not, change of vehicle ownership remains 'unconfirmed.' Without buyer confirmation, after twenty-one days have lapsed the LTSA sends a letter to the buyer (coded BNCOCVL), informing them that they are required to present notification of change of ownership (form MR13B), identification, and pay the required fee.[64] After this letter has been sent there is no further follow-up by the LTSA, except to send a final notice (MR1F) to the 'unconfirmed' owner after the vehicle has been unlicensed for twelve months, prior to having the registration cancelled by the Registrar.[65]

The TRC has a record of the number of vehicles with 'unconfirmed' ownership at any point in time. Presented in Table 6.11 is the number of vehicles with a change of ownership status that is 'unconfirmed' or 'incomplete' at the end of June, for the years 1997 – 2002.

Table 6.11: Number of Vehicles on Register with 'Unconfirmed' or 'Incomplete' Ownership Status

	June 1997	June 1998	June 1999	June 2000	June 2001	June 2002
'Unconfirmed'	42,557	36,963	39,039	40,099	38,954	38,085
'Incomplete'	26,637	24,175	27,031	17,730	13,393	11,394

Source of data: Transport Registry Centre, LTSA

[63] If when presenting notification of change of ownership without adequate identification, the new owner is also applying for exemption from licensing, exemption will be denied until the change of ownership process is complete. The letter 'EXEMPTION DECLINED, Identification required' will be sent to the new owner informing them of their responsibility to present both the completed form MR34 and identification, and reapply for an exemption from licensing (using form MR24). The new owner is reminded that they are liable for any unpaid licensing fees while the vehicle is registered in their name. Further, if the vehicle is left unlicensed for twelve months, registration will be cancelled.

[64] If the vehicle is exempt from CVL, then the letter sent is the version coded BNCONON.

[65] When the vehicle's registration is soon to expire, however, the 'unconfirmed' purchaser will be sent the letter coded FIN-UNC informing them of their options (these are the same as outlined in the MR1F FINAL NOTICE).

From Table 6.11 it can be seen that at any point in time the number of vehicles with 'unconfirmed' ownership status has remained reasonably constant at around 40,000 vehicles. This record, however, makes no distinction between temporarily 'unconfirmed' ownership status and ownership that is never confirmed.[66] The number of 'incomplete' change of ownerships on a given day appears to have halved from 1997-1999 to 2001-2002.

When the change of ownership of a vehicle remains 'unconfirmed' owner liability remains with the seller, so that the seller is liable for all traffic infringements on the vehicle.[67] If the vehicle is involved in an accident, however, and the seller, as the last party registered as owner of the vehicle, can prove that s/he were somewhere else at the time of the accident, s/he is exempt liability.

Liability is a different matter where outstanding licence fees are concerned. For an unlicensed vehicle that changes ownership, the seller is liable for any outstanding licence fees up until the date of notification of sale (on receipt of the form MR13A or the tear-off section of the Certificate of Registration, by the TRC). When licence fees remain outstanding, the seller is sent the form MR1C ('PAYMENT DEMANDED'), demanding that the quoted fees outstanding be paid within fourteen days of the invoice date.[68] Where the vehicle is subject to CVL the buyer is responsible for licensing the vehicle and paying the licence fees (or, alternatively, applying for exemption from licensing) from the date the buyer confirmed possession, regardless of whether the change of ownership was completed at that date. The implication is that there can be a gap in the licensing of a vehicle, and in collection of licence fees from the date of notification of sale until the date of confirmation of possession by the new owner (pers. comm. TRC 2002). Sometimes confirmation of possession never comes, therefore after twelve months of being unlicensed, registration of the vehicle is cancelled by the Registrar, the LTSA

[66] The TRC does not keep a record of vehicles whose ownership is never confirmed. They are only recorded as having 'lapsed' registration status after being unlicensed for twelve months.
[67] This is made clear to the seller on notification of sale form, MR13A.
[68] If payment is not made, the debt is forwarded to the debt collection agency. On form MR1C the LTSA use the words "you have *disposed* of an unlicensed vehicle" rather than *sold*, as experience has shown that when the LTSA has said, ... "*sold* an unlicensed vehicle," people refute the bill on the grounds that the vehicle was not *sold*, but was *given away* (pers. comm. TRC 2002).

records the registration as 'lapsed,' and the ownership and whereabouts of the vehicle is now unknown.

For an unregistered vehicle that changes ownership, the seller completes the notification of sale form and sends it in to the TRC. The buyer, however, cannot complete the buyer form and receive a Certificate of Registration. To reregister the vehicle for use on the road, it will require an inspection, certification, reregistration, the issuing of plates, and licensing, all at a cost to the new owner (LTSA 2002d).[69]

6.3.5 Cancellation of vehicle registration

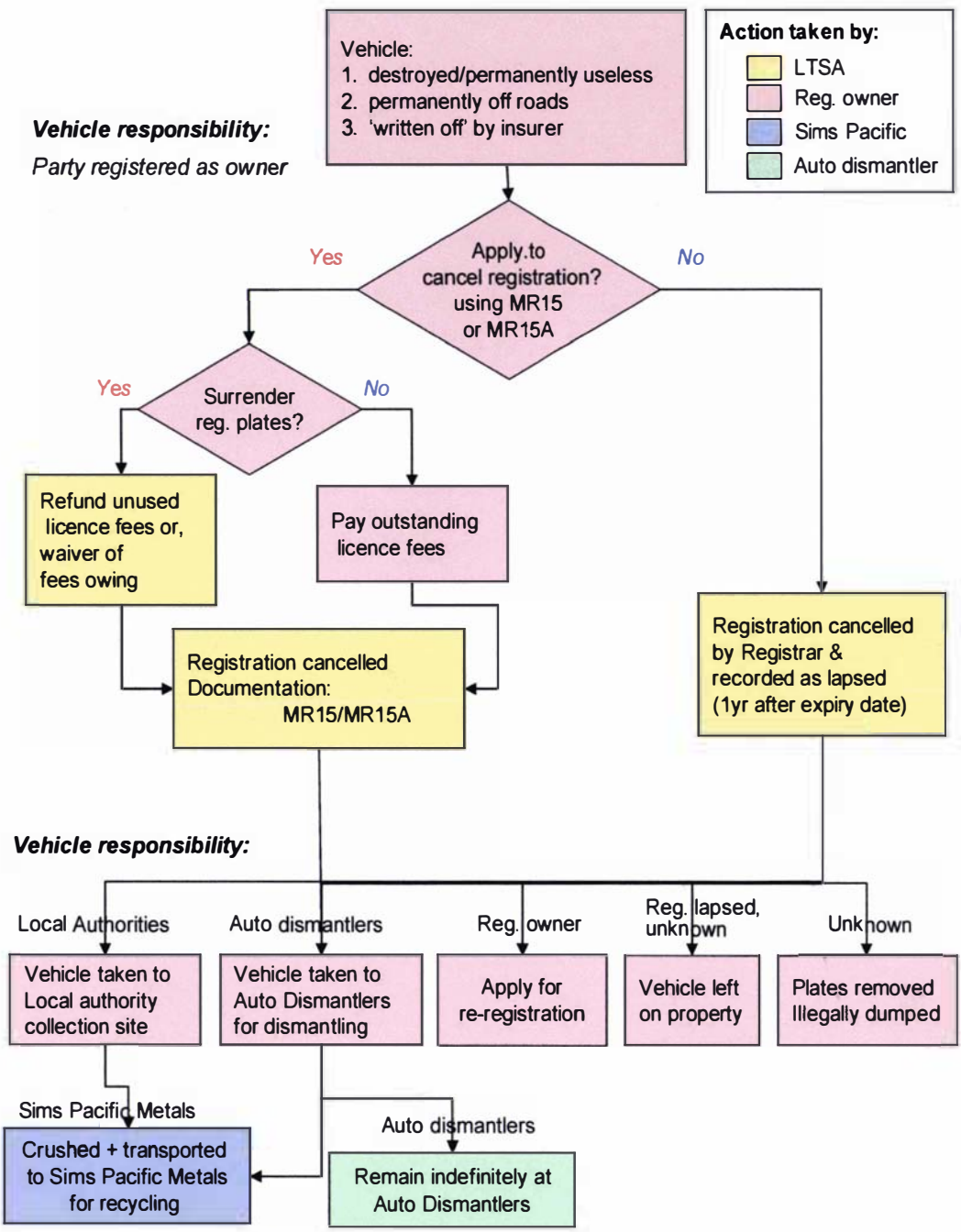
Cancellation of vehicle registration should occur when the vehicle is to be destroyed or rendered permanently useless, permanently removed from New Zealand roads (whether on private property or permanently removed from New Zealand) or, written off by an insurer. Currently about 5 percent of the cars in the passenger fleet have their registration cancelled each year (LTSA 2004). Illustrated in Figure 6.5 is the sequence of events surrounding the cancellation of registration and the disposal of a vehicle. The party responsible for the vehicle during the proceedings is also shown.

As shown in Figure 6.5, cancellation of vehicle registration can be carried out by the vehicle owner or by the Registrar. Registration cancellation requires the completion of form MR15, 'Application to Cancel Registration of a Motor Vehicle' along with surrender of the vehicle's registration plates. If the owner is a private individual they must present their driver's licence (or another form of identification) when cancelling the registration of a motor vehicle.[70] The party cancelling the registration of the vehicle indicates on the form whether the vehicle is to be destroyed or rendered permanently useless, permanently removed from New Zealand roads or, written off by an insurer. If the vehicle is currently licensed, a refund of the unused portion of the licence fee will be paid to the person (or company) handing in

[69] The purchaser is advised to get an estimate of this cost, as it can sometimes be more than the value of the vehicle.

[70] Another individual can act on behalf of the owner, but must present identification. A corporate organisation/insurance company will use their LTSA customer number as identification. Approved storage providers (usually dealing with unclaimed, impounded vehicles) are required to complete form MR15A (instead of form MR15) when cancelling the registration of a vehicle (MR15 – Notes, which are on the reverse side of MR15 in Appendix Three).

Figure 6.5: Cancellation of Registration and Vehicle Destination



MR15 Application to Cancel Registration
MR15A Application for a Storage Provider to Cancel Registration

the registration plates.[71] If the vehicle is unlicensed and there are licence fees owing, this debt will be cancelled on receipt of the registration plates (pers. comm. TRC 2002). When application is made to cancel a vehicle's registration and the registration plates are not available for surrender to the TRC, the cancellation of registration and any refund of unexpired licence fees are at the discretion of the Registrar (MR15 – Notes).

The Registrar is empowered to cancel the registration of a vehicle remaining unlicensed for a continuous twelve-month period (see Figure 6.5).[72] These are identified as 'lapsed' registrations. The current ownership and whereabouts of these vehicles is unknown (it was only known twelve months prior to the registration being 'lapsed'). The registration cancellation figures for 1998-2002 are given in Table 6.12.

Table 6.12: Annual Vehicle Registration Cancellations

	1998	1999	2000	2001	2002
Total cancelled & 'lapsed' registrations	149,382	131,180	128,115	133,848	124,648
Owner cancellations	50,594	56,032	66,882	68,052	67,081
'Lapsed' registrations	98,788	75,148	61,233	65,796	57,567
'Lapsed' registrations as percentage of total	66.1%	57.3%	47.8%	49.2%	46.2%

Source of data: Transport Registry Centre, LTSA

It is interesting to note from Table 6.12 that the number of vehicles being removed from the Motor Vehicle Register (having their registration cancelled) is not increasing as yet, despite the increase in the number of vehicles coming into the country, particularly used imports which are already on average seven years old when they enter the country. The number of vehicle owners who allow the vehicle's registration to 'lapse' does seem to be falling, however, they still represent nearly one-half of vehicle owners whose vehicle registration has been cancelled.

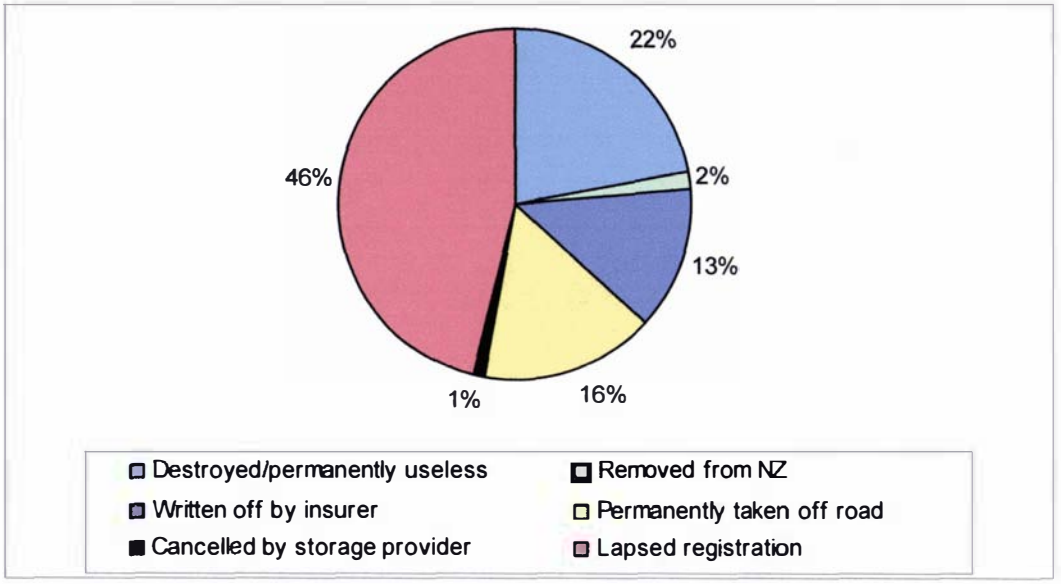
Almost 125,000 vehicles had their registrations cancelled in 2002. Forty-six percent of these (58,000 vehicles) did not have their registrations cancelled by their owners

[71] For this reason an automotive dismantler buying a vehicle for parts may, if the licence has not expired, complete the change of ownership papers in order to cancel registration, surrender the plates, and receive the licence-fee refund.

[72] This period is two years for vehicles which are exempt from CVL.

and so their registration was recorded as 'lapsed.'[73] These are shown in Figure 6.6 along with the 67,000 vehicles whose registration was cancelled by their owner. For those vehicles in the latter category, distinction was made as to whether they had been destroyed or rendered permanently useless, permanently taken off the roads, removed from New Zealand, or written off by an insurer.

Figure 6.6: Proportion of 'Lapsed' and Cancelled Registrations in 2002 (Including Declared Vehicle Destinations)



Source of data: Transport Registry Centre, LTSA

As shown in Figure 6.6, in 2002 approximately 27,000 vehicles (22 percent of those whose registration was cancelled) were declared destroyed or rendered permanently useless, 20,000 (16 percent) were permanently taken off the road, and insurers wrote off 16,000 vehicles (13 percent of vehicles whose registration was cancelled).

6.3.6 Reregistering a vehicle

A cancelled registration may not mean the end of the road for a vehicle. Some vehicles are written-off by insurance companies because it is advantageous from an economic viewpoint, without the vehicle having been destroyed or rendered permanently useless. In this case the insurer is likely to cancel the registration, surrender the registration plates, receive any refund owing, and then sell the vehicle

[73] In 2001 this figure was 49 percent.

'as is, where is,' either for parts or to be worked on to be made roadworthy again. Alternatively, a vehicle whose registration has been cancelled by the Registrar or the owner may be reregistered at a later date. For each of these scenarios the reregistration process is the same. The vehicle must be taken to a TSD agent to undergo a safety inspection and certification. For a vehicle that has suffered structural damage or deterioration or, had previous structural repairs, the TSD agent may refer the vehicle to a repair certifier. Where modification affecting safety performance has taken place, the TSD agent will refer the vehicle to a Low Volume Vehicle specialist certifier. Once the vehicle has passed the safety inspection and certification it automatically qualifies for a WoF. At this point the TSD agent can reregister the vehicle issuing it with new registration plates and a new licence (LTSA 1999a).

6.3.7 Areas of weakness with institutional practices

Almost one-half of the annual vehicle registration cancellations are executed by the Registrar and not by the vehicle owner. These vehicles have 'lapsed' registration status and the ownership and whereabouts of these vehicles was confirmed at least twelve months prior to the date of registration cancellation. This results in a data gap on the Motor Vehicle Register.

There are two opportunities for a vehicle owner to allow the vehicle registration to lapse. The first is when CVL (including temporary exemption) is not enforced (see Figure 6.3). The likelihood of enforced compliance or the size of the penalty is such that the vehicle owner ignores all reminders and warnings, neither relicensing the vehicle nor cancelling the registration. After twelve months the registration is recorded as 'lapsed.' The second opportunity occurs when the buyer does not confirm the change of vehicle ownership (see Figure 6.4). If the buyer ignores the letter reminding them of their responsibility to confirm the change of ownership and pay the transaction fee, no further action is taken.[74] Without enforcement, compliance does not necessarily take place.

[74] Except to send a final notice that the vehicle registration will be cancelled by the Registrar (twelve months after the license expired).

Once vehicle registration has lapsed these vehicles are 'lost' from the system.[75] They may continue to be driven on the roads[76] and there may be further change of ownership. When vehicle change of ownership remains 'unconfirmed,' owner liability remains with the seller as the last party registered as owner of the vehicle. This means that the seller is liable for all traffic infringements on the vehicle. The New Zealand Police and the local authorities find it difficult to enforce, however, and have to waive speed camera offences and stationary offences as a result (pers. comm. TRC 2002).

It is difficult to balance and account for all vehicle registrations on the Motor Vehicle Register in any given year as temporary exemptions from licensing can be granted any time (from a minimum of three months, up to an indefinite period of time). This difficulty in balancing the figures can be shown in Table 6.13 which provides the number of vehicles coming on and off the Motor Vehicle Register in 2002.

Table 6.13: Registration Figures for Light Motor Vehicles in 2002

Vehicle registrations for 2002		
Vehicles licensed (& registered) at end of 2001		1 985 220
plus Registrations for new vehicle imports in 2002	+	64 086
plus Registrations for used vehicle imports in 2002	+	136 418
plus Reregistrations (assumed not registered at end of 2001)	+	5 433
		2 191 157
less Cancelled registrations in 2002	-	67 081
less Lapsed registrations in 2002	-	57 567
Total		2 066 509
Actual number of vehicles licensed (& registered) at end of 2002		2 017 503

Source of data: Transport Registry Centre, LTSA

It can be seen in Table 6.13 that the actual number of licensed vehicles in New Zealand at the end of 2002 is 2,017,503. If, however, the expected number of light motor vehicles licensed by the end of 2002 was calculated by taking the number of vehicles licensed at the end of 2001, plus the 2002 registrations, minus cancelled and lapsed registrations in 2002, the expected total at end of 2002 would be 2,066,509. The discrepancy in these figures can be explained by the vehicles granted temporary

[75] 'Unconfirmed' ownership details are passed on to those in enforcement.
[76] Around 2,000 infringements are issued annually for vehicles which are unregistered and are on the roads (Source: New Zealand Police).

exemption from licensing (which is recorded by the TRC and is known at any point in time, but cannot be given as an annual figure because it is constantly changing). A further discrepancy is that those vehicles that were given 'lapsed' registration status during 2002 will not have been accounted for in the number of vehicles which were licensed at the end of 2001 (as there is a 12-month lag before registration is 'lapsed'). Some vehicles not accounted for could be some of the estimated 25,200 abandoned in 2002.[77] A few of the vehicles reregistered in 2002 may have been registered at the end of 2001, which means that in the figure labelled 'Total' they will have been double-counted.

Another area of weakness in the institutional process comes at the time of the registration cancellation and disposal of the vehicle. To cancel registration the owner must provide adequate identification, complete form MR15, and surrender the vehicle's registration plates. On the form the party cancelling the registration is required to indicate whether the vehicle is to be destroyed or rendered permanently useless, permanently removed from New Zealand or just from New Zealand roads or, has been written off by an insurer. The owner is not required, however, to provide proof of the vehicle's destination. As shown in Figure 6.5 some of these vehicles will go to a dismantling facility or to a local authority collection site in order to be recycled. A number of vehicles will remain on private property, some to be used on the property, others to be restored for reregistration at a later date, and others will just be left to deteriorate. A small proportion of vehicles will permanently leave the country, some written off by insurers will be bought 'as is, where is' in order to be made roadworthy for reregistration, and some will be abandoned. Since no proof is required the actual number of vehicles that are recycled or, that remain on private property, etc is not known. This lack of certainty surrounding the destination of a vehicle at registration cancellation contributes to the information gap regarding ELVs in New Zealand.

The Motor Vehicle Register becomes incomplete when CVL is not enforced and when a vehicle changes ownership without full and complete documentation. The

[77] Abandoned vehicles whose registrations were cancelled by the Registrar during 2002 would be recorded as 'lapsed' registrations in Table 6.13, but for those whose registrations had lapsed in a previous year, the vehicle would not be recorded in the above figures.

destination of motor vehicles whose registration is cancelled is uncertain without clearer alternative choices and requirement of proof. Therefore the number of vehicles on the roads, the annual number of ELVs, and the number of ELVs being recycled is not known with accuracy.

6.4 Examination of the Legislation Relevant to Abandoned Vehicles

There are four laws that refer to abandoned vehicles and provide instruction on the procedures to follow when dealing with them. Examination of these laws will be made in the subsection which follows. In addition, sections of the Transport (Vehicle and Driver Registration and Licensing) Act 1986 have an indirect impact on the ability of a local authority (or other administrative body) to trace an abandoned vehicle owner and enforce them to take responsibility for the vehicle. This legislation will be looked at in subsection 6.4.2.

6.4.1 Examination of the laws relating to removal, notification, and disposal of abandoned vehicles

The Government has enacted laws specifically to instruct and empower administering bodies on the removal and disposal of vehicles abandoned on public property. Responsibility for abandoned vehicles lies primarily with local authorities under the Local Government Amendment Act (No. 3) 1992, Section 2.[78] Responsibility for abandoned vehicles in national parks is with the Department of Conservation (National Park Act 1980, Section 71), in public reserves it lies with the administering body of that reserve (Reserves Act 1977, Section 110), and on public works land responsibility is with any person authorised by a Minister of the Crown responsible for public works (Public Works Act 1981, Section 239; Public Works Amendment Act 1988, Section 81).[79]

Since the local authorities remove the large majority of abandoned vehicles, the in-depth look at the legislation regarding abandoned vehicles will focus on the LGAA (1992).[80] Under the LGAA (1992), or indeed any of the other three acts, it is not a

[78] Henceforth referred to as the LGAA (1992). For Section 2, LGAA (1992), see Appendix Four. Section 2 of LGAA (1992) supersedes Section 356 of the Local Government Act 1974.
[79] Copies of the relevant Sections of each of these Acts are provided in Appendix Four in the order in which they are mentioned here.
[80] Points made with regard to the LGAA (1992) that are relevant to the other three acts can be applied to them also.

prosecutable offence to abandon a vehicle.[81] In addition, Section 2 of the LGAA (1992) is specific to abandoning a vehicle on a road, but there is no provision for a course of action where a vehicle has been abandoned on public land other than the road or, on private land without consent from the owner of that land. Where for example, a vehicle is abandoned near or in water it becomes the responsibility of the regional council (under the Resource Management Act 1991), however, some of the regional councils have come to an arrangement with the local authority whereby responsibility for abandoned vehicles remains with the local authority regardless of where the abandonment took place.

Abandoned vehicles are categorised in three ways in Section 2 of the LGAA (1992), in order to distinguish between the ways in which the search for the owner is conducted, and also the time frame of the notification of sale or disposal of the vehicle. The three categories are as follows:

> "A category A vehicle is a motor vehicle that has neither a number plate nor a current licence label affixed to the vehicle; a category B vehicle is a motor vehicle that has affixed to it either a number plate or a current licence label (but not both); [and] a category C vehicle is a motor vehicle that has affixed to it either i) a number plate and a current licence label; or ii) a number plate and a licence label that expired not more than 6 months before the council took possession of the vehicle."

A category has not been included for vehicles that have no form of identification (no plates, no licence, either current or expired, no readable chassis number or VIN), even though many abandoned vehicles come under this category.[82] If there were such a category, these untraceable vehicles could be disposed of immediately, as anecdotal evidence from local authorities suggest that attempts to find the vehicle owner via newspaper advertisements are unsuccessful and owners who have abandoned a vehicle in this manner do not want to be traced.

The LGAA (1992), Section 2, 2(c) states that "the council shall make reasonable efforts to give notice to the last registered owner of the vehicle of its intention to sell the vehicle . . ." Later in Section 2, 2(h), however, when liability is stated it says "the owner shall be liable to pay to the council all expenses incurred by the council

[81] Prosecuting a person for abandoning a vehicle has to be done under the Litter Act (1979).
[82] According to the responses to question 5 in Survey II.

in removing and storing the vehicle . . ." In 2(c) the words 'last registered owner' are used, while in 2(h) when referring to the same person it says simply 'the owner.' This provides a loophole for the last registered owner to be absolved of liability for the vehicle, by stating that s/he is no longer the owner of the vehicle.[83]

In Section 2, 2(d) "the council may give not less than 10 working days' notice, by advertisement in 2 issues of a daily newspaper . . . of its intention to sell the vehicle . . . " This applies to category A and B vehicles, and for category C vehicles the period of notice extends to one month (Section 2 3(a)).[84] Although there is no ambiguity here, the period of notice is such that at $12 per day for storage, it is relatively expensive for a council that does not recover any of its costs ($120 for ten days and $360 for a month). Councils suggest that advertising is usually fruitless, so it would seem that this form of notification is not worth the expense, and that the notification period could be reduced in order to reduce the cost to local authorities.

The National Park Act (1980), Section 71, and the Reserves Act (1977 to 1996) Section 110 also refer to the removal and disposal of abandoned vehicles. Both of these laws require the holding of a vehicle, assumed abandoned, for two months. After this two-month period, for a vehicle displaying a current licence, "the Minister may give not less than 14 days' notice to the last registered owner of the vehicle of his intention to sell or destroy the vehicle" (National Park Act 1980, Section 71 4(b)).[85] Where the vehicle is not currently licensed, the same notice period applies, with notice of sale or disposal being required in the form of "advertisement in 2 issues of a newspaper circulating in the district in which the park is situated . . ." (Section 71 4(a)). If storage were being charged at commercial rates, a storage cost of $888 would have accrued in two and one-half months, which may be more than the value of the abandoned vehicle. For abandoned vehicles without visible identification, it is likely that the current owner does not wish to be traced, which makes notification via advertisements of questionable worth.

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[83] Many do this. as has been discussed in Section 6.2.2 of this chapter.
[84] Similar instructions to notify, for category A and B vehicles are given in the Public Works Act 1981, Section 239. There is, however, no mention of a category C vehicle.
[85] The same statement is made in the Reserves Acts (1977 to 1996), Section 110 3(a).

6.4.2 Examination of the legislation impacting on the ability to trace abandoned vehicle owners

Sections of the Transport (Vehicle and Driver Registration and Licensing) Act (1986),[86] which indirectly impact on the ability of a local authority to trace an abandoned vehicle owner and enforce liability for the removal and disposal of that vehicle, are discussed here. The relevant sections of the Transport (VDRL) Act (1986) are those which relate to CVL and the procedures for the change of vehicle ownership.[87] The law regarding the requirement to display a current licence for vehicles on the roads, and regarding the procedures and requirements for legal change of vehicle ownership are clear and enforceable. With almost half of the vehicle registration cancellations being cancelled by the Registrar and on average 79,000 infringements issued annually for vehicles failing to display a current licence, it is clear that compliance with these laws does not always occur. Under Section 26 of the Transport (VDRL) Act (1986),[88] failure to notify the change of ownership of a motor vehicle by the seller and/or failing to produce the certificate of registration is an offence with a maximum fine of $500 (Section 26(2)), and providing false or misleading information is an offence with a fine not exceeding $1,000 (Section 26(1)). This is also the case for failure to confirm ownership by the buyer (as in Section 14 of the Transport (VDRL) Amendment Act 1992). Therefore while there is penalty for noncompliance, prosecution for these offences are rare (pers. comm. TRC 2002).

Where change of vehicle ownership remains 'unconfirmed', the seller (the last registered owner) is liable for all traffic infringements on the vehicle (stated on the notification of sale form, MR 13A). Without prosecuting for the offence of failing to notify of change of ownership, a consequence is that traffic infringements involving vehicles with 'unconfirmed' change of ownership status, are difficult to enforce since information on vehicle ownership on the Motor Vehicle Register is unreliable. Most often these offences have to be waived, having already imposed costs on the local authority or the New Zealand Police in officer time and administrative costs.

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[86] Henceforth referred to as the Transport (VDRL) Act (1986). All relevant sections of this Act and its Amendments are given in Appendix Four.

[87] Namely Sections 5 and 20 of the Transport (VDRL) Act (1986), Section 13 of the Transport (VDRL) Amendment Act (1992), and Sections 7 and 8 of the Transport (VDRL) Amendment Act (1997).

[88] Amended in Section 16 of the Transport (VDRL) Amendment Act (1992).

6.5 Conclusion

An estimated 25,500 vehicles are abandoned throughout New Zealand each year. The direct cost to local authorities to recover, notify, and dispose of these abandoned vehicles is estimated to be at least six million dollars a year. This does not include the cost to society from the associated environmental externalities. Local authorities have implemented different policy instruments to encourage the correct disposal of ELVs with varying degrees of success.[89]

Although the law is clear regarding CVL and change of vehicle ownership, institutional practices and lack of enforcement is such that vehicle owners may avoid compliance with these laws. This results not only in an incomplete Motor Vehicle Register, but also in difficulties enforcing the laws concerning abandoning a vehicle, which allow ELV owners to abandon their vehicles without penalty. Consequently, of the vehicles illegally dumped nationwide, only an estimated 35 percent of owners are currently traced and costs recovered.

Throughout much of New Zealand local authorities provide a collection site and storage for ELVs waiting to be recycled. There is, however, no standard practice regarding the setting of cost levels for the disposal of ELVs at these collection sites. In some areas the cost to leave ELVs for disposal is greater than the actual stripping cost, while in others it is less, so that ELV disposal is subsidised by ratepayers. In some areas there is a regulatory requirement that ELVs be stripped prior to acceptance for disposal at the collection site. Where stripping is a requirement for disposal or, where ELV owners are required to pay for the vehicle to be stripped, an incentive is created to abandon the vehicle.

Prior to making recommendations aimed at both increasing the number of ELVs that enter New Zealand's recycling system and reducing the negative environmental impact from ELV disposal, a study is made of the approach taken to ELV recycling and disposal in other countries. The results of this study are presented in Chapter Seven with the primary focus being case studies on the management of ELVs in the Netherlands, Germany, Sweden and the United Kingdom.

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[89] Policy implementation costs are not necessarily included in the six million dollar estimate.

Chapter Seven

International Case Studies Regarding the Management of End-of-Life Vehicles

"Practical policymaking is an art of timing, combining, and sequencing instruments to meet multiple goals amidst changing circumstances."

Sterner (2003, 218)

7.1 Introduction

Chapter Seven outlines the approach taken to the management of ELVs in other countries. Presented here are the current management practices regarding ELV recycling and disposal in four Member States of the EU, namely the Netherlands, Germany, Sweden, and the United Kingdom. Three areas of ELV management are examined. The first is the ELV recycling rate currently being achieved, and the level of government intervention or the cost to industry to accomplish this. The second is the use of policy instruments in the management of ELVs, and the third is the institutional practices that impact on the number of vehicles being abandoned. In each of the country studies emphasis on these three areas will vary according to the importance of each in the country's management of their ELVs.

In this chapter Sections 7.2 to 7.5 present the case studies for the Netherlands, Germany, Sweden, and the United Kingdom. Section 7.6 concludes the chapter with a summary of the main findings from the country studies. Management practices regarding ELV recycling and disposal in a number of other countries provide either unique practices or elements relevant to New Zealand. For this reason they are given a brief mention in the concluding section as they will contribute to the discussion when presenting options for the management of ELVs in New Zealand.

Driven by extreme pressure on landfill capacity in some Member States, the European Union adopted the EU Directive (2000/53/EC)[1] on end-of-life vehicles in September 2000. The approach is one of extended producer responsibility (EPR) toward the disposal of ELVs. The EU Directive provides the backdrop for the case studies and so a brief overview of the Directive is necessary prior to the presentation of the country reports. The EU Directive makes mandatory the formal deregistration of an ELV upon presentation of a Certificate of Disposal by the last owner of the vehicle to ensure the vehicle enters the recycling system, and that it does so via a certified treatment facility. Presentation of the Certificate of Disposal formally releases the vehicle owner from fiscal responsibility of the vehicle. The EU Directive embraces extended producer responsibility for the management of ELVs

[1] Henceforth referred to as the EU Directive. This directive applies to the fifteen Member States of the European Union in 2000 and was to be translated into national legislation by April 2002.

with the free take-back of all ELVs by the automobile manufacturers and professional importers of each of the Member States from 2007.[2] ELV reuse and recovery targets have been set in the EU Directive at 85 percent of a vehicle (by weight) with no more than 5 percent in energy recovery by 2006, and 95 percent by 2015, with at most 10 percent in energy recovery. New vehicles on the market from the beginning of 2005 are required to be at least 85 percent reusable and/or recyclable.[3] The EU Directive stipulates stringent ELV management systems with specific requirements for both collection and treatment facilities. Included in these are improvements in facility design and in treatment practices, with monitoring and certification of facilities a requirement. Also mandatory is the removal of fluids, hazardous materials, and recyclable materials prior to shredding (EU Directive 2000).

The EU Directive has provided the time frame for compliance, which the case study countries will be required to meet. Presented here are the current ELV management practices of each of the four Member States until that time.

7.2 The Netherlands[4]

In the Netherlands, with a population of sixteen million, nearly one thousand vehicles were retired daily from the roads in 2000, designated as ELVs.[5] The number of ELVs had been rising in the late 1990s, with the number in 2000 up 15 percent on the previous year. The two main reasons for this trend were the strong Dutch economy of the late 1990s, which led to an increase in the number of vehicles registered, and a decline in the number of used cars exported from the Netherlands

[2] In addition producers must incorporate product design that improves the reuse and recycling of components and materials, and increase the quantity of recycled materials used in production. They must also code components and materials to facilitate recovery and reuse and provide dismantling information on all new vehicles (EU Directive 2000).

[3] In addition, the EU Directive dictates the phasing out of the use of the heavy metals lead, mercury, cadmium and hexavalent chromium in car manufacture except in specified components (EU Directive 2000).

[4] Information was collected through an interview with the Manager Recyclingprojecten, Auto Recycling Nederlands BV, and an on-site a visit to an automobile dismantling operation, to see the practices carried out in order to meet the stringent environmental standards and the high levels of recycling set by the Dutch government.

[5] The number of vehicles retired in 2000 was just over half the number of new vehicle registrations for that year.

(Zoboli, Barbiroli, Leoncini, Mazzanti, and Montresor 2000).[6] Car sales in 2002, however, were down 2 percent on the previous year, and the number of ELVs for disposal also decreased (Auto Recycling Nederland (ARN) 2003).[7]

With the increased pressure on landfill space, the automobile industry decided on a bold and unique way to vastly improve both the quantity and the quality of automobile recycling in the Netherlands, thus reducing the amount of automobile shredder residual (ASR) requiring disposal. The motivation for this move was to take the initiative before any legal obligation was forced upon them. In October 1993, the industry set up the Auto Recycling Foundation,[8] with the endorsement and legislative backing of the Ministry of Housing, Spatial Planning and Environment. The Foundation created an independent, non-profit company Auto Recycling Nederland BV (ARN), which began operation in 1995.[9] ARN was to implement the Foundation's policy to reduce automobile waste by half of the (then) current level. This required recycling or reusing 86 percent of a vehicle (by weight), which involved recovery of materials not previously recovered. Remarkably, the 86 percent ELV recycling target was achieved before the end of 1997 (ARN 2003).[10]

To achieve this level of recycling ARN set and monitored standards for dismantling and recycling, conducted research and financed those parts of the operation that were uneconomic. This they continue to do by giving recycling premiums for those dismantling and recycling activities that are not yet profitable. The premiums are financed by a mandatory deposit known as the waste disposal fee, paid by importers

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[6] The number of used car exports decreased from approximately 155,000 in 1997, to 115,000 in 2000. Used car exports from the Netherlands went primarily to France, secondly to Eastern Europe, and thirdly to Africa. The trade in used cars with Eastern Europe had declined as those countries increased in prosperity and also imposed import restrictions. Poland for example, stopped accepting vehicles that were more than seven years old (pers. comm. Auto Recycling Nederland BV (ARN) 2001).

[7] The proportion of incoming vehicles that are used imports is around 8 to 9 percent (ARN 2003).

[8] Those involved were the car manufacturers and importers, garages, repair shops. car dismantling companies, and the shredder companies. In 1997, the shredder association ceased to exist and so withdrew from the Foundation.

[9] The ARN is a limited company with only eighteen full-time employees and is 100 percent owned by the Foundation (pers. comm. ARN 2001).

[10] See Table A5.1, Appendix Five. The Dutch Ministry of Housing. Spatial Planning and Environment have legislated for the 95 percent recycling target to be reached in the Netherlands by 2007.

on first registration in the Netherlands of any new or used vehicle.[11] The Minister of Housing, Spatial Planning and Environment declared the waste disposal fee binding, and without payment of the fee, registration cannot be obtained (ARN 2001). Where the importer passes the fee on to the consumer it is declared an environmental fee, and is added to the list price of the car. The waste disposal fee was introduced at the beginning of 1995 and was set at NLG250 ($NZ212.50)[12] for the first three years.[13] As a sufficiently large reserve fund soon accumulated and the cost of the recycling operation decreased, it became possible to reduce the disposal fee.[14] In 2001 at €45 ($NZ84.28) the disposal fee was less than 0.25 percent of the average price of a new vehicle. The fund is used to run ARN, with the bulk of the money being used for the recycling premiums paid to car dismantling, transport, and recycling firms contracted to ARN (pers. comm. Auto Recycling Nederland (ARN) 2001).

In 2001 there were nearly eight hundred registered automotive dismantlers in the Netherlands, and of these 267 were contracted to ARN and processed nearly 90 percent of the country's ELVs.[15] Of those outside the ARN system, most are very small operators. Many are 'sleeping' companies as far as dismantling is concerned (particularly ELV dismantling), registered as dismantlers but seldom practising. Licensed automotive dismantling companies have to comply with increasingly stringent standards,[16] rigorously monitored by a certification body recognised by the Accreditation Council (pers. comm. ARN 2001).[17]

The dismantling companies' primary income is from the sale of used parts and the sale of the car hulk to the metal trade. Companies contracted to ARN are required to

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[11] Vehicles must have at least four wheels and weigh at most 3,500 kilograms. Classic cars that are at least 25 years old are exempt (pers. comm. ARN 2001).
[12] All conversions to New Zealand dollars in the thesis were calculated using the exchange rates on 26 January 2004: NLG1 (obsolete) = $NZ0.849994. €1 = $NZ1.8728.
[13] The car importers group use modelling techniques to calculate the size of the fee. See Figure A5.1 in Appendix Five for the components used to calculate the disposal fee.
[14] The fee was reduced to NLG150 ($NZ127.50) for the years 1998 to 2000 and to €45 ($NZ84.28), inclusive of the 19 percent VAT, as of January 2001 until the end of 2003 (pers. comm. ARN 2001).
[15] When dismantlers first registered with ARN in 1995, those registered with ARN processed approximately 40 percent of the country's ELVs and by 1998 it was up to 80 percent of ELVs.
[16] For example, fluids must be drained from an ELV within three days of its arrival at the dismantling facility.
[17] The dismantling industry underwent re-organisation in the late 1990s so that now there are fewer facilities operating, but they tend to be larger and more professional (pers. comm. ARN 2001).

further remove materials which can either be usefully recycled or, could become an environmental burden. By 2002 these companies were recovering and recycling up to nineteen different types of material and these are listed in Table A5.2 in Appendix Five (ARN 2003).[18] The techniques used are relatively simple with most processes being carried out manually. This means that expensive capital outlay is not required, and no economies of scale are achieved in ELV dismantling (pers. comm. ARN 2001). ARN makes regular quality inspection of the materials recovered and of the dismantling process. The premiums (paid per kilogram, or per litre of recovered materials) are evaluated annually by ARN, based on time and cost studies for 'best practise' dismantling methods. Dismantlers then try to increase their own efficiency to improve their profit margin. When the dismantlers group as a whole increase efficiency, then ARN lowers the premiums paid.[19] It is in the interest of car importers, the Government, and consumer organisations to lower premiums where feasible, in order to keep the waste disposal fee as low as possible (*ibid.*).

Six collection companies are business partners with ARN, transporting the dismantled materials to the recycling companies. The full containers of materials are weighed and recorded by both the dismantler and the collection company. Transport of materials and administrative costs are paid for by ARN. Recycling companies are also contracted to ARN. As with the collection companies, selection is carried out by tender in order to encourage competition. ARN offers contracted recycling companies guaranteed quantities of materials of a consistent quality, and for these they either receive or pay recycling premiums. The contract is conditional on proof of high-grade recycling, and stringent requirements must be adhered to (pers. comm. ARN 2001).

In 2002 ARN collaborated with domestic and foreign shredding companies to instigate a new project to monitor shredder intake. Shredder companies are now required to be licensed and to meet environmental and safety standards. Contracted dismantlers trade their dismantled ELVs with contracted shredders who extract and

[18] Detail of the uses of these recycled materials is also given in Appendix Five.
[19] ARN sets and fixes the premiums for a three-year period, providing some certainty for the dismantlers and as an incentive to increase efficiency (pers. comm. ARN 2001).

sell the ferrous and nonferrous metals. The dismantling company attaches a barcode to the ELV which contains all the data relevant to that ELV, so that it can be traced throughout the recycling chain. The shredder company scans the barcode on receipt of the ELV, so that shredder intake can be monitored, and it also provides a record to authorities of correct dismantling and disposal of the ELV (ARN 2003).

To achieve the new recycling target of 95 percent ARN has invested a great deal of resources on research and pilot recycling projects. The 95 percent recycling target is considered unattainable without the processing of shredder waste, and therefore a cost-effective solution is needed. Future developments are likely to be in thermal processes like pyrolysis, gasification, and staged incineration. This is of economic interest to the shredder companies as they face increasing fees for the disposal of shredder waste at landfills (ARN 2003).

The Dutch have a very comprehensive and interconnected database of information concerning vehicles. The starting point is registration with the Centre for Vehicle Technology and Information (RDW).[20] On entry into the Netherlands a car is issued a licence by the RDW once the waste disposal fee has been paid. With the licence comes the vehicle's registration number, which remains with the vehicle throughout its lifetime. The vehicle owner has to pay an annual ownership tax, an amount that varies relative to the weight of the vehicle. There is an on-line recording system for vehicle ownership, on which any change of ownership is recorded. A record is also kept of payment of the annual tax. When payment is overdue a reminder is sent out. If the reminder is ignored a court order is sent or, a credit agency is sent to collect the payment, which if still outstanding, is usually forthcoming (pers. comm. ARN 2001). Since the Netherlands uses an ownership tax there is no temporary exemption from licensing.

Car dealers are required to keep on-line registration of their stock which is linked to the central database so that when a car owner sells his/her vehicle to a dealer, the dealer does not fill out change of ownership papers as a new owner would have to,

[20] Rijksdienst voor het Wegverkeer.

but must register the vehicle on the on-line system. Failure to do so results in a fine (pers. comm. ARN 2001). All authorised dismantling companies have an on-line registration of their dismantling operation (ORAD),[21] which is also linked to the central database. When the owner of an ELV brings it (complete with licence plates) to a dismantling company, the owner receives a Certificate of Disposal. This is entered on the ORAD (and therefore into the central database), along with any particulars regarding that vehicle. Also recorded on the ORAD is the material balance of each ELV. The ARN has a data link to this information, which is closely monitored. The RDW Data Centrum processes the data on behalf of ARN. The other part of the record keeping lies with those responsible for the export of used vehicles from the Netherlands. The export system is also linked into the central database (*ibid.*).

Receipt of the Certificate of Disposal relieves the owner of any further ownership tax. Without a Certificate of Disposal the registered owner must continue paying the annual ownership tax as there is no exemption offered. This, along with the free take-back of ELVs in the Netherlands, provides the incentive for ELV owners to take their vehicles in for recycling. As a result abandoned vehicles are not an issue in the Netherlands (pers. comm. ARN 2001).

