The Value of Urban Design

The economic, environmental and social benefits of urban design

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The Value of Urban Design aims to establish whether there is a persuasive case for urban design – the design of the buildings, places, spaces and networks (both public and private) that make up our towns and cities, and the ways people use them.

Is there value to be gained through good urban design? What kinds of value does it offer, and how can New Zealand's towns and cities benefit? *The Value of Urban Design* seeks to answer these questions by:

- Examining a wide range of international and local documentary evidence about the range of benefits and costs associated with urban design. While there is relatively little quantitative evidence in this field, *The Value of Urban Design* focuses strongly on empirical evidence derived from robust scientific studies. It also takes account of the views and judgements of recognised experts in the field, but discounts anecdotal evidence. It does not attempt to provide a cost-benefit analysis of urban design.

- Evaluating the merits of claims commonly made about the economic, social and environmental effects of urban design.

- Clarifying the nature of urban design and what, realistically, it can deliver in the context of New Zealand's towns and cities.

The Value of Urban Design has been commissioned by the Ministry for the Environment (the Ministry), with the Wellington City Council and the Auckland Regional Council. It is one of several documents that support the Ministry's *New Zealand Urban Design Protocol* (March 2005).

It is intended to assist both the public and private sectors. Public agencies will find it helpful in formulating policy, setting development objectives and evaluating projects that affect the urban environment. It will also assist developers and property investors to gain an understanding of the less tangible costs and benefits of the urban developments they initiate.

Overall findings

Urban design involves many people including practitioners (architects, engineers, planners, landscape architects and many more), local and central government agencies, property developers and investors, community groups and the public. They have varying interests, perspectives and criteria by which they assess the merits of urban design activity.

Furthermore, many kinds of 'value' can be considered – economic, environmental, social or cultural; tangible or intangible. The benefits (and costs) of good urban design often accrue to the wider community; therefore, many stakeholders have an interest in what takes place at both the micro scale (street and building design) and the macro scale (eg, patterns of land use).

Urban design remains an art as much as a science, involving concepts that are sometimes elusive, such as character. It involves both public urban space and parts of the private domain, and concerns the urban environment at a range of scales. Urban design is also context-specific. There is relatively little robust evidence about New Zealand urban design initiatives. Overseas examples of successful (or poor) urban design initiatives may reflect conditions that do not exist in New Zealand. Caution has been exercised in drawing conclusions for New Zealand solely on the basis of overseas evidence.

Taking into account these constraints and based on the extensive evidence consulted, *The Value of Urban Design* reaches the following broad conclusions about the benefits urban design might offer in the New Zealand context:

- Good urban design can offer significant benefits to the community; conversely, poor design can have significant adverse effects on the urban environment, society and economy.

- While good urban design sometimes costs more upfront, this is not necessarily the case; moreover, long-term costs can be avoided.

- Communities value the better quality of life that good urban design can deliver.

- Urban design can affect people's ability and willingness to undertake physical exercise: good design can offer health benefits.

- Urban design can help make towns and cities safer and more secure.

- Urban design elements are interconnected: urban design is most effective when a number of elements come together (eg, mixed use, density and connectivity).

The value of specific urban design elements

In reaching these broad conclusions, *The Value of Urban Design* examined evidence relating to eight core elements of urban design. These elements – and the key economic, social and environmental findings for each – are summarised below.

Local character

Definition: the distinctive identity of a particular place that results from the interaction of many factors, including built form, people, activity and history.

Key findings: Urban design that respects and supports local character can:
- attract highly skilled workers and high-tech businesses

- help in the promotion and branding of cities and regions

- potentially add a premium to the value of housing

- reinforce a sense of identity among residents, and encourage them to help actively manage their neighbourhood

- offer people meaningful choices between very distinctive places, whose differences they value

- encourage the conservation and responsible use of non-renewable resources.

Connectivity

Definition: the physical conditions facilitating access within a region, city, town or neighbourhood.

Key findings: Well-connected cities, towns and neighbourhoods can:

- enhance land values
- make local shops and facilities more viable
- enhance people's safety and security by encouraging surveillance
- encourage more walking and cycling, leading to health benefits
- reduce vehicle emissions through fewer cars being used for non-work trips.

Density

Definition: the concentration of population and activity in an urban area.

Key findings: Urban design that promotes a higher density of buildings and public spaces (in conjunction with other conditions, such as mixed use, good building design and adequate open space) can:

- deliver savings on land, infrastructure and energy
- reduce the economic costs associated with time spent travelling
- help concentrate knowledge and innovative activity in the core of the city
- promote social connectedness and vitality
- help encourage greater physical activity, with consequent health benefits
- help conserve green spaces, in conjunction with certain kinds of urban development
- reduce run-off from vehicles to water, and overall emissions to air/atmosphere (although air emissions may be more locally concentrated).

Mixed use

Definition: where a variety of different living and working activities are in close proximity within a neighbourhood.

Key findings: Urban design that supports mixed-use neighbourhoods (in conjunction with other factors including connectivity and a relatively high intensity of different uses) can:

- offer people convenience, choices and opportunities, which lead to a sense of personal wellbeing
- allow parking and transport infrastructure to be used more efficiently
- lower household spending on transport
- increase the viability of local shops and facilities
- encourage walking and cycling – bringing health benefits, reducing the need to own a car and thus reducing emissions
- increase personal safety
- enhance social equity.

Adaptability

Definition: the capacity of urban buildings, neighbourhoods and spaces to adapt to changing needs.

Key findings: Urban design that addresses adaptability can:

- extend the useful economic life of buildings and public spaces

- increase the diversity of uses and users in a public space, and the length of time it is used for

- encourage the conservation of non-renewable resources

- contribute to economic success over time.

High quality public realm

Definition: all parts of the physical environment of towns and cities that the public has access to, and that form the setting for community and public life.

Key findings: An urban design approach that emphasises quality in the public realm can:

- lead to enhanced urban economic performance by attracting more people and activities

- encourage greater participation in community and cultural activities, and enhance civic pride and commitment to the community

- increase the use of public space and support associated business

- enhance personal safety.

Integrated decision-making

Definition: integration between and within organisations involved in urban policy, planning and implementation, as well as integration of the different urban design elements.

Key findings: An integrated approach to decision-making can:

- increase opportunities for greater numbers of people to benefit from good urban design

- allow urban design to produce the greatest possible benefits by working with complementary economic, social and environmental policies.

User participation

Definition: the public consultation process, and other forms of involvement in urban design projects, such as surveys or design workshops.

Key findings: User participation in urban design activity can:

- improve the fit between design and user needs

- allow more effective use of resources, by providing informed direction for decision-making

- offer time or cost savings during the decision-making process, by encouraging increased user support for positive change

- develop a greater sense of 'user ownership' over changes, and legitimise user interests

- enhance a sense of community and local democracy.

1 Introduction

1.1 Purpose

The Value of Urban Design examines the case for urban design and asks: is it persuasive?

In considering this question, we examine documentary evidence of the economic, social and environmental effects of urban design, thereby building a picture of the possible benefits, and costs, of designing towns and cities better.

This report is not a cost-benefit analysis; much of the evidence in this area is qualitative and cannot be summarised in a simple quantitative manner.

Urban design is a relatively new field, and has only recently achieved widespread attention in New Zealand. The recent interest in urban design within the public and private sectors, and among community organisations, stems partly from a 'hunch' that high-quality urban environments may be able to significantly help New Zealanders live more sustainably. Although some remain doubtful, many harbour the hope that better urban design can tangibly enhance New Zealand's enviable lifestyle, and even help to sustain economic development.

This report sieves the international urban design literature, and draws on what little New Zealand evidence exists, to see whether these hopes have any real basis. In doing so, the report seeks to promote a wider understanding of the nature of urban design, and to clarify just what it can, realistically, deliver.

Urban design developed during the 1960s, largely as a reaction to the perceived failures of both modernist architecture, with its focus on the 'ideal building', and modernist planning, with its focus on segregation of land uses. Because of these critical and reactive origins, much of the early urban design literature is based on ideology rather than empirical evidence. Seminal publications contained manifestos or sets of design principles that were more articles of belief than established fact, and anecdotal accounts of the disappointing performance of modernist planning and architecture. However, in recent decades, as urban design has become a recognised profession, theorists and researchers have placed the discipline on a more secure footing.

Today, there exists a wide body of international literature that systematically examines the implications of key elements of urban design. *The Value of Urban Design* surveys this material and reviews the merits of claims commonly made for urban design.

Findings are extremely diverse. Much of the evidence still consists of expert views and judgement, but there are an increasing number of robust scientific studies. An underlying difficulty is that urban design entails both 'hard' economic realities and a number of 'soft' human-oriented elements coming together to create a whole that is more than the sum of the parts. Moreover, some of the judgement is necessarily place-specific. In this sense, urban design remains as much an art as a science. This report does not discount evidence and judgements on 'soft' matters, but it places the most weight on empirical evidence (whether quantitative or qualitative) from robust scientific studies, where available.

The overwhelming majority of the information comes from overseas sources. An important purpose of *The Value of Urban Design* project is to evaluate, interpret and organise these findings so that they can be applied in New Zealand by those working in urban design.

1.2   Using this document

The Value of Urban Design has been commissioned by the Ministry for the Environment (the Ministry) together with the Wellington City Council (WCC) and the Auckland Regional Council (ARC). The report is not intended to be used in isolation, but as one component of a larger suite of documents and resources on urban design developed to support implementation of the *New Zealand Urban Design Protocol*:

• *New Zealand Urban Design Case Studies*

• *Urban Design Toolkit*

• *Urban Design Research in New Zealand.*

This work in turn forms part of the Government's *Sustainable Development Programme of Action*, launched in January 2003, which identified the importance of making New Zealand cities more sustainable.

The Value of Urban Design is intended for a number of audiences – those engaged in urban design at central or local government agencies, property investors and developers, urban design professionals, and members of the public with an interest in enhancing the quality of our urban places.

Public agencies can use *The Value of Urban Design* to inform policy, shape development objectives or evaluate projects that are intended to improve the urban environment. Key claims examined in this study might, where they are shown to have merit, also provide a basis for monitoring the performance and management of streets, squares, parks and other public open space assets.

Although the project is sponsored by central and local government, *The Value of Urban Design* aims to be useful to both public and private sectors. The evidence suggests that many of the dividends of good design at the site level accrue to property investors and developers, especially where the investor takes a longer-term view, and where enhancing the public domain can also add value to a private development. *The Value of Urban Design* provides a basis for bringing new factors into cost-benefit assessment informing investment decisions, in two ways. First, it identifies the full range of economic advantages of better urban design. Second, it identifies how, under certain conditions, private investments can also generate wider spin-off benefits, contributing to the wellbeing of the community as a whole.

1.3   Definitions of key terms

Urban design

The *Urban Design Protocol* describes urban design as: "the design of the buildings, places, spaces and networks that make up our towns and cities, and the ways people use them". This is an inclusive definition that addresses both the public and private domains of cities, and

embraces the social as well as physical dimensions of the urban environment. According to this interpretation, urban design must be considered at a number of different scales, from the details of street furniture to the infrastructure that shapes entire cities and regions.

Because the field of urban design is so broad, no single profession has a monopoly on expertise. Instead, architects, engineers, landscape architects, planners, economists, surveyors and many others must combine their knowledge with that of property developers, public agencies and community groups. Good urban design is thus collaborative in nature, integrating various perspectives and concerns. This is one reason why the subject is best approached with a long-term, 'big-picture' perspective.

The inclusiveness of urban design is both a strength and a potential weakness. By its very nature, design is integrative. It creates relationships among things that might otherwise be considered separate. The holistic nature of urban design reflects the multi-faceted nature of urban areas themselves, where so many problems and potentials are interconnected. However, there is a risk that urban design may become so all-encompassing that it lacks focus, substance or bite. Inclusiveness poses particular difficulties for *The Value of Urban Design*, because the purpose of the project is to identify specific causes and effects. Studies that are able to disentangle distinct effects, while holding other factors constant, are thus particularly valuable.

The Value of Urban Design adds two points of emphasis to the definition of urban design in the *Urban Design Protocol*. First, while urban design's principal concern is the 'public realm' (ie, the streets, squares, parks, buildings and other spaces to which the average person has full or partial access), this study emphasises that urban design does not exclude private property. Private buildings and spaces have a significant impact on the quality of adjacent public areas. Also, privately owned spaces such as shops and entry lobbies are often freely accessible to passers-by. As a result, public and private spaces are better thought of as a continuum than entirely distinct.

A second feature of urban design that this report underlines is a concern for physical elements and spatial relationships. This focus keeps urban design firmly grounded in a tangible, three-dimensional world: a place that is experienced through sight and sound, and sometimes through the tactile qualities of materials and details. This emphasis does not discount people, their behaviour, the significance of collaboration and participation in the urban design process, or even the meanings people attach to places. But it does stress that most of the impacts of urban design flow essentially from tangible, physical characteristics.

Value

In competitive markets, value in a narrow economic sense is determined by supply and demand. Property markets in most cities are relatively competitive. But in assessing the value of urban design, a complicating factor is that the value from a design investment often accrues in part to parties other than those making the investment. As a United Kingdom (UK) study noted, "Of course there is agreement that good urban design is desirable but that agreement does not extend to taking responsibility for creating it."[1]

In economic terms, a key issue is that urban design may create positive 'external benefits' – benefits of an economic, social or environmental nature that accrue to the wider community and

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[1]   Gibson et al, 1996, p 4.

are not fully captured by the developer.[2] It is rare that a development will be large enough that external benefits can be essentially 'internalised'. A related issue is that developers may have shorter time horizons (higher 'discount rates') than the community as a whole.[3] Developers may thus tend to emphasise short-run returns and curtail costs, whereas the community may favour a durable yet flexible outcome that provides lasting utility. Carmona et al in the United Kingdom describe this as commercial pressures militating against long-term investment in design quality.

There are two consequences. One is that the market will tend to provide poorer urban design than is socially optimal. This raises the policy issue of how the urban authority can best correct the deficiency, but that question goes beyond the scope of this paper. Second, many of the benefits of good urban design (or costs of poor design) are intangible social, environmental or even economic impacts affecting a range of parties. They include neighbours, other city residents, and even those beyond the city in question who may, for example, benefit from a thriving urban environment. Although these impacts may be identifiable and significant, they cannot be readily quantified or valued without a significant investment in econometric studies: "[W]hile the direct benefits to stakeholders (in the form of enhanced real estate asset value) can be evaluated through their monetary 'exchange value' in the marketplace using standard valuation techniques, the same cannot be said of the wider 'value in use' benefits that accrue to society as a whole … [for example] social value, aesthetic value and other non-market concepts of worth."[4] This problem greatly hinders attempts to examine the value of urban design.

Where quantitative studies of value gains have been carried out, for example by the Property Council of Australia,[5] the focus has usually been fairly narrow. For instance, better design and special architectural features may be rewarded with higher rents and values. But information on relative market returns, and data on other possible confounding variables, are often patchy or absent. This means overall value is unclear, despite higher profit margins often being claimed.[6] Even when sophisticated methods are used, complex findings are likely to be revealed, such as that value is added in some circumstances and contexts, but not in others:[7] "[A]ny answers about the value of urban design are only relative, given the varying contextual and market conditions at a local scale and the peculiarities of the different sectors within which decisions on design are made."[8]

In short, this report takes a broad view of 'value', and underlines that the focus of interest is not just on returns to the developer or the local council involved, but to the community as a whole, including those in the future who will benefit or suffer from today's urban design decisions. It does *not* accept that just because value in a wider sense is hard to quantify, it is therefore unimportant. Moreover, value is interpreted in the sense of a range of benefits to society –

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[2]   Carmona et al, 2001a, p 15. Equally, the costs of poor urban design (often deficiencies with mainly local impacts) may be externalised – often from a property to its close neighbours.

[3]   Leinberger, 2001.

[4]   Carmona et al, 2001a, p 14.

[5]   Other examples often cited are Vandell et al, 1989; Doiran et al, 1992.

[6]   Property Council of Australia, 1999, p 4, for example. Factors such as timing of development, mix of uses, and so on, may also have influenced value gains.

[7]   Vandell et al, 1989, cited in Carmona et al, 2001a, p 86.

[8]   Carmona et al, 2002c, p 145.

economic, environmental and social – although the time constraints on this project meant that not all aspects of these three dimensions of benefit could be fully explored.[9]

1.4 Scope

The scope of this project has been determined by the following considerations:

- The project was a relatively short one, carried out over a four-month period.

- The literature search focused on the last five years, but integrated seminal or important earlier work.

- The project could not review the full range of elements in the urban design literature, such as visual complexity and heritage. The focus has been selective, addressing the main issues of interest or contention. A number of issues omitted could merit further investigation, especially heritage.

- Key areas of interest or contention are those:
    - undergoing debate and also central to urban design activity
    - derived from the New Zealand urban design literature, such as the *Urban Design Protocol*, or *People + Places + Spaces*
    - raised in the international urban design literature, for example, the *Urban Design Compendium* (Llewelyn-Davies, 2000) and *The Value of Urban Design* (Carmona et al, 2001a).

1.5 How do the urban design elements relate to the Urban Design Protocol?

The urban design elements identified from the literature and analysed in *The Value of Urban Design* are subtly different from the urban design qualities identified in the *New Zealand Urban Design Protocol*. While the vocabulary used in this report is closely based on standard elements in the literature, there is a substantial degree of correspondence with the *Urban Design Protocol*. The following table shows the main relationships between the elements. For example, the discussion of 'Density' in *The Value of Urban Design* covers green space and the environmental effects of emissions, matters that are covered under 'Custodianship' and environmental responsibility in the *Urban Design Protocol*.

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[9]   For example, the literature on social equity impacts of urban form is only fleetingly discussed. See Syme et al, 2005, p 44, for further coverage.

