# ESSENTIALS OF URBAN DESIGN


MARK SHEPPARD

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# Foreword

The industrial revolution and the advent of the motor car saw many cities transition from mixed use 'places for people' into specialised and separated areas serviced by roads and freeways. The street that makes up 80% of a city's public realm was increasingly dominated by motor vehicles rather than people. This model, particularly those cities that grew up post the motor car, started in the 1960s to fail, economically, socially and environmentally. Commentators such as Jane Jacobs and Jan Gehl noticing this trend started to advocate for a return to people-based cities and emerged as the new urban philosophers. They argued for a new approach that was neither planning as it had emerged in the 20th century nor the architecture of the modern movement, but rather the general practice of urban design. As general practice is the platform for specialisation in medicine, then urban design is increasingly emerging as the platform from which planning, architecture, engineering and landscape architecture specialities need to spring. Not surprisingly, as more and more people live in cities a common understanding of what makes cities good places to live is emerging. Basic ingredients such as mixed use, density, good connectivity, local character and a high quality of public realm are now emerging as the drivers of social cohesion, economic vitality and sustainability.

The 1980s saw the use of these ingredients to help turn around the flagging fortunes of many cities, from well-known cities such as New York, Copenhagen and Glasgow to cities such as Melbourne which lifted itself from relative obscurity in the 1980s to an exemplar of urban transformation by the 21st century.

The secret to this transformation was not a series of grand projects but rather the incremental application of good urban design principles over an extended period of time. This has seen the reestablishment of a balance between people and the technologies of our modern society, the gradual breaking down of the isolationist tendencies of the motor car city towards a city for all ages and abilities.

There is no great mystery to these ingredients and Mark Sheppard in this book looks at the tools and many ways in which citizens, planners, architects and many others can work to make our cities better places for the future. If urban design can become the basis of better understanding the way we use our cities, and the techniques illustrated in this book start to become better understood and applied, then we will all become the beneficiaries of places that allow people to operate in a more equitable, productive and sustainable urban environment.

Why is this important?

Cities are emerging as the drivers of our national economies and if we are to survive the dual pressures of rapid population growth and climate change it will be because cities are repurposed

to absorb these pressures and turn them into positive drivers rather than destructive forces. Successful urbanisation will see population growth stabilise and decline while making living in compact cities more sustainable and capable of being supported by better utilisation of our limited resources.

This book is an important tool in making this possible.

Professor Rob Adams AM
Director City Design
City of Melbourne

# Contents

# Preface

This is not a book for expert urban designers. It does not contain any new urban design ideas or explain any of the important urban design theories. If you are interested in cutting-edge concepts, or a history of the evolution of urban design, this book is not for you.

This book is for students seeking a plain-English guide to the practice of urban design. It is also for those who are not urban designers but whose work affects the urban environment – architects, town planners, traffic engineers, landscape architects, property developers, city councillors, planning lawyers, planning appeal arbitrators and residents concerned about development. Many people in these positions have little or no formal urban design training. However, their influence on development and infrastructure projects has a lasting effect on the quality of the urban environment.

If you are one of these people, this book aims to give you the tools to contribute to better outcomes by explaining basic urban design concepts for the most common types of development. It is intended to be equally useful for designing places and evaluating designs.

This book is about how urban places really work from a human perspective. It is not based on idealism or innovation for its own sake, but on practical and time-honoured strategies for developing successful places for people. Towns and cities evolved because of a need for people to exchange goods, services and ideas, and grew because people love to socialise and gather together. Urban design seeks to establish the conditions that support exchange and interaction – social, commercial, intellectual and cultural – by creating an accessible and inviting public environment.

If many of the ideas in this book seem more prosaic than aesthetic, that is because urban design is as much technical as it is artistic. It involves solving challenges presented by the circumstances of each site to create a place that functions well.

However, the art of urban design is no less important. It is the art of urban design that raises great places above the ordinary and utilitarian, to those that feel good. It is the art of urban design that creates exceptional places in which people want to live, work and visit. This has become known as *placemaking*.

Placemaking is not merely about designing beautiful buildings, streets and spaces. The art of urban design is in the three-dimensional arrangement of the physical components of a city or town to create unique, appealing and memorable experiences. It is these qualities that draw people back to the world's great cities and towns.

The demands of efficient function and placemaking can sometimes pull in different directions. Just as influential classical Roman architect Vitruvius identified the need to reconcile 'firmness, commodity and delight' in architecture,[1] urban design involves simultaneously ensuring a well-connected and vibrant *public realm*, accommodating the desired types of development and creating an appealing and memorable place.

Application of the principles outlined in this book will help to avoid flawed urban development by ensuring good function and utility. They also provide clues to the creation of an appealing environment. But nothing can replace the skill of an expert urban designer in the creation of truly great places that at once operate smoothly and delight their occupants.

The goal of ecologically sustainable development underpins many of the concepts explained in this book – particularly the promotion of more compact, mixed-use places and walkable environments to reduce the need for travel and to encourage public and *active transport*. However, like other foundations of good urban design, this is not drawn out in detail, because it is well covered by other publications.

Similarly, the process of involving the users of the public realm (the community) in urban design is barely touched upon here. This is not to suggest that it is unimportant, merely that outlining the need for and methods of engagement are not key purposes of this book.

The ideas in this book are explained in straightforward, relatively jargon-free language. However, common urban design terms are used where appropriate because knowledge of them will assist the reader to engage in urban design discussions. These terms are explained in the Glossary. Such terms are *italicised* the first time they are used in each chapter.

If you disagree with something in this book, think it fails to address an essential urban design issue, or have any other comment or suggestion, please email me at essentialsofud@gmail.com. I hope that you find this book helpful!

[1] Wotton H (1969) *The Elements of Architecture*. Gregg, London (translation of Vitruvius' *de Architectura*).

# How to use this book

This book is not intended to be read from cover-to-cover. It is designed as a reference manual. All common types of urban development are addressed, from single infill buildings to whole urban growth areas, and from residential to industrial uses. It also addresses public transport interchanges because of their importance as public places.