The Dutch recycling system required no adjustment with the implementation of the EU Directive on ELVs by Member States in April 2002.[22] Their system is based on producer responsibility, and ensures that all ELVs are disposed of through authorised and monitored treatment facilities. Furthermore, free take-back of an ELV of zero or negative value has been required by law since 1995, and the Certificate of Disposal is in place. The EU Directive set a recycling target of 85 percent by 2006. This target had already been achieved in the Netherlands since the end of 1997, through 80 percent recycling and 5 percent energy recovery (ARN 2003). ARN provides the infrastructure, guarantees payment for recycling, and guarantees quantities of materials to the next participant in the recycling chain. With the increase in the ELV

[21] Online Registratie Auto Demontage system.
[22] In fact the successful ARN system served as a model for the EU Directive (ARN 2001).

recycling rate from 75 percent to 86 percent, the amount of ASR to landfills has been almost halved, environmental impact has been significantly reduced, and the increased materials reuse implies little unnecessary use of raw material resources (pers. comm. ARN 2001).

Two economic instruments drive the management of ELV disposal in the Netherlands. The first is effectively a user charge, and the second a recycling subsidy. The vehicle user is charged a disposal fee, but it is the first owner (or the importer) not the last who is charged the fee. "The system implies a certain and fixed payment by the first owner (as opposed to an uncertain and variable payment by the last owner)" (Zoboli *et al.* 2000, II.48). If the disposal charge were required of the final owner, it would provide an increased incentive to abandon the vehicle. The disposal charge is regressive in that the fee is the same for new and used vehicles and irrespective of the value of the vehicle, creating a disadvantage for those presumably lower-income consumers buying vehicles of lesser value (Zoboli *et al.* 2000). Subsidies are paid to all those in the recycling chain of the ARN infrastructure, for all recycling and recovery that would not occur under free market conditions. The subsidising of dismantlers and shredders has met with criticism. European car manufacturers oppose the need for incentives to initiate new recycling activities that may eventually become self-sustaining (pers. comm. BMW Group 2001).

7.3 Germany[23]

In Germany there were approximately forty million passenger cars displaying a current registration in 1997 for a population of just over eighty-three million ([Germany] Ordinance on used motor vehicles 1997). In 1998 more than 3.7 million new passenger cars were registered in Germany, nearly 27 percent of the new registrations for the whole of the EU15. In the same year just over 40 percent of new car registrations in the EU15 were for cars produced by the four German-based

[23] An interview was conducted with the Head of the Division for Product Responsibility, Avoidance, Recovery and Utilization of Product Waste for the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. For the industry perspective, time was spent looking at the processes developed for car disassembly and hazardous waste removal at the Recycling and Disassembly Centre for the BMW Group, and an interview was conducted with the Head of the Recycling Department at the Centre.

manufacturing groups, namely Daimler-Chrysler, the BMW Group, Opel, and the Volkswagen Group (Zoboli *et al.* 2000).

There is no reliable data on the exact number of ELVs in Germany each year, however, approximately 2.6 million cars are deregistered annually[24] with about 1.7 million of them being scrapped (ARGE-Altauto 2000). These figures are likely to increase with the rise in number of vehicles registered annually.[25] Also increasing is the quantity of ASR requiring landfilling, as the proportion of plastics and other non-metal materials used in automobiles increases ([Germany] Ordinance on used motor vehicles 1997).[26] Therefore issues relating to the recycling and disposal of ELVs are of real importance to Germany, such that both the Government and industry have invested a great deal of resources into addressing them.

In Germany the Waste Avoidance and Waste Management Act of 1986 (WMA) set waste minimisation as its key objective, with reutilisation as the preferred option over disposal or incineration. The WMA provided the legal framework for the Federal Government to set statutory and technical regulations on specific waste streams. It also introduced producer responsibility for post-consumer waste which included producer take-back and obligatory recycling. Following this the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)[27] issued policy papers advocating free take-back of ELVs by manufacturers and importers, and the reuse and recycling of car parts and materials, where it was technically and economically attainable (Zoboli *et al.* 2000).

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[24] Some of these will not have been permanently deregistered, but will have temporary exemption from licensing.

[25] It should be noted that there has also been a rise in the number of deregistered cars being exported to former USSR states, Poland and other Eastern European countries, as well as France and the Netherlands (approximately 18 percent of deregistered cars are less than ten years old). A proportion of these exports are ELVs, and there are a number of reasons for this. Firstly, some importing countries have relatively low emissions standards; secondly, these countries have a greater demand for used and reconditioned parts; thirdly, Eastern European labour costs (for dismantling) are lower, regulations regarding dismantling and waste disposal are less stringent, and ASR disposal is less expensive (Zoboli *et al.* 2000).

[26] The increasing proportion of a vehicle made up of plastics is given as: 2.9 percent in 1970, 10.2 percent in 1983, 13 percent in 1991, and by 1997 the proportion of plastics in an average automobile was up to 15 percent.

[27] Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU).

In response the German automotive industry, Verband der Automobilindustrie e.V (VDA) suggested alternative policy proposals. The VDA agreed there was a need to improve the depollution of ELVs, and increase the level of ELV recycling. Their approach, however, was one of 'shared responsibility,' with the last vehicle owner being responsible for transferring the vehicle to an authorised dismantling facility. The VDA felt that it was important to retain the free market mechanism in all transactions involved in the disposal of ELVs, including the final owner either receiving or making payment for the ELV depending on current market conditions. In addition, the VDA advocated a national network for the collection, depollution, and dismantling of ELVs, and expressed commitment to increase the recyclability of future vehicles, as well as work toward a higher level of use of recycled materials in the manufacture of new vehicles, without being constrained by specific targets. The other concern was the possibility of statutory restrictions on the options of ELV processing (pers. comm. Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (BMU) 2001; Zoboli *et al.* 2000).

By the mid 1990s there had been some movement toward common ground by the two parties. The VDA had accepted that there would be specific recycling targets and the BMU had conceded the possibility of incineration for some waste reduction. There were, however, still two unresolved issues. The first was the BMU's free take-back requirement.[28] The industry maintained that the market mechanism should be the one to distribute the costs, which meant 'shared responsibility' not 'producer responsibility.' The second issue was one of policy. The VDA preferred self-regulation via a voluntary pledge, while the Ministry wanted direct regulation (as with waste packaging) regarding economic and organisational facets of ELV disposal (pers. comm. BMW Group 2001; Zoboli *et al.* 2000).

In 1996, the VDA along with the associated recycling industries (Arbeitsgemeinschaft Altauto, known as ARGE-Altauto), put forward a 'Voluntary Undertaking on ecologically compatible disposal and recycling of used motor vehicles in accordance with the German Law on Recycling and Waste Management'

[28] In its free take-back proposal the BMU did leave it open for car manufacturers to include the cost of take-back in the price of a new car.

([Germany] Ordinance on used motor vehicles 1997). Key objectives of the voluntary undertaking were that vehicle design ensured the increasing reuse and recycling of parts and materials in order to reduce the amount of waste requiring landfilling, and that the treatment of ELVs be compatible with environmental objectives. To achieve these objectives, they pledged to establish a nation-wide infrastructure for the collection and recycling of ELVs and ensure that the removal of hazardous wastes, and the disposal of non-recoverable residues be carried out in such a way as to be environmentally acceptable. They also agreed to work towards reducing the quantity of waste from an ELV to at most five percent by 2015 (Verband der Automobilindustrie e. V. (VDA) Press Release 21 February 1996). The car manufacturers and importers undertook to take back their own vehicles from the last registered owner "at the terms and conditions prevailing in the market" (VDA Press Release 21 February 1996, 3).[29]

The Federal Government responded positively to this voluntary undertaking seeing it as an important step toward the implementation of product responsibility. The Ordinance on the Disposal of End-of-Life Vehicles and the Adjustment of Provisions under Road Traffic Law (also called the End-of-Life Vehicle Ordinance), was adopted by the Federal Government in November 1996 and enforced from April 1998. The ordinance provided the necessary legal framework to be able to execute the voluntary undertaking. It included an obligation to dismantle ELVs at certified, audited treatment facilities operating in an environmentally acceptable manner, and specific accreditation procedures were prescribed for publicly appointed experts that would monitor and approve the dismantling facilities. Minimum requirements were set down to ensure the avoidance of ecological hazards when storing, handling, and recycling ELVs. In addition, deregistration of a vehicle became conditional on the presentation of a Certificate of Destruction issued by a certified treatment facility ([Germany] Ordinance on used motor vehicles 1997). While environmental objectives were the driving force behind this ordinance, it further aimed to ensure that the waste management sector remained competitive. Any firm meeting the standards set by the ordinance is entitled to enter the waste management market.

[29] This meant taking back free-of-charge, vehicles that enter circulation after the enforcement of the ordinance, that are no more than 12 years old (BMU 1997).

Prior to the regulation of vehicle dismantling centres, there were about 5000 dismantling facilities of varying standards in Germany. Once certification of dismantling centres became mandatory a large number of facilities closed, reducing the total number to 1,400 (pers. comm. BMW Group 2001; ARGE-Altauto 2000). In order to operate, such facilities are required by the Federal Emission Control Act (BImSchG) to hold a licence. Independent auditors monitor the dismantling centres on an annual basis, renewing certification of centres that have met the standards set.[30] The dismantler, regardless of whether they are successful in gaining certification, pays for monitoring. Treatment facilities are subject to detailed requirements. Areas where vehicles are stored prior to depollution and where depollution takes place must be paved making the area impermeable to oil and acid-resistant. It must also be enclosed and roofed in order to protect the environment and to ensure the quality of the recyclable waste (pers. comm. BMW Group 2001). Prior to depollution ELVs must not be stored on their side or roof, nor are they permitted to be stacked directly on top of each other. This reduces the risk of damage to components containing hazardous fluids, and removable parts.[31] Once pre-treated they can be stacked on top of each other, no more than three cars high ([Germany] Ordinance on used motor vehicles 1997).

Dismantling facilities were encouraged to recover at least 10 percent of an ELV (by weight) (pers. comm. BMU 2001).[32] It is obligatory for dismantling centres to provide detailed documentation on all incoming and outgoing flows of materials. This means documentation on vehicles received, fluids removed (and how they are to be disposed), disassembly, reuse of parts, recycling of materials (whether as secondary raw materials or as an energy source), and disposal of the hulk. At every stage proof of material flows is required, and the various recycling concerns have to

[30] Auditors or experts are certified by the German Accreditation Council. Monitoring organisations like Technical Inspection Authorities can also be accredited. In 2001 there were approximately 90 to 100 qualified, publicly appointed auditors nationwide (pers. comm. BMU 2001).

[31] Regulations are the same at collection centres which merely accept and temporarily store ELVs before they are transferred to authorised treatment facilities. They are required to have an official building law permit, be fenced, have adequate fire-fighting equipment, and a paved storage area. A record must be made of all ELVs received and dispatched, including any operational disturbances and consequent remedial action.

[32] This included components, materials, and fluids. Possibilities had been examined and modelling carried out to arrive at this figure (pers. comm. BMU 2001).

verify the quantities of materials they are purchasing ([Germany] Ordinance on used motor vehicles 1997).

Shredding facilities are required to be "erected, operated, and maintained in such a way as to ensure compliance with the requirements for safe and correct recycling, as well as disposal of the waste in accordance with the public interest" ([Germany] Ordinance on used motor vehicles 1997). The shredder operation was required to reduce the volume of ASR by 5 percent and energy recovery was likely to be used in order to achieve this.[33] The problem with energy recovery is that ASR is contaminated by hazardous waste, which when undergoing thermal treatment can be detrimental to air quality (pers. comm. BMU 2001). Shredding facilities are also required to hold a licence and undergo monitoring by auditors (whose services they pay for). The shredding plant is required to keep a plant journal to record the incoming and outgoing flows of substances and materials. This ensures the complete monitoring of the vehicle from the point of deregistration until the final hulk is recycled and disposal of ASR has occurred. Administrative offences incur a maximum fine of DEM100,000 ($NZ95,760)[34] ([Germany] Ordinance on used motor vehicles 1997).[35] In Germany in 2001 approximately 82 percent of a vehicle by weight, was recycled.

Compliance with the regulatory standards set for the collection, dismantling, and shredding facilities increased the cost of these operations, but most notably in the short-term. The expectation is that the constantly improving disassembly technology by the automobile manufacturers will lead to reduced operational costs at the dismantling facilities, and the larger quantities of materials for recycling (as a result of the regulations) will lead to the economic recycling of these materials. These outcomes are expected to offset the increase in costs incurred with meeting the regulatory standards. Further, the eventual reduction in the quantity of ASR requiring disposal will decrease the cost of its disposal. Since market forces determine the cost to the ELV owner of disposing of an ELV of negative value, the short-term increase in costs in the recycling and disposal process were likely to be

[33] The 85 percent recycling target for 2006 is expected to be achieved.
[34] The exchange rate on 26 January 2004 was DEM1 (obsolete) = $NZ0.9576.
[35] These are offences such as transferring an ELV to an unauthorised person or plant, failing to present proof of transfer, issuing a recycling certificate without being authorised to do so, etc.

passed on to the ELV owner. When free take-back by the automotive industry is enforced (in 2007), disposal costs could be passed on to new car buyers, however, these costs are negligible when compared with the total cost of production, so are unlikely to noticeably affect the price of a new vehicle ([Germany] Ordinance on used motor vehicles 1997).[36]

Much has been achieved through voluntary action by the VDA and ARGE-Altauto. The automobile industry had made product design optimised for recycling a priority, investing considerable time and money in this direction. This has been done through the development of new components and the construction of disassembly plants in which technologies were developed to improve the profitability of recycling.[37] An extensive infrastructure for acceptance and recycling was in place with the German automobile manufacturers holding individual contracts with the collection centres, car dismantlers, recyclers, and some of the large steel companies. Approximately 15,000 authorised collection centres are available nationwide, so that an ELV owner has on average, at most three kilometres to travel to dispose of the vehicle and obtain a Certificate of Destruction. Members of the public are kept informed of the location of recycling companies and current recycling offers via the ARGE-Altauto web site (pers. comm. BMW Group 2001).

Car manufacturers are critical of some aspects of the EU Directive, stating that a few of its requirements will be difficult to implement. The Directive imposes a ban on the use of certain substances and materials without any suggested suitable alternatives. Furthermore there are inconsistencies in that some of these substances are permitted for use elsewhere (pers. comm. BMW Group 2001).[38] The Directive also dictates 95 percent recycling of vehicles by 2015, with incineration restricted to no more than 10 percent. Manufacturers already know that with these vehicles (which have already been designed and many are in use), the 95 percent target is not attainable by material recycling with the restriction on thermal transformation. This

[36] The estimated cost of disposal of an ELV is less than DEM200 ($NZ191.52), which is less than 0.5 percent of the cost of a new vehicle (pers. comm. BMW Group 2001).
[37] Detail of some of these developments was covered in Chapter Three, Section 3.4.
[38] One such substance is lead, for which there is no foreseeable alternative for wheel balancing, yet hunters used lead shot, much of which was left on the ground after firing. Cadmium is another substance to be banned in the auto industry, yet it is used in fertiliser (pers. comm. BMW Group 2001).

requirement is also in conflict with the obligation they have to build lightweight vehicles and improve fuel efficiency. Manufacturers maintain that the industry will need free choice on the method of recovery in order to meet the 95 percent target (*ibid.*).

Institutional practices in Germany are rigorously enforced. Registered vehicles are required to display licence plates on which are fixed two round stickers, along with the licence plate number. One of these stickers verifies that the vehicle has passed an annual check for road-worthiness, while the other sticker indicates that the vehicle is licensed and current associated taxes have been paid. These stickers are displayed on the number plate to make them visible to the police, so that enforcement is made easier. Failure to display the current registration sticker results in a substantial fine (pers. comm. BMU 2001; pers. comm. BMW Group 2001).[39] In the event of the change of ownership of a vehicle new licence plates are issued so that a registered vehicle can be traced to the current owner.[40] If a vehicle is to be temporarily removed from the roads a declaration of intention has to be submitted to the registration office immediately. This is to facilitate examination of the vehicle to ensure it is being stored without risk to the environment. License plates must be taken in to have the registration sticker removed before exemption from licensing is granted. No further action is required if the vehicle is reregistered within 18 months, however if this does not occur the vehicle is automatically deregistered. The owner of a vehicle who wishes to permanently deregister it is required to transfer the vehicle to a certified dismantling or recycling facility or, an authorised collection centre.[41] Depending on the make, age, and condition of the vehicle, the last owner either receives or makes payment on transfer of the vehicle. The owner then receives a Certificate of Destruction which is presented in order to have the vehicle permanently deregistered. Abandoning a vehicle incurs a substantial fine (pers. comm. BMU 2001).[42]

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[39] If unpaid, enforcement was ensured through a debt collection agency (pers. comm. BMU 2001).
[40] A licence plate and the associated number remain with a vehicle owner, not with the vehicle (pers. comm. BMW Group 2001).
[41] A collection point can be an authorised car dealer or a repair shop, but these have to be licensed, and are only permitted to issue a Certificate of Destruction on behalf of an authorised dismantling facility.
[42] A Certificate of Destruction is also required for an ELV (or scrap chassis) which is being exported for recovery. The certificate had to be issued by the treatment facility abroad that is receiving the

To summarise, the laws in Germany relating to motor vehicle ownership and disposal are clear, penalties sufficient to deter illegal behaviour, and enforcement is carried out. The approach to the recycling and disposal of ELVs is one of co-operation and shared responsibility, with the intention of ensuring market-driven, low-cost recycling and environmentally responsible disposal of post-use vehicles. ELVs are not permitted to remain indefinitely on private property but must be disposed of through the recycling system. Automobile dismantlers are required to execute depollution of a vehicle in a way that does not harm the environment, and then dismantle and recycle parts and materials before transferring the stripped hulk to an authorised shredding plant. The shredding operation must be environmentally compliant and aim to reduce the overall quantity of ASR. It is the function of the state to create effective instruments, set appropriate standards and put in place mechanisms that ensure compliance of these standards by all parties (ARGE-Altauto 2000). The use of independent auditors in the monitoring process, however, removed the burden from public enforcement agencies. In addition, with a vast network of industry-supplied ELV collection centres, the provision of public collection and handling sites is avoided. ELV disposal costs are therefore largely internalised with minimal burden falling on Federal, Länder or municipal authorities (pers. comm. BMU 2001).

7.4 Sweden[43]

In comparison with those in other EU countries, the Swedish car fleet is relatively old. In 1999 55 percent of the vehicles were at least ten years old, and the estimated probable average age of a scrapped passenger car was around seventeen years. In 1998 the number of ELVs for Sweden's population of 8.9 million was believed to be approximately 164,000, and of these an estimated 143,600 were scrapped (Zoboli *et al.* 2000).[44]

ELV. This facility (and the subsequent shredding operation) has to be recognised by an approved auditor

[43] To gather information concerning practices in Sweden, interviews were conducted via e-mail with the Head of Section for the Ministry for the Environment. also the Head of Section for the Swedish Environmental Protection Agency, a representative from the foundation Håll Sveridge Rent (HSR), and the Naturvårdsverkets branschexpert för bilskrotning. The relevant legislation was provided by the Swedish Environmental Protection Agency.

[44] The calculation for the total number of ELVs used the number of new registrations minus the net increase in the car stock (Zoboli *et al.* 2000).

Sweden was a pioneer in the use of economic instruments in its management of ELVs. In response to the large number of ELVs being abandoned in Sweden the Government introduced the Motor Vehicle Scrapping Act (1975:343) in July 1975. For every light motor vehicle registered on the Road Traffic Register a disposal charge was required, and beginning a year later the owner of every vehicle brought in for recycling received a premium (refund).[45]

The Swedish car manufacturer (or importer) must pay the disposal charge within one month of the vehicle being entered on the Motor Vehicle Register. For vehicles not procured through either a registered manufacturer (or importer), the vehicle owner is liable for the disposal charge. This is also the case for vehicles that have undergone modification or, have been removed from the register for a time and then reregistered ([Sweden] Motor Vehicle Scrapping Amendment Act 2001:561). The vehicle disposal charges set by the National Road Administration go into a state-regulated Vehicle Disposal Fund. The refund paid to the ELV owner has first right to the Fund ([Sweden] Motor Vehicle Scrapping Amendment Act 1986:228). Following this, the Disposal Fund provides grants to local authorities for the disposal of abandoned vehicles and any related environmental clean-up.[46] Grants appraised by the EPA are also made for materials recovery operations from these vehicles. In effect the disposal charge also provides some subsidy to improve the level of recycling beyond that which is commercially viable. There have been a number of changes to the values of both the refund and the disposal charge since the scheme's inception. The refunds and charges are given in Table 7.1.

[45] This has sometimes been labelled a deposit-refund scheme (Opschoor and Vos 1989), but to do so requires qualification. With Sweden's scheme most often the recipient of the refund is not the person who paid the disposal charge, and the refund is not necessarily the same value as the charge. More importantly, up until 2001 the ELV owner had to pay from the refund received, any payment (where the reuse value was negative) required by the dismantler accepting the ELV. Most often therefore, it was a partial refund only and in some years payment to the dismantler was greater than the refund received. From July 2001 the ELV owner has received the full refund. In addition, the disposal charge funds more than just the refund, as it is also used to subsidise some recycling and fund disposal of abandoned vehicles.

[46] These grants are appraised by the local administrative board, and are payable only if the approved costs are at least SEK25,000 ($NZ5122.55) (excluding related administrative costs for the local authority). In addition the grant must not to exceed 90 percent of that cost ([Sweden] Motor Vehicle Scrapping Amendment Ordinance 1989:775; [Sweden] Motor Vehicle Scrapping Act 1975:343).

Table 7.1: Sweden's Refund and Disposal Charge Since Inception in 1975

Date taken effect	Refund (SEK)	Disposal charge (SEK)
1 July 1975		250
1 July 1976	300	
1 April 1988	500	
1 July 1988		300
1 January 1992	500/1,500[a]	850
1 November 1993		1,300
1 January 1998	500	700
1 July 2001	700/1,200/1,700[b]	700/1,500[c]

[a] The higher level of refund was for cars approved at the annual vehicle inspection within a specified number of months prior to scrapping.
[b] The refund is set at SEK700 for all vehicles covered by producer responsibility. For all other vehicles, the refund received is dependent on the age of the vehicle:
SEK700 for vehicles at most seven years old at the time of deregistration.
SEK1,200 for vehicles more than seven years old, and at most sixteen years old.
SEK1,700 for vehicles that are more than sixteen years old ([Sweden] Motor Vehicle Scrapping Amendment Ordinance 2001:371).
The age of the vehicle on deregistration is determined from the date on which it was first taken into service, unless this was prior to 1996, in which case it is determined by the model year.
[c] For cars covered by producer responsibility, the disposal charge was SEK700. For privately imported vehicles, however, the charge was SEK1,500.

Note: The exchange rate on 26 January 2004 was SEK1 = $NZ0.204902

Source: BIL Sweden (1998) quoted in Zoboli *et al*. 2000.
BIL Sweden 2002

The increase in the refund to ELV owners since its inception in 1976 is shown in Table 7.1. It would be helpful to have the changes in the refund and disposal charge over the years in real prices. Using the Consumer Price Index (CPI) from Statistics Sweden (2004) the refund and disposal charges have been recalculated in real prices and these are shown in Table 7.2.

Table 7.2: Sweden's Refund and Disposal Charge in Real Prices

Date taken effect	Refund (real prices) [a] (SEK)	Disposal charge (real prices) (SEK)
1 July 1975		28.18
1 July 1976	30.64	
1 April 1988	19.36	
1 July 1988		11.62
1 January 1992	14.73	25.04
1 November 1993		36.59
1 January 1998	13.99	19.59
1 July 2001	17.94	17.94

[a] In the calculations the annual average CPIs were used. The base year is 1914.

Source of CPIs: Statistics Sweden 2004

It is evident from Table 7.2 that the relative value of the refund fell by a large margin. The refund remained at its initial value until April 1988, so that by 1987 the real value of the refund had fallen 60 percent. Even after the first increase in 1988

the real value of the refund was 36.8 percent lower than its initial value. The refund remained at SEK500 ($NZ102.45) in January 1998, less than half (54.3 percent lower) the real value of the 1976 refund. There must have been some acknowledgement of the erosion of the value of the refund, when in July 2001 the refund was increased by 40 percent (in nominal terms) from SEK500 to SEK700 ($NZ143.43) even though the CPI only rose 3.9 percent from 1998 to 2001. The refund set in 2001, however, in real prices, was still 41.5 percent lower than the initial value of the refund to ELV owners. This erosion of the real value of the refund could have contributed to the continuing abandoned vehicle problem.

Another key point in the reporting is that while owners were paid a refund from the Vehicle Disposal Fund for handing in an ELV for recycling, dismantlers charged owners a fee to receive ELVs of negative value. Therefore, as long as the refund received was greater than the payment required by dismantlers there was an incentive to hand in the ELV for recycling. While scrap steel prices were high, the automobile recycling industry subsidised the cost of depollution. By the late 1990s, however, with the fall in value of scrap metal ELV owners were now required to pay for the depollution of the vehicle. As shown in Table 7.1 the refund was a uniform rate of SEK500 ($NZ102.45) from the beginning of 1998 until mid 2001, but during this time the cost for scrapping the ELV (the cost of depollution) became greater than the refund, which meant that the ELV owners had to pay the shortfall themselves. The result was an increase in the number of vehicles being abandoned (pers. comm. [Sweden] Ministry for the Environment 2002). To address this issue the Government decided that ELV owners should receive the full value of the refund and it should cost them nothing to scrap their vehicles. To this end the Government introduced the [Sweden] Ordinance on Producer Responsibility for Vehicles (1997:788), which took effect from the beginning of 1998. Producer responsibility required Swedish car manufacturers and importers to accept free-of-charge vehicles manufactured or imported into Sweden from 1998 onwards, and meet the scrapping costs of those vehicles.[47] With producer responsibility in place the ELV owner no longer had to pay the dismantler to receive the vehicle, and so could retain all of the

[47] There is likely to be a change to this policy so that from 2007 producers will also become liable for half the scrapping costs of cars manufactured or imported into Sweden prior to 1998, with the other half of the cost being met by the state fund (BIL Sweden 2002).

refund which was set at SEK700 ($NZ143.43) from July 2001.[48] As stated above, not all ELVs were covered by producer responsibility, for these vehicles the refund was set at three levels, dependent on the estimated cost of scrapping (pers. comm. [Sweden] Ministry for the Environment 2002).[49]

In Tables 7.1 and 7.2 information is also provided on the fluctuations in the nominal and real values of the disposal charge since its introduction in 1975. The disposal charge was not increased until July 1988, so that by 1987 the real value of the charge had fallen 63.6 percent, and at the first increase the new real price was still 58.8 percent lower than the original real charge. It could have been that as with the disposal charge in the Netherlands there was the opportunity to reduce the charge as the money in the fund increased. It seems unlikely that this was the case, however, as the disposal charge was increased to SEK850 in January 1992 which was closer to the real value of the original charge (although it was still 11.2 percent lower in real terms). The increase to SEK1,300 ($NZ266.37) in 1993 increased its real value, up 29.8 percent on the 1975 disposal charge, and by 2001 it had been lowered again to SEK700 where its real value was half that of its 1993 value.

The introduction of a differentiation in the disposal charge came in response to the changes brought about by the [Sweden] Ordinance on Producer Responsibility for Vehicles (1997:788). A distinction was required between the disposal charge paid by manufacturers and importers faced with producer responsibility and the disposal charge paid by a vehicle owner (often a private importer) who was not bound by producer responsibility. From July 2001 registered manufacturers and importers therefore have only to pay into the fund the value of the refund SEK700 ($NZ266.37), as they are now covering the disposal of the vehicle through producer responsibility. For privately imported vehicles not covered by producer responsibility, the vehicle owner is required to pay a disposal charge that covers the refund paid to the last registered vehicle owner, plus the cost of scrapping the vehicle, a total of SEK1,500 ($NZ307.35).

[48] Previously where there were taxes outstanding for the vehicle, these were deducted from the refund before it was paid to the ELV owner, however, this ruling was over-turned so that from July 2001 the ELV owner now receives the full refund (BIL Sweden 2002).
[49] This took into account the likelihood of the vehicle still having parts or components of value.

Since July 2001 when the refund for ELVs increased, the number of abandoned vehicles declined and the number of ELVs delivered for scrapping each month increased dramatically (BIL Sweden 2002; [Sweden] Environmental Protection Agency ([Sweden] EPA) 2002). An estimate is that for the year from July 2001 to July 2002, the number of scrapped cars could have been up to ten times greater than the number for the previous year (pers comm. [Sweden] Ministry for the Environment 2002). The planned rise in the value of the refund, however, was announced six months prior to the date of the increase, and as a result, a large number of ELV owners waited to hand in their vehicles for scrapping, so that the number of vehicles scrapped in 2001-2002 was abnormally high. In addition some people who had handed in their ELV for scrapping prior to the refund increase, hoarded their Certificates of Disposal until the refund had increased. It is estimated that this prior warning of the rise in the value of the refund cost the Vehicle Dismantling Fund at least SEK100 million ($NZ20.49 million) (pers. comm. [Sweden] Ministry for the Environment 2002; [Sweden] EPA 2002).

With the increase in the number of abandoned vehicles from 1998, another initiative was introduced in 2001 to address the problem, and it was implemented by the foundation Håll Sverige Rent, HSR ('Keep Sweden Tidy'). HSR has links to the EPA and works in cooperation with the local authority and an insurance company (FOLKSAM). Anyone who sees an illegally dumped vehicle can report it to HSR. HSR and the local authority complete the necessary paperwork to take control of the vehicle and hand it over to a dismantler for scrapping. This initiative is partially funded out of the Vehicle Disposal Fund and accounted for just over 10 percent of the Fund's expenditure in the first year of HSR's involvement with abandoned vehicles ([Sweden] EPA 2002). From its inception in May 2001 until September 2002 nearly 70,000 vehicles had been reported to HSR for collection (pers. comm. Håll Sverige Rent (HSR) 2002).

A further requirement of the [Sweden] Motor Vehicle Scrapping Act (1975:343) was that light motor vehicles are required to be commercially scrapped by an authorised motor vehicle dismantler. The ELV owner receives a Certificate of Disposal issued to them either by the authorised dismantler, a Swedish motor vehicle manufacturer

or, a vehicle importer.[50] Presentation of the Certificate of Disposal is required to have the vehicle removed from the Road Traffic Register, and to receive the refund ([Sweden] Motor Vehicle Scrapping Act 1975:343). Authority lies with the Government (which it has delegated to the National Road Administration) to set the regulations regarding the Certificate of Disposal, the level of the refund, and the conditions for its payment ([Sweden] Motor Vehicle Scrapping Amendment Act 2001: 145).[51]

In Sweden a motor vehicle dismantler is given authorisation by the administrative board of the local county, which must be renewed every five years. To gain authorisation the dismantling operation must comply with the relevant building and environmental regulations and must be able to guarantee the final disposal of ELVs into metal scrap ([Sweden] Motor Vehicle Scrapping Ordinance 1975:348).[52] Authorised motor vehicle dismantlers are required to accept any ELV delivered to them[53] informing the Government appointed Environmental Protection Agency (EPA) of the extent of the recovery and recycling of parts and materials from ELVs ([Sweden] Motor Vehicle Scrapping Amendment Act 2000:1436). The EPA has the authority to set regulations regarding the dismantling or handling of scrap vehicles ([Sweden] Motor Vehicle Scrapping Amendment Ordinance 1998:926).

Under the [Sweden] Ordinance on Producer Responsibility for Vehicles (1997:788) manufacturers and importers are required to provide a suitable network of sites for receiving their own ELVs. It is also the responsibility of the producer to provide information to the dismantler on the vehicle's components, materials, hazardous substances, and to provide instructions on the dismantling of parts and the drainage of fluids. All procedures must meet the environmental regulations.[54] A recycling

[50] Automobile manufacturers and importers have agreements with dismantlers and recyclers for the disposal of these ELVs so can accept them and pass them on to a dismantler.
[51] The National Road Administration is required to maintain an up-to-date list of those authorised to sign Certificates of Disposal, which is accessible to all county administrative boards.
[52] Zoboli *et al.* (2000) reported that the authorisation procedure was loose. Also, of the 700 registered dismantling centres, only 400 were in operation, and of those in operation only about 70 had the capability of complying with the regulations, though Zoboli *et al.* (2000) say that this could double as appropriate experience was gained.
[53] Prior to 2001 acceptance of an ELV was conditional on receipt of the required payment at the time of delivery.
[54] New environmental dismantling regulations were introduced in 2002, which have increased scrapping costs.

target of 85 percent of a vehicle (by weight) was set under the Ordinance for 2002, and this was achieved. All requirements are monitored and enforced by the EPA and fines imposed for those producers contravening the ordinance ([Sweden] Ordinance on Producer Responsibility for Vehicles 1997:788; Zoboli *et al.* 2000).

With regard to institutional practices in Sweden, vehicle owners pay an annual road tax for registered vehicles. Where a vehicle is to be temporarily removed from the roads the owner can apply for exemption from current licensing. The owner is able to do this electronically, by phone or, by letter and is required to remove the tax tag from the vehicle. A vehicle with an exemption from licensing cannot be used on the roads, and does not need to be insured for that period. A nominal annual fee of SEK35 ($NZ7.17) is required to ensure the vehicle remains on the register. If this fee is not paid the National Road Agency will permanently deregister the vehicle (pers comm. Bilskrotning 2002b). Temporary exemption from licensing has been open to abuse. Some owners apply for exemption from licensing and then never relicensed their vehicle. The nominal annual fee required to keep the vehicle on the register is so low that it has not warranted enforcement. The vehicle has then been permanently deregistered without a Certificate of Disposal and without knowledge of the vehicle's final destination. Roughly 700,000 of the four million vehicles on the register (17.5 percent) would be in this category (*ibid.*).

To transfer ownership of a vehicle requires both the seller and the buyer to sign dual notification on the same form and send it in to the National Road Agency. Only the original form is accepted, and without the signatures of both parties the change of ownership cannot take place (pers comm. Bilskrotning 2002a).

The Government's intervention in the management of ELV disposal in Sweden since 1975 has been reasonably successful. The ELV recycling rate increased (to between 81 and 85 percent), but more importantly a greater proportion of ELVs were directed into the recycling system. The number of vehicles being abandoned reduced, and where a vehicle was abandoned the local authority could apply to the Disposal Fund to have the disposal costs and environmental clean-up costs subsidised. The abandoned vehicle problem increased again between 1998 and 2001 as a consequence of the payment to the dismantler by the ELV owner exceeding the

value of the refund received by the owner. Although the mechanism was in place to avoid vehicles being abandoned, the Government was slow to react and increase the refund (Lindhqvist 2001).

In his analysis of the effectiveness and socio-economic consequences of extended producer responsibility for ELVs in Sweden, Lindhqvist (2001)[55] levelled criticism against Sweden's flat vehicle disposal charge for all motor vehicles, saying that it does not provide an incentive for innovation in the area of improved recyclability in automobile manufacture. He did, however, acknowledge the [Sweden] Ordinance on Producer Responsibility for Vehicles (1997:788) had gone some way in addressing this criticism. With manufacturers ultimately responsible for the disposal of their own vehicles, any innovation made to make dismantling easier and faster and to increase the quantity of components and materials that can be recycled, will be of direct benefit to them. A further criticism was that since the Government determines the levels of both the vehicle disposal charge and the refund, it cannot be assumed that the charges and refunds are set at an economically efficient level. Lindhqvist also questioned the need for the recycling industry to achieve an ELV recovery rate beyond that which can be attained profitably. With regard to continuous vehicle licensing Lindhqvist (2001) suggests that the provision for a temporary exemption from licensing should be abolished and vehicle owners pay the annual licence fee regardless of how often the vehicle is going to be on the road. He argues that this is no different from charging the same licence fee irrespective of whether the vehicle did 5,000 or 40,000 kilometres in the year.

7.5 United Kingdom[56]

In 1998 with a population of just under sixty million, there were 2.25 million new vehicle registrations in the United Kingdom, 16.1 percent of the total new vehicle

[55] Lindhqvist is at the international institute for industrial environmental economics (IIIEE) at Lund University, Sweden.

[56] In the United Kingdom interviews were conducted with the Head of the Environmental Division of the [United Kingdom] Department of Trade and Industry ([United Kingdom] DTI), the Technical Manager for Vehicle Recycling at the Society of Motor Manufacturers and Traders (SMMT), and Mike Wattam and Associates of the Automotive Consultants Group for SMMT, who was just completing an extensive investigation into the processes employed by key Member States of the EU to meet the EU Directive on ELVs. Interviewed via email was a representative from the Licensing, Roadworthiness and Insurance Division of the [United Kingdom] Department of Transport, Local Government and the Regions ([United Kingdom] DTLR) one of the authors of a consultation document on Abandoned Cars.

registrations for the EU15 that year (Zoboli *et al.* 2000). ELVs number approximately 1.8 million in the United Kingdom each year, with the average age of scrapped vehicles being twelve to thirteen years old ([United Kingdom] Select Committee on Trade and Industry 2001).[57]

The preferred approach to ELV management in the United Kingdom is that of shared responsibility with coordinated action by the respective industries. To this end the Automotive Consortium on Recycling and Disposal agreement (ACORD), a voluntary inter-sector agreement on the treatment of ELVs was signed in 1997.[58] The aim of ACORD was to organise a comprehensive ELV treatment infrastructure, develop appropriate recycling and disposal options, and reduce the quantity of ASR requiring landfilling.[59] Achievement was reliant both on market forces and on cooperation from the Government to require the dismantlers to be licensed and to set and enforce high environmental protection standards for the dismantling and recycling operations. The ACORD group was opposed to the possibility of an EU Directive as it was likely to be over-regulating and encourage the use of incentives which would create market distortions (Society of Motor Manufacturers and Traders (SMMT) 2000; pers. comm. Society of Motor Manufacturers and Traders (SMMT) 2001).

Three-quarters of the automobile manufacturers also operated a self-funded Consortium for Automotive Recycling (CARE), which was in support of ACORD. The focus for CARE was in creating and improving disposal technologies in mechanical recycling and energy recovery.[60] The ACORD agreement included a commitment to achieving an ELV recovery rate of 85 percent (by weight) by 2002 and 95 percent by 2015 using both recycling and energy recovery. CARE, with its research in technical and economic feasibility maintained that it was not possible in terms of markets and technological capabilities to achieve these targets with reuse

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[57] Between 11 and 17 percent of these are accident-damaged vehicles and as such are premature ELVs ([United Kingdom] Select Committee on Trade and Industry 2001).

[58] The agreement was between the automobile manufacturers and importers, material and component suppliers, dismantlers, and the recyclers.

[59] In the United Kingdom approximately 75 percent of ELVs have long been recovered or recycled through a well-established recycling and disposal infrastructure.

[60] Particular emphasis was improved separation and recovery for plastics, improved depollution and therefore increased hazardous fluid recovery, and to develop processes for glass, rubber and ASR recovery.

and recycling of components and materials only.[61] Therefore ACORD supported energy recovery in areas such as fuel electricity generation, blast furnaces and cement kilns, and promoted market forces in determining the choice between recycling and energy recovery (Zoboli *et al.* 2000).

In order to achieve ACORD's objectives automobile manufacturers were encouraged to improve the suitability of parts and materials for recycling,[62] while plastics and rubber industries were asked to develop new applications and markets for recycled products. Dismantlers were charged with removing more non-metallic materials in order to reduce the delivery of mixed materials to the shredders, and the shredding facilities were encouraged to find new economically feasible ways to recover energy. ELV owners were to deliver their vehicles to approved and certified dismantling sites at market prices and the Government was required to support the agreement and monitor the disposal agents to ensure an acceptable and uniform standard of environmental protection (SMMT 2000).

Since the ACORD agreement was signed the United Kingdom infrastructure for the recycling and disposal of ELVs has not performed well. The intention of the voluntary agreement was to demonstrate that environmentally sound practices for ELV recycling and disposal could be achieved and the ELV recycling rate increased, without the need for legislation. In fact, however, the ELV recovery rate actually fell from 76 percent to 74 percent over the first two years (pers. comm. [United Kingdom] Department of Trade and Industry ([United Kingdom] DTI) 2001; pers. comm. SMMT 2001). This fall was due primarily to adverse conditions in the market for parts and materials.[63] With the fall in global steel prices the value of the car hulk dropped so that dismantlers became reluctant to collect ELVs or even accept them free-of-charge. Also with high dismantling costs and low returns for materials, dismantlers preferred dealing in accident-damaged vehicles with higher-valued parts (pers. comm. [United Kingdom] DTI 2001). The recovery rate, however, was

[61] The first study carried out by CARE established that it was technically feasible to recover half the non-metal materials from an ELV (inclusive of energy recovery). Therefore adding this 15 percent to the metal recycled would make 88 percent a technically feasible recovery rate. (Zoboli *et al.* 2000).
[62] Manufacturers in the United Kingdom developed dismantling manuals for their vehicles, contributing this information to the International Dismantling Information System (SMMT 2002b).
[63] This was exacerbated by adverse exchange rate conditions.

estimated to have increased to 80 percent in 2000, primarily as a result of the increased recycling of batteries, glass and tyres (SMMT 2002a).[64]

With the approach of deadlines for the compliance of specific regulations set out in the EU Directive, United Kingdom stakeholders have had difficulty coming to an agreement on a number of issues. A complication in the market-driven automobile recycling industry has been the cost of depollution. The SMMT felt that its members should not have to cover the cost of depollution but that the dismantlers and shredders should carry the cost, as it is a direct cost to their industry. The SMMT thought it preferable for shredder companies to receive the entire negative-valued ELV so that they could receive higher revenue, as nonferrous metals are more profitable than the recycled steel, and that they should carry out the depollution (pers. comm. SMMT 2001). There are around thirty-seven shredders throughout the United Kingdom. More than 60 percent of the shredding capacity, however, is owned by two companies, and they did not want the shredding operations to be involved in the depollution of individual ELVs as they often did not have the room at their sites and many vehicles brought to them were already crushed ([United Kingdom] Select Committee on Trade and Industry 2001). Furthermore, the dismantlers and shredders saw that in Europe it was only a matter of time before producer responsibility would become mandatory, so they were waiting for producers to be required to cover depollution costs (pers. comm. SMMT 2001). As a consequence depollution of ELVs was seldom carried out. The British Metals Recycling Association said that less than 1 percent of ELVs that were shredded had undergone depollution. In addition, the United Kingdom lacked explicit legislation making depollution mandatory, it was only implicit in that shredders were not permitted to pollute rivers with oil ([United Kingdom] Select Committee on Trade and Industry 2001).

As of the 21st of April 2002, the EU Directive had to be transposed into national law by all Member States. By the end of 2001 practices in the UK fell far short of EU Directive requirements. ELVs were not undergoing depollution and the number of

[64] Where it was in competition with the free delivery of uncontaminated glass containers from household collections, the recycling of automotive glass was not economically viable (SMMT 2002b). Less than half of the tyres could be recovered with positive value, the rest were used in energy recovery or were land filled (Zoboli *et al.* 2000).

dismantlers operating in the United Kingdom was not known with accuracy. The [United Kingdom] Department of Trade and Industry ([United Kingdom] DTI) estimated that there were approximately 3,500 dismantlers of which around 1,500 were operating illegally, while the [United Kingdom] Department for Environment, Food and Rural Affairs ([United Kingdom] DEFRA) said it was closer to 3,000 dismantlers, of whom 700 to 800 were illegal operators.[65] An estimated 70 percent of ELVs were entering the recycling system via automotive dismantlers ([United Kingdom] Select Committee on Trade and Industry 2001). The stringent standards of the EU Directive on storage and treatment of ELVs implied that substantial upgrading costs would be required for those dismantling operations wishing to become authorised treatment facilities (ATFs). Many had not been prepared to make the investment without the assured knowledge that monitoring and enforcement was going to be implemented (*ibid.*).

With the EU Directive making mandatory the free take-back of vehicles from 2007 manufacturers have not come to an agreement on how to fund the disposal of the vehicles currently on the roads. One possibility is to divide the funding of their disposal according to current new vehicle market share. Those who have increased their market share in more recent years, however, do not want to pay for the disposal of other manufacturers' ELVs. The other alternative is for the manufacturer of the ELV to pay for its disposal. This could place a financial burden on manufacturers who previously enjoyed a large market share but for whom this is no longer the case. There is also the unanswered question of the funding of the disposal of 'orphan' cars and the treatment of imported cars (pers. comm. Mike Wattam and Associates 2001).[66]

In the United Kingdom the recycling rates set by the EU Directive have been questioned. Firstly, the cost to increase the recycling rate of ELVs to 85 percent and later 95 percent is unknown, and neither is it clear whether the net environmental

[65] The automobile dismantling and scrap metal recycling industries are regulated under the [United Kingdom] Scrap Metal Dealers Act 1964, the [United Kingdom] Environmental Protection Act 1990 (Part II) and the [United Kingdom] Waste Management Licensing Regulations 1994. The [United Kingdom] Environment Agency is responsible for monitoring and enforcement. DEFRA said that 1,500 small companies were operating under 'registered exemptions' ([United Kingdom] Select Committee on Trade and Industry 2001).