Table 1: Relationship to the Urban Design Protocol's attributes and qualities

New Zealand Urban Design Protocol		The Value of Urban Design
Attributes of successful towns and cities	Urban design qualities: the Seven Cs	Key design elements
Competitive, thriving, creative and innovative	Creativity	High Quality Public Realm
	Connections	Connectivity
Liveable	Choice	Adaptability
		Mixed Use
		Density
Environmentally responsible	Custodianship	Density (including green spaces)
Opportunities for all	Collaboration	User Participation
		Integrated Decision-making
Distinctive identity	Character	Local Character
Shared vision and good governance	Context	Integrated Decision-making
		User Participation

1.6   Methodology

The key points of the method adopted in this project are as follows. An initial stage identified the claims for urban design value set out in three recent Ministry for the Environment publications:

- *People + Places + Spaces*

- *Creating Great Places to Live + Work + Play*

- *New Zealand Urban Design Protocol*.

These claims were taken as a provisional starting point, and an extensive body of overseas and (where possible) New Zealand literature was examined. The aim was to establish what sort of evidence the literature provided supporting or rejecting these claims. Literature reviewers looked specifically for links between urban design and economic, social/cultural and environmental outcomes.

A key part of the review was an assessment of the quality of the evidence available, using the categories Conclusive, Strong, Suggestive, or Anecdotal, and placing considerable weight on empirical findings:

- **Conclusive**: Consensus conclusions of top experts in the field; **or** objective evidence based on findings of *more than one empirical* study, reaching a clear and firm conclusion.

- **Strong**: Conclusions of a top expert in the field, supported by multiple citations; **or** some systematic objective evidence, especially a robust empirical study (quantitative or qualitative).

- **Suggestive**: Assertions from someone with standing in the field; **or** a collation of anecdotal evidence; **or** conclusions based on only a single empirical study of limited validity or restricted application.

- **Anecdotal**: Examples, assertions, observations – but not from a recognised expert or someone with standing in the field.

When the various findings were collated, a significant task was interpreting and judging the quality of the findings – for example, judging the combined impact of a group of mutually supportive findings. Important methodological caveats are:

- A scarcity of literature on an element of urban design does not necessarily mean that it is not valued; rather, it may reflect measurement difficulties or other factors.

- It is difficult to extract conclusions about certain design elements because they tend to be commonly found in combination with other features.

- The evidence is largely from overseas and, thus, although some aspects of urban design are universal, caution needs to be exercised in drawing conclusions for New Zealand.

2 Overview

2.1 Summary of findings

The following table summarises the principal findings from an extensive survey of writings and empirical studies of urban design. It focuses specifically on the elements of urban design about which there are 'useful' findings. Each finding is characterised in terms of the quality of the evidence it offers, using an asterisk system: *** conclusive, ** strong, * suggestive. This excludes findings that were classed as anecdotal. These findings are described in more detail in Section 3.

Table 2: Summary of findings about the key urban design elements

	Economic Value Findings	Social/Cultural Value Findings	Environmental Value Findings
Local Character	Attracts highly skilled workers and new economy enterprises*	Reinforces a sense of identity among the residents of a neighbourhood*	Supports conservation of non-renewable resources*
	Assists the promotion and 'branding' of cities and regions*	Encourages people to become actively involved in managing their neighbourhood*	
	Contributes a competitive edge by providing a 'point of difference'*	Offers choice among a wide range of distinct places and experiences*	
	Potentially adds a premium to the value of housing*		
Connectivity	Increases viability of local service shops and facilities**	Enhances natural surveillance and security***	Vehicle emissions are reduced through fewer non-work trips**
	Increases a site or area's accessibility, thereby enhancing land value**	Encourages walking and cycling, mainly for non-work trips, leading to health benefits**	
		Shortens walking distances, encouraging people to walk**	
Density	Provides land savings***	Is difficult to disentangle from the benefits of mixed use and other factors**	Reinforces green space preservation if linked into clustered form***
	Provides infrastructure and energy savings**	Can contribute to social cohesion**	Reduces run-off from vehicles to water***
	Reduces the economic cost of time allocated to mobility**	Tends to promote health through encouraging greater physical activity**	Reduces emissions to air and atmosphere**
	Is associated with concentration of knowledge and innovative activity in urban cores*	Enhances vitality*	May conflict with micro/local green space needs**

	Economic Value Findings	Social/Cultural Value Findings	Environmental Value Findings
Mixed Use	Enhances value for those preferring a mixed-use neighbourhood***	Improves access to essential facilities and activities***	Reduces car use for local trips (but minor impact on commuting) and hence emissions***
	Utilises parking and transport infrastructure more efficiently***	Provides convenience**	
	Increases viability of local service shops and facilities**	Encourages walking and cycling, leading to health benefits**	
	Significantly lowers household expenditure on transportation**	Reduces need to own a car**	
		Increases personal safety**	
		Can enhance social equity*	
Adaptability	Contributes to economic success over time**	Increases diversity and duration of use for public space***	Supports conservation of non-renewable resources*
	Extends useful economic life by delaying the loss of vitality and functionality*	Gives ability to resist functional obsolescence**	
High Quality Public Realm	Attracts people and activity, leading to enhanced economic performance***	Higher participation in community and cultural activities***	
	Public art contributes to enhanced economic activity**	Increased use of public space***	
		Gives greater sense of personal safety**	
		Attracts social engagement, pride and commitment to further achievements**	
		Public art contributes to greater community engagement with public space**	
Integrated Decision-making	Coordinates physical design and policy in related areas to ensure the benefits of good urban design are realised or enhanced**	Encourages people to take advantage of opportunities presented by good urban design**	
		Provides equity of opportunity for a range of people to benefit from good urban design*	
User Participation	Makes more effective use of resources***	Improves fit between design and user needs***	
	Offers process cost savings by encouraging user support for positive change**	Develops user ownership of positive change**	
		Enhances sense of community**	
		Enhances sense of well-being*	
		Legitimises user interests*	
		Enhances democracy*	

2.2 The overall value of urban design

To place findings about individual design elements in context, some general questions about the overall value of urban design are discussed with reference to the literature. This discussion serves as a preface to the fuller exploration in Section 3 of key urban design elements.

What is good urban design, and how do perceptions of urban design differ?

A task force set up by the former Australian Prime Minister[10] concludes that good urban design:

- demonstrates design excellence in urban development and architecture

- distributes benefits widely in the population

- produces environmental benefits

- responds to local features and needs

- is relevant to the contemporary world

- leaves open the possibility for continuing adaptation and change

- forges connections with the past.

Not surprisingly, different views and priorities exist among the potential assessors of urban design, with a gap sometimes arising between public and professional assessment of quality.[11] Architects and designers tend to be more concerned with design concepts and theories, ambience, character, image, symbolic significance and aesthetics generally ('cultural aspects'). These are matters addressed through critical discourse and professional judgement, and exemplified in case studies. Users and owners, however, are more interested in fitness for purpose, which they assess more pragmatically.

In practice, the way the two groups assess a number of aspects of urban design may not be so far apart. A study of 'common' urban design elements in the city of Brisbane – ranging across the aesthetics of historic buildings and streets, constraints on new buildings adjacent to historic buildings, the use of trees, retention of vistas, noise levels, air quality, glare and the provision of street furniture such as seats, surfaces and fountains – concludes that the 'gap' between the two groups is not highly significant.[12] A more recent study into assessment of the 'compatibility' and 'aesthetic success' of the design of new apartments on top of existing buildings in Wellington concludes that professional designers and the public made similar assessments.[13]

What features of urban design can contribute value to the community? Recognising both differences in perception, and areas of common agreement, the literature reviewed in this study suggests that a wide range of features influence good urban 'quality of life' outcomes. These extend from micro features, such as street design, through to macro features, such as patterns of land use and the shape of transport systems. Other significant features include the selection of

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[10]   Australian Prime Minister's Urban Design Taskforce, 1994.

[11]   For example, Giddings and Holness, 1996; Hubbard, 1996.

[12]   Holden, 1991.

[13]   Holden, 2004.

materials, massing and form of buildings, the design of elements at a range of scales (from street furniture up to urban landscape settings), and the layout of streets and spaces and their linkages.

An early and significant advocate of urban design, Jonathan Barnett, wrote that, "Design is a methodology that … can help solve some of the problems of misallocated resources, misused land and the unnecessary destruction of historic buildings."[14] More positively, urban design provides a means by which to bring together a wide range of factors affecting quality of life and – going beyond utilitarian value – gives us scope to introduce coherence and beauty into our towns and cities.

Is good design profitable to the developer?

The answer is a qualified 'yes'; good design can be profitable.

There is often a market demand for better design. The Property Council of Australia finds that, with good design, higher than normal returns generally do accrue to the developers themselves. In addition, the study finds that while developers can sometimes do well without good design, good design is, by and large, a good bet: "While good urban design by itself cannot guarantee positive financial returns, and lack of attention to good design principles can still result in a financially successful project, it is also clear that it substantially enhances a project's likelihood of becoming a financial winner."[15] Similarly, a study of Eastern United States apartment buildings finds that developers can typically gain higher rents, and frequently gain a profitable return, on good design (fairly narrowly defined). But this is by no means guaranteed.[16]

Looking at design more broadly, United States (US) studies – some of which present strong evidence – find that people are willing to pay a premium to live in a neighbourhood that combines mixed land use, good public transport, effective street design and other factors associated with 'New Urbanism', as opposed to living in conventional neighbourhoods.[17] For example, a US study suggests that, "If the product mix and architecture is correctly executed and phased, TNDs [traditional neighbourhood developments – i.e. developments following New Urbanist principles] can command base pricing levels that are 10 percent to 15 percent higher than conventional single-product projects."[18] Another US study reports that people will pay a price premium of about 15 percent to live in a New Urbanist (or neo-traditional) community over a comparable conventional suburban subdivision, although clearly not all households have such preferences.[19] The UK Commission on Architecture and the Built Environment (CABE) cites an exploratory study carried out by property consultants FPD Savills in 2002, which indicated that volume house builders who had invested in higher quality design in residential

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[14] Barnett, 1982, p 7.

[15] Property Council of Australia, 1999, p 3.

[16] Vandell et al, 1989, pp 235, 236.

[17] Plaut and Boarnet, 2003; Steuteville et al, 2001. New Urbanism is a particular US movement to reshape urban design, emphasising the re-building of community through design: see, for example, Loomis, 1999; Talen, 1999.

[18] Steuteville et al, 2001 pp 18–19.

[19] Eppli and Tu, 1999; cited also in Lang, 2005.

schemes could expect to yield a residual value per hectare of up to 15 percent more than conventionally designed schemes.[20]

Similarly, a persuasive study led by Carmona et al in London for CABE and the UK's Department of the Environment, Transport and the Regions (DETR), "consistently concluded that good urban design added economic value in the form of better value for money, higher asset exchange value and better lifecycle value".[21] These elements tend to accrue to the investor, especially if the investor retains a longer-term stake.[22] Other writers also note the longer-term returns from 'more progressive' design.[23]

Microeconomic theory suggests that the gains to investors from investing in 'higher quality' design may not necessarily be ongoing. In a competitive market, design innovations yielding higher returns will tend to be copied, with the supply of imitations reducing returns to normal market levels over time, ie, there will be initial first-mover (innovator) advantages, but not necessarily ongoing higher returns. The other side of this is that the market will tend to penalise what is then perceived as poor-quality design.

Good urban design takes a variety of forms and may appeal to a range of market segments and public tastes. In terms of the design of specific developments, the market is generally differentiated, so that developers who make an exceptional design contribution with a particular property may be appealing to a particular market (perhaps upmarket) niche. They may achieve a good return, on perhaps a slightly higher investment, but limited market size means not everyone can exploit this same market segment.[24] There may, however, be a demonstration effect that, subject to income constraints, tends to lift demand for high-quality design more broadly over time.

Does good urban design cost more?

Good design is sometimes more costly in the short term, but generally pays off over the lifetime of the building or place.[25]

Steuteville et al[26] in the United States note that while up-front planning costs may be higher for compact, mixed-use development, reduced infrastructure costs can make up for this. Overall costs do not rise as a result. In the United Kingdom, too, the CABE/DETR study finds that good urban design does *not* necessarily raise design or development costs, "good design is not necessarily expensive or unaffordable …".[27] Similarly, the Property Council of Australia notes:

> *… that the opposite [of higher cost] can be true. By and large, the design fee component of chosen projects does not vary greatly from general industry standards. And, judging from*

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[20]   Commission on Architecture and the Built Environment, 2002, p 5.

[21]   Carmona et al, 2001a, p 74.

[22]   Carmona et al, 2001a, p 75.

[23]   Leinberger, 2001.

[24]   Similarly, Lang (2005) notes that not everyone will pay more to live in a 'New Urbanist' development.

[25]   Leinberger, 2001.

[26]   Steuteville et al, 2001.

[27]   Carmona et al, 2001a, p 74; Worpole, 2000, p 25; CABE (2002) p 2.

the information available to us there is little evidence that better design takes longer to produce, in the sense of delaying the time required for good general development planning and project preparation.[28]

However, there is some evidence of higher *up-front* costs from various studies, including one from the United States, which finds that:

... developments that have pedestrian-friendly design features are more complex and costlier to build [in part due to local regulatory requirements]. To lenders, this translates into higher project risk and, therefore, higher lending rates ... The outcome is that builders often have trouble obtaining financing of any kind for novel projects that might include, for example, a mixture of uses or a pedestrian oriented design.[29]

Where benefits of good design accrue more widely, who benefits, and how?

The literature suggests that many benefits of good urban design accrue beyond the site. The combined weight of evidence, such as the CABE/DETR study, strongly supports the view that good urban design – providing it is sensitive to context[30] – adds 'spill-over' social and environmental value. Economists describe such benefits as 'externalities'. Conversely, the evidence shows that some poorly designed places and developments "limit the spread of social benefits … and may even create social (and economic) costs".[31]

Where urban areas have become run-down, the CABE/DETR study suggests that, "good urban design could confer social and environmental value and provide long-term economic spin-offs in the wider economy from regenerative effects".[32] The study goes on to note that private sector activity alone has great difficulty providing, "the full range of positive social impacts that well-designed development can deliver".[33] This underlines the point that because some of the benefits of good urban design accrue beyond the site, the market by itself will tend to under-provide it.

The Property Council of Australia notes that good project design need not generate wider benefits; to do so requires integrative and interconnecting design.

[G]ood urban design enhances a project's performance in itself as well as within its surroundings. Good architecture can mean greater longevity, better internal performance and higher symbolic and aesthetic value, but in itself cannot guarantee that the project connects well with its surroundings in the sense that it utilises the wider setting as an asset – and becomes an asset to its context in turn.[34]

If a design does ensure connection and supports local character, a range of benefits flow. Some are *economic*, such as increased attractiveness and competitiveness of the city. This is important in an age where knowledge workers and others are increasingly vital to economic innovation

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[28] Property Council of Australia, 1999, p 3.

[29] Frank et al, 2003, p 174; see also Worpole, 2000, p 25.

[30] Burayidi, 2001, p 63 stresses context-specific design.

[31] Department of the Environment, Transport and the Regions, 2000, p 43, and Carmona et al, 2000, p 78.

[32] Carmona et al, 2001a, p 74.

[33] Carmona et al, 2001a, p 78.

[34] Property Council of Australia, 1999, p 3.

and success; such workers are also more discriminating about the sort of city they wish to live in.[35] 'Quality of life' is increasingly the basis on which towns and cities compete for inward investment and population growth.[36] Other literature, such as the CABE/DETR study, points to the *social* value of greater city pride – social inclusiveness and wellbeing, increased vitality and safety, and the simple satisfaction gained by both residents and visitors from the availability of pleasant amenities and facilities.[37] There are also a range of potential *environmental* benefits – reduced emissions and energy use (also an economic gain), less diffuse run-off of polluted water, and improvement of derelict sites with brownfield redevelopment.[38]

The Australian Prime Minister's Urban Design Taskforce, mentioned above, emphasises the 'softer' benefits (among others) of good urban design. It concludes that:

> *The quality of urban design matters. It does so in terms of experience and meaning because of the messages and feelings different places provide us with; functionally, for the efficient and effective working of the city; socially, as a means of building equitably supportive towns and cities; and for the way it can strengthen economic life and competitiveness. Urban design gives us the tools with which we can consciously improve the quality of cities and regions.[39]*

Urban design features that help to achieve these gains include compactness, mixed land use, greater connectivity (including more accessible public transport and support for pedestrian and bicycle activity), reduced impervious surfaces and improved water retention, and safeguarding of environmentally sensitive areas. The US Environmental Protection Agency (USEPA) notes that, "[u]sed in combination, these practices can significantly reduce impacts to habitat, ecosystems and watersheds, and can reduce vehicle travel, which in turn reduces emissions of local, regional and global concern".[40]

If such features are to create real coherence and vitality, they need to be brought together so that they can act synergistically.[41] Features that interact to good effect include broader measures such as appropriate land use regulation, but also micro design measures at the street level – such as steps taken to enhance street safety or calm traffic. The EPA review mentioned above notes that multiple place-specific initiatives are required to achieve lasting social, environmental and economic benefits: "The effectiveness of good urban design practices depends on how well they are implemented, and how they are combined with other programs."[42]

Such initiatives need to operate at a range of scales, from the wider city or region down to the neighbourhood or site. This is particularly true of transport arrangements, which are so pervasive in relation to urban design, but it also applies to other cross-cutting initiatives, such as ensuring the quality of green areas.[43]

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[35] Florida, 2002, p 95; Planning Institute of Australia, 2004, Appx A, p vi; Worpole, 2000, p 19.

[36] Worpole, 2000, p 36.

[37] Carmona et al, 2001a, pp 78, 79.

[38] Carmona et al, 2001a, p 79.

[39] Australian Prime Minister's Urban Design Taskforce, 1994, p 7.

[40] United States Environmental Protection Agency, 2001.

[41] This is also the implication of Williams et al, 2000, p 355.

[42] United States Environmental Protection Agency, 2001.

[43] Greater London Authority Economics, 2003; Carmona et al, 2004.