The book is divided into two parts. Part I, *Infill Development*, deals with types of development and urban design that typically occur within existing urban areas – single developments, *centres* and large retail developments, public transport interchanges and urban renewal strategies. The second and third chapters may also find application in large developments outside existing urban areas. Part II, *Greenfield Development*, deals with the types of plan typically required outside existing urban areas – urban growth frameworks, precinct structure plans, and master plans for residential neighbourhoods and employment precincts. The last two chapters may also be relevant for large sites within an existing urban area.

Each chapter follows a step-by-step process for designing or assessing a different type of development. The universal starting point is a comprehensive analysis of the site and its context. For larger projects, this is followed by confirmation of the 'program' or principal ingredients of the development. Commonly accepted urban design principles are then outlined, working from the broad to the particular. Typically, this begins with the overall configuration of the development and ends with the detailed design of streets, spaces and building frontages. However, urban design is not a linear process. Design decisions made early in the sequence often need to be reviewed and refined based on subsequent analysis and more detailed design. Some steps are so inter-related that they need to be undertaken concurrently.

'Rules of thumb' are provided in case direction is not found within town planning provisions. These should be used with care: good design results from creative responses to context, not from slavishly following a formula. Each chapter culminates in a checklist to assist in confirming that all the appropriate steps have been followed.

The focus of Chapter 7 on residential uses and the focus of Chapter 8 on employment uses should not be taken as an encouragement to single-use places. On the contrary, good urban places have a range of uses. These chapters discuss how additional uses can be incorporated. Residential neighbourhoods and employment precincts should form part of broader, mixed-use districts.

Some of the issues addressed by this book are commonly governed by planning controls. The design concepts presented here may provide a useful guide to the exercise of discretion where it is allowed by these controls. They may also provide valuable guidance in any review of urban design-related controls.

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# Acknowledgements

Few of the ideas in this book are original. The vast majority are filched from books and people I've studied and worked with over my career.

My uncle Peter Sheppard inspired me to appreciate the *sense of place* and spatial drama of medieval European hilltowns. Later, at Oxford Polytechnic, Lora Nicolaou taught me how to reconcile spatial drama with legibility. Also at the Poly, Ian Bentley provided cogent rationales for the essential qualities of good urban places and encouraged me to relate them to local identity and ecological sustainability.

When I joined David Lock Associates, Will Cousins gave me the tools to build these qualities into real projects, Lawrence Revill illustrated how to foster innovation in science parks and David Lock imparted untold wisdom in the mechanisms of cities and city processes. From Jim Urwin and Keith Mitchell I harvested the principal principles of integrated land use and transport planning.

Arriving in Australia, I was privileged to collaborate with numerous experts who grew my knowledge of urban dynamics. Jim Higgs taught me how to tame traffic; Roger Gibbins relayed recipes for retail success; Alex Hrelja offered gems about job generation; Kobus Mentz showed me how to chaperone a charrette; Mike Cullen stressed the centrality of amenity in centres; and Greg Dowling demonstrated the desirability of diversity.

All my colleagues at David Lock Associates in Australia have added to my comprehension of urban affairs. I must make particular mention of David Klingberg, who always reminds me when I stray, to look after the basics: permeable street grids, strong built form and mixed use; and of Jenny Donovan, who taught me to always start with people.

Of course, this is only a selection of the people I have gleaned material from for this book. There are hundreds of others who deserve mention but are too numerous to name individually.

I was inspired to put fingers to keys by the writing of Jenny Donovan and the prolific John Patrick, whose industry constantly astounds. Having now laboured through the process myself I am even more in awe of them both!

It was an extraordinary leap of faith for Ted Hamilton of CSIRO Publishing to agree to publish this book based on the brief ramblings of an unpublished author, and I am eternally thankful for his daring. I have been fortunate to be in the care of the kind and understanding team at CSIRO including Briana Melideo, Lauren Webb, Melinda Chandler and Tracey Millen. The book is also much the better for the diplomatic counsel of Adrienne de Kretser.

I am indebted to Peter Sheppard for his pithy advice on concise writing, and the following people who were generous enough to provide constructive criticism of my formative drafts: David Sheppard, Tim Sheppard, David Klingberg, Mike Cullen, Alex Hrelja, Phil Carter and Greg Dowling.

Thanks too to David Lock Associates, which provided permission to use its plans throughout the book, and Alastair Campbell, who provided numerous images where my own collection was found wanting.

Rob Adams' foreword not only dignifies this work but also offers an incisive exposition on the importance of urban design. I am honoured by his generosity.

Finally, my everlasting love and gratitude goes to my forgiving wife and children, who have endured me tapping away for long evenings and on family holidays. May all our future vacations be free of wordsmithing!

PART I

# Infill Development

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# Single developments

## 1.0 Introduction

Development within existing urban areas is dubbed *infill development*. This can range from the redevelopment of single properties to the renewal of whole precincts, such as redundant industrial areas.

This chapter presents the key urban design principles of good infill development at the scale of single development projects. Larger, precinct-scale infill development is discussed in separate chapters on new *centres* and large retail developments (Chapter 2), and urban renewal areas (Chapter 4). Chapters 7 and 8 (residential neighbourhoods and employment precincts) may also be relevant for larger infill development projects.

The chapter begins by outlining what analysis should be undertaken, goes on to discuss site planning – the overall layout of development on the site – follows with building massing and finishes by addressing detailed design.

# 1.1 Urban context and site analysis

Comprehensive analysis is the launching pad for good urban design.

There are four scales of analysis:

- **district** – the area within ~1000–2000 m of the site;
- **neighbourhood** – the area within ~500–1000 m of the site;
- **streetscape** – both sides of the street(s) abutting the site, for a distance of ~100 m in either direction;
- **site** – the site and immediately neighbouring conditions.

Streetscape and site analysis are sufficient for development that will generally maintain the prevailing pattern of urban development. An understanding of the district and neighbourhood context is required if variation from the prevailing pattern is being considered.

Of course, the design of infill development should also be underpinned by an analysis of relevant town planning provisions.


*Urban context and site analysis.*

## 1.2 District analysis

District-scale analysis explores how the site relates to the broader *urban structure*. It encompasses the area within ~1000–2000 m of the site.

Analysis at the district scale should identify the relevance of major urban and natural features such as:

- centres and employment areas;
- railway lines and stations;
- freeways and arterial roads;
- major open spaces, water bodies and waterways.