[66] These issues had not been resolved at the time of the writing of this thesis.

effect will be positive or negative. With the increasing quantity of plastics used in automobile manufacture in order to improve fuel efficiency and reduce carbon emissions, it is costly to separate and recycle the plastics, and recycling processes may impact negatively on the environment (pers. comm. SMMT 2001). Secondly, if the primary aim of the EU Directive is to reduce the overall quantity of waste to landfills, the question has to be asked, why was ELV waste being targeted? Waste from ELVs represented less than 0.5 percent of the United Kingdom's total waste stream in 2000, and if the ELV recycling rate was increased from 75 percent to 85 percent this would mean a reduction in the amount of ELV waste by 40 percent, but the total waste stream would be reduced by only 0.2 percent. This left stakeholders wondering why other waste streams had not been specifically targeted in preference to ELV waste. Furthermore, the [United Kingdom] DTI and other groups in the planning process felt that the 85 percent target was not an environmental measure but a single market measure that had been set principally because it had been proven achievable, rather than it having been decided by economic analysis that 85 percent was the optimal level for ELV recycling (pers. comm. [United Kingdom] DTI 2001). By December 2002 the United Kingdom was not in compliance with the EU Directive in terms of recycling and disposal processes and procedures, and the level of recycling of ELVs was well short of the 85 percent required recycling rate.

Attention is turned now to the institutional practices regarding vehicle ownership and disposal and the magnitude of the abandoned vehicle problem in the United Kingdom. Under the [United Kingdom] Vehicle Excise and Registration Act (1994), it is a requirement that for every powered vehicle on the road, the Vehicle Excise Duty (VED) has been paid and the vehicle displays a current licence. A vehicle is licensed for a six or twelve month period and is issued with a 'tax disc,' which is displayed on the inside of the windscreen. Prior to licensing, the vehicle must have a Certificate of Insurance and have passed a vehicle inspection test, therefore, display of the tax disc is evidence that the vehicle is insured and is deemed roadworthy at the time the licence was obtained (pers. comm. [United Kingdom] Department for Transport, Local Government and the Regions ([United Kingdom] DTLR) 2001). In the United Kingdom it is permissible to let a current vehicle license lapse if the vehicle is to be kept off the roads, however, there is a requirement to sign a Statutory Off-Road Notification (SORN) that has to be renewed annually. The [United

Kingdom] Department for Transport, Local Government and the Regions ([United Kingdom] DTLR) say that ignorance of SORN requirements means that the system has not been adhered to ([United Kingdom] Department for Transport, Local Government and the Regions and the Department for Environment, Food and Rural Affairs ([United Kingdom] DTLR and DEFRA) 2001). Well over one million vehicles did not have a current licence in mid-2001. There is a maximum fine of £1,000 ($NZ2,717.33)[67] for a vehicle without a current licence, but in reality this is seldom followed up and if it is, the fine is usually around £40 ($NZ108.69), which is an insufficient deterrent to having an unlicensed vehicle (pers. comm. [United Kingdom] DTI 2001).

Prior to 1997, the change of vehicle ownership document was a two-part registration document. Both the seller and the buyer had their own portion of the form to complete and send in to the [United Kingdom] Driver and Vehicle Licensing Agency ([United Kingdom] DVLA). When the seller's portion of the form was received the DVLA deleted this person's ownership of the vehicle. If the buyer did not complete his part of the form, the [United Kingdom] DVLA no longer had record of an owner for the vehicle.[68] In 1997 notification for the change of ownership was altered so that dual notification is now on the one form. The seller completes his/her own details, records the buyer's driver licence number on the form and also obtains his/her signature. The seller then sends the form in to the DVLA where the change of ownership details is recorded. The number of pre-1997 vehicle registration forms that are still used number in the millions, which means that change of ownership continues to take place without DVLA notification (pers. comm. [United Kingdom] DTI 2001). Theoretically dual notification on the change of vehicle ownership form, and the SORN system should have reduced the number of vehicles lost from the motor vehicle record. In 2001, however, there were an estimated two million vehicles for which the current owner was unknown ([United Kingdom] DTLR and DEFRA 2001).

[67] The exchange rate on 26 January 2004 was £1 = $NZ2.71733.

[68] There was less incentive for purchasers to send in their details to the DVLA because from that point on they were required to pay the vehicle tax (pers. comm. [United Kingdom] DTI 2001).

It was estimated that approximately 350,000 cars were abandoned in the United Kingdom in 2000, which was nearly 20 percent of the 1.8 million cars that were properly scrapped (pers. comm. [United Kingdom] DTLR 2001; pers. comm. [United Kingdom] DTI 2001).[69] The number of vehicles abandoned each year had shown a notable increase, with two suggested explanations for this. One was the collapse in the price of scrap metal,[70] which meant that where previously ELV owners had received payment for their vehicles, this was no longer the case, and if an ELV owner wanted a car dismantler to collect the vehicle, it cost up to £40 ($NZ108.69).[71] The second was the fall in value of used vehicles, while costs to keep them roadworthy had risen. Under the [United Kingdom] Refuse Disposal (Amenity) Act (1978), abandoning a vehicle is a criminal offence with a maximum penalty of £2,500 ($NZ6,793.33), and/or three months imprisonment. In addition, ELVs are classified as hazardous waste, which means that unlawful disposal carries a maximum fine of £20,000 ($NZ54,346.60) and/or six months imprisonment. Most of the vehicles removed from public land by local authorities, however, are unlicensed. In addition, many old vehicles have been bought and sold at very low prices and without documentation, leaving the [United Kingdom] DVLA records incomplete. Prosecutions are minimal because of the difficulty in tracing the person in current possession of the vehicle (pers. comm. [United Kingdom] DTI 2001; [United Kingdom] DTLR and DEFRA 2001).

In the United Kingdom abandoned vehicles are the responsibility of the local authorities. Prior to 2003 an abandoned vehicle could not be removed until an attempt had been made to notify the vehicle owner,[72] and the appropriate specified notice period had passed.[73] A vehicle that was of value could only be disposed of if the owner could not be located or, the owner failed to comply with the notices served

[69] The figure on the number of abandoned vehicles in the United Kingdom in 2000 was estimated from the collective reporting of local authorities.
[70] The price of scrap metal has fallen from approximately £35 ($NZ95.11) per tonne in 1998 to £10 ($NZ27.17) per tonne in 2001.
[71] Prior to 1998 an ELV owner was paid £20 to £30 by a dismantler for their vehicle (pers. comm. [United Kingdom] DTI 2001).
[72] This was done by attaching a notice to the vehicle or sending it to the address of the last known owner. Where a vehicle was a hazard or was causing danger to traffic, the police had authority to remove it to a pound or to a safer location on the highway.
[73] If the vehicle was abandoned on private land the notice period was fifteen days. If the vehicle was abandoned on a highway the notice period was seven days for a vehicle of no value, otherwise it was a twenty-one day notice period. Following removal it was supposed to be stored for a further thirty-five days.

and the licence had expired.[74] Approximately 40 percent of vehicles wheel-clamped for VED evasion were released within twenty-four hours (with the owner procuring a new licence and paying release fees). The remaining 60 percent were impounded, and of these only about 7 percent were released. Most of the remaining unclaimed vehicles went to the shredder, with a few sold at auction ([United Kingdom] DTLR and DEFRA 2001).

Recognising a need for changes to some of their laws and institutional practices, late in 2001 the [United Kingdom] DTLR put forward a number of proposals for change. The Department wished to allow local authorities to be able to deal with abandoned vehicles more quickly and efficiently. In January 2003 legislation was passed empowering local authorities to remove abandoned vehicles within 24 hours. Notification periods in most circumstances were also reduced to 24 hours and local authorities were given computer access to [United Kingdom] DVLA registered vehicle owner records (Edinburgh Evening News 27 December 2002). With regard to vehicle registration and ownership the [United Kingdom] DTLR wanted to enforce continuous registration for vehicles in the United Kingdom by introducing a stronger deterrent for VED evasion. In addition the [United Kingdom] DTLR wished to ensure that an owner retains fiscal responsibility for the vehicle until the owner had sent the complete change of ownership documentation to the [United Kingdom] DVLA.[75] Alternatively the owner could send proof of disposal of the vehicle in the form of a Certificate of Destruction. Failing these two alternatives the vehicle owner should be responsible for tax payments and any other charges or fines associated with that vehicle ([United Kingdom] DTLR and DEFRA 2001). To this end a [United Kingdom] Department for Transport Press Release 22 May 2003 informed the public that as of 2004 registered vehicle owners will be legally responsible for having their vehicle licensed at all times, until such time as the DVLA was notified that the vehicle has been sold, stolen, exported or, unless a current SORN has been declared. The Government proposed that as of 2004 vehicle owners, who failed to renew their vehicle licence by the due date faced an automatic

[74] There was evidence that once a notice had been attached to an unlicensed vehicle, it was relocated and abandoned again, utilising more resources from a different local authority and police office.
[75] The DTLR thought it necessary to tighten the control of the transfer of vehicles. One possibility was to follow the example of a number of European countries where it was necessary to formally register the transfer of a vehicle at a Government office or Post Office, along with proof of identity. Also under question was whether this could be done as successfully using web-based arrangements.

£80 ($NZ217.39) penalty, and that there would be no requirement for the vehicle to have been seen on a public road.[76] Furthermore, if the vehicle remained unlicensed the DVLA may prosecute and if found guilty, the vehicle owner would face a fine of at least £1,000 ($NZ2,717.33) or up to ten times the annual vehicle excise duty.[77] The aim is to keep vehicles on the vehicle registration system, reduce the number of unlicensed and often uninsured vehicles on the road, and limit the number of vehicles being abandoned.

To summarise, the United Kingdom, like Germany, prefers a market-driven approach to determine the level of automobile recycling undertaken. Stakeholders in the manufacturing and recycling industries and relevant Government departments see the need for more stringent environmental standards and a greater degree of monitoring and enforcement of the depollution of ELVs. Lack of enforcement of the display of a current motor vehicle licence, or the completed change of ownership of a vehicle, or fiscal responsibility for abandoned vehicles, has led to an incomplete motor vehicle register, a large number of vehicles that do not have a current licence, and a serious abandoned vehicle problem in the United Kingdom. The Government has recently begun implementing measures aimed at reducing these problems, and the effectiveness of these measures will be known with time.

7.6 Synopsis

A summary of the findings from the four countries studied is now presented. These include the policy instruments used in the management of ELVs, the level of automobile recycling achieved, and the institutional practices that impact on the number of vehicles being abandoned. Comments relating to policies and practices in the United States, Australia, Japan, and British Columbia, Canada will be included where they have something to contribute.

7.6.1 Policy instruments used in the management of ELVs

Economic and regulatory instruments used in the four case study countries are presented in Table 7.3, including the year each was introduced and the sector that administers the instrument.

[76] The value of this penalty was to be subject to public consultation later in 2003.
[77] At the time of writing, this proposal was unconfirmed.

Table 7.3: Policy Instruments Used in ELV Management in Case Study Countries

	Netherlands	Germany	Sweden	United Kingdom
Use of Economic Instruments (EIs):				
Product charge (explicit waste disposal fee)	✓ (1995)		✓ (1975)	
Refund to ELV owner			✓ (1976)[a]	
Subsidies for recycling	✓ (1995)		✓ (1976)	
Primary motivation for use of EIs:				
Reduce auto waste (pressure on landfills/ASR disposal costs high)	✓			
Reduce abandoned vehicles & environmental externalities			✓	
EIs administered by:				
Central Government			✓	
Independent organisation	✓			
Use of Regulatory Instruments (RIs):				
Extended producer responsibility	✓ (1995)	✓ (partial)	✓ (1998)[b]	
Free-of-charge disposal to end-user	✓ (1995)		✓ (1998)	
Auto dismantlers authorised and monitored	✓ (1995)	✓ (1998)	✓ (1975)	
Metal shredders authorised and monitored	✓ (2002)	✓ (1998)	✓	
Mandatory depollution	✓ (1995)	✓ (1998)	✓ (1975)	
Recycling quantity standards	✓ (1995)		✓	
RIs administered by:				
Local authorities			✓	
Independent organisation	✓			
Industry (auto and/or recycling)		✓		

[a] This refund needs qualifying, as the last owner was still required to pay for the vehicle's disposal (dependent on market forces) out of that refund, until June 2001 when it became a full refund.
[b] As of 1998, producers are responsible for take-back of vehicles manufactured or imported from 1998 onward.

As is shown in Table 7.3 both Sweden and the Netherlands have a mandatory product charge or waste disposal fee for light motor vehicles. This is paid by the car manufacturer or importer when the vehicle is entered on that country's motor vehicle register for the first time. In Sweden the disposal fee is set and administered by the Government, whereas in the Netherlands this is done by an independent organisation set up by the automobile industry (including manufacturers, importers and the recycling industry). The funds created by the collection of this fee serve a different purpose in the two countries. In the Netherlands it is used to directly subsidise the automobile recycling industry. The motivation for this action was to reduce the quantity of ASR requiring disposal in landfills. In Sweden the disposal fee is collected primarily to provide a refund to ELV owners delivering their vehicles to authorised treatment facilities, though some of the money is used to deal with abandoned vehicles and some is used to subsidise recycling. For Sweden the primary motivation for the use of economic instruments was to reduce the number of vehicles abandoned annually and the resulting environmental externalities.

Table 7.3 also presents the regulatory instruments used by the countries studied. Sweden and the Netherlands have both adopted the EPR approach to the disposal of their motor vehicles, with producers and importers providing free take-back of their ELVs. German manufacturers and importers have taken some responsibility by providing an extensive infrastructure for the acceptance of their ELVs for disposal. They will not, however, implement free take-back of ELVs until the EU Directive requires it in 2007.

In Germany, Sweden, and the Netherlands depollution of ELVs is mandatory and automobile dismantlers must have authorised treatment facilities subject to detailed requirements. In Germany independent auditors monitor the dismantling centres on an annual basis, paid for by the dismantlers. Authorisation and monitoring of dismantling facilities is carried out by ARN in the Netherlands, and by the administrative board of the local county in Sweden. Monitoring is stringent in Germany and the Netherlands, however, Zoboli *et al.* (2000) reported that in Sweden the authorisation procedure was loose and many facilities were not compliant with the regulations. In the United Kingdom, without enforced mandatory depollution of ELVs very little depollution of ELVs was undertaken.

The other regulatory instruments that have been adopted by the Netherlands and Sweden are the recycling quantity standards (see Table 7.3). Other EU Member States have until 2006 to meet the first recycling quantity standards set by the EU Directive. As shown in Table 7.3 the United Kingdom has preferred a market-driven unregulated approach to the management of motor vehicle disposal.

Japan has decided to follow Europe and use EPR in its management of ELVs.[78] From the beginning of 2005 Japanese automobile manufacturers and importers will be required to take-back and dispose of air bags and air conditioning units, either as direct take-back or by commissioning specialised facilities to do so on their behalf.[79] They will also be required to take-back or cover the cost of ASR disposal (Yamaguchi 2002; Ando, Steiner, Selinger, and Shin 2002). It will be mandatory for car dealers, automobile repair facilities, and companies collecting fluorocarbons and air bags to be registered, while dismantlers and shredders must be licensed. The first owner of a vehicle will bear the cost of recycling, contributing to a fund managed by a third-party organisation. Manufacturers and importers will claim costs for the disposal of air bags, air conditioning units, and ASR from the fund (Ando *et al.* 2002).

In the United States there is no legislation specific to ELVs, instead laws regarding solid and hazardous waste disposal have influenced ELV management. Under these laws landfill disposal of free liquids and lead-acid batteries is prohibited, which has led to the collection and recycling of these from ELVs (Staudinger and Keoleian 2001). The regulatory approach taken by the European Union with set recycling standards has put pressure on the United States; however it is unlikely to follow the European model. The United States is more likely to restrict landfill disposal of ASR, which will encourage research into the reduction of ASR and alternative means of its disposal (*ibid.*). Currently there are two particular areas of focus in the United States. The first is the uncontrolled release of mercury into the

[78] Japan retires approximately five million motor vehicles each year and has a market-driven ELV recycling industry (Kyosai and Glass 2000). In recent years, however, an increasing number of vehicles have been illegally dumped as vehicle owners have been required to pay dismantling facilities to take their ELVs (Yamaguchi 2002).

[79] The removal cost of gases from air conditioning units constitutes more than half of the total cost of depollution of a vehicle.

environment.[80] The second area of focus is the elimination of tyre stockpiling. The concern with tyre stockpiling is the relatively common occurrence of fire outbreak and the resulting air pollution (*ibid.*).

No legislation exists in Australia to make the depollution of ELVs mandatory. All states and territories, however, prohibit the disposal of hazardous substances to storm water, but this may create an incentive to leave the hazardous wastes in the ELV. Inadequate facilities and poor operating practices are likely to be resulting in ground, water, and air pollution from many automotive dismantling facilities (Environment Australia 2002).

In June 1999 Denmark adopted a deposit-refund approach to ELV management called the 'Scrap-car Package' to encourage the recycling of all ELVs. Under the Scrap-car Package every vehicle owner pays an annual environmental tax of DKK90 (€12.11 or $NZ22.68).[81] On delivery of the vehicle to a waste management operator the ELV owner receives reimbursement of an amount set by the Minister for Environment and Energy (Collins, Fanning, Crowe and Meaney 2002).

British Columbia put forward a proposal late in 2002 to take an extended product responsibility approach to the management of ELVs. The proposal was to implement an industry-operated stewardship programme for managing hazardous residuals (including ELVs) from the after-market automotive sectors in British Columbia ([British Columbia] Automotive Retailers Association 2002). It included the establishment of independent, non-profit associations or advisory boards from each sector to provide the structure and governance for the stewardship programme for that sector, and ensure commitment to the long-term funding of the programmes. Under the proposal the Automotive Recyclers Environmental Association (AREA) would govern the ELV stewardship programme, which was to be self-funding, following the pollution prevention hierarchy to encourage the best use of the residuals collected. Automotive recyclers would be required to adhere to a Code of Practice and undergo an annual inspection and certification by the AREA, paid for

[80] Mercury is a highly toxic, bio-accumulative, heavy metal which can be released into the environment at dismantling sites during the shredding operation, during the processing of ferrous scrap. and in ASR destined for the landfill.
[81] The exchange rate on 26 January 2004, DKK1 = €0.134556 and €1 = $NZ1.8728.

by the recyclers (*ibid.*).[82] The proposal was accepted and implementation of the stewardship programme is in its infancy. The inclusion of ELVs of negative value, however, was not accepted so that the programme includes only the estimated 40 percent of ELVs that have salvage value and are bought by dismantlers for parts. ELVs of negative value continue to go to scrap metal recyclers who do not face the same environmental laws and regulations.

7.6.2 Automobile recycling

Presented in this subsection is the summary of the countries approaches to automobile recycling and the recycling rates achieved by each. These are shown in Table 7.4.

Table 7.4: ELV Recycling in Case Study Countries

	Netherlands	Germany	Sweden	United Kingdom
Free market approach for recyclers		✓		✓
ELV recycling rate (by weight):				
71 – 75%				
76 – 80%				✓
81 – 85%		✓	✓	
86 – 90%	✓			

As shown in Table 7.4 both Germany and the United Kingdom adopt a free-market approach in their automobile recycling industries and achieve recycling rates of 81-85 percent, and 76-80 percent respectively. As previously stated the Netherlands uses a vehicle waste disposal fee to subsidise recycling activities not yet profitable, and as a result the Netherlands recycles at least 86 percent of an ELV (by weight). Sweden subsidises its automobile recycling industry to a lesser extent and achieves an ELV recycling rate of 81-85 percent.

ELV recycling in Australia and the US is market-driven and so involves all ferrous metals and most nonferrous metals (Environment Australia 2002; Staudinger and Keoleian 2001). Occasionally windscreens are used as replacements and with the exception of battery casings and some salvaged plastic bumpers, plastics are not recycled. Technical barriers to separation, quality concerns regarding recycled

[82] This has been undertaken in the City of Abbotsford since 2000 and has demonstrated a marked improvement in the environmental performance of the automobile recyclers.

plastics, and competition with virgin materials have provided strong economic deterrents to the recovery of plastics (Staudinger and Keoleian 2001; Energetics Incorporated 2001). In addition the Automobile Parts Recyclers Association of Australia suggests that the market for spare parts is decreasing, probably due to the preference for newer vehicles, the fall in cost-effectiveness of maintaining older vehicles, and the increase in warranty periods. To increase the level of ELV component reuse and materials recycling in the Australian automobile industry would therefore be too costly. Environment Australia (2002, 2:6) notes that the "effectiveness [of EPR for ELVs] in Europe has yet to be tested. It remains to be seen whether the approach will be sufficient to overcome the current failure of markets to produce higher levels of recycling."

Like the Netherlands, Japan has a high population density and as a result landfill capacity has become extremely limited (Kyosai and Glass 2000; Ando *et al.* 2002).[83] This pressure on waste disposal sites has resulted in the real disposal cost of ASR in Japan increasing by 89.9 percent between 1993 and 2001.[84] In response to the high cost of ASR disposal, Japan has developed technology to apply a thermal process to ASR to reduce the quantity of ASR requiring landfilling. Through the process the remaining ferrous and nonferrous metals are separated from the ASR for recycling, inert mineral material is separated and recycled for use as construction materials, and organic materials are transformed into energy and converted to electricity. With this technology instead of the 20 to 25 percent of a vehicle (by weight) becoming ASR to be disposed of in landfills, only 2.5 percent need be consigned to landfill, with a further ten percent being recycled (metals and inerts) and 12.5 percent goes to energy recovery (Ando *et al.* 2002).

[83] By 1999 existing landfills in Japan had an estimated combined remaining capacity of 2.6 years. Furthermore only twenty-six new landfill licences were issued in 1999 as compared with 136 new licences issued in 1998 (Ando *et al.* 2002).

[84] Until 1993 ASR disposal costs were steady on 13,000 ¥/ton but by 2001 they were at 25,000 ¥/ton. Using the CPIs for 1993 and 2001 (Statistics Japan 2004), the real disposal costs were 13,265 ¥/ton in 1993 and 25,176 ¥/ton in 2001. The main cause of the price increase was the prohibiting of ASR disposal at simple controlled landfill sites in 1996. Instead ASR disposal was only permitted at managed landfill sites, which have liquid interception facilities and treatment of waste water (Ando *et al.* 2002).

7.6.3 Legislative and institutional practices regarding vehicle licensing, disposal, and abandonment

The laws regarding motor vehicle ownership, licensing, and disposal and the effective implementation of those laws, influence the likelihood of an ELV being abandoned. Presented in Table 7.5 are the institutional practices in place that affect the number of vehicles being abandoned.

Table 7.5: Institutional Practices Impacting on Abandoned Vehicle Numbers

Institutional practices regarding vehicle licensing and disposal:	Netherlands	Germany	Sweden	United Kingdom
Licence fee – ownership tax	✓			
Licence fee – road usage tax		✓	✓	✓
CVL enforced	✓	✓		
Certificate of Disposal required	✓ (1995)	✓ (1998)	✓ (1975)	
Enforced penalty for abandoning a vehicle	✓	✓		

As shown in Table 7.5 Germany, Sweden, and the United Kingdom have a licence fee which is essentially a road usage tax which allows vehicles to be granted a temporary exemption from licensing when they are to be off the roads for a period of time. In contrast, annual motor vehicle licence fees in the Netherlands are for vehicle ownership rather than road usage. This means that there is no exemption from licensing for a vehicle that is temporarily off the road. In the Netherlands therefore, a vehicle must always have a current licence until a Certificate of Disposal is presented, and this is strictly enforced. CVL is also stringently enforced in Germany and although there is allowance for temporary exemption from licensing, it is permitted for a maximum period of eighteen months only, by which time the vehicle licence must be renewed or the vehicle handed in for scrapping and a Certificate of Disposal presented. Continuous vehicle licensing (with temporary exemption) is in place in Sweden and the United Kingdom but it is inadequately enforced, so that there are many vehicles on the roads that do not hold a current licence. As shown in Table 7.5 a Certificate of Disposal (or Destruction) is required in Sweden, Germany, and the Netherlands when deregistering a vehicle. In each of these countries the incentive to comply is the same, to no longer have to pay the tax associated with vehicle licensing and to be absolved from any further responsibility for that vehicle. This is strictly enforced in both Germany and the Netherlands, but

not in Sweden. In Sweden, however, there is the additional incentive in the form of a refund.

The other issue presented in Table 7.5 relates to abandoned vehicles. Abandoning a vehicle is a strictly enforced offence in Germany and the Netherlands. This is made possible with vehicle ownership more easily traced as CVL is enforced, and fiscal responsibility is required until a Certificate of Disposal is presented. Therefore abandoned vehicles are not a serious problem in these two countries. In the United Kingdom and Sweden, without adequate enforcement of CVL, change of vehicle ownership, and disposal for recycling, abandoned vehicles are a problem. This is why Sweden offers a financial incentive to ELV owners to bring their vehicle in for recycling and why the United Kingdom has begun implementing changes to their laws and the enforcement of them.

Currently in Australia there are no legislative or regulatory requirements on the owner of an ELV to place the vehicle into the recycling system, neither are there any formal requirements for that owner to officially deregister the vehicle. The owner either cancels the registration or allows the registration to lapse. There is, however, strong stakeholder support for "some form of national vehicle deregistration process" (Environment Australia 2002, 10:53).

In the United States it is becoming increasingly popular to donate old, unwanted vehicles to a charitable organisation in order to receive a tax deduction equal to the market value of the vehicle.[85] Many of these vehicles are ELVs and the receiving organisation usually provides a free tow-away service. The National Kidney Foundation is one such charitable organisation which began its Kidney Cars program in 1992. In the 2000 fiscal year the organisation received 72,000 vehicles donated from across the United States. These vehicles had a collective value of $US 17.7 million (MSN Carpoint n.d.). It has to be assumed that these are vehicles with a positive market value as there would be no incentive to receive a negative tax deduction. Therefore this practice offers no solution to dealing with ELVs of negative value.

[85] Many donated vehicles are then sold at auction (which would indicate that these vehicles are not ELVs of negative value).

An Abandoned Vehicle Recovery Program has been operating in Kentucky since 1973 and by 2000 had been responsible for the removal of more than 40,000 ELVs for recycling. The programme operates at the county level and the sale of the abandoned vehicles for scrap metal raises funds for sponsors. The sponsor is a civic group or school and they are responsible for locating abandoned vehicles, gaining signed liability release from the owner and temporarily storing the vehicle.[86] The Division of Waste Management who organises the programme provides release forms and assistance, supervises the retrieval operation, and notifies the scrap dealer. The sponsor receives 70 percent of the proceeds, with the remainder being used to run the programme (Kentucky Abandoned Vehicle Recovery Program 2000).

The findings of the investigation into the approach taken to ELV recycling and disposal in the Netherlands, Germany, Sweden, and the United Kingdom have been presented in detail in this chapter. The focus has been on the policy instruments used, the level of recycling achieved, the extent of the abandoned vehicle problem, and the institutional practices which influence the magnitude of that problem. In the concluding section a number of countries (other than the case study countries) were mentioned where they had taken a unique approach to some aspect of ELV management. Consideration of a variety of policy options for the management of ELVs in New Zealand will be discussed in the following chapter.

[86] Many of these vehicles are lying unused on private property.

Chapter Eight

Discussion

". . . yes, without sustained attention garbage problems can certainly get out of hand. But once reasonable policies are in place, the task of disposing of garbage should be neither Herculean nor hideously complex."

Rathje and Murphy (1992, 245)

8.1 Introduction

The extent of the externalities arising from the current management of ELVs in New Zealand has been ascertained, including an estimate of the number of vehicles abandoned each year. In addition, factors that contribute to the existence of these externalities have been identified. The findings of Chapter Seven indicate that New Zealand is not alone in grappling with externality issues relating to motor vehicle disposal. It is time in this chapter to discuss the policy options and institutional practices used overseas to encourage ELVs into the recycling system, discourage the dumping of ELVs, and improve the quality and quantity of automobile recycling practices. Of particular importance in this discussion is the measure of success of these policy options for ELV management, and the likelihood of their acceptance in the New Zealand regulatory climate.

Before the discussion gets underway a recap of the externalities arising from the recycling and disposal of New Zealand's ELVs is presented in Section 8.2. Included in this section are the factors that contribute to the existence of these externalities. Possible changes to institutional practices are considered in Section 8.3, and policy options regarding ELV access into the recycling system are discussed in Section 8.4. Relevant policy aimed at improving both the incidence of the depollution of ELVs, and the handling and disposal of hazardous substances at dismantling operations, is presented in Section 8.5. The level of automobile recycling and the disposal of automobile shredder residual (ASR) are discussed in Section 8.6, and Section 8.7 provides a brief discussion on the merit of intervention in the number of vehicles coming into the country. Recommendations arising from this discussion will be forthcoming in Chapter Nine.

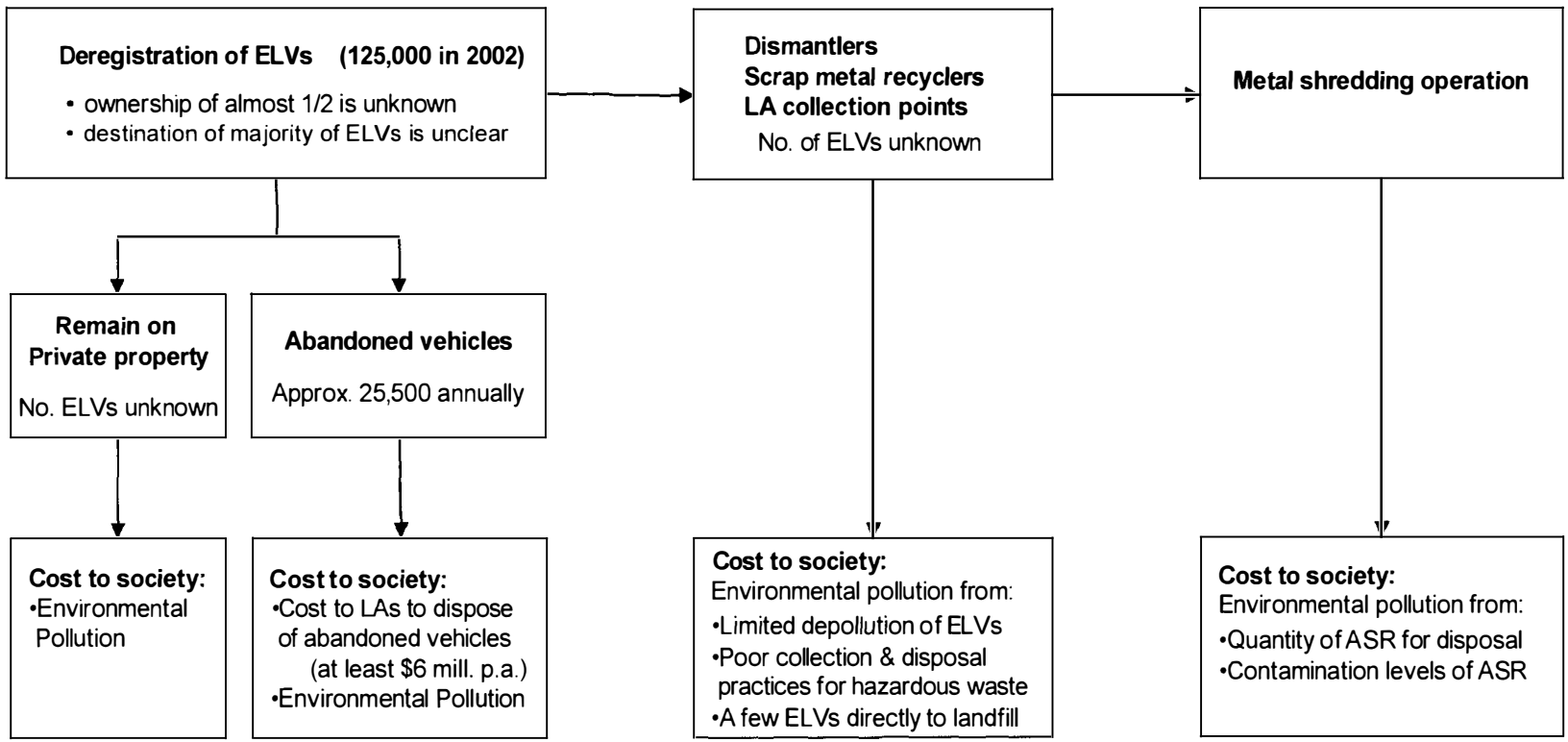
8.2 Externalities Arising from the Management of ELVs in New Zealand

This section is separated into two subsections. The first outlines the externalities resulting from the current ELV disposal practices in New Zealand. The second presents the main factors that contribute to the externalities.

8.2.1 Externalities arising from the management of ELVs

An overview of the sources of externalities from ELV disposal in New Zealand is presented in Figure 8.1.

Figure 8.1: Externalities Arising From the Current Management of ELVs in New Zealand



These externalities are unable to be quantified due to the lack of available data. As shown in Figure 8.1, once an ELV has been deregistered the owner has three options. S/he can choose to keep the ELV on private property, abandon it or, dispose of the vehicle through the recycling system, and each of these options has environmental consequences. An unknown proportion of vehicles remain indefinitely on private property, some contributing to environmental pollution through the leaking of hazardous fluids and gases into the surrounding environment, through visual pollution, and by providing a habitat for vermin.

An estimated 25,500 vehicles nationwide are abandoned each year (see Figure 8.1). This represents around 20 percent of the number of light motor vehicles whose registration is cancelled annually.[1] Under the law abandoned vehicles are primarily the responsibility of local authorities, which place a conservative annual estimate of $6 million on the collective cost to remove, store, and dispose of these vehicles. Many vehicles are abandoned in rugged terrain, however, where they remain, as it is too costly to retrieve them. Although the majority of abandoned vehicles eventually end up in the recycling system, before they do they have caused environmental degradation and imposed a cost on society far in excess of the direct cost estimated by local authorities.

The alternative destination for ELVs is to go directly into the recycling system via dismantlers, scrap metal recyclers or local authority collection sites. As indicated in Figure 8.1 externalities also occur in the automobile recycling operation itself. There is no record of the number of vehicles passing through car dismantling facilities nationwide and there is little organisation within the industry. Individual operators are not legally required to hold an operating licence specific to vehicle dismantling or, belong to an association. With regard to the removal and disposal of hazardous fluids, gases, and components from vehicles, practices and standards are variable. Depollution is undertaken, but without adequate monitoring and enforcement, it is not carried out on all ELVs. As a result hazardous substances enter the environment with the effect of both an environmental burden, and also a financial burden in terms of the eventual cost of clean-up and the cost of replacing substances and materials

[1] These vehicles, however, have not necessarily been deregistered in the year that they are abandoned.

that could otherwise have been reused. The final source of externalities arising from ELV disposal is from ASR itself. ASR contains the traces of hazardous substances remaining in ELVs. The quantity of ASR for landfilling and the level of depollution undertaken prior to shredding affect the extent of the environmental contamination from ASR.

8.2.2 Factors that contribute to the externalities

There are two main factors which influence the choice made by ELV owners regarding the options available to them for the disposal of their vehicles. The first relates to institutional practices regarding vehicle deregistration and disposal. The second concerns the cost and ease of access of an ELV into the recycling system.

At the point of vehicle deregistration in New Zealand, the ownership of almost half of the vehicles is uncertain and the destination of all deregistered vehicles is unclear (see Figure 8.1). Forty-six percent of the 125,000 light motor vehicles whose registration was cancelled in 2002 had not been deregistered by their owners, but instead had 'lapsed' registration status, indicating that registration had been cancelled by the Registrar.[2] For such vehicles it is at least twelve months since the licence expired and ownership was verified, so that the last registered owner may no longer be the current owner of the vehicle. This means that the whereabouts and ownership of such vehicles is uncertain, making difficult the enforcement of fiscal responsibility regarding abandoning a vehicle. For the 54 percent of registration cancellations that were carried out by the owner of the vehicle, no proof of the destination of the vehicle is required so that the annual number of ELVs being recycled in New Zealand is unknown.

There is no standard practice regarding the charge for the acceptance of an ELV of negative value into the recycling system. Dismantlers and scrap metal dealers often charge a fee to accept an ELV of negative value, however, sometimes they are accepted free-of-charge. So it is with local authorities, some collection sites accept ELVs free-of-charge while others do not. Fifty-two of the seventy-three local authorities on the New Zealand mainland provide a collection site and storage for

[2] This figure was 49 percent for the 134,000 vehicle cancellations in 2001.

ELVs destined for recycling. Of interest in this discussion is the response of local authorities toward the depollution of ELVs. Thirty-five local authorities charge a fee for the acceptance of ELVs which have already undergone depollution. Information is provided in Table 8.1 regarding the cost to leave a vehicle that has not undergone depollution, at the collection sites of the forty-seven local authorities that responded to that question.

Table 8.1: Local Authority (LA) Levies for ELVs at Collection Site in 2002

Levy for a vehicle that has not undergone depollution [a]	No. of LAs
Free-of-charge	6
Levy, less than the cost of depollution	6
Levy, equal to the cost of depollution [b]	17
Levy, more than the cost of depollution	14
Not accepted at collection site	4

[a] Council levies at October 2002.
[b] The estimated average cost of depollution is $40 for a vehicle with air-conditioning and $17.50 for one without (2002/2003 prices, inclusive of GST). For this table the cost of depollution has been taken as between $17.50 and $40 (more often the levy was at the lower end of this range, which is expected as a greater proportion of current ELVs will not yet have air-conditioning).

As shown in Table 8.1, six local authorities accept free-of-charge vehicles that have not undergone depollution, and these local authorities do not have large numbers of abandoned vehicles to deal with.[3] Four local authority collection sites do not accept vehicles which have not undergone depollution and fourteen others charge a fee that is greater than the cost of depollution. For vehicles that have not undergone depollution, seventeen collection sites charge a fee within the range of the cost of depollution ($17.50 to $40) and six charge a fee that is less than the cost of depollution.

Twelve local authorities (nearly one-quarter of those responding on this issue) subsidise the depollution of ELVs.[4] This cost is borne by ratepayers. The fourteen local authorities that charge more than the cost of depollution are using ELV disposal to collect revenue (assuming that the cost of storage is negligible).[5] A total of sixty-one local authorities either do not have a collection site for ELVs, do not accept those ELVs which have not undergone depollution or, charge a disposal fee to

[3] It is difficult to make a direct comparison of the number of abandoned vehicles in areas where unstripped ELVs are charged a levy, as compared with areas where there is no charge, as the demographics of the cities and districts vary widely.
[4] The six local authorities accepting ELVs free-of-charge and the six which charge a fee that is less than the minimum cost of depollution.
[5] This is possibly done to offset some of the cost to the council incurred by abandoned vehicles.

do so, and while this is the case New Zealand continues to have a problem with abandoned vehicles.

In order to reduce the environmental externalities, and hence the cost to society from ELV disposal, steps can be taken to 1) reduce the number of ELVs being abandoned, 2) encourage a greater number of ELVs into the recycling system, 3) ensure depollution is undertaken on each ELV entering the recycling system, and 4) encourage best practice among dismantlers in handling and disposing of hazardous substances. In considering policies for recommendation, the acceptance of the policy is likely to be constrained by New Zealand's regulative tradition and the past effectiveness of similar policies (Opschoor and Vos 1989). It is also likely to be influenced by the legal administrative structures currently in place and the level of resources available for implementation of the policies (Smith and Vos 1997). Such considerations will shape the recommendations that will be made aiming to reduce the environmental impact of ELV disposal in New Zealand.

8.3 Discussion of Institutional Practices

With regard to abandoned vehicles, local authority officers say that for a vehicle with traceable identification often the last registered owner of the vehicle denies being the vehicle's current owner. Most often abandoned vehicles have 'lapsed' registration status so that the information on the Motor Vehicle Register is no longer reliable. This means that the local authorities are unable to recover the costs incurred removing, storing, and disposing of such abandoned vehicles.

8.3.1 Continuous vehicle licensing and notification of change of vehicle ownership

There are two opportunities for vehicle owners to allow the vehicle registration to lapse. The first is when continuous vehicle licensing (CVL) is not enforced and the second is when the change of vehicle ownership remains unconfirmed.[6] There is a strong incentive to evade the annual vehicle tax as some 79,000 infringements are

[6] The law regarding vehicle change of ownership is clear but not enforced.

issued annually for vehicles on the road without a current licence and a further 2,000 are issued for vehicles on the road that are unregistered.[7]

Evidence from the four countries studied shows that the enforcement of CVL, of change-of-ownership notification, and of fiscal responsibility for a vehicle until it enters the recycling system, is necessary to minimise the number of vehicles abandoned, and the associated costs borne by society. With regard to CVL in New Zealand, as long it is not enforced there remains a data gap on the Motor Vehicle Register and a free-rider problem, with some vehicle owners using the country's roads without contributing to the National Road Fund or the Accident Compensation Corporation (ACC) levies.

CVL is achieved in the Netherlands by having a vehicle ownership tax rather than a road usage tax. Lindhqvist (2001) advocates such a policy for Sweden, arguing that it is no different from charging the same licence fee irrespective of whether the vehicle was used to travel 5,000 or 40,000 kilometres in the year. As den Hond (1996) correctly points out, a tax regime based on vehicle usage rather than vehicle ownership provides greater opportunity for a vehicle to be illegally dumped. New Zealanders, however, are used to having choice and are likely to find unpalatable a vehicle ownership tax with no opportunity for temporary exemption from licensing. Furthermore, the licence fee expressly contributes to the National Road Fund for road construction, ACC to cover medical costs related to injuries resulting from road accidents, safety programmes run by the LTSA and the New Zealand Police, and safety and audit standards. These reasons would make it difficult therefore, to convince vehicle owners that this fee should be paid when the vehicle is going to be off the road for the following year.

Two suggested alternatives would aid the enforcement of CVL. One would be to make it an offence to be without a current licence (or temporary exemption) whether the vehicle is observed on the road or not.[8] To have an automatic fine imposed immediately the licence has expired (as is proposed in the United Kingdom),

[7] Both these figures are the averages for the years from July 1997 to June 2002 (Source: The New Zealand Police). These figures do not include infringements issued by local authority enforcement officers.

[8] Currently in New Zealand it is only an offence if the vehicle is caught on the road.

however, is very confrontational in style, which is likely to be counterproductive in New Zealand. To give a warning and provide a stated time frame before the automatic fine is imposed may achieve greater cooperation. Alternatively if the status quo remains, with vehicle owners fined only if the unlicensed vehicle is caught on the road, then the licence needs to be more visible, as in Germany where the current licence sticker is displayed on the vehicle's number plates, coded by colour for that year. Compliance would be more visible to the New Zealand Police and the local authority enforcement officers, and would be evident in speed camera photos. It would, however, necessitate all vehicle licences being renewed at the same time of the year, putting pressure on the administrative systems.

The law on the change of vehicle ownership is clear and the penalties adequate, however it is not enforced. In Germany and the Netherlands enforcement ensures compliance. An automatic infringement (avoiding the judicial system) may make enforcement less costly, alternatively changing the incentives could influence behaviour. While the buyer must confirm change of vehicle ownership, there is a disincentive for this to occur because at that point responsibility for licensing is transferred to the buyer. If the last registered owner of a vehicle is to remain responsible for the vehicle, the seller should have responsibility for the notification of change of ownership, as s/he is the party with the incentive to ensure it takes place. Once notification has taken place the liability for vehicle licensing is transferred to the buyer.

8.3.2 Registration cancellation and vehicle disposal

With the enforcement of both CVL and notification of change of ownership, it is possible and necessary to ensure that fiscal responsibility for a motor vehicle remains with the last registered owner until the vehicle owner cancels the vehicle's registration. This should also facilitate the enforcement of vehicle disposal via the recycling system. Evidence from Europe suggests that proof of correct disposal in the form of a Certificate of Disposal ensures that most vehicles are ultimately recycled and the number of vehicles recycled is known. If this were to be instigated in New Zealand, when a vehicle is handed in for recycling to either a dismantler or a local authority, the owner would receive a Certificate of Disposal as proof of the vehicle's disposal. The certificate along with the registration plates would be

presented to the Land Transport Safety Authority (LTSA) agent so that the vehicle could be removed from the Motor Vehicle Register. This would provide an accurate record of the number of motor vehicles being recycled.