3 Findings

3.1 Local character

Introduction

Local character is one of the generators of urban design. Virtually every manifesto, charter, normative theory or statement of design principles advocates maintaining or enhancing local character. The following examples illustrate broad consensus on this point:

- Good urban design includes "responsiveness to important qualities in the urban and landscape context as well as valuable historical characteristics".[44]

- One of the first principles of urban design is to "[promote] character in townscape and landscape by responding to and reinforcing locally distinctive patterns of development and culture".[45]

- Sustainable urban design "[r]espects and enhances existing cultural heritage and communities". It produces "distinctive places" that "foster a strong sense of community, pride, social equity, integration and identity".[46]

In recognising the importance of character, urban design also acknowledges that it is beneficial for places to have different physical and social characteristics. The value derives from distinctiveness itself. In this sense, character can be distinguished from the individual attributes that constitute it: density, connectivity, scale, use. While each of these qualities may be advantageous in its own way, 'character' describes the additional benefit that results when such qualities combine to create an easily recognisable identity. So, character results from an amalgam of features, and combines built form with the people and activities that occupy a particular location.

The desire for coherence in neighbourhood character underpins design controls in many parts of cities and towns in New Zealand and elsewhere. Such controls are generally driven by the community's desire to retain a valued sense of place. References to existing character may be also understood as society's need for "stability and reassurance in the face of environmental changes".[47] However, a belief in the value of local character does not always compel urban designers to replicate existing conditions. Sometimes, it is just as important to add new elements to the built environment and to stimulate the development of a 'future context'. This evolution is critical because cities constantly reinvent themselves. Urban design needs to keep pace with this evolution in order to remain responsive to "new cultural, technical or economic pressures".[48] Several authorities[49] suggest that overly restrictive design controls, especially those

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[44]   Property Council of Australia, 1999, p 3.

[45]   Carmona et al, 2002a, p 66.

[46]   Commission of the European Communities, 2004, Annex 2, p 46.

[47]   Costonis, 1989, p xv.

[48]   Tesdeorpf et al, 1997, p 16.

[49]   Scott Brown, 1990; Boyer, 1994; Moore, 2003.

that require particular stylistic solutions, are inappropriate because they inhibit the evolution of architecture's expression of contemporary culture and, as such, are detrimental to cultural development.

Neighbourhood character

Though place-specific identities may be defined at city-wide or even regional levels, support for local character is strongest at the scale of individual neighbourhoods. Indeed, it is possible to describe 'neighbourhood character' as the prime example of this design principle.

Neighbourhood character is important because urban neighbourhoods, as well as being functional units, provide an important source of "identity" or "meaning" for their residents.[50] Paraphrasing Amos Rapoport, Gharai writes: "the availability of local areas and the ability of people to personalise at the group and individual level will help them to establish group identity and express their preferences, perform their proper activities and create noticeable differences and complexity in the cities". According to Rapoport, these deliberately made differences help people to orient themselves within cities. By reinforcing the cultural differences between one locality and another, variations in character increase opportunities for self-expression and make available a wider range of experiences.[51]

Gharai takes this argument further, suggesting that neighbourhoods counteract the "gigantism" of the metropolis, and "protect" their residents from the "hazards and inconveniences of the city". In other words, the neighbourhood mediates between the individual and the metropolis, making urban life more attractive. This effect is supported by what Gharai calls the "implicit belief that localism and smallness are associated with higher quality of life". So a recognisable neighbourhood has the potential to provide "a small town feeling" even in the largest city.[52]

Several authors suggest that a strong sense of neighbourhood identity encourages residents to become more actively involved in managing the urban environment. For example, Oktay writes that the neighbourhood is "a vehicle for strengthening bonds between residents and those between them and their environment",[53] and others concur: "[Neighbourhoods] facilitate people's participation in the management of their residential environment."[54] The Campaign to Protect Rural England (CPRE) regards such an engagement as essential because, from its perspective: "Understanding the local significance of the historic environment is by definition a collaborative endeavor." The distinct character of places is a "shared concern" and, as a result, decision-makers must have access to a "shared knowledge base" created by local communities as well as specialists.[55]

It is possible that neighbourhood character has diminished in importance with the growth of personal mobility and other forms of communication. These innovations have created "more heterogeneous" communities that may be less distinctive from one another because of their

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[50]   Gharai, 1998, p 3.

[51]   Tesdeorpf et al, 1997, p 7.

[52]   Gharai, 1998, p 4.

[53]   Oktay, 2002, p 262.

[54]   Gharai, 1998, p 6.

[55]   Garthorne-Hardy, 2004, p 28.

polyglot composition. In addition, communities of interest have substituted for many place-based relationships. This causes some authors to conclude that, while neighbourhoods remain important for day-to-day services, they no longer provide an important context for social contacts.[56] Southworth doubts that the decline in neighbourhood significance can be reversed by clever urban design. Referring to 'New Urbanist' creations such as Seaside and Celebration, he writes: "The assumption that neighborly looking streets and spaces will generate community life runs through New Urbanist literature … Taken at face value, this environmental determinist stance runs counter to most environment/behaviour research over the past 40 years."[57]

However, a contrary view is advanced by other authors who argue that, "a strong sense of community [still] exists in well-defined city neighbourhoods". Jane Jacobs contends that: "even the most urbane citizens do care about the atmosphere of the street and district where they live" and "depend greatly on their neighbourhoods for the kind of everyday life they have".[58] The continued relevance of neighbourhoods and neighbourhood character may help to explain why two independent studies found that people place more importance on the quality and appearance of their neighbourhood than they do on their own homes.[59] It also suggests that an enduring preference for clearly defined neighbourhoods accounts for the popularity of the neo-traditionalist and New Urbanist planning movements.[60]

An interesting objection to local character is that it promotes social segregation, particularly when differences between one neighbourhood and another reflect spending patterns. Because "[n]ot all [citizens] … are part of this consuming society" the commercial component of neighbourhood character can encourage "new forms of social exclusion".[61] However, such exclusionary differences are not necessarily commonplace.

Heritage character

Heritage provides a second important source of character. *The Value of Urban Design* does not attempt to survey the extensive literature that exists on this subject. However, the importance of architectural heritage and, more generally, the value of 'old buildings', are recurring themes in urban design. For example, DETR finds that historic buildings make "a great contribution to the character, diversity and sense of identity of urban areas".[62] This attribute implies more than a memorable or attractive appearance. According to Gathorne-Hardy, built heritage is also an important repository of knowledge:

> *… the historic environment shapes how we live our lives as individuals, households and communities. It represents a truly invaluable storehouse of information, knowledge and understanding about why people and places are like they are and offers insights into what they could become.*[63]

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[56] Gharai, 1998, p 3.

[57] Southworth, 2003, p 214.

[58] Jacobs, 1961, quoted in Gharai, 1998, pp 3–4.

[59] Gharai, 1998, p 1; CABE, 2002, C6.

[60] Gharai, 1998.

[61] Thorns, 2002, p 147.

[62] Department of the Environment, Transport and the Regions, 2000, p 72.

[63] Gathorne-Hardy, 2004, p 9.

These qualities stimulate economic revitalisation: "Small-scale improvements" to an area's historic urban fabric can generate "a market-led return to urban living, supporting existing communities and adding to the [local] economic base."[64] Older "character" buildings and precincts may have acquired greater economic value in recent years because they fit the smaller business units (or "modern workplaces") of the 'New Economy'. For example: "Small software companies seem ideal for fitting into old, oftentimes eccentric downtown space."[65] However, the match between heritage and high-tech does not depend solely on a preference for smaller floor plates. Older buildings are also favoured because they are distinctive, and are often part of a highly differentiated locality. For instance, not only can software-related companies fit into smaller urban spaces, but the people who populate them are often not attracted to massive office developments. Another author sees older buildings as a point of difference, which assists established urban centres to compete with new suburban developments.[66]

Respect for local character may lead to more responsible use of non-renewable resources. Existing urban environments represent enormous investments of physical resources that societies can ill afford to discard. The Campaign to Protect Rural England refers to the historic fabric of the built environment as "an incalculable mass of material and energy to be conserved and re-used with care".[67] Conservation is more likely if new development acknowledges existing settlement patterns. Indeed, CPRE argues that the "landscape and form of settlements" should be part of the planning framework for future resource use.[68]

Although CPRE presents a strong case for retaining older buildings, functional issues such as operational efficiency and maintenance must also be taken into account (see Section 3.5 Adaptability). A CABE/DETR study identifies another potential cost associated with retaining heritage character. It finds that conservation controls "raise design times, construction costs (through higher quality materials and finishes) and therefore overall development costs, as well as the time taken to secure detailed consents".[69]

Increased choice

Distinct localities add variety to a city, and help to satisfy a growing preference for diversity over standardisation. The demand for differentiation and choice may be prompted partly by new demographic patterns and more intricate career paths. "Not only is today's workforce more diverse by typical measures – gender, age, race, ethnicity – but people no longer experience life in lock-step, predictable patterns. Diversity and complexity shape daily life … Not only do people *need to choose among* many options for living and working, but they increasingly value *having a choice.*"[70]

Thorns agrees that the modern appetite for choice is a response to economic factors. However, he thinks that increased differentiation stems from the post-industrial preoccupation with

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[64]   Department of the Environment, Transport and the Regions, 2000, p 72.

[65]   Henton and Walesh, 1998, pp 17, 18.

[66]   Robertson, 2001, p 16.

[67]   Gathorne-Hardy, 2004, p 9.

[68]   Campaign to Protect Rural England, 2004, p 9.

[69]   Carmona et al, 2001a, p 77.

[70]   Henton and Walesh, 1998, p 19.

consumption rather than production. "Distinctive consumer cultures" have emerged and, as a result of the fragmentation of markets, consumers possess a greater degree of "individual agency" than they had previously.

Differentiation of value can occur at both the local level and on a wider scale. A UK survey of 600 households on a large suburban housing estate that had "little or no distinctive design quality" found that these houses were harder to sell than those on "more distinctively designed developments".[71]

At a wider level, because consumers are better able to "craft … [a] sense of identity", cities have become imprinted with a wider variety of taste cultures.[72] According to Thorns, "[c]hoice, and the freedom and opportunity that this is seen to bring, can improve the well-being of individuals. This in turn encourages the differentiation of culture rather than the blandness of conformity attributed to modernism and mass-commodity production".[73] In fact, the New Economy's emphasis on niche production and marketing allows whole communities to "define what they want to be", and to make this decision in response to local "history and values".[74]

In this commercial environment, variety itself becomes an economic asset: "At the local level, the preservation of difference has become valued, sometimes as a commodity to sell, through the rediscovery of heritage sites [and] the conservation and recreation of the past."[75] Thorns links the "emphasis upon heritage, culture and the uniqueness of the city" to a need for "images and branding".[76] A distinctive local character can strengthen these promotional messages, which may be pitched at residents as well as visitors and investors. "Place promotion is in part a process whereby cities, regions and countries are imbued with new meanings and sold through the agency of advertising, packaging and market positioning."[77] In this process, the landscapes, social practices, buildings, residents, symbols and meanings of places are potentially available for sale to investors and tourists. Place promotion also includes a representational element directed at local residents. "Positive images of places are created by local government agencies and private-sector boosters which are designed to encourage the locals to feel good about their home towns and the quality of life that can be had there."[78]

The benefits of differentiation apply to regions as well as individual neighbourhoods and cities. "[The] New Economy values choice among regions that provide distinctive habitats … Regions participate in the New Economy by creating distinctive habitats that can grow high-value businesses." Like successful companies, "regions develop niches where they can sustain competitive advantage".[79] This view is reiterated in *Canada's Urban Strategy*, which states, "Urban regions should be a blend of distinct communities – centres within centres, villages within cities – with unique economic, social and cultural characteristics. They will become the

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[71]   University of Bristol, cited in CABE, 2002.

[72]   Thorns, 2002, p 121.

[73]   Thorns, 2002, p 128.

[74]   Henton and Walesh, 1998, p 16.

[75]   Thorns, 2002, p 10.

[76]   Thorns, 2002, pp 125–126.

[77]   Thorns, 2002, p 144, citing Britton 1991.

[78]   Thorns, 2002, p 145.

[79]   Henton and Walesh, 1998, p 20.

focal points for interaction and enterprise within the larger regions, all with their own purpose, flavour and community pride."[80]

Facilitating redevelopment

Designing in sympathy with local character may facilitate the introduction of more compact dwelling types that could otherwise encounter resistance from host communities. Danielsen and Lang contend that new housing is more likely to be accepted by neighbours and purchasers if its layout and design acknowledge local building traditions. They write: "[Housing designs] that reflect local traditions also enhance the value of higher-density developments. Projects that fit their surrounding are an easier sell – both to local officials and consumers – than those that seem out of context." According to these writers, acknowledging local patterns is particularly important for affordable housing projects in suburban locations. In this context: "Higher-density developments gain better acceptance to the extent that they resemble modestly sized versions of single family homes found throughout the community."[81]

Conclusion

Good urban design supports local character. When urban neighbourhoods possess distinctive physical and social characteristics, residents benefit from a clearer sense of personal identity, and may be more inclined to become actively involved in managing the environment. Evidence suggests that characterful neighbourhoods are valued by their inhabitants. People may even be prepared to pay more to live in such locations. Historic buildings and precincts containing older buildings provide a particularly strong local image. These areas seem to have special appeal to small high-tech enterprises and footloose knowledge-workers of the New Economy. Increasingly, people appreciate having access to a range of distinctly different places. This preference appears to be part of a more widespread demand for a greater choice of commodities, work patterns and lifestyles. Urban design supports choice by maintaining or enhancing the features that make one place different from another. Taken together, these benefits mean that it is easier to promote or 'brand' cities and regions that have within them very distinct localities.

3.2   Connectivity

Introduction

The physical conditions that give access are a combination of urban structure (with connectivity being a key factor), quality of space, and the relative proximity of activities and destinations. Some urban design literature and research focuses on connections at the scale of the region and city. However, most relates to connectivity of the neighbourhood structure. The following discussion covers both these areas of research, with greater focus on the latter. Another kind of connectivity considered in the literature is that between the public and private realm, at the level of individual site development. Research canvassed here relates to safety.

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[80]   Prime Minister's Caucus Task Force on Urban Issues, 2002, p v.

[81]   Danielsen and Lang, 1998, p 24.

Regional and city-wide considerations

At the regional, city, town and neighbourhood levels, urban design research on connections relates to the connectivity or 'permeability' of the urban structure.

The real estate agent's insistence on the importance of 'location, location, location' is supported by the research on accessibility and connectivity. Competitive cities tend to have high transport connectivity, both externally (to other regions and cities) and internally. This facilitates efficient access, for both individuals and organisations, underpinning economic activity. It is also clear that further research is needed to refine understanding of the links between city competitiveness and transport connectivity.[82]

Sources, including Klaasen and Jacobs,[83] indicate that the economic value of land is influenced by the relative location of various activities, and better connections and accessibility will enhance the value of a location relative to others. Distribution-type businesses place a particular premium on accessibility, and will be attracted by peripheral or city fringe locations because of the congestion suffered by some city centres.[84]

But while highway projects at the periphery, and the resulting development this generates, may create local benefits – such as higher land prices, greater employment and population growth – they can also impose costs in other parts of the town or city. Findings show these costs may include greater social isolation and inequity, increased air pollution and traffic congestion, and a general weakening of the potential benefits of central city agglomeration.[85] For example, an unrestricted choice of location for shopping centres and leisure developments was shown to be unsustainable in one UK study because of negative effects on the city as a whole.[86] This is one example of the ways in which transport activity can impose significant 'external costs' on parts of society.

Other evidence suggests that poor connectivity at the larger spatial scale imposes costs. A CABE/DETR study notes that poor connectivity and infrastructure limits investment opportunities and "imposes costs which later have to be borne by public and private stakeholders, although original developers have often moved on". [87] The same study also observes that "introspective, exclusive and disconnected urban environments ... limit the spread of social benefits from development and may even create social (and economic) costs". For example, a US study shows that suburban sprawl increasingly isolates the growing minority and immigrant populations in North American inner city and older suburbs "from the new job and housing opportunities in the outer suburban ring". [88] While the evidence indicates that connectivity and the accessibility it brings generally confer benefits at a regional scale, it is equally clear that connectivity must be closely tied to land use planning.

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[82] Parkinson et al, 2004, p 58; Office of the Deputy Prime Minister (ODPM), 2003, Section 3.

[83] Klaasen and Jacobs, 1999.

[84] Landry, 2004, p 29.

[85] Commission of the European Communities, 2004, pp 25, 26; Boarnet and Haughwout, 2000, pp 13, 15.

[86] Department of the Environment, Transport and the Regions, 2000, pp 43, 45.

[87] Carmona et al, 2001a, pp 77, 78.

[88] Yaro, 2001, p 138.

Connectivity and implications for vehicle use

Of the primary modes of transport, the car is the dominant means of travel for most urban trips other than highly local, short trips. Under optimum conditions, the car gives valuable mobility. Cars can provide good access even when an urban area lacks the interconnection necessary for walking and cycling. Under free-flowing traffic conditions, it takes little extra time and effort to travel by car around a large block, or along a tree-like hierarchy of roads, conditions that make walking or cycling more difficult. But many observers, including the US Environmental Protection Agency,[89] note that the mobility offered by the car, especially if tied to hierarchical patterns of suburban design, comes with significant costs. These include the time it takes to travel to distant destinations, particularly where congestion occurs; environmental degradation; energy costs and fossil fuel dependence; and poor community health as a result of people's inability to integrate physical exercise into their daily routines.

Neighbourhood connectivity and its impact on walking and cycling

The evidence shows that a well-connected network of neighbourhood streets encourages walking and cycling.[90] People are generally willing to walk or cycle a limited distance to reach a destination, and a relatively well-connected (or 'fine-grained') network of streets allows a greater range of destinations to be within comfortable walking or cycling distance from any point in the neighbourhood. Internal connectivity, therefore, can dramatically shorten walking distances and provide convenient foot and cycle access to recreational and community facilities.[91]

Cyclists also gain access benefits from appropriate connectivity. Frank et al cite studies of cycle use in 18 US cities, in Delft and in the German cities of Rosenheim and Detmold.[92] All demonstrate links between the structure and design of the cycle network and cycle mode share. The studies indicate that increased cycle use can be fostered with design improvements, sometimes despite an increase in car ownership. These findings are significant, because they show a combination of connectivity and sensitive public space design can encourage some people to change their mode of transport – at least for predominantly local trips.

People might change their long-distance travel and commuting habits if the built environment provides opportunities for mode change, but are more likely to increase the amount of time they spend walking or cycling to local destinations. One study[93] of walkable environments found a 10 percent increase in the rate of walking for shopping trips and access to transit stations relative to the rate in car-oriented developments. The study noted also that this finding contravenes conventional wisdom about shopping being necessarily 'heavily auto-oriented'.