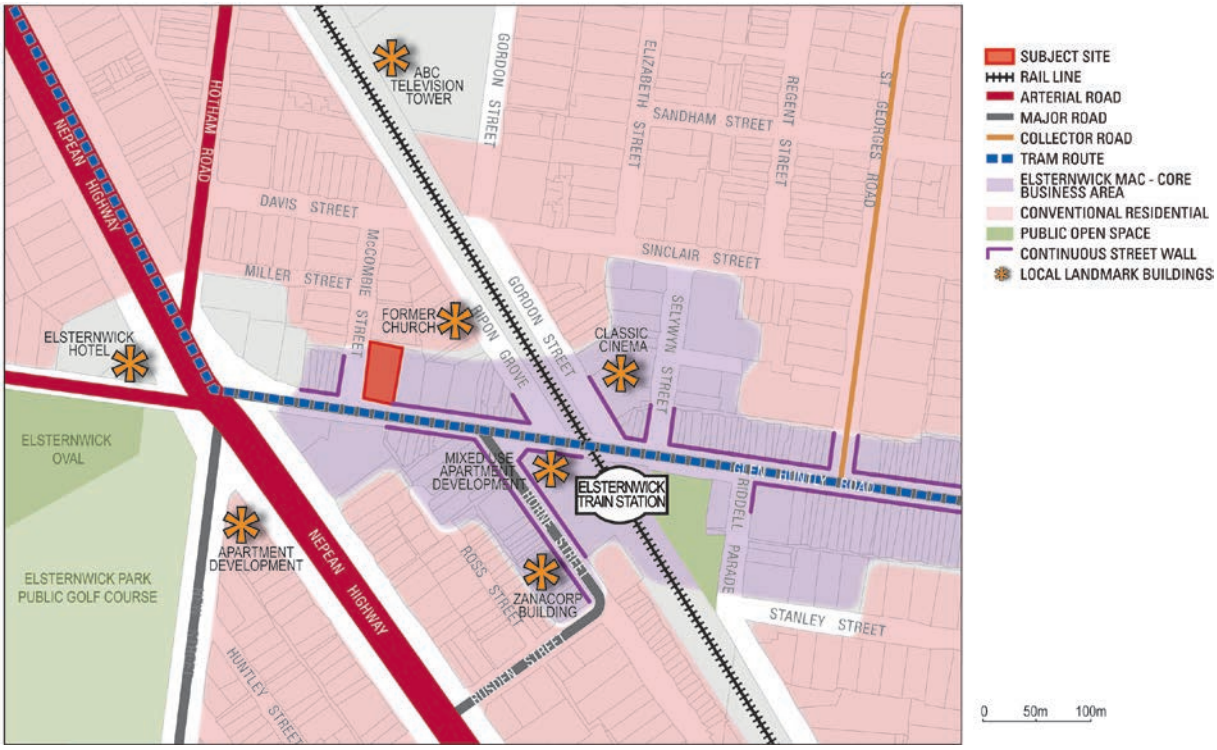

*District analysis.*

## 1.3 Neighbourhood analysis

Neighbourhood-scale analysis identifies the patterns, facilities and features of the local area. It spans the area within ~500–1000 m of the site.

Analysis at the neighbourhood scale includes consideration of:

- **urban structure** – the key structuring elements of the surrounding urban area, including main roads and major intersections, railway lines and stations, significant open spaces, the broad pattern of land uses and building types, *landmark* features, major attractions such as key public facilities, key topographic features, water bodies and waterways;
- **natural environment** – natural features near the site, including topographic features, significant publicly accessible views and vistas, parks and water bodies and waterways, and vegetation;
- **access** – the surrounding movement network for all travel modes, including the street hierarchy, train stations, light rail and bus stops, pedestrian footpaths and crossings;
- **subdivision pattern** – the configuration of lots near the site;
- **development potential** – the likelihood of redevelopment in the surrounding area (see section *4.3 Development potential*);
- **built form pattern** – the pattern of building types, including predominant front setbacks and heights.




*Urban structure analysis.*

## 1.4 Streetscape analysis

Streetscape analysis discerns the characteristic patterns and special features surrounding the site. It should include both sides of the street(s) abutting the site, and generally extend to the next intersection in each direction. This may be curtailed where there is a particularly long *block* or where a hill prevents views of the site frontage.

Analysis at the streetscape scale should identify patterns of:

- **land use** (if there is any variation);
- **built form** – building height, setbacks, width and separation (including approved but unbuilt developments);
- **architectural character** – typical features of development in the street(s) abutting the site, such as roof types, window forms, materials and colours, and fences;
- **heritage** – heritage fabric and historic activities;
- **landscape character** – common vegetation features in the street(s) abutting the site, such as street trees, the extent and type of planting in front and rear gardens, and side setbacks.

