Shared spaces in New Zealand urban areas

David Shearer

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School of Surveying/Te Kura Kairuri

University of Otago/Te Whare Wananga o Otago

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Abstract

The concept of shared spaces is gaining popularity around the world as an innovative approach to streetscape design. Shared spaces are streets which have very little separation between road users; meaning pedestrians, cyclists, and vehicles literally share the road space. Traffic control infrastructure is often removed from shared spaces to introduce a degree of uncertainty to urban streets, necessitating a more careful and courteous style of driving with the aim of increasing safety for all road users.

Shared spaces are beginning to appear in New Zealand cities. This thesis provides a context of this introduction of shared spaces into New Zealand’s urban areas and the issues that may affect the success of shared space in New Zealand. This includes examining what shared spaces currently exist and how well they are functioning, as well as any proposed shared spaces. Local authorities were contacted to evaluate the position of local government with regard to the shared space concept. Also, the purported advantages and disadvantages of shared spaces are investigated in a New Zealand-specific context to gauge the appropriateness of the concept for the country.

It was found that well designed shared spaces could enhance New Zealand’s urban areas by balancing the needs of all road users and creating more pedestrian friendly public spaces. However, more research needs to be undertaken to investigate the effect that shared spaces will have in New Zealand, and also to find ways to aid blind and visually impaired people in navigating the spaces. Three types of shared space have been suggested and case studies have been used to apply these suggestions in public spaces in Dunedin and Oamaru.
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Chapter 1: Introduction

Canadian author and political activist Naomi Klein (2000) has described a British protest movement which began in 1995 called “Reclaim the Streets”. The movement, which has since spread worldwide, consists of secretly organised street parties involving thousands of people. Streets, roads and highways are spontaneously blocked in a theatrical fashion, a sound-system is set up and protesters hold a carnival-like party on the street (10,000 activists/partiers took over London’s six-lane M41 in one event). Signs are erected with anti-corporate and environmental slogans, and sometimes more extreme measures are taken to “reclaim the street”. For example; in one event, “guerrilla gardeners” hid under the oversized skirts of stilt-walkers with jackhammers, and planted trees in freshly dug holes in the road surface. Their slogan: “Beneath the tarmac... A forest”, a reference to the rallying cries of students in the Paris protests of May 1968; “Under the pavement... The beach”, a chant yelled as cobblestones pulled up from the street surface were thrown at police (leaving the sand under the cobblestones exposed).

Mainstream media labelled the parties “anti-car” protests, but Klein (2000) suggests this is an oversimplification of the movement and its objectives. The protesters view the automobile as a manifestation of the loss of public space to private interests, and the very name of the events, “Reclaim the Streets”, expresses the wider goals of the parties.

The Reclaim the Streets parties are a radical and sometimes, unfortunately, destructive expression of a wider discontent with the state of public space in cities and towns around the world. There are many less extreme movements with similar goals of reclaiming public space for public interests. The New Urbanist design movement is a prominent example (see CNU, 2001), and others such as the English Heritage’s (2004) “Save our Streets” campaign are discussed in this thesis. Shared space incorporates elements of all of these movements and offers something more. At the heart of the shared space concept is the idea of sharing the street; both literally, with the removal of footpaths and defined carriageways forcing road users to share the space, and figuratively, with aims of re-asserting a sense of place and involvement in public spaces.

Shared space evolved out of the Netherlands and has recently gained popularity around the world. Shared spaces have been popular in Western Europe for a number of years, but
examples have recently been seen in the United States and Australia, and the first real example of a shared space in New Zealand was constructed in Auckland in 2010. Several other shared spaces are proposed around the country. As the concept of shared spaces is such a fundamental departure from historical design approaches, which focus on the separation of road users using footpaths and raised kerbs, it is important that the safety effects of the new approach are understood, as well as any other economic, social, and environmental benefits or detriments.

1.1 Research problem

This thesis examines the role that shared space design could play in New Zealand urban design and land development. The central hypothesis is that shared spaces could improve New Zealand’s urban areas by making them more people-oriented, as opposed to traffic-oriented. To investigate this hypothesis, several sub-issues are investigated:

- Could shared spaces enhance New Zealand’s urban areas by balancing the needs of various road users and creating more pedestrian friendly public spaces?
- Do shared spaces already exist in New Zealand, and if so, in what form and how well do they function?
- Would shared spaces be safe for road users in New Zealand cities?
- Do the advantages and disadvantages of shared spaces, both demonstrated and hypothesised, apply in a New Zealand context?
- What sort of shared spaces would be appropriate in New Zealand?

By the end of this thesis, the key issues regarding shared spaces in New Zealand will have been examined, and a way forward to the promotion and design of shared space in New Zealand will be suggested.

Objectives

The following objectives correspond to the sub-issues above. They demonstrate how solutions to the research problems were found.

- To investigate the history and theory behind the shared space concept and in doing so examine the advantages and disadvantages (both empirically demonstrated and hypothetical) of the concept.
• To consider the current status of shared spaces in New Zealand. This objective involves assessing the stance of local and central government regarding shared spaces and evaluating any existing or proposed shared space examples in New Zealand.

• To look at New Zealand’s urban areas to identify where shared spaces may provide benefits. This will involve an examination of road safety data and the urban character of our cities, as well as other social, environmental, and economic issues.

• To define the best design approach to shared spaces in New Zealand. By looking at the experiences of other countries, and the evidence that has been produced from these experiences, a design approach specific to New Zealand’s particular urban characteristics can be described.

• To apply the design approach to New Zealand cities in the form of case studies.

**Need and significance of research**

Decisions regarding shared spaces in New Zealand need to be based on evidence, not simply on the theoretical advantages of the concept. The design of a street affects the street’s safety, so shared spaces should not be introduced into New Zealand without reasonable evidence to indicate that they will be safe in New Zealand urban areas. This thesis aims to compile the evidence regarding all aspects of shared spaces to assess whether the advantages that have been espoused and demonstrated would eventuate in New Zealand urban areas.

More generally, this research is adding to the body of literature investigating methods of reducing traffic accidents around the world, something that has been labelled “of global health importance” (Bunn, et al., 2003, p. 200). In New Zealand alone, over 300 people lose their lives in road accidents every year, and over 2000 are seriously injured (Ministry of Transport, 2009c). Worldwide, a staggering 1.2 million people die in traffic accidents every year (WHO, 2009).

It is important that we continue to seek safer alternatives to the status quo of street design; i.e. separated streets. In doing so, we can develop better designs so that developing countries, where road accidents are predicted to increase as the countries become more motorised (Bunn, et al., 2003), can avoid making the same mistakes that developed countries have made. Alternatives that try to raise the profile of “vulnerable road users”; i.e. pedestrians and cyclists, are especially worthy of further research. Vulnerable road users are at particular risk when their needs have not been considered in road design; they make up 46% of all those killed on the roads around the world (WHO, 2009).
This research also adds to New Zealand urban design’s limited knowledge base. Improving this knowledge base is something that is considered a priority in efforts to promote walking and cycling in New Zealand (Ministry of Transport, 2005). In the past, there has been little action to promote good urban design and improve the liveability of New Zealand cities, and as a result there is little information available concerning the issue. Correspondingly, there has historically been a lack of interest from the public regarding urban issues (Parliamentary Commissioner for the Environment, 1998). This situation is changing, however, and this thesis aims to be a part of this change.

1.2 Methodology

The methodology of this research is explained below. The end result of the research proposes an approach to implement shared spaces in New Zealand. A review of existing and proposed shared spaces in the country accompanies this, along with an assessment of local government urban design documentation.

Figure 1: Literature review of shared spaces.

Firstly, a literature review is carried out to provide background information for the research, including the history of shared spaces, the theory behind them, and their advantages and disadvantages (Figure 1).
A New Zealand-specific context is also presented so that the role that shared spaces could play in New Zealand urban design and land development can be examined (Figure 2). The New Zealand context is created in a number of ways. The history of New Zealand’s urban development is explained, as is the influence that the automobile has had on New Zealand cities. The legal and political environment surrounding urban New Zealand is also discussed. Existing and proposed shared spaces in New Zealand are identified through literature review, online searches and informal telephone discussions with representatives from local government. These discussions are also used to establish the position of local government with respect to shared spaces, and to identify any documentation, for example design codes and development standards, that may impact on the viability of shared spaces in New Zealand.

Figure 2: The New Zealand-specific context.

Once a background to shared spaces is provided and a New Zealand context created, the issues surrounding shared spaces in New Zealand can be investigated and conclusions can be made as to the role they could play in New Zealand urban design and land development (Figure 3). In a final step; case studies are used to practically demonstrate possible examples of shared spaces in New Zealand.
Data collection

Information for this thesis was sourced in a number of ways. Online journal databases, libraries and internet search engines were used to find literature to provide a background on shared spaces and a New Zealand-specific context for the research. All of New Zealand’s sixteen city councils were contacted by the author, most by telephone (although some by email), and an informal discussion was held with a representative (staff member) from each council involved with urban design, planning, or roading. The most appropriate representative was identified by talking to several people at the council, explaining the research, and asking them to suggest the best person to speak to. The aim of these discussions was firstly to try to locate any existing or proposed shared spaces in the councils’ constituencies, and secondly to identify any council documentation that may mention shared spaces or affect their viability. Council documentation was obtained directly from the councils themselves, or from their websites.

It should be noted that on the 1st of November 2010, North Shore City Council, Auckland City Council, Manukau City Council, Waitakere City Council, three district councils, and one regional council merged into a single Auckland “Super-city” council. The research in this thesis has only looked at the situation prior to the merger of the councils. It is expected that
the new council will replace the council documentation from each existing council with a single set of new documents, although it is unclear how and when this process will take place.

Several site visits were undertaken to gain first-hand experience of existing shared spaces, and of the sites where shared spaces are proposed. Many of the photographs used in this thesis were taken on these site visits.

**Terms used in this thesis**

The term “shared space”, when used in this thesis, has a wide definition that incorporates many street design theories. Although these theories are diverse, they share some similarities. Generally, however, shared space can be defined as any type of road design that removes some or all separation between road users and reduces traffic control infrastructure. This includes woonerven, shared streets, naked intersections, shared zones and home zones (see Chapter 3 for an introduction to some of these terms).

This definition is wider than some interpretations which define shared spaces specifically as inner city streets with commercial land uses, level surfaces, and no separation between road users or traffic control. This explanation of shared space has originated from the specific designs of the late Dutch traffic engineer and shared space innovator Hans Monderman, who is discussed later in this thesis.

The terms “car”, “automobile”, “vehicle”, and “motor vehicle” are used interchangeably throughout the thesis. They are used with a liberal interpretation (unless stated otherwise) that includes private cars, trucks, motorbikes and buses. The term “traffic” implies motorised traffic unless specifically stated (for example; “pedestrian traffic flows”). The term “road users” implies all users of public spaces, including all forms of motorised transport, cyclists, pedestrians, and skateboarders.

### 1.3 Chapter outline and summary

**Chapter 1**: The introduction chapter contains an explanation of the research problem, objectives, the need for research, and the significance of the research. Methodology is also outlined in this chapter, and an introduction to the terms used throughout the thesis is given.

**Chapter 2**: The concept of shared spaces is introduced with a history of street design providing context for the rest of the thesis. The available literature regarding shared spaces is
reviewed while the suggested advantages and disadvantages of shared spaces are also discussed.

**Chapter 3:** New Zealand’s urban development history is explained in this chapter, beginning with the first towns constructed during European colonisation. The effect of the automobile on the country’s urban areas is discussed, as is traffic safety in the past and present. The legal and political situation regarding urban issues in New Zealand is also outlined.

**Chapter 4:** This chapter, titled “Shared space in New Zealand”, presents information collated as a result of discussions with local government. Firstly, the existing and proposed shared spaces that were identified are described. The council documentation reviewed is then explained with special reference to parts of the information that have connections to the shared space concept.

**Chapter 5:** This chapter expands on the role that shared spaces could play in New Zealand by suggesting a design approach for their implementation. Firstly, the findings from Chapters 2, 3 and 4 are consolidated by discussing the issues that need consideration before an approach can be defined. A number of suggestions are then provided as to what types of shared spaces may be appropriate in New Zealand urban areas.

**Chapter 6:** Several case studies are contained in Chapter 6, applying the design recommendations from Chapter 5 to real situations in New Zealand cities.

**Chapter 7:** The conclusion chapter summarises findings from the rest of the thesis and suggests options for future research.

It is hoped that the research contained in this thesis can contribute to an improvement of New Zealand’s public spaces by encouraging a rethink of street design theory. Shared space designs are inspired by the notion that the focus of street design should be on the needs of people, whether they be pedestrians, cyclists or drivers, rather than the needs of traffic. The concept itself is rather simple, although it is complicated by the fact that most public spaces have been created with quite different objectives. This thesis aims to show that a rethink of street design will benefit New Zealand’s towns and cities, and that the benefits that are possible make the task of finding solutions to any complications more than worthwhile.
Chapter 2: Context

This chapter provides a context for the ensuing evaluation of shared space in New Zealand. It reviews some of the key texts that are used in the writing of this thesis and provides the background information needed to understand shared space. The chapter begins by tracing the origins of the shared space concept right back to the Roman Empire by discussing the history of separation of pedestrians and other road users, and the development of the idea throughout the last half-century is then described. Because shared space as a street design concept is largely a European development, much of the information in this chapter is Eurocentric.

2.1 Street design in history

Origins of the separation concept

The shared space concept attempts to address an issue that stems from the invention of wheeled transport. Ben-Joseph and Southworth (1997) explain the first recorded examples of traffic and pedestrian conflicts. They begin with Julius Caesar’s banning of carts and chariots from the city of Rome during daylight hours in 47 B. C. to reduce congestion. Thirty-two years later, Emperor Augustus set the first minimum street widths (at fifteen feet for most roads) in the same city.

Until the invention of the steam engine nearly two millennia later, there was little advancement in transportation technology, and as a result; few major developments in the principles of separation between wheeled traffic and pedestrians that the Romans had established. If anything, footpaths were largely forgotten in medieval times, and it wasn’t until the Great Fire of London in 1666 that footpaths were provided on all new streets in the city (Hass-Klau, 1990). It was two hundred years later, in Haussmann’s renovation of Paris, that over one thousand kilometres of footpaths were finally built on the city’s streets (Gunnarsson, 2004).

In 1487, Leonardo da Vinci proposed a plan for a city that incorporated vertical separation between pedestrians and other road users, i.e. two levels, the upper for pedestrians and the lower for vehicles (Gunnarsson, 2004). The multi-level separation idea was promoted by
Eugène Hénard and French modernist Le Corbusier, and the idea was also suggested (but not put into practice) in the 1905 Royal Commission on London Report (Hass-Klau, 1990).

In the late nineteenth century, French planner Eugène Hénard, labelled the “father of modern traffic engineering”, began designing modern roundabouts and sketching street layouts that included a grade separation between pedestrians and horse-drawn traffic. Although Hénard’s work predated the automobile, the principles he followed were adapted in the earliest set of American traffic engineering guidelines (Hamilton-Baillie, 2004).

By the time Le Corbusier designed his city model, the Ville Radieuse (The Radiant City, 1935); automobiles had begun to fill the streets of European and North American cities. Le Corbusier’s design proposed radical separation of pedestrians and vehicles by assigning motorised vehicles to huge freeways elevated above ground on pillars, leaving pedestrians able to move unobstructed below (Grammenos, Craig, Pollard, & Guerrera, 2008). Although Le Corbusier’s most radical ideas were never put into practice, his promotion of strict separation through the architectural group the Congrès Internationaux d’Architecture Moderne (International Congresses of Modern Architecture) was very influential (Hamilton-Baillie, 2008b).

In 1902, Ebenezer Howard’s extremely influential design, the Garden City, provided a regional model for a city but did not provide much detail about actual road patterns or possible conflict between vehicles and pedestrians (Grammenos, et al., 2008). As automobiles became faster and more common in the early 1900s, city streets became more dangerous for pedestrians and the most influential town designs from this time reflected a fear of traffic and pedestrian conflict. By 1930, in the United States, the automobile had taken full control of the transportation scene and began to have an enormous influence on the social, political, and economic norms of society (Ben-Joseph & Southworth, 1997). The most well-known plan from this time is Radburn, New Jersey, which was designed in the late 1920s by Clarence Stein and Henry Wright. The plan, influenced by Ebenezer Howard’s Garden City, provided complete separation between pedestrians and traffic through the use of an extensive pedestrian network segregated from traffic, and a traffic-focussed system of cul-de-sac roads and footpaths (Grammenos, et al., 2008).

Historian Joe Moran (2006) provides an interesting insight into British policy regarding the conflict between pedestrians and cars in the years following the Radburn and Radiant City designs in his article Crossing the Road in Britain, 1931-1976, and some of his findings may also apply to New Zealand during the same period. He describes the growing concerns over
pedestrian deaths in the 1930s, which led to the introduction of pedestrian crossings, and then explains the many crossing technologies used over this period to reconcile conflicts between traffic and the pedestrian. By the end of the 1930s, the House of Lords, in a select committee report investigating road accidents, concluded that the best option was to strictly segregate road users as much as possible (Moran, 2006).

**Traffic in Towns**

In 1963, Colin Buchanan’s Ministry of Transport-commissioned *Traffic in Towns* report was published. The report was interpreted, at least by British politicians, as supporting the segregation concept (Moran, 2006), and still is interpreted this way by some authors (Hamilton-Baillie Associates & Local Agenda, 2007; Hamilton-Baillie & Jones, 2005). However, other authors have pointed out that Buchanan did not advocate separation at all levels of the roading hierarchy, and have even gone as far as claiming that the philosophical roots of the integration, not separation, concept can be found in *Traffic in Towns* (Ben-Joseph, 1995, 1997).

In *Traffic in Towns*, Buchanan (1963) proposes a city design to rectify the growing conflict between traffic and pedestrians at the time; a design made up of neighbourhoods (environment zones) serviced by a hierarchical network of urban corridors. In the environment zones, considerations of the environment itself, such as noise, pollution, pedestrian activity, and land use are given equal consideration to traffic capacity. Within these zones, Buchanan specifically states that “up to a point, a mixture of pedestrians and vehicles is not seriously harmful” (p. 51). It is asserted that adopting the complete separation of pedestrians and vehicles as an objective is tempting, as it would simplify matters greatly, but that it is not always desirable because, firstly; it is impossible to fully achieve, and secondly, some streets function satisfactorily without separation. In England and Wales, it seems that this argument was overlooked, as the strict separation policy was continued and expanded upon in subsequent design standards (Clayden, McKoy, & Wild, 2006).

Buchanan was not the only author writing at this time who acknowledged that streets had functions other than to simply move traffic from one place to another. Jane Jacobs (1961), in her influential *The Death and Life of Great American Cities*, stated that the car itself wasn’t the problem, but that urban designers and planners had not yet learnt how to create workable cities around the automobile. Jacobs was highly critical of planners such as Le Corbusier, Ebenezer Howard, Clarence Stein, and Henry Wright and their view that the street is an unsuitable environment for humans, describing the “entire concoction as irrelevant to the
Two years after Jacob’s book, Buchanan (1963) echoed some of her views in *Traffic in Towns* when he stated that complete separation is an overly simple objective and that consideration of pedestrians is inseparable to considerations of traffic.

**The Woonerf**

*Traffic in Towns* (Buchanan, 1963) was interpreted differently in the United Kingdom and the Netherlands, where Niek de Boer of the University of Emmen and Joost Váhl of the Planning Department of Delft developed the *woonerf* (residential yard) concept around the mid 1960s and early 1970s (Hass-Klau, 1990). De Boer first proposed the idea as a method to resolve the conflict between car use and children playing on an urban street. Woonerven (plural of “woonerf”) took the form of a long cul-de-sac, designed so that motorists felt they were driving in a residential yard or garden. Váhl developed the concept further by introducing design measures such as speed humps, trees and benches, and also disregarded the traditional separation between the footpath and carriageway (Hass-Klau, 1990).

The idea was formalised by the Dutch government in 1976 with the adoption of a set of design guidelines, and the idea soon spread throughout the world; it was especially popular in Germany, Israel, and Japan, where similar guidelines were adopted (Ben-Joseph & Southworth, 1997). Forward-thinking planners saw the woonerf as more than just another street cross-section for designers to place alongside “neighbourhood connector”, and “local access street” in their design toolbox; it was an example of what an integrated approach to street design could look like.

![Figure 4: Woonerf in Rijswijk, the Netherlands (image from Google Streetview).](image)

Figure 4: Woonerf in Rijswijk, the Netherlands (image from Google Streetview).
One of these planners was American Donald Appleyard (1980). Appleyard described the woonerf as a street that is shared between pedestrians, playing children, and vehicles where each user has to look out for each other. The woonerf is presented as a possible element of the “protected neighbourhood”; an area similar to Buchanan’s “environmental area”, i.e. an area where environmental concerns are given priority over vehicle access. Appleyard was a strong advocate of the view that streets have functions other than purely conveying traffic, for example; the residential street should serve as a place to participate in community activities. The ability of a street to provide a range of functions is lost when residents are unable to control traffic on their streets.

Traffic calming

As Hass-Klau (1990) describes, traffic calming has its origin in work carried out in response to the woonerf, although it did not become a familiar term until the late 1980s. Hass-Klau states that the main objectives of traffic calming are to make streets safer, reduce air and noise pollution, and improve the street environment for non-vehicular users; and that these objectives are achieved by reducing vehicle speeds to a maximum of 30 km/h.

The Institute of Traffic Engineers (ITE) (Lockwood, 1997, p. 22) defines traffic calming as:

“The combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users.”

As the ITE definition states, traffic calming uses largely physical measures designed to force a vehicle to slow down. For example; speed humps, chicanes, and reduced radii corners will slow a driver because driving fast through them is uncomfortable for the vehicle occupants. Narrowing the carriageway either physically or with road markings is another method of slowing traffic. Because traffic calming mainly utilises physical design measures, Engwicht (2005) has described traffic calming as a “poor man’s version” of the woonerf. This is because traffic calming involves designing physical devices to slow traffic, but does not include the devices to facilitate social interaction that are found in woonerven. Traffic calming is discussed further below.

Home zones

The woonerf had influence in the United Kingdom, although not until the 1990s when Barbara Preston (1995) started promoting “home zones” as a way of increasing safety for children on streets. The term “home zone” (coined by Preston and fellow road safety advocate
C. I. Howarth) gained popularity in the late 1990s as a number of unofficial zones began to appear around England. In 1999, the Labour government announced a pilot program of nine home zones which would be evaluated by the Transport Research Laboratory in a “before and after” analysis (Gill, 2006).

Home zones, although influenced by the Dutch woonerven, are not exact copies, and Gill (2006) has described some zones as more similar in appearance to a street with extensive traffic calming than a woonerf. Shared (or level) surfaces are not universal in home zones, and speeds are usually slightly higher. Political support for home zones grew, and in 2001, before the pilot program was finished, Prime Minister Tony Blair announced the “Home Zones Challenge” in which local authorities competed for funding for home zones.

The Transport Research Laboratory’s report was released in 2006 showing largely positive results for the pilot home zones; including reduced vehicle speeds and flows, increases in the perceived attractiveness of the street, a high level of resident support for the schemes, and positive influences on pedestrian and cyclist travel (Buttress, Nicholls, Tilly, Webster, & Wheeler, 2006). Home zones are seen as an important step towards official recognition that careful design can create areas that influence driver behaviour naturally (as opposed to artificially; such as with posted speed limits) and create streets that are safer for all users (Hamilton-Baillie & Jones, 2005).

Home zones and woonerven are terms reserved for streets in residential areas with relatively low traffic volumes, i.e. streets near the bottom of the roading hierarchy. However, the design principles at work in these areas can also be applied to streets in other parts of the hierarchy, to create what are called “shared spaces”.

**Shared space**

Woonerven and home zones are, as prominent British shared space advocate and architect Ben Hamilton-Baillie has stated, “but a small manifestation of a greater sea change away from the principle of traffic segregation towards integration” (2004, p. 50). Hamilton-Baillie’s writings on shared space are based on the teachings of the late Dutch traffic engineer Hans Monderman (see 2004; Hamilton-Baillie, 2008a, 2008b; Hamilton-Baillie & Jones, 2005). Monderman was the world’s most influential proponent and practitioner of the shared space concept until his death in early 2008, and his personal friend, Hamilton-Baillie, is now Britain’s leading shared space consultant (The Times, 2008).
Monderman spent a large part of his life as a traffic accident analyst. During this time he developed his ideas after coming to the realisation that all accidents have a human element. This human element is nearly always ignored by traffic engineers; who instead focus their guidelines on cars; for example by specifying stopping distances and design speeds, but ignoring human factors such as the place function of streets and risk compensation theory (Monderman, 2007). As stated by Sutcliffe (2009), Monderman believed there was a problem with the separation principle in traffic engineering, and with the extensive use of traffic signs, because:

1. They absolve driver’s responsibility to drive carefully and thoughtfully and to behave courteously toward other road users, creating a dangerous situation, and
2. They destroy the place function of streets and roads, hindering community development and destroying relationships with the surrounding environment.

Monderman believed that the principles employed in woonerf designs could be applied to commercial streets and intersections as a solution to the above problems.

Shared space designs have similarities to traffic calming designs; however they differ in some fundamental ways. Traffic calming consists of standardised street treatments that can only contribute so much to traffic safety and liveability, however the shared space approach is a much more flexible and receptive approach (Ben-Joseph, 1997). Shared space represents a more human-oriented approach to achieve aims similar to those of traffic calming. Shared space designs attempt to slow traffic by subtly employing some of the same design features as traffic calming, although not in a standardised manner using signs and control devices, but by creating a sense of intrigue or uncertainty in the mind of the driver (Engwicht, 2005).

The table below (Table 1) provides an overview of the differences between the woonerf and traffic calming design philosophies discussed so far, and compares them to Monderman’s shared space approach.

Monderman’s first experiment with shared space design was the main street of Dutch village Oudehaske in 1984. The aim of the project was to make motorists aware that they were in a village and should therefore drive appropriately. The results were generally positive and speeds were reduced by up to five times as much as conventional traffic calming methods would have been expected to achieve (Engwicht, 2005). In the following years, Monderman designed many other village schemes around the Netherlands which also proved to be successful (Hamilton-Baillie, 2008b) (Figures 5 and 6).
<table>
<thead>
<tr>
<th>Alternative names</th>
<th>Woonerf</th>
<th>Traffic calming</th>
<th>Shared space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home zone, residential yard</td>
<td>Traffic control, liveable streets</td>
<td>Naked intersections, liveable streets, shared streets/zones</td>
<td></td>
</tr>
<tr>
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<td>Any land use</td>
<td>Any land use</td>
</tr>
<tr>
<td>Is social interaction an aim?</td>
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<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Design approach</td>
<td>Flexible</td>
<td>Standardised</td>
<td>Flexible</td>
</tr>
<tr>
<td>Objective</td>
<td>Slow traffic to allow social interaction</td>
<td>Slow traffic</td>
<td>Multi-faceted</td>
</tr>
<tr>
<td>Who has priority?</td>
<td>Pedestrian</td>
<td>Traffic</td>
<td>Equal</td>
</tr>
</tbody>
</table>

Table 1: Woonerf, traffic calming, and shared space.