As shown in Figure 6.6, Chapter Six, of the owner-cancelled registrations in 2002, 16 percent (20,000 vehicles), were declared permanently taken off the road which indicates that they are likely to have remained on private property. Some may continue to be used on private property (particularly on rural properties), some may be sold or made roadworthy at a later date, and others are kept for the possibility of using for parts. To prohibit New Zealanders from having this option would likely face strong opposition, however, to require 'temporary' exemption from licensing to be renewed annually until the vehicle is disposed of, may be acceptable. If this were the case the vehicle would remain on the Motor Vehicle Register and would remain the responsibility of the registered owner until such time as it is handed in for recycling.[9] This would improve the reliability of the information on the Motor Vehicle Register.

8.3.3 Legislation concerning abandoned vehicles

The laws in New Zealand regarding abandoned vehicles were more appropriate when vehicles in general were of greater value. They focus on the requirements for notifying the vehicle owner of the impending sale or disposal and as such are unnecessarily costly and time-consuming for the authority empowered to dispose of them. A shift of focus is required to make the action of abandoning a vehicle a specific offence. In the United Kingdom abandoning a vehicle is an offence subject to a substantial penalty, however, since offenders are seldom prosecuted, abandoned vehicles have been a problem in the United Kingdom. This suggests that the offence must be subject to an appropriate and enforced automatic infringement. With enforced CVL and notification of change of ownership, there should be no 'lapsed' registrations. Therefore as long as an abandoned vehicle has identification, the owner can be issued with the infringement and will be required to reimburse the local authority any costs incurred removing and storing the vehicle. Enforced, this

[9] The same could apply for the 13 percent written off by an insurer. The insurance company usually owns these until they are sold for parts or to make roadworthy again, or they are handed in for recycling.

action will internalise the cost to society caused by abandoning a vehicle, as is the case in Germany and the Netherlands.

In New Zealand the Local Government Amendment Act (LGAA) 1992 empowers local authorities to dispose of vehicles abandoned on roads, but where the abandoned vehicle threatens the possibility of hazardous fluids leaking into water, it becomes, under the Resource Management Act (1991), the concern and responsibility of regional councils. It is, however, unclear if regional councils have a specific mandate to dispose of abandoned vehicles (pers. comm. Manawatu-Wanganui Regional Council 2003). Some areas prefer to leave all abandoned vehicles as the clear responsibility of the city or district council in that area. In other areas the regional and district councils cooperate, working together on the issue so that regional councils remove vehicles abandoned in or alongside rivers and lakes. Regarding the question of which authority is empowered to remove abandoned vehicles from an area, no law change is required, since under the current laws local authorities can and do, contract out the removal and disposal of abandoned vehicles to the private sector. They can similarly, therefore, pass on the authority to a regional council to remove and dispose of abandoned vehicles under a mutual agreement.

8.4 Policy Options Regarding Access into the Recycling System

Dismantlers will always accept ELVs that have a positive value, the objective is to ensure that ELVs of negative value have ready access into the recycling system. The policy chosen, therefore, should be independent of the fluctuations in the global market price for steel scrap. The policy options considered here will impact on the number of ELVs that are recycled.

8.4.1 Disposal fee charged to the last user, or the use of a regulatory instrument

Charging the owner a disposal fee (to cover the cost of depollution) for an ELV at the point of entry into the recycling system provides an incentive to dump the vehicle. So too does the use of a regulatory instrument that requires a vehicle to have undergone depollution before it is accepted, as the ELV owner is faced with only two options, pay for depollution of the vehicle or dump it. This is verified by

the fact that local authorities in New Zealand with a free acceptance policy for ELVs that have undergone depollution, still have a problem with abandoned vehicles in their area.[10] Evidence from Germany and the United Kingdom suggests that if ELV owners have to pay for their vehicle to enter the recycling system, the way to avoid vehicles being abandoned is the implementation of clear laws regarding vehicle ownership, licensing, and disposal, with penalties high enough to deter illegal behaviour, and the resources to enforce them.

8.4.2 Refund for an ELV entering the recycling system

Provision of a refund for ELV owners may encourage ELVs into the recycling system, however, to be acceptable such a policy would need to provide an economically efficient solution to the abandoned vehicle problem. With a refund scheme it can be difficult to establish with reasonable certainty, the minimum level of refund required to stimulate the desired outcome for a commodity like a motor vehicle, and it is likely to be a dynamic decision. The real value of the refund to ELV owners in Sweden has severely eroded over the years. By 1998 the real value of the refund was less than half the value of the initial 1976 refund and by 2001, prior to the increase of the refund the real value of the refund had fallen 58 percent from the value in 1976.[11] This would indicate that it was either overvalued in 1976 or that it was undervalued thereafter, providing a possible explanation as to why vehicles have continued to be abandoned to greater and lesser degrees over the years.

Another point for discussion is that the refund does not address the issue of who pays for the depollution of the vehicle. If the cost of depollution is to be met by the ELV owner (the recipient of the refund), it counters the effect of the refund. This has been illustrated in Sweden, where in the years that the fee (to cover depollution) charged by dismantlers eroded the actual net refund received by the ELV owner, the incidence of abandoned vehicles increased. In order for the refund to be an effective policy tool in reducing vehicle dumping in Sweden it needed to be independent of the fee charged by dismantlers, over which policy makers had no control. Sweden

[10] In addition, the thirty-five local authorities that require vehicles to have undergone depollution and then charge a fee for acceptance, provide a double disincentive to have their vehicle recycled, the cost of depollution and the disposal charge.
[11] After the increase in July 2001 it remained 41.5 percent lower than the original refund (in real terms).

made this change in 2001 by introducing extended producer responsibility (EPR) to cover the fee for accepting an ELV, charged by dismantlers. The refund is financed by a disposal charge (or environmental tax) imposed when the vehicle is first registered in Sweden. Lindhqvist (2001) questions the efficiency of Sweden's economic instrument used as a policy tool to change behaviour.[12] He argues that because the Government sets the level of both the refund and the disposal charge, there is no mechanism (other than the political one) to keep the refund to the minimum level required. With the refund for the ELV financed through the producer funded disposal charge, and EPR meeting the cost of the vehicle's depollution, the cost of motor vehicle disposal in Sweden is internalised.

Denmark has a deposit-refund approach to ELV management, which requires all vehicle owners to pay an annual environmental tax of DKK90 (€12.11 or $NZ22.68).[13] The accumulating fund from these taxes is used to pay a refund to ELV owners delivering their vehicles into the recycling system. In this deposit-refund scheme recipients of the refund are also contributors so that the cost of vehicle disposal is internalised, however, there is some subsidisation between contributors and recipients. For those vehicles that are not on Danish roads long enough for the owner to have contributed the full value of the refund before the vehicle becomes an ELV, the vehicle owner receives a refund which has been subsidised by other vehicle owners.[14] In fact the majority of contributors will never be recipients of the refund.

In contrast, the $10 petrol voucher schemes operating (or under trial) in New Zealand are funded by the local authorities so do not internalise the cost of the externality. To obtain the refund the ELV must have been stripped (which includes depollution). In the one district where the $10 refund scheme has been operating for

[12] Lindhqvist of the International Institute for Industrial Environmental Economics (IIIEE) at Lund University was commissioned by BIL Sweden to report on the effectiveness of extended producer responsibility for ELVs in Sweden.
[13] The exchange rate on 26 January 2004 was DKK1 = €0.134556 and €1 = $NZ1.8728.
[14] Consider for example the owner of a newly imported vehicle which is on Danish roads for 13 years before it is scrapped. By the time it is scrapped the owner may have contributed €194.81 or $NZ364.84 (if calculated at 3 percent per annum real interest) in environmental tax. Whereas the owner of a vehicle that is written off and destroyed in its first year on Danish roads, has contributed only €12.11 ($NZ22.68) to the deposit-refund system. The contribution of the owner of the thirteen-year-old car is subsidising the refund to the ELV owner of the vehicle that is less than one year old.

over a year it has not been effective in changing behaviour, as the number of dumped vehicles has not been measurably reduced. Under this scheme the local authority is paying ELV owners that would have brought their vehicles in for disposal anyway, as well as covering the cost of vehicles continuing to be abandoned in their area.

The conclusion regarding the use of a refund to change behaviour where it relates to the disposal of a motor vehicle, is that it is too difficult to ascertain the minimum level required to entice someone who would dump a vehicle to instead hand it in for recycling. In addition the introduction of a refund affects the market for old cars by increasing the value of a vehicle at the point in which it becomes an ELV (to the owner only, not to the recycling industry). While the majority of ELVs in New Zealand already enter the recycling system without the enticement of a refund, and since a party other than the recipient usually funds the refund, it is unlikely that an efficient outcome would be achieved.

8.4.3 Free acceptance of ELVs

An alternative to the refund is to provide for the acceptance of ELVs into the recycling system at no cost to the owner. The minimal data provided by New Zealand local authorities that offered free acceptance amnesty periods for ELVs suggested that this may reduce the dumping of vehicles.[15] Free acceptance of ELVs requires the cost of depollution to be covered by a party other than the vehicle's final owner. In previous decades when the price of scrap steel was high enough, the metal recyclers absorbed this cost, however, this is no longer the case. One way to achieve this is through extended producer responsibility (EPR).

The European Union favours EPR, preferring that the cost of depollution be borne by automobile producers and importers. EPR has already been implemented for ELV disposal in Sweden and the Netherlands. It is effective in the Netherlands but the policy is not operating in isolation as there are also strictly enforced laws regarding vehicle licensing and disposal. In Sweden EPR has only been in place since 1998 (and only for vehicles produced and imported since January 1998), operating

[15] There was insufficient data to test this suggestion using a hypothesis test. Of the seven local authorities that kept a record of the number of abandoned vehicles during the amnesty period. five observed a reduction in the number of abandoned vehicles during the amnesty, with four observing many fewer abandoned vehicles than expected.

alongside the refund scheme. EPR is estimated to cost the producer SEK800 ($NZ163.92) per vehicle.[16] Japan is also adopting the EPR approach (as of the beginning of 2005) by partially subsidising the cost of depollution for the ELV owner through the free take-back of airbags and air conditioning units,[17] and subsidising metal shredding operations through the take-back of ASR.

In New Zealand there are a large number of vehicle importers, some of whom are very small operators, since under the Motor Vehicle Sales Act 2003, Section 8(1)(c), a person importing more than three vehicles in a year is declared a motor vehicle trader.[18] The Motor Vehicle Traders Register does not differentiate between importers and sellers so that no figure could be given of the number of motor vehicle importers in New Zealand (Motor Vehicle Traders Register 2004). Producer responsibility for New Zealand, therefore, is likely to be administratively impractical. In New Zealand many importers import vehicles of different makes and ages. Therefore, were importers required to contribute into a fund today for the future disposal of today's imports, administrative requirements for keeping record of vehicles funded for disposal by producer responsibility, could be great. Far greater than for countries where vehicles are manufactured domestically and importers are licensed for one vehicle brand. In addition, if importers' contributions were for future ELV disposal, it poses the question, who would be responsible for the two million vehicles currently on the roads? Alternatively, if it were suggested that importers today pay for the disposal of vehicles becoming ELVs today based on market share, there would be issues of equity.[19]

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[16] Since this is what is charged for vehicles imported privately and so not covered by producer responsibility. Therefore the total cover for vehicle disposal in Sweden is currently 1500 SEK ($NZ 307.35), which includes producer responsibility for disposal and the producer-paid refund to the final owner of the vehicle. The exchange rate on 26 January was SEK1 = $NZ0.204902.

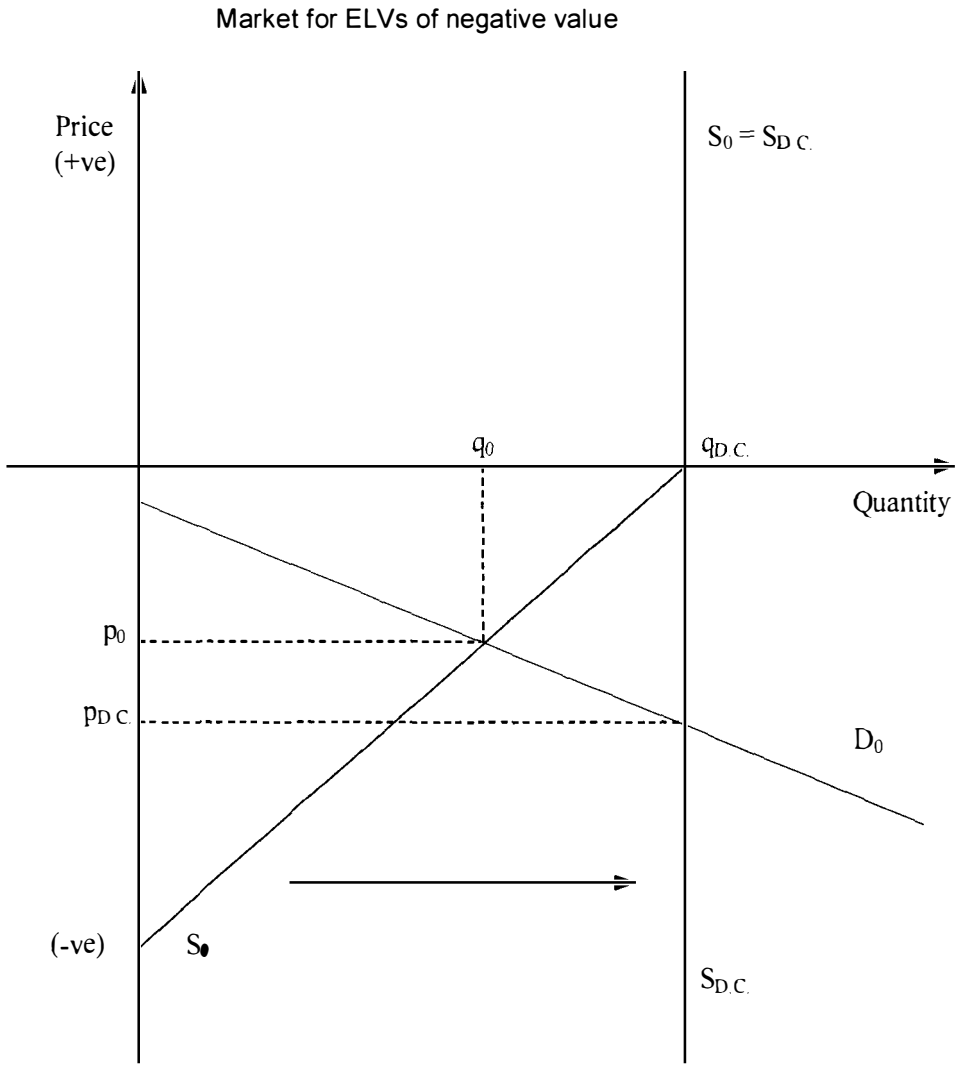
[17] The ELV owner still has to pay for the removal of hazardous fluids from the vehicle, however, this is less than half the cost of depollution.

[18] The UBD E-Directory lists seventy-six commercial car importers. but this list is by no means exhaustive as there are likely to be many small importers not listed here (UBD E-Directory 2004). The Motor Vehicle Traders Register does not differentiate between importers and sellers so that no figure could be given of the number of motor vehicle importers in New Zealand (Motor Vehicle Traders Register 2004).

[19] For example a small importer with a market share of 0.1 percent in 2002 would have had to fund the disposal of 125 ELVs from the profits gained from importing 201 vehicles, while an importer with a 10 percent market share would have the profits from the sale of 20,050 vehicles to fund the disposal of 12.465 ELVs. In addition importers importing new vehicles only, have a greater profit margin per vehicle while being faced with the same cost per vehicle for ELV disposal.

An alternative to producer responsibility would be for the cost of depollution to be paid by the first owner of a vehicle (in New Zealand) in an up-front disposal charge, funding the dismantler so that s/he can accept an ELV free-of-charge from its owner. This proposal is examined graphically in Figure 8.2.[20]

Figure 8.2: Effect of an Up-Front Disposal Charge and Free Acceptance of ELVs



S_0 = initial Supply (by ELV owners)
$S_{D.C}$ = Supply when funded by an up-front disposal charge
D_0 = initial Demand (by dismantlers)
$q_{D.C.}$ = quantity of ELVs when funded by an up-front disposal charge

[20] Figure 8.2 is adapted from Zoboli, Barbiroli, Leoncini, Mazzanti, and Montresor (2000).

Figure 8.2 shows the market for ELVs of negative value. The supply curve represents the supply of ELVs by their owners and the demand curve, the demand for ELVs by the dismantlers. A negative price indicates that the ELV owner is paying the dismantler to take the vehicle. The less the ELV owners have to pay the dismantler to take their vehicles, the more ELVs they will supply (upward sloping S_0). Assuming ELV owners are rational, if they can hand in their ELV free-of-charge or be paid for it ($p \geq 0$), they will supply all ELVs. Hence where $p \geq 0$, S_0 is vertical at the full supply of ELVs. The demand curve is downward sloping, since the more dismantlers are paid for an ELV, the more they will demand. The initial equilibrium is at (q_0, p_0) where $p_0 < 0$ so that ELV owners are paying dismantlers to accept their ELVs into the recycling system. Not all ELVs are supplied by their owners for recycling at p_0. If $q_{D.C.}$ is the quantity corresponding to all ELVs ($q_{DC.}$ = quantity supplied under the disposal charge regime) then $q_{DC.} - q_0$ is the number of vehicles abandoned and never retrieved, plus those left on private property which never get recycled (see Figure 8.2).[21]

Consider now the implementation of a policy of free acceptance of the ELV from its owner, with the dismantler's disposal fee being paid from a fund financed by all incoming motor vehicles' first New Zealand owners. All ELV owners will dispose of their vehicles into the recycling system, so that S_0 shifts out to $S_{DC.}$ (for $p < 0$ as well as $p \geq 0$). As shown in Figure 8.2 the supply curve is now vertical out at the total number of ELVs ($q_{DC.}$) irrespective of the price dismantlers charge for depollution. The dismantlers' demand curve does not shift and the dismantlers will not want to take all the ELVs ($q_{DC.}$) unless the price they receive is right. Since currently most abandoned vehicles do eventually enter the recycling industry (with p_0 paid by ratepayers rather than by the ELV owners), the extra ELVs to be recycled ($q_{D.C.} - q_0$) in proportion to the total number of ELVs being recycled, is not great.

As outlined in Chapter Three the dismantling industry is a competitive industry with many small operators running operations with limited technical equipment. These are labour-intensive operations so that there is not the opportunity to realise economies of scale. Therefore it is not unreasonable to assume that the marginal

[21] The majority of abandoned vehicles are removed and enter the recycling system, however, it is local authority ratepayers who pay p_0 for the abandoned vehicles to undergo depollution.

cost (MC) of carrying out depollution on the next ELV is similar to the average cost (AC). The implication is that the dismantlers would only demand $q_{D.C.}$ at price $p_{D.C.}$ so that to process all the ELVs the price would need to be $p_{D.C.}$, a little higher than p_0. If p_0 = AC then $p_{D.C.}$ = AC + some premium, which would be paid to the dismantler from the disposal fund (initially paid into by the up-front disposal charge). Under this policy the dismantler now carries no uncertainty, as s/he knows the payment s/he will receive for the depollution of all incoming ELVs. The dismantling industry is a localised one and as the number of ELVs needing recycling increases over the years it is likely that new dismantling operations would enter the market.

The rationale for an up-front depollution charge on vehicles coming into the country is to remove that cost from ELV owners and remove the incentive for dumping. It is acknowledged that buyers of vehicles entering the country are subsidising ELV owners disposing of their vehicles (as buyers of incoming vehicles are unlikely to later be ELV owners). The up-front depollution charge does, however, have a progressive distribution effect. This is because ELV owners are at the end of the vehicle-buying chain, therefore it can be assumed that they have less income than those who are first owners of vehicle imports. With fewer abandoned vehicles, environmental impact will be reduced and ELV owners will be better off as they no longer have to pay for the disposal of their ELV. The welfare of dismantlers should remain unchanged as they receive payment for the depollution of the ELV as before, however, it now comes from the Fund rather than from the vehicle owner. Local authorities will be better off as there will be fewer abandoned vehicles to dispose of and there will be no need to subsidise the cost of disposal of ELVs brought to the collection site.

Were such an economic instrument used, the money collected from incoming vehicles could fund the disposal of the ELVs in the following year. If this were the case the environmental (or depollution) charge could be equal to the current average cost of depollution, which is known, plus a small percentage. This is preferable to the depollution charge being 'tagged' to the depollution of that particular vehicle, for several reasons. Administrative costs would be far lower than if it were necessary to keep a record of those vehicles that have their cost of depollution covered and those that do not. In addition, the charge would equate to just over the current cost of

depollution, a known cost, as compared to an estimation of the charge required to cover an unknown cost at an undetermined time in the future. The use of a duplicate copy of the Certificate of Disposal could be used as proof of acceptance and processing of an ELV, as there is no requirement for another form, and false claims for depollution reimbursement are ruled out as there can be a cross check that the vehicle owner has presented the Certificate of Disposal and had the registration of the vehicle cancelled.

Were this approach to be adopted in New Zealand the depollution charge could be added to the registration fee for a vehicle being entered onto the Motor Vehicle Register for the first time, and payable by the vehicle's first owner in New Zealand.[22] Administration costs for the collection of the fee would be minimal as currently the registration fee is paid as one fee, with the money being separated into a number of different accounts or funds.[23] Therefore one more fund, a Disposal Fund would need to be created. Costs would be incurred administering the Fund, but these should be able to come from the Fund itself. The figures can be examined to verify this. For example, the cost for the depollution of an air-conditioned vehicle was estimated at $40 (inclusive of GST) in October 2003 (this cost would need to be reviewed regularly).[24] Suppose the price required by dismantlers to accept all ELVs was the average cost of depollution. An additional $40 would be collected from each of the vehicles added to the Motor Vehicle Register. Payment to dismantlers for carrying out the depollution of the ELV would come from the Fund rather than the ELV owner or the local authority. This payment of $40 for vehicles with air-conditioning units (or $17.50 for vehicles without air-conditioning) could begin a year after the

[22] It is acknowledged that with this proposal, that owners of incoming vehicles are funding the disposal of the current vehicle fleet so do not directly benefit from their own contribution. It is, however, internalising the cost within the group of vehicle owners, in contrast to the current situation where vehicle disposal is frequently either directly or indirectly funded by local ratepayers.

[23] These include the National Road Fund, the ACC Motor Vehicle Account Premium, the Safety Standards Levy, the Audit and Standards Levy, the Transport Licence Fee, and funds for safety programmes run by the LTSA and the New Zealand Police.

[24] Estimates of depollution costs from local authorities were extremely varied, ranging from under $25 to $235, therefore the estimate given comes from several dismantlers and a vehicle air-conditioning company. The breakdown of this figure is: approximately $8 plus GST for the removal and disposal of hazardous fluids, tyres are collected for $8 plus GST ($1.60 to $1.65 plus GST, per tyre), the air-conditioning unit requires a trained technician to remove the hazardous gases at a cost of $20 plus GST and the dismantler is paid $1.00 for the battery which is then recycled.

environmental charge is enforced.[25] Looking at the vehicle numbers for 2002, there were 200,504 incoming cars registered for the first time in New Zealand that year (LTSA 2003a)[26] and 124,648 cars had their registration cancelled (see Table 6.13, Chapter Six). Suppose at worst, all the registrations occurred on the 31st of December 2002 and were charged $40 for depollution, the Fund would gain $8,020,160 and if all the cars taken in for recycling the following year (based on 2002 cancelled registration figures) were processed on the 1st of January 2003, claiming $40[27] plus incurring 20 percent administration costs, the Fund would have a surplus of $2,037,056. The Fund would only be exhausted if administration costs were more than 60.85 percent of each payment being made. If the shredding company requires other parts of the ELV to be removed prior to crushing, transporting and shredding, the cost of this further stripping should be at the expense of the shredding company.[28]

With such a surplus, consideration could be made to reimburse local authorities one $40 tow fee (the minimum tow fee currently quoted) for each abandoned vehicle whose owner is not traced. Based on the 65 percent of the estimated 25,500 abandoned vehicles not traced, and including a 20 percent administration fee, this would cost a further $795,600 which would leave a surplus of $1,241,456. This may provide a disincentive for the local authority to go to the effort of tracing the owner of the abandoned vehicle, therefore, the tow fee reimbursement should be restricted to vehicles with no visible identification. Depollution of abandoned vehicles will be covered by the Disposal Fund on entry of the abandoned vehicle into the recycling system. This tow fee reimbursement would mean that the cost of untraced abandoned vehicles would no longer be the sole burden of the local authorities, but would be subsidised by the Fund.[29]

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[25] At the outset of the scheme, the vehicle must have been received for disposal in the year after the start of the fund (Certificate of Disposal forms cannot be saved from previous months).

[26] Those vehicles being reregistered have not been included, but if they were the fund surplus would increase.

[27] Though in reality many may not be air-conditioned and so only claim $17.50.

[28] The motivation for this further stripping requirement (for example the seat foam) is likely to be to reduce the quantity of ASR for disposal. From an economic perspective it makes sense to landfill it prior to shredding as the landfill rate will be cheaper than the rate charged for ASR, which contains traces of hazardous fluids and heavy metals and is therefore designated special waste. It should, however, be a cost to the shredding company, not a cost to dismantlers or ratepayers.

[29] For those abandoned vehicles requiring one tow to the collection site or dismantler only, there would be no cost to the local authority.

8.4.4 Location of access to recycling system

Currently in New Zealand, ELVs enter the recycling system via an automotive dismantler or a local authority collection site. Local authorities have provided this point of access and most often the collection site is situated at the local landfill where the marginal cost to store an ELV is negligible. The trend in New Zealand, however, is to move away from the large number of landfills toward an increased number of transfer stations, with the refuse being transported to larger, privately owned (or joint venture) sub-regional landfills. According to the 1995 National Landfill Census and the 2002 Landfill Review and Audit there were 327 landfills operating in 1995, but the number had reduced to 115 by 2002 (MfE 2003). The number of landfills is further expected to decrease to forty-three landfills by 2010 (*ibid.*) as existing landfills close and the cost of landfill establishment rises. The rising establishment cost is due to increased consent criteria, pressure to include environmental costs in the cost accounting (MfE 2002d), and increased public objections to proposed landfill sites. These factors increase the incentive for fewer and larger landfill operations. In the future it may be too costly to transport ELVs the greater distance to fewer landfill facilities. If this were the case it may be preferable for all ELVs to be received by automotive dismantlers and where possible, local authority transfer stations. This is likely to increase the cost of storage for ELVs waiting to be transported to the shredding facility, therefore it may be necessary to decide whether this is more costly than additional and more frequent collections of ELVs by the metal shredding company.

Both Germany and the Netherlands operate a comprehensive network of industry-supplied collection sites in order to keep the burden away from municipal authorities. This may be a lead New Zealand should follow in the future.

8.4.5 Suasive approach targeting vehicle owners

Full information is to be encouraged as it is likely to improve cooperation from vehicle owners and reduce the cost of enforcement. Education of the vehicle-owning public is needed to inform them of the changing and tightening up of institutional procedures and the reasons for these changes. Equally important is the understanding of the need for responsible disposal of motor vehicles.

Full information is necessary on the cost and location of motor vehicle disposal. Dissemination of local information on where an ELV is to be taken for recycling is carried out to good effect in Germany, Sweden, and the Netherlands. In Sweden informing the public regarding the reporting of the sighting of an abandoned vehicle to Håll Sverige Rent (HSR) has resulted in many more ELVs entering the recycling system. To reinforce the importance of the dissemination of information Turner and Pearce (1994) provide evidence that deposit-refund schemes (for beverage containers) result in only a small decrease in the level of littering, and that return rates relate to the convenience of the collection sites and how widely they are publicised, not the size of the refund.

8.5 Policy Options for ELV Depollution and Monitoring of Automotive Dismantling Operations

Depollution of ELVs and environmentally sound practices regarding the handling and disposal of hazardous substances by dismantling operations are not profitable activities, therefore the market will not ensure that they take place. Where they do not occur society bears the cost of the environmental externalities resulting from automobile recycling. Discussion is required regarding the management of the depollution of ELVs and the disposal of hazardous materials from ELVs.

8.5.1 Depollution of ELVs

Enforced mandatory depollution of all ELVs with careful collecting and recycling or disposal of hazardous substances will ensure minimal environmental impact. While depollution technology is not static, making it mandatory does not restrict innovation as improvements in technology or in techniques for carrying out depollution will reduce the costs to comply with the regulatory instrument. To be enforceable, pollution abatement must be preferred over the risk and cost of noncompliance (Barde 1995). This requires adequate resources to monitor regularly, and penalties for noncompliance to be high enough that depollution is the preferred option. The evidence from the four countries studied concur that mandatory depollution is not enough, it must be stringently monitored and enforced (as is the case in Germany and the Netherlands) to ensure that all ELVs being recycled first undergo thorough depollution.

8.5.2 Monitoring of dismantling operations

While many automobile dismantlers operating in New Zealand have sound management practices for the removal and disposal of hazardous fluids, gases, and components from motor vehicles, others do not and so operate at an economic advantage without having to internalise all their costs. Experiences in Sweden and the United Kingdom demonstrate that without adequate enforcement, regulations and standards are ineffective. Germany and the Netherlands demonstrate that dismantling industries monitored from within can operate efficiently and with minimal environmental externalities. A similar model could be applied in New Zealand with an association of automotive dismantlers being formed (whether through the existing Motor Trade Association (MTA) or some other) with whom all dismantlers must be registered. This body could provide a Code of Practice, guidelines for building requirements, and for best practice depollution and the handling and disposal of hazardous substances.[30] During the transition period, and when dismantlers first set up, an educatory approach could be taken, presenting operators with alternatives of acceptable practices. Following the transition, auditors from the industry's association could monitor dismantling facilities for compliance with the Code of Practice, paid for by the dismantler.[31] This would relieve local authorities of the burden of monitoring, and would internalise the costs for compliance and monitoring within the industry. In addition it would mean that to operate a dismantling facility would require compliance with the regulations eliminating the opportunity to operate at an economic advantage.

Consider now the graphical representation of the effect of an increase in the dismantlers' compliance costs as a result of certification and monitoring from within the industry. Combine this with the previous scenario of the economic instrument in the form of an up-front disposal charge funding dismantlers for the free acceptance of ELVs from their owners. This is shown in Figure 8.3, with the initial equilibrium at (q_0, p_0).

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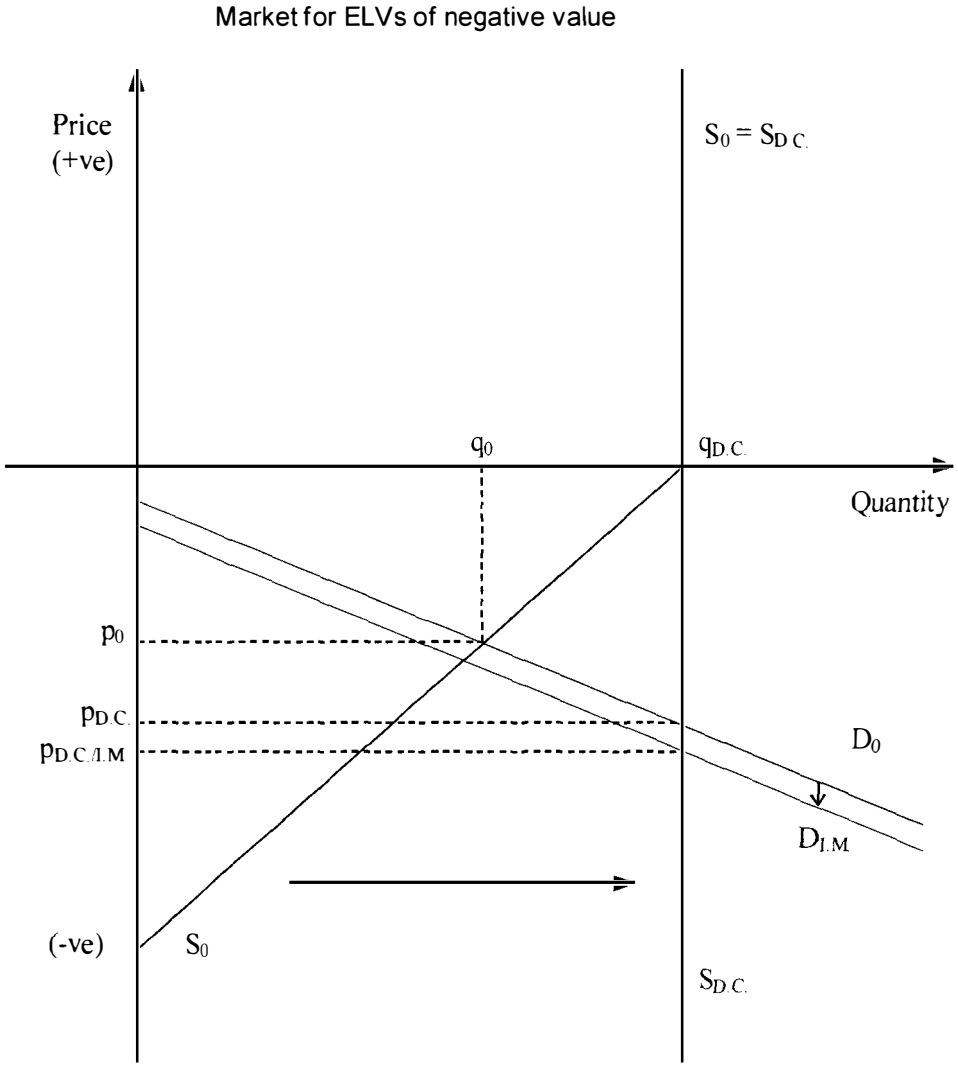
[30] The MTA already provides for their members, plans, specifications and guidelines for the depollution area of a dismantling facility. (pers. comm. MTA 2002).

[31] The cost to the dismantler should be just the cost of the audit for dismantling operations which are compliant, and a higher fee to those who fail compliance and for whom additional administration and auditing is required.

Figure 8.3: Effect of Certification and Monitoring Costs for Dismantlers, in Addition to Up-Front Disposal Charge



S_0	=	initial Supply (by ELV owners)
$S_{D.C}$	=	Supply when funded by an up-front disposal charge
D_0	=	initial Demand (by dismantlers)
$D_{I.M}$	=	Demand under industry monitoring of environmental compliance
$q_{D.C}$	=	quantity of ELVs when funded by an up-front disposal charge
$p_{D.C./I.M.}$	=	price after the effect of both disposal charge and industry monitoring

To recap, implementation of the economic instrument shifts S_0 to $S_{D.C.}$ and a new equilibrium at ($q_{D.C}$, $p_{D.C.}$) with all ELVs recycled. Now (as shown in Figure 8.3) with an increase in the compliance costs faced by dismantlers, the demand curve will shift down resulting in fewer ELVs being accepted for depollution and recycling at $p_{D.C.}$. In order to get all ELVs ($q_{D.C}$) into the recycling system the payment made to

the dismantlers will need to increase to $p_{D,C/I,M}$, the price that includes the effect of both the disposal charge and the industry certification and monitoring.[32]

For ELVs brought to the local authority collection site (most often the landfill), there remains the question of the depollution of these vehicles. The local authority would continue as they do now, to contract the depollution work to a local dismantler. Depollution is likely to be carried out at the landfill site, to avoid the cost of transportation to and from a dismantling facility. This would require a depollution area at the landfill to the same standard as required at a dismantling facility, covered from the weather and with an impermeable floor. This would be a one-off cost to the local authority every time a new landfill site is established, however, this cost is likely to be minimal compared to the current costs incurred dealing with abandoned vehicles and the monitoring of dismantling facilities. The alternative is to use the landfill as a storage point only,[33] requiring all ELVs to pass through a dismantler first for depollution and removal of any other parts, and then be stored at the landfill until it is crushed and transported to the shredding facility. If this were to be the case, there remains the question of which party would pay for the transportation of the ELVs from the dismantler to the local authority collection site?

8.6 Discussion of ELV Recycling Rates, and Disposal of Automobile Shredder Residual (ASR)

Increasing materials recycling reduces the quantity of waste requiring disposal, and has the potential to reduce both the amount of contaminating substances destined for landfills and the use of scarce resources. In this section the discussion centres firstly on ELV recycling rates and secondly on the landfill disposal of ASR and individual hazardous materials and components.

8.6.1 Recycling rates for ELVs

Here consideration is given to a possible increase in recycling of ELVs beyond that currently achieved through market-driven recycling. When policy makers are considering a decision on recycling that moves away from the market-driven level,

[32] The price should not be increased for the act of environmental compliance by dismantlers as many are operating in a compliant manner already and this is simply a part of their operational costs.
[33] The benefit of being able to take an ELV directly to a local authority collection site is that it would always be accepted, it would not be dependent on whether the dismantler had the room or availability to deal with it.

Turner (1995) advocates the use of a cost-benefit analysis to ensure that the net social cost of recycling plus final disposal is less than the net social cost of the least-cost disposal option. Recycling targets (or standards) have been a commonly used tool in the reduction of municipal solid waste to landfills. In general they have been difficult to achieve, have not been backed up by an economic analysis, and have proven to be a very costly diversion of waste from landfills (Arrandale 2000).

The Netherlands achieves an ELV recycling rate of more than 86 percent of a vehicle, by subsidising recycling activities that are uneconomic. With the high cost of landfill disposal in the Netherlands, it is quite possible that the net social cost of this recycling and final disposal is less than the net social cost of landfilling more than 20 percent of each ELV. The EU Directive, influenced by the success in the Netherlands, however, has mandated ELV recycling levels of 85 percent and later 95 percent (of a vehicle by weight) for all EU Member States.

There has been much criticism of the EU approach of setting single, inflexible recycling rates. Reuter, van Schaik, and Boin (2002) say that a mandated single recycling rate is unrealistic since the material composition of motor vehicles (which determines their recyclability) is quite variable. To illustrate their point they cite Germany with a car fleet of around 42 million vehicles spanning at least 30 years. These 42 million vehicles are sourced from 139 different manufacturers, and if each produced only four models every five years, the German car fleet could consist of over 3300 different models each differing in materials composition.

VDA (2000) maintains that setting high recycling rates is counter-productive as they are in conflict with the environmental objectives of reducing fuel consumption and carbon emissions, which have resulted in the substitution of metals for the lighter plastic components which are more costly to separate and recycle.

> "Recycling is not always the most ecologically and the most economically desirable option. In justification of the material recycling ratios put forward by the Commission, a report by the University of Delft was cited. In the meantime however this University has stated that the Commission has acted counter to the findings of the study and that motor vehicles are a case where the alleged advantages of material recycling do not apply. The University of Delft, and also the University of Munich, have been unable to establish that

> material recycling has inherent ecological advantages. Nevertheless, the Commission and the Council remain wedded to a high material recycling ratio" (VDA 2000, 1).

In Germany and the United Kingdom it was felt that the single recycling rate of 85 percent had been set because it had been proven achievable, not because it had been demonstrated to be optimal. To introduce a uniform recycling rate across all EU Member States, requires that the recycling rate be optimal for each of the Member States, in order for the recycling mandate to be the efficient disposal option for all. If the recycling rate is higher than the efficient level of recycling for a Member State, then compliance with the EU Directive may prove a very costly diversion of waste from landfills. In addition, with waste from ELVs representing less than 0.5 percent of the United Kingdom's total waste stream, if the primary aim in Europe is the diversion of waste from landfills, it was arguably more sensible to target other waste streams.

Both the United States and Australia have market-driven recycling of ELVs and are unlikely to follow Europe in mandating recycling targets (Staudinger and Keoleian 2001; Environment Australia 2002). Poor performance of recycled plastics compared with virgin plastics and the cost of separation and decontamination provide a strong economic deterrent to the recovery of plastics. Therefore these countries say that it is too costly to increase the level of recycling, and neither is there any real economic incentive to use recycled materials in automobile production (Environment Australia 2002; Whitfield 2001).

Any government intervention in recycling should result in net social welfare gains. Since ELV recycling in New Zealand is market-driven, if the government were to set recycling targets above the levels achieved by the market, this would require subsidising that additional recycling. Without markets for further recycled products in New Zealand, these materials would need to be transported at significant cost to markets elsewhere. Landfill capacity in New Zealand is not scarce, so although increased levels of recycling would reduce the overall quantity of ASR destined for the landfill, mandating an increased level of recycling is likely to be inefficient. In addition, if an increased level of recycling was required, evidence from Europe suggests that this would result primarily in the recycling of glass, plastics, and seat

foam (over and above the steel and nonferrous metals already recycled by the private sector). Glass, plastics, and polyurethane foam are not scarce, therefore this outcome would not slow the depletion of scarce resources. Furthermore recycling these materials would not reduce the environmental impact from ELV disposal, as these materials are inert when disposed of in landfills.

Without pressure on landfill capacity in New Zealand the primary focus has to be to reduce negative environmental impact, rather than waste reduction. The Life-Cycle Assessment (LCA) carried out by Sweden's ECRIS project, monitored and aggregated all environmental impacts of an automobile from 'cradle to grave.' The findings of the LCA were that to raise the level of recycling of an ELV from 75 percent to 85 percent reduced the overall environmental impact from the recycling phase by only 2 percent. Therefore "common sense must be applied in implementing higher levels of recycling. Over-emphasis on the recovery of polymeric materials will not reduce the environmental loading" (ECRIS 1998, 8). To mandate increased ELV recycling rates for New Zealand would achieve very little in terms of lessened environmental impact.

8.6.2 Landfill disposal of ASR and hazardous components from ELVs

In countries like the Netherlands and Japan the population density is high and the pressure on landfill capacity is extreme. In response, both of these countries have introduced (or are soon to) policies which minimise the disposal of ASR to landfills. Both have used EPR, in the Netherlands to subsidise automobile recycling, and Japan by the free take-back of ASR. By legislating to ensure producers fund the disposal of ASR, an incentive is created to implement ways of reducing the volume of ASR. For Australia and many states of the United States where landfill capacity is not under pressure, the intention is to continue with ASR disposal to landfills.

Other direct disposal issues, however, can and need to be addressed regarding the reduction of environmental impact from ELV disposal in New Zealand. Of those local authority officers who provided information regarding the disposal of items stripped from car hulks at the collection site, 3 percent of councils consigned car batteries to landfill, 14 percent disposed of hazardous fluids to landfill and 30 percent disposed of whole tyres to landfill. In addition, seven local authorities still

disposed of complete ELVs in their landfills. To reduce environmental degradation from landfill disposal, it would be more effective to target the current disposal of these items to landfills where they are contaminating the environment.

8.7 Discussion Concerning Age Restriction for Vehicle Imports

When looking at ways to reduce the number of ELVs being abandoned and also reduce the environmental degradation resulting from vehicle recycling, consideration could be given to restricting the overall number of vehicles coming into the country. The obvious target would be the large number of older used imports entering the New Zealand motor vehicle fleet. The average age of used motor vehicles coming into the country is seven years. In 2002, 35.6 percent of used imports were over seven years old, but this proportion was higher in 2001, at 46.1 percent.

It is a complex issue to consider restricting the age of used imports in the context of externalities arising from vehicle disposal. Assuming the average life of a new vehicle is fourteen to fifteen years on the roads,[34] then two used imports (whose average age is seven years) are required to provide the same lifetime on New Zealand roads. The combined cost of these two seven year old vehicles is less than one new vehicle, therefore the option of the fourteen years on the road being serviced by two seven year old vehicles is cheaper for the consumer, and so society is better off.[35] What it does mean is that two vehicles must be disposed of instead of one. With the automobile recycling industry operating below capacity and being a market-driven, profitable industry, two vehicles provide twice the resources for recycling. Disposal of the ASR is adequately catered for so that there is no problem with the extra disposal requirements here. In addition, once the externalities are addressed and the costs to society removed, the number of vehicles to dispose of is not an issue. Furthermore, in an economy where Government policy has favoured deregulation, to reverse the policy toward new regulation would require evidence of a resulting improvement in welfare to society. This is unlikely to be the case when considering restricting the age of used imports in the context of vehicle disposal, it is much more likely in the context of vehicle safety standards and carbon emissions levels, which is outside the scope of this research.

[34] There is no record kept of the age of vehicles at the time of vehicle registration cancellation.
[35] This would also include consideration of the extra cost of repairs for seven years.