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[89]   United States Environmental Protection Agency, 2001, p 25.

[90]   United States Environmental Protection Agency, 2001, p 71; Frank et al 2003, pp 132–135.

[91]   Pickrell, 1998, p 15.

[92]   Frank et al, 2003, pp 134, 135.

[93]   Cervero and Radisch, 1996, p 140.

There is some counter-evidence[94] that suggests that grid street patterns might increase vehicle trip generation. But Frank and Engelke[95] cite evidence that suggests that after controlling for other factors, neighbourhood street pattern had no effect on pedestrian or car travel; they specifically criticise studies for not taking into account the effect of micro-scale design attributes that influence people choosing to walk. Frank and Engelke also suggest that when convenient connections are made, following microeconomic theory, the utility of walking or cycling relative to driving is increased. This is likely to lead to both reduced vehicle dependence and increased physical activity.

Quality of public space and walkability

To provide connections that simply allow through-access for pedestrians is insufficient. A considerable weight of evidence[96] indicates that there must also be attention to the quality of those connections if they are to attract use. A high quality environment increases the likelihood that people will walk, to work or anywhere else. One condition is that connections "must be visible, otherwise only people who already know the area can take advantage of them."[97] Frank and Engelke[98] demonstrate that moderate physical activity is increased most efficiently in environments where traffic calming strategies both reduce traffic speeds and create conditions that encourage walking and cycling. At the same time, quality spaces and routes enhance enjoyment and quality of life.[99] Other research also supports the converse claim: that activity is discouraged where there are poor footpaths and bad lighting, and a perceived lack of safety, both from accident and crime, and particularly for women and children.[100] The importance of safety – both perceived and actual – is emphasised as a necessary condition if walking is to be encouraged.

Connectivity and health

There is strong evidence of the adverse community health effects of patterns of development that encourage excessive car use, cause pollution and lead to reductions in daily exercise. Vandegrift and Yoked provide strong evidence that new location patterns caused by suburban sprawl are an important cause of rising obesity rates.[101] Another US study showed that for some ethnic groups, "[e]ach additional hour spent in a car per day was associated with a 6% increase in the likelihood of obesity".[102]

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[94] For example, Crane and Crepeau, 1998, pp 226, 227.

[95] Frank and Engelke, 2001, p 214.

[96] For example, USEPA, 2001, p 71; Craig et al, 2002, p 39; Giles-Corti and Donovan, 2002, p 1806; Jackson and Kochtitzky, 2001, p 8.

[97] Bentley et al, 1985, p 12.

[98] Frank and Engelke, 2001, p 214.

[99] Gharai, 1998, p 4; Gehl, 2001.

[100] Kjellstrom and Hill 2002, p 32 citing the Hillary Commission.

[101] Vandegrift and Yoked, 2004, p 221.

[102] Frank et al, 2004 p 87.

Gains in physical activity engendered by a better designed urban environment are important given that the World Health Organization[103] provides conclusive evidence of the significant health benefits from regular sustained physical activity. A lack of exercise, pollution, and social isolation are all "factors which have been found to be associated with higher mortality and morbidity in the elderly".[104] Other research reinforces that commuting by walking or cycling improves health outcomes,[105] and also that physical activity is more likely to be adopted and sustained when it is "integrated into the routines of everyday life".[106]

The question here, however, is how important connectivity is in fostering physical activity and hence health gains. Viewed conservatively, where increased neighbourhood connectivity encourages a switch from car use to other modes for commuting, there are likely to be moderate health benefits. For example, Frank et al have conclusively shown that modest design differences among neighbourhoods can translate into significant population-level health differences.[107] But connectivity is only one of several factors (including density and mixed use) influencing neighbourhood walkabilty. In addition, people derive health benefits from being able to walk and cycle around the local neighbourhood even if they continue to use their car for trips at the regional scale.[108]

More research is required to fully isolate the impact of connectivity – as distinct from the joint impact of structure, mixed land use and density – on people's choice of transport mode.

For example, there is a complex interrelationship between connectivity, mixed use and travel behaviour. A combination of connectivity and mixed use that places local facilities and activities within walking distance influences mode choice. A study by Moudon et al found: "neighbourhoods with greater connectivity and (urban) facilities generated higher pedestrian traffic volumes than those with poorer levels of connectivity and poorer (suburban) facilities …".[109] Several studies also show that while the physical environment is important, it is secondary to individual and social environmental determinants in influencing exercise.[110] Clearly, a combination of social and physical environmental factors influences the likelihood of walking and physical activity.

Connectivity and safety

Conventional wisdom suggests that restricting public access – specifically by the absence of interconnection at the neighbourhood structure level – enhances safety. This contention may

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[103]   Dora and Phillips, 2000, p 67; see also Hou et al, 2004, p 862.

[104]   Dora and Phillips, 2000, p 67.

[105]   European Union Environmental Council, 2004, p 4; Frank and Engelke 2001, p 214.

[106]   Kjellstrom and Hill 2002, p 32, quoting the Hillary Commission.

[107]   Frank et al, 2005, p 123.

[108]   Crane and Schweitzer 2003, p 243. Regular local physical activity is supported by the United States Department of Health and Human Services, 2003, p 1.

[109]   Frank et al, 2003, pp 132, 133; Mouden et al 1997 p 48.

[110]   Stahl et al, 2001, pp 3,7; Giles-Corti and Donovan, 2002, p 1793.

well be influenced by Oscar Newman's theory of 'Defensible Space' and the idea of 'territoriality', but it is not supported by recent empirical research.[111]

At the neighbourhood scale, patterns of burglary are strongly linked to the street structure, and studies show that areas that are well-connected and visible have a significantly *reduced* risk of burglary.[112] Large-sample empirical studies carried out in the United Kingdom and Australia conclusively contradict the idea that spatial segregation and separation are desirable and show that long and complex cul-de-sac arrangements lead to an increased safety and security risk. They also support Dovey's contention that enclosure and segregation in fact redistribute danger and diminish people's willingness and capacity to deal with it.[113]

This finding reflects the fact that connectivity allows people and places to benefit more from natural surveillance, where, because of 'eyes on the street', "people feel safer and criminals feel exposed".[114]

The research emphasises that social factors are also relevant in understanding crime. Furthermore, a number of macro- and micro-scale design factors have been shown to work together in reducing vulnerability.[115] Burglars in any area will select the most vulnerable target from the local menu: the effects of connectivity and degree of exposure to view are only two of the relevant factors in their choice.[116] If there is too much connectivity, spaces may be created that become more vulnerable due to low use and consequent reduced 'natural surveillance'. The evidence conclusively demonstrates that "… 'access-without-use' increases risk, but access with good potential use … should always be created". [117] Dwellings that adjoin pedestrian footpaths connecting cul-de-sac heads tend to have the highest risk of burglary.

Current research and practice[118] also maintains support for the benefits of natural surveillance promoted by Jane Jacobs in the 1960s, and that are an important plank in Oscar Newman's theory. A strong distinction between the public and private realm – ensuring all users of the public environment are aware of the expectations and conventions of access to any space – remains important. This contributes to safety and security at the level of the individual site.[119]

Visual connections and safety

There is conclusive evidence about the safety and security benefits of building fronts with entrances and windows (that is, 'active edges') facing the street. This 'inter-visibility' is important, and significantly lower burglary rates were found where houses face the entrance of other houses. Houses with high front boundary walls were shown to be more vulnerable to

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[111]   Shu, 2000; Space Syntax, 2001.

[112]   Shu, 2000, p 177; Space Syntax, 2001, p 3.

[113]   Dovey, 2000, p 12.

[114]   City of Gosnells, 2001 pp 7, 14.

[115]   Hillier, 2004, p 31, Llewelyn-Davies, 2004, pp 16–20.

[116]   Space Syntax, 2001, pp 4–8, 14, 27, 39.

[117]   Space Syntax, 2001, pp 7, 8.

[118]   Llewelyn-Davies, 2004, pp 24–29.

[119]   Eben Saleh, 2001; Hillier et al in City of Gosnells, 2001.

burglary than those with lower walls that allow views across.[120] Shu's major empirical study in the United Kingdom found that streets characterised by active edges had a burglary rate less than a third of that on streets with inactive frontages.[121] Shu also found that houses on streets accommodating cars and pedestrians had a burglary rate less than half that of pedestrian-only streets.

Conclusion

Connectivity at the regional scale is necessary for cities to be economically competitive. However, the provision of access needs to be carefully managed to ensure that peripheral connectivity does not undermine the overall urban form, and that a net benefit for the region is achieved.

Connectivity of the neighbourhood street system is essential if walking and cycling are to be encouraged, and the significant public health benefits of even moderate physical activity are to be gained. An appropriately interconnected street network structure, allied with good-quality public space design, provides conditions that encourage walking and cycling for local trips, and leads to health benefits. Conversely, lack of connectivity is linked to vehicle dependence and consequent significant public health risks.

Lack of connection and segregation – both of a new neighbourhood from surrounding areas, or of a dwelling from its neighbours – is shown to have negative effects. These range from vehicle dependence and social isolation, at the neighbourhood level, to increased risk of burglary at the site level.

3.3 Density

Introduction

Often it is the densest parts of cities that have the greatest vitality and sense of excitement. Cities typically offer specialised and valuable facilities, opportunities and choices and would not exist in the absence of what economists call 'economies of agglomeration'– the benefits arising from people being close enough to readily access or exchange ideas, goods or services, for business or for pleasure. This exchange is facilitated by density. City centres tend to be dense, with high land values, because they are the most effective places to conduct business, or because they offer convenient services to many users. Reflecting land market demand, densities and property values usually fall with distance from the city centre or from nodes such as transport interconnection points. At the same time, there is a tension between the benefits of maintaining the population at or near the city core, and the problems caused by that density in terms of congestion, noise and other externalities.[122]

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[120] Space Syntax, 2001, pp 4, 5.

[121] Shu, 2000, p 185.

[122] For example, odour, possible contamination, White, 2002, p 32.

Does good urban design necessitate a high density of buildings and public spaces, or are there benefits in less compact urban configurations? Is there evidence that denser urban configurations are likely to offer higher overall value (private and public) to their communities? Or does the evidence suggest that less dense cities are equally valued by their citizens? Possible benefits and costs of density are analysed and the public element of value (the 'externalities') is emphasised. The central question is whether there are 'value' benefits in more compact development than the market would otherwise provide.

Transport and communication links

Urban densities vary hugely. Some vibrant European cities such as Barcelona have an average density of about 400 dwellings per hectare.[123] Generally, cities in the United States, Australia and New Zealand have much lower densities, including dispersed suburban areas with only a few dwellings per hectare.[124] More dispersed cities developed in the age of cheap fossil-fuel based transport, and after most western cities adopted zoning restrictions to separate land uses, and push commercial and industrial activity out of the city core.[125] Dispersion has been driven partly by *non*-economic factors too – for example, open green spaces are valued for the greater privacy and contact with nature they provide.[126]

A view of some US writers is that density is costly,[127] especially as the price of communication falls over time: "High rise or concentrated settlement is costly and only worthwhile if transport or communications costs are high"[128] and "the economic and resource 'efficiency' of compact development has never been adequately demonstrated".[129] However, other writers point to the time costs of 'sprawl' (low-density peripheral urban development). For example, an Italian study concludes that diffuse, sprawling development is associated with higher economic (and environmental) costs of mobility – especially time allocated to mobility (and environmental impact of the mode).[130]

But even if market pressures drive sprawl as communication costs fall, is there evidence of negative externalities of dispersed settlement? Conversely, is there evidence of 'external benefits' of greater density?

A recent study by the Organisation for Economic Cooperation and Development (OECD)[131] reinforces the importance of city and town centres to regional and local economies. Similarly, the UK's Office of the Deputy Prime Minister states: "The weight of research evidence which

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[123] Urban Task Force (UK), 1999, p 59.

[124] Northwood's (Christchurch) density is reported to be 9.5 units/ha, while Manson Development's terrace housing in Takapuna (Auckland) is 55 units/ha; Ministry for the Environment, 2005b, pp 77, 84.

[125] White, 2002, p 32 and Frank et al, 2003, chapter 2.

[126] Bentley, 1999, pp 200, 201.

[127] Williams, 2000, p37 notes that intensification of a city centre can lead to congestion/traffic nuisance.

[128] Gordon and Richardson, 1997, p 100.

[129] Gordon and Richardson, 1997, p 99.

[130] Camagni et al, 2002, p 214.

[131] Organisation for Economic Cooperation and Development, 2003, p 18.

demonstrates the pivotal role of cities in advanced economies also shows that the concentration of knowledge and innovative activity in urban cores potentially goes with the grain of wider policy goals for greater urban densification ... ."[132] Higher densities, such as found in town or city centres, provide exceptional access to office and retail employment (even if not to other more specialised occupations).[133]

It is difficult, however, to disentangle the benefits of such concentration from the advantages of other urban design features, such as mixed use.[134] The New Economy hubs described by some authors combine both density and a high degree of mixed use and amenity.[135] Factors such as the availability of affordable housing in central city areas can also make a difference to whether businesses can attract employees, remain competitive, and therefore stay close to the centre.[136] Perhaps because of interaction effects, there is also some evidence that there is a 'non-linear' relationship between density patterns and use of active travel options such as walking. The influence of increasing density on travel choices may be felt only "when a certain critical mass of people and destinations is reached. At this point, synergistic effects may begin to occur, wherein transit becomes more viable, walking and cycling are feasible, and driving may become much more expensive due to the cost of parking and other factors".[137]

Other resource costs

High land prices in dense cities provide the impetus to economise on land resources,[138] but savings also occur in other resources such as infrastructure and energy. A UK study suggests that, "real land economy gains are significant" when housing concentrations are increased "… from low to medium densities [eg, 35–40 dwellings per hectare]".[139] Beyond such densities, further land savings offer diminishing returns.

Infrastructure savings from higher density, for example, savings in roads, water mains, sewerage systems and schools, have also been shown to be significant, although infrastructure costs may start to rise again at very high densities.[140] Services infrastructure – sewers, water, gas and power – in the established inner suburban areas of towns and cities was often originally designed for higher population densities than now exist. In Brisbane, there has been a typical drop in the rate of household occupancy from approximately 4.8 persons per household in the 1950s to 2.5 in 2000. Brisbane City has sought to increase the utilisation of its existing services through an urban intensification strategy that includes permitting a second dwelling on sites,

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[132]   Office of the Deputy Prime Minister, 2003, Executive Summary.

[133]   Williams, 2000, p 40.

[134]   Alexander and Tomalty, 2002, p 405.

[135]   Henton and Walesh, 1998, p 24.

[136]   Danielsen and Lang, 1998, pp 23, 27.

[137]   Frank et al, 2003, p 148, citing also a study of Seattle neighbourhoods by Frank and Pivo, 1995.

[138]   United States Environmental Protection Agency, 2001, pp 39, 40, 42; but note dissenting views of Gordon and Richardson, 1997.

[139]   Urban and Economic Development Group, 2000, s B5.4.

[140]   Buxton, 2000; USEPA, 2001, pp 39, 44; Ewing, 1997, pp 115, 116; but note a dissenting view in the New Zealand context – Hill Young Cooper Ltd, 1997, pp 26, 32.

introducing mixed-use zoning and multiple-residential zoning in nominated areas.[141] Optimising existing services with increased density may offer cost savings for other cities.

Cumulatively, there is strong evidence that higher density yields energy savings, essentially through fewer, and shorter, vehicle trips. Increased density and increased clustering (higher density nodes) can significantly reduce a city's use of energy (especially petrol) and dependence on the car.[142] United States authors have noted that a polycentric urban form may also be energy efficient: "[C]entralized development patterns consistently outperform low-density sprawl. [However] … [w]hen energy studies include polycentric development, that emerges as the preferred settlement pattern, even over monocentric development."[143] In the United States, density is an important factor affecting distance driven and non-motorised activity: "a doubling of residential density levels produced 25–30 percent fewer miles driven per household".[144] As a USEPA study concludes, most compact development patterns result in less vehicle travel than dispersed patterns.[145]

Even at the micro level of the site and its neighbouring buildings, more compact designs can save energy. For example, there is some evidence that as storey height (within limits) and the degree of attachment between dwellings increases, operating energy requirements are reduced.[146] This study has not investigated evidence concerning the energy embodied in, and required to operate, high-density buildings. However, some evidence suggests that, in practice, high densities in intensified areas are linked to fuel-efficient technologies being increasingly adopted in building design.[147]

Emissions, run-off and waste

Energy use might not in itself be problematic (for example, it might be associated with higher productivity) if it did not create negative external effects. But, given higher levels of energy use, low-density urban form is strongly associated with higher vehicle emissions. Emissions can adversely affect both quality of life and health.[148] There is strong evidence that, when they are carefully located and directed, concentrated forms of city development, such as the 'compact city', 'multi-nodal' or 'edge city' can lead to reduced pollutant emissions relative to 'business-as-usual'.[149] Redevelopment of brownfield sites has been shown to generate significantly less vehicle air pollution than the same development on a greenfield site.[150] These findings contradict

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[141] Loder et al, 1988.

[142] Urban Design Task Force (UK), 1999, p 103, citing Newman and Kenworthy, 1999; Newman and Kenworthy (2000); DETR, 2000, p 28; but note the dissent of Gordon and Richardson, 1997, p 97.

[143] Ewing et al, 1997, p 114.

[144] From a study of neighbourhoods in California, by Holtzclaw, 1994: Frank et al, 2003, p 147; see also Ewing, 1997, p 113.

[145] United States Environmental Protection Agency, 2001, pp 144, 147.

[146] Buxton, 2000, p 61.

[147] Williams, 2000, p 37.

[148] Woodward et al, 2002.

[149] Newton, 2000, p 51; Hall, 1998, p 970.

[150] United States Environmental Protection Agency, 2001, p iii, 47.

the speculation of some[151] that higher density may increase air pollution because it reduces space for growth of trees and shrubs that purify the air and cool the urban area.