The success of Monderman’s schemes prompted the local authority of the Friesland province, and the Keuning Institute where Hans Monderman was employed, to establish the European Union-funded Shared Space project, which consists of an expert team that was led by Monderman until his death in 2008 (Shared Space, 2008). The Union is funding the project to design and build five demonstration schemes in Europe (Engwicht, 2005).

Figure 5: Friesland, the Netherlands. A five-way intersection with a shared level surface, traffic lights, signs and road markings removed. Photo: Hamilton-Baillie (2004, p. 57).
The theory behind shared space

“A dangerous road, it seems, is a safe road”

Warwick Cairns (2008, p. 188)

The underlying theory behind the shared space concept, and also behind woonerven and home zones, is risk homoeostasis or risk compensation. John Adams (1999) has written extensively on the theory of risk compensation and although some of his applications of the theory in the past have been shown to be inappropriate (for example, see MacKay, 1985), his explanation of the theory itself is sound. Adams proposes that everyone has an in-built “risk thermostat”, i.e. a certain level of risk that a person will try to maintain or balance for a given situation. For example, in a situation perceived as dangerous, a rational person will act in a less risky manner, or in a situation perceived as safe, the person will act in a more risky manner.
Figure 7: Adam’s (1999, p. 9) "risk thermostat" model.

The model above (Figure 7) shows that a person’s behaviour in a certain situation is influenced by their tendency to take risks (for example, the level their “thermostat” is set to) and by the danger perceived by the person (the “temperature” – this may be perceived very poorly or very accurately depending on a number of factors). The person’s balancing behaviour then results in risk-taking actions that will either result in an accident, or produce a reward (no accident). The result then influences the perceived danger and the level of risk the person is comfortable with, completing the ongoing cycle.

Risk compensation theory has been used, with varying degrees of success, to argue against many forms of road safety regulation, for example seat belts in cars (Adams, 1999), the removal of trees alongside highways (Dumbaugh, 2005), and safety standards in vehicle manufacturing (Wilde, 1994). Although some of the applications of the risk compensation theory have indeed been proven to be contentious (see MacKay, 1985; Pless & Robertson, 2002) there is a logic to it in some situations that is important to understand. For a comprehensive guide to risk compensation theory, see Gerald Wilde’s “Target Risk” (1994).

It is essential to understand the difference between actual risk and perceived risk. Road safety features such as wide lanes or painted centrelines may give the perception of safety without actually reducing the risk of an accident. This false sense of security will make a person drive in a more risky manner, increasing the likelihood of a crash (Dumbaugh, 2005). Trees on the side of a highway, however, present a real and measureable risk to drivers, although Dumbaugh (2005) has shown that a driver’s sense of security is balanced when trees are present, i.e. their perception of the risk is more accurate, so their adjusted behaviour is more appropriate and better prepares them for potential hazards.
How does risk compensation theory relate to the shared space concept? Ben-Joseph and Southworth (1997, p. 114) put forward the following as typical design characteristics of residential shared spaces:

- Paved surface shared by pedestrians and vehicles.
- Clearly marked entrances.
- No conventional raised footpaths; little demarcation between footpath and carriageway.
- Vehicle speed and movement is reduced through the use of physical barriers such as undulations, and bends.
- Extensive landscaping and street furniture.

Hamilton-Baillie (2008a) offers further proposals for shared spaces that are relevant in non-residential areas as well as residential neighbourhoods. Among other proposals, he advocates the removal of traffic lights, anti-skid surfaces, road markings, formal pedestrian crossings, pedestrian guard rails and most signage.

All of these physical characteristics of shared spaces can been viewed in the context of risk compensation theory as increasing a driver’s, pedestrian’s or cyclist’s perceived level of danger on a street. Like the trees in Dumbaugh’s (2005) example, these features are claimed by shared space advocates as methods of relating the true risk level of a street to a driver, making them, either consciously or subconsciously, drive in a more appropriate manner.

The shared space concept as promoted by Monderman has been gaining popularity around the world, especially in Western Europe and the United Kingdom. The above paragraphs on risk compensation explain the theoretical advantage of shared space designs, but what other benefits are there, both theoretical and empirically measured?

### 2.2 Shared space advantages and disadvantages

The benefits that can result from shared spaces are largely related to the generic benefits of a street with high-quality design and reduced reliance on motor vehicles. Something that is apparent when reviewing literature regarding the benefits (or otherwise) specific to shared spaces is that there is little empirical data available. The following section of this thesis provides an overview of a wide range of advantages and limitations of shared spaces, both theoretical and tested. Much of the literature referred to does not specifically refer to shared
spaces, but to related design approaches such as traffic calming and pedestrian-oriented design.

The United Kingdom Department for Transport’s Shared Space Project has recently released the *Appraisal of Shared Space* (2009), primarily authored by sustainable transport expert Stuart Reid. The appraisal defines shared space in the context of the United Kingdom and outlines the supposed purposes and objectives of shared space schemes. The report then looks at the empirical evidence supporting, or otherwise, the ability of the shared space concept to achieve these goals. The appraisal offers evidence for the ability of shared spaces to positively affect a number of indicators that can be construed as facilitators of social functions in streets. The report is a key text in this part of the thesis.

**Social advantages**

Jane Jacobs (1961) has stressed the importance of the city street as a facilitator of public and social life, and has also described the “erosion” of the street’s ability to do so in American cities. When considering the role of the automobile in this erosion, Jacobs ponders whether traffic is to blame, or instead; a “sheer disrespect for other city needs, uses and functions” (p. 339). Either way, the shared space concept offers a solution to a street that has lost its ability to provide for social contact.

*Shared space as a place*

The United Kingdom Department for Transport’s *Manual for Streets* (2007) identifies “place” as the most important function of a street, and the function that distinguishes a street from a road. The sense of place of a street depends on a number of qualities, many of which may be enhanced in a shared space scheme, for example visual quality and tendency to promote social activity. The Department’s *Appraisal of Shared Space* states that “shared space is a deliberate effort to reassert the place status of streets while maintaining their link status” (2009, p. 7).

There is little empirical evidence showing the ability of shared spaces to increase the sense of place conveyed by a street, because of the difficulty of measuring this sense, and the overall lack of data on shared space schemes. However, qualitative research carried out for the appraisal indicated that shared spaces function not just as corridors for movement but also as destinations themselves, especially where features such as seating and active frontages are encouraged (Reid, 2009, p. 22). In British home zones, slight increases in outdoor activity have been shown since the implementation of a scheme (Buttress, et al., 2006). Creating a
sense of place is reliant on a number of factors, and is related in some way to most of the shared space advantages and disadvantages discussed here.

**Visual amenity**

It has been shown that shared space street designs offer a higher degree of visual amenity than a traditional street design. Residents in British home zones have agreed visual amenity was improved as a result of the schemes (Buttress, et al., 2006). Research carried out for the Department for Transport’s *Appraisal of Shared Space* showed a similar result for shared spaces (Reid, 2009). In Drachten, Hans Monderman’s redesign of a busy intersection with shared space principles showed a huge improvement in public perceptions of the quality of the intersection (Noordelijke Hogeschool Leeuwarden, 2007).

**Pedestrian movement**

Appleyard (1980) has discussed the importance of pedestrian priority in aiding social interaction on a certain street. Recent design guides have acknowledged this fact and altered their road user hierarchy accordingly, placing pedestrians at, or near, the top. For example, the *Manual for Streets* (Department for Transport, 2007) requests that designers place a higher priority on pedestrians and cyclists to encourage these types of travel and to aid a transformation in the quality of streets. New Zealand’s new *Land Development and Subdivision Infrastructure* standard (NZS 4404:2010) made some significant changes to the “Roads” section of the standard to emphasise the importance of pedestrians and human interaction when considering the movement functions of streets (Standards New Zealand, 2010). The old standard, NZS 4404:2004 (Standards New Zealand, 2004) largely focussed on motor vehicle movement and access in its road classification. The NZS 4404 standards are discussed further in Chapter 3.

Shared spaces attempt to increase pedestrian priority by removing segregation between users. How does this affect the pedestrian environment? The *Appraisal of Shared Space* (Reid, 2009) collated data on a variety of performance indicators related to the pedestrian environment in shared space schemes:

- It has been anecdotally suggested that as shared space designs try to remove segregation devices, such as pedestrian barriers and specified crossing points, that pedestrian flows will be freer. Evidence has shown that pedestrian freedom of movement is restricted by traffic flow and speed, i.e. even in the absence of separation devices, pedestrian movement will be restricted by high volumes of traffic and vehicles travelling at a high speed.
• The Laweiplein roundabout shared space scheme in Drachten has reported that pedestrians and cyclists are almost always given priority at the intersection (Noordelijke Hogeschool Leeuwarden, 2007).

• There is little published evidence regarding pedestrian numbers in shared space schemes; however, in what does exist, there has generally been an increase in pedestrians after the development of a scheme.

• It has been claimed that due to the ambiguity introduced into shared space schemes by the removal of traffic controls, that traffic will slow down and road users will be forced to interact with each other resulting in a tendency for drivers to give way to pedestrians more often. There is some evidence to support this claim, but it appears that this tendency is related to the speed of the vehicle (Hamilton-Baillie & Jones, 2005; Reid, 2009).

An improved pedestrian environment should allow increased social interaction and community life. The available evidence has yet to conclusively show that a shared space design can do this, however the theoretical basis for it to do so is clear.

_Design approach_

Shared space has been described as an approach to urban design rather than a standard design for streets and other public places (Reid, 2009). The Shared Space project, founded by Monderman, has stated after its experience with the development of several shared spaces in Europe that having a new vision of what a public place can look like generates not only a new streetscape, but a new approach based on cooperation and participation (2008). The project outlines a plan of a ten-stage process for optimum participation (p. 17), starting with the development of a basic vision and ending with the implementation and management of a shared space. The plan also includes steps such as identifying stakeholders and final decision-making.

A participatory design approach is not necessarily a successful or straightforward task. A 2006 study of home zone schemes in the United Kingdom (Clayden, et al.) showed that residents were not always open to new streetscape features such as shared surfaces, even when the advantages of such features could be clearly demonstrated, especially in places where there was a longstanding preference for segregated street layouts.

_Social equality_

A traditional segregated street design could be said to discriminate against vulnerable road users and the poor. The relationship between car ownership and income levels has been
analysed extensively and is well understood (for example, see Dargay & Gately, 1997), i.e. higher income levels are strongly related to higher car ownership. It can be taken from this that pedestrians and cyclists are more likely to be from a lower-income background. For example, in New Zealand, there is higher pedestrian exposure to vehicle traffic among lower socio-economic classes, largely due to low car ownership rates (Public Health Advisory Committee, 2003). Pedestrians and cyclists are defined as “vulnerable road users” by the World Health Organisation, as they do not have a protective metal shell surrounding them as car drivers do (WHO, 2009). Vulnerable road users have been shown to have a much higher risk of dying compared to a car occupant in a specific traffic accident (Atkins, Turner, Duthie, & Wilde, 1988).

A study on pedestrian safety in the United States (Ernst, 2004) showed that ethnic minorities (Hispanics and African Americans) were disproportionally represented in pedestrian fatality rates. The report attributed this to the fact that these minorities were less likely to own a car; meaning they were more likely to walk or bike, which exposed them to greater dangers. By designing roads with the movement of automobiles as the priority, traditional street designs discriminate against people on lower-level incomes because they are less likely to own a car and are therefore more likely to be vulnerable road users. If shared space can be shown to make roads safer for these vulnerable road users by designing public places with the needs of all road users in mind, then it may be able to help reduce social inequalities.

Level surfaces, with differentiated spaces for pedestrian and vehicle movement and appropriate tactile information, are considered to be a favourable road design alternative for mobility impaired people (Reid, 2009), however blind and vision impaired people have concerns as to the level of the differentiation of the spaces and the type of tactile information used, as discussed in the next section.

**Social disadvantages**

*Safety concerns*

As the shared spaces design approach and resulting streetscapes represent a radical departure from traditional street design, there is likely to be considerable apprehension about such schemes from the public. In Drachten, the Netherlands, after the redesign of a busy intersection according to shared space principles, accidents were reduced dramatically, however public perception of traffic safety at the intersection decreased (Noordelijke Hogeschool Leeuwarden, 2007). In a study of British pilot home zones, it was shown that residents are concerned about safety (particularly children’s) on shared surfaces; in one case
rejecting the shared surface outright (Clayden, et al., 2006). Considering risk compensation theory, however, suggests that it is this fear and uncertainty in shared spaces is what makes them safer.

**Blind and vision impaired people**

The Guide Dogs for the Blind Association (Guide Dogs) have emerged as a prominent opponent to shared space. Specifically, Guide Dogs are concerned with the level surface, i.e. the lack of vertical separation between pedestrian and vehicle areas. The Association expressed its support for other design features in the shared space design approach, such as reduced clutter and dominance of the motor vehicle, but stated that blind and vision impaired people need a way of navigating a street safely. Shared surfaces made this difficult, and blind and partially-blind people have stated that they are not confident navigating such a space (Thomas, 2008b).

Further research by Guide Dogs tested design solutions to this problem which, although showing promise in some solutions, did not prove to be conclusive enough to change the Association’s opposition to the removal of traditional delineators (kerbs) (Thomas, 2008a). Without providing specific design solutions to the issue, the Manual for Streets (Department for Transport, 2007) has indicated that appropriate physical demarcation needs to be incorporated into shared space designs to cater for blind and vision impaired people’s needs. Appropriate solutions to this problem will be discussed later in this thesis in Chapter 5.

**Safety advantages**

Shared spaces increase the safety of a street by attempting to match a driver’s perceived risk of the street to the true risk, enabling them to drive appropriately. Some of the design features have originated from traffic calming theory, for example chicanes, raised intersections, and the use of paving materials, so firstly the well-documented successes of traffic calming designs will be discussed.

**Traffic calming**

There have been many studies around the world that consider the safety effects of traffic calming schemes, so meta-analyses were referred to in this thesis to get an overall picture of the safety benefit traditional traffic calming schemes can provide. The first meta-analysis was carried out by Elvik (2001) and consisted of thirty-three studies of area-wide (not just one street) traffic calming schemes. The analysis found that the schemes reduced accidents area-wide by 15-20%, on local roads by 25-55% and on main roads by 8-15%. The different
reductions on local roads and main roads may indicate that vehicles and accidents are redistributed by the schemes, i.e. from local roads to main roads, but the area-wide accident reduction suggests reasonable safety improvements. Elvik’s meta-analysis included studies that were methodologically-flawed, and although this was accounted for in the statistical analysis, another meta-analysis (Bunn, et al., 2003) used strict criteria for the inclusion of studies. This analysis showed that area-wide traffic calming schemes can reduce road traffic injuries and deaths by 11%.

These studies show that traditional physical traffic calming methods - such as road narrowing, road closures, intersection redesigns, one way street creation, surface treatments, speed humps and turning bans can reduce accidents if applied area-wide. These findings may also relate to shared space designs that also incorporate features that have been called “psychological traffic calming” (Kennedy, 2005).

Shared space

If we consider that the shared space design approach has been called second generation traffic calming (Engwicht, 2009), it would seem that the above findings will have at least some relation to shared space. The primary objective of traffic calming is to slow traffic to achieve the secondary goals of reducing accidents and improving the pedestrian environment (Hass-Klau, 1990). Shared space, or second generation traffic calming, includes improving the pedestrian environment and safety as its primary objectives; however, reduced speeds are an essential prerequisite to achieve these objectives. In line with shared space thinking, the Manual for Streets (Department for Transport, 2007) has encouraged designers to try to achieve appropriate speeds naturally, without artificial traffic calming measures.

As shared spaces have different objectives and utilise different design instruments to traditional traffic engineering, they will have different safety effects. There has been little study undertaken specifically on the safety of shared spaces, and as the range of shared space designs vary greatly due to the flexibility of the design approach, it is difficult to make empirical judgements on their safety effects.

A recent review of simplified streetscape schemes (Castle & Quimby, 2006) recognised this lack of published evidence in its review of a wide range of shared space schemes around Europe, and concluded that although the available data showed generally positive results, they were far from conclusive. The Appraisal of Shared Space (Reid, 2009) arrived at a similar conclusion, but stated that any positive safety effects appear to be more prominent in schemes with traffic volumes below 6600 vehicles a day. Both of the above reports affirm the
theoretical safety effects of shared spaces and theorise that the mixed results may be related to the huge range of shared space designs reviewed. More study needs to be undertaken to identify which designs are the most safe to establish if the theoretical safety effects of shared spaces can be verified by evidence.

There are a number of studies that indirectly attest to the safety of shared space schemes:

- If shared space designs can attract more cyclists and pedestrians to the street, which is usually an aim of such designs, then the “safety in numbers” effect observed by Jacobsen (2003) will increase safety for these users.
- Shared space advocates have suggested that speeds in most shared spaces should be around 30 km/h. This is due to the fact that at speeds above 32 km/h deaths and serious injury becomes much more likely:

<table>
<thead>
<tr>
<th>Speed</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 km/h</td>
<td>5%</td>
</tr>
<tr>
<td>48 km/h</td>
<td>45%</td>
</tr>
<tr>
<td>64 km/h</td>
<td>85%</td>
</tr>
</tbody>
</table>

Table 2: Speed and fatalities (Hamilton-Baillie & Jones, 2005, p. 44).

- Hamilton-Baillie (2005) has used evolutionary biology to explain the significance of this speed. 30 km/h is approximately the maximum speed of a running human being, so our bodies have evolved to withstand impacts at this speed. For example if a human fell at this speed they may break bones, but they would probably survive.
- Shared space designs have been shown in some cases to reduce speeds (Kennedy, 2005; Reid, 2009).

An important issue when assessing the safety effects of a certain scheme is the phenomenon known as “accident migration” (Wilde, 1994). Elvik (2001), in a meta-analysis of traffic calming safety effects, has described that a traditional “black spot” approach to traffic accident prevention may cause accidents to be simply redistributed to other parts of a street network. For example, if speed humps are used to slow traffic on a particularly dangerous street, but nothing is changed in surrounding streets, drivers may simply avoid the calmed street; increasing volumes, and accidents on the other streets. This implies that any measures designed to prevent accidents, whether traditional traffic calming or shared space designs, should be carried out on an area-wide basis to achieve the desired effect.
The theory behind shared space indicates that substantial safety improvements may be possible, as does existing evidence on traditional traffic calming, but these improvements are yet to be empirically evidenced in existing schemes as the initial results of studies, although generally positive, are far from conclusive. The wide range of design options available in shared space designs makes it even more difficult to make judgements about the safety of schemes.

**Economic advantages**

There are a number of ways that a shared space design can be advantageous from an economic perspective. Some of these advantages are generic benefits associated with urban street renewal, but others are specific to shared spaces.

*Increased property values*

It is clear that a high quality street design increases property values in an area. For example in London it has been calculated that an “improvement in street design quality” can add up to 5% to property prices and retail rents (CABE, 2007). The “improvement” may include design features such as:

- Tactile paving with colour contrast
- Smooth well-draining surfaces
- High quality materials
- Potential obstacles placed well out of way
- Moderate traffic levels
- Public spaces along the street
- Sufficient crossing points

The use of all of the above is encouraged in shared space design, so a link can be tentatively drawn between shared space designs and increased property values, simply because they represent a form of high quality street design. Reid (2009) has also discussed a link between increased property values and the orientation of a street toward pedestrian priority, pointing to evidence showing that shop vacancy rates are inversely related to traffic flow rates.

*Improved traffic movement*

Although counter-intuitive, shared space designs and associated “naked intersections” seem to improve traffic flows through intersections. Hans Monderman’s redesign of a signal-controlled intersection into a shared space roundabout has reduced the average waiting time of vehicles at the intersection from fifty seconds to less than thirty seconds, despite an increase
of traffic (Noordelijke Hogeschool Leeuwarden, 2007). This seems strange considering that shared space designs also try to reduce traffic speeds, although the Shared Space project has noticed similar reductions in traffic waiting times, and explains the increased efficiency despite reduced speeds as the result of traffic signal removal (Lutz, 2008).

Cost of shared space designs

Some authors have argued that shared space designs are cheap to build due to their relative simplicity. Hamilton-Baillie and Jones (2005) have stated that money could be saved by refraining from investment in traditional traffic control devices such as traffic lights, road signage, road markings, bollards and barriers, and instead, money should be spent on low-maintenance, durable materials. Kennedy (2005), has also stated the cost of traditional traffic engineering measures as limiting their application, and advocates psychological traffic calming as a cheaper alternative. Sutcliffe (2009) holds the view that one of the fundamental problems with the segregation concept in traffic engineering is that there will never be enough funding to build all of the necessary infrastructure to create a safe and practical pedestrian environment with all of the separation and crossings needed.

Ben-Joseph (1995) has written that shared space designs may often have a slightly more expensive up-front cost largely due to the extensive paving used in most schemes, and studies of home zones in the United Kingdom show a similar finding (Buttress, et al., 2006). However, as Ben-Joseph explains, this cost is offset by subsequent savings. Pavers have a longer lifespan than asphalt, and when services under the pavers need to be accessed, the pavers are simply lifted up and then replaced after maintenance has been carried out.

Ultimately, the cost of a shared space design depends on the specific design of the space. There is such a wide range of options that it is impossible to state outright that shared space designs are the cheaper option. However, what the sources above show is that shared space designs can sometimes achieve similar (or better) affects as other design approaches at a lower cost.

Environmental advantages

Reduced speed and car use

The most recent International Panel on Climate Change Synthesis Report (2007) has stated unequivocally that the Earth’s climate is warming, and that this warming is “very likely” due to anthropogenic carbon emissions. The report promotes non-motorised transport as a key
mitigation practice, as non-motorised transport has a much lower greenhouse gas emission profile.

As one of the principal objectives of shared spaces is to balance the needs of all users, i.e. to reduce the dominance of the automobile and improve spaces for pedestrians and cyclists, a decrease in vehicles as more people choose to walk or cycle to their destinations may be expected. Shared space schemes have been shown to reduce traffic volumes, and in some cases an increase in pedestrian flow has also been recorded (Reid, 2009). It is unknown; however, if in the cases reported traffic was simply redistributed to other streets.

Shared space designs cannot force people out of their vehicles and into non-motorised forms of transport, although they do provide a platform for increased non-motorised transport use by increasing pedestrian and cyclist priority.

Reduced clutter

Recently, in the United Kingdom, there have been campaigns to improve the appearance of the country’s streetscapes by removing excessive signage, road markings and other street furniture. Two of the most well known campaigns are the “Campaign to Protect Rural England”, which opposes roadside clutter and roadside advertising on rural roads (CPRE, 2010), and English Heritage’s “Save our Streets” campaign, which has an urban focus, but similar goals (English Heritage, 2004). Both of these campaigns oppose the excessive use of traffic engineering devices and signage and “the resulting visual chaos [that] diminishes the quality of all of our lives” (English Heritage, 2004).

The cluttered landscapes that concern these campaigns not only create an ugly and impersonal environment; they have also been called unsafe by shared space advocates who have examined the behavioural and psychological impacts of highly controlled road environments (Hamilton-Baillie, 2008b). A cluttered road environment relies on drivers being able to filter out what is relevant to them, so they can ignore the rest. This is a potentially confusing task. High levels of traffic control devices can take the responsibility to drive safely away from the driver (Castle & Quimby, 2006). As Hans Monderman has famously stated, when outlining his belief in driver’s ability to organise their behaviour to suit an environment: “If you treat them [drivers] like idiots, with all of those signs, you will see that they behave like idiots” (2007).

Shared spaces remove all unnecessary traffic control devices (Lutz, 2008) for two reasons, reflecting the origins of the concept in both traffic management and urban design:
1. To improve traffic safety by making streets less confusing and more self-explaining, and to
2. Improve the aesthetics of streetscapes which are degraded by the overuse of standardised traffic management devices.

*Vehicle emissions*

The amount of carbon dioxide a vehicle emits on a certain journey is complex, as it is related to a number of factors. The graph below shows that low speeds (below 30 mph or 48 km/h) are associated with high carbon emissions (Barth & Boriboonsomsin, 2009). This is partly because low speeds are often associated with “stop-start” driving which involves a lot of high carbon-emitting acceleration and deceleration.

Shared space designs reduce stop-start driving practices in a number of ways, for example by forcing a slower driving speed (30 km/h), and also by reducing waiting times at intersections (Lutz, 2008). It should be noted that, as can be seen on the graph below (Figure 8), most vehicles are not at their most fuel efficient while travelling at the 30 km/h (19 mph) speed limit recommended for shared spaces. However, if shared spaces can reduce waiting times and improve traffic flows, as they have in Drachten (Noordelijke Hogeschool Leeuwarden, 2007), then they may be able to reduce the carbon emissions of vehicles travelling through such spaces.

![Figure 8: Carbon dioxide emissions and vehicle speed (Barth & Boriboonsomsin, 2009, p. 5).](image)
Kennedy (2005) has stated that traditional traffic calming measures encourage high-emission driving involving a lot of acceleration and deceleration, and states that shared spaces and psychological calming may offer less-carbon intensive methods of slowing drivers. Researchers at the University of California have made a similar recommendation that “traffic smoothening” should be used to reduce stop-start driving (Barth & Boriboonsomsin, 2009).

### 2.3 Conclusion

The shared space approach to public space design is one design concept among many that have emerged in the last quarter century that offer an alternative to the standardised and motor vehicle-dominated streetscapes found in most western cities. There have been books written discussing the strict adherence to engineering standards since the advent of motorised transport, and the damage to the public realm that this has had (for example, see Ben-Joseph & Southworth, 1997).

This chapter has provided an outline of the historical development of the shared space concept and explained the theory behind it. It has also explored the evidence to support the advantages of the concept promoted by its advocates under social, economic, environmental, and safety headings. The next chapter will outline the status of the shared space concept in New Zealand, and also look at New Zealand’s traffic management history.
Chapter 3: New Zealand context

In this chapter, New Zealand’s urban environment is examined to provide a New Zealand-specific context for this thesis. First of all, the physical form of our cities is explained. The influence of the automobile in the shaping of New Zealand cities is then looked at along with road safety in New Zealand. The legal environment is reviewed, with explanations of relevant legislation, policy documents, rules, design guides and standards.

3.1 A brief history of urban New Zealand

To investigate the role that shared spaces could play in New Zealand’s urban areas, we need to understand these urban areas. First, we will look at the historical context in which New Zealand’s cities and towns were developed. This account of New Zealand’s transportation and planning history begins with the colonisation of the country after the signing of the Treaty of Waitangi.