Identified in this chapter are the areas to target when reducing the environmental impact and associated cost to society from ELV disposal in New Zealand. These target areas are the institutional practices regarding vehicle licensing, ownership, and disposal (including abandoned vehicles), the cost of ELVs entering the recycling system, the depollution of ELVs, and the quality and quantity of automobile recycling. Overseas policies and practices that target these areas have been discussed. In the following chapter conclusions will be drawn and recommendations made to improve the management of motor vehicle disposal in New Zealand.

Chapter Nine

Conclusion and Recommendations

"So far, the small size of the New Zealand population and the relatively large land area and water resources at our disposal have allowed us to have our environmental cake and eat it too. In effect, the environment, . . . has partly subsidised our economic development by providing a succession of quarried resources and plentiful energy resources to use, and abundant land, water and fresh air to absorb our wastes. However, those subsidies cannot be sustained indefinitely . . ."

The State of New Zealand's Environment 1997

9.1 Introduction

The current management of motor vehicle disposal in New Zealand is such that not all costs are included in the decision-making process of disposal alternatives. As a result ELV disposal imposes a cost on society. Externalities arise as a result of vehicles being abandoned on public and private property. The number of vehicles currently abandoned is sub-optimal[1] with local authorities diverting resources to the removal and disposal of many of these abandoned vehicles. In addition, externalities occur during the vehicle dismantling process, and as with the abandoned vehicle problem, the optimal level of externalities resulting from automotive dismantling has not been pursued. Instead, it has been accepted that society, by way of the Resource Management Act 1991, has made the decision that pollution externalities should be avoided and mitigated. The sources of the externalities have been identified and in this chapter recommendations are made to internalise the externalities, improving the management of ELV disposal in New Zealand. These recommendations are very much in line with the first two core goals of the New Zealand Waste Strategy, that of "lowering the social costs and risks of waste, and reducing the damage to the environment from waste generation and disposal" (MfE 2002a, 3).

9.2 Sources of Externalities and Contributing Factors

The New Zealand automobile recycling industry functions well and is operating below capacity. There is, however, no standardised approach that ensures all motor vehicles are ultimately disposed of through the recycling system. At least 25,500 cars are abandoned each year nationwide, which represents approximately 20 percent of the number of light motor vehicles whose registration is cancelled annually. Currently around 35 percent of the owners of these abandoned vehicles are traced and costs recovered. The direct cost to local authorities to remove, store, and dispose of the remaining abandoned vehicles is more than six million dollars each year. This estimate does not include environmental clean-up costs when recovering vehicles from places like rivers and coastline, or the social cost of the environmental

[1] This starting point for the research was discussed in Section 2.3 of Chapter Two.

externality. Many other vehicles remain permanently on private property, exposed to the weather, and leaking hazardous fluids into the environment. In addition, not all ELVs entering the recycling system undergo depollution, and practices and standards for the removal and disposal of hazardous substances and components from ELVs are variable.

Based on the surveys of New Zealand local authorities, meetings with the Land Transport Safety Authority (LTSA), the Manawatu-Wanganui Regional Council, and interviews with selected operators in the automobile recycling industry, it is evident that a combination of factors contributes to the existence of these externalities. An institutional framework is in place for the registration, ownership, licensing and deregistration of motor vehicles, however, some institutional practices lack enforcement, allowing a vehicle owner to evade responsibility for the disposal of his/her vehicle. In addition, the law regarding abandoned vehicles needs to move ahead to better reflect the changed value of old vehicles. No standard practice exists regarding the acceptance of ELVs into the recycling system. Some local authorities apply a regulatory instrument, requiring an ELV to have undergone depollution prior to acceptance for recycling. Others use economic instruments with some charging the ELV owner a disposal fee, while other local authorities subsidise ELV disposal. Finally, within the recycling industry dismantlers operate to different standards and with the absence of consistent monitoring and enforcement nationwide, not all ELVs being recycled undergo depollution.

9.3 Recommendations for ELV Management in New Zealand

Semi-structured surveys with those in government and industry in the United Kingdom, Germany, Sweden and the Netherlands provided a sound basis for the discussion on possible policy and procedural alternatives to improve the management of motor vehicle disposal in New Zealand. As a result it can be concluded that no single policy will address the environmental externalities present in vehicle disposal, however, a combination of regulatory, economic and suasive policies or instruments will reduce them.

The recommendations target four areas, legislation, institutional practices, entry into the recycling system, and the dismantling operation. Gaps in the data and free-rider problems arising from institutional practices can be overcome through minor changes to the existing legislation and to several institutional procedures. Also required is the rigorous enforcement of the legislation and the institutional practices. Regarding ELV entry into the recycling system, altered outcomes can be achieved through a change in incentives. The acceptance of ELVs free-of-charge into the recycling system reduces the incentive to abandon a vehicle. Since the processing of an ELV of negative value is not costless, the imposition of a depollution charge on incoming vehicles to New Zealand is advocated to cover the cost of ELV depollution. Dissemination of information is advised regarding free access for ELVs into the recycling system, and the need for changes to the institutional practices. Good information is needed in order to gain cooperation from the vehicle owning public, increasing the effectiveness of the changes and reducing the cost of enforcement. Finally, it is recommended that automotive dismantlers be licensed and monitored from within their own industry. Monitoring is required to ensure the mandatory depollution of all ELVs, and environmentally acceptable practices for the removal and disposal of hazardous substances and components. A summary is presented in Table 9.1 of current practices and associated problems with respect to the institutional practices concerning vehicle licensing and disposal, the accessibility of ELVs into the recycling system, and the standards and practices of the automobile recycling industry itself. Alongside the current practices and resulting problems, recommended solutions are presented. Following Table 9.1, each of these recommendations will be presented in detail.

Table 9.1: Motor Vehicle Licensing and Disposal: Current Practices and Recommendations

Areas of Concern	Current practices	Current problems	Recommended Solutions
Vehicle licensing	• CVL[a] with temporary exemption. • Not enforced. • Registration 'lapsed' if overdue 12 months. • Fine of $200 if vehicle caught on roads without licence.	• 80,000 annual infringements issued for vehicles on road without licence. • Data gap. • Fines often waived, as ownership uncertain.	• CVL (including exemption) enforced: • Licence overdue 2 months, automatic infringement equal to the on-road infringement. • 'Flag' owner's name on register, owner required to pay debt before relicensing another vehicle.
Vehicle change of ownership	• Separate notification from both seller & buyer direct to LTSA[b]. • Buyer confirms & pays fee.	• Some vehicle ownership never confirmed. • Data gap.	• Single dual notification form only (public to public sale), with seller responsible for notification & fee. • Ownership change involving car dealers, done on-line.
ELV disposal	• Disposal is choice of ELV[c] owner. • No proof of whereabouts required. • Plates surrendered to cancel registration.	• Destination of ELVs uncertain. • Percentage ELVs recycled, unknown. • Environmental externalities.	• Owner presents Certificate of Disposal from LA[d] or dismantler, plus plates, to cancel vehicle registration. • Otherwise, fiscal responsibility remains with owner.
Abandoned vehicles	• Not a specific offence. • LAs responsible for abandoned vehicles. • Lengthy notification period.	• 20% of ELVs removed from Motor Vehicle Register are abandoned. • Cost to LAs, more than $6 million/year. • Environmental externalities.	• Abandoning a vehicle, made an offence & subject to automatic infringement. • Notification period reduced, enforce fiscal responsibility of last registered owner.
Accessibility of ELVs into recycling system	• Via auto dismantlers & LA collection sites. • No standard practice for acceptance. • Some LAs charge more than cost of depollution, others subsidise ELV disposal.	• Not all ELVs brought in for recycling. • Incentive to dump ELVs. • Externalities resulting.	• LAs & dismantlers to accept ELVs free-of-charge. • Depollution costs covered by first NZ owner when vehicle registered in NZ (into Vehicle Disposal Fund). • Dismantler claims from Fund for depollution of ELV.
Depollution standards **Dismantling practices**	• No operating licence for dismantlers. • Monitoring by LAs & regional authorities. • Inconsistent monitoring of disposal of hazardous fluids, due to limited resources.	• Percentage of ELVs undergoing depollution is unknown. • Some practices result in environmental degradation.	• Mandatory depollution for ELVs. • Industry to educate dismantlers on compliance re removal & disposal of hazardous fluids, then license & monitor dismantlers (cost added to disposal charge).
Recycling	• Market forces – 75% of ELV (by weight).		• No change.
ASR disposal **Component disposal**	• To landfill. • Some components to landfill.	• Possible limited landfill contamination. • Environmental degradation.	• No change (ASR to landfill). • Prohibit landfill disposal of lead-acid batteries, hazardous fluids, whole tyres & ELVs.

[a] Continuous vehicle licensing [b] Land Transport Safety Authority [c] End-of-life vehicle [d] Local authority

9.3.1 Vehicle licensing recommendations

It is recommended that continuous vehicle licensing, CVL, (with allowance for temporary exemption), be fully enforced. To this end, it is recommended that when a licence has been overdue for two months (and a one-month reminder notice has been ignored) an automatic infringement equal to the on-road infringement be issued, irrespective of whether the vehicle has been observed on the road.[2] If the vehicle is to be relicensed, the infringement fee is to be paid in addition to the licence fee renewal. It is further recommended that a 'flag' be placed beside the vehicle-owner's name on the register, so that when this person comes to relicense another vehicle, they are first required to pay the outstanding debt and deal with the vehicle with the overdue licence.[3] In addition as is currently the case, if the vehicle is caught on the road by the New Zealand Police or by local authority officers any time after the licence has expired, an automatic infringement (currently $200) is issued and payment enforced.

The next recommendation relates to the temporary exemption from licensing. If the owner of a vehicle wishes for it to remain on private property indefinitely, the licence exemption is to be obtained each year and responsibility for the vehicle is to remain with the registered owner. Failure to do so would incur the above penalty for an unlicensed vehicle. If the owner wishes to cancel the vehicle's registration, it would be a requirement that the vehicle be disposed of through the recycling system (as outlined in subsection 9.3.3).

9.3.2 Vehicle change of ownership recommendations

Three recommendations are made that relate to change of ownership procedures, the first two apply when a vehicle is sold by one member of the public to another. The

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[2] The current fine for an unlicensed vehicle observed on the road is $200. In the law the fine could be stated as a maximum of four times the annual licence fee (for example), so that if a fine of $200 was not providing an adequate deterrent, this could be increased. Money collected from infringements would remain with the LTSA to offset additional costs incurred from the increased use of the debt collection agency.

[3] The same procedure would occur for those owners for which the vehicle record is flagged 'Gone, No Address.'

first recommendation is that a single dual notification change of ownership form only, be used. This form would require the signatures and drivers' licence numbers (or passport numbers) of both the seller and the buyer. The second recommendation is that the single form be the responsibility of the seller, who would be required to send the form to the LTSA agent along with the change-of-ownership fee. This would require relevant sections of the Transport (Vehicle and Driver Registration and Licensing) Act 1986 to be changed accordingly.[4] Current penalties for failing to notify change of ownership should be a deterrent, however, they must be enforced. The third recommendation is that all licensed car dealers have an on-line link to the LTSA database and that notification of all vehicle changes of ownership involving a car dealer, be the responsibility of the dealer and be carried out directly through the on-line link.

9.3.3 Vehicle disposal recommendations

It is recommended that final disposal of a motor vehicle must be through the recycling system in order for the vehicle owner to be absolved from liability for the vehicle. This means that removal from the Motor Vehicle Register would require the owner to hand in the vehicle to a licensed automotive dismantler or to the local authority collection site for recycling, and receive a Certificate of Disposal (a copy of which is retained by the issuer). In addition, it is recommended that presentation of the Certificate of Disposal and the vehicle's registration plates be required in order to cancel the vehicle's registration and release the registered owner from vehicle liability (and receive any fees refund owing).[5] Vehicles remaining on private property would remain on the Motor Vehicle Register with 'temporary exemption' status (renewed annually) until such time as they were handed in for recycling.

9.3.4 Legislative recommendations: liability and responsibility for abandoned vehicles

Firstly, it is recommended that abandoning a vehicle be made an offence subject to an automatic infringement. This infringement is in addition to being required to cover the costs incurred by the local authority for removal, notification, and storage

[4] See Appendix Four.
[5] For those vehicles permanently leaving the country, registration cancellation (and receipt of any fees refund) would require proof of this and surrender of the New Zealand registration plates.

of the vehicle. Secondly, in the Local Government Amendment Act (No. 3) (LGAA) 1992, Section 2 (2)(h) where liability is stated, the phrase 'the owner' needs to be changed to 'the last registered owner' in order to remove the loophole that allows the last registered owner to claim that s/he no longer owns the vehicle and so evade liability. Thirdly, it is recommended that in Section 2 (1) of the LGAA (1992) the words 'on a road' be omitted so that local authorities are empowered to remove and dispose of abandoned vehicles in their area of jurisdiction regardless of where the vehicle has been abandoned.

9.3.5 Legislative recommendations: notification requirements regarding abandoned vehicles

It is recommended that there be a reduction in the notification periods and the notification requirements expected of the local authorities, regarding abandoned vehicles. To do this requires some changes in the vehicle categories stated in Section 2 of the LGAA (1992).

The new categories and notification requirements recommended are as follows. Firstly, that Category A be changed to include only vehicles without any form of identification, and that these vehicles be removed and sent directly for recycling.[6] Secondly, that the local authority be permitted to claim the minimum tow fee[7] from the Vehicle Disposal Fund (to be discussed in the following subsection) toward the cost of removal of Category A vehicles.

Thirdly, it is recommended that Category B be changed to include vehicles with registration plates and/or a readable VIN, and no licence current in the last six months. Fourthly, that photographic proof of the vehicle's identification and its abandoned status be required and that Category B vehicles be removed for disposal and the costs recovered from the last registered owner (unless it has been recorded by the Police as stolen).

[6] This can occur once the vehicle has been checked with Police records of stolen vehicles.
[7] The minimum tow fee quoted by local authorities is currently $40 (October 2002 prices) and will need to be updated on a regular basis.

The fifth recommendation is that Category C be changed to cover vehicles with registration plates and/or a readable VIN, and a licence current within the last six months. Sixth, that the Category C vehicle be removed and stored, and the notification period reduced to eight working days by which time its owner has collected the vehicle or given instruction for its disposal. The seventh recommendation is that no advertisement be required as ownership and contact details can be obtained directly from the LTSA. The eighth recommendation is that for Category C vehicles the last registered owner be required to fully reimburse the local authority for removal and storage costs (and possibly the cost to transport for disposal).

Similar changes are required to the other three Acts[8] in order to empower the administering body to immediately dispose of vehicles with no form of identification, reduce the notification period for traceable vehicles and ensure the recovery of all costs incurred from the last registered owner of the vehicle.

9.3.6 Recommendations for accessibility into ELV recycling system

The first recommendation is that all ELVs be accepted into the automobile recycling system free-of-charge.[9] For automotive dismantlers to be able to accept ELVs free-of-charge, the second recommendation is that the cost of the depollution of ELVs be covered by a depollution charge on vehicles coming into the country. The third recommendation is that this depollution charge be included with the initial registration fee for a vehicle being entered on the Motor Vehicle Register, to be paid by the first owner of the vehicle in New Zealand. As with other portions of the registration fee, it is recommended that this depollution charge be separated into a new Vehicle Disposal Fund set up to cover the cost of depollution of all ELVs entering the recycling system. The fourth recommendation is that the depollution charge be the current cost of depollution (a distinction being made as to whether the vehicle has air-conditioning or not), and claims from the Vehicle Disposal Fund to

[8] The National Park Act 1980, Section 71, the Reserves Act 1977, Section 110 and the Public Works Act 1981, Section 239.

[9] This will not eliminate abandoned vehicles, there will always be vehicles which are stolen and abandoned without traceable identification.

begin one year after the implementation of the depollution charge.[10] In order to claim from the Fund, dismantlers and local authorities, on presentation of their duplicate copy of the Certificate of Disposal, can claim depollution costs for all vehicles disposed of.

Finally, it is recommended that the current practice by local authorities of providing a collection site for ELVs be continued in the immediate future. This should be reviewed in time as the number of landfills in New Zealand decreases to the point where the cost to transport ELVs to the landfills outweighs the cost savings on storage at the landfills.

9.3.7 Suasive initiatives targeting vehicle owners

It is recommended that there be effective education of vehicle owners regarding the need for clear and enforced institutional procedures relating to CVL, notification of change of ownership, and the responsible disposal of vehicles. It needs to be well publicised that acceptance of ELVs for recycling is free-of-charge. Local information needs to be passed on to the public as to where they can take ELVs for disposal (the location of both local authority collection sites and dismantlers that accept ELVs of negative value), and also to whom they should report the sighting of an abandoned vehicle. Dissemination of information regarding the up-front depollution charge and the necessity for it, is required so that the need for the policy is clear and transparent.

9.3.7 Depollution of ELVs and monitoring of automobile dismantlers

The first recommendation for the automobile dismantling industry is that there be enforced mandatory depollution of all ELVs entering the recycling industry. The second recommendation is that automotive dismantlers be licensed and monitored from within their own industry. It is recommended that in the first instance an educatory approach be taken, providing guidelines for building requirements (for example, an ELV depollution area, covered from the weather and with an impermeable floor), for best practice depollution, and for the handling and disposal

[10] Certificates of Disposal must have been completed the year after the start of the Fund.

of hazardous substances. Following the transition phase, monitoring and enforcement will take place. It is recommended that the cost incurred by dismantlers for monitoring and enforcement be included in the disposal charge for vehicles entering New Zealand (spread over all incoming vehicles the cost per vehicle would be minimal).

A final recommendation is that while local authorities are providing collection sites, these sites be required to have a depollution area. These would need to be of the same standard as that required by dismantlers, so that the dismantler and air-conditioning technician are able to carry out depollution of incoming ELVs at the local authority collection site.

9.3.8 Recommendation for New Zealand's ELV recycling rate

The New Zealand automobile recycling industry is market-driven, recovering and recycling approximately 75 percent of an ELV (by weight). It is recommended that the market-driven approach continue without intervention.

9.3.9 Recommendations for disposal of ASR and hazardous components from ELVs

It is recommended that ASR continues to be disposed of in engineered landfills. For those local authorities that allow the landfill disposal of some lead-acid batteries, hazardous fluids, whole tyres, and ELVs, it is recommended that this practice be prohibited and the prohibition enforced.

9.4 Relative Importance of the Recommendations and their Costs and Benefits

Given the set of recommendations presented, it is relevant to consider how important each of them is. Does the achievement of the objective to reduce the externalities from motor vehicle disposal depend on the full acceptance of all of the recommendations? That is, would the omission of some of these recommendations significantly weaken the overall policy package?

Beginning with the institutional practices, is the enforcement of both CVL and notification of change of vehicle ownership necessary? Currently these are not enforced resulting in information on the Motor Vehicle Register that is unreliable, which makes it difficult to enforce fiscal responsibility throughout the life of a vehicle, until its disposal. Therefore the enforcement of CVL is a necessary prerequisite to hold accountable ELV owners who abandon their vehicles. Key to the enforcement of CVL is the issuing of an infringement for an unlicensed vehicle irrespective of whether or not the vehicle has been caught on the road. Also necessary is the enforcement of the notification of change of vehicle ownership.

Does vehicle disposal in New Zealand have to take place through the recycling system? In New Zealand the only legitimate current course of action for vehicle disposal is through the recycling system or to leave a vehicle indefinitely on private property. Recycling is the disposal method for motor vehicles that has the least environmental impact, and with the increasing number of vehicle imports each year, it is really the only sustainable approach to disposal in the long-term. If recycling of motor vehicles is required then documented proof (for example, the Certificate of Disposal) is also necessary. If the status quo remains, however, and a vehicle can be removed from the Motor Vehicle Register without disposal via the recycling system, the Certificate of Disposal is unnecessary. Were current practices to continue, it is recommended that there be clarification of the owner-declared destinations of ELVs, so that each option includes only one clear alternative. This will provide greater certainty regarding ELV destinations and information on the annual number of vehicles being recycled (a figure currently unknown).[11]

Consider now the legislation. Is it necessary to make the abandoning of a vehicle an offence subject to an automatic infringement? Although preferable, it is not crucial.

[11] Suggested options for declaration of destination of an ELV by the owner cancelling the vehicle's registration are, that the vehicle has been:

1. handed in for recycling
2. permanently removed from the roads and remaining on private property
3. written off by an insurer and remaining on private property
4. written off by an insurer and handed in for recycling
5. removed from New Zealand.

As long as CVL is enforced and data gaps are closed, an abandoned vehicle owner is more easily traced and held accountable irrespective of whether abandoning a vehicle is a specific offence. With regard to the current notification periods, if there was no reduction in the time frame with which local authorities must notify the public in an attempt to trace the owner, then fiscal responsibility for the vehicle by the owner must be enforced so that local authorities can recover the cost of notification and storage during this period.

Regarding entry into the recycling system, the proposed up-front disposal charge is a necessary prerequisite to enable ELV owners to dispose of their vehicles into the recycling system free-of-charge. If, however, ELV owners continue to be required to pay for the disposal of their vehicle, in order to remove the incentive to dump the vehicle, those abandoning vehicles must be made accountable with an enforced penalty sufficient to deter ELV dumping. Once again the necessity for enforced CVL and notification of vehicle change of ownership is observed.

The recommendation that the dismantling industry be licensed and monitored from within its own industry is not pivotal to the complete package of policy changes, however, the enforced mandatory depollution of all ELVs for recycling is necessary to improve the environmental impact of motor vehicle disposal in New Zealand. The local authorities that currently monitor the dismantlers could enforce mandatory depollution of ELVs, but to do this they would need increased resourcing. Whilst improving the environmental impact from the industry's activities, this would not see the industry's costs internalised.

The recommendation of educating vehicle owners on the need for clear and enforced procedures for vehicle licensing, ownership and disposal, and full information on the free disposal of ELVs and the associated up-front vehicle disposal charge will help facilitate some of the other recommended policy changes and contribute to the reduction of enforcement costs. As such they are a wise inclusion to the recommendations, but probably not pivotal to the strength of the overall policy package.

As previously stated, an attempt to determine the optimal level of abatement of environmental externalities from dismantling operations and from vehicles left abandoned, (and the policies needed to achieve these levels of abatement) is not undertaken in the research. This does raise the concern that the thesis may provide policy recommendations which lead to a reduction in abandoned vehicle numbers (and externalities resulting from automotive dismantling) where abatement costs at the margin are greater than the damage avoided. However, given the current situation and the level of societal dissatisfaction (toward abandoned vehicles in particular), implementation of these recommendations is a move in the right direction.

Each recommendation is now assessed in terms of the costs it will incur or the benefits it will provide to each of the stakeholder groups involved or affected by motor vehicle disposal in New Zealand. The stakeholder groups are vehicle owners, the LTSA, local authorities, automotive dismantlers, and society and the environment as a whole. Suggested net costs and benefits to each of the stakeholder groups (arising from the recommendations) are presented in Table 9.2.

As seen in Table 9.2, the recommended institutional changes regarding vehicle licensing, change of ownership and disposal impose administrative and enforcement costs on the LTSA and costs on those vehicle owners not currently complying with CVL or handing in their ELV for recycling. The suggested changes, however, result in direct benefits for the local authorities in terms of reduced costs for CVL enforcement and for abandoned vehicle disposal. There is benefit to society with the reduction of free-riders, and to the environment with increased vehicle disposal via the recycling system. The suggested legislative changes increase costs to ELV owners who choose to dump their vehicles, but have direct benefits for local authorities in terms of costs recovered, and benefit to the environment with reduced environmental degradation.

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Table 9.2: Costs and Benefits to Stakeholder Groups Resulting From Policy Recommendations

Policy Recommendations	Vehicle owner	LTSA[a]	Local Authorities	Dismantlers	Society / Environment
Licence overdue 2 months, automatic infringement/ 'Flag' owner's name on register for follow-up enforcement	-[b]	-	+		+
Temporary licence exemption renewed annually until the vehicle's disposal	-	-			
Enforced change of ownership (notified by seller)		-[c]	+		+
Enforced vehicle disposal via recycling system with Certificate of Disposal required to cancel registration	-	-	+	+	+
Abandoning a vehicle made an offence & subject to an automatic infringement	-[b]	-	+		+
Notification period reduced for abandoned vehicles	+		+		+
Enforced fiscal responsibility of last registered owner	-[b]		+		+
ELVs accepted for recycling free-of-charge	+		+[d]		+
Up-front disposal charge attached to registration fee	-		+	+	
Dismantler claims from Fund to cover depollution costs				-	
Mandatory depollution of ELVs for recycling				-	+
Licensing & monitoring of dismantlers from within own industry			+	-	+
Full information to vehicle owners, particularly ELV owners		-	-		+
Enforced prohibition of landfill disposal of car batteries, hazardous fluids, whole tyres, & ELVs.			-		+

[a] Land Transport Safety Authority [b] to non-compliant vehicle owners only [c] initially only, while forms are changed [d] Except those local authorities using a disposal fee for revenue gathering

Key: + represents an overall benefit
- represents an overall cost

Regarding entry into the recycling system, the recommended up-front disposal charge imposes a compliance cost on those buying an incoming vehicle to New Zealand. Free-of-charge acceptance of ELVs for recycling provides benefit for ELV owners, for local authorities subsidising ELV disposal and for the environment in terms of reduced incentive for abandoning vehicles on public and private property. The informing and educating of the public and of ELV owners in particular, imposes costs on the LTSA and on local authorities but is expected to provide benefit to society through the reduction of free-riders and of environmental externalities resulting from abandoned vehicles.

Finally, the recommendations pertaining to dismantling operations will increase compliance costs for those in the industry, in particular those dismantlers who currently take shortcuts regarding the depollution of ELVs and the handling and disposal of hazardous substances. There will, however, be benefit to local authorities who will no longer have the responsibility of the monitoring and enforcement of dismantling operations, and to society with reduced environmental degradation from some automotive dismantling practices. While it is acknowledged that the implementation of policy changes is never costless, and that the implementation of these recommendations may not lead to an optimal solution regarding externalities, they will go a long way toward internalising the costs associated with motor vehicle disposal and will result in net benefit to New Zealand society.

9.5 Recommendations for Further Research

Policies aimed at improved environmental outcomes are difficult to evaluate, most often due to a lack of available data. Prior to policy implementation there is often no 'before' data which can be used in a comparison with data collected some time after the implementation of the new policies. Although environmental degradation cannot easily be measured, the estimation of abandoned vehicle numbers and the costs incurred by local authorities in removing and disposing of them, given in this thesis, does provide some 'before' data. Regardless of the policies and instruments implemented, further research could be conducted at a later date to evaluate their success in terms of the number of vehicles abandoned, the proportion of abandoned vehicles traced, and the costs incurred by local authorities in dealing with them.

Further research could evaluate the effect of legislative and institutional changes on the number of vehicles being 'lost' to the Motor Vehicle Register, the number of infringements issued for unlicensed and unregistered vehicles and the number of infringements which currently have to be waived.

The number of vehicles coming into New Zealand has increased in the last decade at almost 10 percent per year. These vehicles will ultimately require disposal. It would be judicious, therefore, to implement changes to the management of ELVs as soon as possible, in order to reduce the environmental impact from motor vehicle disposal. To this end it is suggested that a working group, involving representatives from the Ministry for the Environment, Local Government New Zealand, LTSA, Ministry of Transport, and the automobile recycling industry, be formed to assess the findings contained in this thesis with a view to addressing the current deficiencies in the management of ELVs in New Zealand.

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Appendix One

Questionnaires for the Surveys of Local Authorities

Abandoned vehicles survey

City/District Council _____

Your name (if required for further information) _____

1) What was the number of abandoned vehicles found in your city/district in:

1995 _____

1996 _____

1997 _____

1998 _____

1999 _____

2) What was the total annual cost to the Council (including tow fees, storage costs, placing adverts etc), to dispose of those vehicles not claimed?

1995 _____

1996 _____

1997 _____

1998 _____

1999 _____

3) What happens to these vehicles? Please number these (1, 2, 3) according to which is the more frequent destination (1 being the more frequent destination). If you know rough percentages of destination, please put these down:

auto wreckers _____

straight to the crusher _____

disposed of in landfills _____

other _____

4) Does the City/District have a place where owners can legally dump their vehicle?

Yes / No

If yes, what is the cost to dump the vehicle

a. if the vehicle is stripped? _____

b. if the vehicle requires stripping? _____

c. if the actual cost of stripping is higher than b), does the council bear the additional cost? _____

Please turn over

5) When car bodies are collected by the crusher, what has happened to the:

seats _____

wheels _____

tyres _____

fluids _____

battery _____

other _____

if some waste is regarded as hazardous waste, does disposal cost more, if so how much?

_____

6) Has the council used any incentives to date to encourage responsible disposal of post-use vehicles? If yes, what are these? If amnesty periods, how often?

_____

_____

_____

_____

7) When did you introduce landfill fees (or significantly increase them)? Do you think this has had an effect on the number of abandoned vehicles in your area?

_____

_____

8) If there are environmental concerns regarding dumped vehicles, what are these?

_____

_____

_____

_____

9) Have you got any suggestions as to what more could be done to reduce the problem, by government and/or local body?

_____

_____

_____

_____

_____

_____

Abandoned vehicles survey II

City/District Council _____

Your name and email address (if required for further information)

_____

A) Abandoned Vehicles:

1) How many abandoned vehicles were recorded in your city/district during

2000 _____ 2001 _____

2) What was the total annual cost to the Council (including tow fees, storage costs, officer time, administration, etc), to dispose of these vehicles?

2000 _____ 2001 _____

Tracing abandoned-vehicle owners:

3) Do you usually try to trace the owner of an abandoned vehicle?

Yes ☐ No ☐

4) What would be the approximate rate of success? _____%

5) Please indicate the extent to which you agree with the following statements (*for each part, circle one of the numbers given*):

From your experience, key hindrances to tracing abandoned-vehicle owners would be:

	Totally agree				Totally disagree
a. Lack of vehicle information (plates, chassis no./VIN removed)	1	2	3	4	5
b. LTSA database information inadequate	1	2	3	4	5
c. Too costly to follow up	1	2	3	4	5
d. Not enough staff to follow up	1	2	3	4	5
e. Too low on department's priority list	1	2	3	4	5

6) On average, how many abandoned-vehicle owners are prosecuted each year? _____

7) Please indicate the extent to which you agree with the following statements (*for each part, circle one of the numbers given*):

From your experience, prosecution of abandoned-vehicle owners is often not carried out because:

	Totally agree				Totally disagree
a. The last registered owner of an abandoned vehicle says it no longer belongs to them	1	2	3	4	5
b. The council lacks the evidence to prosecute	1	2	3	4	5
c. The council lacks the funding	1	2	3	4	5
d. It is too much of an administrative hassle	1	2	3	4	5
e. It is too low on the department's priority list	1	2	3	4	5
f. The council lacks the legal expertise	1	2	3	4	5
g. The council lacks support from the Police	1	2	3	4	5

8) Please indicate the extent to which you agree with the following statements (*for each part, circle one of the numbers given*):

	Totally agree				Totally disagree
a. Abandoned vehicles are a serious problem in our city/district	1	2	3	4	5
b. Vehicle disposal should not come out of rate-payer money	1	2	3	4	5
c. The cost of cars in New Zealand should include a disposal fee	1	2	3	4	5
d. Abandoned-vehicle owners should receive a hefty fine, in addition to the expenses incurred by the council in removing and disposing of the vehicle.	1	2	3	4	5

9) Do you think the council should charge owners for disposal of their unwanted vehicles?

Yes ☐ No ☐ If yes, how much? $_____

10) Alternatively, as an incentive, do you think owners should be paid to bring in their unwanted vehicle for disposal?

Yes ☐ No ☐ Unsure ☐ If yes. how much? $_____

B) Vehicles left legally at the designated collection point for the crusher (this is often at the landfill):

11) How many passenger vehicles have been left at the collection point for the crusher, in your city/district, each year?

1996 _____ 1997 _____

1998 _____ 1999 _____

2000 _____ 2001 _____

12) History of charging the public for leaving unwanted vehicles at the crusher collection point in your city/district.

Please indicate the charges levied, and the years this service has been operating:

Year	Charge: Stripped vehicle	Charge: Un-stripped vehicle
e.g. 1996-2000	*$25*	*$50*
e.g. 2001-2002	*Nil*	*$50*

13) Vehicles must be stripped of certain items prior to being crushed. For vehicles that are left unstripped, how much does it cost the council to have the vehicle stripped?

$_____

14) What happens to the items that have to be removed before crushing?

	land-filled	collected for special disposal
a. Batteries	☐	☐
b. Tyres	☐	☐
c. LPG/CNG tanks	☐	☐
d. Seat foam & vinyl	☐	☐
e. Hazardous fluids	☐	☐

15) Has your council imposed a fine on abandoned-vehicle owners (in addition to recovering expenses incurred in removal and storage/disposal of the vehicle)?

Yes ☐ No ☐ If yes, how much is the fine? $_____

When was the fine imposed? _____

16) Has your council ever offered an incentive (other than an amnesty, which is dealt with below), to vehicle owners to bring in their unwanted vehicles for disposal?

Yes ☐ No ☐ If yes, what was the incentive? _____

During what period was the incentive offered?

_____

Abandoned Vehicle Amnesty – the following questions are only to be answered by those councils that have offered amnesty periods:

17) During the amnesty,

a. did your council offer to collect unwanted vehicles from private residences/sites?

Yes ☐ No, vehicles could be left at the collection point free-of-charge ☐

b. if yes, did your council charge to collect unwanted vehicles from private residences/sites?

Yes ☐ No ☐

c. if your council levied a charge to collect unwanted vehicles during the amnesty, what was the charge?

Year	Charge
_____	$_____
_____	$_____
_____	$_____

18) Please supply amnesty details:

Length of amnesty period:	Years in which amnesty offered	No. of vehicles illegally abandoned, during amnesty period	No. of vehicles legally disposed of during amnesty period
e.g. 1 month:	*2001*	*14*	*130*
	2000	*11*	*153*
e.g. 2 weeks:	*1999*	*6*	*54*

If you have any further comments or suggestions, please attach them to your survey.

Appendix Two

The Automotive Industry and the Trade Wastes Bylaw: Guidelines

The Automotive Industry and the Trade Wastes Bylaw

- A guide for local businesses

Businesses within the automotive industry may discharge liquid waste into the sewer. This waste is classified as "Trade Wastes" and includes byproducts such as solids, oils, greases, metals and other contaminants carried by water.

The Hutt City Council and Upper Hutt City Council have recently implemented the Hutt Valley Trade Wastes Bylaw 1997. Automotive Industry premises discharging trade wastes to the sewer will now require a Trade Wastes Discharge Consent.

Who is considered to be part of the Automotive Industry ?

This industry includes the following types of businesses:

- Car Groomers
- Mechanical workshops and Service Stations
- Vehicle washpads
- Spray Painters and Panel Beaters
- Radiator repairers
- Engine and gearbox reconditioners
- Automotive Dismantlers

Liquid Trade Wastes can be generated by activities including the following:

- Engine and parts cleaning operations
- Vehicle cleaning and steam cleaning
- Workshop clean-outs and floor cleaning
- Radiator repairs
- Spray painting and Panel Beating
- General mechanical repairs and dismantling activities

Waste Products from the Industry include :

- Oil and oily water
- Solids from cleaning and sanding activities
- Petroleum Hydrocarbons (diesel, petrol, kerosene, degreasers, solvents, oils)
- Battery acid
- Antifreeze
- Heavy metal residues from machining and cleaning operations
- Acidic or alkaline waste from cleaners
- Detergent residues
- Chlorinated solvents
- Paint residues

None of these waste products may be disposed of to the stormwater system.

These waste products/contaminants can have the following impacts upon the waste water treatment system if they enter the sewer :

Suspended Solids	e.g. grit.	Can settle in the sewers and wet wells causing blockages and increased wear in pumps.
Petroleum Hydrocarbons	e.g. Petrol, oils, diesel, Kerosene	Can create oil slicks at the discharge point. If flammable hydrocarbons enter the sewer then they can create a risk of explosion within the system.
Metals	e.g. Copper, Lead	Can cause harm to the environment and be toxic to sewage treatment systems.
Chlorinated Solvents	e.g. Some decarbonising liquids	Can be toxic to people, the environment and sewage treatment systems.
Ethylene Glycol	e.g. Antifreeze	Toxic to the environment and aquatic life.
pH	e.g. Acidic or alkaline cleaners	The discharge of acidic or alkaline solutions whose pH is outside of the Bylaw range of pH 5 - pH 10 (neutral water is pH 7) can cause problems within the sewer system. These problems include corrosion, the release of toxic gases and the risk of injury to sewer system workers.

2

How can your business minimise the risk of contaminants entering the sewer or stormwater systems ?

Rainwater or contaminant free cooling waters are the only liquids allowed to be discharged to the stormwater system. Should any contaminants such as oil, enter the stormwater system then that oil may contaminate a stream. If a business is found to be responsible for the discharge of a contaminant to the environment then they will be prosecuted under the Resource Management Act.

You may discharge "Trade Wastes" to the sewer system provided that those wastes comply with the Bylaw. Where your business produces a liquid waste which will not be acceptable (e.g. solvent waste) then alternative disposal arrangements will need to made with a waste disposal contractor. For some types of waste, compliance with the Bylaw may be achieved by an appropriate pretreatment method being implemented.

One of the first things that you can do to reduce the potential for contaminants to enter the sewer or stormwater systems is to examine the way you use potential contaminants within your business.

- Are you using a chemical that could be replaced by a less harmful substance that may also prove to be cheaper to dispose of ?
- Do you use chemicals efficiently ?
- Can spillage's migrate to the sewer or stormwater drains ?
- Do you have underground storage tanks and when did you last check them ?
- Do you store a much greater volume of potential contaminants than you actually need to ?

Pretreatment of your waste

The sewerage treatment system cannot treat large quantities of grease, oil, chemicals or large amounts of suspended solids. Therefore businesses that discharge trade wastes must install and maintain suitable pre-treatment systems to reduce or eliminate contaminants discharged to the sewer.

Pretreatment systems may consist of items such as grit traps, settlement traps, oil traps, corrugated plate separators, screens, diversion valves, pH correction systems, filters, etc. The exact requirements of each business will vary dependent upon the nature of their work and the type and volume of contaminant produced.

How should waste products from your industry be disposed of ?

A wide range of liquid wastes can be created and their acceptability in the waste water system ranges from some acceptance after pretreatment to not acceptable at all.

WASTE PRODUCT	DISPOSE TO SEWER?	DISPOSAL METHOD
Waste oil	No	Segregate from other waste. Collection for reuse/ recycling by Waste Disposal companies.
Oily Water	May be possible after pretreatment	Can be collected by waste disposal contractors for disposal via a waste recycling plant.
Antifreeze	No	Should not be discharged to the sewer or stormwater systems. It should be segregated from other wastes (not mixed with oil or oily water) and it can then either be recycled or sent on to a waste disposal company. See attached listing of recyclers/waste recycling companies.
Battery acid	No	Battery acid should not be discharged to the sewer system, it can contain high levels of metallic contaminants in addition to being corrosive to the sewer. It should be safely stored and disposed of via a waste disposal company. See attached listing of recyclers/waste recycling companies
Chlorinated Solvents	No	Not permissible to discharge to the sewer system. Use a waste disposal/recycling company. See attached listing of recyclers/ waste recycling companies
Oil based paint Residues or waste thinners	No	Not permissible to discharge to the sewer system. Use a waste recycling company. See attached listing of recyclers/waste recycling companies
Acidic or alkaline waste cleaning solutions	May be possible after pretreatment	Dependent upon their nature these contaminants .may be suitable for disposal to the sewer system after pretreatment, i.e if the waste meets the Bylaw acceptance standards, otherwise it will need to be stored and transported to a waste disposal/recycling company.
Radiator repair waste water.	May be possible after pretreatment	May contain high levels of Zinc, Lead and Copper.
Diesel, petrol, kerosene, degreasers, solvents	No	Not permissible to discharge to the sewer system. Any discharge point that has the potential for any of these contaminants to enter the system requires pretreatment systems so that hydrocarbons are effectively trapped.

Antifreeze Recycling

Within the Hutt Valley there are now a number of workshops operating antifreeze recycling machines and outside workshops may be able to arrange for the recycling of their waste antifreeze by these machines. This will result in savings for the workshop and their customers.

The following businesses have antifreeze recycling capability that may be available for other workshops to make use of:

• Lake Auto Services	Ross Lake	Ph 568 8815
• Hutt Automatics(Lower Hutt)	John Henderson	Ph 569 3161
• Wainuiomata Motors	Peter Hutchison	Ph 564-8823
• Midas Automotive Services	Mark Watchman	Ph 569-8885

Antifreeze recycling machines are distributed by :

Century Distributors NZ Ltd	John Jenkins	Ph/Fax 04 566 6291
Peart Holdings	Terry Cutting	Ph 09 379 8888
		Fax 09 307 6479

Waste Oil Disposal

Waste oil that has not been contaminated with other liquids such as water, solvents or antifreeze can be sent for recycling/reuse via :

- Thurline Transport Services Ltd
  Used Oil Collection
  20 Barnes Street
  Seaview
  Ph 04 568 2185

NOTE : **A number of other waste disposal companies can also offer a waste oil collection service.**

Other Liquid Waste Products

May be able to be disposed of either directly or indirectly by one or more of the following Waste Disposal/Waste Recycling Companies:

United Environmental Ltd	57 -59 Port Road Seaview Ph 04 568 8622	Liquid and Hazardous Waste
Refined Solvents Ltd	9 Gough Street Seaview Ph 04 568 3784	Liquid and Hazardous Waste
Wastecare Ltd	PO Box 38-383 Wellington Mail Centre Ph 04 568 3579	Liquid Waste
Onyx New Zealand Ltd	146 Hutt park Road Seaview Ph 04 472 3140	Liquid waste
Dawsons City Sumps	PO Box 48-094 Silverstream Ph 04 528 9909	Liquid Waste
Daily Waste	PO Box 7174 Wellington South Ph 04 383 5692	Liquid Waste
Silverstream Plumbing	PO Box 48-070 Silverstream Ph 527 8529 025 427 145	Liquid Waste
Wellington Liquid Waste	PO Box 20-046 Wellington South Ph 04 383 6023	Liquid waste

NOTE: **The above list is not exclusive or exhaustive and there may be other waste disposal contractors available. Please consult other sources such as the yellow pages for other operators and further information on the services offered.**

The Automotive Industry and the Trade Wastes Bylaw

HUTT CITY COUNCIL

UPPER HUTT CITY

- A guide to Washpads, Radiator Repair Waste and Stormwater Diversion Valves

1. Washpads

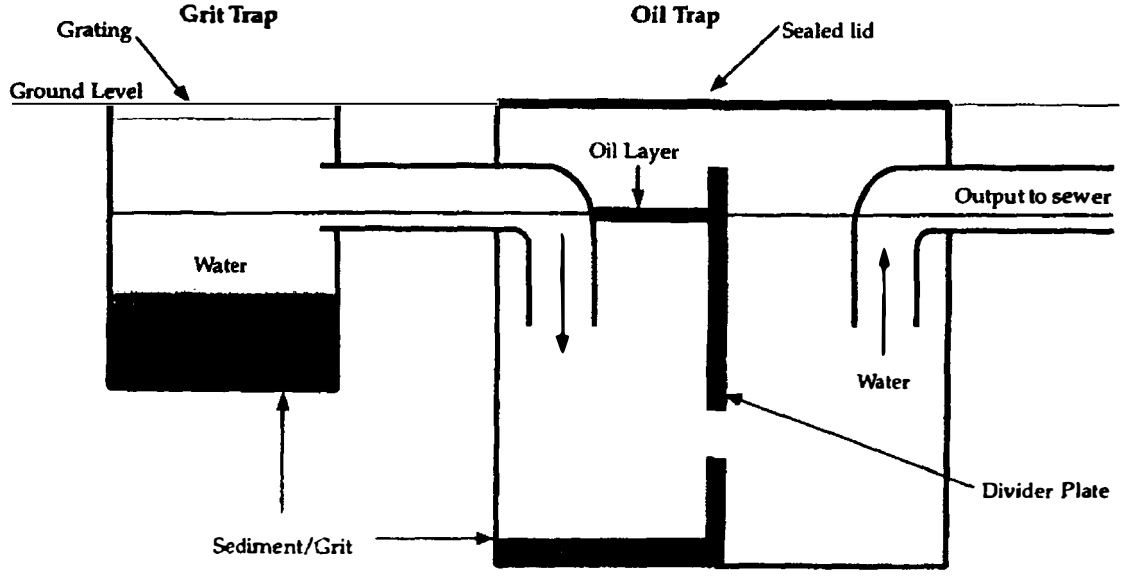
Within the automotive industry one common potential source of contamination is vehicle or vehicle component cleansing operations utilising detergents, steam cleaning and caustic or acidic cleaners.