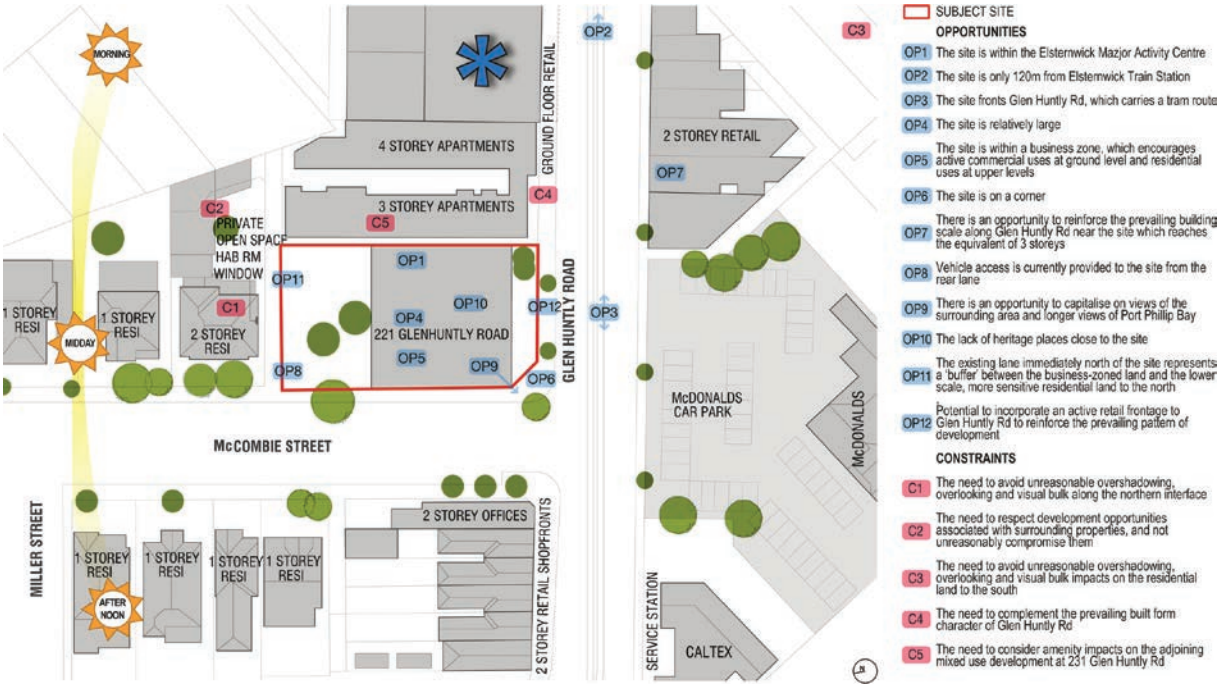

*Streetscape analysis.*

# 1.5 Site analysis

Site analysis reveals the site's attributes and constraints. These include the nature of its immediate interfaces.

Site analysis should identify:

- the size and shape of the site;
- solar orientation;
- levels within and immediately adjoining the site;
- views to and from the site;
- existing structures and vegetation within the site;
- historic use of the site;
- existing vehicle access points;
- overhead and underground services within and in front of the site;
- existing boundary fences;
- trees close to the site within the street and neighbouring properties;
- existing and approved neighbouring buildings' siting, height and use;
- existing and approved neighbouring developments' windows and private open spaces;
- existing level of shadowing of site and surrounding land;
- drainage, services and carriageway easements.




*Site analysis.*

# 1.6 Local character

Sensitivity to context is fundamental to good urban design.

In areas dominated by highly valued buildings with a consistent *character*, such as heritage areas, new development should adopt the key aspects of that character to maintain its value. However, cities and towns need to evolve to accommodate social trends and planning imperatives. For example, falling household sizes, an ageing population and changing lifestyle preferences fuel demand for more compact forms of housing. Most mature planning authorities also have a desire for more environmentally sustainable urban growth, leading to policies that promote increased residential densities in locations close to employment, public transport and services.

## Degree of change

The first step in contextual design is to examine planning policy to determine whether the area is intended for:

- **minimal change**, typically because its character is considered outstanding;
- **moderate, incremental change**, typically because it is considered appropriate to respond to changing social preferences;
- **substantial, rapid change**, typically because it is an area identified for a change of use or a significant increase in density to accommodate growth.

## Character elements

Even where change is anticipated, some elements of the existing character may be able to be incorporated within the 'future character'. Elements of private development to consider include:

- subdivision pattern (particularly lot width);
- land use and building type;
- front and side building setbacks, and the extent and type of vegetation within them;
- building height (including consistent departures from the prevailing height, such as taller buildings on corners or larger sites);
- building width (as seen from the street);
- architectural style, including roof styles and typical building elements;
- street facade openness (the extent of windows and usable open spaces facing the street);
- building materials and colours;
- front fence height and type;
- backyard character (rear setbacks, building width at the rear, and the extent and type of vegetation in the rear yard).

*Public realm* elements such as street trees and views also make a significant (and sometimes greater) contribution to local character. However, only development that creates new public realm needs to consider these elements.

It is important to identify which elements contribute most to the character of the area. These are more sensitive to change. The greatest contribution is generally made by elements that are more evident from the street or rear gardens, and either relatively consistent in the vicinity of the site or unusual when compared with surrounding areas.

## Desired future character

In areas where planning policy encourages change, it often defines the desired form of development. If not, a desired future character needs to be delineated that responds to policy aspirations (e.g. in relation to housing or land use change) before designing or assessing a development. This should address land use, building setbacks, building height, landscaping, fences and, potentially, architectural style and external materials.

## Landmarks

Most development should conform with the existing or desired future character. However, buildings that stand out from the surrounding character are appropriate at key intersections or public transport nodes, and where they are to accommodate key public uses, to provide 'markers' that reinforce our *mental map* of the area (see section *1.17 Legibility*). In these cases, development should be deliberately designed to stand out in terms of use, siting, height, style and/or striking building features such as a sculptural shape or rooftop feature.


*Character analysis.*

### Rule of thumb

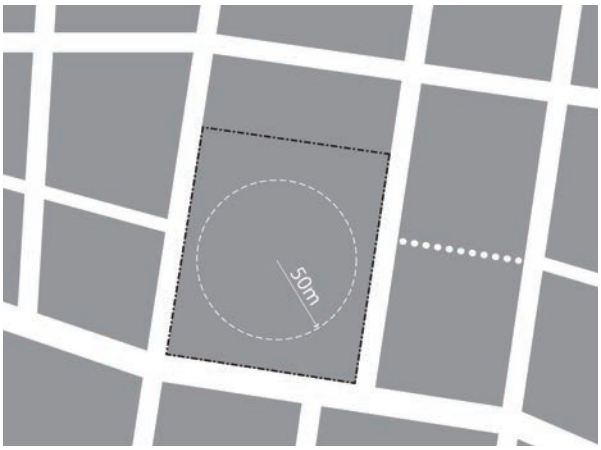
Analyse the local character within approximately five properties either side of the site, on both sides of the street. This may be varied based on the 'visual catchment' of the site – i.e. the area within which it is possible to clearly make out the site. For example, where a site is near the top of a hill, there may be no benefit in analysing properties beyond.