When Captain Cook visited New Zealand in 1769, the Maori population was estimated to be about 100,000; although settlements were widely dispersed and of low density (King, 2003). It was not until after the Treaty was signed in 1840 that the cities we know now, which are the focus of this thesis, developed.

After the Treaty was signed the settler population grew from 2000 in 1840 to 59,000 in 1858 (the Maori population at this time had already fallen to 53,000 due to war and disease) (King, 2003). Pownall (1956) has investigated the origins of New Zealand’s towns and cities, finding over half originated as trading centres, and over a quarter as colonial settlements. Of the colonial settlements, most were founded by private companies who established urban bases from which to develop rural land.

The New Zealand Company, formed by Edward Gibbon Wakefield and his brother Colonel William Wakefield, was the largest of these private companies (Olssen & Stenson, 1989). The Company founded settlements such as Wellington, Nelson and Christchurch with the aim of attracting settlers and countering the “barbarianism” of the frontier land (Hamer, 1995).
Street patterns

Wakefieldian towns were planned around a grid street layout, usually ignoring local topography and removing landscape features that were in the way (Hamer, 1995). There was no shortage of land when these towns were first settled, and therefore most dwellings were single story, detached, and on large one-acre blocks. Towns quickly became dispersed over large areas, although the subdivision potential of the one acre blocks was quickly realised (Hamer, 1995; Kilmartin & Thorns, 1978).

As the grid was a popular street layout at the time in Europe, it brought familiarity to New Zealand cities for immigrants, and the Plans of Towns Act 1875 made straight roads and right-angle intersections mandatory in new developments (Benge, 2005). Most of New Zealand’s larger towns and cities were already planned with a grid pattern by that time; however, many smaller and less-planned settlements had also adopted a grid system as they grew from small country lanes into urban centres (Plishke, 1947).

Examples of such layouts in some of New Zealand’s biggest urban centres are shown (Figures 9-12; sourced and adapted from Quickmap). Although these grids have been modified over time, the original layout is still reasonably clear.

Figure 9: Auckland (Grey Lynn suburb and central business district) grid street layouts, with motorway in bottom right.

Figure 10: Central Wellington's grid street pattern.
At the end of the 1800s, the town planning movement was beginning to flourish in New Zealand, motivating businessmen to form groups such as Dunedin’s “Reserves Conservation Society” which, in 1888, advocated village-style designs in the growing cities (Gelfand, Ali-Memon, Perkins, & Swaffield, 1993). The Garden City movement had worldwide influence in the early twentieth century, and cities like Dunedin, Auckland, Wellington and Christchurch reflect this; their basic layouts featuring a town centre separated from residential areas by a green belt; a common theme of garden cities (Benge, 2005).

In the twentieth century, however, other design models emerged, including Radburn-inspired designs that attempted to fully separate pedestrians and vehicles by creating pedestrian reserve networks completely removed from the streets. Examples include Plishke’s (1947), Trentham which was never fully implemented (Figure 13), and another development at Talbot Park in Auckland, which has encountered security and social problems partly associated with the enclosed pedestrian reserves (Ministry for the Environment, 2008).

The importance of street layout in regards to shared spaces is discussed in Chapter 5.

**Street width**

Urban conditions grew worse as towns experienced growth in the provincial period of the 1850s and 1860s (Olssen & Stenson, 1989), partly due to a lack of development controls. Kilmartin and Thorns (1978) have described capitalism in New Zealand as taking a “freedom of the individual”-type form which is partly expressed through a dislike of authoritative planning, which may explain the lack of any real urban planning in these first settlements. To resolve the problems, basic subdivision development controls began to appear; firstly as specific statutory provisions for footpaths (Hayes, 2007). In 1867, the Municipal Corporations...
Act passed into law, prescribing a width of forty feet to streets and twenty feet to alleys. Similar requirements persisted under the Public Works Act 1876 (Humphris, 2010).

Figure 1: Detail of Plishke's (1947, p. 83) Radburn-inspired design for Trentham, showing a completely separated pedestrian network.

The Public Works Act 1900 required that any road fronting a new allotment must be one chain (20.12 metres or one hundred links) wide, a width that the Crown had been using in their developments. This legislation aimed to prevent the private development of narrow streets (Hayes, 2007), which reminded settlers of the overcrowded cities in Europe from which they had escaped. A very large portion of New Zealand’s streets retain this width of one chain.

The early controls described may have been created too late in some cases; authors such as Hamer (1997), Kilmartin and Thorns (1978), and Plishke (1947) have all commented on the effect that the lack of development controls in early settlements has had in creating messy and confused urban scenes in our modern urban areas.

**Land use**

On a worldwide scale, New Zealand has a low urban density (Figure 14).
Figure 14 compares whole city densities for several geographic groupings of cities. New Zealand has a relatively low density of population and jobs in its cities; only Australian cities have lower densities in both categories.

![Whole city density 1991 - NZ's cities compared worldwide](image)

**Figure 14**: Whole city density of New Zealand’s cities compared worldwide in 1991 (Compiled from data in Bachels, Kenworthy, Laird, & Newman, 2001, p. 55).

There are several reasons for this low density. As noted, many of the first New Zealand towns, especially the Wakefieldian settlements, were laid out with one acre sections, causing excessive sprawl (which eased slightly as the subdivision potential of the sections was realised) (Hamer, 1995). European immigrants to New Zealand had left cramped cities and arrived in a place where space was plentiful, and therefore they desired large sections in which they could have a private lawn and vegetable garden (Clark, 1975). Hamer (1995) has explained that emigration propaganda often emphasised the abundance of land in New Zealand when describing the country.

New Zealand’s geographical location on the tectonic fault line between the Australasian and Pacific plates has been offered as another reason for low urban densities. Constructing
earthquake-proof multi-story buildings is costly, and when combined with New Zealanders’ preference for single-story, detached housing, has resulted in low levels of apartment living (Clark, 1975). Single-use (Euclidean) zoning introduced under the Town and Country Planning Act 1953 to separate incompatible uses (Coutts, 2005) has also contributed to New Zealand’s car-oriented urban form by distancing people from their places of work.

In the 1960s, supermarkets became popular, bringing the need for large car parks to cater for the predominantly car-borne customers. Other commercial activities began establishing similar stores; hardware stores, for example, and fast-food outlets also aimed at attracting drivers with drive-through facilities (Watson, 1996). These land uses require large amounts of land to provide customer parking; further contributing to low-density sprawl.

Rapidly growing car ownership levels after World War Two initiated a period of planning in New Zealand that focussed on building cities around the automobile (Bachels, et al., 2001). This fulfilled New Zealanders’ preferences for large sections and allowed that preference to persist into the twenty-first century (Preval, Chapman, & Howden-Chapman, 2010).

The motor vehicle in New Zealand

![Figure 15: Queen Street, Auckland in 1912 (Holcroft, 1979). Cars, pedestrians, trams, and horses and carts share the same space in relative freedom. As traffic volumes grew, pedestrians were pushed to the sides, where, as can be seen, separate pedestrian infrastructure already existed.](image)
Horse-drawn carts and trams were the principle forms of transport before the turn of the century, and electric trams grew in popularity after they began operation in Auckland in 1902 (Bachels, et al., 2001). The first motorcars in New Zealand were two Benz cars assembled in Wellington in 1898. As cars slowly increased in numbers in the early 1900s there was little change in everyday life (Holcroft, 1979).

Many of New Zealand’s city streets were very wide so there was ample width for all road users, and it was not until 1913 that the first traffic regulations were adopted by the Manawatu County Council – firmly in favour of non-motorised traffic. The detailed rules stated that motorists were required to leave a fair proportion of the carriageway to any non-motorised traffic that may be passing (Holcroft, 1979). In these early years of the automobile, horse and cart was still an option, and trams continued to grow in popularity until the 1930s and 1940s. Cars were not truly considered a necessity until after World War Two (Bachels, et al., 2001).

Things began to change rapidly as more and more cars arrived in the country. By the 1920s the car, which was much faster than horse-drawn carts, had begun to dominate transport. In the first year of national registration, 1925, there were over 71,000 cars in the country (Watson, 1996).

Holcroft (1979) has discussed the impact of the vehicle on New Zealand’s social and environmental landscapes. As the effect of the vehicle on pedestrians slowly became more apparent, the media expressed unease at the situation, leading to an increase in regulation in response. Holcroft hypothesises that although the spread of the automobile was a global phenomenon, at least in the developed world, it acquired unique characteristics in New Zealand. New settlers rejected England’s class system and an egalitarian attitude permeated society, which, Holcroft claims, has made the impact of the motor car stronger in New Zealand than in other countries. It has done so by contributing to a very high car ownership rate (Figure 16); not because cars could be purchased cheaply, but because people insisted on having one whether they could afford it or not.

As car ownership grew after the Second World War, apprehension about road safety grew as it was speculated in newspapers that traffic was becoming unmanageable (Holcroft, 1979). The central business districts of the main cities were starting to become congested by this time, and by 1955 there were twenty-two sets of traffic signals in Auckland (the first was installed in 1947). Growing prosperity led to an increasing proportion of the population living in suburbs and using cars to get to work, creating the need for certain routes to be designated as arterial roads and motorways (Watson, 1996).
Car ownership statistics

Car ownership in New Zealand skyrocketed after World War Two as the car became seen as a necessity as opposed to a luxury. In 1935 there were 91 registered cars per 1000 population in New Zealand, and by 1955 there were 178. In 1970 the number had climbed to 381 cars per 1000 population (Holcroft, 1979; Statistics New Zealand, 2010). The irrevocable change toward the motor car after the war initiated a dependency on cars and over half a century of building New Zealand cities around the needs of the motor vehicle (Bachels, et al., 2001). By 2008, the total vehicle fleet had reached approximately 4,126,000; 2,916,000 of which are cars, motorbikes and campervans. This equates to an ownership rate of 681 vehicles per 1000 population (NZTA, 2009a; Statistics New Zealand, 2010).

New Zealand now has one of the highest car ownership rates in the world (Figure 16):

![Image: International comparison of vehicle ownership by vehicles per 1000 population in 2008 (Ministry of Transport, 2010, p. 8).]

The above data is based on light vehicles. This is to avoid issues resulting from the categorisation of different vehicles, for example in the United States, sport utility vehicles (SUVs) are categorised as trucks. Of the selected countries, the United States is the only country with higher vehicle ownership than New Zealand.

Like Australia, New Zealand has only been exposed to major urban development in the past two hundred years. Because of this, most development has taken place in the age of motorised...
transport. The automobile made lower density development possible by making increasingly distant suburbs more accessible.

### 3.2 New Zealand road safety

Concern over the growing road toll grew gradually in New Zealand. It was originally thought that early road deaths were the result of inexperience with the new mode of transport, and that the toll would disappear as people became familiar with motor vehicles. As the toll grew from 69 deaths when first reported in 1923, to 216 in 1939, it became apparent that the road toll would not decrease as people became more experienced with vehicles (Holcroft, 1979).

The road toll grew to over 400 in the sixties, peaking in 1973 (Figure 17):

**Road deaths in New Zealand**

- 843 deaths in 1973
- 795 deaths in 1987
- 366 deaths in 2008

*Figure 17: Total road deaths in New Zealand since 1950 (Ministry of Transport, 2009c, p. 5).*

The rising road toll in the fifties and sixties prompted numerous road safety initiatives, including the removal of trees and hedges blocking driver views, compulsory front-seat seatbelts, the exclusion of all non-vehicular users from high volume roads (motorways), and, later; speed cameras (Watson, 1996).

The road toll has improved significantly since the late eighties, although progress has stalled since 2000, with the toll remaining within the range of 360 and 460 deaths per annum. 384 deaths were recorded in 2009 (Ministry of Transport, 2009d). The Ministry of Transport
(2009c) has reported that in the last ten years; vehicle kilometres travelled, the number of vehicles registered, and the population have all grown while the number of deaths has decreased slightly and the number of hospitalisations has stayed static, suggesting that the roads are becoming safer.

There has been a huge improvement in New Zealand’s road safety over the last quarter century. However, these improvements have still left New Zealand lagging behind comparable countries in terms of road safety (Figure 18).

![International comparison of deaths per 1 000 million vehicle kilometres travelled (IRTAD)](image)

Figure 18: International comparison of road deaths (Ministry of Transport, 2009c, p. 7, sourced from International Road Traffic and Accident Database (IRTAD) data).

The results are similar to the above graph when comparing road deaths on a population basis, although New Zealand performs better than the United States in this respect.
As can be seen (Figure 19), the pedestrian road casualty rate has remained almost static over the past decade, despite the fact that New Zealanders are spending less time walking (Ministry of Transport, 2009a).

New Zealand’s road toll, while improved since the record highs in the seventies and eighties, still needs to be reduced to match the road safety standards of other developed countries. The progress that was made from 1988 to 2000 has slowed, with both deaths and serious injuries of most road users showing only slight signs of improvement over the past decade, possibly even remaining static or worsening.

**Cost of traffic accidents**

It is estimated that the social cost of traffic accidents in New Zealand, which includes cost of life, loss of quality of life, loss of work output, medical costs, legal costs and property damage, is $3.8 billion per annum (Ministry of Transport, 2009f). There are other, more difficult to quantify, costs such as the impact on non-urgent surgery waiting lists and loss of workforce productivity (Ministry of Transport, 2009f). In 1999, the social cost of traffic accidents involving pedestrians was $290 million (National Pedestrian Project, 2000), although it is expected that this figure will be larger now, as the total cost of traffic accidents has risen from $2.8 billion in 1998 (Bachels, et al., 2001) to $3.8 billion over approximately the same period.
3.3 Transport policy

There are various guides, strategies, pieces of legislation and other documents commissioned or written by central and local government that can help us understand the political, social, and pedestrian and traffic environments in New Zealand. Firstly, legislation will be examined.

Legislation

Early legislation

The management of roads and streets has been locally based ever since the Public Works Act 1876. The Municipal Corporations Act 1867 also provided for local street management. In 1900, a new Public Works Act was passed, requiring private developers to build access to their subdivisions to a certain standard before management of the road would be taken over by the local authority (Hayes, 2007). A new Municipal Corporations Act was also introduced in 1900, enforcing regulations such as street width more strictly (Humphris, 2010).

New Zealand’s first real planning legislation was the Town Planning Act 1926, which proved to be ineffective for a number of reasons, including effects brought on by the Great Depression and World War Two. The ineffectiveness of this Act was recognised by central government in the post-war period, and in 1953 the Town and Country Planning Act was passed into legislation, introducing the concept of land use zoning and delegating the responsibility of planning to local authorities (Gelfand, et al., 1993). This Act was amended almost annually until the Town and Country Planning Act 1977 consolidated the evolving planning system. The latest step in New Zealand’s planning legislation came when the Resource Management Act comprehensively overhauled planning law in 1991 (Coutts, 2005).

The Resource Management Act 1991

The purpose of the Resource Management Act, contained in section 5, is “to promote the sustainable management of natural and physical resources”. Sustainable management is then defined in section 5, clause 2:

“In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while—

(a) sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
(b) safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) avoiding, remedying, or mitigating any adverse effects of activities on the environment”

The Act has several “Matters of national importance” which must be taken into account when managing all resources; however, none of these matters specifically mention urban issues. Gelfand et al. (1993) have claimed that the Act isn’t suitable to plan for urban issues. They are concerned that the definitions of “environment” and “resources” ignore “urban social tenets”, and that the general bio-physical focus may not be appropriate when it comes to urban planning.

Territorial authorities (which include city councils) are required by the Act to prepare and adopt district plans to control land use and the environmental effects of these uses. If a developer wants to carry out an activity on a site where that activity is not permitted due to the land use zoning, then that developer must go through a process to obtain a resource consent (Coutts, 2005). It is through this process that private subdivision development takes place. The process also presents local authorities with an opportunity to improve the road network for pedestrians as well as other road users (NZTA, 2009b).

**Local Government Act 2002**

The purpose of this Act is to provide for “democratic and effective local government that recognises the diversity of New Zealand communities” and to enforce a framework for local governments to operate within. It makes provisions for territorial authorities to create and enforce general bylaws in public places to protect the public from nuisance, and to promote and maintain public health and safety. As the definition of public places includes roads, local governments (road controlling authorities) have the ability to create bylaws regarding speed limits, parking, traffic control, and shared zones.

**Land Transport Act 1998**

The Land Transport Act covers a variety of transport related issues, including driver licensing, driving offences, enforcement of transport legislation and other miscellaneous matters. The Act also gives the Minister of Transport the authority to create rules as a form of delegated legislation, regulating vehicles, roads, road user behaviour, licensing and transport of dangerous goods.
Rules

Some of the pertinent rules created under the Land Transport Act are introduced below. Further analysis of these rules can be found in Chapter 5.

**Land Transport (Road User) Rule 2004**

This rule sets out the basic regulations governing all traffic on our roads. Well-known provisions of this rule include keeping to the left side of the road when driving, and requiring the use of seatbelts. Rules for pedestrians are contained in Part 11:

- Section 11.1 requires that pedestrians use footpaths, when practicable and where provided.
- Section 11.3 prevents pedestrians crossing a road except when on a designated crossing, when one is available within 20 metres.
- Section 11.4 states that when pedestrians cross a street without using a designated crossing that they must cross the road at right angles to the kerb.

The rule has legal provisions for shared space-type designs in the form of shared zones, which are defined as “a length of roadway intended to be used by pedestrians and vehicles” (Section 1.6). There are two rules set out for traffic in shared zones; the first states that vehicles must give way to pedestrians, and the second requires that pedestrians do not unduly impede the flow of traffic. These rules are similar to the rules for a woonerf; however woonerf rules go further by limiting vehicle speed to walking pace (Appleyard, 1980).

**Setting Speed Limits Rule 2003**

The Setting Speed Limits Rule 2003 establishes the procedure by which a road controlling authority sets a speed limit for a road. The rule has the objective of creating a safe road network by establishing 50 km/h speed limits on urban roads and 100 km/h speed limits on rural roads and motorways. The establishment of limits other than 50 km/h on urban roads and limits lower than 100 km/h on rural roads is at the discretion of the road controlling authority. The rule requires that road controlling authorities must:

“consider the safe and appropriate speed limit for a road with regard to the function, nature and use of the road, its environment, land use patterns and whether the road is in an urban traffic area or a rural area”

Schedule 1 of the rule is a modified version of *Road Traffic Standard 17: Guidelines for setting speed limits*, called *Speed Limits New Zealand*. It is this document that the road
controlling authority must use to calculate speed limits. Its objective is to “balance the interests of mobility and safety by ensuring speed limits are safe, appropriate and credible for the level of roadside development and the category of road”.

Other relevant documents

Central government also publishes numerous documents, with varying levels of legal status, which influence transport and pedestrian policy around the country.

*The New Zealand Transport Strategy 2008*

The New Zealand Transport Strategy (Ministry of Transport, 2008) was first published in 2002 to address environmental and economic challenges facing the transport sector. The Strategy covers all aspects of transport (land, sea and air) and states the government’s intentions for transport until 2040. It is also intended as a guide for local government.

Cycling and walking are promoted as environmentally friendly and healthy modes of transport that increase the vibrancy of urban areas while reducing congestion. It is acknowledged in the document that to increase these modes they need to be placed higher on the road user hierarchy. Suggested ways of doing this include reducing traffic volumes and speeds to increase safety, and “the further adoption of shared zones”. It is also acknowledged that more than a simple investment in infrastructure is needed to increase levels of walking and cycling; a fundamental change in the design of our cities combined with education and information is necessary.

*Getting There – on foot, by cycle 2005*

The first New Zealand Transport Strategy committed the government to producing a national strategy for walking and cycling to address the recent declines in these modes of transport. The resulting document, *Getting There*, explains the role that walking and cycling could play in achieving the goals of the strategy.

Four ‘focus areas’ are set out in the document, each with two or three “priorities for action” (Figure 20).

Focus Two, “Providing supportive environments and systems”, is the most relevant section of the document to this research, and priorities 4 and 5 are of the most interest. In this section it is acknowledged that past and existing land development and land use practice in New Zealand has tended to focus solely on the needs of the automobile, resulting in an urban environment that is sometimes hostile to pedestrians and cyclists.
Figure 20: Four focus areas and their priorities for action from Getting There – on foot, by cycle (Ministry of Transport, 2005, p. 3).

The importance of urban form to pedestrians and cyclists is also acknowledged. Highly-connected, active and intimate street designs, where cars and pedestrians are encouraged to share the space are needed in New Zealand; district plan rules and other territorial authority policies should encourage walkable urban form, and subdivision standards should promote pedestrian-friendly street design.

It is proposed that urban environments should not simply accommodate pedestrians and cyclists, but should encourage them. It is stated that there are different solutions to different roads; for example while local residential streets may be shared, larger collector streets need safe and convenient places for pedestrians to cross, and motorways need to be carefully designed so they do not present barriers to cyclists and pedestrians.

Getting There is an excellent overall framework for an improvement to New Zealand’s pedestrian and cyclist environments. It is stressed that New Zealanders need to view walking and cycling less as a leisure activity and more as a valid mode of transport – and urban street design is part of the solution to this issue.

The Pedestrian Planning and Design Guide 2009

This New Zealand Transport Agency-published document (2009b) outlines best practices for the provision of pedestrian infrastructure and networks, and is intended to be used alongside
the *New Zealand Transport Strategy* and the *Getting There* strategy. The principles of pedestrian infrastructure, the design processes involved, and actual best practice examples are covered by the guide.

A new road user hierarchy is proposed in the guide; placing pedestrians at the top and automobiles at the bottom. Shared zones are tentatively proposed for low traffic volume areas, and it is stressed that community consultation is paramount in such schemes. Generally, though, it is recommended that separate footpaths are always provided in urban areas.

It is suggested that streets need to be more than just functional; they should also be beautiful and engaging places. The tendency of standard traffic engineering devices to create ugly and unattractive pedestrian environments is also discussed. Opportunities to improve the pedestrian environment are proposed; including local authority-initiated community, workplace and school travel plans. The Resource Management Act application process presents more opportunities; although policies need to be included in district plans to achieve improvements this way.

While the guide is an excellent manual of current best practice, it still presents the shared space design approach as a concept with very limited application, instead focusing on the provision of traditional separated infrastructure.

*People, Spaces, Places 2002*

This document (Ministry for the Environment, 2002) is a broadly-focused urban design guide aimed at achieving better standards of design in New Zealand. It is intended for use by local government, developers, infrastructure providers, communities and any professional groups with an interest in urban planning and design. The guide outlines the value of urban design in a New Zealand context and sets out process and design principles such as consolidation, connectivity, diversity and legibility.

*The Urban Design Protocol 2005*

The *Urban Design Protocol* (Ministry for the Environment, 2005) is a voluntary commitment made by private development firms, local government and any other design professionals. As part of the government’s sustainability initiatives, the Protocol aims to create “more successful” cities and towns through better urban design. It is largely based around what are called “the seven Cs”; seven essential design considerations that contribute to good urban design. The seven “Cs” are Context, Connectivity, Choice, Custodianship, Collaboration,
Creativity and Character. Although the Protocol is not legally binding; signatories agree to support its principles and also to work towards the vision of the document.

*Subdivision for People and the Environment 2001*

The various versions of NZS 4404 (discussed below) provide developers with a degree of certainty when they follow tradition methods of land development. With growing interest in sustainable land development there has been a corresponding rise in alternative design options; and without standards for these alternative designs there has been a lack of certainty that discourages the adoption of these alternative designs by developers. The New Zealand Standards *Subdivision for People and the Environment* (2001) has attempted to resolve this lack of certainty for developers.

The document has two parts. The first provides a context and defines the design approach promoted by the guide, while the second gives guidelines on how to achieve the design approach conveyed in the first part. Transport and roading are not covered in great detail, however it is stated that the design of a street should provide for people’s well-being and a sense of community, i.e. streets should have a place-function. Developers are encouraged to make the best use of a road by considering all users, and in some cases, in cul-de-sacs serving a “small group of houses”, pedestrians could be given right-of-way.

*New Zealand Standard 4404:2010*

New Zealand Standard (NZS) 4404 is New Zealand’s standard for subdivision design, engineering, and construction. It has recently undergone a review process due to perceptions that it discouraged innovation, got in the way of recent urban design thinking, and made it difficult for designers to create a sense of place in a subdivision. In terms of roading, the old standard (Standards New Zealand, 2004) was thought to give too much emphasis to the movement function of streets and not enough to the place functions. While it is true that the design tables in the 2004 standard could be used to create good streets, the result was often highly uniform and characterless (Gawn, 2009).

The review process has resulted in a new standard; *Land Development and Subdivision Infrastructure* (Standards New Zealand, 2010) which purports to overcome the shortcomings of the 2004 standard. In terms of roading, the new standard gives special emphasis to the place and context functions of roads. To achieve this, four land uses are given:

1. Live and play
2. Work and learn
3. Shop and trade
4. Make, grow and move

These four land uses can occur in four different contexts:

1. Rural
2. Suburban
3. Urban
4. Centre

This produces a possible sixteen different “places” which indicate to designers the nature of the movement needs of a particular area. The link function of roads is also considered and three levels of link context are provided; lanes, local roads where slow speeds and pedestrian amenity prevails, and connector roads where higher vehicle speeds are more likely.

Figure 21: Shared space for mixed use urban centres (Standards New Zealand, 2010, p. 258).

A table listing the design standards for the various combinations of place context, design environment and link context is provided (Standards New Zealand, 2010, Table 3.2). The
The table recommends shared carriageways for all residential and commercial roads that serve less than twenty dwelling units/lots; with design speeds of 20 km/h or less. In these situations the traffic volume should be less than 200 vehicles per day. However, shared spaces themselves are mentioned in the table as suitable street designs for mixed use land uses in urban centres where traffic volumes may be up to 2000 vehicles per day (Figure 21).

The overall principles of the 2010 standard are also more compatible with shared space design. For example, roads are to be designed to “target-operating speeds”, which are the maximum speeds for a particular land use and road classification. These speeds are to be enforced by design, including physical and psychological devices.

The inclusion of these provisions for shared spaces in New Zealand’s primary subdivision design code is a positive step forward for developers who wish to incorporate modern streetscapes in their plans.

As an aside, it is worth taking note of the NZS 4404:1981 document, which was the industry-standard before NZS 4404:2004. The concept of separation of road users dominates this standard:

“Wherever possible pedestrians and vehicular traffic should be separated. (The surest way to improve pedestrian safety is to remove automobiles from areas of potential conflict with pedestrian traffic.)” (Standards New Zealand, 1981, p. 30)

The 1981 standard states that footpaths should be provided in response to need rather than due to arbitrary policy; i.e. if an “alternative pedestrian system” is provided, for example the completely separated pedestrian access-ways in Radburn, then footpaths on the roadside should be eliminated.