Other impacts of sprawl aside from air pollution include "non-point source water pollution … resulting from increased automobile use and paving of vast areas of the growing suburban ring, undercutting quality of life for all metropolitan residents".[152] Infill development can accommodate new urban growth with significantly less impervious surface area, leading to less run-off and water pollution.[153] Pavement area and run-off can also be reduced by using parking and transportation infrastructure more efficiently.[154]

One writer, Troy,[155] raising concerns about increased housing density in the Australian context, argues that increased housing density "decreases capacity to cope with domestic wastes and reduces opportunities for recycling." However, this appears to be a weak argument for dispersed development, given other options such as waste minimisation and improved waste management.

Green spaces

There is evidence that green spaces, which tend to reduce density, are valuable to people's health[156] and quality of life (including for recreation for children),[157] and for conserving local biodiversity. However, it is not clear how much green space needs to be conserved inside the city, to provide optimal green space for the urban area as a whole. Iconic green spaces such as Hagley Park in Christchurch, The Domain in Auckland, or Central Park in New York are clearly valuable in a local sense. This is indicated by property prices around such parks, and by local usage.[158] But urban design that incorporates significant swathes of green space can have the effect of lowering densities and causing 'leapfrog' development in new peripheral suburbs. This irreversibly changes the nature of rural areas on the periphery and makes them less accessible to many in the city,[159] raises the costs of doing business in the urban area, generates more traffic, and lowers the environmental quality of the wider urban area.[160]

There must always be some degree of trade-off between density and city greenery. The Urban Task Force in the United Kingdom and the US Environmental Protection Agency, among others, suggest a way through this conundrum. This is the polycentric urban form (or "cluster

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[151] Troy, 1996a, p 210.

[152] Yaro, 2001, p 138.

[153] United States Environmental Protection Agency, 2001, p 41, 42.

[154] United States Environmental Protection Agency, 2001, p iv.

[155] Troy, 1996a, p 210.

[156] For example, Stone and Rodgers, 2001; Maller et al, 2002, p 37.

[157] de Vries et al, 2003, p 1729; Bentley, 1999, pp 200, 201; Sallis et al, 1998, p 393.

[158] Commission for Architecture and the Built Environment, 2005, p 6; Luther and Gruehn, 2001, p 23.

[159] Landry, 2004, pp 29, 36; Hill Young Cooper Ltd, 1997, p 46.

[160] Ewing, 1997, pp 112, 115–117.

zoning") with high-density areas ("pyramids of intensification") interspersed with green wedges or areas.[161] Auckland's node-focused growth strategy is an example of this concept.[162]

East Hills Development, Napier, Hawkes Bay

Although it does not reduce car dependence, this development is an example of design that clusters and intensifies peripheral urban development. It provides an alternative to large lot rural/residential subdivision that is encroaching on fertile farming and agricultural land. A private development initiative, East Hills caters to growing market demand for low maintenance rural lifestyle properties. It is located on 76 hectares above State Highway 2 at the entrance to the Esk Valley in Hawkes Bay. Relatively small house sites are placed in strategic locations to maintain privacy, benefit from views and blend in with the natural landscape – features not commonly associated with higher density living, or new greenfield subdivisions. Roads were also carefully designed to take these features into account, as well as to minimise vehicle noise. The balance of the land is designated as reserve and an owners' association will be established to both own and manage this, along with community amenities.

The landscape development focuses on ecology and protects existing areas of bush. A programme of planting an additional 100,000 trees and shrubs is already underway. A network of walking tracks enables residents and others to enjoy this special area, and connects the subdivision to the surrounding community. This approach is intended to protect the local environment and enhance habitats as well as provide an attractive lifestyle option in a rural area close to an existing city centre.

Source: Logan, 2004, *Lifestyle Property Development – A New Zealand Case Study*.

Viewed at a broader scale, this type of compact, clustered development is also likely to reduce disruption and fragmentation of habitat, and preserve large areas in highly valued parks and open spaces.[163]

Social connectedness, vitality and diversity

The evidence suggests that denser urban areas have more social connectedness and visible vitality. It also suggests that they tend to accommodate greater diversity of housing forms (eg, apartment living) and lifestyles. Conversely, there is no evidence that denser areas are less safe.[164]

The UK Urban Task Force has noted that social vitality is enhanced with higher densities: "a critical mass of development contributes to the informal vitality of the streets and public places

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[161] Urban Design Task Force (UK), 1999, p 64; USEPA, 2001, p 42; Vandegrift and Yoked, 2004, p 228; Camagni et al, 2002, p 214.

[162] Auckland Regional Growth Forum, 1999; also Auckland Regional Council's web pages on Urban Form and Growth Nodes, eg, www.arc.govt.nz/arc/index.cfm?03621BB3-E018-8BD1-320D-5DE6 FD0AE862#what_is_a_growth_node. (Retrieved May 2005.)

[163] United States Environmental Protection Agency, 2001, p 39; Ewing, 1997, p 118.

[164] Syme et al, 2005, pp 31–33; Hillier, 2004, p 43.

that attracts people to city centres and urban neighbourhoods …".[165] A US study showed that residents of "more compact and interconnected portions of the Atlanta region know their neighbours better and have a better sense of their communities than residents of more dispersed and disconnected environments"[166] and other US studies have suggested similar results.[167] While some argue that it is "easier to achieve both independence and engagement with one's neighbours in conventional housing",[168] the weight of evidence suggests that the "reduced encounter rate between people in dispersed settlements diminishes the potential for forming communities of choice …".[169] This is more likely to be true where lower density is associated with greater car dependence, as is often the case.[170]

Robert Putnam of Harvard University, an expert on social capital, has found that, "each additional 10 minutes of commuting time cuts all forms of civic engagement (such as attending public meetings and volunteering) by 10%".[171]

While urban sprawl may reduce connectedness, there may be thresholds beyond which *increased* density ceases to increase social connectedness: "Propinquity may increase the likelihood of social contact but we also know that at a high density people act to preserve their personal space and privacy; that is, they withdraw from others or try to limit interactions." [172] There is no clarity as to the density range over which intensity of interaction leads to people withdrawing into privacy, and this is likely to vary among people. The buzz of urban life in dense cities that might be so exciting and attractive to some will equally deter others. Thus, self-selection may occur: people who prefer more 'vital' higher densities locate in such areas, while others choose to live elsewhere.[173]

It may take people time to decide whether they appreciate higher density residential living. A recent Auckland study of intensification by Syme et al found that while some reported very positively on cohesion and sense of identity, other residents did not want a high level of connectedness with their neighbours. This survey also found that the comparative socio-economic profiles of those in higher-density housing were similar to the profiles of those of the wider suburb.[174]

Health

Important evidence is now emerging that higher density urban environments tend to promote health, mainly through encouraging greater physical activity (walking and cycling). On the other

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165   Urban Task Force (UK), 1999, p 60.

166   Frank et al, 2003, p 188.

167   Ewing, 1997, pp 117, 118; but note that Freeman, 2001, does not confirm this.

168   Troy, 1996b, p 164.

169   Bentley, 1999, pp 200, 201.

170   Freeman, 2001, p 76.

171   Putnam, 2000, p 213.

172   Troy, 1996b, p 163.

173   Note that there seems to be no evidence that higher density is associated either positively or negatively with crime: see Hillier, 2004, p 43; Syme et al, 2005, reach a similar conclusion.

174   Syme et al, 2005, p 27.

hand, higher density can be associated with noise impacts on health, depending on specific design features and mixing of land uses.

Medium-density housing in Auckland

Ambrico place is a medium-density housing development in New Lynn, Waitakere City. Its development was significantly influenced by "an extensive consultation and group design process" conducted by the Waitakere Council. It covers an area of 5 hectares, which includes community facilities and walkways, and is adjacent to 2 hectares of reserve and wetlands. When the area was studied by Dixon and Dupuis in 1999 and 2000, it consisted of "250 terraced housing units in eight different developments", and now numbers around 300 residential units.

Dixon and Dupuis found that the majority of residents appeared satisfied with many aspects of Ambrico Place. They enjoyed the convenience of quick access to local facilities, and the close proximity of neighbours created a sense of safety, while not compromising acceptable levels of privacy or noise.

However, Dixon and Dupuis are cautious about some of the claims made for this housing form. They found that convenience of access to public transport did not lead to reduced car dependence for almost half the residents However, they cite survey evidence suggesting people would be attracted to use public transport more if there was better service and lower costs. It is clear in this instance that factors other than physical proximity impact on behavioural change, a finding supported by other research.

Dixon and Dupuis also raise concerns that while Ambrico place has been successful in several areas, some other medium density developments may be seen as 'slums of the future'. They link these concerns to inappropriate location, insufficient infrastructure, and poor quality design and construction. These issues highlight the need for the development of medium-density housing to be carefully monitored and controlled by regulation, particularly when many separate developments are taking place in close proximity to one another. This allows its potential benefits to be realised, and ensures it offers a high quality lifestyle as an attractive alternative to low-density housing.

Source: Dixon and Dupuis (2003).

A recent Auckland study on noise impacts found only small differences in reported noise disturbance between households in medium–high density housing and those in stand-alone housing (for both groups, traffic noise was the main source of disturbance), but the former were more bothered by noise transmission from neighbours. The study did not go beyond perceptions to actual health effects.[175]

As noted, low-density development is a configuration that promotes vehicle use. This effect partly occurs because low density makes it difficult to justify public transport, which itself entails some walking: "As density levels are increased ... [m]ore people [become] close enough to communal facilities to walk, and an efficient bus service can be made viable."[176] United States studies provide strong evidence that higher densities promote active travel (walking and cycling) and this in turn promotes health, as for example in Atlanta: "… [W]e have found

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[175] Lyne and Moore, 2004, cited in Syme et al, 2005, p 36.

[176] Urban Task Force (UK),1999, p 60; see also Newman and Kenworthy, 1999.

significantly lower obesity rates for those who reside in more compact, denser, more pedestrian friendly and transit supportive areas of the Atlanta region."[177] The density-health linkage is being quantified in a range of urban areas, such as in California where, as noted above, higher density levels reduce distance driven per household.[178] However, more research is necessary to pin down all the urban design factors that influence behaviours and, hence, health:[179] "Shortening distances [between destinations] is a necessary strategy for increasing utilitarian physical activity, but it is not sufficient; other factors, such as [other] urban design variables and transportation system characteristics, are fundamental as well."[180]

Conclusion

Because most of the housing stock in New Zealand will last many decades, any changes in density in New Zealand urban areas will be only gradual. Intensification is likely to occur in nodes, with other parts remaining at lower density. Multi-unit housing made up 22 percent of Auckland's housing stock in 2001, and between a fifth and a third of recent building consents have been for developments of more than five units.[181]

The literature is equivocal about whether higher density alone is valuable. United States experience suggests that: "Without an appropriate location, a good mix of different uses nearby, adequate open space and a vibrant, safe and interesting life along the sidewalks and streets, dense neighbourhoods will flounder."[182] That is, a number of integrated design issues must be successfully resolved if the potential benefits of higher density environments are to be realised.

The UK Urban Task Force sums up key points in the value case for greater urban density: "[D]ensity per se is not an indicator of urban quality. ... [T]here can be no hard and fast rules for establishing 'ideal' density levels. [Nevertheless], research has shown that real land economy gains are being achieved from increasing densities … [H]igher densities allow a greater number of public amenities and transport facilities to be located within walking distance, thus reducing the need for the car, and contributing to urban sustainability."[183]

To this can be added the emerging but important evidence that a denser urban environment can contribute to greater social connectedness and higher levels of physical activity, and these in turn, have the potential to yield real gains in health. Denser cities also function better if they preserve small green areas within the city. Within an overall polycentric or clustered urban form, there is social and environmental value in protecting green wedges or spaces. Higher density urban environments do present difficulties when poorly located, or elements are badly planned and constructed. But these difficulties can be overcome by good design.

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[177] Frank et al, 2003, p 185.

[178] Holtzclaw, 1994, cited in Frank et al, 2003, p 147; see also McCann and Ewing, 2003.

[179] Committee on Physical Activity, Health, Transportation and Land Use, 2005, pp ES-3–ES-6.

[180] Frank et al, 2003, p 110.

[181] Dixon and Dupuis, 2003, p 357.

[182] Local Government Commission with USEPA, 2003, p 28.

[183] Urban Design Task Force (UK), 1999, pp 63, 64.

3.4   Mixed use

Introduction

Mixed use in an urban design sense occurs where a variety of different activities coexist in close proximity, allowing living and working to be integrated. Reflecting the focus of recent research, this discussion focuses exclusively on mixed use at the neighbourhood scale, even though the term 'mixed use' can also be applied to the mix of activity within a single building.

The concept of mixed use has been at the forefront of urban design since the 1960s and is strongly advocated in current practice.[184] The widely claimed benefits of mixed use include easier and more convenient access to essential services, reduced vehicle dependence and enhanced public health. There is some market resistance to mixed use; however, evidence suggests that in the right conditions it can be successfully implemented.

Mixed use and movement

There is considerable evidence to support the claim that a fine-grained mix of land uses minimises travel distances between some destinations, with the result that many trips are made by walking and cycling rather than motor vehicle.[185]

Findings show that mixed use does not significantly affect car ownership, commuting by car or mode choice for heavy food shopping trips. People continue to travel beyond their immediate neighbourhood for work, or for specialised shopping.[186] Also the social network of most people is not determined by their immediate neighbourhood.[187] At the same time, evidence does suggest that mixed use is related to some increase in the number of people walking or cycling to work.[188] Car ownership rates may not necessarily change, but people may not use their car as much.

But in combination with micro-scale design conditions that support walking and cycling (including appropriate connectivity and safety), mixed use leads to a reduction in car use for local, non-work trips – including light food-shopping trips.[189] Research indicates that if there are shops nearby, people are more likely to walk to them.[190] Furthermore, a 2002 study shows that walking for non-work purposes most highly correlates with the number of shops, restaurants

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[184]   For example, DETR, 2000, p 43.

[185]   United States Environmental Protection Agency, 2001, pp 44, 60, 61; Burton, 2000, p 27; Frank et al, 2003, p 146.

[186]   Crookston et al, 1996.

[187]   Thorns, 2002, p 223; Williams, 2000, p 37.

[188]   Frank, et al, 2003, p 150 citing Cervero.

[189]   Van and Senior, 2000, p 148; Cervero and Radisch, 1996, p 140.

[190]   Sallis et al, 1998, p 383.

and office buildings within 400 metres of a person's home.[191] An earlier study defines the limit of the 'local scale' beyond which few people are willing to walk as one mile.[192]

Considering central areas, mixed use in both city and suburban centres, and even in car-oriented locations, is conclusively linked to reduced vehicle trip rates.[193] This might be because public transport viability is improved by allowing a single stop to serve several destinations, and because people are able to access a number of destinations in a single multi-purpose car trip when these are in close proximity.[194] Mixed use in the vicinity of public transit stations increases the use of transit,[195] and increased access to public transport increases the likelihood of public transport use, "irrespective of vehicle ownership rates".[196]

Mixed use and health

Having local amenities within walking distance is associated with better health.[197] A study from the United States found that land use mix – specifically the availability of retail or commercial uses close to people's homes – led to a three-fold reduction in the likelihood of obesity for certain sectors of the population.[198] Another North American study found that the likelihood of obesity across gender and ethnicity declined by 12.2 percent for each quartile increase in land use mix, and by 4.8 percent for each kilometre walked.[199]

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[191]   Frank et al, 2003, p 180.

[192]   Cervero and Radisch, 1996, pp 133, 140.

[193]   United States Environmental Protection Agency, 2001, p 63.

[194]   Pickrell, 1998, p 17.

[195]   Pickrell, 1998, p 17.

[196]   United States Environmental Protection Agency, 2001, p 68.

[197]   Sooman and Macintyre, 1995, p 25.

[198]   Frank et al 2003, p 185.

[199]   Frank et al, 2004, p 93.

Case study: Botany Downs, South-east Auckland

Botany Downs is a new and rapidly growing urban area in Manukau City. In a survey of residents in a study area of four medium-density housing developments, 121 respondents comprising 41 percent of residents were interviewed for their observations on life in Botany Downs. This study found that people with reasonable access to local services and shopping will often access these on foot, and a reasonable proportion will walk to undertake supermarket shopping.

The study found that less than 10 percent of respondents go outside Botany Downs to shop for their day-to-day needs. Just under half the survey respondents walk to the shops, with another 22 percent indicating that they both walk and drive.

Over 80 percent of respondents report doing their bulk grocery shopping in Botany Downs with 50 percent driving to the supermarket, 17 percent walking or driving and a further 22 percent walking. This was in a setting where 97 percent of respondents own or have access to a car. When questioned on how often they used their car, 40 percent of respondents indicated they use the car the same amount as in their previous residence, but 44 percent use it less, and only 13 percent use it more.

The popularity of walking to the shops was attributed to the close proximity of the Botany town centre. Furthermore, proximity to facilities is valued, with 42 percent of people citing this as the most positive aspect of living in Botany Downs. When questioned as to how their lifestyle had changed following moving to Botany Downs, the most common responses were an increase in walking, exercising more and playing different sports.

Another study, by Research Solutions for the Auckland Regional Council, found the medium-density residential developments at Botany Downs benefit local business. It reports: "Businesses and service providers are generally very positive about the developments, with many feeling that they had attracted more people and that it brought more money into the area."

Sources: Thompson-Fawcett and Bond, 2004, pp 66–69; Research Solutions, 2000, p 145.

Convenience and choice

Mixed use brings intangible benefits related to perceptions of personal wellbeing. A CABE/DETR report involving a number of case studies found: "Mixing uses leads directly to higher user and occupier satisfaction and was fundamental to the social, economic and environmental value added by the most successful case studies."[200] People value easy access to a variety of uses and facilities in a single location, and miss them where they do not exist.[201] Thorns concurs, noting that, "choice and the freedom and opportunity that mixed use is seen to bring can improve the well being of individuals".[202] But he cautions that perceptions of (single-use) suburbs as places of restricted opportunity are not necessarily supported by social research.

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[200]   Carmona, 2001a, p 11.

[201]   Carmona, 2001a, p 79; Petersen, 1998, p 49; Congress for New Urbanism and Pricewaterhouse Coopers, 2001, p 3.

[202]   Thorns, 2002, p 128.