# 1.7 Mid-block links

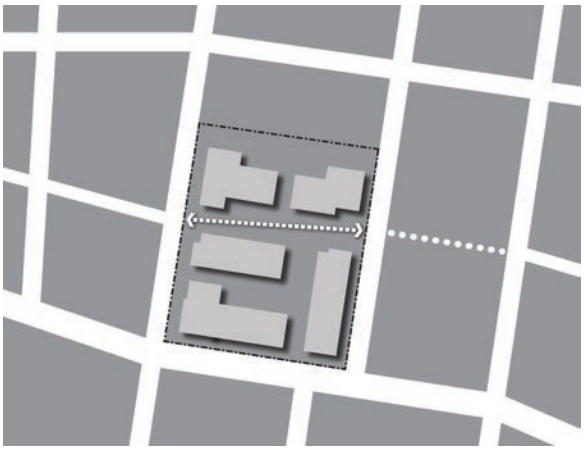
Large sites should be dissected by new public thoroughfares.

There are two key reasons for this:

- all buildings should have direct access from a public thoroughfare (normally a street, but can also be a pedestrian lane). This ensures they have an address that is easily found. It also enables them to be redeveloped in the future independently of other buildings in the block. (This is important to avoid buildings becoming obsolete when property markets change.) So, mid-block links are sometimes necessary to provide access to buildings in the middle of large sites;
- *permeability* is a fundamental quality of good urban places, for all modes of travel. Larger sites sometimes provide the opportunity to create a new link through large blocks that currently create a blockage in an otherwise *permeable* movement network.




*Sites wider than 100 m need a mid-block link.*



*Align mid-block links to form part of a longer route.*

## Alignment

Where possible, a mid-block link should be aligned to complete a partial link through the block or to form part of a longer route through the broader precinct. However, it is critical that its alignment through the site allows for one or more buildings to face it on at least one and preferably both sides to provide an inviting environment. It should also avoid sharp bends to ensure clear lines of sight for *legibility* and safety.

Where sites or blocks are large enough to warrant a mid-block link but the site does not span the block, the link should be aligned to maximise the opportunity for it to be extended to the other side of the block in the future.

## Types of link

Mid-block links may take several forms:

- conventional streets;
- lanes shared by vehicles, cyclists and pedestrians;
- pedestrian and cycle-only paths;
- arcades.

(See Chapters 2, 7 and 8 for guidance on the design of streets and lanes.)

Mid-block links may be bridged by buildings at one or both ends to maintain the spatial definition of the principal streets and to contribute to their own distinctive identity, provided the bridge is not too low or deep.

## Private links

It is preferable that mid-block links are dedicated as public land, so that they can be managed for the public benefit rather than for the narrower interests of the adjoining property owners. However, where this is not compatible with the use of the adjoining buildings, a privately owned but publicly accessible link can still contribute to legibility and permeability, even if it is not open 24/7.

### Rules of thumb

- Determine the need for a mid-block link by looking at the dimensions of the site and the spacing of the surrounding streets. If the distance from the middle of the site to any surrounding street is more than 50 m, a mid-block link is probably needed to access the middle of the site.
- Look for opportunities to insert a mid-block link in any block longer than 100 m in a centre or 180 m elsewhere.
- Ensure built form bridging a mid-block link is at least 4 m above the ground and no deeper than 2.5 times its height.


*Shared lane.*

*Mid-block pedestrian/cycle link in centre.*

*Mid-block pedestrian/cycle link in residential area.*

*Covered mid-block retail lane.*

# 1.8 Rear lanes and car courts

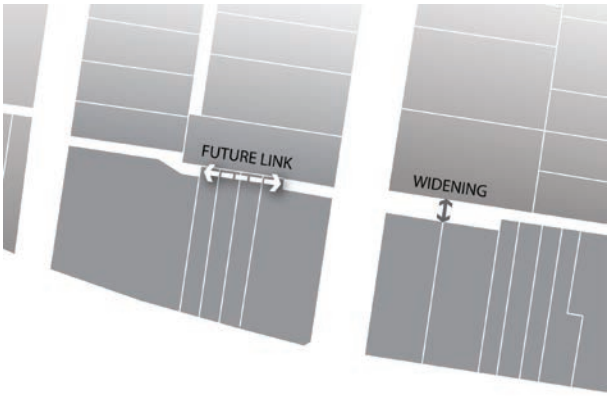
Rear lanes are an essential tool of good urban design.

A lane or court that provides vehicle access to the rear of a property can bring significant urban design benefits where:

- a high level of pedestrian amenity is desired in the street, e.g. a centre;
- there are narrow lots that would otherwise result in unacceptably frequent footpath crossovers (or crossings) and garages facing the street, e.g. townhouses;
- extensive kerbside parking is required;
- the use requires a dedicated loading area, such as a larger retail development.

## Extending existing lanes

Where possible, development should extend existing rear lanes adjacent to the site to maximise the efficiency of the block. Rear lanes may also need to be widened to provide adequate vehicle capacity.




*Extend and widen existing lanes.*

## New lanes

New rear lanes or courts can be created on corner lots and wide sites. Where a new lane is to be created, consideration should be given to how it may be extended as other lots in the block are developed in the future. In short, the alignment of rear lanes should be coordinated across a whole block.

## Design

If there is a desire to encourage secondary dwellings fronting a rear lane (see section *1.16 Medium-density housing*), or a rear lane makes a significant contribution to permeability, it should be designed to support pedestrian activity through an even, shared surface treatment, *passive surveillance* from adjoining buildings and, potentially, landscaping. However, this should not be at the expense of the lane's core function of providing vehicle access to abutting properties.


*Rear lane in centre.*

*Townhouses served by rear lane.* *Image: Alastair Campbell.*

## Rule of thumb

Provide a rear lane or car court behind residential lots up to 6 m wide that are intended to have single or tandem garages, or lots up to 12 m wide that are intended to have double garages.

# 1.9 Fronts and backs

Most forms of development have a 'front' and a 'back'. Houses typically have a front door and front yard open to view, and a backyard surrounded by a high fence. Shops have a largely glazed shopfront, including the entry, and 'back of house' facilities including storage and sometimes loading at their rear.

There is less distinction between the front and back of apartment and office buildings, though both have a front door and often locate outdoor amenities and surface parking at the rear where it is more private and secure. At upper levels, there is usually little distinction – apartment and office buildings can function and look the same on both sides.