Development standards and design guides

Most territorial authorities in New Zealand have a document that sets out the minimum engineering standards required for public infrastructure. The standards have many different names (for example Porirua City Council has a Code of Land Development and Subdivision Engineering, while Nelson City Council has Engineering Standards), but most are in some way based on one of the versions of NZS 4404. These standards are generally quite prescriptive, and it has been suggested that they stifle innovation in urban design and lead to less sustainable outcomes (Birchfield & Howell, 2009); however this may change with the introduction of the revised NZS 4404 document (Standards New Zealand, 2010).
Development standards are not statutory documents; but compliance with them is often given legal effect through reference in the district plan. Upper Hutt City Council’s *Code of Practice for Civil Engineering Works* (1998) is an example of a standard given legal status by this method. The standards are usually provided as a means of compliance with district plan rules, and they can be enforced in resource consent conditions. Because standards usually have promoted a traditional form of subdivision, many local authorities have already reviewed, or are in the process of reviewing their standard to include more up-to-date provisions. They are used in the same way, but are sometimes less prescriptive; using performance criteria to assess proposals, which allows alternative approaches (Ministry for the Environment, 2006).

Councils sometimes also have a design guide, for example North Shore City Council’s *Design of Streets* (2009a), which is usually more general and less prescriptive than development standards. They are intended to guide developers; strict compliance is not required and the guides have no legal status unless they are granted it in a district plan (Birchfield & Howell, 2009). There is a broad range of documents in this category; from urban design strategies, to guidelines for specific infrastructure devices.

Development standards and design guides of New Zealand city councils and their relation to shared spaces are discussed in the next chapter.

**Local government strategies**

Local authorities have the power to create strategies (or frameworks and policy statements) to provide a guide when formulating policy. Strategies can be developed for transport, road safety, walking, cycling, urban design, growth and recreation. Some of these strategies are discussed in the next chapter.

### 3.4 Conclusion

As much of New Zealand’s urban growth occurred subsequent to the introduction of the motor vehicle, our urban places have been developed with a focus on providing for private vehicle use; not providing for people themselves. This has led to New Zealand becoming labelled one of the most automobile-dominated countries in the world (Bachels, et al., 2001). There is no doubt that the automobile played an essential role in the economic development of New Zealand (Watson, 1996), but this does not change the fact that we may now be overly dependent on cars for everyday life, and that the adverse social and environmental costs of
automobiles have largely been ignored. Comparing New Zealand to other countries shows that the country’s transport mode-split is certainly dominated by cars (Figure 22).

![Mode-split by number of trips](image)

**Figure 22: Mode-split by number of trips.** International data from Bassett, Pucher, Buehler, Thompson, & Crouter (2008) for the years between 1999 and 2006, with the exception for France’s data (sourced in 1994). New Zealand data from the New Zealand Travel Survey 2003-2009 (Ministry of Transport) for the years 2003-2007. Walking and cycling data is combined for Spain.

A high proportion of trips involve an automobile, while cycling and public transport (transit) use is very low (Figure 22). Walking, however, is relatively high, perhaps due to low public transport ridership. Low pedestrian and cyclist activity levels are an impediment to successful shared spaces, because the fewer pedestrians and cyclists in a shared space; the more dangerous it is for the pedestrians and cyclists that are in the space (Jacobsen, 2003).

This information is not surprising given New Zealand’s low density of development, wide streets and vehicle carriageways, and historical focus on separated infrastructure that favoured motorised transport. The car-dominated nature of New Zealand’s urban areas presents a barrier to the successful development of shared spaces, although there are clearly many opportunities for improvement.

New Zealand has made huge improvements to its road toll over the last quarter century, however improvements seem to have stalled in the last decade and New Zealand still has a poor road safety record when compared internationally. Pedestrians make up one in four road deaths, and the number of pedestrian fatalities has actually risen in the last five years. The social cost of traffic accidents in New Zealand is estimated to be over $3.8 billion per annum (Ministry of Transport, 2009e).
The current legal and political environment is largely concentrated on the separation of road users; and is therefore not conducive to shared spaces. However, there are signals that this situation is changing, for example with the introduction of a revised subdivision standard (NZS 4404:2010), and an increasing interest in urban design best practice. The following chapter examines the status of shared space with local authorities, and also looks at existing and proposed shared spaces in New Zealand.
Chapter 4: Shared space in New Zealand

An objective of this thesis is to identify existing and proposed shared spaces in New Zealand, and to examine the status of the shared space concept in relation to local government strategies and rules. To gather information for this section, the sixteen city councils of New Zealand were contacted by phone and email. The research objectives were then discussed informally with a council staff member involved with urban design, planning, or roading. This process helped to identify any existing shared spaces in New Zealand, and also to identify relevant development standards and design guidelines. The shared space concept was also discussed informally with the council representatives.

The representatives were asked if they knew of any existing formal or informal shared spaces in the area. A formal shared space is one that could be defined as a “shared zone” under the Land Transport (Road User) Rule 2004; i.e. where pedestrians have the right of way. An informal shared space is one which functions like a shared space but without the formal shared zone legal status. A formal shared space is likely to be specifically designed as a shared space; with little separation between pedestrians and vehicles and a lack of traffic control devices. An informal shared space may be an ordinary city street that for some reason, whether it is low traffic volumes, high pedestrian volumes, or a lack of pedestrian infrastructure, functions as a shared space.

This process has limitations. If the council staff member/representative spoken to is not aware of a certain space then it may have been overlooked in this research. This is especially the case with respect to informal shared spaces, which are more difficult to identify. This research does not claim to have identified all existing shared space examples, although it is thought that the majority of formal shared spaces in the sixteen cities have been discussed.

The informal discussions with council representatives were also used to establish what documentation was available from the council that impacted on shared space designs. For example; does the council have design guidelines for shared spaces? What is the council’s development standard and is a shared space design possible under it? These guidelines are examined in the second part of this chapter. Documentation considered includes council development standards, urban design guidelines, pedestrian strategies, cycling strategies, road safety strategies, transport strategies and district plans.
The full list of local authority documentation examined is provided in Appendix 1.

4.1 Existing and future shared space in New Zealand

Auckland City Council

Auckland City Council is planning at least four shared space streets in the central city as part of its “CBD streetscapes upgrade programme” (Auckland City Council, 2009a). The council states that the programme was inspired by the shared spaces that have been “developed by pioneers in urban design, such as Hans Monderman”; i.e. spaces with paved level surfaces, pedestrian right-of-way, and a lack of traffic signals, signs and road markings.

O’Connell Street, Elliott Street (including Darby Street), Lorne Street, and Fort Street (including Jean Batten Place) are all to become shared spaces in the next two years.

Figure 23: Existing Fort Street formation, looking east from near Queen Street intersection.

Figure 24: Aerial view from Queen Street of proposed Fort Street shared space (Auckland City Council, 2009d, p. 3).
Another shared space proposed in the central city is Federal Street on the block bound by Wellesley and Victoria Streets. This space was proposed by the company SKYCITY as a private-public partnership to improve the streetscape for pedestrians near the Sky Tower (Campbell-Reid, 2010). The objective of the proposal is to raise pedestrian priority and “Establish a ’critical mass’ of people within the street to modify vehicle behaviour and establish a ‘Shared Space’ dynamic” in the area, which is an important tourist destination (SKYCITY, 2009, p. 9). Design consultants Boffa Miskell and Transport Planning state that there is latent demand for high quality pedestrian space in the area near the Sky Tower; and that shared space can provide this space by increasing streetscape amenity and reducing through-traffic (the street is not strategically important for through traffic in terms of the traffic network).

The shared space itself is similar in design to the proposed shared spaces discussed above, and the Council requires that it is built to the same high standard (Campbell-Reid, 2010). Traffic will be one-way and the predicted vehicle flow rate in the upgraded street is 2,000 vehicles per day (SKYCITY, 2009).
SKYCITY have offered to fund the proposed upgrade of the street, in return for an airspace lease to extend a conference centre over the street (Figure 26). Auckland City Council have expressed reservations about the extended conference centre’s impact on the street from an urban design perspective, although the entire package of the shared space and conference centre extension is generally supported (Campbell-Reid, 2010).

The final shared space identified, the Wairepo Swamp Walk, is noteworthy as the first purpose-designed shared space in New Zealand. The space has been recently constructed as part of transportation upgrades around Eden Park for the Rugby World Cup, which is to be held in New Zealand in 2011. Due to the large numbers of visitors requiring access to and from Eden Park, a complete redevelopment of the surrounding streets is being undertaken with the aim of transporting 75-85% of patrons by non-car methods (walking, public buses, and trains) (Rednall & Jacques, 2009). The shared space will provide a short link between Walters Road and Sandringham Road (Figure 27).
Figure 27: Proposed Wairepo Swamp Walk shared space at Eden Park shown in red (image sourced and adapted from Google Maps).

The link will be pedestrian-only during events at Eden Park, easing pedestrian congestion on Sandringham Road from the end of Walters Road to the train station, and providing a more direct route for patrons walking to the central city. The Wairepo Swamp Walk was successfully trialled for this purpose in July 2010 during a rugby test match at Eden Park (Auckland City Council, 2010). At other times, the lane will be a shared space with one-way traffic (southbound only) (Rednall & Jacques, 2009). It is important that any redevelopments continue to provide benefits to the community after the World Cup. The Wairepo Swamp Walk provides these benefits through increased accessibility to the various destinations in the area, including the train station, a school, a kindergarten, and a swimming pool. The lane has been constructed to a high design quality incorporating CPTED (Crime Prevention Through Environmental Design) principles (Rednall & Jacques, 2009).

There is one non-shared space initiative worth noting in the Auckland area; the Point England self-explaining roads project in Tamaki (See Auckland City Council, 2008b). The council initiated the project because the area had the highest accident rate in Auckland City. The aim
is to use street design elements to make drivers more aware of other road users so they will drive more appropriately around them. Examples of the elements incorporated in the streets of Point England are shown below in Figure 28. They include planted chicanes combined with informal pedestrian crossing points, small-scale public art, trees on the centreline in low profile concrete planters, and large low-profile roundabouts. All of these features narrow the carriageway substantially, slowing drivers. As pictured below, when the white car is parked on the side of the road next to the centreline tree, drivers have to literally drive over the planter box to get through the gap.

![Figure 28: A local street in the Point England self explaining streets project area.](image)

The project does not involve shared spaces, but the principles used to create a self-explaining street are also principles that are incorporated into a shared space; for example lower speeds and more aware drivers. The Point England project shows that some of the fundamental objectives of shared spaces are being acknowledged as worthwhile by local authorities.

**Christchurch City Council**

No true shared space streets were identified in Christchurch, although there are several central city streets that incorporate similar design elements to shared spaces.
Figure 29: High Street, Christchurch.

Figure 30: Cashel Street Mall, Christchurch.

Figure 31: New Regent Street, Christchurch.

High Street (Figure 29), the Cashel Street Mall (Figure 30), and New Regent Street (Figure 31) are all located in the central business district of Christchurch. All of the streets are labelled as having pedestrian priority in Jan Gehl’s recent Christchurch study *Public Space Public Life* (Gehl Architects, 2009), although only Cashel Street Mall is a pedestrian-only area. The report shows that the streets have largely commercial land uses and relatively high pedestrian volumes (10,000 people per day on High Street to 2,000 per day on New Regent Street).
As can be seen, tramlines are a dominant feature in each of the spaces. While trams can use the streets at any time, the only other vehicles permitted are loading vehicles and these are only authorised to enter the streets at certain times. It is not clear how much traffic that loading vehicles generate. All of the streets shown have no vertical separation between pedestrian and vehicle areas. Instead, coloured pavers are used, and in Cashel Street and High Street, bollards and street furniture provide further separation.

**Dunedin City Council**

No formal shared spaces were identified in Dunedin, although the Esplanade at St Clair could be viewed as an informal shared space. The Esplanade stretches for approximately 200 metres along St Clair beach. It is a one-way street with a waterfront pedestrian walkway on one side and cafes, bars, and beachfront accommodation on the other.

![Figure 32: The Esplanade, St Clair, Dunedin, looking east towards St Kilda beach.](image1)

![Figure 33: The Esplanade, St Clair, Dunedin, looking west towards St Clair suburb.](image2)

As can be seen in Figures 32 and 33 above; the Esplanade has no vertical separation between vehicles and pedestrians. There is, however, a degree of separation introduced by the different coloured paving materials used, and also the low spherical bollards on the seaward side of the street. The street has no special legal status; i.e. the same traffic laws apply as on any other city street. It is a 50 km/h zone, although due to a number of design elements, including; the built form right up to the legal boundary, the high pedestrian activity, and general design as a ‘people place’; cars appear to drive very slowly and courteously.
Hamilton City Council

Hamilton has several small-scale residential shared spaces which can be described as low-density woonerven or home zones. For example, Olwyn Green serves approximately twenty-six dwellings and consists of an asphalt carriageway with no footpaths and a central green space (Figure 34).

Figure 34: Olwyn Green in Hamilton (image from Google Streetview).

Napier City Council

No formal shared spaces were identified in Napier, although discussions with a council representative involved with roading revealed that many streets in the city’s hill suburbs function as informal shared spaces due to the difficulty of building traditional streetscapes on steep terrain.

Figure 35 shows an example of such a street. Nelson City Council is currently dealing with a similar issue (see below).
Nelson has several residential hill suburbs with winding streets that are too narrow for standard footpaths, and are therefore used as informal shared spaces. Residential shared zones have been proposed on these streets; these are discussed in the second part of this chapter.

Waitakere City Council

Although no existing shared spaces were identified in Waitakere, there is a short shared space proposed near the New Lynn town centre. The proposal is for a short stretch (approximately 35 metres) linking Ambraco Place to a residential apartment complex. The space will have no vertical separation between pedestrians and vehicles, although coloured pavers will provide a certain degree of separation (Figure 37):
Wellington City Council

Three informal shared space streets were identified in central Wellington; Blair Street, Allen Street, and Woodward Street.

Blair Street (Figure 38) and Allen Street, both off Courtney Place, have very similar designs that use ninety degree parking to separate pedestrians and vehicles on a level surface. Kerb and channel is unnecessary due to a central dished drainage channel on Blair Street, and dished channels running through the car parks on Allen Street. Coloured pavers are used to separate road users and also to delineate parking spaces. Woodward Street is a short (60 metres) street running uphill off Lambton Quay. The street has a level surface with a degree of separation provided by coloured pavers and bollards on one side, although pedestrians were observed using the entire surface. There are no formal restrictions of use of the street; although the commercial land uses on the street, high pedestrian levels due to the central city
location, and the fact it is one-way, mean that most vehicles entering the street are loading and unloading goods, i.e. there is no through traffic.

There are two shared spaces proposed as part of the council improvements of the “Golden Mile” bus route. The proposals involve the creation of shared spaces in Lower Cuba Street and the pedestrian-only part of Manners Mall. The Manners Mall shared space will only be open to buses, and the creation of a shared space in Lower Cuba Street is proposed to offset this loss of pedestrian-oriented space in Manners Mall (Wellington City Council, 2009c). The preferred scenario for the Cuba Street shared space is shown below (Figure 40). Two lanes of parallel parking were seen as a desirable compromise between the pedestrian-oriented alternative of one lane of parallel parking, and the vehicle-oriented alternative of a row of 90° parking spaces.

![Plan layout of proposed Lower Cuba Street shared space](image)

**Figure 40: Plan layout of proposed Lower Cuba Street shared space (Wellington City Council, 2009d, p. 6, adapted by author).**

The shared spaces proposed are influenced by Hans Monderman’s particular vision of shared space. The design includes a 30 km/h speed limit/design speed, a level surface, no differentiation between the vehicle and pedestrian zones (especially in Lower Cuba Street), extensive landscaping, and a low level traditional traffic control, road markings and separation devices (Wellington City Council, 2009c).
4.2 Selected District Councils

Papakura District Council

Some small residential shared spaces were identified in the recent housing development of Addison in Takahini, just south of Manukau City.
The shared spaces consist of carriageways that range in width from 2.4 metres to 5 metres (Ministry for the Environment, 2008). They serve between eight and sixteen dwellings. There are three types of shared spaces in the Addison development. The first has standard kerb and channel but no footpaths (Figure 42). The second space incorporates a level surface and a narrower carriageway. Rear access lanes with a level surface and no footpaths are the final form of shared space.

The focus of the Addison design was “place-making” (Ministry for the Environment, 2008); with the aim of creating a low-speed environment. Sales in the development have exceeded expectations (Ministry for the Environment, 2008), a possible indication that small-scale shared spaces are not just accepted by the public, but preferred.

Rodney District Council

The first stages of the Orewa Boulevard upgrade on the Hibiscus Coast Highway through Orewa were completed in late 2009 with the vision of increasing pedestrian priority and establishing connections between the town centre and the beach (Evans, 2009).
The Orewa Boulevard initiative is significant because of the relatively high traffic volumes on the road. The Boulevard is part of State Highway Seventeen/the Hibiscus Coast Highway and is the secondary route north of Auckland to Puhoi after the State Highway One motorway. Traffic counts slightly north of the site show an annual average daily traffic volume of well over 9000 vehicles (NZTA, 2010), which is much more than any other New Zealand street identified in this thesis.

Although vehicles are separated from pedestrians on the boulevard with coloured pavers, parking, and planting, it can still be considered a type of shared space due to the lack of vertical separation, the increased pedestrian priority, and the alternative pedestrian crossings featured (Figure 43). It should be noted that at the time of the site visit, signs had been erected at the alternative crossings stating: “Pedestrians give way to vehicles. Alternative zebra crossing”. It is unclear whether or not these signs are to become permanent features. There is also a standard zebra crossing on the street. Narrow carriageways and speed tables on side roads are used to slow traffic entering the highway (Evans, 2009).
4.3 Local authority positions on shared space

Auckland City Council

Auckland’s *Code of Urban Subdivisions* (Auckland City Council, 2009b) provides a means of compliance with the performance criteria set out in the *District Plan Isthmus Section* (Auckland City Council, 2007). However, many of the standards for road construction in Auckland are contained in the district plan itself, as well as in the Council’s *Standard Engineering Details* (2009e). A shared space would be difficult to develop under these documents, as the district plan, which is statutory, requires footpaths on at least one side of the road in all urban areas. There are a set of specific engineering requirements for Queen Street, reflecting the importance of this street.

The *Mt Wellington Code of Subdivision and Design* (Auckland City Council, 2008a) has been created solely to guide development at what was Auckland’s largest brownfield site. The extensive streetscape guidelines in the code state that pedestrians should be able to cross the road at any point on all but the two highest speed road typologies, however separated footpaths are required on all roads except on the lowest street typology. An interesting feature of this code is the support of the naked streets philosophy (where all street signage, road markings and traffic control is removed). The concept is supported because it “increases greater individual responsibility, and encourages both drivers and pedestrians to interact and adapt to one another” (p. 90), rather than relying on signage for guidance. The naked streets concept is not fully adhered to, however, with standard signage and road markings still required at all cross intersections.

Christchurch City Council

Christchurch’s *Infrastructure Design Standard* (Christchurch City Council, 2007b) promotes a relatively progressive approach to roading design, especially in regard to vehicle speed issues. Its processes for natural speed calming and enforcing design speeds according to the surrounding land uses are some of the most modern that were identified. Shared spaces are not specifically mentioned in the standard, although shared zones are mentioned as a traffic control measure in a table that sets out various traffic control options and then compares them with each other. The options are compared by listing them against a set of objectives of traffic control methods; which include reducing speed and traffic volume, increasing pedestrian safety, reducing crash risk and improving environmental effects. In the table, shared zones
score three out of five against each of the objectives; making them the most consistently beneficial traffic control method across a range of objectives.

Christchurch City Council’s development standard does not contain technical construction procedures; these are contained in the extensive Civil Engineering Construction Standard Specifications (2007a).

In the Christchurch City Council-commissioned report mentioned above, Public Space Public Life (2009), renowned Danish urban designer Jan Gehl’s company Gehl Architects recommends turning central Christchurch from a traffic dominated area into a pedestrian oriented area. Specific recommendations include excluding private vehicles from Colombo Street in the central city (allowing only public transport), introducing a 30 km/h speed limit around the city centre, the narrowing of carriageways, and the upgrade of intersections for pedestrians. Level surfaces are proposed for low traffic-volume streets and Cathedral Square (extending onto Colombo Street).

**Dunedin City Council**

Dunedin City Council has recently reviewed its development code, resulting in a new document released in August 2010; the Dunedin Code of Subdivision and Development.

The Roads and Transportation section of the Dunedin Code of Subdivision and Development (2010b) is largely based upon NZS 4404:2004, although the Council has amended and expanded upon the standard to introduce a Dunedin context and make it less prescriptive. An important element of the proposed standard is that alternative roading designs can be submitted for consideration if appropriate engineering information is provided to explain how a standard of design equivalent to the code is created. It should be noted that the Dunedin City Council has added an extra objective to the Roads and Transportation section of the NZS 4404:2004 standard, requiring the safe and integrated movement of all road users while supporting the surrounding land use and minimising environmental impacts.

The Dunedin City Council District Plan (2005) adopts the code to protect road amenity, address road safety and to provide for pedestrians and cyclists, although it does not specifically require compliance, making the code itself non-statutory.

**Invercargill City Council**

Invercargill City Council has adopted the NZS 4404:1981 (Standards New Zealand) document as their development standard, with some amendments (Invercargill City Council,
Compliance with the code is required by the *District Plan* (2009). This document is almost thirty years old, meaning that Invercargill has the least current development standard reviewed.

**Hamilton City Council**

The *Hamilton City Development Manual* (Hamilton City Council, 2009) states that vehicles and pedestrians should be separated from each other, unless they are in specifically designed shared environments. The Manual’s road classification table allows these shared environments on short cul-de-sacs (less than 80 metres) serving less than fifteen household units. Other than this provision for small-scale shared spaces, Hamilton’s development standard is outdated in terms of modern urban design best practice.

**Hutt City Council**

Hutt City Council does not have its own development standard. Although the council is looking into developing its own standard, NZS 4404:2004 is currently used as the default guide. NZS 4404:2004 is discussed in Chapter 3.

**Manukau City Council**

The roading section of Manukau City Council’s *Engineering Quality Standards* (2007) is relatively basic and delegates many requirements to other documents, for example the district plan and New Zealand Transport Authority standards. Although the Quality Standard itself contains no provisions for alternative designs; the document is non-statutory and Manukau City Council’s *District Plan* (2002) allows alternative designs through its Engineering Performance Standards (these standards are contained within the District Plan and are different to the *Engineering Quality Standards* discussed below).

The *Engineering Quality Standards* document gives accepted methods of achieving compliance with the district plan-enforced performance standards; but they may not be the only method. The performance standards in the district plan are focussed on the movement of vehicular traffic and the reduction of environmental effects arising from this movement. In spite of this, nothing contained in the performance standards indicates that a shared space design would not be appropriate, so long as it provides for the safe movement of traffic, disposal of stormwater, and the reduction of adverse environmental effects.

Manukau City Council’s *Local Area Traffic Management* guidelines (2004) list shared zones as a traffic management device for commercial areas, medium to high density residential areas, and low traffic volume recreational areas. A 10 km/h speed limit is recommended and
the need for differentiation between shared zones and ordinary streets is stressed. It is also stated that shared spaces are only cost effective when created in new subdivisions or in major pavement reconstructions, as opposed to generic street repairs or upgrades.

**Napier City Council**

Napier’s *Code of Practice for Subdivision and Land Development* (Napier City Council, 2007) consists of six parts; three statutory and three non-statutory. Included in the statutory parts are Resource Management Act 1991-related requirements, a set of performance criteria, and minimum engineering standards. The remaining non-statutory parts are design and construction means of compliance. The code therefore is performance-based, although because there are separated footpath requirements in both sections, shared space designs are not possible.

**Nelson City Council**

Nelson City Council has one of the most advanced stances on shared spaces identified in this research, especially considering the size (in terms of population and area) of its constituency. In the *Nelson Annual Plan 2010-2011* (Nelson City Council, 2010b) a “Residential Shared Zone” is proposed to formalise the informal shared spaces in the hill suburbs of the district. This would negate the need for traditional footpaths which, due to the steep terrain, would require large retaining walls to widen the streets. The plan states that the benefits of the new zone would be increased safety, minimal changes to existing parking, reduced costs of upgrades, and retention of the existing street character.

![Image](image.jpg)

**Figure 45:** Locking Street, Nelson is a proposed Residential Shared Zone. The street already functions as an informal shared space due to its narrowness (image from Google Streetview).
Internal guidelines (Nelson City Council, 2010c) for the shared zones show that they will feature the following design elements:

- A maximum speed limit of 30 km/h.
- Entry treatment/demarcation, for example a speed table, narrowing and signage.
- Mid-block treatment to keep 85th percentile speeds to 30 km/h, using reduced sight distances and landscaping.
- A lane width of 2.7 metres.
- No separation between users except in short sections where vulnerable road users need extra safety, for example on blind corners.
- Use of kerb and channel is discouraged, instead the use of lower impact stormwater devices is recommended.
- Parking areas demarcated without the use of road marking, for example with planter boxes.

The zones are recommended for local roads and residential streets with a traffic volume less than 100 vehicles per hour or 1000 vehicles per day.

![Figure 46: An artist's impression of a proposed Residential Shared Zone (Nelson City Council, 2010d).](image)

The shared zones have more in common with British home zones than with Dutch woonerven, however there are certainly differences – they will not be paved, and the lower density and relatively severe topography of the proposed streets will create a very different atmosphere to the home zones or woonerven.
Nelson’s initiative with its Residential Shared Zones is exciting in several ways. Firstly, it appears to be the only city council proposing a shared space as a standard street design typology. Secondly, it is the only place identified in New Zealand proposing “shared zone” status (under the Land Transport (Road User) Rule 2004) in residential streets. A possible exception to this is Wairepo Swap Walk in Auckland (see above), however this street is a “once off” development aimed at easing congestion around Eden Park. Thirdly, the Nelson City Council seems to be applying the shared space concept comprehensively, by removing street markings and footpaths and introducing a maximum design speed of 30 km/h. Lastly, the scheme is important as it could probably be applied in many other New Zealand towns and cities; this idea is explored further in Chapter 5.

Nelson City Council has recently released a new development standard; the Land Development Manual (Nelson City Council, 2010a). The manual will provide a means of compliance with the Nelson Resource Management Plan (2007), although it is non-statutory. The manual itself has two levels of requirements: minimum standards, which are compulsory to achieve the statutory requirements of the Management Plan, and design guidance, which is not compulsory. It is acknowledged that alternative designs are possible even under the minimum standards.

The manual is one of the more progressive development standards reviewed, and some of the more interesting elements include: a road user hierarchy that suggests the mixing of pedestrians and vehicles on local roads (s. 4.2.3.6) and the use of design speeds of 10 km/h lower than the speed limit on low-volume roads (s. 4.3.1). It also implies that traffic calming should not be necessary to achieve design speeds if roads are designed appropriately in the first instance (s. 4.3.23).

Even though the manual is quite a progressive development standard; the type of shared space designs possible within its rules are less of a departure from traditional street layouts when compared with overseas shared space examples.