Recent New Zealand research on user perceptions of mixed-use developments for the Auckland Regional Council (ARC) notes that, "in most cases residents move to these [mixed-use] areas in pursuit of a particular lifestyle. This lifestyle is based on 'convenience' living, enjoying both personal safety, and the ability to be part of a real community". The research indicates that there are negatives, with issues such as noise, lack of space and traffic becoming problematic if not addressed by planning, design and management.[203]

Mixed use and the local economy

Findings show that mixed use improves access to employment, and enhances job opportunities.[204] Crane and Schweitzer identify how mixed use may contribute to better employment opportunities for low-income earners, providing more employment opportunities close to home and thus enhancing entire low-income communities.[205]

At the micro-scale of the design of streets and other urban spaces, there is evidence that the mix of appropriate uses is a building block for "safe, successful and thriving public spaces".[206] Findings also indicate that the healthiest downtowns contain a wide range of activities that attract different people for different reasons at various times. Furthermore, central city and downtown revitalisation relies on the interaction of a range of different elements and activities, including jobs and a diverse residential population.[207] Some authorities suggest that, "combining the primary activities of living and working supports a greater variety of secondary facilities".[208] This contention is supported by findings from the ARC mixed-use developments perception survey: "For business in these [study] areas, mixed use developments have the potential to provide them with a customer base, and an environment that will attract others to the area."[209] Supporting this, a recent study of residents' reasons for shifting to a 'planned urbanist development' in south-east Auckland, Botany Downs, found that close proximity to shops and facilities was an important motivation (See Botany Downs case study above).[210]

A new use may also complement existing facilities, strengthening their economic performance by attracting more users. For example, a supermarket was placed in the existing suburban centre of Ferrymead, in Christchurch. This new facility complemented the existing conventional neighbourhood retail service centre, acting as an anchor and helping to generate increased vitality. It led to a change in the food shopping patterns for local residents with a significant proportion utilising the new local supermarket rather than driving to more distant locations outside the neighbourhood.[211]

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[203]   Research Solutions, 2001, pp 4, 7–8.

[204]   United States Environmental Protection Agency, 2001, p 60; Burton, 2000, p 27; Carmona, 2001a, p 76.

[205]   Crane and Schweitzer, 2003, p 244.

[206]   Madden and Wiley-Schwartz, 2002, p 21.

[207]   Robertson, 2001, p 14 and Petersen, 1998, pp 47, 53.

[208]   Llewelyn-Davies, 2000, p 41.

[209]   Research Solutions, 2001, p 4.

[210]   Thompson-Fawcett and Bond, 2004, p 17.

[211]   Morgan et al, 2003, p 48.

Personal cost savings

The individual may gain financial benefits from living in a mixed-use area. These benefits arise because of a reduced need to own or use a car. Camagni et al[212] identify a tendency for mixed use to lower travel costs. There is also strong evidence that households in car-dependent neighbourhoods devote significantly more of their budgets to transportation than households in neighbourhoods with more accessible land-use and multi-modal transportation systems.[213]

Social equity and interaction

Spatial separation and segregation "creates and maintains patterns of inequality".[214] Some people may walk by choice, but others – the young, old, unlicensed and those without access to a car or alternative public transport – have no choice. Evidence shows that accessible local facilities (when combined with a safe and attractive street system with an appropriate degree of connectivity) enhance social equity by reducing the need to own a car to get access to services.[215] While not linking findings to this particular issue, Burton records that the position of the poor relative to the affluent is better in cities characterised by mixed, rather than separated, uses.[216]

While mixed use may help to create socially diverse communities, it does not necessarily lead to social inclusiveness. Work in the United Kingdom by DEMOS[217] suggests that there may be little contact between richer and poorer people in mixed-tenure developments. Talen, in a discussion of 'New Urbanism' (typical characteristics of which are mixed use and greater integration of private and public space) reaches a related conclusion, that New Urbanist developments in the United States tend to be socially and economically homogeneous. But she also notes: "More defensible is the presumption that New Urbanism increases social interaction and that this interaction in turn creates at least weak social ties."[218]

Mixed use and safety

Research findings do not substantiate separation and segregation of different types of use as strategies to achieve safety. In fact, the research findings show that mixed use offers certain benefits. Empirical research by Sampson and Raudenbush reveals a statistically significant link between mixed land use and decreased personal violence, and no correlation with crime such as homicide, robbery and burglary.[219] Balancing this, they also found mixed use to be associated

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[212] Camagni et al, 2002, p 214.

[213] McCann, 2000, cited in Litman, 2004, p 9.

[214] Thorns, 2002, p 175.

[215] United States Environmental Protection Agency, 2001, p 152; Bentley, 1999, p 200; URBED, 2000, s B5.4; Bentley et al, 1985, p 27.

[216] Burton, 2000, p 28.

[217] Urban and Economic Development Group, 2000, s B5.4.

[218] Talen, 1999, pp 1372, 1374.

[219] Sampson and Raudenbush, 1999.

with increased physical and social disorder such as graffiti, broken windows, public intoxication, verbal harassment and rowdy groups of youths in public places.

The ARC study found that both residents and businesses consider that mixed use offers security. Residents recorded advantages of mixed use as being "[s]ecurity of more people around", while businesses report "[i]ncreased security".[220] These findings from user groups are consistent with expert observations of a linkage between intensive mixed use and safety in the centres of major US cities.[221] This linkage is likely to derive from the enhanced natural surveillance from the number of people in and around their neighbourhood at all times of the day and night. Wekerle[222] suggests that a mix of activities attracts diverse users and this contributes to safety.

Factors restricting mixed use

Economic forces tend to promote separation of land uses.[223] Mixed use is difficult to achieve, with local planning policies often prescribing use restrictions, and many developers resistant to delivering mixed-use development of any kind. Mixed-use development is more complicated for developers and investors, requiring a range of occupiers with an increased risk of incompatible activities, real or perceived. The perceived higher risk of mixed-use development may lead to difficulty in obtaining finance, and higher interest rates.[224]

Several studies indicate the need for perceptions about incompatible uses to be overcome.[225] In the ARC study, residents report traffic and competition for parking as disadvantages, and businesses note a range of disadvantages including limited market for business. Both user groups are concerned about the effect of noise on residents.[226]

Grant notes that while mixed use may add new dimensions to large greenfield developments, and has helped inner-city revitalisation, "not all urban residents nor all uses benefit from such changes".[227]

However, even while difficulties exist, it is possible in a market economy to achieve mixed use.[228] The Urban and Economic Development Group[229] cite 1996 research in the United Kingdom by the Royal Institute of Chartered Surveyors (RICS). The RICS found that developers and investors may have serious reservations about mixed use, but noted that: "creating or conserving mixed-use development often requires a special effort, but … in the right circumstances it is achievable". Mixed use is difficult to achieve in greenfield

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[220] Research Solutions, 2001, pp 7, 8.

[221] Petersen, 1998, p 51.

[222] Wekerle, 2000, p 46.

[223] Grant, 2002, p 71.

[224] Frank et al, 2003, p 174.

[225] Carmona, 2001a, p 78; Bentley, 1999, p 91.

[226] Research Solutions, 2001, pp 7, 8.

[227] Grant, 2002, p 72.

[228] Urban and Economic Development Group, 2000, s B5.4; Alexander and Tomalty, p 408.

[229] Urban and Economic Development Group, 2000, s B5.4.

developments. However, Landry[230] observes that as a critical mass of population develops, generating greater demand for facilities from shopping to leisure, mixed use becomes more sustainable. The ARC study identified cause for optimism in that both business and residential users want similar quality outcomes and to address similar shortcomings, and notes that, "with careful planning mixed use developments can succeed".[231]

Conclusion

Mixed land use helps to minimise travel distances and improve access to employment, services and recreation. It provides convenience and a safer environment. While the value of mixed use is established, mixed use alone will not realise maximum value. A combination of factors allows mixed use to be most successful.[232] Benefits can be best realised in environments where mixed use is combined with a relatively high intensity of different uses in close proximity, relatively higher densities and good connectivity.

3.5 Adaptability

Introduction

A number of linked although distinct concepts fall within the broad area of adaptability. These are 'flexibility', 'robustness', 'resilience', 'choice', 'mixed use' and 'diversity'.[233] Adaptability applies to buildings, including their interiors, as well as to external space, both private and public. The capacity for buildings and spaces to adapt to changing needs is well shown by Brand.[234] He refers to US studies demonstrating that more is spent on changing buildings than on building new ones because of changes in technology, use and fashion. Brand concludes that the cost of changing buildings is higher than needed because most buildings are not designed to anticipate change in use over their life span. Crowther's research[235] concludes that buildings that are initially designed to be more flexible in structure and construction are more sustainable.

Bentley et al in the 20-year-old, but still influential, text *Responsive Environments*[236] propose that environments offering choice have the quality they call 'robustness'. This is also the quality of averting, avoiding or delaying the loss of vitality and functionality.

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[230]   Landry, 2004, p 29.

[231]   Research Solutions, 2001, p 4.

[232]   United States Environmental Protection Agency, 2001, p 79; Alexander and Tomalty, 2002, p 405.

[233]   Bentley et al, 1985; Property Council of Australia, 1999; DETR, 2000; Llewelyn-Davies, 2000; Watson et al, 2003; Carmona et al, 2003.

[234]   Brand, 1994.

[235]   Crowther, 2003.

[236]   Bentley et al, 1985.

Distinguished matriarch of urban planning and design Jane Jacobs[237] identifies four conditions that must be present for vital cities, the first of which is the need for districts to serve more than one primary function and preferably at least three. This concept of 'mixed use' to encourage different users at different times has underpinned the development and re-generation of many successful cities. Jacobs' other criteria are short city blocks for ease of access and movement; a mixture of buildings of varying ages and condition to encourage a variety of enterprises, and dense concentrations of people to support diverse activities in a compact area. With these conditions in place, greater diversity of use and increased choice of engagement with the city becomes possible.

The case for adaptable urban design, and its links to the wider issues of social and environmental sustainability, receives increasing attention. For example, Loe suggests that, "good urban design itself does not guarantee sustainability within an urban context unless over time, adaptability is inherent within the design and matched in the surrounding environmental and social fabric".[238]

Property industry advocates adaptability

Case studies of high-quality urban design projects by the Property Council of Australia[239] include as one of seven assessment criteria "the ability to change over time". Numerous projects were evaluated against the criteria, but only those that were financially successful over five years and performed well against all of the criteria were included in the final selection. Research by Carmona et al with reference to property development case studies found that the "... ability to recognise the gap in the market and to design suitable, flexible accommodation seems most influential in determining vacancy rates".[240]

Research literature supports human-centred approach to adaptability

A paper to the Environmental Design Research Association (EDRA) by Shehayeb is based on an extensive literature review of empirical research into human behaviour in public space. It concludes that, "increasing behavioural opportunities of urban public spaces is a key prerequisite to adding performance for different users, and the adaptability of the physical environment to change over time".[241] Shehayeb finds that choice increases the diversity of users, and encourages freedom of body posture expression. People interact more when they have the choice to avoid it.[242] It is clear that, "adaptable public space is used by more people in more

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[237]   Jacobs, 1961, *The Death and Life of Great American Cities*.

[238]   Loe, 2000, p 35.

[239]   Property Council of Australia, 1999.

[240]   Carmona et al, 2001a, p 75.

[241]   Shehayeb, 1995, p 208.

[242]   Shehayeb, 1995, p 211.

diverse ways over a longer time period (day and night as well as enduring time), than spaces designed for specific (limited) functions".[243]

Research that gives guidance for good urban design identifies key attributes of adaptable urban space as including – open space along streets that are well defined by enclosed edges of buildings and landscapes; open spaces that are connected but not split by movement paths through the main space; thresholds along the defining boundaries allowing users control over the degree of permeability between private and public domains; and generous footpath dimensions to allow for 'breathing space' where unplanned activities can occur.[244]

Similarly, Watson et al[245] provide design guidelines that are derived from the research literature to address diversity. A mix of uses is needed if a city is to be sufficiently complex to sustain safe public contact. This can be achieved by ensuring that, while places may attract different people at different times and for different purposes, people are able to use many facilities in common.

Conclusion

Lang applies the concept of 'behaviour settings', which is a human-centred approach to ideas about adaptability and character of public spaces. Lang writes that, "The character of any settlement … depends on the number and nature of the functions served by the behaviour settings that exist there and by the number of people who participate in them".[246] Lang concludes that the overall aim of urban design is "to create robust places – cities, precincts, open spaces – that endure under change … to make the city legible and to fulfil human needs in a multidimensional way".[247]

Adaptability is emerging as a core issue in the sustainable design agenda. It applies across a wide range of scales from the individual house, through public space, to movement networks. There is a strong case for the merits of adaptability across the three areas of economic, social/cultural and environmental value.

3.6   High quality public realm

Introduction

The public realm comprises all parts of the physical environment that the public can experience or have access to. This is primarily the system of public space, but also includes the facades of private buildings that frame public space, and associated landscape and design treatments. The

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[243]   Shehayeb, 1995, p 209.

[244]   Shehayeb, 1995, p 209.

[245]   Watson et al, 2003.

[246]   Lang, 1994, p 168.

[247]   Lang, 1994, p 180.

public realm provides an inclusive setting for cultural, social, recreational and commercial interaction, as well as the physical space and connections that allow movement from one place to another.

The public realm is also a 'behavioural setting'. Seen in this light, there are three key human factors associated with the public realm:

- comfort

- community and public life

- the aesthetic city and public art.

Many cities and towns focus on some of the above, with varying degrees of success, but do not address the full range. However, the overwhelming evidence points to the need to adopt an integrated, all-encompassing approach to the design of the public realm.[248]

The essential link between the economic performance of cities, the quality of the public realm and the need for a comprehensive approach is made clear in the final recommendation of O'Connor and Stimpson's research paper *The Economic Role of Cities*. They call for designers and city authorities to "recognise the vital importance of urban amenity, environmental quality and cultural facilities in the long term strategies for metropolitan areas".[249]

An integrated design approach to achieve overall quality

An integrated approach encompasses economic, social/cultural and environmental performance. It involves aesthetic, functional and technical considerations, and it addresses the full range of public realm urban design aspects – including materials, colour, elements, forms, landscape. Carmona et al[250] adopt the term "holistic approach" to embrace the comprehensive nature of urban design.

Melbourne is one of several outstanding examples where an integrated, sustained and visionary urban design approach that emphasises quality has contributed acknowledged 'value' to a city. Twenty-five years ago, Melbourne had "taken itself to the very edge of anonymity as a functioning centralised metropolis".[251] Since then, the city has developed a series of urban design strategies, plans and actions that have collectively positioned it as one of the most 'liveable' cities in the world. In fact, it has been voted as the world's most liveable city three times in the past decade.[252] Melbourne's liveability has been measured empirically. Its performance is demonstrated in reports of progress against past achievements and future targets – including economic aspects, social participation and environmental improvement. The city's 2003–04 annual report[253] gives performance figures on key urban design policies and strategies: accessibility, vitality, inclusiveness, environmental responsiveness, overall sustainability and

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[248]   Giles-Corti and Donovan, 2002; Jackson and Kochtitzky, 2001.

[249]   O'Connor and Stimpson, 1995, p 63.

[250]   Carmona et al, 2003.

[251]   Adams, 2005, p 50.

[252]   Adams, 2005, p 50.

[253]   City of Melbourne, 2004.

more. The success of Melbourne is not a happy circumstantial accident; it has come about explicitly through good urban design focused on the public realm.[254]

Meanwhile, in the United Kingdom, Birmingham has transformed itself from a car-dominated and uninviting place to one of the country's showcases for private sector investment with far-reaching social, economic and environmental benefits. Birmingham's success derives from:

> ... recognition that the built environment was actively working against attempts to revive the city's economy; a need to establish a robust design vision based on an in-depth understanding of context; relentless pursuit of quality through all policies; sustained investment in the public realm; and the full use of statutory powers available to the local authority.[255]

Other notable examples of success through integrated, visionary and high-quality urban design of the public realm are Copenhagen[256] and Curitiba.[257]

Using empirical studies, Gehl and Gemzøe[258] demonstrate the relationship between the quality of public open spaces and the amount of use they attract. They provide conclusive evidence that a 'high-quality' public environment, with the appropriate combination of conditions for its specific context, leads to a significant increase in occupation and activity. Gehl observes that only strictly "necessary activities" occur in poor-quality outdoor areas. But when a place is of high quality, an additional "wide range of optional activities will also occur because place and situation now invite people to stop, sit, eat, play and so on". [259] The benefits of increased everyday activity may be intangible; there may be little obvious link between the sense of wellbeing that arises from being in a safe place with other people and the better commercial performance of nearby activities.[260] However, Litman observes that in successful retail malls and similar places, environmental quality for pedestrians is highly valued. He notes that, "a shopping centre or office complex may become more economically competitive if walking conditions improve".[261]

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[254]   Adams, 2005.

[255]   Carmona et al, 2002c, p 99.

[256]   Gehl and Gemzøe, 2000.

[257]   Taniguchi, 2005.

[258]   Gehl and Gemzøe, 2000, p 13.

[259]   Gehl, 2001, p 13.

[260]   Cozens, 2002.

[261]   Litman, 2004, p 12.

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Blair and Allen Streets, Wellington

A successful initiative to enhance this central city area took place during the 1990s. Blair and Allen streets were transformed from a redundant industrial and market area, which was dominated by produce warehousing between the two streets up until 1992. Street paving and landscaping improvement substantially enhanced the quality of the streets, creating an attractive area to work in, or walk through. While the majority of the funding for this venture came from private resources, Wellington City Council was the driving force behind the planning, and negotiation amongst investors. Wellington City Council also assisted with earthquake strengthening of heritage buildings, and facilitation of investment planning with local building owners, and tenants.

One of the most significant effects of this development has been that the faith shown in the area by the council encouraged building owners to see new potential for their buildings. The area is "now considered fashionable for niche markets and small firms", as well as retail and restaurants.

Value gains have been evident in rents, capital values and physical indicators such as pedestrian counts, estimated to be over 50 percent higher than in 1990, as well as the presence of cafes. The area now has some of the highest ratios of pedestrians per rental dollar when compared with similar locations in central Wellington. An economic assessment of property values suggests that by the late 1990s, values were approximately double what they would otherwise have been.