## Fronts

The public realm is more inviting and safe if it is edged by the fronts of development, with doors and windows at ground floor level, rather than blank walls, high fences or service areas. This is because doors and windows create the potential for people within the building to enter or at least look into the public realm, providing the potential for both social interaction and passive surveillance.

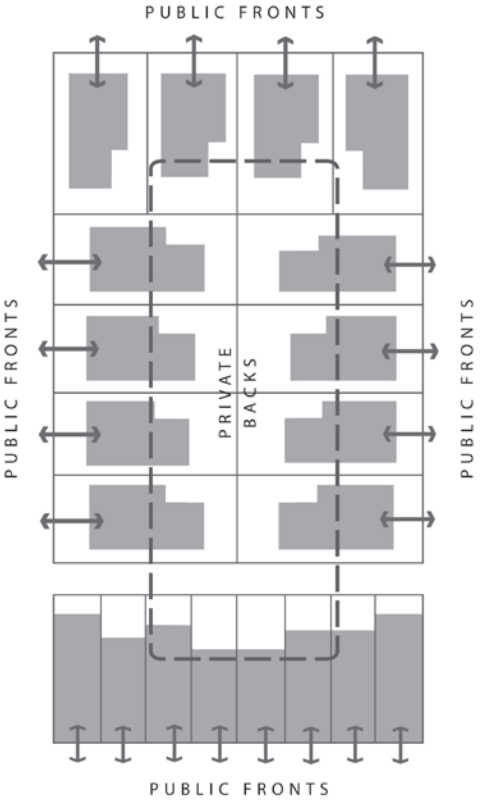
Importantly, this is not a question of aesthetics. Art walls and display windows can make a very attractive facade. However, they do not offer the potential for human interaction that makes the public realm inviting and safe.

## Backs

The private parts of development – residential backyards, storage areas and surface parking – are more private and secure if they are bounded by other 'backs' rather than adjoining public spaces from which people might be able to see or gain access into them.

## Block size

In conventional blocks two properties wide, the individual properties can back onto each other and front the public realm. This pattern has an added benefit: locating private spaces at the rear allows buildings to sit towards the front of the property, where they provide better definition of the public realm. This creates a more memorable place.




*Arrange buildings to face the street.*

*Good residential frontages.* *Image: Alastair Campbell.*


*Poor residential frontage.*

*Private 'backs'.*

# 1.10 Vehicle access and services cabinets

Vehicle access disrupts the pedestrian environment. In addition to the disruptive effect of footpath crossovers (or crossings), driveways and garage entries take the place of *active frontages*, reducing the contribution of the building to the social and visual experience of the public realm. However, most buildings require vehicle access for parking, loading and servicing (including rubbish collection).

Externally accessible services cabinets (e.g. substations, fire hydrant booster cabinets and meter cupboards) are required in larger buildings. The responsible authorities typically require them to be at ground level facing a road. This means that they also take the place of active frontages.

## Location and design

In order to minimise their detrimental impact on the public realm, vehicle access and services cabinets should be located and designed as shown in Table 1.1.

**Table 1.1: Location and design for vehicle access and services cabinets**

| | |
|---|---|
| Where a service lane exists along the rear or side of the site | Vehicle access and services cabinets should be located on the service lane. |
| Where a site has two or more street frontages | Vehicle access and services cabinets should be located on the street with the least pedestrian movement (subject to acceptable traffic impacts). |
| Where a site has only one street frontage | Vehicle access should be located as far as possible from any important pedestrian locations, e.g. a building entry, seating or waiting area, bus or tram stop.<br>The height of services cabinets should be minimised, so that active facade elements above are as close as possible to footpath level. |
| Where a site has only one street frontage and a fully active street facade is desired | A glazed garage door and services cabinets with translucent glass fronts should be considered to mimic an active frontage. |

## Vehicle access design

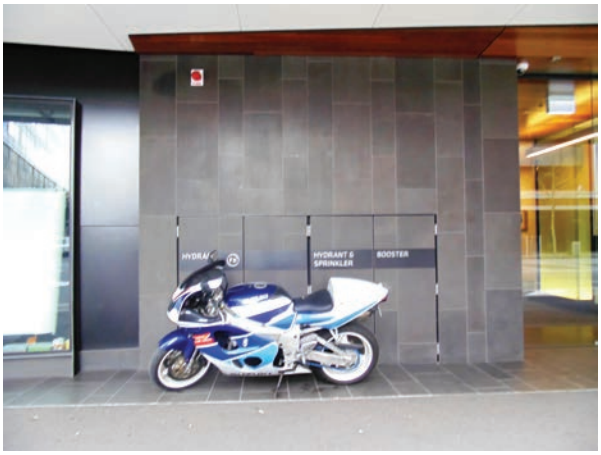
The number and width of vehicle crossovers (or crossings) should also be minimised. Where there is a need for more than one vehicle access from a street frontage, they should be separated to avoid the creation of a long stretch of inactive frontage. Vehicle accesses should also be located to minimise the loss of kerbside parking.

Where they are to be located on a street frontage:

- car parking accesses should have a security door that provides clear definition of the public realm and whose design forms an integrated part of the building facade;
- services cabinets should be designed as an integrated part of the building facade.

*Discreet vehicle access on side street.*

*Glazed garage door.*




*Integrated services cabinets.* *Image: Leo Sheppard.*

*Poorly considered services cabinets.* *Image: Alastair Campbell.*

# 1.11 Street-edge apartments

Ground-level apartments contribute to safe and engaging streets. However, when their only aspect is towards the public realm, it can be difficult to simultaneously provide street engagement and privacy for their indoor and outdoor living spaces.

Where the ground floor is at or close to the level of the public realm, a high fence is required to provide privacy for the ground-level accommodation. However, this prevents any interaction or passive surveillance and reduces the amenity of the apartment. Alternatively, a fence that is low enough for apartment dwellers to see over is also low enough for passing pedestrians to look straight in.

## Preferred techniques

There are three preferred techniques for reconciling these competing needs in different situations (see Table 1.2).