**North Shore City**

North Shore’s development standard is the non-statutory Infrastructure Design Standards Manual (North Shore City Council, 2009b). The manual is largely based on Austroads standards and presents rather traditional development and design requirements. North Shore’s District Plan (North Shore City Council, 2002) acknowledges the damaging impact that high levels of traffic can have on a neighbourhood. It is stated that within certain residential areas, the roading criteria against which resource consent applications are evaluated aim to achieve a
shared environment for pedestrians, cyclists and vehicles. There is, however, a clear preference for separation of road users, as evidenced by the promotion of pedestrian and cyclist shared paths with the justification that: “These ‘slow modes’ do not mix well with motor vehicles” (2002, p 12-9).

The district plan states that new roads should be constructed in accordance with the plan itself (and its technical supplement in the appendices), NZS 4404:1981, and Austroads design codes. It should be noted that contrary to the Infrastructure Design Standards Manual, which requires a design speed 10 km/h above the posted speed limit, the District Plan requires a maximum design speed of 45 km/h on residential roads.

North Shore City has a reference document for street design, Design of Streets (North Shore City Council, 2009a), proposing a progressive approach to street design that focuses on the place-function of streets; putting pedestrians at the top of the road user hierarchy. The guide encourages shared space designs that incorporate low vehicle speeds, reduced signage, level surfaces, increased community activity on the street, and high pedestrian amenity.

**Palmerston North City Council**

Palmerston North’s development standard is called the Engineering Standards for Land Developments (Palmerston North City Council, 2008). The roading provisions of the document are partly based on NZS 4404:2004, although a number of Austroads documents also make up the specifications. The non-statutory standard is quite traditional and a shared space design would not be possible under it.

**Porirua City Council**

Porirua has no subdivision or design guidelines, although it has a development standard in the form of the Code of Land Development and Subdivision Engineering (Porirua City Council, 2010) which adopts and expands upon NZS 4404:2004. The Porirua City Council has added its own performance goals and performance criteria, and “special provisions” are provided to show where the code differs from the NZS 4404:2004 standard.

The performance goals and criteria of the Roading and Access section introduce more focus on the place function of roads to balance NZS 4404:2004’s focus on the access function. The code is non-statutory and non-prescriptive. It details approved methods of complying with the performance goals, but allows for alternative methods so long as the same goals are reached and criteria fulfilled.
Tauranga City Council

Tauranga City Council’s *Code of Practice for Development* (2007) is the development standard for the region. It invites alternative design proposals and is not a statutory document, although the *District Plan* (Tauranga City Council, 2010) for the area requires compliance with the code for the provision of services in new subdivisions. The council also has an urban design *Development Guide* (2008).

Neither the *Code of Practice* nor the *Development Guide* mention shared spaces or give any real indication that they might be appropriate in a certain area, although the *Code of Practice* does allow for alternative designs that satisfy its performance requirements. The *Development Guide* stresses the importance of street design that makes drivers instinctively travel at an appropriate speed, and also the value of an attractive street design to pedestrians.

Upper Hutt City Council

The Upper Hutt City Council’s *Code of Practice for Civil Engineering Works* (1998) has three main sections. The first is a set of “Engineering Performance Criteria” which establish the code as a performance-based standard. The second is the mandatory engineering requirements and the third a non-statutory design guide. Upper Hutt’s standard is fairly conventional, although its structure, which utilises performance criteria as well as mandatory requirements, means that alternative designs are welcomed. In this case, however, the mandatory requirements rule out a shared space design by requiring footpaths in all new and upgraded streets.

Waitakere City Council

Waitakere’s non-statutory *Engineering Standards Manual* (Waitakere City Council, 2008), while quite modern, does not provide for shared spaces. Kerb and channel and separate footpaths are required on all urban roads. Despite this, the standard does provide for other solutions with a set of performance criteria by which to assess proposals.

Wellington City Council

Wellington City Council is currently consulting over a new development standard draft. The draft standard has been examined here instead of the old standard, as the new standard, when finalised, is likely to be more similar to the current draft than the old standard. There is no mention of shared spaces in the *Draft Code of Practice for Land Development* (2009a), despite the relative modernity of the standard. The code will effectively be a statutory
Although shared spaces are not mentioned in the Code of Practice; the recently revised Subdivision Design Guide (Wellington City Council, 2008), a statutory design guide, suggests that shared spaces may be appropriate on streets at the lower-volume end of the roading hierarchy that serve small numbers of dwellings. Traffic calming is encouraged in these areas to slow traffic.

### 4.4 Discussion

A number of questions were asked about each of the development standards so that the standards can be compared to each other. These questions are explained and answered below so that conclusions can be made about the general receptiveness of the standards to shared space designs.

- **Is there an acknowledgement of the place function of roads in the roading network objectives?** This would suggest that the standard is more welcoming toward shared space designs, as shared spaces aim to improve the place function of streets (Reid, 2009). The majority of development standards do not put significant emphasis on the place functions of roads in the roading network objectives (see Table 2 in Appendix 1).

- **What materials are authorised for footpath and carriageway surfacing?** Shared space designs often feature a variety of paving surfaces (See, for example, the case studies featured in Castle & Quimby, 2006); therefore strict rules on surfacing materials may restrict them. Paving blocks/stones are an approved surfacing material for footpaths and carriageways in nine out of seventeen standards reviewed, however of the remaining eight, five allow paving stones on either the footpath or carriageway (but not both) (see Table 3 in Appendix 1).

- **Are separated footpaths required on all streets?** Separated footpaths are required on both sides of the road by all but three city councils except in low traffic volume areas and where restricted by topography (see Table 4 in Appendix 1). Hamilton City Council allows specifically designed shared space environments where footpaths are not required, while Nelson City Council does not require footpaths in “Hillside
environments”, where they are establishing shared zones. Invercargill City Council only requires separate footpaths “in response to need”.

- What are the options for stormwater drainage? Strict requirements for kerb and channel stormwater removal may hinder a shared space design, as kerbs often form the vertical separation that is inconsistent with shared space design (Hamilton-Baillie, 2008b). A majority of city councils allow alternatives to kerb and channel stormwater drainage, with half allowing swales and a small number specifically allowing dish channels (see Table 5 in Appendix 1).

- What is the policy regarding design speeds? Shared space designs try to achieve desired speeds through road design rather than through posted speed limits (Sutcliffe, 2009). Some city councils recommend design speeds 10 km/h above the speed limit to make the road safe for speeding drivers (for example, see Palmerston North City Council, 2008). This is contrary to the shared space philosophy; which aims to control speed through legible design rather than through posted speed limits (Hamilton-Baillie, 2008c).

Most of the development standards are not statutory documents, and some have only partly been given legal effect (see Table 6 in Appendix 1). If a development standard is non-statutory, then even if it does not allow shared spaces they may still be possible within the roading requirements of the district plan.

Local authority strategies for transport, cycling, walking, and road safety were also examined to aid understanding of the possible attitudes of local authorities to shared spaces. Full lists of strategies looked at are provided in Tables 7 and 8 of Appendix 1.

- Of the sixteen authorities reviewed; three have combined cycling and walking strategies. Of the remaining thirteen, seven have cycling strategies, five have pedestrian strategies, and six have neither (i.e. there are two authorities with a cycling strategy only, and five have both a cycling and a pedestrian strategy).

- In terms of cycling; central city areas sometimes appear to already function as shared spaces due to low vehicle speeds and lack of separated cycle facilities. Local authorities in Nelson (Nelson City Council, 2006) and Palmerston North (Palmerston North City Council, 2002) encourage sharing of the carriageway in their cycling strategy and transport management plan respectively.

- Travel Demand Management initiatives are outlined in ten of sixteen local authorities’ transport strategies. Tauranga City Council (2006, p. 78) describes Travel Demand
Management as “activities which focus on changing the travel behaviour of individuals by providing incentives for people to utilise sustainable modes of travel and reduce the need to travel”.

- Seven from ten of the cycling strategies included “share the road” campaigns which are driver education initiatives aimed at increasing courtesy between road users, mostly on rural roads without cycle lanes.
- Nelson’s pedestrian strategy, *Stepping Out* (Nelson City Council, 2005), identifies the lack of footpaths in some parts of the city as an issue that needs addressing. Due to steep topography in some areas the provision of footpaths would have required expensive earthworks and engineering design, so a shared space approach has negated the need for separate pedestrian facilities (as discussed above). This solution may have an application in numerous New Zealand cities with suburbs on steep terrain, for example Dunedin, Napier, Wellington, and the Port Hills in Christchurch.

The strategies examined all promote active modes of travel and aim to increase them and make them safer, although the separation of road users is usually presented as the solution.

### 4.5 Conclusion

In this chapter the current status of shared spaces in New Zealand has been examined. The examples of shared spaces that currently exist in New Zealand can be called informal shared spaces, with the exception of the recently constructed Wairepo Swamp Walk in Auckland. This is because not all of the streets listed below incorporate level surfaces, and all but the Wairepo Swamp Walk lack legal pedestrian priority (Table 3).

<table>
<thead>
<tr>
<th>Location and street</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland</td>
<td></td>
</tr>
<tr>
<td>Wairepo Swamp Walk</td>
<td>New pedestrian priority lane as part of Eden Park Stadium transport upgrades</td>
</tr>
<tr>
<td>Hamilton</td>
<td></td>
</tr>
<tr>
<td>Olwyn Green</td>
<td>Small scale residential space, one example of several such spaces</td>
</tr>
<tr>
<td>Napier</td>
<td></td>
</tr>
<tr>
<td>Hill suburbs</td>
<td>Narrow residential streets on steep slopes without footpaths</td>
</tr>
<tr>
<td>Wellington</td>
<td></td>
</tr>
<tr>
<td>Blair Street</td>
<td>Commercial street with level surface and extensive parking</td>
</tr>
<tr>
<td>Allen Street</td>
<td>Commercial street with level surface and extensive parking</td>
</tr>
<tr>
<td>Woodward Street</td>
<td>Commercial street with level surface</td>
</tr>
</tbody>
</table>
Table 3: Existing shared spaces (formal and informal) in New Zealand.

<table>
<thead>
<tr>
<th>Location and street</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auckland</td>
<td></td>
</tr>
<tr>
<td>Elliott Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>Fort Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>O’Connell Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>Lorne Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>Federal Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>Waitakere</td>
<td></td>
</tr>
<tr>
<td>Ambrico Place</td>
<td>Small link street with level surface</td>
</tr>
<tr>
<td>Wellington</td>
<td></td>
</tr>
<tr>
<td>Manners Mall</td>
<td>CBD shared space with pedestrian priority and restricted vehicle use</td>
</tr>
<tr>
<td>Lower Cuba Street</td>
<td>CBD shared space with pedestrian priority</td>
</tr>
<tr>
<td>Nelson</td>
<td></td>
</tr>
<tr>
<td>Locking Street</td>
<td>Residential shared space with pedestrian priority</td>
</tr>
</tbody>
</table>

Table 4: Proposed shared spaces in New Zealand.

New Zealand’s existing and proposed shared spaces, both formal and informal, vary in scale; but in general they are less radical than Hans Monderman’s Dutch designs in terms of the amount of “sharing” of the carriageway, traffic volumes, and lack of traffic control. For example, all but two of the proposals have one-way carriageways (Ambrico Place in Waitakere and Nelson’s residential shared zones are both two-way). There are no high-volume uncontrolled intersections proposed, such as Monderman’s naked intersections. The proposed shared spaces, if successful, may inspire more radical designs. They are the first real shared spaces in New Zealand; it can be expected that these first designs are not quite as much of a departure from traditional street layouts as European shared space examples.
There is little information about shared spaces in local authority documentation. Within the development codes there is almost no mention of shared spaces, for example there are no guidelines to aid a developer who wants build a shared space in their subdivision. There are signs that this may be changing. Examples of this include the promotion of naked streets philosophy in the Mount Wellington Quarry Subdivision in Auckland, North Shore City’s Design of Streets handbook (2009a) and its promotion of shared space philosophy, Nelson’s Residential Shared Zones, and a general shift towards less prescriptive development codes.

The above research was conducted prior to the merger of the Auckland councils on the 1st of November 2010. It is unclear how this will affect the promotion of shared spaces; however it seems that the development standards of the Auckland City Council, Manukau City Council, Waitakere City Council and North Shore City Council will be replaced by a single document. The form that this new document will take is uncertain; however, given the growing popularity of shared spaces in New Zealand as evidenced above, there is an increased probability that shared spaces may feature in it.
In this chapter, an approach to the design of shared spaces that is specific to New Zealand is developed. First of all, some of the issues explored in the last three chapters are analysed so that New Zealand’s specific urban situation can be understood. The recommended approach is then outlined and the wider issues of how local and central government could promote shared spaces are looked at, as are specific design options.

## 5.1 Issues for consideration

**Land use in New Zealand cities**

Past land use patterns, for example low density development, have made New Zealand an automobile-dependent country, as discussed in Chapter 3. There are, however, signs that this may be changing (for example the increases in density shown in Figure 47).

![Figure 47: New Zealand city density changes 1991-1996 (Bachels, et al., 2001, p. 55).](image)

Figure 47 shows an increase in density in the central business districts (CBDs) and inner areas of cities, with a decrease in outer area density. This suggests people are moving closer to the centres of cities, and infill housing is becoming more common. Other research has shown an
increasing preference for small house and apartment living (Preval, et al., 2010). The Resource Management Act 1991 supports performance-based zoning which is an improvement on the single-use zoning practised previously, but there is still a concern that the Act does not actively support sustainable urban design (Johnson, 2007). An example of this is the lack of reference to urban issues in the “matters of national importance” in the Act.

Shared spaces function best in cities that are pedestrian-oriented or already cater for the full range of road users. New Zealand has a very car-oriented urban form, but there are signs this is changing. An example of this change can be seen in the New Urbanist movement that has been popular with New Zealand subdivision designers in recent years (Benge, 2005).

Automobile dependence

New Zealand’s high vehicle ownership rates may also be changing with the number of light vehicles, which grew steadily by a quarter of a million from 2000 to 2007, dropping in 2008 and 2009 (while the population continued to grow) (Ministry of Transport, 2010; Statistics New Zealand, 2010). Litman (2010) has talked about decreasing automobile use in the United States due to demographic and market changes, for example aging populations and high fuel prices. It is likely that these trends will have similar effects in New Zealand.

Efforts have been made to instigate a change in the transport mode-split, for example the Getting There (Ministry of Transport, 2005) document aims to reduce the proportion of private vehicle travel. The document states that a significant proportion of our vehicle trips are relatively short distances (two or three kilometres), making them environmentally harmful “cold starts”, where high levels of carbon are emitted by the cold engines. Distances of two or three kilometres are walkable in around half an hour, suggesting there is scope for some change in the transport mode-split by getting people to walk or cycle these trips. This increase in physical activity would also be beneficial to the nation’s health. There is some evidence that the creation of shared spaces can alter the transport mode-split, shifting the split towards walking and cycling, although results of studies in the United Kingdom are mixed (Reid, 2009).

Place

Shared spaces may be able to restore a sense of place in parts of New Zealand’s cities where this sense has been eroded by standardised streetscape designs that focus on traffic control. Many traffic calming schemes, while built with similar intentions to shared spaces (i.e. slowing traffic), could be viewed as ugly or monotonous due to large amounts of road
markings and signage. For example, the *Pedestrian Planning and Design Guide* (NZTA, 2009b) recommends “Main street projects” to improve main streets for all users. An example is given (Figure 48), and as can be seen; the projects result in road environments which disregard place and are the same in every town. Engwicht (2005) has described how the standardised traffic calming found in these environments lacks “intrigue”, subconsciously making drivers unaware of their surroundings and encouraging them to speed.

![Figure 48: Main street project in Queenstown (NZTA, 2009b).](image)

Because of the large range of shared space design options available, shared space could be a way of achieving similar benefits for road users as the “Main street projects”, while simultaneously allowing a sense of place to be fostered through more aesthetically pleasing and culturally or historically sensitive designs.

**Urban enhancement**

The introduction of the automobile into New Zealand, while crucial to the economic development of the country, decreased the social interaction involved in transportation. As public transport ridership decreased and private vehicle use rose, spontaneous social interactions on rural highways and urban streets were made more difficult by the high speeds (and resulting noise) of motorcars (Watson, 1996). Shared spaces provide an opportunity to re-establish the street as a place for social interaction.
In the United Kingdom there have been campaigns aimed at saving streets with significant heritage value from becoming ugly due to, and cluttered by, traffic control infrastructure. An example is the “English Heritage Save Our Streets” campaign (English Heritage, 2004). Street furniture, road markings, traffic control devices, and signage all contribute to “clutter”. According to Sutcliffe (2009), the excessive clutter found in Europe is not such a problem in Australia because of restrictions on intersection signage, and a similar situation is assumed in New Zealand. Although clutter may not be as much of a problem in New Zealand as it is in Europe, some of our public spaces could certainly benefit from reduced clutter (Figure 49).

![Image of cluttered streetscape](image)

Figure 49: Cluttered streetscape at Queen's Gardens in Dunedin.

Shared spaces often incorporate simplified streetscapes where traffic control devices and road markings are reduced in number, or removed completely. Remaining street furniture is carefully positioned to slow traffic and improve amenity while not presenting an obstacle to pedestrians and cyclists (Castle & Quimby, 2006). In this respect, shared spaces could improve New Zealand’s public realm. New Zealand’s current Traffic Control Devices Rule 2004 and the Traffic Control Devices Manual (NZTA, 2008) do not acknowledge the negative
Effects that traffic control devices can have, indicating it may be difficult to convince officials of this particular benefit of shared space.

**Economics**

It is expected that the economic gains from improved streetscapes that have been shown in the United Kingdom (CABE, 2007) should also eventuate in New Zealand cities when streets are upgraded. Traffic flow improvements that have been observed in other countries (see, for example, Noordelijke Hogeschool Leeuwarden, 2007) and the resultant economic benefits are also expected in New Zealand where shared spaces and naked intersections are constructed as part of a wider road network upgrades.

Shared spaces are likely to be more expensive to build than traditional separated streets, largely due to the extensive paved shared surfaces required (Buttress, et al., 2006; NZTA, 2009b) (see also the shared spaces cost analysis in Appendix 2). Shared spaces in New Zealand may be constructed by local government or private developers. When private developers are designing a subdivision; a shared space, although more expensive per square metre of road reserve, may be the more cost-effective option (see Appendix 2). This is because narrower road reserves are possible with shared space (leaving more saleable land), and also due to the fact that an enhanced streetscape will increase property value. Careful design of shared spaces helps to minimise areas of expensive cobblestone paving.

Local authorities will usually be involved with retrofits of urban streets rather than greenfield development. Manukau City Council (2004) has stated that creating shared spaces by retrofitting old streets is a more expensive method of creating shared space than constructing them in greenfield subdivisions due to the costs of removing kerbs and modifying surface drainage patterns.

**Boy racers**

The issue of boy racers is one that could potentially impact on the success of a shared space. Boy racers are “a diverse grouping of predominantly young people, who come together at varying times and places, to revere private vehicles and socialise.” (Falconer & Kingham, 2007, p. 181). Boy racers, who have been subject to a large amount of media attention, often participate in sub-cultural activities, most notably; stunt-driving. This includes sustained loss of traction and illegal drag racing, both of which pose real threats to both participants and the public, as well as causing long-term damage to road surfaces. Due to media and police attention, these activities have been increasingly relocated from central city areas to the
peripheries of the city and industrial areas where there is little public presence. Boy racer activity in the central city, then, tends to be more of a nuisance (noise, high traffic volumes) than illegal or dangerous (Falconer & Kingham, 2007).

Boy racers are not expected to pose a threat to the success of shared spaces for the reason that most of the dangerous and socially disruptive activities they engage in are carried out where there is little public presence. In suburban and central city areas, where boy racers are more of an irritation than a safety concern, shared space may help to mitigate the negative effects of their actions by creating slow-speed, pedestrian environments rather than car-oriented spaces.

**Street width**

New Zealand’s wide streets encourage high speeds and emphasis the movement function as opposed to the place function of streets; although they also provide an opportunity for a wide range of shared space designs (Engwicht, 2005). Because the road reserve is wide does not mean the carriageway also has to be wide, and a wide road reserve allows a designer more freedom in carriageway positioning, for example a range of chicane sizes are possible. However, New Zealand’s wide road reserves are often an inefficient use of land that present an obstacle to increased living densities (Plishke, 1947).

**Street layout**

As discussed in Chapter 3, grid layouts are common in many New Zealand urban centres. The grid is excellent at providing a well-connected city centre, although this connectivity can result in unwanted through-traffic on some streets. The Urban Design Compendium explains that the grid can be modified to avoid pitfalls in relation to through-traffic (English Partnerships, 2007). This could be achieved using shared spaces by turning local roads on the grid into shared spaces, directing drivers toward more suitably designed arterial roads (Ben-Joseph & Southworth, 1997). This modified grid scenario could retain the benefits of the grid without the negatives that have been experienced in some cities.

As grid layouts are common in New Zealand, this approach could be used to improve pedestrian conditions in city centres. The other common street layout found in residential New Zealand is the “cul-de-sacs and loops” subdivision, for example Plishke’s (1947) Trentham design shown in Chapter 3. These too can be improved with shared spaces. The low traffic volumes in cul-de-sacs often create a woonerf-like environment that could be made safer if converted to shared space (Ben-Joseph & Southworth, 1997).
Traffic policy

Several of New Zealand’s traffic policy documents were introduced in Chapter 3. Some of these documents are discussed in further detail here, and their association to shared space is explained.

*Land Transport (Road User) Rule 2004*

In Chapter 3 some of the rules concerning pedestrians in this law were set out. These rules required pedestrians to use footpaths where provided and to only cross roads on pedestrian crossings (where provided within 20 metres). Where there is no crossing provided within 20 metres, pedestrians must cross roads at right angles to the kerb. These rules show no regard for pedestrian desire lines (i.e. direct routes that pedestrians would walk if they had no restrictions), and give an indication of the inferior position of pedestrians in traditional separated streets.

The following clauses are contained in this rule:

- Section 3.1 (1): Pedestrians must obey traffic light signals.
- Section 3.2 (2): Pedestrians can cross a road when the traffic light is green, but not if the “red man” (i.e. “do not cross”) is flashing.
- Section 3.2 (4 and 5): Pedestrians must not cross a street if there is a red or orange light showing, unless the “green man” (i.e. “cross”) is lit.
- Section 3.5: Pedestrians must not cross the road when the “red man” is showing.
- Section 6.1: Drivers must not park their vehicles without “due care and consideration” for other road users.

There are some inconsistencies with these rules:

- Sections 3.2 and 3.5 show that pedestrians crossing a road that is controlled by traffic lights with a button-press device for pedestrians, must not cross if the “red man” is lit up. However, they can cross if neither the “green man” nor “red man” is showing; i.e. if the button has not been pressed.
- Section 3.2 forbids pedestrians from crossing roads when a red light is showing. This may seem rational, but consider, for example, someone walking late at night on empty streets. They are likely not to wait for the lights to turn green to cross a road if they can easily see that there is no traffic, even if they are technically breaking the law.
These inconsistencies are irrelevant in shared spaces; as they are, by definition, simpler and more convenient pedestrian environments. Examination of the rules highlights the two main problems of the separation principle that Sutcliffe (2009) has identified. The first is that it costs too much to provide the necessary infrastructure for pedestrians to cross roads legally, safely and conveniently, and the second is that pedestrians do not always use the infrastructure anyway.

Also worth consideration is Section 6.1 above. This clause shows that road markings delineating parking may not always be necessary, as there are already ways to prosecute people who park inconsiderately.

*Setting Speed Limits Rule 2003*

Section 3.2 of this rule allows road controlling authorities to propose speed limits less than 50 km/h, even if 50 km/h is calculated as the appropriate speed, but only if it is likely to increase safety for all road users. This presents a “chicken and egg” scenario of what comes first if the road in question is not already frequented by cyclists and pedestrians. A lower speed limit will always be safer for these users, but if they do not use the road in question then the safety benefit of a lower speed limit will be minimal. However, cyclists and pedestrians will not use a road if they perceive it to be unsafe because of a high speed limit.

The issue of “place” is not a specific consideration in the objectives of the document that guides the actual calculation of speed limits; *Speed Limits New Zealand* (Schedule 1 of the *Setting Speed Limits Rule 2003*). However the document does use information such as the character of the surrounding land development, road function, detailed roadside development data, crash data, carriageway geometry and pedestrian and cyclist activity to calculate a limit. A general urban speed limit of 50 km/h is recommended. It was noted in Chapter 2 that the probability of death or serious injury for a pedestrian hit by a vehicle at this speed is over 45% (Hamilton-Baillie & Jones, 2005). Limits of 20-40 km/h can be set for local or minor roads, including shared zones, although the general focus of the rule is on the calculation of limits higher than 50 km/h.

*The Pedestrian Planning and Design Guide*

The advantages and disadvantages of separated footpaths are discussed in the *Pedestrian and Planning Design Guide* (NZTA, 2009b). The only disadvantage of separated zones presented is that footpaths encourage high vehicle speeds in shared zones. This is contradictory; if footpaths are provided on a street, then it is not a real shared zone. However, this is an acknowledgement that separated footpaths encourage high speeds, and the ability of shared
zones’ to slow traffic. In urban areas the guide recommends that separate footpaths are always provided.

**Legal and political issues**

It has been reported overseas that local governments have been reluctant to support shared spaces due to a fear of litigation in the event of an accident (Adams, 2005; Ben-Joseph & Southworth, 1997; Sutcliffe, 2009). It remains unclear whether or not this fear exists in New Zealand, however the accident compensation statutes in New Zealand have abolished civil liability actions against councils for damages for personal injury by accident (Hollyman, 2005). If an accident occurred in a shared space, and a case was brought in negligence against a local authority, the plaintiff would need to prove the existence of a duty of care owed to the plaintiff, a breach of that duty, and the resulting harm. It may be difficult to prove the duty of care (Hollyman, 2005), and in the case of shared spaces, if carefully designed, it may also be difficult to prove a breach of the duty.

Another political issue that presents a barrier to successful shared spaces in New Zealand is the current focus of government policy on providing for private car users:

> “The reality is that, given our population density and history of the development of our transport system, private vehicles will continue to be the method by which most people will travel within the foreseeable future, and our investments need to reflect that reality.”

Stephen Joyce, Minister for Transport (2010).

Mr Joyce’s comments ignore the adverse social and environmental factors of private vehicle use, and the risk that increasing oil prices will impact on future demand for private vehicle use. It has been acknowledged by other authors that a change in New Zealand’s traditionally laissez-faire approach to transport planning is needed to encourage a more sustainable mode-split (Harris, 2010) (which would help to ensure the success of shared spaces), although this would seemingly require strong political leadership.