Source: Reid, 1997.

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The US Environmental Protection Agency[262] emphasises the importance of "micro-scale urban design factors such as building orientation, street connectivity and design, and building design" as contributors to the "relative friendliness", desirability, safety and convenience of an area. The EPA observes that high-quality design of the public realm strongly influences the desirability of walking, cycling, using public transport and living in higher density areas.

Bentley[263] emphasises visual complexity and richness in the public realm, an issue that was prominent in architectural and urban design discussion through the 1960s and 70s but seldom emphasised in the current literature. He notes the adverse effects of blank building facades and inactive building edges that reduce the normal range of sensory experiences, reduce memorability and consequently lessen legibility. This is supported by Gehl,[264] who also presents a strong case for providing places where people can linger at the interface between buildings and adjacent public space.

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[262] United States Environmental Protection Agency, 2001, p 71.

[263] Bentley, 1999, pp 201, 202.

[264] Gehl, 2001, pp 123, 185.

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Botany Downs Town Centre

A combination of high population growth, the ARC regional growth strategy, and its "location near major road and proposed public transport units" led to the Botany Downs area being identified by Manukau City Council as a suitable node for intensification. It has been developed from greenfield on privately owned land by a private developer who implemented a master plan for the town centre.

The town centre is situated within a large commercially zoned area, surrounded by low- and medium-density housing, and undeveloped land. Its development followed, and was based on, "a six month period of consultation with focus groups from the business and residential community, market research, and considerable interaction with the council". The town centre includes bulk and boutique retail, apartments, community facilities, cafes and restaurants. While on privately owned land, the planning was strongly influenced by the Manukau City Council, "either through policy documents, or through Council's direct interest in the development".

Both the council and the property owner aimed to "create a quality, high amenity, main street style, community orientated town centre, consistent with the future needs of local people". It was also important for the developer to gain "a long term financial return for clients". They both appear to have achieved their goals, because the new development has had an overwhelmingly positive response, from customers, apartment tenants, and shop owners, as well as other retail development professionals. "The main street is indeed a vibrant, human-scale, attractive, community-oriented, social and functional shopping area" in which the value placed on prioritising pedestrians and architectural quality is clearly evident. It has been observed that the town centre has been the most successful element of the Botany Downs development, in terms of meeting the "urbanist agenda".

Source: Thompson-Fawcett and Bond, 2003.

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Comfort

"Comfort, at a minimal level, implies freedom from pain on all dimensions of environmental experience." [265] A sense of physical comfort in an urban environment mainly embraces metabolic, sonic and olfactory aspects. These are linked to the microclimate (including sun/shade, temperature, wind) and to city noises (mainly traffic-related) and odours. In an urban setting, a sense of psychological comfort derives from social affiliation, self esteem, self-actualisation (the capacity to initiate and achieve one's desires and be fulfilled) and aesthetic pleasure.[266] Aspects of psychological comfort are addressed separately below under 'Community and public life' and 'The aesthetic city, including public art'.

Carr et al[267] refer to empirical studies that support their claim that certain criteria should apply to the design of public space. They say places should be meaningful (allowing people to make strong connections between the place, their personal lives and the larger world); democratic (accessible to all groups); and responsive (designed and managed to serve the needs of users).

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[265]   Lang, 1994, p 221.

[266]   Lang, 1994.

[267]   Carr et al, 1992.

Carmona et al[268] conclude that good public spaces generally serve more than one of the following primary needs: physical comfort; physiological relaxation; passive engagement (mainly through observing activity); active engagement (direct experience); and discovery, which relates to variety and change.

While the microclimate contributes significantly to comfort, an urban environment does not need the 'ideal' climatic conditions identified by Givoni[269] and Lang,[270] providing other key factors – including high quality and vitality of a place – are present.[271] Gehl and Gemzøe [272] discuss the experience of Copenhagen where, because of the psychological comfort deriving from the high-quality urban environment and experience, public place activity has increased into winter months previously considered climatically unsuitable.

A high noise level, especially from vehicular traffic, is shown to be a significant detraction from a quality urban experience.[273] There is conclusive evidence that while noise is pervasive and generates stress for individuals, this can be addressed through design and management interventions such as barriers and traffic re-direction.[274]

City odours resulting from activities and from the biological environment can be both pleasant and unpleasant. Pleasant experiences typically derive from food and drink preparation and from flowers, trees and shrubs, whereas unpleasant odours derive mostly from machines and waste.[275]

Community and public life

The Brazilian city of Curitiba is internationally famous for its sustainability and emphasis on public life. Studies of the city show that where there is integrated transport, preservation of the environment, job creation and social integration, citizens can feel at home in their city and have a highly developed sense of civic pride and artistic spirit.[276] The Commission for Architecture and the Built Environment[277] also conclusively shows that good design of public spaces (in conjunction with high-quality architectural design) helps to boost city pride.

Melbourne is another conclusive example of a city that is consciously setting and achieving urban design quality and performance targets. The strong community support for these targets reaps dividends in terms of civic pride and widespread commitment to further achievements.[278]

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[268]   Carmona et al, 2003, pp 168, 169.

[269]   Givoni, 1998.

[270]   Lang, 1994.

[271]   Nikolopoulou and Steemers, 2003.

[272]   Gehl and Gemzøe, 2000, p 59.

[273]   Commission of the European Communities, 2004, p 14.

[274]   Dora and Phillips, 2000.

[275]   Lang, 1998.

[276]   Taniguchi, 2005.

[277]   Carmona et al, 2001a.

[278]   Adams, 2005; City of Melbourne, 2004.

The OECD reports that social integration and cohesion in cities occur where disparities between socio-economic groups are narrowing.[279] There is also strong evidence that people are willing to pay more to live in neighbourhoods where there is a combination of mixed land use, good public transport, and good street design.[280] As has been shown, mixed use enhances walking, cycling, general health and job opportunities.[281] According to Litman,[282] walkability can help achieve equity objectives. Conversely, the Commission of the European Communities[283] finds that because peripheral development can impose costs on city centres, it may be inequitable.

The Commission for Architecture and the Built Environment found that: "Gentrification was the only identified social cost linked to improving the environment, as marginal uses and lifestyles are dislocated from regenerated areas. Significantly, good urban design can actively encourage gentrification by spreading economic and social benefits over a wider area."[284] On the other hand, gentrification can bring some social benefits. For example, there is strong evidence that good-quality public space is highly valued throughout the community.[285] On balance, gentrification may be regarded as positively contributing to urban regeneration, provided social dislocation issues are also addressed.

Urban design – especially elements such as mixed-use developments, environmental improvements and public art – is described by Wansborough and Mageean[286] as integral to the process of cultural regeneration. They propose using culture as an organising principle for city management and urban design. The value of linking cultural development with urban design has been demonstrated in the success of Melbourne. Significantly, Melbourne's director of city projects (including urban design) is also the director of arts and culture.[287]

The aesthetic city, including public art

The creation of cities is one of humankind's highest achievements. Cities are powerful indicators of economy, culture and technology. The greatest exhibit such aesthetic beauty, such clarity of vision, and so fully embody the spirit of the culture that generated them, that they are regarded as works of art – as well as expressions of economy and technology.

People respond differently to the aesthetic qualities of cities, according to their personality, stage in life, socio-economic status and cultural background. Their responses involve both sensory (mainly visual) and intellectual factors (such as theoretical constructs of what constitutes an ideal city, and symbolic associations with culture).[288]

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[279] Organisation for Economic Cooperation and Development, 2003, p 19.

[280] Plaut and Boarnet, 2003.

[281] Burton, 2000.

[282] Litman, 2004.

[283] Commission of the European Communities, 2004.

[284] Carmona et al, 2001a, p 79.

[285] Worpole, 2000.

[286] Wansborough and Mageean, 2000.

[287] City of Melbourne, 2004.

[288] Lang, 1998.

Increasingly, city authorities see public art as integral to their cities' cultural enhancement and renewal strategies, which are linked in turn to economic enhancement.[289] In some cities, public space may be a work of art: for example, the boulevards of Paris. But public space can also be a container for works of art. Most public art is either regarded as an object in space, or it is applied to surfaces. But increasingly, art is being built into city buildings and public spaces. For example, the Queensland Government requires 2 percent of the budget for all public capital works projects to be allocated to public art through their 'Art Built-in Policy'. Other cities and states make similar commitments to public art projects (for example, Melbourne, Portland, Lyon and Barcelona).

The aesthetic appreciation of cities extends beyond public space. Worpole[290] finds that beautiful and successfully articulated buildings (especially public buildings) are themselves visitor attractions that can generate widespread benefits. Further, a study for CABE finds: "Good urban (and architectural) design – particularly well-designed public spaces – help to boost city pride."[291] The same study observes that in some circumstances, while social value can be diminished by poorly designed public spaces, good urban design enhances social inclusiveness by reducing the need for high-profile security arrangements. [292]

Conclusion

The symbiotic relationship between the public realm, and the many activities and ideas that constitute public life, is clear. Despite the rapid development of technology-based communications that impact widely on personal and business intercourse, people continue to want to meet in person and to mingle with other people. Carr et al[293] point out that, "public space design and management has a cultural mission. Our parks and plazas and main streets can be precious social binders which help create and sustain a coherent and inclusive public culture".

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[289] For example: Mossop and Walton, 2001; Wansborough and Mageean, 2000; Cartes, 1997; Roberts and Erickson, 1996; Urban Design in Australia, 1994, p 28; Carr et al, 1992.
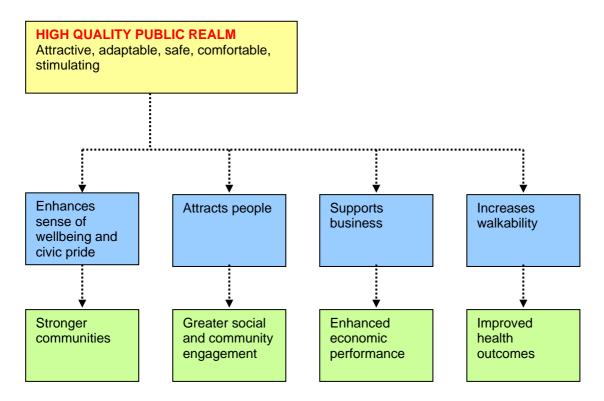
[290] Worpole, 2000.

[291] Carmona et al, 2001a, p 78.

[292] Carmona et al, 2001a, pp 78, 79.

[293] Carr et al, 1992, p 345.

Figure 1: Benefits of a high quality public realm

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┌─────────────────────────────────────┐
│ HIGH QUALITY PUBLIC REALM            │
│ Attractive, adaptable, safe,         │
│ comfortable, stimulating             │
└─────────────────────────────────────┘
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Enhances sense of wellbeing and civic pride	Attracts people	Supports business	Increases walkability
Stronger communities	Greater social and community engagement	Enhanced economic performance	Improved health outcomes

There is considerable evidence to show that cities require high-quality and well-functioning public space if their human capital is to be enhanced. Florida[294] highlights that the values and lifestyle expectations of the emerging 'creative class' who, he argues, are increasingly driving the economies of cities, demand cultural enhancement at street level.

3.7   Integrated decision-making

Introduction

The built environment exists within a social, economic and ecological urban framework. The built environment's effects – whether beneficial or otherwise – depend not only on design, but on various 'mediating factors' presented by this framework.[295] Urban design that will optimise benefits for a wide range of people and achieve good results from a wide range of perspectives requires integration at policy, planning and implementation levels. This means integration between and within organisations, as well as integration of different urban design elements with each other and with complementary social and economic policies.

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[294]   Florida, 2002.

[295]   Committee on Physical Activity, Health, Transportation and Land Use, 2005.

Integration of public and private initiatives, objectives and values

As discussed in the introduction to this report, the market does not always cater to the public's urban design needs. Often, it may cater only to the needs of those who can offer financial rewards for a developer's investment.

With residential development, this means that higher income earners or those with families have a disproportionate effect on the nature of urban development.[296] As well as discouraging diversity, this trend raises issues of equity. To ensure that the opportunity to benefit from good urban design is available to all people, local authorities need to work with private developers to ensure that well-designed residential areas offer a variety of housing types, sizes, and, of course, prices. Regulation, developer or home buyer subsidies, and other financial incentives are all potential tools for encouraging equitable outcomes.[297]

Harbour View development, Te Atatu, Auckland

This initiative illustrates value gains from integrated decision-making on a medium-density infill development within the Auckland urban area, with strong green amenity features. Waitakere City Council played a lead role, inviting a private developer to take part in a joint venture on council owned land. At the time, the Harbour View concept involved significant risk-taking by both parties; the Council was underpinning a product that the private market was not yet prepared to offer unsupported.

This development of 370 residential units took place in the mid-to-late 1990s. Features include a mix of medium-density attached and single-level attached dwellings, grouped in clusters, which resulted in a diverse range of residents; a high investment in landscape development, with extensive reserves and open space linkages; and some mixing of land uses. While lack of easy connectivity to employment is a locational disadvantage, a network of pedestrian pathways and streets provides local connectivity, and easy pedestrian access to local shops for most residents.

Comparison with a nearby development suggests that the design features of Harbour View have generated value gains. The units did cost more to design, and the reserve contribution was around three times as much as required, representing an opportunity cost. Nevertheless, gains to developers have been profitable, and can be seen in distinctly higher values and faster sales than more conventional developments nearby. As well, there is wider community and non-governmental organisation (NGO) support for the environmental benefits of the development's conservation of surrounding coastal wetlands and green space. Homes facing directly onto reserve land are the most popular, while the foreshore reserve is viewed as a significant local asset.

Source: Ministry for the Environment, 2005b, pp 50–55; correspondence with Phil Rhodes (Hopper Developments), February 2005.

Harbour View in Waitakere City is a good example of a council working closely with private developers to create a development that offers benefits – both social and environmental – that

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[296]   Filion et al, 1999.

[297]   Alexander and Tomalty, 2002, p 406.

the market did not consider valuable (for example, a high proportion of reserve and landscaped areas).[298]

Integration across geographical scales and authorities

Integrating local authorities' decision-making processes is crucial if urban design is to generate value, in two senses. First, when urban policy is developed without adequate integration between authorities, the very creation of good urban design may be jeopardised if policies – for example, about the intensity of development and growth – do not complement each other. Alexander and Tomalty observe that where extensive amounts of land on the fringe are still allocated for low-density developments, there will be little incentive for densification closer to centres in already established areas.[299]

Secondly, if an urban design initiative is geographically isolated, it will be unable to produce the full range of values it might be capable of generating. For example, pedestrian-oriented design can ideally create both health and environmental benefits, because walking and cycling substitute for private vehicle use. But if local walkability is not complemented by regional initiatives such as accessible transit, then only some of the health benefits may be realised. The potential environmental benefits will not materialise, because local walking trips will simply continue to complement longer-range car use rather than replace any component of it.[300]

Klaasen and Jacobs suggest that conditional rather than causal relationships determine the effects of 'spatial interventions', with the implication that "… each spatial intervention at a particular scale has the potential to change the spatial conditions in a surrounding area".[301] Policy that is consistent between neighbouring jurisdictions is required.

Integration within local authorities

As well as integration between organisations, it is important to have well-integrated decision-making within local authorities if good urban design is to be successfully planned and implemented. Local authorities have many different departments involved in shaping urban areas, and they may often have very different objectives and concepts of value.[302]

To ensure that an urban design initiative does create value – that it responds to the full range of criteria and can be successfully implemented – an integrated, interdisciplinary approach to management is required. This is often termed a 'matrix' organisational approach, whereby members of various departments work together on project teams and combine their perspectives to create the best possible outcome.

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[298]   Ministry for the Environment, 2005b; Rhodes, 2005.

[299]   Alexander and Tomalty, 2002.

[300]   Crane and Schweitzer, 2003.

[301]   Klaasen and Jacobs, 1999, pp 24, 34.

[302]   Alexander and Tomalty, 2002, p 408.

Integration of various physical design elements

Much urban design literature emphasises the difficulty of linking a particular individual element of good urban design with a particular positive effect.[303] Rather than proving that good urban design is ineffective or irrelevant, this underscores the fact that most urban design features work in combination. No element acts independently from any other, and many elements require the support of others in order to realise their full value (as the issue of geographical consistency in urban design implementation illustrates).[304]

Unfortunately, if the right balance of elements is not achieved, certain urban design elements commonly perceived as 'good' may have undesired effects.[305] Thus, while the individual effects of an urban design element may never be extracted, it is extremely important that the effects of combinations of elements are understood, and that the implementation of each element is planned with reference to the others.

Integration of physical design and complementary policies

While there is no doubt that urban design can create the opportunity for many benefits to be realised, these effects may be minimal without a supportive social and economic environment and geographic consistency. Thus, urban design policies require complementary economic and social policies so they can produce the greatest possible benefits.[306] For example, economic incentives can be used to encourage shifts from private vehicles to public transit, while at the same time an awareness-raising social policy can support this transition by promoting health and environmental benefits.[307]

Integration of physical design with local cultural, social and economic context

Well-integrated decision-making can allow good urban design to produce many positive effects. However, it is important that the planning and implementation of projects takes place within a contextual framework relevant to the area in which they are being implemented.[308]

Physical design alone will not necessarily achieve the required results. As an example of the importance of the social context, research by Stahl et al[309] demonstrates that physical environment is not as significant a factor as social mores in encouraging physical activity. Giles-Corti and Donovan note that the qualities of the physical environment alone will not necessarily increase physical activity. "Complementary strategies are required that aim to

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[303]   Crane and Crepeau, 1998.

[304]   Filion et al, 1999.

[305]   Crane and Crepeau, 1998.

[306]   Sallis et al 1998; Hall, 1998.

[307]   Stahl et al, 2001.

[308]   United States Environmental Protection Agency, 2001.

[309]   Stahl et al, 2001; see also Koskela and Pain, 2000.

influence individual and social environmental factors."[310] However, these and other authors[311] note that a supportive physical environment is necessary to provide the opportunities for activity to occur.

Whether people choose to change their behaviour in response to good urban design is often due to cultural values. Density presents a good example of the importance of cultural context. What is considered acceptable density in many parts of Asia or Europe may not be acceptable to many New Zealanders. While such cultural mores may change over time, or within particular sectors of a population, it is important that they are taken into consideration when decisions are being made about implementing urban design.