A typical vehicle washpad or steam cleaning bay should contain the following pretreatment items:

1. The input (first stage) is a grit trap, the volume of which will be determined by the nature of the work and the rate of flow.

2. The second stage is an oil trap that is connected to the output of the grit trap. For large installations there may need to be several oil traps in series to ensure that as much oil as possible is captured before the discharge can enter the sewer.

Below is a diagram of a typical pretreatment system for a washpad

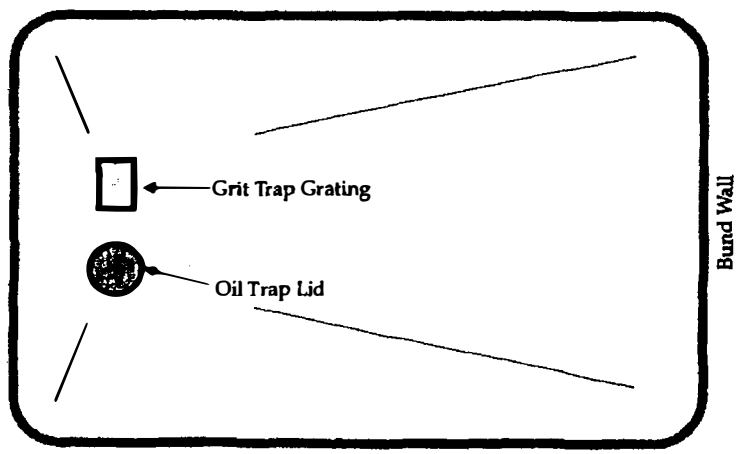


Waste water from the bunded washpad enters the grit trap via a grating or grill which forms the lid of the trap. The majority of any solids being carried by the waste water then settle on the bottom of the trap and the water and any oil or other hydrocarbons present are carried through to the oil trap. Once in this trap any oils or hydrocarbons present rise to the surface of the waste water and since the exit point is well below the surface these hydrocarbons are trapped in the first chamber of the oil trap.

There should be a divider plate(usually steel) in the centre to effectively create two chambers within the trap. The divider will have a hole in it to allow the passage of water but not oil or solids. Any residual solids that have got past the grit trap should settle to the bottom of the oil trap in the first chamber.

The washpad itself will be surrounded by a bund wall to contain any wash water and exclude additional surface rainwater; and the pad will be sloped towards the grit trap grating.

Typical Washpad Layout Plan



Maintenance requirements

The traps will require periodic emptying and cleaning to ensure that they are able to function properly. If the grit trap is allowed to become full of sediment then additional sediment will either cause a blockage at the grit trap, or flow into the oil trap decreasing its efficiency and possibly causing blockages within the sewer system. If the sewer does

become blocked and the source of the problem can be traced, the generator will be held financially liable for remedial costs.

Regular maintenance should be by way of a cleansing contract with a waste disposal contractor. These contractors are listed in the yellow pages under "Waste Disposal" and "Recycling". The contractors should empty the trap, clean the trap walls and any inspection/cleaning eyes present. Afterwards the trap will need to be refilled with cold water to ensure that it can function effectively.

Note 1: The excessive use of detergents can cause oils to be carried through to the sewer as part of an emulsion. This situation should be avoided as the oil will eventually separate out in the sewer system and it may cause you to breach the Trade Wastes Bylaw. Use detergents and other cleaning solutions as per the manufacturers instructions.

Note 2: Solvent based degreasers should only be used within sealed system parts cleaners or similar systems that are not discharged to the sewer.

2. *Radiator Repairers*

In addition to the generation of waste antifreeze radiator repair operations can produce high concentrations of metals in the waste water, Iron is not normally a problem metal but Lead, Zinc and Copper are. The pH of the waste water may also be an issue given that the nature of the repair process tends to acidify waste water and some waste precipitation/ settlement methods may create a waste water that is alkaline.

A reduction in heavy metal content is almost certainly required for the waste water to meet Bylaw acceptance criteria and this removal may be achieved by a range of treatments including:

1. Settlement and/or filtration. These methods will remove heavy metals that are in the form of particulates but will not remove heavy metals that have been dissolved into solution.
2. Chemical or electrochemical techniques are options that can be used to achieve the removal of dissolved metals.

3. Stormwater Diversion valves

It is not acceptable to have stormwater discharged to the sewer system primarily because of the unpredictable loading it places on the system. The ingress of stormwater to the sewer system should be eliminated where possible and minimised otherwise. Appropriate bunding of wash areas and areas that might drain to a sewer connection is one simple way of minimising the impact on the system.

Ideally washpads should be roofed to prevent the entry of rainwater into the sewer system but failing this washpads may need to be fitted with a stormwater diversion valve. This valve will be arranged such that the washpad when not in use drains to the stormwater and when being used the connection will be to the sewer system. The requirement for the installation of diversion systems will be determined by the Trade Wastes Officer.
A number of different designs of diversion valve systems exist and they all require regular maintenance to ensure that the unit functions correctly. Diversion systems can be obtained from a number of sources including:

Wilkinson Valve

Mr Alan Wilkinson
90 Greenhaven Drive
Christchurch 9
Phone 03 383 1853

Fox First Flush Systems

Plumtec New Zealand Ltd
PO Box 302-027
North Harbour Post Centre
Auckland
Ph 09 415 2165
Fax 09 415 2167

Remember - Any traps or diversion valves will need to be installed by a registered drainlayer and you must apply for a building consent prior to installation.

HUTT CITY
WE'VE GOT THE LOT

Hutt City Council
Private Bag 31912
Lower Hutt

Issue Date: Aug 1998

Appendix Three

Land Transport Safety Authority Functions, Forms and Follow-Up Letters

Legislative Functions of the Land Transport Safety Authority (LTSA)

The principal objective of the LTSA is to "undertake activities that promote safety in land transport at a reasonable cost" (Section 189 of the Land Transport Act 1998). Section 190 of the Land Transport Act states:

(1) In carrying out its principal objective, the Authority has the following functions:

(a) To establish safety standards concerning entry into, and operation in, the land transport system;

(b) To monitor adherence to safety standards within the land transport system;

(c) To ensure regular reviews of the land transport system to promote the improvement and development of its safety;

(d) To investigate and review land transport accidents and incidents in its capacity as the responsible safety authority, subject to any limitations set out in the Transport Accident Investigation Commission Act 1990;

(e) To maintain and preserve records and documents concerning activities within the land transport system, and in particular to maintain the Land Transport Register;

(f) To provide to the Minister such information and advice as the Minister may from time to time require;

(g) To promote safety in the land transport system by providing safety information and advice, and fostering safety information education programmes;

(h) To carry out its functions in relation to the Safety (Administration) Programme under the Transit New Zealand Act 1989.

(2) The Authority must carry out such other land transport functions, and such land transport duties, as the Minister may from time to time prescribe by notice in the Gazette.

Vehicles Exempt from Registration and Licensing

The following vehicles are exempt from being registered and licensed for road use:

- vehicles used on a road that is closed temporarily by a local Authority or other body, for holding special events
- powered vehicles that are temporarily being towed without the use of their own power
- trailers designed exclusively for agricultural operations and used on the road to or from a farm for inspection, servicing or repair
- trailers being towed by Exempt Class B vehicles.

Exempt Class A

Exempt Class A vehicles are not exempt from registration and licensing but are exempt from registration fees and the vehicle licence portion of the licensing fee. You still have to pay for other fees and levies included in the total licensing fee - for example, you still have to pay for the appropriate ACC levy, registration plates and labels.

Exempt Class A vehicles are:

- Vehicles used on a road that is not a public highway, vehicles used on public highways only for inspection, servicing, repair or for a practical driving test (please note that you can only drive vehicles without a WoF or CoF on the road for the purpose of bringing the vehicle into compliance, and it must be safe to be operated for that purpose)
- pedestrian-controlled goods services vehicles
- fully tracked vehicles
- vehicles used in a declared road construction zone
- vehicles crossing or proceeding along a section of a road when authorisation has been given by a local roading authority under certain conditions
- all-terrain vehicles (ATVs) used on a public highway, in moving from the owner's residence to a road that isn't a public highway, where the distance traveled doesn't exceed three kilometres, or in connection with the inspection, servicing or repair of the vehicle.

Exempt Class B

Exempt Class B vehicles may be exempt from the payment of some levies.

Exempt Class B vehicles are:

Farm vehicles

- a motor vehicle (not a trailer) designed for agricultural operations and used on a road solely for agricultural operations, including mobile or movable huts, galleys, and similar motor vehicles used on a road solely in connection with such operations. (Not including a vehicle designed for cartage or spreading of lime or fertiliser when used on the road for cartage or a weed sprayer on a truck chassis)
- a motor vehicle (not a trailer) owned by a farmer and only used on the road to go from one part of the farm to another part of the same farm (for farming purposes); or from one farm to another farm owned or managed by the same person
- a tractor or traction engine used on the road solely for agricultural operations; or if used mainly for agricultural operations and otherwise only in connection with road construction and maintenance
- a tractor owned by a farmer used on a road only for
    a. the owner's agricultural operations, and/or
    b. the cartage of milk, cream, or whey to or from a dairy factory, and/or
    c. cartage of any farm produce, implements, stock, or other farm requisites from one farm to another farm that is owned or managed by the same person or for a maximum round trip of 21 kilometres of public highway
- a tractor that is designed and used partly for the purpose of loading lime or fertiliser into topdressing aircraft and partly for drawing a trailer that is designed and used exclusively for carrying aviation fuel in a permanently attached tank for use in topdressing aircraft, and for no other purpose and is not taken on any round trip of more than 21 kilometres of public highway.

Mobile machinery

Any vehicle (other than a tractor) with machinery permanently attached, designed to be used on the road for driving, carrying or propelling:

- airport runway sweepers
- electrical substations
- filters for transformer oil
- stationary log haulers, or
- aero engine test benches.

Miscellaneous

- self-propelled grass mowers used solely for the upkeep of grounds (cemeteries, recreation or education grounds) or cutting of grass verges on roads
- mobile huts, galleys or similar vehicles used solely for construction or maintenance of roads
- traction engines
- forklifts

- airport crash tenders when only used on the road in emergencies
- vehicles used solely for loading and unloading ships, including embarking and disembarking passengers, baggage, mail and other cargo, and used on a public highway only when unladen and going from one wharf to another wharf, or from its usual place of storage to a wharf
- tractors used by local authorities solely for the construction. maintenance and ,owing of stopbanks and the banks of other watercourses, such as rivers, streams, drains and canals
- tractors used solely for shunting railway rolling stock.

MR1

transportsafety
Transport Registry Centre

Application for Motor Vehicle Licence

Plate No. [redacted]
Reminder No. 150401

[redacted]
Hillsborough
AUCKLAND 1004

Current Details
TRIUMPH 2500 TC
BLUE **Vehicle Usage** Private Passenger

Residential Address (if different from postal address)

The licence for this vehicle will expire on 16/07/2002.
To renew the licence -
- ★ **Ensure your vehicle has a current Safety Inspection (WOF or COF).**
- ★ **Complete Section ❶ if applicable, then in all cases complete panels ❷ and ❸.**
- ★ **Present this form and the licensing fee to an authorised agent for the LTSA.**

If you are not going to licence the vehicle please read the important information in Note 5 on the reverse of this notice.

❶ Change of Details

Vehicle Usage - If the usage has changed from Private Passenger enter the new usage from Note 1 overleaf.

Code	Description

Vehicle Colour - If the vehicle has a new colour, enter the colour from Note 2 overleaf.

Basic Colour	Secondary Colour

Change of Address - If the address shown above is incorrect, please enter the correct details below. To change the address of other vehicles you own please complete a form MR28, available from LTSA agents.

Residential Address

Suburb Town

Postal Address

Suburb Town

LTSA Agents

AMI Insurance
Automobile Association
NZ Post Ltd
On Road NZ Ltd
Vehicle Inspection NZ
Vehicle Testing NZ
Independent Agencies

OFFICE USE ONLY

DATE STAMP

INPUT	CHECKED

Total Payable (GST inclusive)
$

❷ I certify that the particulars given are correct.

X Applicant's Signature

❸ Licence Period.

- ☐ 6 MONTHS $112.30
- ☐ 12 MONTHS $217.05
- ☐ OR SPECIFY MONTHS REQUIRED (3-12)

THIS PORTION IS ONLY TO BE DETACHED BY THE LTSA AGENT ONCE THE MR1 HAS BEEN PROCESSED

transportsafety
Transport Registry Centre

Plate. [redacted]
TRIUMPH
2500 TC

Receipt for Motor Vehicle Licence MR1

[redacted]
Hillsborough
AUCKLAND 1004

Due Date
17/07/2002

Fee Components
(shown for 12 month licence)

Licence Fee*	$43.50
ACC Levy*	$141.10
Other Levies*	$1.64
Administration	$6.72
GST*	$24.12
Total*	$217.05

*Fee varies with licence period
More information over page

TAX INVOICE WHEN RECEIPTED
GST REG NO 60-931-331

DATE STAMP

New licence expiry date

Total Payable (GST inclusive)
$

255401971/002/MR1

MR1 - NOTES

1 **Vehicle Usage** *(Please also read vehicle usage notes)*

01 Private Passenger	05 Commercial Ambulance	09 Fire Brigade
02 Taxi, Commercial Passenger	06 Other (non-commercial) Ambulance Hearse	10 Exempt Class A (EA)[3]
03 Transport Licensed Goods[1]	07 Rental	11 Exempt Class B (EB)[3]
04 Other (standard) Goods[2]	08 Recovery Service	12 Diplomatic
		13 Special Purpose Caravan[4]

Vehicle Usage Notes.

1 *For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) where payment is received for the delivery of the goods, and for goods vehicles with a gross vehicle mass (GVM) of 6000 kg or greater.*

2 *For vehicles used in the carriage of goods if* ***no payment*** *is received for the delivery of the goods, and provided the GVM is less than 6000 kg. Examples are - domestic trailer, light goods van used for domestic purposes.*

3 *Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from other requirements. When usage 10 or 11 has been nominated, the completed and signed MR1 form will be used as a declaration that the motor vehicle registered by use of that form, and the vehicle's usage, complies with the requirements of the relevant legislation. Information regarding the registration and licensing of exempt vehicles can be obtained from the LTSA or authorised LTSA agents. LTSA Factsheet 27 provides a plain English summary and guide to the registration and licensing of exempt vehicles. If you are unsure of your obligations please call the Motor Vehicle Registration Helpdesk - 0800 108 809.*

4 *For vehicles which are designed for the transportation of special purpose equipment, rather than for the carriage of goods, e.g. trailer type caravans, tractors graders, forklifts, self-propelled cranes or cherry pickers.*

2 **Colours.** The vehicle colours should be selected from the following list.
Black Blue Brown Cream Gold Green Grey Orange Pink Purple Red Silver White Yellow

3 **Identification.** Where the vehicle ownership record is incomplete, the owner will be advised of the requirement to present identification while relicensing. This can be one of the following - NZ driver's licence, LTSA card or documents which provide proof of full name, date of birth and signature.

4 **Licence Fee Components. (Note - total amount due is rounded down to nearest 5c)**

4.1 The licence fee goes to the National Roads Fund for road construction and to road safety programmes by LTSA, and New Zealand Police.

4.2 The ACC Levy, is collected on behalf of the ACC and provides personal injury insurance cover for those injured in motor vehicle accidents on public roads. It covers entitlements such as medical and hospital costs, weekly compensation and rehabilitation care.

4.3 Other Levies - The vehicle may be subject to one or more of the following levies depending upon vehicle type and usage: - Safety Standards levy - $1.64, Audit and Standards levy - $1.33, Transport Licensing Fee - $21.33 (all exclusive of GST). These levies are used by the LTSA for the audit and administration of the Safety Standards regime.

4.4 The Administration fee funds the operating costs of the Transport Registry Centre.

4.5 Note - Fees are payable in accordance with the applicable legislation. Fees quoted on this notice were correct at time of printing. Where the fees have subsequently changed the amount to be paid is that specified in the applicable legislation.

5 **Vehicles not being used on the road.** Legislation requires vehicles to be licensed at all times. If the vehicle remains unlicensed for 12 months its registration will be cancelled by the Registrar. Outstanding licence fees will remain payable and this debt will be referred to our debt collection agency. Additional costs may also be charged at this time.

You can apply for an exemption from licensing if the **vehicle will not be used for more than 3 months**. Please read section 4 at the bottom of this notice. If a vehicle with an exemption from licensing is licensed before the minimum 3 month exemption period has ended, licensing fees will be payable from the date the last licence exemption expired.

If the **vehicle has been stolen** contact the Transport Registry Centre. Current legislation does not allow for a stolen vehicle's registration to be cancelled.

If the **vehicle has been premanently removed from the road** you must complete an Application to Cancel Registration (form MR15) and surrender the registration plate(s). Note: NZ Post do not process MR15's.

If you **sell the vehicle**, you are required to advise this office of the new owners name and address details within 7 days from the date of disposal by, either completing a Notice by Person Selling Disposing a Motor Vehicle (form MR13A) or by telephoning 0800 108 809. If you sell dispose of an unlicensed vehicle you remain liable for outstanding fees to the date the notification is received at this office.

Failure to take one of these actions outlined means that you remain liable for outstanding licensing fees. If you are unsure of what action to take please phone 0800 108 908.

6 **Payment.** If you wish to pay by:
- Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
- Credit Card please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions.

7 **Additional Information.** Please call the Transport Registry Centre Help Desk on 0800 108 809 Monday to Friday 8.00 am - 6.00 pm. Our postal address is Transport Registry Centre, Private Bag, Palmerston North.

❹ Application for Exemption.

A) Before the Due Date 17/07/2002. No fee is payable before this date.

This vehicle will not be used for ☐ specify period (minimum of 3 months and maximum of 12 months)

I understand that it is an offence to use this vehicle on a public road while it has an exemption from licensing. I certify that the particulars given are correct.

X Applicant's Signature

HO53Ø
150401

If any details have changed please complete Section ❶ overleaf.

To apply for an exemption from licensing you can either - Lodge an Application for Exemption from Licensing (form MR24) available from LTSA agents, or mail this application to the Transport Registry Centre, Freepost 493, Private Bag, Palmerston North.

If you mail this application, confirmation of your exemption will be sent to you. If you do not receive a letter of confirmation within one month, please phone 0800 108 809 to ensure that your application has been received and processed.

B) After the Due Date. Complete a form MR24, available from LTSA Agents.

If an application for exemption is late a fee may be payable for the unlicensed period since the Due Date.
No fee is payable if an application is made before 17/09/2002. If an application for exemption is not made -

- before 17/09/2002 the outstanding licence fee will be $42.20
- before 17/11/2002 the outstanding licence fee will be $77.15
- the outstanding licence fee will continue to increase. After remaining unlicensed for more than 12 months this vehicle's registration will be cancelled and you will be required to pay 12 months outstanding licence fee.

The Transport (Vehicle and Driver Registration and Licensing) Act 1986 provides for the registration and licensing of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to and may request correction of any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

25540197 1/002/MR1

MR1 - NOTES

1. The Transport (Vehicle and Driver Registration and Licensing) Act 1986 provide for the registration and licensing of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

2. **Vehicle Usage** *(Please also read vehicle usage notes)*

01 Private Passenger	08 Recovery Service
02 Taxi, Commercial Passenger	09 Fire Brigade
03 Transport Licensed Goods[1]	10 Exempt Class A (EA)[3]
04 Other (standard) Goods[2]	11 Exempt Class B (EB)[3]
05 Commercial Ambulance	12 Diplomatic
06 Other (non-commercial) Ambulance/Hearse	13 Special Purpose/Caravan[4]
07 Rental	

Vehicle Usage Notes

1. *For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) if payment is received for the delivery of the goods, and for goods vehicles with a gross vehicle mass (GVM) of 6000 kg or greater.*
2. *For vehicles used in the carriage of goods if* ***no payment*** *is received for the delivery of the goods, and provided the GVM is less than 6000 kg. Examples are:- domestic trailer, light goods van used for domestic purposes.*
3. *Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from motor taxation. The completed and signed MR1 form, when usage 10 or 11 has been nominated, will be used as a declaration that the rules in regard to exempt vehicles will be complied with. Information regarding exempt licensing for motor vehicles can be obtained from authorised agents of the Land Transport Safety Authority. Nomination of a usage of 10 [exempt class A (EA)] or 11 [exempt class B (EB)] requires compliance with the rules as set out in the Exempt Vehicles pamphlet.*
4. *For vehicles which are designed for the transportation of special purpose equipment, rather than for the carriage of goods. e.g. trailer type* caravans, tractors, graders, forklifts, self-propelled cranes or cherry pickers.

3. **Colours**
The vehicle colours should be selected from the following list:

Black	Blue	Brown	Cream	Gold	Green	Grey
Orange	Pink	Purple	Red	Silver	White	Yellow

4. **Payment**
If payment is by cheque, make the cheque payable to the Land Transport Safety Authority agent where the cheque is being processed.

5. **Additional Information**
For further information please call the Transport Registry Help Desk Free on 0800-108 809, Monday to Friday 8.00 am - 5.30 pm.

MR1 12/97

transportsafety
Transport Registry Centre

Application to License Motor Vehicle

MR1B

Vehicle details

Plate number

Make

Model *(See note 2 overleaf)*

Please ensure your vehicle has a current Safety Inspection (WOF or COF)- *(see note 3 overleaf).*

Licence period

☐ 6 Months ☐ 12 Months ☐ or specify months required (3-12) *(see note 4)*

Vehicle colour

*Please select vehicle colour from note 5 overleaf and show here

*Basic colour

*Second colour

Changed details

New Usage

01 Private Passenger
02 Taxi, Commercial Passenger
03 Transport Licensed Goods*
04 Other (standard) Goods*
05 Commercial Ambulance
06 Other (non commercial) Ambulance/Hearse
07 Rental
08 Recovery Service
09 Fire Brigade
10 Exempt Class A (EA)*
11 Exempt Class B (EB)*
12 Diplomatic
13 Special Purpose (excluding EA & EB)*

*See note 6 overleaf.

Please show New Usage here

Owner details

Last name/Company name

First name/s

Residential address

Note: If your address details have changed in order to update the address of other vehicles you own, please complete an MR28 form, which is available from an LTSA agent.

Suburb

Town

Postal address (if different from above)

Applicant's signature

I certify that the particulars given are correct

X

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

New Licence Expiry Date

Total Payable (GST inclusive)

$

Input

Chkd

Date Stamp

MR1B05/02 TRC COPY

MR1B - NOTES

1. The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the registration, licensing and notification of change of ownership of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

2. **Model**
State the manufacturer's designation e.g. Corolla, Sigma etc. - not the year of manufacture.

3. **Vehicle Inspection**
Some miscellaneous classes of vehicles are exempt from the safety inspection requirement. If you are unsure of the requirements for your vehicle, please call the Help Desk. (See Note 10)

4. **Licence Period**
Minimum licence period is 3 months. If you want to change your licence expiry date, please lodge an Application to Change Licence Expiry Date (form MR27).

5. **Colours**
The vehicle colours should be selected from the following list:

Black	Cream	Grey	Purple	White
Blue	Gold	Orange	Red	Yellow
Brown	Green	Pink	Silver	

6. **Vehicle Usage** *(Please also read vehicle usage notes)*

03	Transport Licensed Goods ❶	10	Exempt Class A (EA) ❸
04	Other (standard) Goods ❷	11	Exempt Class B (EB) ❸
		13	Special Purpose (excluding EA & EB) ❹

Vehicle Usage Notes

❶ *For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) if payment is received for the delivery of the goods, and for goods vehicles with a gross vehicle mass (GVM) of 6000kg or greater.*

❷ *For vehicles used in the carriage of goods, if no payment is received for the delivery of the goods, and provided the GVM is less than 6000kg. Examples are:- domestic trailer, light goods van used for domestic purposes.*

❸ *Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from other requirements. When usage 10 or 11 has been nominated, the completed and signed MR2B form will be used as a declaration that the motor vehicle registered by use of that form, and the vehicle's usage, complies with the requirements of the relevant legislation. Information regarding the registration and licensing of exempt vehicles can be obtained from the LTSA or authorised LTSA agents. LTSA Factsheet 27 provides a plain English summary and guide to the registration and licensing of exempt vehicles. If you are unsure of your obligations please call the Motor Vehicle Registration Helpdesk - 0800 108 809.*

❹ *For vehicles which are designed for the transportation of special purpose equipment, rather than for the carriage of goods, e.g. trailer-type caravans, tractors, graders, forklifts, self-propelled cranes or cherry pickers.*

7. Fees
The fees comprise the appropriate licence fee payable under the Transport (Vehicle and Driver Registration and Licensing) Act 1986, an accident compensation levy payable under the Accident Compensation Act 1982 (except for trailers and a few specified vehicles), a charge for the licence label, and where applicable, a transport licence fee. Please note an administration and label fee is charged on every licence application, therefore fees will vary with period purchased.

8. **Payment**
If you wish to pay by:
- Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
- Credit Card, please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions.

If you sell an unlicensed vehicle which is subject to continuous vehicle licensing or its registration is cancelled because it has remained unlicensed for over one year, outstanding licensing fees will remain payable. The debt will be referred to our debt collection agent who is empowered to order payment of the outstanding licensing fees and any additional costs.

9. **Continuous Vehicle Licensing (CVL) and exemptions.**
Vehicles that are subject to CVL must remain licensed at all times. If such a vehicle remains unlicensed for more than 12 months, its registration will be cancelled. Outstanding licence fees will remain payable and this debt will be referred to our debt collection agency which is empowered to order payment of outstanding licensing fees. Additional costs may also be charged at this time.
If you sell an unlicensed vehicle, you remain liable for licensing fees to the date of sale.
If the vehicle is to remain unlicensed for a period of more than 3 months, an exemption from licensing can be applied for in advance, by filling out an application (form MR24), available from LTSA agents.
If a vehicle with an exemption from CVL is licensed before the minimum 3 month exemption period has elapsed, licensing fees will be payable from the date the previous licence/exemption expired.

10. **Additional Information**
For further information please call the Transport Registry Centre Help Desk 0800-108 809, Monday to Friday 8.00am - 6.00pm.

OVERDUE MR1

Plate No.

Reminder No 872334

transportsafety
Transport Registry Centre

Application for Motor Vehicle Licence

AUCKLAND 1002

OVERDUE

The Motor Vehicle Licence For

MAZDA
MPV

Colour **Green/Cream**
Vehicle Usage **Private Passenger**

EXPIRED ON
18/06/2002

You are now required to take one of the following actions at a Land Transport Safety Authority Agent

- License the Vehicle ➤ Lodge this form with the licensing fee. **This vehicle must be licensed at all times unless an exemption has been granted.**
- Apply for an exemption (3 to 12 months) ➤ **Complete form MR24** - see over page for details.
- If the vehicle is to be permanently removed from the road ➤ Lodge form MR15 and surrender the registration plates.
- If the vehicle has been sold ➤ **Complete form MR13A** - you will continue to be liable for the licensing fees up to the date you notify the LTSA of the sale of your vehicle.
- If the vehicle has been stolen contact the Transport Registry Centre.

If this vehicle remains unlicensed for more than twelve months its registration will be cancelled by the Registrar. If the registration is cancelled, to get the vehicle back on the road you must pay additional costs for certification, registration, licensing, plates and labels.

ANY OUTSTANDING LICENSING FEES REMAIN PAYABLE AND MAY BE REFERRED TO OUR DEBT COLLECTION AGENCY WHICH IS EMPOWERED TO ORDER PAYMENT.

To license this vehicle -

➤ Ensure your vehicle has a current Safety Inspection (WOF or COF)
➤ Complete all sections 1,2,3 and 4 below, and over page if applicable
➤ Present this form and the licensing fee to an LTSA agent

LTSA Agents

AMI Insurance
Automobile Association
NZ Post Ltd **
On Road NZ Ltd
Vehicle Inspection NZ
Vehicle Testing NZ
Independent Agencies
** Not for MR15

OFFICE USE ONLY

DATE STAMP

Total Payable (GST inclusive)

$

❶ **Has the vehicle COLOUR or USAGE changed?**
☐ No ☐ Yes ⇨ *You must complete the Change in Colour/Usage section over page.*

❷ **Has any of your ADDRESS details changed?**
☐ No ☐ Yes ⇨ *You must complete the Change of address section over page*

❸ *I certify that the particulars given are correct.*

Applicant's Signature

❹ **Licence Period.**

3 Months	$56.40	MONTHS REQUIRED (3-12)
6 Months	$105.20	

Plate

MAZDA
MPV

transportsafety
Transport Registry Centre

Receipt for Motor Vehicle Licence MR1

AUCKLAND 1002

FOR OFFICE USE ONLY

OVERDUE

$202.85

For 12 month licence from 19/06/2002

Fee Components
(shown for 12 month licence)

Licence Fee*	$43.50
ACC Levy*	$128.45
Other Levies*	$1.64
Administration	$6.72
GST*	$22.54
Total*	$202.85

*Fee varies with licence period
More information over page

TAX INVOICE WHEN RECEIPTED
GST REG NO. 60-961-331

DATE STAMP

New licence expiry date

Total Payable (GST inclusive)

$

CHANGE IN VEHICLE COLOUR - Enter the new COLOUR from list of colours provided:

Basic Colour	Secondary Colour							
		Select from this list	Black Blue	Brown Cream	Gold Green	Grey Orange	Pink Purple	Red Silver	White Yellow

CHANGE IN VEHICLE USAGE - Tick the new USAGE (refer to the notes where indicated by a reference number):

- ☐ 01 Private Passenger
- ☐ 02 Taxi, Commercial Passenger
- ☐ 03 Transport Licensed Goods [1]
- ☐ 04 Other (standard) Goods [2]
- ☐ 05 Commercial Ambulance
- ☐ 06 Other (non-commercial) Ambulance/Hearse
- ☐ 07 Rental
- ☐ 08 Recovery Service
- ☐ 09 Fire Brigade
- ☐ 10 Exempt Class A (EA) [3]
- ☐ 11 Exempt Class B (EB) [3]
- ☐ 12 Diplomatic
- ☐ 13 Special Purpose/Caravan [4]

1 *For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) where payment is received for the delivery of goods, and for goods vehicles with a gross vehicle mass (GVM) of 6000 kg or greater.*

2 *For vehicles used in the carriage of goods if* ***no payment*** *is received for the delivery of goods, and provided the GVM is less than 6000 kg. Examples are;- domestic trailer, light goods van used for domestic purposes.*

3 *Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from other requirments. When usage 10 or 11 has been nominated, the completed and signed MR1 form will be used as a declaration that the motor vehicle registered by use of that form, and the vehicle's usage, complies with the requirements of the relevant legislation. Information regarding the registration and licensing of exempt vehicles can be obtained from the LTSA or authorised LTSA agents. LTSA Factsheet 27 provides a plain English summary and guide to the registration and licensing of exempt vehicles. If you are unsure of your obligations please call the Motor Vehicle Registration Helpdesk - 0800 108 809*

4 *For vehicles which are designed for the transportation of special purpose equipment, rather than for the carriage of goods, e.g. trailer type caravans, tractors, graders, forklifts, self-propelled cranes or cherry pickers.*

CHANGE OF ADDRESS - Enter the new ADDRESS in full:

Recorded residential address (where different from postal address).

New Residential Address

Suburb Town

New Postal Address

Suburb Town

Note: To change the address of other vehicles you own please complete a form MR28, available from LTSA agents.

GENERAL NOTES

The Transport (Vehicle and Driver Registration and Licensing) Act 1986 provides for the registration and licensing of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

Identification. Where the vehicle ownership record is incomplete, the owner will be advised of the requirement to present identification while relicensing. This can be one of the following:- NZ driver's licence, LTSA card or documents which provide proof of full name, date of birth and signature.

Licence Fee Components. **(Note - the total amount due is rounded down to nearest 5c)**
The **Licence fee** goes to the National Roads Fund for road construction, and to road safety programmes by LTSA and New Zealand Police.
The **ACC Levy** is collected on behalf of the ACC and provides personal injury insurance cover for those injured in motor vehicle accidents on public roads. It covers entitlements such as medical and hospital costs, weekly compensation and rehabilitation care.
Other Levies: The vehicle may be subject to one or more of the following levies depending on vehicle type and usage:- Safety Standards levy - $1.64, Audit and Standards levy - $1.33, Transport Licensing Fee - $21.33. These levies (all amounts exclusive of GST) are used by the LTSA for the audit and administration of the Safety Standards regime.
The **Administration fee** funds the operating costs of the Transport Registry Centre.

Payment Terms. If you wish to pay by
- Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
- Credit Card, please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions.

Additional Information. Please call the Transport Registry Centre Help Desk on 0800 108 809, Monday to Friday 8.00am - 6.00pm. Our postal address is Transport Registry Centre, Private Bag, Palmerston North.

To apply for an Exemption: Complete form MR24

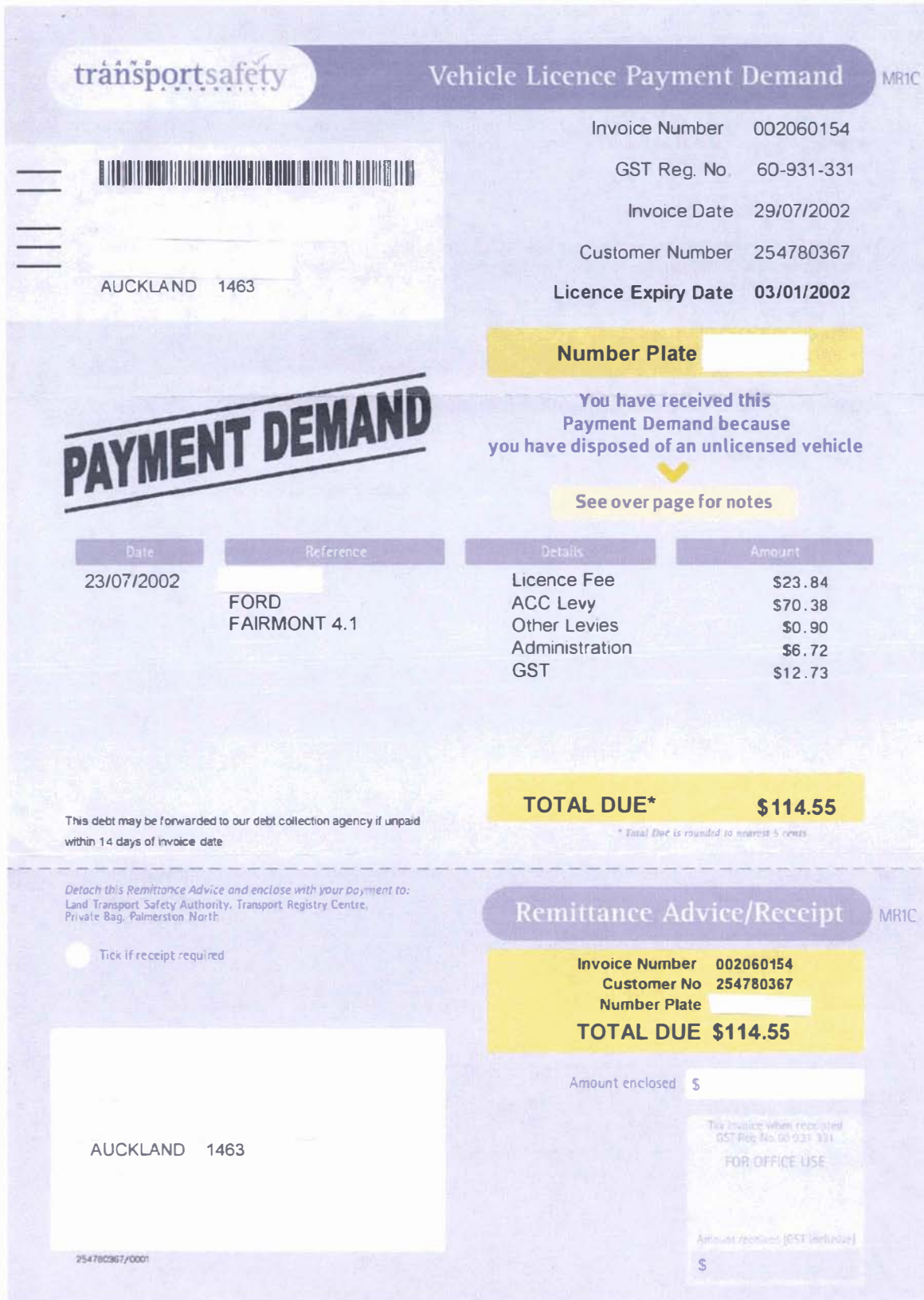
If an application for exemption is late, a fee may be payable for the unlicensed period since the DUE DATE. No fee is payable if an application is made before 19/08/2002. If an application for exemption is not made:

- before 19/08/2002 the outstanding licence fee will be $39.85
- before 19/10/2002 the outstanding licence fee will be $72.40
- the outstanding licence fee will continue to increase. After remaining unlicensed for more than 12 months this vehicle's registration will be cancelled and you will be required to pay 12 months' outstanding licence fee. At this time the debt will be referred to our debt collection agency. Several steps will need to be taken at an increased cost to get the vehicle back on the road.

If you license your vehicle within the first 3 months of an exemption, the licence will be backdated to the expiry date of the previous licence or exemption, or the date of the last change of ownership, whichever is the most recent.

If this vehicle has been stolen please contact the Transport Registry Centre.

203381395/040/MR1R



transportsafety

Vehicle Licence Payment Demand

MR1C

Invoice Number 002060154
GST Reg. No 60-931-331
Invoice Date 29/07/2002
Customer Number 254780367
Licence Expiry Date 03/01/2002

AUCKLAND 1463

Number Plate

PAYMENT DEMAND

You have received this Payment Demand because you have disposed of an unlicensed vehicle

See over page for notes

Date	Reference	Details	Amount
23/07/2002	FORD FAIRMONT 4.1	Licence Fee	$23.84
		ACC Levy	$70.38
		Other Levies	$0.90
		Administration	$6.72
		GST	$12.73

TOTAL DUE* $114.55

* Total Due is rounded to nearest 5 cents

This debt may be forwarded to our debt collection agency if unpaid within 14 days of invoice date

Detach this Remittance Advice and enclose with your payment to:
Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North

Tick if receipt required

AUCKLAND 1463

254780367/0001

Remittance Advice/Receipt

MR1C

Invoice Number 002060154
Customer No 254780367
Number Plate
TOTAL DUE $114.55

Amount enclosed $

Tax invoice when receipted GST Reg. No 60-931-331

FOR OFFICE USE

Amount received (GST inclusive)

$

Why did you get this Payment Demand?

Our records show that you have recently disposed of an unlicensed vehicle. You are liable for any licensing fees that accrued in your name when the vehicle was unlicensed. This Payment Demand gives you the opportunity to pay these fees.

What should you do now!

You must make payment of the outstanding fees as totalled over the page to the Transport Registry Centre. Cheques should be made payable to Land Transport Safety Authority, and be enclosed with the Remittance Advice over the page.

If you do nothing!

You remain liable for the outstanding fees totalled over the page. The debt for the outstanding amount may be forwarded to our Debt Collection Agency. You would then have to make arrangements to pay the collection agency's account which may include additional collection charges.

For further information:

Please call the Transport Registry Centre Help Desk, free on 0800 108 809, Monday to Friday 8.00am to 6.00pm.

254780367/0001

transportsafety

Vehicle Licence Final Notice

MR1F

Invoice Date 7/07/2000

Customer Number 204768625

Licence Expiry Date 04/08/1999

WHANGAREI 0101

Number Plate

FINAL NOTICE

IMPORTANT

To avoid this bill being passed to a debt collection agency you should review the options on the back of this notice and take action before the Registration expires:

Registration Expiry Date 04/08/2000

Date	Reference	Details	Amount
04/08/1999		Licence Fee	$24.50
		ACC Premium	$138.81
		Other Levies	$1.64
		Administration	$6.72
		GST	$21.46

TOTAL DUE* **$193.10**

** Total Due is rounded to nearest 5 cents*

Detach this Remittance Advice and enclose with your payment to:

Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North

Tick if receipt required

Tick if you want the Registration number plate to be cancelled (vehicle never to be used again) *See note on back*

WHANGAREI 0101

204768625/0001/F/F

Remittance Advice/Receipt

MR1F

Customer No 204768625

Number Plate

TOTAL DUE $193.10

Amount enclosed $

Tax Invoice when receipted
GST Reg No 80 931 331

FOR OFFICE USE

Amount received (GST inclusive)

$

Why did you get this Final Notice?

This vehicle is subject to continuous vehicle licensing and our records indicate that the last licence expired 11 months ago. During this period reminder notices have been sent to the registered owner as recorded at the time of posting. The licence label displayed on the vehicle is no longer valid and it is an offence for the vehicle to be used on a public road.

This **Final Notice** gives you the opportunity to pay the outstanding fees before the registration expires (12 months from the Licence Expiry Date). If not paid, the vehicle's registration will be cancelled, meaning the number plate(s) on the vehicle will no longer be lawful and an offence will be committed if the vehicle is used on a public road with these plate(s).

Fees that you need to pay.

The fees shown over the page relate to a 12 month licence, <u>or</u> the amount from the date ownership was transferred to your name. The fees due <u>may</u> be different, dependant on whether you decide to license the vehicle, apply for an exemption from licensing, or cancel the vehicle's registration without the registration plates. Your LTSA agent will advise you of the correct amount payable at the time of lodgment.

If you do nothing!

You remain liable for the outstanding fees totalled over the page. The vehicle's registration will be cancelled and it will cost you additional money to get the vehicle back on the road. After the vehicle's registration expires the debt for the outstanding amount may be forwarded to our Debt Collection Agency. You will then need to pay the amount directly to the Collection Agency's account which may also include additional collection charges.

To prevent this, take action before 04/08/2000!

<u>*YOUR SITUATION*</u>	<u>*ACTION REQUIRED*</u>
■ The vehicle is being used on the road	● ***Either*** licence the vehicle at an LTSA agent by completing form MR1B. The licence will backdate, and the fee payable may be different to the amount on the front page. *See note on "Fees that you need to pay"* ***Or*** pay this account directly to LTSA Transport Registry Centre (TRC). Your payment must be received in full at TRC <u>before</u> the Registration expiry date and the licence will backdate.
■ The vehicle is not being used on the road	● Apply for an exemption at an LTSA agent by completing form MR24. You will be required to pay outstanding fees at the time of application, which will be different to the amount on the front page. *See note on "Fees that you need to pay"*
■ The vehicle is permanently off the road *Note: If the registration is cancelled and the vehicle is to be used on the public road, you will have to pay additional costs for inspection, certification, and re-registration which includes the issue of new number plates*	● ***Either*** cancel the vehicle's registration by completing form MR15 at a LTSA Agent* and surrender the registration number plate(s). The outstanding fees will then be waived. ***Or*** cancel the vehicle's registration as above without surrendering the number plates. You will be required to pay outstanding fees which will be different to the amount on the front page. See *note on "Fees that you need to pay"* ***Or*** pay this account direct to the TRC and request the vehicle's registration be cancelled by ticking the box on the bottom of the form over the page. The fees payable will be the amount detailed over the page.
■ The vehicle has been sold or disposed of.	● You must advise the LTSA of the new owner details - ***Either*** by posting the details on a postpaid form MR13A which is attached to your Certificate of Registration (form MR3). Form MR13A is also available separately from an LTSA agent. ***Or*** you can advise the TRC by phoning 0800 108 809. As the registered owner of the vehicle, you are liable for the outstanding fees up to the date TRC receive notification of the sale/disposal. You should ignore this account - a new account will be posted to you.

For further information:

Please call TRC Help Desk, free on 0800 108 809 Monday to Friday 8.00 am to 6.00 pm.

The above forms are available from the following LTSA agents: Automobile Association, AMI Insurance, NZ Post Limited, On Road NZ, Vehicle Identification NZ, Vehicle Testing NZ or a range of independent agencies.
* Please note that NZ Post Ltd does not accept Form MR15 (Applications to Cancel Registration)

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Please print clearly in the panels provided – IMPORTANT – Please read notes on back of form.

Application for Registration of a Motor Vehicle MR2A

Vehicle details

Dealer's customer no | Lease company's customer no | Plate number

VIN | CC rating | GVM

Description

* Please select vehicle colour from note 2 overleaf and show here.