As discussed in Chapter 3, New Zealand’s low levels of public transport ridership are related to the country’s high levels of private automobile usage, which is an impediment to successful shared spaces (Bassett, et al., 2008; Jacobsen, 2003; Ministry of Transport, 2009b). New Zealand cities are among the world’s worst performers when it comes to public transport (Bachels, et al., 2001).
Local authorities

In Chapter 4 the position of New Zealand’s sixteen city councils in regard to shared space was assessed. It was found that, in general, the councils’ development codes were not receptive to shared space designs. Particular issues include:

- Lack of recognition of the place function of road networks
- Restricted choices of paving materials
- Requirements for footpaths
- Requirements for kerb and channel drainage
- Designing for speeding drivers

However, most of the development codes were non-statutory, meaning that if the developer can demonstrate that their design meets district plan performance criteria and rules, a shared space design may be possible.

Anecdotal evidence obtained during discussions with local government staff suggests that many urban designers/transport managers/engineers are open to the idea of shared spaces. However, some of the council representatives talked to believed that because shared space represents such a major change in approach to street design from traditional methods, getting political movement on the issue may be extremely difficult.

Safety

As shared spaces are largely an urban (as opposed to rural) design solution then accident patterns in New Zealand’s urban areas need to be examined. In terms of automobile accidents, urban roads account for a small proportion of deaths but almost half of all serious injuries (Ministry of Transport, 2009c). 92% of pedestrian fatalities and injuries occur in urban areas with 50 km/h speed limits. Pedestrians account for well over one quarter of all urban road deaths (National Pedestrian Project, 2000).

Figure 50 shows that higher-volume roads present more of a risk to pedestrians than lower-volume local roads. It is also worth noting that 57% of pedestrian injuries occur within two kilometres of the pedestrian’s home, and over half of pedestrian accidents occur in residential areas (while one third occur in commercial areas) (National Pedestrian Project, 2000).
There is a “culture of speed” amongst New Zealand drivers (Ministry of Transport, 2009e, p. 25), in that speeding is often viewed as socially acceptable behaviour.

This “culture” is reflected in the number of drivers exceeding the speed limit (Figure 51). New Zealanders speed for various reasons: impatience, thrill-seeking, negative attitudes towards enforcement, and road characteristics that correspond poorly to the posted speed limit (Ministry of Transport, 2009e).
Pedestrians in New Zealand have also been shown to be impatient at times, as shown by a study carried out in Christchurch which showed up to 60% of pedestrians crossing roads at signalled intersections when the “red man” was showing. It is interesting to note that the highest proportions of people crossing on the “red man” were recorded just after peak pedestrian volumes were recorded at around 5-6 pm, possibly indicating that people are rushing to get home (Turner, Rozenburg, & Francis, 2006).

Other unsafe driving practices are common in New Zealand, especially in young male adults. Begg and Langely (1999) have studied young New Zealanders’ driving habits, showing high levels of drunk driving, driving under the influence of marijuana, and speeding for the “thrill” of it.

Shared spaces may help change New Zealand’s “culture of speed” by enforcing speeds naturally through design, rather than through posted speed limits. The Ministry of Transport (2009e) has predicted that a drop in mean urban vehicle speeds of 5km/h could save thirty lives per year; this may be where real opportunities for improved safety lie.

**Potential opposition to shared spaces**

Overseas experiences with shared spaces have indicated there is likely to be opposition from some organisations. Opposition to shared spaces in New Zealand may come from the following groups.

*Blind and vision impaired people*

Guide Dogs for the Blind Association (Guide Dogs) are prominent opponents to shared spaces in the United Kingdom, as discussed in Chapter 2. The Association of Blind Citizens New Zealand have expressed their support for the Manners Mall bus lane in Wellington, and while they supported the plans to redevelop Lower Cuba Street, there is still some concern about allowing vehicles in the space (Wellington City Council, 2009c). The Royal New Zealand Foundation for the Blind has expressed similar sentiments about the Manners Mall and Cuba Street developments, stating that if lower Cuba Street is to be converted into a shared space, then “it must be designed so that it can be traversed safely and effectively by blind and partially sighted pedestrians” (Clunie, 2009).

The Foundation for the Blind has also submitted to the Ministry of Transport during consultation carried out for the *Safer Journeys* documents. The submission highlighted the need for extensive consultation during the development of any shared space proposals to ensure that the spaces are safe and easily navigable for blind or vision impaired people (Royal
New Zealand Foundation of the Blind, 2009). Opposition from these groups has not been as strong in New Zealand as in the United Kingdom. Here, the groups have taken a proactive approach focused on ensuring shared spaces are designed with consideration for vision impaired people.

**Cycling groups**

Getting separated cycling facilities constructed has been the central focus for cyclist lobby groups around the world since the invention of motorised traffic, so the suggestion that separated facilities may not always be the best option is sometimes not welcomed. In a shared-space-for-cyclists case study in Spain, cycling groups opposed the scheme and were reluctant to accept any other design than the tradition separation of cyclists, vehicles and pedestrians (Garcia, 2009).

Similar opposition to shared space from cycling groups is likely to be an issue in New Zealand. Research at the University of Canterbury (Kingham, Koorey, & Taylor, 2009) has suggested that non-regular cyclists especially prefer some level of separation from vehicles, largely due to a fear that drivers will not respect their space. In the redevelopment of Manners Mall and Cuba Street in Wellington, cyclists requested that cycle lanes were considered as part of the proposals (Wellington City Council, 2009b).

The fears cyclists have concerning the removal of separated cycle lanes may be unfounded; with evidence showing that most cycle crashes do not involve automobiles, and those that do occur largely at intersections where effective separation infrastructure is difficult to provide and largely ineffective (Koorey, 2005). What must be understood in these cases is that cyclist lobby groups have been pushing for cycle lanes on dangerous roads that have been designed for cars. To suggest that separation may not be the best option contrasts with what these groups have been campaigning for decades. However, what is being suggested is not to simply remove all cycle lanes, but to design roads where a safe cycling environment can be achieved without separate lanes.

**Business owners**

Although shared spaces can be viewed as a practical compromise between full pedestrianisation and traditional streets, there has still been some opposition to shared spaces around the world from retailers. For example, in Hobart, Tasmania, a proposal for a shared space design in a commercial retail area drew opposition from a local business owner, largely due to the perception that reduced parking and restricted vehicle access would decrease customer numbers (Waterhouse, 2010). In Wellington, retailers have requested that at least
some of the parking on Lower Cuba Street is retained, although they are not concerned that the number of parking spaces is almost halving (Wellington City Council, 2009c). There is anecdotal evidence of opposition to Auckland’s shared spaces from local businesses (See Jon C, 2009), apparently concerning losses of parking spaces.

It is desirable to retain at least some parking in shared space schemes, although high levels of parking will likely decrease pedestrian amenity, which, in turn, may result in reduced customer numbers – a balance needs to be found.

Public

Because the shared space concept can be a rather radical departure from traditional street design, there is likely to be opposition from members of the general public.

In the United Kingdom, research has been undertaken investigating residents’ attitudes to home zone schemes. It has been found that safety concerns regarding shared surfaces are the most common reason why some residents object to shared spaces (Clayden, et al., 2006). However, in the same study it was reported that the majority of residents were pleased with the scheme after it had been carried out. Another study involving home zones similarly showed that after the home zones had been constructed, residents were generally satisfied with the design; especially with the improvements in visual amenity (Buttress, et al., 2006).

Auckland’s Wairepo Swamp Walk at Eden Park drew eleven submissions specifically opposing the proposal, and seven supporting it. Specific concerns included the ability of cars and pedestrians to share the road safely, the possibility of anti-social behaviour in the lane, and the removal of housing to attain land for the space (Rednall & Jacques, 2009).

5.2 Shared space options for New Zealand

First of all, whether or not shared space is an idea worth pursuing and developing for urban New Zealand needs to be established. The benefits of shared spaces were examined in Chapter 3 and the available evidence on these social, environmental, economic, and safety advantages was outlined. In this chapter the applicability of the evidence in New Zealand is assessed. It is the author’s opinion that, based upon the evidence examined, carefully designed shared spaces can provide a range of benefits to New Zealand towns and cities, and that a design approach should be developed. To begin, a set of criteria is needed to define what is to be achieved by shared spaces in New Zealand:
- Improved road safety
- People-oriented public places
- A shift in transport mode-split towards active transport modes (walking and cycling)
- Economic gains
- Balance between the movement and place function of streets
- Enhanced streetscape amenity
- Intuitive road rules
- Reduced anti-social behaviour (boy racing and tagging)

There are a number of restrictions that need to be considered alongside the above criteria:

- Opposition from various groups
- New Zealand’s car-dependency
- The needs of various users
- Limited funding

**Solution**

Three categories of shared spaces that could be successful in New Zealand have been suggested:

1. **Residential shared spaces**: Although similar to Dutch woonerven and British home zones, residential shared spaces will be distinct due to the low density, suburban rather than urban nature of our residential areas. Residential shared spaces could be especially useful in steep terrain, as in Nelson. They will have very little, if any, separation between road users due to the low traffic volumes that are found in most urban areas. The aim is to create a slow speed environment where it is safe for children to play on the space (Figure 52).

2. **Main streets shared space**: These spaces are intended to allow towns and suburbs that are centred along an arterial road to balance the place function of their main street with the movement function. The spaces are likely to have higher traffic volumes than the other two types of spaces proposed; therefore a higher degree of separation of road users may be necessary. The Orewa Boulevard project gives an indication of how shared spaces could look on higher volume roads running through commercial centres. The Orewa Boulevard is a part of State Highway Seventeen, showing that the New Zealand Transport Authority is willing to work with local authorities to create shared
space designs on State Highways within towns. Another example of a main street shared space, this one in the Netherlands, is shown below (Figure 54).

Figure 52: A residential shared space in Addison, Manukau.

Figure 53: Haren, the Netherlands. Main street before shared space (Hamilton-Baillie, 2007).

Figure 54: Haren, the Netherlands. After the creation of a shared space (Hamilton-Baillie, 2007).

3. **Inner city shared spaces**: New Zealand’s inner city areas present many opportunities for shared spaces of various scales similar to overseas examples inspired by Hans
Monderman, such as Blackett Street in Newcastle-upon-Tyne (Hamilton-Baillie, 2008c) and the proposed Exhibition Road in London (Castle & Quimby, 2006), as well as Monderman’s much-referenced Drachten shared spaces (Castle & Quimby, 2006). These streets have minimal separation between road users, because although there are high traffic volumes at times, there are also high pedestrian volumes that enforce slow driving speeds.

Figure 55: Jean Batten Place in Central Auckland; an example of a proposed inner city shared space (Auckland City Council, 2009d, p. 4).

Although none of the above spaces will have full separation of road users like a traditional street, a degree of separation will be needed due to high traffic flows in some of the spaces. Research carried out in London involving “Pedestrian Priority Areas” has shown an upper limit of 90-110 vehicles per hour for road users to safely share the carriageway at a speed of 40 km/h. These findings are deemed applicable to shared spaces. The limit could be increased to up to 200 vehicles per hour if a 30 km/h design speed was used (Castle & Quimby, 2006). At these traffic flows and speeds, pedestrians in shared spaces are likely to walk on the sides of the street; effectively creating a similar situation to a traditional separated street.
This suggests that all shared spaces sit on a continuum where spaces with higher traffic volumes have more separation (regardless of the actual design of the street), and a more significant movement-function, while at the other end of the scale are spaces with low traffic volumes and a stronger place-function. The chart below attempts to portray this situation (Figure 56). An example could be the Orewa Boulevard project. With traffic flows of up to 9000 vehicles per day (NZTA, 2010) on this “main street shared space”, pedestrians will never be able to truly share the space with vehicles, even at 30 km/h. The road has a strong movement function. The shared space influence in the design has been adopted to ensure that the important place function of the street is also represented.

Figure 56: Chart showing three shared spaces and their relationship to function, land use, and the degree of separation of road users needed.

Wherever a shared space is to be provided with safety improvements as an objective; the concept of “accident migration” should be considered. Accident migration is where the redesign of a certain street simply redistributes traffic and accidents to surrounding streets. An area-wide approach can prevent accident migration and help achieve true safety improvements (Elvik, 2001); such an approach should be adopted where possible in New Zealand.

**Common requirements for shared spaces in New Zealand**

There are some common requirements recommended for all shared spaces in New Zealand.
**Shared space design approach**

It is important that a shared space approach to design is adopted wherever a shared space is proposed; an approach based on cooperation and participation. This will help to ensure that any potential opposition to shared space will be minimised. A flow chart suggested by the Shared Space Project (2008) outlines a participatory approach to the development and implementation of a shared space proposal (Figure 57):

How does this approach correspond with the one set out by the Resource Management Act 1991 (and its subsequent amendments)? First of all, resource consents are only needed to carry out an activity which is not permitted under the Act or a plan under the Act, so consent and public participation are not needed for every development. There are six principal steps in the process to gain a resource consent (Coutts, 2005):

1. Pre-application preparation
2. Application
3. Public notification, including submissions and pre-hearing meetings
4. Hearing
5. Decision
6. Appeals

A report of consultation carried out is required for inclusion in the application, implying (but not explicitly requiring) that stakeholders be identified and consulted. Apart from these requirements, any other participatory action with stakeholders is up to the applicant.

All stakeholders need to be consulted in a shared space development. The shared space concept and its advantages and disadvantages need to be clearly explained. In residential

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**Figure 57: Stages of participation procedure (Shared Space, 2008, p. 17).**
shared spaces the views of all residents need to be recorded. Retailers need to be consulted, to ensure their needs are met. Retailers should be made aware of the economic benefits that more pedestrian and cyclist-friendly streetscapes can bring (CABE, 2007).

Websites can be good ways of distributing information and allowing feedback to be received. An example of this is The Royal Borough of Kensington and Chelsea’s Exhibition Road (2010) website (www.rbkc.gov.uk/subsites/exhibitionroad.aspx). Exhibition Road in London is an extremely significant tourist destination; therefore it is important that the proposed shared space is a success. The website clearly explains the design features of the proposal, provides a timetable of events, and allows feedback to be recorded.

Even though there is no legal requirement for a participatory process as put forward by the Shared Space Project (2008), it is recommended that such a process is followed in all shared space developments in New Zealand.

**Provision for blind and vision impaired people**

*RTS 14: Guidelines for facilities for blind and vision-impaired pedestrians* (Land Transport New Zealand, 2007) provides best practice guidelines for the design and installation of pedestrian facilities for blind and vision impaired people. The principles in this document should be adopted whenever a shared space is designed. It is the responsibility of the designer to design for blind and vision impaired people without sacrificing the benefits of shared spaces by defaulting to a traditional separated street design. Blind and vision impaired people need a variety of environmental cues to negotiate a road system, and there is no doubt that shared spaces may be harder for these people to negotiate than traditional roadways (the level surface is a large issue: guide dogs are trained to recognise changes in grade, and the vertical component of a kerb has been shown to be the most reliable cue for blind and vision impaired people to detect roads). However, if shared spaces are carefully designed as slow speed environments that make drivers more aware of their surroundings, then the overall risk to blind and vision impaired people can be reduced.

There are a number of simple techniques that should feature in all shared space in New Zealand. For example; high contrast and changes in paving texture between “safe” and “unsafe” parts of the space. The use of tactile indicators can be used to direct blind and vision impaired people when crossing vehicle paths, and to warn them of hazards. Some degree of consistency in the design tools applied for blind and vision impaired people will be needed. There are “Orientation and Mobility Instructors” at the Royal New Zealand Foundation for the Blind that can advise on best practice.
Rules for shared spaces

The *Land Transport (Road User) Rule 2004* already allows streets to be designated shared zones where pedestrians hold the right of way. The same clause stops pedestrians from unduly impeding vehicular traffic flow. No new traffic laws need to be enacted for shared spaces to function efficiently.

Steep topography

Nelson City Council (2010b) is creating Residential Shared Zones as a solution to the engineering dilemma of providing footpaths on steep land where large earthworks are required to widen roads. Similar spaces could be useful in many New Zealand cities with residential development on steep aspects, for example Dunedin, Wellington, and Napier (see Chapter 4). These shared zones differ from home zones in that they are located on narrow, steep, and sometimes long, roads, rather than short flat streets, although both types of shared space are created with similar objectives.

The cost effectiveness of shared spaces improves when pedestrian infrastructure is needed on steep topography. For example, on gentle grades a shared space may be more expensive to construct than a traditional street. However, on steep terrain; providing footpaths requires expensive earthworks that will reduce the cost effectiveness of traditional street layouts.

Government guidance

*Getting There* (Ministry of Transport, 2005) emphasises that effective local action is necessary to increase walking and cycling in New Zealand and achieve the strategy’s goals, but that support from central government in terms of policy and funding is also required. A similar combination of local and central government support will be needed to create successful shared spaces in our urban areas.

Central government should provide guidance on the design of shared spaces. For example the British government launched a £30 million home zone program to establish the concept, as well as carrying out an earlier pilot study. Like woonerven in the Netherlands, here are no legal requirements for the design of home zones in the United Kingdom; instead there are several good practice guides (Gill, 2006). A similar approach may be possible in New Zealand. Because of the unclear safety effects of shared spaces in New Zealand, it may be in the interest of central government to sponsor a pilot scheme and the corresponding research into accident rates.
Local governments should be more receptive to alternative street designs such as shared spaces. Development codes could be more open to shared space designs if the issues identified in Chapter 4 were addressed. All roading network objectives in the codes should acknowledge the place function of roads. Increasing the choice of paving materials and stormwater drainage options would allow designers more freedom regardless of whether or not they are creating shared spaces. Requirements for footpaths do not need to be relaxed, although exceptions should be made for specially designed shared spaces, as in Hamilton City Council’s development code (2009).

Because there are a large range of shared space designs possible, and because there are advantages that result from the adaptability of the concept, it is recommended that legal requirements for shared space designs in New Zealand are minimised, as with home zones in the United Kingdom. Local governments need a way of controlling development without restricting innovation in design, as they have in the past with prescriptive development standards (Birchfield & Howell, 2009). Some authorities have been adopting less prescriptive models which involve a set of statutory performance criteria (contained in the district plan) against which proposals are assessed, and then a number of non-statutory design guidelines (in the development code) by which to satisfy these criteria (for example, see Manukau City Council, 2002; Manukau City Council, 2007).

Local authorities’ cycling and walking strategies should shift focus away from separating vehicles from cyclists and pedestrians to creating streets where all road users can coexist safely. By promoting cycling and walking through these strategies and their traffic demand management initiatives, these forms of transport may become more popular; making shared spaces more likely to succeed.

Although the matter of shared space is one for local government, a lack of leadership and support for urban sustainability initiatives from central government has been identified as an issue in the past (Parliamentary Commissioner for the Environment, 1998). Firstly, the Resource Management Act 1991 should explicitly recognise urban issues in the “matters of national importance”. In such an urbanised country, it is extremely important that the principal planning legislation acknowledges the importance of sustainable cities and towns. Shared spaces could be encouraged by providing guidance on their design and/or philosophy in central government documents such as the Pedestrian Planning and Design Guide (NZTA, 2009b), People, Places, Spaces (Ministry for the Environment, 2002), and NZS 4404:2010: Land Development and Subdivision Infrastructure (Standards New Zealand, 2010).
**Speed limits**

A 30 km/h speed limit is recommended for shared spaces for safety reasons and to ensure that road space is truly able to be shared (Hamilton-Baillie & Jones, 2005). 30 km/h limits are recommended in New Zealand for residential and inner city shared spaces, however it is acknowledged that higher speeds may be necessary on main street shared spaces. The posted speed limit should be equal to, or more than, the design speed of the street. The *Setting Speed Limits Rule 2003* should be modified to provide more focus on speeds below 50 km/h. The benefits of slow speed zones are well-known, and it is important that the document that governs speed limits in New Zealand reflects this by offering guidance for speed limits less than 50 km/h.

**Physical design**

It needs to be stressed that some of the advantages of shared spaces result from their unpredictability (Engwicht, 2005), and so all of the following rules are provided simply as a guide.

**Parking**

Parking spaces should be provided in all shared spaces to ensure a certain level of activity, and because they have the ability to slow traffic by providing visual obstructions and narrowing the carriageway (York, Bradbury, & TRL Limited, 2006). Buchanan (1963) has stated that on-street parking is an essential requirement of all residential areas and Southworth and Ben-Joseph (1997) have recommended that parking is provided in residential shared spaces. They state that numerous parking arrangements are possible and that spaces should be demarcated with physical elements rather than road markings. The New Zealand Transport Authority (2009b) also advises that parking is designated in shared zones. Parking spaces should be limited, however, so as not to dominate the people-oriented spaces. Providing parking spaces also helps to ensure support for a shared space from retailers and other business owners.

**Chicanes**

Chicanes are used in traffic calming to slow traffic by altering the vehicle lane alignment from side to side. Vehicles have to slow down to physically manoeuvre the change in alignment, however chicanes also reduce sight distances, which further slows traffic (York, et al., 2006). They can be created with street furniture such as planters and, more commonly, parking spaces (Craus, Polus, Livneh, Gutman, & Ruhm, 1993). Southworth and Ben-Joseph (1997) recommend chicanes are placed every 40 metres in residential shared spaces, while Craus et.
al. (1993) recommend a distance between 30 – 44 metres. Alcock and Bentley state that chicanes should be placed every 50 – 60 metres.

However, chicanes are traditional traffic calming devices that are not strictly necessary to successfully slow drivers (Kennedy, 2005), and they are discouraged by Hans Monderman (Hamilton-Baillie, 2008b). It is recommended here that chicanes are used regularly in residential shared spaces, occasionally in inner city shared spaces, and almost never in main street shared spaces. Chicanes in residential shared spaces should be every 30 – 40 metres as recommended by the authors above. If used in inner city shared spaces; a spacing of between 40 – 60 metres is recommended. The higher pedestrian volumes in inner city shared spaces will help to reduce vehicle speeds, negating the need for such closely spaced chicanes.

**Vehicle lane width**

Narrow vehicle lanes are used in shared spaces to slow traffic (Kennedy, 2005). Lane widths intended for some of New Zealand’s one-way shared spaces range from 2.7 metres for Nelson’s Shared Zones (Nelson City Council, 2010c) to 3.5 metres for Auckland’s Federal Street (SKYCITY, 2009). For two-way streets they range from 5 metres for Ambrico Place in Waitakere (Waitakere City Council, 2009) to 6.5 metres for Manners Mall’s bus lanes in Wellington (Wellington City Council, 2009c). These widths are consistent with overseas examples (Buttress, et al., 2006; Castle & Quimby, 2006; Gilman & Gilman, 2007; Hamilton-Baillie, 2008b; Kennedy, 2005; Lutz, 2008). Craus (1993) has recommended a width of the vehicle travelling area in a residential shared space as 3.25 – 3.75 metres, or 3 metres in very short streets, and 4 metres in long streets, combined with wider areas at chicanes to allow two vehicles to pass each other. Southworth and Ben-Joseph (1997) recommend narrow sections of roadway (3.3 metres) even on two-way streets. The recommended lane widths for New Zealand shared spaces are influenced from all of the above examples (Table 5).

It may be asked why the lane width has been stated, when shared spaces theoretically have no separation between pedestrian and vehicle areas. While this is true, some shared spaces will have a “movement lane” defined in one of several ways. For example, the lane may be defined with different coloured pavers or street furniture. The reason the lane widths have been recommended above is so that if a vehicle movement lane is defined, the lane is not so wide as to encourage vehicle high speeds.

**Entrance features and signage**

At the entrance to a shared space, it has been recommended by many authors that an entrance feature should be built as a type of psychological reminder to people that they are entering a
special place with different rules than they are used to, ensuring they adopt an appropriate driving behaviour (Buttress, et al., 2006; Gilman & Gilman, 2007; Hamilton-Baillie, 2004; Kennedy, 2005; Reid, 2009). Entrance treatments are seen as an important feature of home zones (Figure 58):

![Figure 58: Entrance treatment in a British home zone (Buttress, et al., 2006, p. 27).](image)

It is recommended that entrance treatments or gateways are designed into all types of New Zealand shared spaces. Nelson’s Residential Shared Zones will all feature an entry treatment consisting of a uniquely paved speed table, planted build-outs to narrow the road, and a sign indicating the shared zone (Nelson City Council, 2010c). A sign should be designed for use at all entrances to shared spaces. It should be a standard design to provide some consistency so road users know what a shared space is and how to use it. In keeping with the shared space philosophy; the signs should be simple to understand and unobtrusive.
Figure 59: An example of signs used at home zone entrances (Buttress, et al., 2006, p. 71).

Figure 60: Possible signage for Nelson’s residential shared zones (Nelson City Council, 2010d).

Figure 59 and Figure 60 give examples of possible signage schemes for shared spaces.

**Australian shared space**

A useful comparison can be made between the status of shared spaces in New Zealand and Australia, given the countries’ similarities in development history and urban form (Preval, et al., 2010). Shared space is slowly becoming popular in Australia, with examples appearing in cities such as Bendigo and Ballarat (Sutcliffe, 2009).

In the state of Victoria, the State Government’s roading department, VicRoads, have published guidelines for shared zones in their *Traffic Engineering Manual* (2008). The guidelines recommend that shared zones are only created in low traffic volume streets where
pedestrians outnumber vehicles. They are proposed for a number of land uses, however, with speed limits of 10 km/h or 20 km/h. Similar to what has been proposed in this chapter, the VicRoads manual recommends the removal of kerbs, a minimum 2.8 metre wide carriageway, chicanes located approximately 40 metres apart, clear entrance and exit signage, provision of parking spaces and a contrasting paving surface between the shared space and surrounding streets.

The scope of the shared spaces possible under the VicRoads guidelines is somewhat limited. This is due to the fact that the spaces are only advised for streets with low traffic volumes, and also due to recommendations that there is no cross traffic in the zones, and that they are not used on streets with a history of traffic problems. The shared spaces/zones proposed by VicRoads are less radical than some European shared spaces, although they are of a larger scale than anything in any New Zealand guidelines. Guidelines similar to those provided in the VicRoads document could be a good intermediate step between the almost total lack of guidance with respect to shared spaces currently in New Zealand, and the recommendations of this chapter.

**Alternative solutions**

There are two alternatives to shared space streets; traditionally segregated streets and pedestrianised streets. The benefits of shared space streets over traditional streets were explored in the second chapter. Fully pedestrianised streets appear, at least on the surface, to have all the benefits of shared spaces without the dangers that motor vehicles bring to the situation.

Shared spaces are recommended over pedestrian streets because they overcome some of the disadvantages of pedestrianised areas such as those set out in the *Pedestrian Planning and Design Guide* (NZTA, 2009b).

- Inconvenient to vehicular traffic
- Difficult to convince retailers of their benefits
- Problematic for public transport
- Can become deserted in the evenings and weekends

The United Kingdom’s Department for Transport (Reid, 2009) also acknowledges the practical benefits of shared spaces over pedestrian areas. For these reasons, shared spaces are considered a better solution than traditional streets and pedestrianised streets, although
pedestrianisation may still be an appropriate option in important areas of high pedestrian traffic.