Burayidi[312] makes the point, with reference to revitalisation projects, that successful results are based on *adaptation* to the specific context, rather than *adoption* of a programme that has worked elsewhere.

Conclusion

Just as the various elements of urban design work in combination, so too the various elements of integrated decision-making interact to enhance the effect of one another. If the planning and implementation of good urban design involves comprehensively integrated decision-making, then the value of urban design can be realised over a larger scale, for the longer term, and for a wider range of people. Crucially, integrated decision-making may not only enhance the value of urban design, but actually enable it to be realised in the first place.

3.8   User participation

Introduction

User participation encompasses public consultation, but extends also to various forms of interactive involvement in project design processes. In urban design, these might include public surveys or planning workshops for a local government policy initiative, and design workshops to develop or test design options with user groups. Assuming a particular initiative will benefit from user participation, the type that is appropriate in each instance depends on the scale and nature of the project, and the social and political context in which it is being designed.

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[310]   Giles-Corti and Donovan, 2002, p 1793.

[311]   Dovey, 2000.

[312]   Burayidi, 2001, p 63.

Emergence of user participation in urban design and planning practice

Concern for user participation became central to urban design activity during the late 1960s. This was in response to growing calls from both users and designers for ways to achieve a better fit between the built environment and user needs and expectations. Ideas and practices of user participation were developed during the following decade.

In *Good City Form*, Kevin Lynch[313] identifies three dimensions of 'control' that help to understand how variations in user participation and control affect the liveability of the city. Lynch describes the first of these, congruence, as the link between use and activity: that is, the degree to which the people who use a place control it. He sees two advantages: a better fit between built form and activity, and freedom of choice for users. Congruence is balanced by the idea of user responsibility. Lynch's third dimension is certainty; the extent to which people understand and feel secure with the system of environmental control. Urban theorists such as Christopher Alexander[314] also advocate user participation in design. Alexander notes that people tend to take responsibility for their place if they have a stake in or feel they own it.

The theoretical propositions of Alexander and others do not contain evidence of the promised benefits flowing from user participation. While more recent research offers little empirical evidence on the value of user participation, it does provide clear and strongly supported findings. These are listed below.

Users provide information essential to the design process

Users have a particular expertise and this needs to be integrated into design.[315] A broad range of researchers and practitioners agree that users are a source of wisdom and information about local conditions, and community needs and attitudes – all of which can enable the designer to respond better to specific needs.[316] With respect to the design of public spaces, it has been suggested that 'the community is the expert'.[317] Such user input improves the effectiveness of decision-making and leads to more effective use of the resources at the disposal of a particular community.

User participation leads to improved 'fit' between the environment and user needs

Participation benefits users. Henry Sanoff and other leading researchers demonstrate that by allowing design to respond to fundamental needs and reflect user values, user participation helps achieve better 'fit'.[318] Sanoff also identifies the satisfaction to users of knowing that they

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[313]   Lynch, 1981, pp 208–211.

[314]   For example, see *The Timeless Way of Building*, 1979; *A New Theory of Urban Design*, 1987.

[315]   Sanoff, 1978, p 1.

[316]   Sanoff, 1990; Kernohan et al, 1992, p 5; Wekerle 2000; US Local Government Commission, 2004.

[317]   Francis, 2003.

[318]   Sanoff, 1990; Kernohan et al, 1992.

have influenced the design process. From many years of experience, he has found that the main source of user satisfaction is "the feeling of having influenced the decisions".[319] Indeed, he suggests people value this more than the satisfaction of having their needs met.

Responsiveness to public and user concerns, and consequent user 'ownership', assist project approval processes

Ultimately, all urban design projects require approval through a public process if they are to be implemented. Individuals will know what they want, and an inclusive process will enable them to appreciate how their needs can be integrated into a wider initiative. Evidence shows that participatory processes can help frame realistic public expectations and increase public awareness of the consequences of decisions.[320]

When accompanied by genuine responsiveness to public concerns, the participatory process may lead to support for positive change and also assist future urban design initiatives.[321] In order to maximise the benefits of this aspect of user participation, consultation might be combined with 'social marketing' and public education.

User participation builds stronger communities

The participatory process engages and informs residents, who consequently feel better connected to their communities.[322] A stronger sense of community is developed along with an increased sense of community control.[323] The US Local Government Commission[324] quotes a former mayor of Pasadena, observing that public participation has "raised the level of trust among residents – not trusting in city hall, but trusting that they own city hall". At the same time, participation legitimises user interests, giving a sense of empowerment and consequent wellbeing.

User participation enhances democracy

There is evidence suggesting that while one of the early intentions of user participation was to engender citizen control over design, this has not arisen. Evidence also suggests that the concept of design without designers – another early tenet of user participation – was not necessarily desirable. Reis[325] suggests that participation in its 'power sharing' sense did not work because in virtually all instances of user participation in design, professional designers had final control

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[319]   Sanoff, 1990, p 1.

[320]   Local Government Commission, 2004.

[321]   Sanoff, 1978; Alexander and Tomalty, 2002, p 405; McClure and Hurand 2001; Thorns, 2002.

[322]   Wekerle 2000, McClure and Hurand 2001.

[323]   Francis, 2003, p 59.

[324]   United States Local Government Commission, 2004.

[325]   Reis, 2000.

over the design. Nevertheless, participatory process defends the interests of people whose needs might be otherwise ignored.

Successful user participation processes in urban design rely on and do not substitute for professional design and technical expertise

There are several ways to address user participation in urban design. These range from no consideration of user satisfaction with design, to total user involvement in design – for example, 'architecture without architects'. The evidence is that a combination of user participation and expert technical and design input is required for optimum results. Dialogue between user and architect combined with design expertise will, in the words of Lasdun, "… allow the architect to give the client not what he wants but what he never dreamed he wanted; something however, which when he gets it he will recognize as what he wanted all the time".[326]

Research by Reis[327] provides strong evidence for a middle course that involves gathering proper information about the factors most affecting user satisfaction, proper respect for these factors, and their reflection in design. With reference to public housing projects, Reis indicates that, while design must be informed by user input, outcomes responsive to user needs may be achieved without specific input from users in the design process.

Design creativity is the result of 'special experience'. Expert knowledge introduces new possibilities and the design professional extends the range of design solutions.[328] As a strong advocate of user participation in design, Sanoff observes that the public should be involved at their level of competence, participating according to their interests and what they know. Users should not be asked for information that they may not hold or that is highly speculative. Anecdotal evidence is not sufficient when resolving complex planning, policy and design issues.

There are inherent risks in participatory process; however, these risks can be managed

A poorly conceived and badly run process can lead to participatory gridlock. This occurs when there is no agreement, or when the outcome of the process contradicts established social or environmental goals.[329] Narrow or vested local interests may contradict the broader public interest. An example of this risk is where strong evidence exists for the environmental and economic benefits of infill relative to peripheral sprawl,[330] but infill is resisted by local residents. The challenge in such situations is to provide tangible evidence demonstrating the value that can be achieved and how potential negative effects can be avoided. Similarly, there is the risk of setting policy or designing community facilities that respond to unrepresentative

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[326] Lasdun, 1984.

[327] Reis, 2000.

[328] Broadbent, 1984.

[329] Francis, 2003, p 60; see also Sanoff 1990, pp 2, 3.

[330] For example, USEPA, 2001.

personal preferences. Achieving community consensus on a politically charged project also raises the risk of a "lowest common denominator approach".[331]

Such risks can be managed by defining a clear brief for the exercise, ensuring representative participation that emphasises the views of groups of people rather than individuals, introducing background research, analysis and appropriate technical expertise, and bringing this together with experienced facilitation.

Conclusion

The overwhelming benefit of user participation in design is to improve the fit between design and user needs, and in doing so, to make more effective use of resources. The result of a properly conceived and well-managed user participation process is simply better, more responsive urban design. The dialogue that is part of user participation leads to increased understanding by users and designers, developers and policymakers. It enhances potential for user commitment and even public 'ownership' of policy and proposals for change or development. This can dispel reactive opposition and support implementation. Other less tangible benefits may be gained because user participation offers social benefits such as an enhanced sense of community and personal wellbeing. The extent and type of user participation may vary widely, depending on the type of project. It complements but does not substitute for expert design input, which is essential for optimum results.

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[331] Wellington Waterfront Limited, 2005, p 8.

4   Discussion

This section of the report offers reflections on the findings and conclusions set out above.

4.1   Interpreting the range of evidence

This study has reviewed a range of evidence, from anecdotal to conclusive. Most is drawn from overseas, but there is also some from New Zealand. The report has sought to discriminate among the sort of evidence available, enabling the creation of a nuanced picture of findings.

The subject area of this report, the value of urban design, is a relatively new one. It continues to change because some concepts are only gradually being clarified and studied. Therefore, it is one in which many conclusions must remain provisional while further research continues. Part of the interest in further research is driven by contemporary issues, such as rises in the price of oil, and the widespread increase in obesity. Emerging trends like these focus researchers' attention on the conditions that might contribute to the problem.

The nature of urban design will also continue to be contested as long as it remains an art as much as a science. Design must always be context-specific, with the consequence that generalisations will always need to be qualified. Some design concepts will remain elusive, such as the way good design responds to local context with what might be described as 'economical gestures'.

4.2   The interconnectedness of urban design factors

Various aspects of urban design work together to generate high-quality urban places. Put another way, good urban design is unlikely to emerge unless a number of conditions are in place.

First, good urban design needs to operate at a range of scales simultaneously, from the site to the wider city or region. This is particularly so in respect of transport arrangements, which are so pervasive in relation to urban design. But it is also true in respect of other cross-cutting initiatives, such as raising the quality of architectural design, and ensuring the quality of green areas.

Second, highly attractive urban places are likely to be ones in which there is a combination of several physical attributes – including good physical connectivity, medium or high density, a mix of land uses, and good street design, often emphasising local character. Repeatedly, interaction between these factors tends to lead to reduced vehicle use and increased walking – mutually reinforcing environmental and social benefits that many studies conclude are indicative of good design. As a recent US Environmental Protection Agency review notes, there is a need for multiple, place-specific initiatives if lasting social, environmental and economic benefits are to be achieved: "The effectiveness of good urban design practices depends on how

well they are implemented, and how they are combined with other programs."[332] Some of the factors in this interaction are illustrated in Figure 1 below.
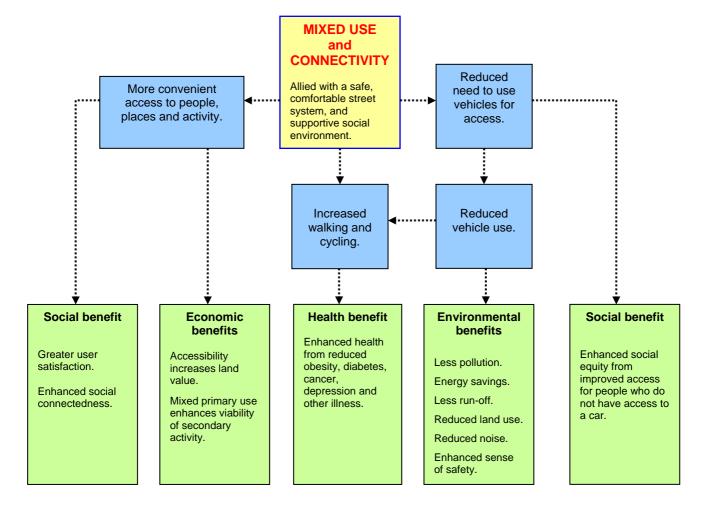
Figure 2: The value of mixed use and connectivity: illustrating the linkages

This figure focuses on only two of the important factors in urban design – mixed use and connectivity – and their impacts. It is illustrative only, and does not imply that the design elements that are included are the most important elements. It does underline, however, how two important design elements can reinforce one another.

In many instances, physical design measures must be complemented by non-physical initiatives if they are to deliver optimal value. For example, perceptions of comfort and safety are influenced by the physical environment, but also by the behaviour of other street users and the degree to which streets are active and lively. These conditions can be influenced by local city governance, and by either public or private initiatives. Good design and planning can act to enhance people's sense of security,[333] which is also influenced by other factors such as personal experience and the social environment.

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[332]   United States Environmental Protection Agency, 2001.

[333]   Wekerle, 2000; Cozens, 2002, pp 132, 133.

4.3 Outstanding findings

Five sets of findings stand out in this report. The evidence supporting them varies in robustness, but they are clear themes running through the literature and are of obvious relevance to New Zealand urban design today.

- **Good urban design can sometimes cost more upfront, but it also offers significant benefits to the community**. Considerable evidence points to well-designed projects generating higher returns to developers, although this is not always the case. Generally, some of the 'value' accrues to the developer, especially if they retain a longer-term stake in the development, while some accrues to those in the vicinity of a well-designed building, street or other public place. Benefits may spill over to a whole neighbourhood or city, and this matters increasingly in an age in which the quality of an urban area is an important part of its comparative advantage. Well-designed urban areas have greater potential to be focal points for interaction, enterprise and innovation. Moreover, good urban design, characterised by compact nodes, mixed use and a high-quality fabric of buildings and places, is important if a city is to be adaptable and resilient in a changing economic environment. An interesting strand of research suggests that cultural assets – including characterful historic areas – can help to attract both tourists and skilled workers. Similarly, as noted above, people choose to live in places that offer a distinctive quality of life, along with career opportunities. [334]

- **Conversely, poor design, or 'business as usual' is likely to have significant adverse environmental, social and even economic effects**. The perpetuation of poor design can lower quality of life and limit employment opportunities. An example of an outdated design 'model' that continues to be commonplace in New Zealand is low-density peripheral urban development with rigidly segregated land uses, and residential areas poorly connected to commercial activity and with poor internal connectivity. The literature is clear that the 'external costs' generated by such development are significant; essentially, such urban design is unsustainable.

- **Urban design that delivers improved quality of life is valued by the community**. As noted above, 'quality of life' is increasingly a platform from which towns and cities compete for inward investment and high-skilled footloose workers in the new globalised economy.[335] But quality of life is also valued for its own sake. Quality of life includes, for most people, attributes such as high-quality air, water that is not threatened by diffuse run-off from traffic, and redevelopment of unused or derelict sites rather than unsightly carparks.[336] In social terms, 'quality of life' includes greater city pride, social inclusiveness, increased vitality and safety, and the simple sense for both residents and visitors that pleasant amenities and facilities are available.[337]

- **Urban design can result in health benefits, for example, through facilitating physical exercise**. Some of the strongest emerging evidence about good urban design relates to walkability and to urban features that encourage walking. Walkability is linked to the density of a neighbourhood, the mix of uses it contains (especially the retail–residential

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[334] Organisation for Economic Cooperation and Development, 2003; Planning Institute of Australia, 2004, Appx A, p vi; Worpole, 2000, p 19.

[335] Worpole, 2000, p 36.

[336] Carmona et al, 2001a, p 79.

[337] Carmona et al, 2001a, pp 78, 79.

mix), the connectivity and attractiveness of the street network, the reasonable proximity of the activities that are the destinations of trips, and perceptions and conditions of safety. There is also some evidence, although less conclusive, that areas with distinct character encourage walking. This report has noted strong evidence that walkable public environments can lead, by a variety of means, to a better quality of life. They can enhance public health for the benefit of individuals as well as the national health budget, provide support and increased custom for business,[338] reduce environmental costs, and may even help to enhance social equity.

- **Urban design can help to make towns and cities safer and more secure**. The risk of crime is lower with interconnected network street systems than with complex cul-de-sac arrangements. A lack of connectivity, and segregation – either of a new neighbourhood from surrounding areas, or of a dwelling from its neighbours – can produce negative effects ranging from vehicle dependence and social isolation at the neighbourhood level to increased risk of burglary at the site level. Mixed use is also associated with reduction in some types of crime, and reduced fear of crime.

4.4   Taking the wider view of good urban design

There can be a divergence of interest in good urban design between those who seek profitability in a property investment, and those who are concerned with the wider, longer-run return to society from a development. As noted above, short time horizons can be an important issue. Private property investors may seek a payback within a few years, and thus be reluctant even to invest in energy efficiency and other sustainable building features that would offer returns within a decade or so.[339] On the other hand, some developers are concerned with wider 'spill-over' benefits and are aware of the broader, longer-term impact of their projects.

In the case of public investments in better urban design – such as public places, street landscaping and transport system configuration – the benefits can be expected to accrue to a wide group or to the community as a whole, rather than to a few individuals. Because so much of the value such investments offer is intangible, such as greater social inclusiveness, they pose the even greater problem of deciding what sort of design investment is likely to yield the best return.

As one UK writer says in relation to both buildings and places:

> *[G]ood design can add enormously to the quality and vitality of the urban or rural setting. Indifferent design, or endless rows of standardised buildings and ill-fitting developments can cumulatively contribute to a form of urban entropy, a general deadening of the visual and even spiritual qualities of the places in which we live and work, leading to what … has [been] described as 'the long term winding down of the system as a whole, in terms of aspiration and the quality of life.' Good design has the capacity to make everything work better, economically and socially, and bring benefits to all.*[340]

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[338]   Litman, 2004, p 12.

[339]   Frej, 2003, p 5; Kats et al, 2003.

[340]   Worpole, 2000, p 53.

4.5   Applicability to New Zealand

It was noted earlier that most of the research on urban design is from abroad. This poses a challenge for New Zealand, because in applying it we cannot assume that conditions here are the same as those in the originating country. New Zealand urban areas are sometimes more like European cities (Wellington, Dunedin) and sometimes more like American or Australian cities (Auckland), although many aspects of our cities are also unique. Moreover, the research often suggests that those urban design features that most influence desired outcomes can be quite location-specific, and can vary from one cultural context to another.

This report has identified the research findings that appear most relevant to the current New Zealand context, noted where those findings come from, and has drawn, where possible, appropriately nuanced conclusions. In particular, it is clear that care should be taken in drawing conclusions from large and dense overseas cities and applying them to smaller and much less dense New Zealand towns and cities. Having said that, it is clear that much of the evidence from abroad in this report can be applied to New Zealand as a robust basis for policy development.

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