**Table 1.2: Reconciling street engagement and privacy for street-edge apartments**

| | |
|---|---|
| Where a highly active frontage is sought | A two-level apartment with a home office facing the street at ground level provides street activation while the primary living area is at the upper level for privacy. |
| Where a less active frontage is acceptable, but zero or small setbacks are characteristic | A raised ground-floor level allows apartment dwellers to see into the public realm over an opaque balustrade or window sill from a sitting position next to it or a standing position slightly further away, while providing privacy from passing pedestrians for sitting and standing positions further back. |
| Where a less active frontage and moderate setbacks are appropriate | A landscaped setback to ground-floor apartments and their private open space can provide sufficient privacy for them while maintaining the potential for some social interaction. |

## Detailed design

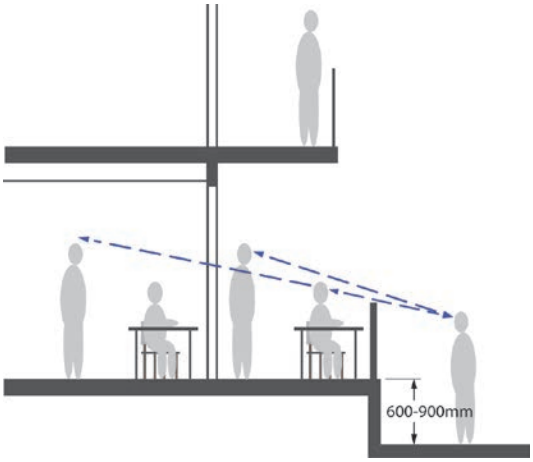
Deep window reveals and mullions can assist privacy by blocking oblique views while maintaining the potential for engagement and passive surveillance. Balconies and rooms at upper levels can be private and contribute to social engagement simply through solid or opaque balustrades, and moderate window sill levels.

Individual pedestrian entries direct from the street should be provided to street-edge apartments where possible, in addition to any internal entries, to reinforce the potential for social interaction and passive surveillance of the public realm.

### Rules of thumb

- Where ground-floor apartments are set close to the street, raise the ground floor level 0.6–0.9 m (ideally ~0.75 m) above the level of the adjacent public realm.
- Where ground-floor apartments are closer to the level of the public realm, set them back ~4 m and incorporate landscaping within the setback.

*Home office.*




*Raised ground floor.*

*Ground floor raised too high limits social interaction.*
*Image: Alastair Campbell.*

*Landscaped setback. Image: Alastair Campbell.*

*Raised ground floor.*

*High fence prevents social interaction. Image: Alastair Campbell.*

# 1.12 Front and side setbacks

Front setbacks are a key measure of the character of an area. The proximity of buildings to the public realm and to each other also has a significant influence on the 'feel' of the street.

## Spatial definition

A public realm that is more strongly defined by built form is more memorable. To achieve this, the front facade of a building should generally be set on or close to the edge of the public realm, be parallel to it, and form as continuous a *street wall* with neighbouring buildings as possible. Front and side setbacks should be minimised except where they are needed for amenity, or where they form an influential element of the character of the area and planning policy seeks to retain that character. Modest front setbacks of 1.5–2 m are appropriate for buildings with residential uses at ground floor, to provide an opportunity for outdoor occupation that fosters social engagement with passers-by. (See also section *1.11 Street-edge apartments*.) Small side setbacks should be avoided without good reason because they serve little purpose.


*Attached buildings with a zero setback create a more memorable public realm.*

## Minimal change

In areas where planning policy seeks to retain the existing character, development should match the prevailing setbacks.[1] Where there is variation, setbacks anywhere within the range of existing setbacks may be adopted, ignoring anomalously large or small setbacks.

## Substantial change

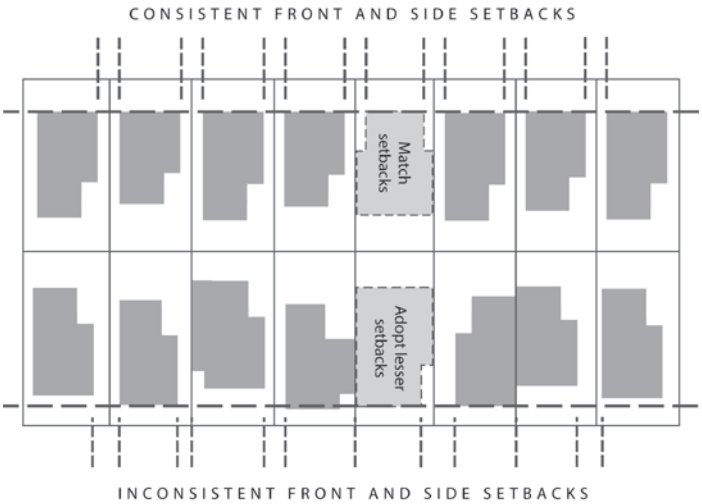
In areas where planning policy encourages substantial change, front and side setbacks should respond to the preferred form of development.

## Moderate change

In areas where planning policy provides for moderate change to the character to provide for increased density, and where preferred front and side setbacks are not specified, the design techniques shown in Table 1.3 should be adopted.

[1] Prevailing setbacks should be determined by analysing the setbacks on the same side of the street up to the next side street in each direction, or 50 m, whichever is the lesser.

| Table 1.3: Design techniques for setbacks in moderate change areas | | |
|---|---|---|
| Front setback | Where the prevailing setbacks are highly consistent | Match the prevailing setbacks |
| | Where the prevailing setbacks are relatively inconsistent | Adopt a setback at the lower end of the range of existing setbacks |
| Side setbacks | Where the prevailing setbacks are highly consistent | Match the prevailing setbacks, but consider lesser (or zero) setbacks well back from the street frontage, where they will not be noticeable from the public realm |
| | Where the prevailing setbacks are relatively inconsistent | Adopt a setback at the lower end of the range of existing setbacks and consider lesser setbacks well back from the street as above |




*Responding to characteristic front and side setbacks.*

## Special locations

Atypical front and/or side setbacks are appropriate for buildings with a public use (e.g. a library, community centre or railway station) or at key intersections or public transport nodes, to help them stand out from their surroundings (see section *1.17 Legibility*).

Where developments abut special buildings, such as heritage places, they should generally be set back to maintain clear viewlines to those places, irrespective of the level of change supported by planning policy. Similarly, increased setbacks may be needed to enable the retention of significant trees.