5.3 Conclusion

Any shared spaces in New Zealand should adhere fully to shared space philosophy of creating a space that can be truly shared by everyone: pedestrians, vehicles, cyclists, children, the elderly, the visually impaired and blind, and other disabled people. As more research is carried out into shared space in New Zealand, the safest and most successful approaches to their design will be identified. Because there is a lack of information on the safety of shared spaces in New Zealand a precautionary approach should be taken until more research is conducted.

It is unclear if shared spaces would make New Zealand’s streets safer, as here is a lack of evidence verifying the theoretical benefits of shared spaces. The most promising method by which shared spaces could improve safety is by reducing vehicle speeds, especially in residential areas.

The following table was compiled with the above information as a quick guide:

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<th>Residential shared space</th>
<th>Inner city shared space</th>
<th>Main street shared space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design speed</strong></td>
<td>20 km/h</td>
<td>20 km/h</td>
<td>20-50 km/h</td>
</tr>
<tr>
<td><strong>1 or 2 way</strong></td>
<td>Either</td>
<td>Either</td>
<td>2 way</td>
</tr>
<tr>
<td><strong>Lane width (1-way/2-way)</strong></td>
<td>2.7m / 5.5m</td>
<td>3.0m / 6.5m</td>
<td>6-7m</td>
</tr>
<tr>
<td><strong>Chicanes</strong></td>
<td>30-45m</td>
<td>40-60m</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Traffic volumes</strong></td>
<td>Low-medium</td>
<td>Low-medium</td>
<td>Medium-high</td>
</tr>
<tr>
<td><strong>Land use</strong></td>
<td>Residential</td>
<td>Commercial/mixed</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

Table 5: Design guidelines for New Zealand shared spaces.

The table is rather prescriptive, and as mentioned above, should only be used as a guide. A set of flexible and non-prescriptive performance criteria, accompanied by some more specific guidelines such as the above table, is the best way to control the design of shared spaces without restricting innovation.

Well-designed shared spaces could enable New Zealand cities to reduce automobile dependence and reassert a sense of place in streets. In inner city areas, the wide streets and grid layouts that are common offer some interesting opportunities for a wide range of shared
spaces that have the potential to be very successful. Other opportunities can be found in residential areas, where high vehicle speeds have decreased amenity and made streets dangerous for children to play on. In the centres of many New Zealand towns, where arterial roads with high volumes of through-traffic make what are important public spaces unsafe and unpleasant, shared spaces could adjust the balance between the movement functions and place functions of these arterials. This way, the centres of these towns can become the people-oriented spaces that they should be instead of the traffic-oriented ones that they are. The design approach articulated above will now be applied to streets in Dunedin and Oamaru in Chapter 6’s case study.
Chapter 6: Case studies

The case studies in this chapter show what shared spaces in New Zealand, as proposed in the last chapter, could look like. A variety of case studies have been carried out to demonstrate the range of designs proposed, from residential shared spaces with relatively low traffic volumes to main street shared spaces on State Highway One.

<table>
<thead>
<tr>
<th>Case study area</th>
<th>Type of space proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Castle Street, North Dunedin</td>
<td>Residential shared space</td>
</tr>
<tr>
<td>Cosy Dell, North Dunedin</td>
<td>Residential shared space on steep terrain</td>
</tr>
<tr>
<td>State Highway One/Thames Street, Oamaru</td>
<td>Main street shared space</td>
</tr>
<tr>
<td>George Street, Dunedin</td>
<td>Inner city shared space</td>
</tr>
<tr>
<td>The Exchange, Dunedin</td>
<td>Inner city shared space to reassert place status</td>
</tr>
</tbody>
</table>

Table 6: List of case studies.

Each case study includes an explanation of why it was chosen, and a brief background on the surrounding area. Objectives are described to show what is to be achieved, and then the shared space solution is defined.

<table>
<thead>
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</tbody>
</table>

Table 7: Design guidelines for New Zealand shared spaces.

The case studies contained in this chapter include proposals that may be considered radical or unfeasible in New Zealand at this time. Without further research it is difficult to say confidently whether these shared spaces would function safely and conveniently or not, although the cases with lower traffic volumes (for example the residential shared spaces) obviously carry a lower risk. The proposals are intended to provoke discussion not just about shared spaces, but of the conflicting functions our urban streets provide with regard to movement and place.
6.1 Residential shared spaces

Castle Street

Castle Street was chosen as an example for a residential shared space because of its width of 20.12 metres, which is a typical width of residential streets in New Zealand (as explained in Chapter 3), and because the street was identified as having poor quality street design in the *Campus Master Plan* (University of Otago & DEGW Consultants, 2010). The street is an iconic student-flatting street and has been the site of alcohol-fuelled anti-social behaviour in the past five years. No traffic counts were found for the street, although it is expected that traffic volumes are relatively low given the street’s proximity to the arterial one-way system. The street has relatively high pedestrian traffic due to the pedestrian links at each end of the street: the University of Otago and the Botanic Gardens (which connects to the Northeast Valley).

![Figure 61: Location of Castle Street North in North Dunedin.](image)

**Objectives:**

- Create a safer pedestrian environment
- Improve amenity on the street
- To counter anti-social behaviour in the area
Solution:

Crime Prevention Through Environmental Design (CPTED) principles can be incorporated into shared space designs, as in Auckland’s Wairepo Swamp Walk (Rednall & Jacques, 2009) and in Nelson’s Residential Shared Zones (Nelson City Council, 2010c). There is some “soft” evidence that home zones in the United Kingdom can reduce crime (Gill, 2006). There are seven qualities that characterise well-designed and safe urban places (Ministry of Justice, 2005). They are listed below with an explanation of how each particular quality could be applied to a Castle Street shared space.

1. Access: Safe movement is especially important after dark. Lighting bollards will be used as well as existing street lamps to provide extra lighting, and to delineate parking areas.
2. Surveillance and sightlines: Visibility needs to be maintained on the street. Trees will be planted with this in mind.
3. Clear and logical layout: Legibility is important, especially with signage and landscaping. Entrances and exits will be clearly signposted.
4. A mix of activities: Informal surveillance should be fostered from legitimate public space use.
5. Sense of ownership: This is especially important on Castle Street, where most residents are renting students. Public and private places should be clearly delineated.
6. Quality environment: Vandal resistant materials should be used where possible. A general improvement in design could reduce anti-social behaviour.
7. Physical protection: Not considered necessary in this case.

The overall aim is to try and create a people-oriented environment in the hope that student events on the street will take a more positive form. A plan view of the proposed space is shown (Figure 62).
90° parking spaces every 40 metres will be used to create a chicane type effect, however due to the need to maintain strong sightlines from one end of the street to the other, the actual physical deviation in the movement lane’s centreline is minimal. A large tree is centred in the vehicle lane at each chicane to help enforce slow speeds. The paving scheme consists of four colours of pavers that make a series of radial patterns around the tree at each chicane. The paving helps to define the movement lane and the parking areas.
Figure 63: Existing formation of Castle Street looking north toward intersection with Howe Street.

Figure 64: Proposed shared space on Castle Street looking north toward intersection with Howe Street.
Smaller trees and lighting bollards can be used to define both the parking areas and the movement lane. Grassed areas and planter boxes are placed throughout the space. All of this street furniture is placed with allowance for a clear path beside the property boundaries either side of the street, for blind and vision impaired people. This strip could be delineated using the tactile strip “central delineator” tested by the United Kingdom’s Department for Transport with positive results (Thomas, 2008a).

**Steep street – Cosy Dell Road**

A street on steep terrain was chosen as a case study to demonstrate that shared spaces can be used where there is insufficient room (without major earthworks) to provide adequate separated pedestrian facilities. The street that has been chosen is a section of Cosy Dell Road in North Dunedin (Figure 65). The street has a low traffic volume of 200-300 vehicles per day (Dunedin City Council, 2010a). There are student flats on the downhill side of the street (to the east), and the other side is a steep bank up to the town belt reserve.

![Figure 65: Location of Cosy Dell Road section in North Dunedin (in red).](image)

The approximate cross section of the existing street is as follows: a one metre footpath, a five metre carriageway, and a one metre swale (Figure 66). The one metre footpath is inadequate...
as it is blocked in some places by power poles and vegetation. This situation demonstrates a flaw of separated streets. Pedestrians that cannot (or choose not) to use the footpath have to illegally venture out onto the vehicle carriageway where drivers do not expect them to be walking. A well-designed shared space will make drivers aware that they are sharing the space and that they need to drive appropriately. It is unlikely that traffic is currently a major problem on the street because of the low volumes; however this does not mean that the area could not be improved for pedestrians by the creation of a shared space.

**Objective:**

- Create a safer and more convenient pedestrian environment without carrying out major engineering works to widen the carriageway.

**Solution:**

To solve the problem caused by the steep aspect, which prohibits the construction of a traditional streetscape, a residential shared space similar to those proposed by Nelson City Council (2010d) is suggested (Figure 67). The street will be two-way, although the carriageway will vary in width (from 2.7 metres to 5.5 metres) so that two cars can pass each other only in certain places. Landscaped vegetation areas shape the irregular carriageway. The vegetation is used to create a chicane effect of moving the carriageway from side to side. A spacing of around 40 metres is recommended between chicanes. Dish channels are located on the edges of the surface to provide stormwater drainage, however the vegetation areas could allow more innovative stormwater drainage/treatment systems.

The street should be designated a shared zone under the *Land Transport (Road User) Rule 2004* so that pedestrians are given right of way, and a 30 km/h speed limit should be established. At each end of the street, an entrance feature is needed to remind drivers that they are entering a different type of driving environment. The design of the space itself should convey this information on its own; however for legal reasons a “shared zone 30 km/h” sign will need to be included at each entrance (see Figure 86 below).

A one metre strip of “safe zone” could be provided down one side of the paved surface for blind and vision impaired people, using similar tactile strips as were proposed for Castle Street in the first case study.

An example of how the proposed shared space may appear is shown (Figure 67).
Figure 66: Existing Cosy Dell streetscape.

Figure 67: Proposed Cosy Dell shared space.
The residential shared space is similar to a British home zone, however the lower density of development and the steep terrain make the New Zealand residential shared space unique. The above model removes some parking spaces, however all dwellings on the street have off-street parking, and informal parking spaces could be easily created in the vegetated areas. A similar model of shared space may be possible in other parts of New Zealand where severe topography makes the provision of separated infrastructure for pedestrians difficult.

6.2 Main street shared space

One main street shared space case study has been undertaken on the main street of the North Otago town of Oamaru.

Oamaru’s State Highway One

Figure 68: State Highway One (yellow) through Oamaru with area of interest in red.
Oamaru is a small town of about 13,000 people (Statistics New Zealand, 2009), with many more people living in the region. The town has a linear form, with State Highway One (Thames Street) forming a spine that runs parallel to the coast (Figure 68).

The highway passes through the middle of the town’s central business district, veering inland near a large Boer War memorial statue. It is this part of the highway that is the focus of this case study. Specifically, the block of Thames Street between Eden Street and Coquet Street, including the Thames Street/Severn Street/Coquet Street intersection, will be redesigned into a main street shared space. The traffic volume five blocks north of this block on the highway has been measured at about 8000-9000 vehicles per day; this gives a good estimation of the traffic on the Eden Street/Coquet Street block.

The stretch of State Highway One through Oamaru’s central business district has recently undergone a significant redevelopment, replacing one set of traffic lights, which controlled a pedestrian crossing point, with four sets of lights controlling all types of traffic at four intersections. The Boer War memorial was moved further south along Thames Street to allow the redevelopment. Pedestrians, while previously restricted by the almost complete lack of crossing points, now have more options of where they cross the road. They are, however, still confined to specific paths controlled by traffic signals (Figure 69).

Figure 68: Crossing point at Eden Street/Thames Street intersection. Figure 69: Crossing point at Eden Street/Thames Street intersection. Figure 70: Bollards restricting pedestrian movement at Coquet Street/Thames Street intersection.
The new traffic signals have necessitated large amounts of asphalt pavement and road markings which detract from the general amenity of the area. A small amount of coloured paving and a raised speed table is located at the eastern intersection of Coquet Street and Thames Street to highlight the departure from State Highway One (visible in Figure 70), and the only landscaping in the area is low (to ensure sight distances are maintained) vegetation on the traffic islands. In short, the redesign of the area is largely focussed on traffic control, and while this has improved pedestrian movement around the intersection, the amenity of the area is still low for so prominent a location.

Figure 71 shows the current layout of the area of interest; with State Highway One depicted in light grey. Thames Street has two lanes in each direction with a traffic island in between. Severn Street has two lanes heading southwest and one lane heading northeast. Extra lanes provide turning bays on some approaches to intersections. Other streets have only two lanes; one in each direction.

The area is significant for a number of reasons. Firstly, it is the central business and retail district of Oamaru, and it is approximately the geographic centre of the town. The Boer War memorial statue and the recently redeveloped Opera House are also in very close proximity; slightly south of the Severn Street/Thames Street intersection.

Figure 71: Current layout of the Thames Street/Coquet Street/Severn Street intersection, with footpaths and traffic islands in yellow, and State Highway One in light grey.
The recently introduced traffic signals at the Eden Street/Thames Street intersection replaced a large roundabout. The roundabout did not work well for two reasons; firstly the traffic volume is much higher on Thames Street than Eden Street (roundabouts work best when traffic on all legs is approximately equal), and secondly because there were no pedestrian crossings at the intersections. The traffic lights have improved these issues, although in doing so, the amenity of the area around the intersection has been completely disregarded; i.e. function has taken priority over form.

**Objectives:**

- Improve amenity of the area, creating character and identity for Oamaru’s town centre
- Retain the ability of State Highway One to process high volumes of traffic
- Improve pedestrian movement

**Solution:**

The Orewa Boulevard project discussed in Chapter 4 serves as a model for an Oamaru main street shared space. Both streets are State Highways and have similar traffic volumes. The Orewa Boulevard redevelopment has retained a relatively high degree of separation for a shared space; although the focus is on balancing the traffic and place functions of the street, rather than forcing road users to share a surface. A similar approach is proposed on Thames Street in Oamaru.

The main difference between the part of State Highway One in Oamaru studied here and State Highway Seventeen in Orewa is the complexity of the intersections along the highways. Oamaru has several crossroad intersections and one five-way intersection, while Orewa has a several more simple “T” intersections. It is difficult to say what type of treatment would be most appropriate at Oamaru’s intersections without carrying out research as to what designs maximise amenity values, safety, and traffic flows, while maintaining accessibility for all users. In Drachten, the Netherlands, a signal-controlled intersection of 22,000 vehicles per day was converted into a roundabout intersection. Careful design ensured the new roundabout conveyed pedestrian and cyclist priority, and the intersection has so far been very successful (Sutcliffe, 2009). The Drachten intersection treatment can be seen as an opposite to the recent redevelopment of the Oamaru intersection. The Oamaru intersection is highly controlled, separated and lacking in aesthetics, while the Drachten roundabout does without traffic signals and demonstrates that a busy intersection can be attractive.
Imitating the Drachten example, the main street shared space design proposes a roundabout at the Severn Street/Thames Street intersection. A give-way intersection is anticipated at the Eden Street crossroads (with priority given to State Highway One). A roundabout on Severn Street has been created by moving the Boer War Memorial and placing it in the centre of the intersection (Figure 73).

Relocating the monument not only creates a large visible obstacle for drivers, forcing low speeds, but it also highlights the importance of the location in the centre of Oamaru. As on Orewa Boulevard, a 50 km/h speed limit is proposed, although design should encourage lower speeds, especially through the intersections. A plan view is shown in Figure 74.

Pedestrians sometimes find roundabouts difficult to navigate, however the slow speeds proposed should assist them here. Informal crossing points (similar in design to Orewa’s) will be situated on all legs of the roundabout and the Eden Street intersection. Informal crossings can be problematic because vehicles do not legally have to give way to pedestrians, and therefore sometimes do not give way. In Orewa, a sign had been erected stating “Pedestrians give way to vehicles. Alternative zebra crossing”. To overcome this problem the street could be declared a “shared zone” under the Land Transport (Road User) Rule 2004, giving pedestrians right of way. Due to the relatively heavy traffic flows on Thames Street, pedestrians would be largely separated from the traffic anyway (Castle & Quimby, 2006), although the designation would allow pedestrians to cross the road.

This proposal has problems for blind and vision impaired people. Because the existing footpath system has been largely maintained, the issue lies at intersections when these people try to cross the roads. The use of contrasting pavements and tactile delineators will be sufficient to allow blind and vision impaired people to locate the crossings, but there is still a problem due to the uncontrolled nature of the crossings. People with good vision can cross at uncontrolled crossings where they have right of way easily, because they can assess if the traffic is going to stop for them using visual cues. Blind and vision impaired people, however, lack the ability to tell if a car is going to stop for them or not, so informal crossings can be difficult for them to navigate. Ears/hearing can be used to judge the speed of a vehicle; so one possible solution proposed is a paving surface that would assist vision impaired people to aurally judge the safety of uncontrolled crossings. This is simply a suggestion; more research needs to be carried out as to the best methods of providing for blind and vision impaired people in shared spaces.
Figure 72: Existing intersection of Thames Street, Coquet Street, and Severn Street, looking north from Severn Street.

Figure 73: Proposed shared space roundabout at the intersection of Thames Street, Coquet Street, and Severn Street, looking north from Severn Street.
Entrance treatment is extremely important to let drivers know that they are entering a different type of driving environment (see Figure 88 below for an example of possible entrance treatment). Other features of the proposed shared space in Oamaru include (these features are shown in Figure 76):

- A reduction in the number of north-south lanes from two in each direction plus turning lanes, to one lane in each direction plus turning lanes.
- Two lanes of parallel parking have been retained.
- The reduction in travelling lanes has allowed the width of the footpaths on either side of the road to be increased. The extra width could cater for outdoor seating and other street furniture.
- The vehicle movement lane on the Severn Street approach to the intersection is 6.5 metres wide, and two lanes on Thames Street are 3 metres wide.
- Trees in the central traffic island create a boulevard-like appearance with a central pedestrian path.
- Kerb and channel will be removed to create a level surface with bollards and coloured pavers delineating movement lanes and pedestrian areas.
Figure 75: Existing Thames Street/State Highway One looking south from Eden Street intersection.

Figure 76: Proposed Thames Street/State Highway One at Eden Street intersection.

While the Orewa Boulevard project covers around two kilometres of State Highway Seventeen, this case study has only focussed on one block of State Highway One through
Oamaru. However, a main street shared space could be appropriate for the full extent of the highway in Oamaru’s urban area, as shown in yellow on Figure 68. For ten blocks north of the Severn Street intersection the highway has two lanes in each direction due to the width of the street (40.23 metres). This is excessive for the traffic volumes on the street. By reducing the street to one lane in each direction, at least in places, a boulevard-like street could be created with shared space principles, much like the Orewa proposal.

6.3 Inner city shared space

George Street and the Octagon

George Street is Dunedin’s main commercial and retail street. Running from the confluence of the North East Valley and the Leith Valley to the centre of the city at the Octagon, George Street is the spine of the central city.

Figure 77: Location of George Street (in red) in North and central Dunedin.

George Street was an obvious extension of Princes Street, which was one of Dunedin’s first streets. Early development was slower on George Street than on Princes Street due to a large hill (Bell Hill) which blocked access from Princes Street to the Octagon. Connections between the two areas were improved in the late 1850s and early 1860s, first with a cutting
through Bell Hill and then the complete demolition of the hill. The improved links facilitated the development of the northern parts of Dunedin, and George Street soon became an important thoroughfare (McDonald, 1965).

The five blocks of George Street from Albany Street to the Octagon are now the retail, dining and entertainment centre of the city, anchored by the Octagon at one end and Knox Church at the other. It is these five blocks that are the focus of this case study. Retail destinations Wall Street and the Meridian Mall are situated on the central block between Hanover Street and St Andrew Street, while the Octagon hosts numerous bars, restaurants and theatres as well as the Municipal Chambers, St Paul’s Cathedral and the Town Hall. All of these attractions convey the message that this section of George Street is a “people place”.

Figure 78: George Street in Dunedin’s central business district. The blocks between the Octagon and Albany Street are highlighted in red.

The street has a traditional separated layout, although the importance of the area has justified a higher design quality when compared to the rest of the city, for example footpaths surfaced with stone pavers instead of asphalt. Traffic calming features are also found on the street in the form of kerb extensions and informal pedestrian crossings (which are occasionally the source of some confusion for pedestrians and vehicles). There is a 30 km/h speed limit in the
five blocks discussed. Traffic flows on the block of George Street between Hanover Street and St Andrew Street were recorded in 2008 as 10,100 vehicles per day (Dunedin City Council, 2010a).

Pedestrianisation of George Street and the Octagon is an issue that arises occasionally, gaining support from some stakeholders and opposition from others (for example see Schofield, 2010). Opposition has come from the Police, stating that they would like to be able to patrol the area by vehicle, and some businesses are worried about the effects of full pedestrianisation and any loss of parking or access. Could shared spaces be an “in-between” solution that meets the needs of all stakeholders?

**Objectives:**

- Increase the place function of the street over the movement function
- Create pedestrian priority
- Reduce adverse effects of vehicles in the area
- Maintain or increase the vitality of the area

**Solution:**

A true shared space with no distinction between vehicle and pedestrian areas is proposed for George Street and the Octagon. A level shared surface with coloured pavers would create an area that forces a slow, careful and courteous driving style. The street should be designated a “shared zone” under the Land Transport (Road User) Rule 2004 so that pedestrians have right of way. Some street furniture could be removed, for example pedestrian barriers and bollards, and room created for outdoor cafe dining.

To provide a safe space for blind and vision impaired pedestrians, tactile delineators (Thomas, 2008a) could be used to demarcate safe zones on either side of George Street. These delineators would set out zones in roughly the same areas as the footpaths that exist currently, where blind and vision impaired people can walk without the fear of unintentionally walking into the path of a vehicle.

An example of how the proposed shared space may appear is shown (Figure 80).

Entrance treatments would be necessary at all entries to the street to ensure that drivers know that they are entering a shared space. Chicanes could be created in a number of ways, for example with trees that shift the available vehicle carriageway from side to side every 50 – 60
metres. The amount of carriageway available for vehicle movement should be 6 metres for the two-way traffic proposed.

Figure 79: George Street's existing formation on the Hanover Street/Frederick Street block.

Figure 80: George Street's proposed formation on the Hanover Street/Frederick Street block.
As discussed in the Oamaru case study above, it is difficult to say what type of treatment is most appropriate at shared space intersections. A true shared space would incorporate naked intersections, although it remains to be seen if this is an appropriate option for New Zealand’s streets. If future research shows them to be safe, the naked intersection approach would be recommended because of the lack of ugly traffic control devices.

The Octagon could also be converted into a shared space at a relatively low cost due to the high design quality of the area, the level surface in some parts of the space, and the pedestrian oriented status of the area, all of which already exist in the area (Figure 81).

![Image of the Octagon](image.png)

**Figure 81**: The Octagon already incorporates some features of a shared space, such as a high design quality and a level surface.

The area could be turned into a shared space with some simple modifications such as the removal of bollards and road markings, the introduction of pedestrian right of way, and by making the movement lane less defined. This would provide a level of uncertainty for drivers, forcing slow speeds and a more courteous driving style.

By creating a shared space along George Street and in the Octagon, the disadvantages of complete pedestrianisation, such as their tendency to become lifeless at night time (Reid, 2009) and their lack of popularity with retailers (NZTA, 2009b), can be overcome. The
advantages of a pedestrianised space are still maintained, however, in that pedestrian amenity and accessibility are increased significantly.

The Exchange

Shared spaces have been called “a deliberate effort to reassert the place status of streets” (Reid, 2009, p. 7). The “Exchange” area in central Dunedin has significant place status. Now the financial centre of the city, the area (within a few hundred metres of the initial landing point of European colonisers) was the location of barracks which housed the city’s first settlers in 1848 (McDonald, 1965). Early development centred on the area and the first permanent building on the site was a building which housed a fire station and council meeting rooms. The Stock Exchange building was constructed in 1867. This impressive building, now demolished, was at different times; a museum, bank, stock exchange, and public office. The open space section of the existing area was designated a reserve in 1863 and the Cargill Monument (Figure 84) was shifted to the reserve from its initial position in the Octagon. The intersection was first controlled with traffic signals in 1955 (McDonald, 1965).

![Figure 82](image.png)

Figure 82: Location of the Exchange (in red) in central Dunedin.

The intersection is now dominated by traffic and traffic engineering devices, making the area noisy and ugly. At the intersection, Princes Street has five traffic lanes heading south and three heading north. Rattray Street has four lanes; two in each direction. Pedestrians are confined to signalled crossing points that do not correspond to desire lines, especially along the diagonal High Street – Queen’s Gardens alignment. Traffic volumes on Princes Street just
south of the Exchange are about 11,000 vehicles per day, and on Rattray Street to the west they are about 8,000 vehicles per day (Dunedin City Council, 2010a).

![Diagram showing current layout of the Exchange](image)

**Figure 83:** Diagram showing current layout of the Exchange, with the area of interest shown by the red box. Pedestrian areas and traffic islands are shown in yellow. * marks Cargill's Monument.

A redesign of the Exchange with a shared space approach could help reassert a sense of place that the site demands; creating a space that could be a focal point for tourists, a location for office workers in the area to take breaks, and a more appropriate setting for the various cultural and historical attractions nearby.

In the past, before the advent of shared space, the Exchange functioned much like a modern shared space, with pedestrians and horses and carts sharing the space in a seemingly chaotic fashion (Figure 84).

**Objectives:**

- Achieve an increased sense of place
- Improve pedestrian access
- Increase general amenity of the area
**Solution:**

Reducing the dominance of traffic in the area is the primary means by which all of these objectives can be achieved. The best way to do this is to slow traffic to 30 km/h. Because of the large volume of traffic at the intersection, road users will probably not share the space apart from in times of low traffic flows. As seen in Chapter 5, at 30 km/h pedestrians are likely to share the carriageway with vehicles at traffic volumes below 200 vehicles per hour (Castle & Quimby, 2006).

![Figure 84: The Exchange in 1885 looking south-west towards the intersection of High Street and Princes Street (McDonald, 1965 [from the Picturesque Atlas of Australasia]).](image)

It is proposed that the traffic signals on both Rattray Street and Princes Street are removed. With traffic volumes combined on the two roads totalling about 19,000 per day, the only comparable shared spaces identified are Hans Monderman’s designs in Drachten in the Netherlands; none of which have traffic signals. The Laweiplein intersection in Drachten, has a total of 22,000 vehicles per day (Hamilton-Baillie, 2008b), while the Kaden-Torenstraat intersection has a total of 17,000 vehicles per day, plus 2000 cyclists (Castle & Quimby, 2006). Both of these intersections function well with minimal traffic control, although the Laweiplein intersection does have a roundabout. The removal of traffic lights has improved
traffic flows at Laweiplein (Noordelijke Hogeschool Leeuwarden, 2007) and in other shared space schemes (Lutz, 2008). Similar improvements may be possible in Dunedin.