*Basic colour | *Second colour | Alternative fuel 3 - CNG 4 - LPG | Engine number | Seats

Vehicle usage/ Industrial usage/ Road transport code

Vehicle usage
Please select vehicle usage from note 3 overleaf and show here.

Industrial class
Please select industrial class from note 4 overleaf and show here.

Road transport code
Complete only if the Industrial Class is 13. Codes are located in note 5 overleaf.

RUC Vehicle details

See overleaf for definition of RUC Vehicle (For assistance with coding please contact Transport Registry Help Desk on 0800 655 644)

RUC Vehicle type
Please complete RUC Licence Application RUCLA

Hubodometer make code (see note 7)

Hubodometer serial number

Hubodometer/odometer start reading

Finance/Licence Period details

Finance 1 Own 2 Lease 3 Dealer/HP 4 Not applicable

Licence period 6 Months 12 Months

Identification details

Please complete one only.

Driver's licence number | OR | Customer No. from LTSA Card

Customer Identification is required *(see note 8 overleaf)*

Owner details

Last name/Company name

First names

Trading as/Representing

Residential address

Suburb | Town

Postal address (if different from above)

Occupation
1 Farmer
2 Proprietor
3 Prof/Executive
4 Clerical
5 Tradesperson
6 Retired
7 Houseperson
8 Other

Sex
Male Female

Date of birth
Day Mth Year

Joint owner details

Last name | First name(s)

Applicant's signature

I certify that the particulars given are correct

X

Dealer stamp (if applicable) | Lease company stamp (if applicable)

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Types of ID sighted | Input | Chkd

Total payable (GST inclusive)
$

Date Stamp

MR2A 11 10/01* TRC COPY

MR2A NOTES

1. The particulars specified on this form are required under the Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, and will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

   Persons who knowingly give false or misleading information commit an offence and are liable to a fine of up to $1000.

2. Colours - The vehicle colours should be selected from the following list:

Black	Cream	Grey	Purple	White	Brown	Pink
Blue	Gold	Orange	Red	Yellow	Green	Silver

3. Vehicle Usage *(Please also read vehicle usage notes.)*

01	Private Passenger	06	Other Ambulance, Hearse	11	Exempt Class B (EB)❸
02	Taxi, Commercial Passenger	07	Rental	12	Diplomatic
03	Transport Licensed Goods❶	08	Recovery Service	13	Caravan/Special Purpose (excluding EA & EB)❹
04	Other Goods❷	09	Fire Brigade		
05	Commercial Ambulance	10	Exempt Class A (EA)❸		

Vehicle Usage Notes

❶ For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) if payment is received for the delivery of the goods, and for vehicles with a gross vehicle mass (GVM) of 6000 kg or greater.

❷ For vehicles used in the carriage of goods if no payment is received for the delivery of the goods, and provided the GVM is less than 6000 kg. Examples are:- domestic trailer, light goods van used for domestic purposes.

❸ Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from motor taxation. The completed and signed MR2A form, when usage 10 or 11 has been nominated, will be used as a declaration that the rules in regard to exempt vehicles will be complied with. Information regarding exempt licensing for motor vehicles can be obtained from authorised agents of the Land Transport Safety Authority. Nomination of a usage of 10 (exempt class A (EA)) or 11 (exempt class B (EB)) requires compliance with the rules as set out in Factsheet 27 "Registration and licensing of exempt vehicles".

❹ For vehicles which are designed for the transportation of special purpose equipment, rather than for carriage of goods, e.g. trailer type caravans, tractors, graders, forklifts, self-propelled cranes or cherry pickers.

4. Industrial Class

01	Private Class	06	Transport Non-Road	11	Business/Financial
02	Mining/Quarrying	07	Agriculture/Forestry/Fishing	12	Community Services
03	Manufacturing	08	Electricity/Gas/Water	13	Commercial Road Transport
04	Construction	09	Wholesale/Retail/Trade		
05	Vehicle Dealer	10	Tourism/Leisure		

5. Road Transport Code

01	Log Haulage	08	Bulk Cartage Liquids	15	Bus Service - School
02	Stock Cartage	09	Heavy Haulage	16	Tour & Charter Service
03	Refrigerated Transport	10	Courier - Urban	17	Taxi Service
04	Furniture Removal	11	Couriers - Rural & Inter-Urban	18	Limousine Service
05	General Goods Line Haulage	12	Vehicle Recovery Services	19	Shuttle Service
06	General Goods Local	13	Bus Service - Urban	20	Shuttle Service - Inter-Urban
07	Bulk Cartage Solids	14	Bus Service - Inter-Urban		

6. Vehicles Subject to Road User Charges

   A vehicle that is subject to Road User Charges (RUC) is any vehicle that is diesel powered, or has a manufacturer's Gross Vehicle Mass (GVM) of more than 3.5 tonnes (3500kg), or is powered by a fuel not taxed at source.
   A RUC licence must be purchased at the time of registration by completing form RUCLA.

7. Hubodometer Make Code

1	Engler	3	Mechanex	5	Argo	7	Marco	9	Jost
2	Veeder Root	4	Accutrac	6	Trailmark	8	Stemco		

8. Identification Details

   Driver's Licence - Private individuals registering vehicles should provide their driver's licence. If a driver's licence cannot be supplied then documents which provide date of birth and signature must be presented at the agency to complete the registration transaction.

   Customer No. - Corporate Organisations (non-individual) may have a customer number allocated to them which should be provided when registering vehicles. If a customer number has not been allocated then a Certificate of Incorporation must be presented at the agency to complete the registration transaction. Application for a customer number can be made on an MR36 form.

9. Joint Owners

   If more than one Joint Owner is required to be recorded, please apply in writing to the Transport Registry Centre, Private Bag, Palmerston North.

10. Additional Information

    For further information please call the Transport Registry Help Desk on 0300-108 809, Monday to Friday 8.00 am - 6.00 pm or visit the LTSA website www.ltsa.govt.nz

    Vehicle Compliance

    The printing of this MR2A is an acknowledgement by the issuer that the vehicle defined on this form complies with requirements specified in applicable Land Transport Acts, Regulations and Rules where these are required. The issuer of this MR2A holds any documentation from the authorised compliance officer.

    Lapse of Compliance Certification and Approval to Register

    If this vehicle is not registered within 2 years following the date of vehicle compliance certification, the vehicle must be recertified before registration in accordance with section 4 of the Compliance Rule. This will require verification that the vehicle was in original compliance with approved standards and a physical inspection to ensure it still is.

11. Payment

    If you wish to pay by:
    - Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
    - Credit Card, please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions

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Transport Registry Centre

Application for Registration of a VIN Exempt Motor Vehicle — MR2B

Vehicle details

Dealer's customer no.

Plate number

Type/Usage

Select vehicle type and usage codes from overleaf.

Vehicle type *(see note 2)*

Vehicle usage *(see note 4)*

Chassis number

Make

Model *(see note 5 overleaf)*

Body type/colour

Select body type and colour from overleaf.

Vehicle year

Body type *(see note 3)*

Basic colour *(see note 6)*

Second colour

Engine number

Engine type

1. Petrol
2. Diesel
3. CNG
4. LPG
5. Electric
6. Other

Vehicle is *(see note 7 overleaf for definitions)*

NEW	N
SCRATCH-BUILT	S
USED IMPORTED	U
RE-REGISTERED	R

Assembly type (please tick one)

1. Imported Built Up
2. NZ Assembled/Built

CC rating

GVM

Seats

RUC Vehicle Type *(See note 9 overleaf)*

Licence Period (Please Tick One)

6 Months

12 Months

Country of origin

Country previously regd

Identification details

Please complete one only (see Note 10 overleaf)

Driver's licence number

OR

Customer number from LTSA card

Owner details

Last name/Company name

First name(s)

Occupation

1 Farmer
2 Proprietor
3 Prof/Executive
4 Clerical
5 Tradesperson
6 Retired
7 Houseperson
8 Other

Trading as/Representing

Residential address

Sex

Male

Female

Suburb

Town

Date of birth

Day Mth Year

Postal address (if different from above)

Joint owner details

Last name

First name(s)

Applicant's signature

I certify that the particulars given are correct

X

LMVD stamp (if applicable)

I understand that if any registration plates are issued in error or are being used unlawfully, I must surrender such registration plates if lawfully required to do so, notwithstanding any fault or error by any person.

Land Transport Safety Authority or Authorised Agent

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Types of ID sighted

Input

Total payable (GST inclusive)

$

Chkd

Date Stamp

MR2B 02/02 TRC Copy

MR2B - NOTES

1. The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the registration and licensing of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North

2. **Vehicle Type**
Only the vehicle types listed below can be registered using this form
All other vehicle types should be referred to a VIN agent for authorisation to register

3. **Body Type**

Vehicle Type - *select the appropriate code*		Body Type - *select the appropriate code*	
Code	Description	Code	Description
01	Moped - power <=2kw Et max speed <=50kph	MC	Motorcycle
02	Trailer/Caravan - GVM <=3500kg	TB	Boat Trailer
		TC	Caravan
		TD	Domestic Trailer
		TF	Flat-Deck Trailer
		TO	Other Commercial Trailer
03	Tractor - max speed <=50kph	TA	Tractor
04	Self Propelled Agricultural Machine	OR	Agricultural Machine - other
05	Trailer not designed for normal highway use	OR	Non Highway Trailer - other
06	Mobile Machines not designed for normal highway use	MM	Mobile Machine
12	All Terrain Vehicle (ATVs)	MC	Motorcycle

4. **Vehicle Usage** *(Please also read vehicle usage notes)*
01 Private Passenger
02 Taxi, Commercial Passenger
03 Transport Licensed Goods (1)
04 Other (standard) Goods (2)
05 Commercial Ambulance
07 Rental
10 Exempt Class A (EA) (3)
11 Exempt Class B (EB) (3)
12 Diplomatic
13 Caravan/Special Purpose (excluding EA Et EB) (4)

Vehicle Usage Notes

(1) *For vehicles used in the carriage of goods (ranging from freight moved by truck to items delivered by motorcycle courier) if payment is received for the delivery of the goods, and for goods vehicles with a gross vehicle mass (GVM) of 6000 kg or greater.*

(2) *For vehicles used in the carriage of goods if no payment is received for the delivery of the goods, and provided the GVM is less than 6000 kg. Examples are:- domestic trailer, light goods van used for domestic purposes*

(3) *Certain vehicles of specified design or use, although required to be registered, qualify for some degree of exemption from other requirements When usage 10 or 11 has been nominated, the completed and signed MR2B form will be used as a declaration that the motor vehicle registered by use of that form, and the vehicle's usage, complies with the requirements of the relevant legislation. Information regarding the registration and licensing of exempt vehicles can be obtained from the LTSA or authorised LTSA agents. LTSA Factsheet 27 provides a plain English summary and guide to the registration and licensing of exempt vehicles. If you are unsure of your obligations please call the Motor Vehicle Registration Helpdesk - 0800 108 809.*

(4) *For vehicles which are designed for the transportation of special purpose equipment, rather than for the carriage of goods, e.g. trailer-type caravans, tractors, graders, forklifts, self-propelled cranes or cherry pickers.*

5. **Model**
State the manufacturer's designation e.g. Corolla, Sigma etc - not the year of manufacture.

6. **Colours**
The vehicle colours should be selected from the following list:

Black	Cream	Grey	Purple	White
Blue	Gold	Orange	Red	Yellow
Brown	Green	Pink	Silver	

7. **New, Scratch-built, Used Imported, Re-registered**

New	a vehicle never previously registered in any country and contains NO used parts.
Scratch-built	a vehicle never previously registered in any country and is • assembled from previously unrelated components and construction materials, or • a production vehicle where the body and chassis are modified by more than 60%. This definition excludes a vehicle rebuilt from parts of the same make and model.
Used Imported	a vehicle which has been previously registered overseas, and never registered in New Zealand.
Re-registered	a vehicle which has been previously registered in New Zealand and not substantially modified from original condition to become scratch-built.

8. **Gross Vehicle Mass (GVM)**
- Show manufacturer's gross vehicle mass in kilograms.
- Required for all vehicles except mopeds and ATVs.

9. **Vehicles Subject to Road User Charges**
A vehicle that is subject to Road User Charges (RUC) is any vehicle that is diesel powered or has a manufacturer's Gross Vehicle Mass (GVM) of more than 3.5 tonnes (3500kg) or is powered by a fuel not taxed at source. State the RUC vehicle type. For more information on Road User Charges obtain Factsheet 38 from an LTSA Agent.

10. **Identification Details**
Driver's Licence - Private individuals registering vehicles should present their driver's licence. If a driver's licence cannot be presented then documents which provide proof of date of birth and signature must be presented at the agency to complete the registration transaction.
Customer No. - Corporate Organisations (non-individual) may have a customer number allocated to them which should be provided when registering vehicles. If a customer number has not been allocated, then a Certificate of Incorporation must be presented at the agency to complete the registration transaction. Application for a customer number can be made on an MR36 form.

11. **Additional Information**
For further information, please call the Transport Registry Centre Help Desk on 0800 108 809, Monday to Friday 8.00 am - 6.00 pm.

12. **Payment**
If you wish to pay by:
- Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
- Credit Card, please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions.

Please print clearly in the panels provided - IMPORTANT - Please read notes on back of this form

transportsafety
Transport Registry Centre

Application for Registration of an Overseas Visitor's Vehicle MR2C

IMPORTANT - Please read notes on the back of this form

Plate number

Vehicle details

* Vehicle types/body types are located on reverse of this form (see note 2 overleaf).

*Vehicle type | Vehicle usage (1,5) | Chassis number

Make | Model

Vehicle year | *Body type | Basic colour | Second colour | Engine number

Engine type
1. Petrol 4. LPG
2. Diesel 5. Electric
3. CNG 6. Other

Vehicle is (U) | Assembly ype (1)

CC rating | GVM (See note 5 overleaf) | Seats

RUC Vehicle Type (See note 6 overleaf)

Licence Period (Please Tick One)
6 Months
12 Months

Country of origin | Country previously regd

Identification details

Customer identification is required (See note 7 overleaf)

Owner details

Last name/Company name

First name(s)

Trading as/Representing

Residential address

Suburb | Town

Postal address (if different from above)

Occupation
1 Farmer
2 Proprietor
3 Prof/Executive
4 Clerical
5 Tradesperson
6 Retired
7 Houseperson
8 Other

Sex
Male Female

Date of bi th
Day Mth Year

Joint owner details

Last name | First name(s)

Applicant's signature

I certify that the particulars given are correct

X

Please ensure that the appropriate documentation is presented (See note 8 overleaf)

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Type of documentation sighted

Types of ID sighted | ID Number

Total payable (GST inclusive)
$

Input | Chkd

Date stamp

MR2C 10/2001 TRC Copy

MR2C - NOTES

1. **The particulars specified on this form are required for the purpose of Part 1 of the Transport (Vehicle and Driver Registration and Licensing) Act 1986 and will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.**

2. **Vehicle/Body Type**

Vehicle Type		Body Type	
1	Mopeds	MC	- Motorcycle
2	Trailers & Caravans	TC	- Caravan
		TO	- Other
		TB	- Boat trailer
		TD	- Domestic trailer
3	Tractors	TA	- Tractor
4	Agricultural machines	OR	- Agricultural machine - other
5	Trailers not designed for normal highway use	OR	- Non-highway trailer - other
6	Mobile machines not designed for normal highway use	MM	- Mobile Machine
7	Passenger cars and vans	HA	- Hatchback
		SP	- Sports car
		SL	- Saloon
		SW	- Station wagon
		LV	- Light van
8	Goods vehicles (trucks, vans, utilities)	LV	- Light van
		HV	- Heavy van
		OT	- Other truck
		UT	- Utility
9	Passenger vehicles (buses)	LB	- Minibus
		HB	- Service coach
10	Motor caravans	SC	- Self-propelled caravans
11	Motorcycles	MC	- Motorcycle
12	All Terrain Vehicles (ATVs)	MC	- Motorcycle
13	Special purpose vehicles	OT	- Other truck
		MM	- Mobile machine

3. **Model**
   State the manufacturer's designation e.g. Corolla, Sigma etc - not the year of manufacture.

4. **Colours**
   The vehicle colours should be selected from the following list:

Black	Cream	Grey	Purple	White
Blue	Gold	Orange	Red	Yellow
Brown	Green	Pink	Silver	

5. **Gross Vehicle Mass (GVM)**
   - Show manufacturer's gross vehicle mass in kilograms.
   - Required for trucks, vans, utilities, trailers, caravans and cranes.

6. **Vehicles Subject to Road User Charges**
   A vehicle subject to Road User Charges (RUC) is any vehicle that is diesel powered, has a manufacturer's Gross Vehicle Mass (GVM) of more than 3.5 tonnes (3500kg) or is powered by a fuel not taxed at source. Where the manufacturer's GVM is more than 3.5 tonnes (3500kg) an approved hubodometer must be fitted to a non-driving axle on the left-hand side of the vehicle. For more information on road user charges you can obtain Factsheet 38 from an LTSA agent or the LTSA website.

7. **Identification Details**
   Driver's Licence - Private individuals registering vehicles should provide their driver's licence. If a driver's licence cannot be supplied then documents which provide proof of date of birth and signature must be presented at the agency to complete the registration transaction.

   Customer No. - Corporate Organisations (non-individual) may have a customer number allocated to them which should be provided when registering vehicles. If a customer number has not been allocated, then a certificate of incorporation must be presented at the agency to complete the registration transaction. Application for a customer number can be made on an MR35 form.

8. **Documentation**
   To register a vehicle in NZ as an OVL one of the following must be signed:

   Carnet de Passages en Douane: Is an entry to multiple countries and is issued by the Chamber of Commerce or Automobile Association. The Carnet must have an original Customs Department stamp.

   Triptyque: Entry to one country and is issued by the Chamber of Commerce or the Automobile Association. The Triptyque must have an original Customs Department stamp.

   C4 - Import Entry (Temporary): Issued by NZ Customs Department. The C4 must have an original Customs Department stamp.

   Approval from LTSA Head Office: Letter of approval on an official LTSA letterhead.

9. **Inspections**
   While being used on New Zealand roads the vehicle is required to have a current New Zealand Warrant of Fitness or Certificate of Fitness.

10. The vehicle is required to be registered with a New Zealand Registration if the:
    - visitor who brought the vehicle into New Zealand becomes a permanent resident in New Zealand
    - vehicle is sold
    - vehicle remains in New Zealand for more than 18 months.

11. **Additional Information**
    For further information you can call the Transport Registry Centre Help Desk on 0800 108 809, Monday to Friday 8.00 am - 6.00 pm or visit the LTSA website www.ltsa.govt.nz

12. **Payment**
    If you wish to pay by:
    - Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
    - Credit card, please contact the agent where the form will be presented, to confirm if credit card payments are accepted for LTSA transactions.

Please print clearly in the panels provided. IMPORTANT - Please read notes on back of form.

transportsafety
Transport Registry Centre

Application to reverse registration

MR2D

Vehicle details

If it appears (from either the condition of the plate(s) or the content of the disclaimers) that the vehicle has been driven on the road, this form will be declined and an alternative method of cancellation will be recommended.

Plate number

Make

Model

VIN

Dealer ID

Owner details

Last name/Company name

First name/s

Residential Address

Suburb

Town

Postal address (if different from above)

Dealer details

Applicant's signature

X

Designation

Dealer's stamp

The particulars specified on this form are required under the Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, and will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

If you answer 'NO' to any of these, this form is unable to be processed

Office Checklist: *(please ✓ appropriate box)*	YES	NO
Plates returned:	☐	☐
Licence label returned:	☐	☐
Copy of MR2A receipt:	☐	☐
Disclaimer from Dealer:	☐	☐
Disclaimer from Owner:	☐	☐

Input

Chkd

date stamp

MR2D 04/02 **TRC COPY**

MR2D - NOTES

1. All Applications for Reverse Registration must be lodged within 4 weeks of the vehicle being registered and must be accompanied by

   - a written request from the Dealer that registered the vehicle, outlining why the Reverse Registration is required, including a statement as to whether or not the customer took possession of the vehicle (a photocopy or facsimile is acceptable)
   - a signed disclaimer from the registered owner stating the reason for the Reverse Registration and whether they took possession of the vehicle (a photocopy or facsimile is acceptable)
   - the Registration Plate(s)
   - the Licence Label and Certificate of Registration (if available), and
   - the receipt copy of the MR2

2. A handling fee of $56.25 AND the admin fee from the licence portion of the original transaction ($7.20) will be deducted from the refund. As the plate(s) and label are not reusable, the fees for these are also deducted from the refund.

3. This form will not be accepted if the vehicle has been driven on a road since registration.

4. For further information please call the Transport Registry Centre Help Desk 0800 [illegible], Monday to Friday, [illegible]

LAND transportsafety AUTHORITY
Transport Registry Centre

MR13A

Notice by Person Selling/Disposing of Motor Vehicle

1. **Within 7 Days after Sale or Disposal of a Vehicle:-**
   The Seller/Disposer:- to complete this form and send by Freepost. We recommend that you take a copy of this form, so that you have a record of the new owner's details.
   The New Owner:- to provide details below and complete the Notice of Change of Ownership of Motor Vehicle - New Owner to Complete (MR13B). Please also see note 2.

2. **Change of Ownership**
   The change of ownership to the new owner will not be complete (and the old owner may still be liable for the vehicle and any fines incurred) until the new owner has presented a completed form (MR13B), identification, and paid the fee, to an agent of the Land Transport Safety Authority. The Seller should sight the Change of Ownership Receipt the buyer receives when completing the change of ownership process before handing over the vehicle.

3. **Additional Information**
   Call the Transport Registry Centre 0800-108 809, Monday to Friday 8.00am - 6.00pm.

Vehicle Details

Make | Model | Plate Number

(FIRST FOLD INWARD)

Seller/ Disposer Details

Last name/Company name

First name(s)

Residential/Company address

Suburb | Town

Date of Disposal | Odometer reading at time of disposal

New Owner Details

Last name/Company name

First name(s)

Residential/Company address

(SECOND FOLD)

Suburb | Town

Signature

I give notice that the vehicle described above has been sold/disposed of on the date stated. See notes overleaf.

X

Seller's/Disposer's Signature

IMPORTANT
It is recommended that the Seller retains a separate record of the new owner details until the change of ownership is completed.

Refer Note 2 above

INSERT IN SLOT

2/02

- The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments provide for the notification of change of ownership of any motor vehicle. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.
- Persons who knowingly give false or misleading information commit an offence and are liable to a fine of up to $1000.

Questions on ownership? Call 0800 108 809

Questions on court fines? Call 0800 609 669

Freepost Authority
493 Palmerston North

transportsafety

freepost

TRANSPORT REGISTRY CENTRE
PRIVATE BAG
PALMERSTON NORTH

You are liable for all fines on this vehicle until both you and the buyer complete ALL that is required.

INSERT IN SLOT

LAND transportsafety AUTHORITY
Transport Registry Centre

Notice of Change of Ownership of Motor Vehicle MR13B

New owner to complete

Vehicle details

Dealer's Customer No. *(Dealer to complete only when selling from dealer network)*

Plate number

Make

Model *(See note 6 overleaf)*

VIN/Chassis No.

Identification details

(Please complete one box only)

Driver's Licence no. / OR Customer no. from LTSA card.

Customer Identification is required *(See note 3 overleaf)*

Industrial class/ Road transport code

(See note 7 overleaf)

Industrial Class

01 Private
02 Mining/Quarrying
03 Manufacturing
04 Construction
05 Vehicle Dealer
06 Transport Non-Road
07 Agric/Forestry/Fishing
08 Electricity/Gas/Water
09 Wholesale/Retail/Trade
10 Tourism/Leisure
11 Business/Financial
12 Community Services
13 Commercial Road Transport

Complete Road Transport Code only if Industrial Class is 13.

Road Transport Code

01 Log Haulage
02 Stock Cartage
03 Refrigerated Transport
04 Furniture Removals
05 General Goods Line Haulage
06 General Goods Local
07 Bulk Cartage Solids
08 Bulk Cartage Liquids
09 Heavy Haulage
10 Courier - Urban
11 Courier - Rural/Inter Urban
12 Vehicle Recovery Service
13 Bus Service - Urban
14 Bus Service - Inter Urban
15 Bus Service - School
16 Tow & Charter Service
17 Taxi Service
18 Limousine Service
19 Shuttle Service - Urban
20 Shuttle Service - Inter Urban

Road user charges

All Diesel Vehicles and all vehicles that weigh over 3500kg are subject to Road User charges (RUC). See note 9 overleaf.

New owner details

Last name/Company name

Sex ☐ Male ☐ Female

Trading as/Representing (if applicable)

Residential Address

Date of Birth Day Mth Year

Suburb

Town

Postal address (if different from above)

Joint owner details

Last name

First name/s

Transfer receipt

Transfer receipt required ☐ Yes ☐ No

This is an optional receipt that confirms the change of ownership and the seller should sight it before the vehicle is handed over. Note: Transfer receipt is NOT available if identification is not provided.

New owner's signature

I certify that the particulars given are correct

X

Dealer's stamp (if applicable)

The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the notification of change of ownership of any registered motor vehicle. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Types of ID sighted /

Total Payable (GST inclusive)

$

Input

Chkd

date stamp

MR13B 07/02 TRC COPY

MR13B – NOTES

1. **Notification of Change of Ownership**
The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the notification of change of ownership of any registered motor vehicle. For full details the Act should be referred to but some of the more important points are mentioned below.
   (a) Within seven days after purchasing or obtaining a motor vehicle the person purchasing or obtaining it must complete this form and present it, along with the change of ownership fee and the necessary owner identification to an authorised agent of the Land Transport Safety Authority.
   (b) The person purchasing or otherwise obtaining the vehicle is primarily liable for payment of the Notice of Change of Ownership fee.
   (c) If you purchase an unlicensed vehicle which is subject to continuous vehicle licensing (CVL) you are required to license or exempt your vehicle from CVL from the date this application is processed.
   (d) Any person who fails to comply with the provisions of the Act commits an offence and is liable to a fine not exceeding $500. Any person who supplies false or misleading information on a Notice of Change of Ownership form commits an offence and is liable to a fine not exceeding $1000.

2. **Change of Ownership**
The change of ownership from the old owner to the new owner will not be complete until the new owner has presented identification as described below. If this form is processed without suitable identification, an Application to Complete Owner Identification form (MR34), must be completed when identification is presented to complete the change of ownership.

3. **Identification Details**
Driver's Licence – Private individuals notifying change of ownership should present their driver's licence. If their driver's licence cannot be sighted then documents which provide proof of full name, date of birth and signature must be presented at the agency to complete the notification transaction.

Customer No. – Corporate Organisations (non-individual) may have an LTSA customer number allocated to them which should be provided when notifying a change of ownership. If a customer number has not been allocated then a Certificate of Incorporation must be presented at the agency to complete the notification transaction. Application for an LTSA customer number can be made on an MR36 form.

4. **Certificate of Registration**
A Certificate of Registration (MR3) will be sent to the new owner within 7 days if this form is processed with identification presented. If no identification is presented then the new certificate will not be sent out until a completed MR34 form has been processed. NOTE: The Certificate of Registration does NOT constitute a certificate of legal ownership but is merely a record of registered owners of a motor vehicle.

5. **Joint Owners**
If more than one joint owner is required to be recorded, please apply in writing to the Transport Registry Centre, Private Bag, Palmerston North.

6. **Model**
State manufacturer's designation e.g. Corolla, Sigma etc, not year of manufacture

7. **Industrial Class/Road Transport Code**
These two panels are used for statistical purposes only and in no way affect the licensing of this vehicle.

8. **Change of Usage**
If the new owner of a vehicle changes its design or the way it is used, it may need to be reclassified for licensing purposes. To notify a change of usage please complete an Application to Change Vehicle Usage form (MR14).

9. **Road User Charges (RUC)**
A vehicle subject to Road User Charges (RUC) is any vehicle that is diesel powered or has a manufacturer's Gross Vehicle Mass (GVM) of more than 3.5 tonnes (3500kg) or is powered by a fuel not taxed at source and therefore must pay Road User Charges (RUC). New owners should ensure that the vehicle has a current RUC licence before purchasing the vehicle. Further information is available by phoning the Transport Registry Centre Help Desk on 0800-655 644, Monday to Friday 8.00am - 5.30pm.

10. **Payment**
If you wish to pay by:
   - Cheque, make the cheque payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
   - Credit Card, please contact the agent where the form will be presented to confirm if credit card payments are accepted for LTSA transactions.

11. **Continuous Vehicle Licensing (CVL) and exemptions.**
Vehicles that are subject to CVL must remain licensed at all times. If such a vehicle remains unlicensed for more than 12 months, its registration will be cancelled. Outstanding licence fees will remain payable and this debt will be referred to our debt collection agency which is empowered to order payment of outstanding licensing fees. Additional costs may also be charged at this time.
If the vehicle is to remain unlicensed for a period of more than 3 months, an exemption from licensing can be applied for in advance, by filling out an application (form MR24), available from LTSA agents.
If a vehicle with an exemption from CVL is licensed before the minimum 3 month exemption period has elapsed, licensing fees will be payable from the date the previous licence/exemption expired.
If you sell an unlicensed vehicle which is subject to continuous vehicle licensing or its registration is cancelled because it has remained unlicensed for over one year, outstanding licensing fees will remain payable. The debt will be referred to our debt collection agent who is empowered to order payment of the outstanding licensing fees and any additional costs.

12. **Additional Information**
For further information please call the Transport Registry Centre Help Desk on 0800-108 809, Monday to Friday 8.00am - 6.00pm.

Please print clearly in panels provided. - IMPORTANT - Please read notes on back of form.

LAND transportsafety

Dealer Certificate

MR13C

Dealer Details

Dealer Name

Dealer's Customer No.

Vehicle Details

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Owner Name

Make | Model

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Owner Name

Make | Model

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Owner Name

Make | Model

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Owner Name

Make | Model

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Owner Name

Make | Model

For further information please call the Motor Registration Help Desk Free on 0800-108 809, Monday to Friday 8am - 5pm.

Plate Number | Purchase Date | Certificate Required ☐ Yes ☐ No | Ow er Name

Make | Model

Dealer's Signature/Stamp

I confirm that the vehicle(s) described above have been acquired on the date(s) shown.

X

LAND TRANSPORT SAFETY AUTHORITY

For Office Use Only

Input

DATE STAMP

MR13C 12/95 **MRC COPY**

FORWARD THIS COPY ONLY TO THE MOTOR REGISTRATION CENTRE, PRIVATE BAG, PALMERSTON NORTH

MR13C – NOTES

1. **Completion of this Form**

   Each week as a dealer buying vehicles from the public you are required to list all vehicles bought since the last MR13C return.

   Where a vehicle is bought and sold within the week, you should have changed the ownership to your customer, the new owner, before your return is sent in.

   In this situation do not include it on the MR13C Form.

   Please forward the top copy only (MRC copy) to the Motor Registration Centre, Private Bag, Palmerston North and retain the bottom copy for your own records.

2. **Payment**

   Please do not forward any payments for these transactions, you will be invoiced by Land Transport Safety Authority on a quarterly basis.

3. **Additional Information**

   For further information please call the Motor Registration Help Desk Free on 0800 822 422 Monday to Friday 8 am – 5 pm. Our postal address is: Motor Registration Centre, Private Bag, Palmerston North

transportsafety
Transport Registry Centre

Application to Cancel Registration

MR15

IMPORTANT – Please read notes on the back of this form

Vehicle Details

Plate number

Make

Model *(see note 2 overleaf)*

VIN/Chassis number

Engine number

Plate(s) surrendered

☐ Yes ☐ No

REASON FOR NIL RETURN OF PLATES

If plates are not available please state reason as approval for the cancellation and any refund of unexpired licensing fees is at the Registrar's discretion.

Reason for cancellation

(Please tick one.)

Note: If the registration is cancelled and the vehicle is put back on the road several steps will need to be followed, including inspection, certification, re-registration, licensing and new registration plates and licence label(s) issued.

- A ☐ Vehicle destroyed or become permanently useless
- B ☐ Vehicle permanently removed from New Zealand
- C ☐ Trade Plate returned
- D ☐ Vehicle written off by insurer
- E ☐ Vehicle taken permanently off the road

Circumstances where cancellation cannot be made:

- F ☐ Vehicle stolen
- G ☐ Plates lost/stolen
- H ☐ Vehicle sold/given away
- I ☐ Handing in plates

See Note 3 overleaf for what action is required.

Only complete if vehicle subject to road user charges *(See note 4 overleaf)*

Road user charges Label(s) surrendered ☐ Yes ☐ No

Reason for nil return of labels

If this vehicle is subject to RUC, an end reading MUST be supplied

Hubodometer/Odometer current distance reading

Identification details

(Please complete one box only)

Customer no. from LTSA card OR Driver's Licence no.

Customer Identification is required *(see note 5 overleaf)*

Applicant details

Last name/Company name First name(s)

Address

Suburb Town

Postal address (if different from above)

I certify that the particulars given are correct

Applicant's signature

X

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

RUC label returned: ☐ Yes ☐ No (Attach label if returned)

RUC end reading keyed:

Number of plates returned: ☐ 2 ☐ 1 ☐ Nil

Types of ID sighted:

Input

Chkd

Total payable (GST inclusive)

$

date stamp

MR15 08/01 TRC Copy

MR15 - NOTES

1. **General**
The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its Amendments provide for the cancellation of registration of motor vehicles. The particulars specified on this form will be part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre Private Bag, Palmerston North.

When a vehicle is destroyed, removed permanently from New Zealand, becomes permanently useless or is written off the owner must surrender the registration plates and notify the cancellation immediately by completing and lodging the required form at an authorised agent of the Land Transport Safety Authority. Any person who supplies false or misleading information on a form commits an offence and is liable to a fine not exceeding $1000.00.

2. **Model**
State the manufacturer's designation e.g. Corolla Sigma etc. - not the year of manufacture.

3. **Reason for Cancellation**
Reasons F, G, H & I are not valid reasons for cancellation of a motor vehicle. Please take the following action:

F (Vehicle Stolen)	- Please contact Transport Registry Centre on phone 0800 108 809
G (Plate/s Stolen)	- Apply for a replacement registration plate (form MR6A)
H (Vehicle sold/given away)	- Complete a Notice by Person Selling/Disposing of Motor Vehicle (form MR13A)
I (Handing in Plates)	- LTSA Agent will take appropriate action

4. **Road user charges**
A vehicle subject to Road User Charges (RUC) is any vehicle that is diesel powered or has a manufacturer's gross vehicle mass (GVM) of more than 3.5 tonnes (3500kg) or is powered by a fuel not taxed at source. Where the manufacturer's GVM is more than 3.5 tonnes (3500kg) an approved hubodometer must be fitted to a non-lifting axle on the left-hand side of the vehicle.
If the vehicle is fitted with a hubodometer state the end reading shown on the hubodometer. If a hubodometer is not required, state the end reading shown on the vehicle's odometer.
A refund equal to the amount of any unused distance recorded against the hubodometer/odometer may be refunded. In order for the refund to be paid, the current distance reading of the hubodometer/odometer must be provided and any existing original RUC licences must be surrendered with the MR15 OR the reason for nil return of labels panel must be completed on this form. Any refund is liable for audit and at the Land Transport Safety Authority's discretion. Claims should only be for licences purchased within the last two years. (See note 7.)

5. **Identification Details**
Driver's Licence – Private individuals notifying the cancellation of a motor vehicle should present their driver's licence. If their driver's licence cannot be sighted then documents which provide proof of name, date of birth and signature must be presented at the agency to complete the transaction.

Customer Number – Corporate organisations (non-individual)/insurance companies may have an LTSA customer number allocated to them which should be provided as identification. Approved storage providers must complete an Application for a Storage Provider to Cancel Registration (form MR15A). MR15A forms are available by contacting Transport Registry Centre on 0800 108 809.

6. **Expired licences**
If the licence for the vehicle has expired and the vehicle is subject to continuous vehicle licensing, payment of licence fees calculated from the licence expiry date to the date of cancellation may be required.

7. **Refunds**
If the Registrar is satisfied that the motor vehicle has been destroyed, became permanently useless, been written off by insurer, or has been permanently removed from New Zealand, then the Registrar may refund an amount equal to the unexpired licence fee paid.

In order for the Registrar to be satisfied, the registration plate(s) must be returned. The Registrar will also require an explanation as to entitlement to refund should the applicant not be the registered owner of the vehicle (the exception to this is where the applicant is an insurance company and the vehicle has been written off by the insurer). If the vehicle is subject to Road User Charges, in order for the refund to be paid, see note 4. Any refund is liable for audit and is at the Registrar's discretion.

8. **Payment of refunds into a bank account**
If the applicant is leaving New Zealand and requires any refund payable to be paid into a bank account, please send this application with details of the bank account into which any refund is to be paid to:

Refunds Section
Transport Registry Centre
Private Bag
PALMERSTON NORTH 5301.

9. **Additional Information**
For further information, please call the Help Desk Free on 0800 108 809, Monday to Friday 8.00am - 5.00pm

transportsafety
Transport Registry Centre

Application for a Storage Provider to Cancel Registration MR15A

Vehicle details

Plate number

Make

Model *(see note 2 overleaf)*

VIN/Chassis number

Engine number

Plate(s) surrendered *(see note 3 overleaf)*

☐ Yes ☐ No

Reason for Nil return of plates

If plates are not available please state reason as approval for the cancellation and any refund of unexpired licensing fees is at the Registrar's discretion.

Declaration

A copy of the form giving permission to dispose of the above mentioned vehicle under Section 98(4) of the Land Transport Act 1998 is attached. ☐ Yes ☐ No

I, _____ (full name),

of _____ (place of residence),

solemnly and sincerely declare that:

- I am a *director of/manager of/managing director of/secretary of/authorised employee of/partner in/ an individual trading as) _____ (name of approved storage provider)
- The above mentioned vehicle has been impounded pursuant to Section 96 of the Land Transport Act 1998 for a period exceeding 56 days;
- Authorisation was given under Section 98(4) of the Act to dispose of the vehicle;
- All reasonable efforts to sell the vehicle have been unsuccessful;
- The vehicle has been permanently destroyed and I now apply to cancel the vehicle's registration.

And I make this solemn declaration conscientiously believing the same to be true and correct and by virtue of the Oaths and Declarations Act 1957.

*Delete words in brackets that do not apply.

_____ (signature)

Declared at _____ this day of _____ 20 _____

_____ (signature)

Justice of the Peace, Solicitor or other person authorised to take a statutory declaration.

Only complete if vehicle is subject to road user charges *(See note 4 overleaf)*

Road user charges Label(s) surrendered ☐ Yes ☐ No

Reason for Nil return of labels

Hubodometer/Odometer current distance reading

Identification details *(see note 5 overleaf)*

Customer no. from LTSA card

Applicant details

Last name/Company name

First name(s)

Address

Suburb

Town

Postal address (if different from above)

Applicant's signature

I certify that the particulars given are correct

X

Contact telephone number (optional)

0

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Input

Chkd

date stamp

MR15A 04/01 TRC COPY

MR15A - NOTES

1. General

The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its Amendments provide for the cancellation of registration of motor vehicles. The particulars specified on this form will be part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

When a vehicle is destroyed, removed permanently from New Zealand, becomes permanently useless or is written off, the owner must surrender the registration plates and notify the cancellation immediately by completing and lodging the required form at an authorised agent of the Land Transport Safety Authority. Any person who supplies false or misleading information on a form commits an offence and is liable to a fine not exceeding $10,000.00.

2. Model

State the manufacturer's designation e.g. Corolla, Sigma etc. - not the year of manufacture.

3. Surrender of plate(s)

The vehicle's registration plate(s) must be surrendered to an LTSA plate agent for destruction. If the registration plate(s) are not available please state why in the panel supplied.

4. Road User Charges

A vehicle subject to Road User Charges (RUC) is any vehicle that is diesel powered, has a manufacturer's Gross Vehicle Mass (GVM) of more than 3.5 tonnes (3500kg) or is powered by a fuel not taxed at source. Where the manufacturer's GVM is more than 3.5 tonnes (3500kg) an approved hubodometer must be fitted to a non-lifting axle on the left-hand side of the vehicle. If the vehicle is fitted with a hubodometer, state the end reading shown on the hubodometer. If a hubodometer is not required, state the end reading shown on the vehicle's odometer.

A refund equal to the amount of any unused distance recorded against the hubodometer/odometer may be refunded. In order for the refund to be paid, the current distance reading of the hubodometer/odometer must be provided and any existing original RUC licence labels must be surrendered with the MR15A GR the reason for nil return of labels panel must be completed on this form. Any refund is liable for audit and is at the Land Transport Safety Authority's discretion. Claims should only be for licences purchased within the last two years.

5. Identification

Please quote your LTSA customer number. This transaction can not be processed unless you have been issued an LTSA customer number (LTSA Card).

If a customer number has not been allocated please apply for an LTSA card using a form MR36, which is available from an LTSA agent or by contacting the Transport Registry Centre. A copy of your company's Certificate of Incorporation if a limited company OR a letter on letterhead paper explaining the nature of your business if not a limited company AND a copy of the letter from the Police approving you to be a storage provider, must accompany the application.

6. Refunds

If the Registrar is satisfied that the motor vehicle has been permanently destroyed, then the Registrar may refund an amount equal to the unexpired licence fees paid and the reimbursement fee.
In order for the Registrar to be satisfied, the registration plate(s) must be surrendered and a copy of documentation from the Police approving the disposal of the vehicle must accompany this form. If the vehicle is subject to Road User Charges, in order for a refund to be paid, see note 4. Any refund is liable for audit and is at the Registrar's discretion.

7. Additional information

For further information, please call the Help Desk Free on 0800 108 809, Monday to Friday 8.00am - 6.00pm.

Please print clearly in the panels provided - IMPORTANT - Please read notes on back of form.

LAND transportsafety AUTHORITY
Transport Registry Centre

Application for Exemption from Continuous Licensing MR24

Vehicle details

Plate number

Make

Model *(see note 6 overleaf)*

Application details

Exemption period

This vehicle will not be used for

☐ Enter period from 3 to 12 months

IMPORTANT - Please read Note 3 overleaf.

Owner details

Last name/Company name

First name(s)

Residential address

Note: If your address details have changed in order to update the address of other vehicles you own, please complete an MR28 form, which is available from an LTSA agent.

Suburb

Town

Postal address (if different from above)

Declaration

Applicant's signature

X

I certify that the particulars given are correct.
It is an offence to have your vehicle on a public road, whether parked or driven, while it has an exemption from licensing.
I HAVE READ AND ACCEPTED THE TERMS AND CONDITIONS LISTED ON THE REVERSE OF THIS FORM

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Exemption expiry date

Input

Total payable (GST inclusive)

$

Chkd

Date Stamp

MR24 12/01 TRC Copy

TERMS AND CONDITIONS - MR24

1. The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the application for exemption from Continuous Vehicle Licensing for motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

2. Continuous Vehicle Licensing
Vehicles in the following categories are not subject to Continuous Vehicle Licensing:
- trailers (3500 kg and under)
- trailer-type caravans (3500 kg and under)
- vintage vehicles (over 40 years of age)
- veteran vehicles (pre 1 January 1919)
- all terrain vehicles
- Class EA and EB vehicles
- any agricultural machinery
- tractors and mobile machines

These vehicles are not required to have an exemption from licensing if they are not used on a public road. An exemption may be requested to retain the vehicle on the Motor Vehicle Register. The section on fees (Note 7) is not applicable to vehicles which are not subject to Continuous Vehicle Licensing.

3. Exemption period/Removal of exemption
The exemption period applied for will begin from the end of the current licence/exemption. If this vehicle does not have a current licence/exemption, the exemption will begin from the date of application. The minimum exemption period is 3 months. When the exemption expires you will need to either relicense the vehicle or apply for another exemption. Note - If a vehicle which is subject to Continuous Vehicle Licensing is licensed before the minimum exemption period has elapsed licensing fees will be payable from the date the previous licence/exemption expired.
If you intend to use this vehicle on a public road before the expiry of the exemption you must license it by lodging an Application to License Motor Vehicle (form MR 1B) at any LTSA agent.

4. Stolen vehicles
If this vehicle has been stolen, please contact the Transport Registry Centre on phone 0800 108 809 for assistance.

5. Cancellation of registration
If this vehicle is removed from the road permanently, you do not need to apply for an exemption. You should cancel the registration of the vehicle by lodging an Application to Cancel Registration of a Motor Vehicle (form MR15), and surrendering the registration plates to one of the following LTSA agents - AMI Insurance, Automobile Association, On Road NZ, Vehicle Inspection NZ, Vehicle Testing NZ, Independent Agencies.

6. Model
State the manufacturer's designation e.g. Corolla, Sigma etc. - not the year of manufacture.

7. Fees
There is no fee for the application for exemption; however, a fee may be payable for any unpaid licence fees from the date the previous licence/exemption expired to the date application for exemption is made. The fees comprise a proportion of the licence fee payable under the Transport (Vehicle and Driver Registration and Licensing) Act 1986, and Accident Compensation levy payable under the Accident Compensation Act 1982 (except for trailers and a few specified vehicles), and where applicable, a Transport Licence Fee.

8. Payment
If you wish to pay by:
- Cheque, make cheques payable to the agent of the Land Transport Safety Authority where the cheque is being presented.
- Credit Card, please contact the agent where the form will be presented to confirm if credit card payments are accepted for LTSA transactions.

If you sell an unlicensed vehicle which is subject to continuous vehicle licensing or its registration is cancelled because it has remained unlicensed for over one year, outstanding licensing fees will remain payable. The debt will be referred to our debt collection agent who is empowered to order payment of the outstanding licensing fees and any additional costs.

9. Additional Information
For further information, please call the Transport Registry Centre Help Desk, on 0800 108 809, Monday to Friday 8.00am - 6.00pm.

transportsafety
Transport Registry Centre

MR28

Application to Change Name and Address Details

(of the party registered as the owner on the Motor Vehicle Register)

Plate Number	Plate Number	Plate Number
Make	Make	Make
Model	Model	Model

Current Owner's Name

(FIRST FOLD INWARD)

If you have an LTSA card, please show your Customer Number here.

Last Name/Company Name

First Name(s)

Customer No. from LTSA Card

Changed Address Details

Please complete this section only if your address has been changed or you wish to add a postal address.

Residential Address

Suburb

Town

Postal Address

Changed Owner Details

This form is not to be used for the removal or deletion of a joint owner for any other reason than that stated in the Box 'Reason for Change'.

(SECOND FOLD)

Last Name/Company Name

Trading As/Representing (if applicable)

First Name(s)

Reason for Change (please tick)

- ☐ Change of Name by Marital Status
- ☐ Change of Name by Deed Poll
- ☐ Correction to Spelling of Name
- ☐ Death of Joint Owner

Deceased owner's name (please print)

Applicant's Signature

I certify that the particulars given are correct.

X

Contact Telephone No.

0

- The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments provide for the change of details of motor vehicles. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.
- Persons who knowingly give false or misleading information commit an offence and are liable to a fine of up to $1000.

Freepost Authority
700 Palmerston North

transportsafety

freepost

TRANSPORT REGISTRY CENTRE
PRIVATE BAG
PALMERSTON NORTH

Note: This form will update the Motor Vehicle Register. To change your address on the Driver Licence Register obtain a form DL8 from an LTSA agent.

MR28 03/02

INSERT IN SLOT

Please print clearly in the panels provided. IMPORTANT - Please read notes on back of form.

transportsafety
Transport Registry Centre

Application to complete owner identification

MR34

Vehicle details

Plate number

Make

Model *(See note 1 overleaf)*

Identification details

(Please complete one box only)

Driver's Licence no. / OR Customer no. from LTSA card

Customer Identification is required *(See note 3 overleaf)*

Owner details

Last name/Company name

First name/s

Sex Male Female

Residential Address

Date of Birth Day Mth Year

Suburb

Town

Postal address (if different from above)

This form must be presented at an LTSA agent with your identification. (See note 3 overleaf)

Owner's signature

I certify that the particulars given are correct

X

The Transport (Vehicle and Driver Registration and Licensing) Act 1986, and its amendments, provide for the notification of change of ownership of any registered motor vehicle. The particulars specified on this form will form part of the Motor Vehicle Register. Corresponding information held on other parts of the Land Transport Register may be amended. You are entitled to have access to, and may request correction of, any retrievable information about you held by the Land Transport Safety Authority, Transport Registry Centre, Private Bag, Palmerston North.

Land Transport Safety Authority or Authorised Agent

FOR OFFICE USE ONLY

Types of ID sighted

Input

Chkd

date stamp

MR34 12/99 TRC COPY

MR34 - NOTES

1. **Model**
   State the manufacturer's designation e.g. Corolla, Sigma etc. - not the year of manufacture.

2. **Certificate of Registration**
   A Certificate of Registration (MR3) will be sent to the new owner within 7 days of acceptance of this form.
   NOTE: The Certificate of Registration does NOT constitute a certificate of legal ownership but is merely a record of the registered owners of a motor vehicle.

3. **Identification Details**
   Driver's Licence - Private individuals should provide their driver's licence. If a driver's licence cannot be sighted then documents which provide proof of name, date of birth and signature must be presented at the agency to complete the notification transaction.

   Customer No. - Corporate Organisations (non-individual) may have a customer number allocated to them which should be provided. If a customer number has not been allocated then a Certificate of Incorporation must be presented at the agency to complete the transaction. Application for a customer number can be made on an MR36 form.

4. **LTSA Agencies are -**
   AMI Insurance, Automobile Association, N.Z. Post, On Road NZ, Vehicle Identification NZ, Vehicle Testing NZ and a range of Independent Agencies displaying the LTSA logo.

5. **Additional Information**
   Please call the Transport Registry Centre Help Desk 0800-108 809, Monday to Friday 8.00am - 6.00pm.

LAND transportsafety AUTHORITY

Transport Registry Centre

EXAPP

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

EXEMPTION APPROVED

Dear Customer

We have approved an exemption from licensing for your *>make< >model<* (registration plate *>plate No<*) from *>Exemption start date<* to *>exemption end date<*.

Before the expiry of this exemption you must license the vehicle, or apply for a further exemption from licensing. The vehicle must have a current safety inspection (WoF/CoF) at the time of licensing.

If you intend to use this vehicle on a public road before the expiry of the exemption, you can license it by lodging an Application for Motor Vehicle Licence (form MR1B) at any Land Transport Safety Authority (LTSA) agent, with the relevant licensing fee. A list of agents and our contact details can be found on the back of this letter.

Any vehicle used on the road, regardless of whether it is parked or driven, must display a current licence and WoF/CoF label. Therefore, the only time your vehicle can be used on the road while exempt from licensing is to obtain a WoF or CoF.

Sincerely

>name<
>title<

PS: Please note the minimum exemption period is 3 months. If your vehicle is licensed before the minimum exemption period has ended, licensing fees will be payable from the date the previous licence expired.

123456789 0001/Y/N

EXDECFEES

LAND transportsafety AUTHORITY

Transport Registry Centre

19 July 2002

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EXEMPTION DECLINED
Outstanding fees owing.

Dear Customer

Your application for an exemption from licensing your >make< >model<(registration plate *>plate No<*) has been declined because there are outstanding licensing fees to be paid for the period of time the vehicle has remained unlicensed in your name.

We recommend that you pay these fees and apply for an exemption from licensing at any Land Transport Safety Authority (LTSA) agent immediately. If these fees are left unpaid they will continue to increase until the registration is cancelled by the Registrar or we receive notification the vehicle is sold. If this happens, they will remain payable and may be referred to our debt collection agency.

A list of LTSA agents and our contact details can be found on the back of this letter.

Sincerely

>name<
>title<

12345678-0001/Y/N

LAND transportsafety AUTHORITY

Transport Registry Centre

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

WARNING NOTICE
Please read the information below

Dear Customer

You are currently liable for outstanding licensing fees for this vehicle

A >make< >model< (registration plate >plate No<) registered in your name has been left unlicensed since >expiry date of current licence<. An Overdue account was sent to you on >first reminder date< exp aining that if one of the following actions was not taken you would become l able for outstanding fees.

Are you still in possession of the vehicle?
If No, and you have sold/disposed of the vehicle to another party, you must inform this office of the new owner's details. As the party registered as the owner you will receive an account for the outstanding licensing fees up to the date we receive notification of the vehicles sale/disposal. *To date no notification has been received.*
If Yes, then you must take one of the actions below.

Are you are using the vehicle?
If Yes, you must license it. When you do so the licence will be backdated to *>expiry date of current licence<*. The vehicle must have a current safety inspection (WoF/CoF) at the time of licensing.
If No, go to the next box.

Is the vehicle temporarily off the road?
If Yes, you must apply for an exemption from licensing. Outstanding licensing fees will be payable at the time of application. No WoF/CoF is required. A 3-month minimum exemption period applies from the date of application. *To date no application has been received.*

Is the vehicle permanently off the road?
If Yes, you must cancel the vehicle's registration and surrender the registration plates or the outstanding licensing fees will be payable.

If none of the above applies to your situation please ring 0800 108 809 immediately for advice on how to prevent the outstanding fees being referred for debt collection when the vehicle's registration is cancelled on *>deregistration/lapse date<.*

Forms for the above transactions are available from any of the following Land Transport Safety Authority agents: Automobile Association (AA), AMI Insurance (AMI), NZ Post, On Road NZ, Vehicle Inspection NZ (VINZ), Vehicle Testing NZ (VTNZ) and a range of independent agencies displaying the LTSA logo. ***Please note:*** *NZ Post do not cancel registrations or accept plates.*

Sincerely

>name<
>title<

123456789:0001/Y:N

NCVL-LAPSE

LAND transportsafety AUTHORITY

Transport Registry Centre

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

IMPORTANT
Please take action immediately

Dear Customer

The registration of your >*make*< >*model*< (plate >*plate No*<) will be cancelled by the Registrar on >*dereg/lapse date*< as it will have remained unlicensed for 2 years.

If you do not wish this to happen you must take one of the following actions **before** >***deregistration/lapse date***<:

- **If you are using the vehicle on the road** – you must license it before the above date. Your licence will start from the date you apply. The vehicle must have a current safety inspection (WoF/CoF) at the time of licensing.
- **If the vehicle is temporarily off the road** – you must apply for an exemption from licensing before the above date.
- ***If the vehicle is permanently off the road*** – you must cancel the vehicle's registration and surrender the registration plates.
- **If you have since disposed of this vehicle** – you must advise this office of the new owner details within 7 days, so the police and local authorities, who use the information, can be advised the vehicle is no longer in your possession. It is then the new owner's responsibility to take one of the above options.

All forms for the above transactions are available from any Land Transport Safety Authority (LTSA) agent. A list of agents and our contact details can be found on the back of this letter.

To date, we have received none of the above notifications. If the registration is cancelled by the Registrar, and the vehicle is to be used on the road at a later date, additional certification and registration costs will be payable.

Sincerely

>**name**<
>**title**<

123456789/000/Y/N

Transport Registry Centre, Private Bag, Palmerston North, New Zealand
Land Transport Safety Authority of New Zealand Te Mana Maraitai Waka Whenua o Aotearoa

LAND transportsafety AUTHORITY

Transport Registry Centre

BNCOCVL

19 July 2002

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This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

IMPORTANT
Please lodge Notice of Change of Ownership

Dear Customer

We have received notification that you have taken possession of a *>make<* *>model<* (registration plate *>plate no<*). ***Legislation requires you to confirm ownership within 7 days.***

Please complete a Notice of Change of Ownership (form MR13B) at a Land Transport Safety Authority (LTSA) agent, present identification and pay the required fee. You will then be sent a Certificate of Registration and future licensing accounts.

Ownership liability means that you are now responsible for the following:

- **If you are using the vehicle on the road** and the licence has expired – you must license it.
- **If the vehicle is temporarily off the road** – you must apply for an exemption from licensing. A 3-month minimum exemption period applies from the date of application.
- **If the vehicle is permanently off the road** – you must cancel the vehicle's registration and surrender the plates.
- **If you have since disposed of the vehicle** – you must advise this office of the new owner's details, so that the police and local authorities, who use the information, can be advised the vehicle is no longer in your possession.

If the vehicle is left unlicensed for more than 1 year and no exemption applied for, the registration will be cancelled by the Registrar. You will be liable for any unpaid licensing fees incurred while the vehicle was registered in your name.

All forms for the above transactions are available from any LTSA agent. Lists of agents, suitable identification, and our contact details can be found on the back of this letter.

Sincerely

>name<
>title<

LAND transportsafety AUTHORITY

Transport Registry Centre

MVRNOID

19 July 2002

This is the persons first name and has a maximum length ending here
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Suburb is entered in here
Town is entered in here & PC TO

IMPORTANT
Identification required

Dear Customer

On >*purchase date*< a change of ownership was lodged registering you as the owner of a >*make*< >*model*< (registration plate >*plate no*<).

To complete the transfer to your name, and to receive a Certificate of Registration and future licensing accounts, please call at a Land Transport Safety Authority (LTSA) agent and:

- lodge an Application to Complete Owner Identification (form MR34) and
- present identification.

There is no fee for this transaction.

Lists of agents, suitable identification, and our contact details can be found on the back of this letter.

If your vehicle is subject to Continuous Vehicle Licensing you will be responsible for any unpaid licensing fees from the date you confirmed possession.

Sincerely

>**name**<
>**title**<

LAND transportsafety AUTHORITY

Transport Registry Centre

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
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EXEMPTION DECLINED
Identification required

Dear Customer

Your application for an exemption from licensing your >*make*< >*model*< (registration plate >*plate No*< has been declined because you have not presented identification to complete the change of ownership process.

For your application to be accepted, and to receive your Certificate of Registration and future licensing accounts, please call at a Land Transport Safety Authority agent and:

- present proof of identification, and complete an Application to Complete Owner Identification (form MR34). There is no fee for the transaction.
- re-apply for an exemption by completing an Application for Exemption from Licensing (form MR24).

We recommend you take action immediately, before fees become payable.

If the matter is overlooked, your vehicle's registration will be cancelled by the Registrar after being left unlicensed for 1 year from the previous licence expiry date. Any unpaid licensing fees incurred while the vehicle is registered in your name will be billed to you at this time or when the vehicle is sold.

Lists of agents, suitable identification and our contact details can be found on the back of this letter.

Sincerely

>name<
>title<

BNCONON

LAND transportsafety AUTHORITY

Transport Registry Centre

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
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This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

IMPORTANT
Please lodge Notice of Change of Ownership

Dear Customer

We have received notification that you have taken possession of a >*make*< >*model*< (registration plate >*plate no*<). ***Legislation requires you to confirm ownership within 7 days.***

Please complete a Notice of Change of Ownership (form MR13B) at a Land Transport Safety Authority (LTSA) agent, present identification and pay the required fee. You will then be sent a Certificate of Registration and future licensing accounts.

If the vehicle remains unlicensed for 2 years from the last licence/exemption expiry date, the registration will be cancelled by the Registrar. If you do not wish this to happen you must either license the vehicle or apply for an exemption ***before*** the registration is cancelled. If the vehicle's registration is cancelled and it is to be used on the road at a later date, additional certification and registration costs will be payable.

If you have since disposed of this vehicle – you must notify this office of the new owner's details so that the police and local authorities, who use the information, can be advised the vehicle is no longer in your possession. *To date, no notification has been received.*

All forms for the above transactions are available from any LTSA agent. Lists of agents, suitable identification, and our contact details can be found on the back of this letter.

Sincerely

>**name**<
>**title**<

LAND transport safety AUTHORITY

Transport Registry Centre

FIN-UNC

19 July 2002

This is the persons first name and has a maximum length ending here
This is the joint owner who is positioned here and finishes at this stop
This is the first line of the address ok
This is the second line of the address
Suburb is entered in here
Town is entered in here & PC TO

IMPORTANT
Please take action immediately

Dear Customer

The registration of your >*make*< >*model*<(plate >*plate No*<) will be cancelled by the Registrar on >*deregistration/lapse date*< as it will have remained unlicensed for 1 year.

Are you still in possession of this vehicle?

If No, you must inform this office of the new owner's details so that the police and local authorities, who use the information, can be advised the vehicle is no longer in your possession. *To date no notification has been received.*

If Yes, and you do not wish the registration to be cancelled, you must lodge a Notice of Change of Ownership, pay the fee and present identification at a Land Transport Safety Authority (LTSA) agent, and take one of the following actions **before >*deregistration/lapse date*<**:

- **If you are using the vehicle on the road** – you must license it before the above date. Your licence will start from the date you confirm ownership. The vehicle must have a current safety inspection (WoF/CoF) at the time of licensing.
- **If the vehicle is temporarily off the road** – you must apply for an exemption from licensing at the time you lodge the Notice of Change of Ownership.
- **If the vehicle is permanently off the road** – you must cancel the vehicle's registration and surrender the registration plates.

All forms for the above transactions are available from any LTSA agent. A list of agents and our contact details can be found on the back of this letter.

If the registration is cancelled by the Registrar, and the vehicle is to be used on the road at a later date, additional certification and registration costs will be payable.

Sincerely

>name<
>title<

1234567890001/Y/N

Transport Registry Centre, Private Bag, Palmerston North, New Zealand
Land Transport Safety Authority of New Zealand Te Mana Marutau Waka Whenua o Aotearoa

Appendix Four

Legislation Regarding Abandoned Vehicles and Motor Vehicle Registration and Licensing

2 Removal of abandoned vehicles from roads

2. Removal of abandoned vehicles from roads---(l) The principal Act is hereby amended by repealing section 356, and substituting the following section:

"356. (l) This section applies where any category A or category B or category C motor vehicle is found on a road within the district of any council and appears to have been abandoned by its owner.

(2) In the case of a category A or category B vehicle, the following provisions shall apply:

(a) The council may authorise any person to remove the vehicle and store it:

(b) No person authorised by the council shall remove the vehicle until a member of the Police has been notified of the proposal to move it:

(c) The council shall make reasonable efforts to give notice to the last registered owner of the vehicle of its intention to sell the vehicle, and those efforts shall include,---

(i) 'In the case of a category A vehicle, taking practical steps to identify the owner of the vehicle by reference to chassis numbers or other numbers appearing on the vehicle:

(ii) In the case of a category B vehicle, identifying the owner of the vehicle by reference to such numbers and by searching the motor vehicle security register or otherwise:

(d) After making reasonable efforts to give notice under paragraph (c) of this subsection, the council may give not less than 10 working days' notice, by advertisement in 2 issues of a daily newspaper circulating in the district in which the road is situated, of its intention to sell the vehicle, but if the council is satisfied that the condition of the vehicle is such that it is of little or no value, it may dispense with the giving of such notice:

(e) At any time after the expiration of a notice given in accordance with paragraph (d) of this subsection or at any time after the giving of such notice has been dispensed with under that paragraph, the council may sell or otherwise dispose of the vehicle to any person or otherwise dispose of the vehicle in such manner as the council thinks fit, and any person to whom such a vehicle is sold or disposed of shall thereupon become the lawful owner of the vehicle:

(f) The advertisement under paragraph (d) of this subsection shall specify the following:

(i) A description of the make, model, and colour of the vehicle:

(ii) The chassis numbers and any other vehicle numbers (if known):

(iii) The location from which the vehicle was removed:

(g) The proceeds of any such sale shall be applied in payment of the costs and charges attending the sale, including the advertisement under paragraph (d) of this subsection, and of the expenses of the removal and storage of the motor vehicle, and the residue, if any, shall be payable to the former owner of the vehicle:

(h) Where any motor vehicle is removed by the council under this subsection, the owner shall be liable to pay to the council all expenses incurred by the council in removing and storing the vehicle, and, where the vehicle is claimed by the owner and not sold or otherwise disposed of pursuant to this subsection, those expenses shall be payable before the owner takes delivery of the vehicle.

(3) In the case of a category C vehicle, the provisions of subsection (2) of this section shall apply with the following modifications:

(a) The notice specified in paragraph (d) of that subsection shall not be given unless the vehicle has been stored for a period of 1 month and reasonable efforts to locate the last registered owner have been made by the council:

(b) In addition to specifying the matters set out in paragraph (f) of that subsection, the notice shall specify the name of the current registered owner and the last known address of that person:

(c) Paragraph (c) of that subsection shall apply as if the vehicle were a category B vehicle.

(4) If, after a search of the motor vehicle security register in accordance with subsection (2) (c) (ii) or subsection (3) (c) of this section, it is found that the vehicle is subject to a registered
security interest, the council shall, before selling or otherwise disposing of the vehicle, notify the holder of that interest of its intention to sell or otherwise dispose of the vehicle.

(5) For the purposes of this section,---

(a) A category A vehicle is a motor vehicle that has neither a number plate nor a current licence label affixed to the vehicle:

(b) A category B vehicle is a motor vehicle, that has affixed to it either a number plate or a current licence label (but not both):

(c) A category C vehicle is a motor vehicle that has affixed to it either---

(i) A number plate and a current licence label; or

(ii) A number plate and a licence label that expired not more than 6 months before the council took possession of the vehicle.

(6) For the purposes of this section, "council", in relation to a State highway that is under the control of Transit New Zealand, means Transit New Zealand.

(7) Nothing in this section limits or affects anything in section 239 of the Public Works Act 1981."

(2) Section 36 of the Local Government Amendment Act 1992 is hereby consequentially repealed.

71 Removal and disposal of abandoned boats and vehicles, and vehicles parked in prohibited places

71. Removal and disposal of abandoned boats and vehicles, and vehicles parked in prohibited places---(l) Any officer or employee of the ~ Department who has reasonable cause to believe that any boat or vehicle has been abandoned in a park may remove it or cause it to be removed to any place authorised by the Minister for that purpose.

(2) Where the Minister has appropriated any part of a park for parking of vehicles, any officer or employee of the Department may remove to any place so appropriated any vehicle that is parked on any part of the park where the parking of vehicles is prohibited.

(3) Where any vehicle is so removed, the owner or other person in charge of the vehicle shall be liable to the Crown for the cost of removing the vehicle and for the charges that, under bylaws made under this Act, would be payable for the use of that parking space if the vehicle has been parked there by the owner or other person in charge.

(4) Unless, within 2 months after the date on which a vehicle is removed under subsection (1) or subsection (2) of this section, the V owner or some other person removes the vehicle from the park or other place where it is stored and pays to the Minister on behalf of the Crown the cost of removing and storing it under subsection (1) of this section or, as the case may be, the cost of removing it under subsection (2) of this section and the parking charges payable under that subsection, then,---

(a) If the vehicle---

(i) Is not a motor vehicle; or

(ii) Is a motor vehicle and no licence to use the vehicle for the current licensing year is affixed to it,---the Minister may give not less than 14 days' notice by advertisement in 2 issues of a newspaper circulating in the district in which the park is situated, of his intention to sell or destroy the vehicle:

(b) If---

(i) The vehicle is a motor vehicle; and

(ii) A licence to use the vehicle for the current licensing year is affixed to it,---the Minister may give not less than 14 days' notice to the last registered owner of the vehicle of his intention to sell or destroy the vehicle.

(5) Any notice under subsection (4) (b) of this section may be given by personal delivery to the last registered owner, or by posting it to him by registered letter addressed to him at his last known place of residence or business in New Zealand.

(6) Unless, before the expiry of the notice given under subsection (4) of this section, the owner of the vehicle---

(a) Pays to the Minister on behalf of the Crown the cost of removing and storing the vehicle under subsection (1) of this section, or, as the case may be, the cost of removing it under subsection (2) of this section and the parking charges payable under that subsection, and, in either case, the cost of any advertisements published under this section; and

(b) Removes the vehicle from the park or other place to which it was removed ---

the Minister may, at any time after the expiry of the notice, sell the vehicle to any person who shall thereupon become the lawful owner of the vehicle, or the Minister may cause the vehicle to be destroyed.

(7) The proceeds of the sale of any vehicle sold in accordance with this section shall be the property of the Crown and shall be paid into LI the [Crown Bank Account] and applied under section 57 of this Act as if it were money received under this Act.

(8) For the purposes of this section, and without limiting the meaning of the term "abandoned", a boat or vehicle shall be deemed to have been abandoned if it is left unused for a period of more than one month without the approval of the Minister.

(9) In this section expressions defined in the Transport Act 1962 have, in relation to any motor vehicle, the meanings so defined. Cf. 1952, No. 54, s. 57A; 1974, No. 69, s. 11

110 Removal and disposal of vehicles and boats

110. Removal *and* disposal of vehicles *and* boats---(l) Any ranger, *any* person employed by the administering body of *any* reserve, or, in the case of a reserve that is not under the management *and* control of an administering body, *any* officer of the Department who has reason to believe that *any* vehicle or boat has been abandoned in a reserve *may* remove it or cause it to be removed to *any* place authorised for that purpose by the administering body or, as the case *may* be, by the Commissioner.

(2) Where the administering body or, in the case of a reserve that is not under the management *and* control of an administering body, the Commissioner has appropriated *any* part of a reserve for the parking of vehicles or the mooring of boats, *any* ranger, *any* person employed by the administering body, or, as the case *may* be, *any* officer of the Department *may* remove to *any* place so appropriated *any* vehicle that is parked or *any* boat that is moored on *any* part of the reserve where the parking of vehicles or the mooring of boats is prohibited. In *any* such case, the owner or other person in charge of the vehicle or boat shall be liable to the administering body or to the Commissioner, as the case *may* be, for the cost of removing the vehicle or boat *and* also for the charges that pursuant to bylaws *made* in respect of that reserve would be payable for the use of that parking or mooring space if the vehicle or boat *had* been parked or moored there by the owner or other person in charge.

(3) Unless within 2 months after the date on which a vehicle or boat is removed pursuant to subsection (1) or subsection (2) of this section the owner or some other person having an interest therein removes the vehicle or boat from the reserve or other place where it is stored *and* pays to the administering body or to the Commissioner, as the case *may* be, the cost of removing *and* storing it pursuant to subsection (1) of this section or, as the case *may* be, the cost of removing it pursuant to subsection (2) of this section *and* the parking or mooring charges payable under that subsection, then,--

(a) In the case of *any* boat, *and* in the case of *any* vehicle if it—

(i) Is not a motor vehicle; or

(ii) Is a motor vehicle *and* has no registration plate affixed thereto or is unregistered: or

(iii) Is a motor vehicle *and* no licence to use the vehicle issued for the current licensing year is affixed to it,--

the administering body or the Commissioner. as the case *may* be, *may* give not less than 14 days' notice, by advertisement in 2 issues of a daily newspaper circulating in the district in which the reserve is situated, of its or his intention to sell or destroy the vehicle or boat. as the case *may* be:

(b) If in the case of any vehicle--

(i) The vehicle is a motor vehicle; and

(ii) A licence to use the vehicle issued for the current licensing year is attached to it,--

the administering body or the Commissioner, as the case may be, may give not less than 14 days' written notice to the last registered owner of its or his intention to sell or destroy the vehicle, by delivering the notice to him personally or by posting it to him by registered letter addressed to him at his last-known place of abode or business in New Zealand.

(4) Unless before the expiry of the notice given under subsection (3) of this section the owner of the vehicle or boat--

(a) Pays to the administering body or to the Commissioner, as the case may be, the cost of removing and storing the vehicle or boat pursuant to subsection (1) of this section, or, as the case may be, the cost of removing it pursuant to subsection (2) of this section and the parking or mooring charges payable under that subsection, and, in either case, the cost of the aforesaid advertisements; and

(b) Removes the vehicle or boat from the reserve or other place to which it was removed—

the administering body or the Commissioner, as the case may be, may, at any time after the expiry of the notice, sell the vehicle or boat to any person, who shall thereupon become the lawful owner of the vehicle or boat, or the administering body or the Commissioner, as the case may be, may cause the vehicle or boat to be destroyed, and in neither case shall any liability attach to the administering body or to the Crown or to the Commissioner or to any other person for any loss or damage occasioned thereby.

(5) The proceeds of the sale of any vehicle or boat sold in accordance with the provisions of this section shall form part of the funds of the administering body in any case where the vehicle or boat has been sold by that body, and in any other case shall be paid into the [Crown Bank Account] and may be applied, as directed by the Minister, in purchasing, taking on lease, managing, administering, maintaining, protecting, improving, and developing reserves or as consideration for conservation covenants.

(6) For the purposes of this section, and without limiting the meaning of the term "abandoned", a vehicle or boat shall be deemed to have been abandoned if it is left unused for a period of more than one month without the approval of the administering body or the Commissioner, as the case may be.

(7) In this section--

Expressions defined in the Transport Act 1962 have, in relation to any motor vehicle, the meanings so defined:

'Moored' " in relation to any boat, includes being left aground or on land.

In subs. (5) the reference to the Crown Bank Account was substituted by s. 83 (7) of the Public Finance Act 1989 for the original references to the Public Account and the Trust Account.

239 Removal and disposal of abandoned property from public works land

239. Removal and disposal of abandoned property from public works land---(l) Any person authorised in that behalf by the Minister in the case of a Government work, or by the local authority in the case of a local work, who has reason to believe that any property has been abandoned on land held for a public work may remove it or cause it to be removed to any place authorised for that purpose by the Minister or, as the case may be, by the local authority.

(2) Unless within 10 working days after the date on which any property is removed pursuant to subsection (1) of this section, the owner or some other person on his behalf takes away the property from the place to
which it was so removed, and pays to the Minister or to the local authority, as the case may be, the cost of removing it pursuant to subsection (1) of this section--

(a) If the property--

(i) Is not a motor vehicle; or

(ii) Is a motor vehicle and has no registration plate affixed to it or is unregistered; or

(iii)Is a motor vehicle and no licence to use it issued for the current licensing year is affixed to it--

the Minister or the local authority, as the case may be, may give not less than 10 working days' notice, by advertisement in 2 issues of a daily newspaper circulating in the district in which the land held for the public work is situated, of his or its intention to sell or destroy the property, but if the Minister or the local authority is satisfied that the condition of the property is such that it is of little or no value, he or it may dispense with the giving of such notice:

(b) If the property is a motor vehicle to which is affixed a licence to use the vehicle for the current licensing year, the Minister or the local authority may give not less than 10 working days' notice to the last registered owner of his or its intention to sell or destroy the vehicle.

(3) The Minister or the local authority, or any other person, shall not be liable for any loss or damage occasioned by or following upon the removal of the property pursuant to subsection (1) of this section.

(4) Unless, before the expire of the notice given under subsection (2) of this section, the owner of the property--

(a) Pays to the Minister or the local authority the cost of removing the property pursuant to subsection (1) of this section, and the cost of the said advertisements; and

(b) Takes away the property from the place to which it was removed--

the Minister or the local authority, at any time after the expire of the notice, may sell the property to any person, who shall thereupon become the lawful owner of it, or

the Minister or local authority may cause the property to be destroyed, and in neither case shall any liability attach to the Minister or to the local authority or to any other person for any loss or damage occasioned thereby.

(5) The proceeds of the sale of any property sold in accordance with this section shall be paid into the Public Account or the general revenues of the local authority, as the case may be.

(6) For the purposes of this section, a vehicle shall be deemed to have been abandoned if it is left unused for a period of more than 1 month without the approval of the Minister or local authority, as the case may be.

(7) For the purposes of this section, "vehicle" means a contrivance equipped with wheels or revolving runners upon which it moves or is moved; and includes a contrivance from which the road wheels or revolving runners have been removed.

(8) In this section, expressions defined in the Transport Act 1962 have, in relation to any motor vehicle, the meanings so defined.

Public Works Amendment Act 1988

General Provisions

81 Removal and disposal of abandoned property from public works land

81. Removal and disposal of abandoned property from public works land---Section 239 (1) of the principal Act is hereby amended by omitting the words "the Minister", and substituting the words "a Minister of the Crown"

I: Registration and Licensing of Motor Vehicles
Registers of Motor Vehicles

20 Notification of change of ownership of motor vehicle

20. Notification of change of ownership of motor vehicle---within 7 days after the sale or other disposition of any registered motor vehicle, the person selling or otherwise disposing of it shall, on a form provided by the Registrar, give to the Registrar---

(a) Notice of the fact and date of the sale or other disposition:

(b) The name of the registered owner of the vehicle:

(c) The name and address of the person selling or otherwise disposing of the vehicle:

(d) The distance recorded on the distance recorder (if any) of the vehicle at the time of the sale or other disposition:

(e) The name, occupation, addresses, and date of birth (if any) of the new owner as given under section 22 of this Act:

(f) Such other particulars relating to the vehicle as may be required by the Registrar as indicated on the form.

Cf. 1962, No. 135, s. 18 (1); 1985, No. 50 s. 4 (1)

26 Offences relating to registration, licensing, and change of ownership of motor vehicle

26. Offences relating to registration, licensing, and change of ownership of motor vehicle---(l) Every person commits an offence and is liable on summary conviction to a fine not exceeding $1,000 who,---

(a) In or for the purposes of any application under section 7 of this Act for the registration of a motor vehicle; or

(b) In or for the purposes of any application or notification under section 9 of this Act for or relating to personalised registration plates; or

(c) In or for the purposes of any application under section 10 of this Act for a licence for any motor vehicle; or

(d) In or for the purposes of any application under section 15 of this Act for a duplicate certificate of registration, a substitute registration plate or plates, or a substitute licence for any motor vehicle; or

(e) In or for the purposes of any notification under section 20 of this Act of the change of ownership of a motor vehicle; or

(f) In or for the purposes of giving that person's name or an address under section 22 of this Act,---

knowingly supplies to the Registrar, or to any person who is to make any application or notification under any of those sections, any false or misleading information.

(2) Every person other than the Registrar commits an offence and is liable on summary conviction to a fine not exceeding $500 who fails to comply with any of the provisions of sections 20 to 23 of this Act or does any act in contravention of those provisions.

Cf. 1962, No. 135, ss. 18 (11), 18A; 1985, No. 50, s. 5 (1); 1985, No. 76, s. 7

Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1992

13 Notification of change of ownership of motor vehicle

13. Notification of change of ownership of motor vehicle --- Section 20 of the principal Act is hereby amended by adding, as subsection (2), the following subsection:

(2) The Governor-General may from time to time, by Order in Council, make regulations for all or any of the following purposes:

(a) Prescribing the obligations of the seller and the buyer, and the functions of the Registrar, where there is a change in the ownership of a registered motor vehicle:

(b) Providing for the appointment, functions, and duties of agents for the purposes of effecting a change in the ownership of a registered motor vehicle:

(c) Prescribing or authorising the Secretary to prescribe the form of certificates of registration for the purposes of the Part of this Act:

(d) Providing for discounts to be granted in respect of the prescribed fee payable where a change in the ownership of a registered motor vehicle occurs.

14. Particulars required to be supplied by persons acquiring ownership

14. Particulars required to be supplied by persons acquiring ownership---(1) The principal Act is hereby amended by repealing sections 22 to 24, and substituting the following section:

22. (1) Every person who acquires ownership of a motor vehicle shall give to the Registrar, on the form referred to in section 20 of this Act, ---

(a) The full name and occupation of the intended registered owner of the vehicle; and

(b) The address of the place of residence or place of business within New Zealand of the intended registered owner of the vehicle; and

(c) The postal address within New Zealand, if that address differs from the address given under paragraph (b) of this section, of the intended registered owner of the vehicle; and

(d) Where the intended registered owner is a natural person, that person's date of birth.

(2) Section 7 (2) of this Act shall apply to applications made under this section as if they were applications under that section.

(3) No person shall be the registered owner of a motor vehicle, except ---
(a) A natural person of or over 15 years of age; or
(b) A body corporate; or
(c) An instrument of the Executive Government of New Zealand.

(2) Section 20 of the principal Act is hereby consequentially amended by repealing paragraph (e).

16 Offences relating to registration, licensing, and change of ownership of motor vehicle

16. Offences relating to registration, licensing, and change of ownership of motor vehicle--- Section 26 of the principal Act is hereby amended---
(a) By omitting from subsection (1) (f) the expression 'section 22 of':
(b) By omitting from subsection (2) the words 'sections 20 to 23 of this Act', and substituting the words 'sections 20 to 22 of this Act or of any regulations made under section 20 (2) of this Act'.

Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1997

7. Notification of change of ownership of motor vehicle

7. Notification of change of ownership of motor vehicle ---(1) Section 20 (1) of the principal Act is amended by inserting, after the words 'give to the Registrar'. The words 'or to a person authorised by the Secretary in that behalf'.
(2) Section 20 of the principal Act is amended by repealing subsection (2).
(3) Section 13 of the Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1992 is consequentially repealed.
(4) The Transport (Vehicle and Driver Registration and Licensing) Amendment Act 1992 is amended by repealing section 14 (2).

8 Particulars required to be supplied by persons acquiring ownership

8. Particulars required to be supplied by persons acquiring ownership---Section 22 (1) of the principal Act (as substituted by section 14 of the Transport (Vehicle and

Driver Registration and Licensing) Amendment Act 1992) is amended by omitting the words ‘, on the form referred to in section 20 of this Act’, and substituting then words ‘ or to a person authorised by the Secretary in that behalf, on a form provided by the Registrar’.

Appendix Five

Automobile Recycling in the Netherlands

Figure A5.1: Calculating the Waste Disposal Fee (The Netherlands) Source: ARN (2001, 45)

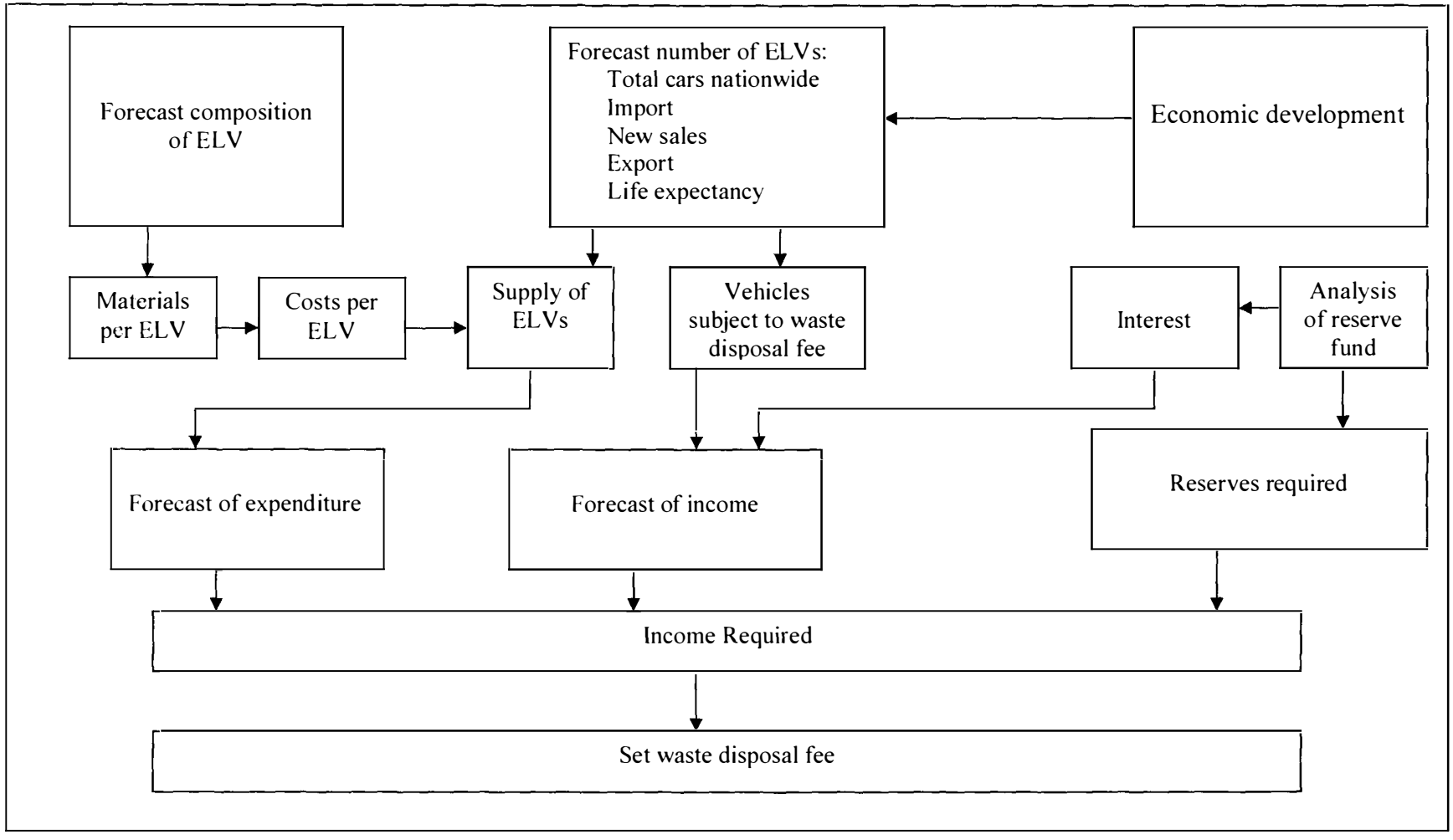

Table A5.1: Recycling of an ELV by ARN in 2002

Metals (assumed)	686.9 kg	75 %
ARN materials*		
Materials recycling	85.0 kg	9.3 %
Thermic recycling	15.6 kg	1.7 %
Recycling	**787.5 kg**	**86%**
Remaining fraction	128.4 kg	14 %
Average weight of a wreck	915.9 kg	100 %

Exclusive of fuel(s) and LPG tanks
2002 Data
Source: ARN (2003, 40)

Table A5.2: Materials Dismantled for Recovery or Recycling by ARN

Material	Kg/ltr/st per car wreck	Dismantling since year
Coolant	3.6	1995
Used oil	4.9	1995
Brake fluid	0.3	1995
Batteries	13.3	1995
Glass	25.4	1995
Tyres	27.9	1995
Inner tubes	0.1	1995
PU Foam	6.5	1995
Rubber strips	7.7	1995
Plastic bumpers	5.6	1996
Safety belts	0.35	1996
Coconut fibre	0.6	1996
Windscreen washer fluid	1.0	1996
LPG tanks	0.06	1996
Grilles	0.7	1997
Rear lamps and indicators	1.4	1997
Hub caps	0.7	1997
Fuels (petrol/diesel)	5.0	1999
Oil-filter	0.5	2002

Source: ARN 2003

Materials Recycled and Processed by ARN

Hazardous substances:

- Sulphuric acid from batteries is decontaminated and reused for metal electrolysis.
- Lead from batteries is reprocessed for recycling in new batteries and the plastic cases recovered from batteries are used in the production of new battery cases.
- Used oil undergoes high-grade processing and is used as lubricating oil (with ARN closely monitoring the quality).
- Oil filters are removed and shredded. Metal from the filters is extracted by magnet and recycled within the steel industry. Oil pressed out of the paper is refined and the paper is used as a secondary fuel.
- The monoethylene glycol present in coolant is retrieved by distillation and is either reused in new coolant or, used as a solvent in the paint industry.
- The various types of alcohol used in windscreen washer fluids are distilled out and reused (or used in other industrial applications).
- Used brake fluid is reused as new brake fluid, but purification is expensive.
- The gas (from LPG tanks) is removed and pure LPG is stored for reuse and the empty tank is then suitable for reuse. Where the tank is not reused, the metal is recycled for alternative uses.
- Fuel removed from an ELV is used by the dismantling company.

Non-hazardous materials:

- Tyres are granulated and used to make insulation mats, sports floors and tiles for children's playgrounds, however, more of them are incinerated to produce heat energy in the cement industry.
- PU-foam in car seating is shredded to make the re-bonded foam in mattresses, sports mats, and furniture. It is also mixed with textile fibres for use in insulation materials in new vehicles.
- Long, used coconut fibre (present in car seats) is mixed with new coconut fibre to make new car seats or mattresses, while shorter used fibres are used in insulating material.

- Inner tubes are high-grade butyl rubber which is no problem to recycle, and for which there was a good market in the car industry and elsewhere. Rubber strips are removed from around doors and windows, shredded and then either heat treated in the cement industry or, incinerated to produce heat energy, with a small proportion being used as drainage material.
- Safety belts are subject to stringent quality control before the material is reused for new seat belts. Most are used as fibre in geo-textile, insulation materials, and carpet underlay.
- Hubcaps are made of different types of plastics, and possibly some metal. Metal is removed from the hubcaps by magnet for recycling, and plastics of different structures are separated and used in various applications, for example in computer monitors.
- Bumpers are hand-sorted into polypropylene (PP) bumpers or, polycarbonate (PC) bumpers to be processed separately.[1] These bumpers are shredded (with any metal being magnetically extracted), further reduced in a grinding mill, and washed. They are used in many plastics applications, including engine covers, wheel arch liners, and plastic housing for car heating systems.
- Indicators and rear lights are comprised of different plastic types bonded by adhesives. They are separated through 'selective dissolving' and used as housing for new rear lights, as well as other general uses in the plastics processing industry.
- The ABS of which grilles are made is used as a plastic in household appliances, as long as it is pure.
- Glass of all types is collected together and is used to make bottles, sheet glass, or, used for glass fibre-enforced materials (ARN 2003).

[1] Only bumpers made from PP or PC are suitable for processing, other bumpers are left on the car shell (ARN 2003).