Mondernman’s Laweiplein intersection has been described as “square-a-bout” with an emphasis on public space created by the use of consistent paving and subtle kerb designs (Hamilton-Baillie, 2008b). The proposed redesign of the Exchange is based on this concept. A central square has been created in the middle of the intersection with coloured paving stones. The square is surrounded by more paving which covers the entire area and extends a short distance along all surrounding streets. This paving uses colour to define a vehicle movement lane that is 6 metres wide. The central square takes priority over the movement lane, reinforcing the primary function of the area as a people place.

![Figure 85: Plan view of proposed Exchange shared space.](image)
All approaches to the proposed shared space need entrance treatment to alert drivers that they are entering a different driving environment. An example of such a treatment is shown on the High Street approach to the space (Figure 88). The treatment proposed consists of a narrowing of the carriageway using planter boxes, changes in paving, a border line of different coloured paving, and a 30 km/h sign (Figure 86). The sign has been taken from Nelson City Council’s brochure on shared zones (Nelson City Council, 2010d). In keeping with the shared space aim of reducing all forms of traffic control, it is anticipated that the only signage needed will be two of these signs at each entrance to the area (four on Princes Street, four on Rattray Street, and two on High Street).

The resulting open space re-establishes the Exchange as an important public open space. North-south traffic is likely to redistribute to the one-way system, while east-west traffic may redistribute to the Manse Street/Jetty Street intersection. A reduction in traffic volume will allow more sharing of the space. The new design better reflects pedestrian desire lines, especially on the line from High Street to Queens Gardens.

Apart from possibly redistributing traffic to surrounding streets, it is unclear (without carrying out more traffic monitoring) exactly what effect the shared space will have on traffic flows. Monderman’s Drachten examples appear to work well, although they show mixed results with respect to safety (Castle & Quimby, 2006). A space such as the one proposed for the Exchange should only be constructed after more research is carried out on shared spaces in a New Zealand context.

Figure 2: Signage proposed for Exchange shared space entrances.
Figure 87: Existing view from High Street across Princes Street to the Exchange.

Figure 88: Proposed entrance treatment for the Exchange shared space, looking east from High Street.
Figure 89: The current intersection of Princes Street and Rattray Street, looking south along Princes Street.

Figure 90: Another view of the proposed Exchange shared space, looking south along Princes Street.
Blind and vision impaired people will be looked after in a similar way to the above case studies; with tactile delineators demarcating safe spaces away from the vehicle movement lanes. Once again, intersections are an issue, especially in times of heavy traffic flow. A perfect solution cannot be offered without more study being undertaken, but a similar design to that proposed in the Oamaru case study may be appropriate.

6.4 Conclusion

All of the above case studies were undertaken to demonstrate how shared spaces could appear in a New Zealand context. In reality, the design process would involve extensive consultation with residents and other stakeholders.

These case studies show that the most uncertain part of shared spaces in New Zealand involves shared spaces on intersections with high traffic volumes. Although there have been some large scale shared spaces at intersections overseas (for example the Drachten example referred to), these have not been properly researched and their effects on pedestrians and blind and vision impaired people are unknown. This does not mean that shared space intersections should be not be built. It does mean, however, that the first spaces built should be modest in scale, and they should be carefully monitored. Especially important are provisions for blind and vision impaired people, which need to be developed and tested until satisfactory solutions are found.
Chapter 7: Conclusions and further research

“Under the pavement... The beach”

The beach in the above slogan implies a better, more natural, environment; an open, beautiful and inclusive space, while the pavement invokes the cold, hard and strictly governed old environment. When the slogan was yelled by Parisian protesters in May 1968 as cobblestones were lifted from the ground and hurled at police (leaving sand underfoot), the metaphorical “pavement” was the old societal norms, and the metaphorical “beach” was a new and better society. The slogan is fitting for this shared space research because of its reference to pavement; by removing the “pavement” of traditional separated streets, can we uncover a better street design philosophy, for example shared space?

This thesis has attempted to demonstrate that there are more appropriate ways to approach street design in New Zealand than the current traditional approach of the strict separation of road users. Shared space shifts the focus of public space design away from the private interests of motorists toward the more public interests of pedestrians. The exceptional thing about shared spaces is that it purports to achieve this without detracting from motorists’ interests. Not only is a more pedestrian-friendly environment created, but shared spaces can also make streets safer and more efficient for drivers.

7.1 Conclusions

This research aimed to examine the role that shared space design could play in New Zealand urban design and land development. The central hypothesis was that shared spaces could improve New Zealand’s urban areas by making them more people-oriented, as opposed to traffic-oriented. Generally, it can be concluded that yes, carefully designed shared spaces could improve New Zealand’s urban public spaces by balancing the needs of motorists with those of all other road users and creating a slow driving environment. Because there is a lack of empirical information regarding the benefits of shared spaces it is difficult to judge how much of an improvement could be made, however the evidence that does exist suggests the potential for large improvements, especially in terms of amenity, pedestrian access, and economic benefits.
After conducting this research into shared spaces, it has become obvious that more study needs to be undertaken before it can be confidently stated that shared spaces would make New Zealand streets safer (in terms of traffic accidents). However, the evidence that does exist from overseas examples indicates to some degree of certainty that a carefully designed shared space would not be significantly more dangerous than a normal street. For this reason it is recommended that New Zealand continues to create modest shared spaces to study their safety before and after the shared space. When the safety of the new designs is understood, more bold designs can be created. Further study into all aspects of shared spaces would also be beneficial for further understanding of what makes a good shared space.

Conclusions can also be drawn from the research into New Zealand’s urban development history. New Zealand’s cities have always had low densities and wide streets due to the abundance of land when Europeans began colonising the country (and the design trend away from crowded European cities), and this low density development continued with the introduction of the motor vehicle. This has resulted in New Zealand becoming one of the most motorised countries in the world, with traffic accident rates reflecting this fact. Public places therefore often have a traffic-oriented focus that is an obstacle to successful shared spaces; however this demonstrates that there is certainly room for improvement to New Zealand public space design.

Shared spaces have only very recently begun appearing in New Zealand cities, with the first true space being the Wairepo Swamp Walk near Eden Park in Auckland (constructed in mid-2010). There are, however, some informal (or pseudo) shared spaces identified. These spaces come in two forms; streets that are either designed as normal streets that a range of road users, for whatever reason, treat as a shared space, or streets that incorporate similar principles to shared space designs, but may be lacking in an important aspect. Many more shared spaces are proposed for construction in New Zealand cities over the next two years. These proposed shared spaces come in a range of forms; from Auckland’s inner city shared spaces to Nelson’s residential shared zones.

Local government development standards can restrict innovative urban design through requirements for footpaths and raised kerbs, restrictions on surfacing materials, lack of recognition of functions of streets other than traffic functions, and by encouraging designing for speeding drivers. Some of the more modern standards invite alternative design solutions and have a less prescriptive form characterised by a set of statutory performance criteria that are complimented by non-statutory guidelines to satisfying the criteria. This form of
development standard would suit shared spaces, especially if shared space guidelines were contained as part of the non-statutory guidelines or design solutions.

Three types of shared spaces that are possible in New Zealand have been suggested; residential shared spaces, main streets shared spaces, and inner city shared spaces. Residential shared spaces are a New Zealand version of the British home zone or Dutch woonerf. Main streets shared spaces are suitable for towns and city suburbs that are centred on a single arterial road that may have high traffic flows. Inner city shared spaces aim to give central business districts, where pedestrian volumes are the highest, a pedestrian-oriented design rather than a traffic-oriented design. These three types of shared space vary in the amount of separation between road users (although all have less separation than a traditional street layout). They also vary in their balancing of the place-function of streets with the movement-function. Examples of how the three types of shared space may look have been provided in the form of several case studies involving streets in Dunedin and Oamaru.

The conclusions outlined above show how the research objectives that were set out in Chapter 1 have been satisfied. These conclusions are the end product of this thesis; however during the research process several areas were identified that warrant further research. These opportunities for further research also form part of this research project’s end product and are therefore outlined below.

### 7.2 Opportunities for further research

More study is needed in all areas of shared spaces to verify the many claims that are made about them, and all of the recommendations or suggestions in Chapter 5 can be further refined as new evidence indicates the safest, cheapest, most aesthetically pleasing and most functional forms of shared space. However, some aspects of shared spaces specific to this thesis have been identified as warranting further investigation.

- More empirical data is needed to verify the safety effects of shared spaces, both in New Zealand and in other countries. Detailed analysis of the design features used in shared space schemes and their relationship to accident rates will be necessary to identify what works and what does not. Rigorous before and after research should be conducted at all new shared spaces constructed. Studies into the safety of shared spaces would shed some light onto the theories behind shared spaces, for example risk compensation and Engwicht’s (2005) ideas on “intrigue” and “uncertainty”.
Further research into what makes urban New Zealand different from urban areas in other countries would make assessment of overseas shared space research more useful to New Zealand urban designers. If more is known about what makes New Zealand cities different to other cities then the applicability of overseas research in New Zealand can be more easily ascertained.

An interesting study could be carried out into how drivers react to a lack of traffic control when traffic lights go down. Research would need to examine specific instances of traffic light malfunctions and the accident rates while the lights are down. This could be compared with the usual accident rate of that intersection. Although more difficult to study, it would also be beneficial to compare waiting times at the intersection while the lights are broken and when they are functioning. This may provide an insight as to how drivers react in situations where their usual driving cues are removed.

City council development standards and their relationship to shared space design was one of the focuses of this thesis. Further investigation into the effectiveness of the standards in producing good urban design would be beneficial. For example, to what extent do councils actually require compliance with the standards? Where do local government and developers differ in their thoughts on development standards?

Existing methods of guiding blind and visually impaired people through shared spaces need to be improved, and new techniques developed. The United Kingdom’s Department for Transport recently investigated ways of delineating safe zones in shared spaces using tactile strips and paving, and low kerbs, but concluded that more research is needed. Perhaps tactile paving could be used on vehicle movement lanes to allow blind and visually impaired people to aurally judge the speed and location of vehicles.

### 7.3 Closing remarks

In the past, good urban design has not been widely seen or practised in New Zealand, and it has not been seen by the public as a significant issue. It appears that this may be changing. Reports such as *People Places Spaces* show an increasing interest from central government in urban design, and some local governments have been putting out their own urban design guidelines (for example see North Shore City Council’s Design of Streets 2009a). This new interest in urban design means that new concepts in urban design will be more readily adopted.
and implemented in New Zealand. It is important that these ideas, which most likely will come from overseas, are adopted with care in New Zealand urban areas. This is because a certain concept which works well, for example in a Western European city, may not function in the same way in New Zealand due to differences in the urban characteristics of the cities and their inhabitants.

This thesis has taken a new urban design concept, shared space, that is starting to gain popularity with those involved in New Zealand urban design and evaluated the suitability of the concept for a New Zealand city. It was found that while New Zealand cities are quite different from the European cities where shared spaces are most commonly found, shared spaces will still provide benefits in New Zealand cities. In fact, because of the historic lack of interest in urban issues, many public spaces in New Zealand’s cities and towns are poorly designed, and could be greatly improved by shared spaces.

Shared spaces will become more common in New Zealand if the first spaces that are currently proposed are successful. This is exciting, but it is important that the spaces are carefully monitored to ensure that the stated benefits really do eventuate, and that the spaces are not dangerous for any road users. By doing this, the shared space concept can be continually improved and further used to create people-oriented and pedestrian-friendly cities and towns around New Zealand.
Bibliography


Hamilton-Baillie Associates, & Local Agenda. 2007. This way to better streets: 10 case studies on improving street design. London: Commission for the Built Environment.


Appendices
Appendix 1

<table>
<thead>
<tr>
<th>City Council</th>
<th>Standard Name</th>
<th>Year</th>
</tr>
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<tr>
<td>Auckland City Council</td>
<td>Code of Urban Subdivisions</td>
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<td>Mount Wellington Quarry Code of Subdivision and Development</td>
<td>2008</td>
</tr>
<tr>
<td>Christchurch City Council</td>
<td>Infrastructure Design Standard</td>
<td>2007</td>
</tr>
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<td>Dunedin City Council</td>
<td>Dunedin Code of Subdivision and Development</td>
<td>2010</td>
</tr>
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<td>Hamilton City Development Manual</td>
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</tr>
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<td>2004</td>
</tr>
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</tr>
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<td>Land Development Manual</td>
<td>2010</td>
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<td>Infrastructure Design Standards</td>
<td>2009</td>
</tr>
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<td>Engineering Standards for Land Developments</td>
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<td>Porirua City Council</td>
<td>Code of Land Development and Subdivision Engineering</td>
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<td>Code of Practice for Development</td>
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<td>Upper Hutt City Council</td>
<td>Code of Practice for Civil Engineering Works</td>
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</tr>
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<td>Waitakere City Council</td>
<td>Engineering Standards Manual</td>
<td>2008</td>
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<td>Wellington City Council</td>
<td>Code of Practice for Land Development draft</td>
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Table 8: List of development standards.
Is significance given to place function of road network in the roading objectives?

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<thead>
<tr>
<th>Council</th>
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</thead>
<tbody>
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</tr>
<tr>
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<td>Yes</td>
</tr>
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<td>Christchurch City Council</td>
<td>Yes</td>
</tr>
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<td>Dunedin City Council</td>
<td>Yes</td>
</tr>
<tr>
<td>Hamilton City Council</td>
<td>No</td>
</tr>
<tr>
<td>Hutt City Council</td>
<td>No</td>
</tr>
<tr>
<td>Invercargill City Council</td>
<td>No</td>
</tr>
<tr>
<td>Manukau City Council</td>
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</tr>
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</tr>
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</tr>
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</tr>
<tr>
<td>Waitakere City Council</td>
<td>No</td>
</tr>
<tr>
<td>Wellington City Council</td>
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Table 9: Acknowledgement of place function of streets in the roading objectives of a council's development code.
<table>
<thead>
<tr>
<th>Council</th>
<th>Footpath paving material allowed</th>
<th>Carriageway paving material allowed</th>
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</thead>
<tbody>
<tr>
<td>Auckland City Council</td>
<td>Concrete, asphalt and pavers</td>
<td>Asphaltic concrete</td>
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<td>Mt Wellington</td>
<td>Concrete</td>
<td>Asphaltic concrete</td>
</tr>
<tr>
<td>Christchurch City Council</td>
<td>Asphaltic concrete, concrete and pavers</td>
<td>Concrete, chip seal and block pavers</td>
</tr>
<tr>
<td>Dunedin City Council</td>
<td>Concrete, asphalt and pavers</td>
<td>Concrete, asphalt, pavers and chip seal</td>
</tr>
<tr>
<td>Hamilton City Council</td>
<td>Concrete, asphalt and pavers</td>
<td>Chip seal and block pavers</td>
</tr>
<tr>
<td>Hutt City Council</td>
<td>Concrete, asphalt and pavers</td>
<td>Concrete, asphalt, pavers and chip seal</td>
</tr>
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<td>Concrete</td>
<td>Asphaltic concrete or chip seal</td>
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<td>Manukau City Council</td>
<td>Concrete</td>
<td>Asphaltic concrete or block pavers for c/ways &lt;7.8m wide</td>
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<tr>
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<td>Concrete preferred, pavers at times</td>
<td>Concrete, asphalt, pavers and chip seal</td>
</tr>
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<td>Concrete, asphalt and pavers</td>
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<td>Porirua City Council</td>
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<td>Asphalt, chip seal, or block pavers for c/ways &lt;8m</td>
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<td>Wellington City Council</td>
<td>Concrete for new paths, asphalt, pavers/concrete for upgrades</td>
<td>Concrete, asphalt, pavers and chip seal</td>
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Table 10: Paving materials permitted in council's development codes.
<table>
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<tr>
<th>Council</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>Auckland City Council</td>
<td>Yes, on both sides, except on cul-de-sacs less than 75 metres in length where only one side is needed</td>
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<tr>
<td>Mt Wellington</td>
<td>Yes, on both sides with the exception of the lowest street typology</td>
</tr>
<tr>
<td>Christchurch City Council</td>
<td>Yes, on both sides except where prevented by topography</td>
</tr>
<tr>
<td>Dunedin City Council</td>
<td>Yes, on both sides except on cul-de-sacs servicing less than 10 dwellings where only one side is needed</td>
</tr>
<tr>
<td>Hamilton City Council</td>
<td>Yes, unless in a specifically-designed shared environment</td>
</tr>
<tr>
<td>Hutt City Council</td>
<td>Yes, on both sides except on cul-de-sacs where only one side is needed</td>
</tr>
<tr>
<td>Invercargill City Council</td>
<td>Only “in response to need rather than to arbitrary policy”</td>
</tr>
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<td>Manukau City Council</td>
<td>Yes, on both sides except for short cul-de-sacs servicing 15 units or less</td>
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<td>Napier City Council</td>
<td>Yes, on both sides except when serving 25 units or less</td>
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<tr>
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<td>Yes, on both sides except in &quot;Hillside Environments&quot; and on local roads serving 25 dwellings or less</td>
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<td>Yes, on both sides except for short streets &amp; cul-de-sacs</td>
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<td>Palmerston North City Council</td>
<td>Yes, on both sides</td>
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<tr>
<td>Porirua City Council</td>
<td>Yes, they are generally required on both sides</td>
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<td>Tauranga City Council</td>
<td>Yes, on both sides where carriageway is over nine metres wide</td>
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<td>Yes, on both sides except on cul-de-sacs serving 20 units or less</td>
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<td>Yes, on both sides except where prevented by topography</td>
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Table 11: Separate footpath requirements in council's development codes.
What are the requirements for stormwater drainage on roads?

<table>
<thead>
<tr>
<th>Council</th>
<th>Requirements</th>
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<tr>
<td>Auckland City Council</td>
<td>Kerb and channel on all urban roads</td>
</tr>
<tr>
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<td>Kerb and channel on all urban roads</td>
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<td>Christchurch City Council</td>
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<tr>
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<td>Swales can be used</td>
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<tr>
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<td>Swales and dish channels can be used in some circumstances</td>
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<td>Kerb and channel on all urban roads</td>
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<td>Dish channels can be used in some circumstances</td>
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<td>Swales may be considered</td>
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Table 12: Stormwater drainage requirements in councils’ development codes.

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Table 13: Legal status of councils’ development codes.
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<tr>
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<tr>
<td>Hamilton City Council</td>
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<tr>
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<td>-</td>
<td></td>
</tr>
<tr>
<td>Manukau City Council</td>
<td>Cycling and Walking Strategy</td>
<td>2005</td>
</tr>
<tr>
<td>Napier City Council</td>
<td>Cycling Strategy</td>
<td>2001</td>
</tr>
<tr>
<td>Nelson City Council</td>
<td>Cycling Strategy &quot;Pedalling along&quot;</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Pedestrian Strategy &quot;Stepping out&quot;</td>
<td>2005</td>
</tr>
<tr>
<td>North Shore City</td>
<td>Cycling Strategy</td>
<td>2009</td>
</tr>
<tr>
<td></td>
<td>Walking Strategy</td>
<td>2009</td>
</tr>
<tr>
<td>Palmerston North City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Porirua City Council</td>
<td>In development</td>
<td></td>
</tr>
<tr>
<td>Tauranga City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Upper Hutt City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Waitakere City Council</td>
<td>Walking and Cycle Strategy</td>
<td>2003</td>
</tr>
<tr>
<td>Wellington City Council</td>
<td>Cycling Policy</td>
<td>2008</td>
</tr>
<tr>
<td></td>
<td>Walking Policy</td>
<td>2008</td>
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</table>

Table 14: List of cycling and walking strategies reviewed.
### Other Strategies

<table>
<thead>
<tr>
<th>Council</th>
<th>Strategies</th>
<th>Year</th>
</tr>
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<tbody>
<tr>
<td>Auckland City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Christchurch City Council</td>
<td>Road Safety Strategy</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>Metropolitan Transport Statement</td>
<td>2003</td>
</tr>
<tr>
<td>Dunedin City Council</td>
<td>Transportation Strategy</td>
<td>2006</td>
</tr>
<tr>
<td>Hamilton City Council</td>
<td>Transport Safety Action Plan</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td>Access Hamilton</td>
<td>2010</td>
</tr>
<tr>
<td>Hutt City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Invercargill City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Manukau City Council</td>
<td>Transport Strategy &quot;Moving Manukau&quot;</td>
<td>2006</td>
</tr>
<tr>
<td></td>
<td>Local Area Traffic Management</td>
<td>2004</td>
</tr>
<tr>
<td>Napier City Council</td>
<td>Roads and Transport Essential Services Report</td>
<td>2000</td>
</tr>
<tr>
<td>Nelson City Council</td>
<td>Regional Land Transport Strategy</td>
<td>2009</td>
</tr>
<tr>
<td>North Shore City</td>
<td>Road Safety Strategy</td>
<td>2006</td>
</tr>
<tr>
<td>Palmerston North City Council</td>
<td>Transport Management Plan</td>
<td>2002</td>
</tr>
<tr>
<td>Porirua City Council</td>
<td>In development</td>
<td></td>
</tr>
<tr>
<td>Tauranga City Council</td>
<td>Integrated Transport Strategy</td>
<td>2006</td>
</tr>
<tr>
<td>Upper Hutt City Council</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Waitakere City Council</td>
<td>Transport Strategy &quot;Way to go&quot;</td>
<td>2006</td>
</tr>
<tr>
<td>Wellington City Council</td>
<td>Transport Strategy</td>
<td>2006</td>
</tr>
</tbody>
</table>

Table 15: List of other strategies reviewed.
Appendix 2

Shared spaces basic cost analysis

A basic cost analysis has been taken out in an attempt to understand what could make a shared street more or less expensive to construct than a traditional shared space. A 100 metre long street was drawn in Google Sketchup so that areas could be calculated quickly.

The shared space street consists of a shared level surface with grassed berms, chicanes that incorporate parking, large trees, and rain gardens instead of traditional stormwater reticulation. The traditional street consists of two footpaths with grassed berms either side, small trees, one lane of parallel parking, and two travelling lanes. A crossing point is also provided. The shared space layout is 1.5 metres narrower than the traditional street.

The problem with a theoretical cost analysis involving shared spaces is that there is such a range of shared space designs possible, even for a 100 metre stretch of straight road on flat ground. Many shared spaces incorporate a higher design quality than usual which makes them more expensive than a normal street. What this analysis attempts to demonstrate is that, with careful and well thought out design, a shared space can be cheaper to build than traditional streetscapes.

Estimates for costs and rates in this exercise have been taken from the following sources:
### Simon Ironside of Eliot Sinclair and Partners Ltd.

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
<th>Unit</th>
<th>Traditional Street</th>
<th>Shared Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotmix paving</td>
<td>$21.70</td>
<td>m²</td>
<td>1126</td>
<td>214</td>
</tr>
<tr>
<td>Cobblestone paving</td>
<td>$82.30</td>
<td>m²</td>
<td>0</td>
<td>560</td>
</tr>
<tr>
<td>Kerb &amp; Channel</td>
<td>$43.00</td>
<td>m</td>
<td>$8,600.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Dish Channels</td>
<td>$45.00</td>
<td>m</td>
<td>$0.00</td>
<td>215</td>
</tr>
<tr>
<td>Grassing of Sections</td>
<td>$0.35</td>
<td>m²</td>
<td>$130.20</td>
<td>560</td>
</tr>
<tr>
<td>Tree (small)</td>
<td>$400.00</td>
<td>each</td>
<td>$4,800.00</td>
<td>$0.00</td>
</tr>
<tr>
<td>Extra saleable land</td>
<td>$180.00</td>
<td>m²</td>
<td>$0.00</td>
<td>150</td>
</tr>
</tbody>
</table>

|                      |         |            |                    |               |
|                      |         |            | $37,964.40         | $38,002.80    |

### Phil Rhodes of the School of Surveying

<table>
<thead>
<tr>
<th>Item</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree (small)</td>
<td>$400</td>
</tr>
<tr>
<td>Tree (large)</td>
<td>$550</td>
</tr>
</tbody>
</table>

With these rates, and areas calculated from the Google Sketchup drawings above, a basic calculation was carried out so the costs of each street could be compared:

This shows that if we estimate the price of land to be $180 dollars a square metre then a shared space street is roughly the same cost as a traditional street. However, this is primarily because the shared space is narrower than the traditional street, meaning that there is 150 square metres of extra land that can be added onto sections. If the shared space was made the same width as the traditional street, then the shared space would be far more expensive. This is due to the extensive cobblestone paving, which is almost four times as expensive as hotmix paving.

The above calculation ignores the following costs:

- Provision for blind and visually impaired people at the crossing point on the traditional street and in the shared space.
- Stormwater sumps and reticulation.
- Construction and planting of the rain gardens in the shared space.
It is reasoned that the cost of providing tactile paving and other infrastructure for blind and visually impaired people will be similar in both streets. It is also assumed that traditional stormwater infrastructure in the traditional street will be similar to that of construction rain gardens in the shared space, so the costs of stormwater infrastructure (other than the channels) have also been ignored.

The calculations below, using the Rational formula to find the likely run-off from the two streets, shows that the shared space street will have significantly less stormwater run-off, largely due to the areas of grass and unsealed paving stones used, and the infiltration these surfaces allow. This means that even if traditional stormwater infrastructure is constructed in both streets, the shared space infrastructure will be cheaper due to the lower rates of run-off.

Using the following run-off coefficients (Department of Building and Housing, 2006) and the areas from above, a composite run-off coefficient was calculated:

<table>
<thead>
<tr>
<th>Runoff Coefficients</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hotmix paving</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Cobblestones sealed</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Cobblestones unsealed</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Grass</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>Traditional street run-off</td>
<td>0.701</td>
<td></td>
</tr>
<tr>
<td>Shared space run-off</td>
<td>0.493</td>
<td></td>
</tr>
<tr>
<td>Rainfall intensity (i)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Area in hectares (A)</td>
<td>0.167</td>
<td>0.133</td>
</tr>
<tr>
<td>Q = C i A</td>
<td>5.95</td>
<td>3.29</td>
</tr>
</tbody>
</table>

Another consideration is the added value that improved street amenity can bring to surrounding land. Research in the United Kingdom has shown that high-amenity, pedestrian-oriented public places can increase property values by 5% (CABE, 2007). Therefore, taking the view of a property developer; spending more on a street to increase the design quality may be justified simply because of the value added to the surrounding properties.

It is usually more expensive to build a higher quality street, as can be seen by the costs of cobblestone paving and large trees. With careful design, however, these more expensive
materials can be minimised without degrading the quality of the street; it is this way that shared space can be made more cost-effective.

It is acknowledged that this is an extremely simple example of what could be a complicated costing exercise. However, the aim is not to make a concrete statement on the cost of shared space over traditional streets, but rather to demonstrate that there are a number of variables that, if approached the correct way, can reduce the costs of shared spaces. More research is needed to investigate the most cost-effective ways of constructing shared spaces, and also to show the effects on surrounding property of higher quality street designs.