Development on corner sites need not match the prevailing setbacks in the side street. Smaller setbacks to secondary frontages 'bookend' the side street, marking the presence of a higher-order street at the end. Secondary street setbacks should generally follow the same principles as side setbacks in the primary street.

## Treatment of setback areas

The treatment of setback areas is also an important component of character. This is discussed in section *1.23 Front and side setback design*.

# 1.13 Backyard character

The public realm is not the only place with valued character. The sense of openness and vegetation experienced from a residential backyard is an important part of the character of its block.

## Conventional backyard character

In a conventional residential block, where the lots 'back onto' each other, the combination of rear setbacks creates a contiguous open space that contributes to the character experienced from each backyard, particularly where this space is occupied by significant vegetation.

## Minimal change

In areas where planning policy seeks to protect the existing character, development should respect backyard character by adopting similar rear setbacks, avoiding atypically wide continuous

*Consistent backyard character.*

building forms and incorporating characteristic planting. This may not be necessary to the same degree or at all where the existing conditions of neighbouring properties do not contribute to an open and/or well vegetated backyard character.

## Substantial change

In areas designated for substantial change, development should respond to the preferred form of development rather than to the existing backyard character.

## Moderate change

In areas with a consistent backyard character where planning policy allows for moderate change to provide for increased density and where no desired future character has been defined, development should incorporate a landscaped rear setback. However, this may be smaller than the predominant backyard size.

*Mixed backyard character.*

# 1.14 Building scale

Building scale – particularly height – provokes especially emotional reactions. Buildings that are bigger than the prevailing scale are often referred to as 'overbearing', 'overwhelming' or 'overdevelopment'. However, the preference for *urban consolidation* rather than urban sprawl in larger cities with growing populations means that bigger buildings are inevitable.

## Character

The first step in determining the appropriate scale for a building is to identify the right balance between contributing to urban consolidation and responding to the existing character. This is discussed in section *1.15 Balancing urban consolidation and character*.

## Public realm

Building scale also affects the following aspects of the public realm:

- **legibility** – see section *1.17 Legibility*;
- **solar access** – see section *1.18 Public realm overshadowing*.

## Openness and enclosure

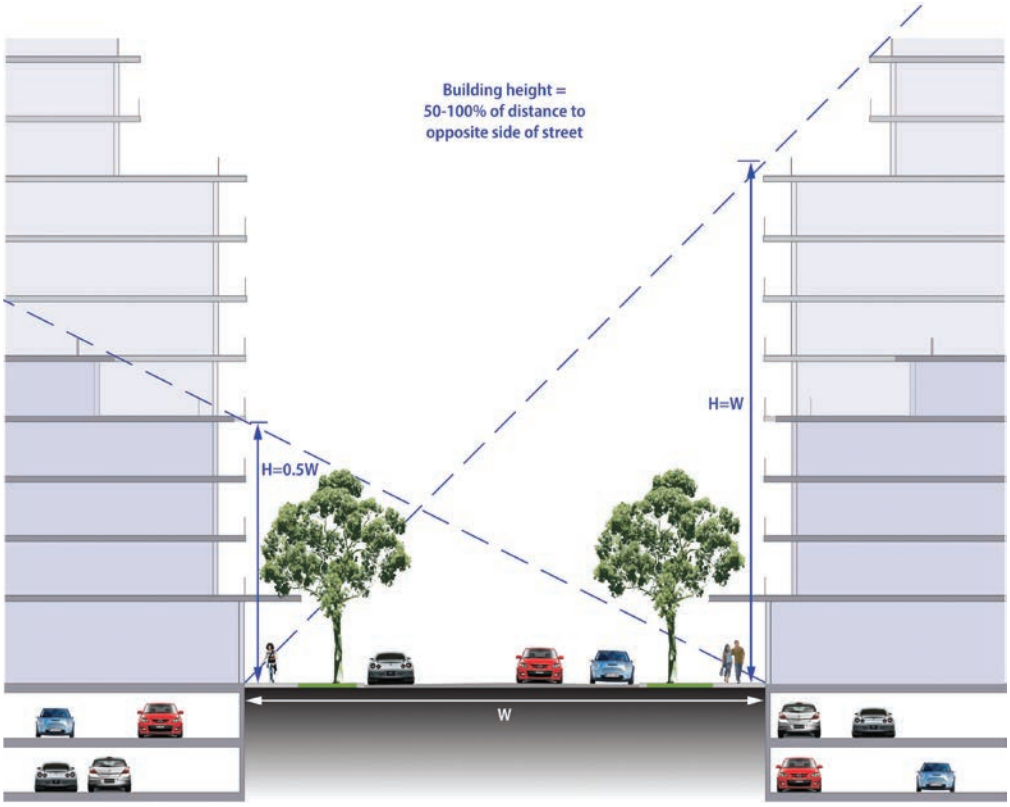
A further aspect of the public realm that is affected by building scale is its sense of openness or enclosure. Taller and more closely spaced buildings create a greater sense of enclosure, whereas lower and more widely spaced buildings provide a sense of openness. Enclosure reinforces spatial definition, which contributes to memorable places. However, too much enclosure can be oppressive, creating a canyon effect.

The height of a building needs to be at least one-third and preferably half of the distance to the opposite side of the street or open space to provide good spatial definition. Building heights greater than the distance to the opposite side of the street or half the distance to the opposite side of a larger open space have a more enclosed feel.

However, diversity is an important quality of good urban places. The contrast between the openness of wide boulevards and suburban streets, and the enclosure of more built-up streets and narrow lanes in centres, is a key part of many cities' appeal. These differences help to create distinct place identities and contribute to the legibility of the city.

Therefore, the effect of building scale on the public realm's sense of openness or enclosure is not an 'impact' to be considered in isolation, but rather an influence on the resulting character of the area.

*Balanced spatial definition and openness.*




*Balanced spatial definition and openness.*

## Views and vistas

Taller buildings can obscure or disturb important views. The potential for a building to affect any valued views or vistas identified in the neighbourhood analysis (see section *1.3*) should influence its design. This includes encroaching within the space around an important landmark that allows it to be clearly seen, and disturbing the backdrop of a landmark. It also includes views of surrounding hills or water bodies (from elevated viewpoints) that are critical for the *sense of place* and legibility of the area.

## Heritage

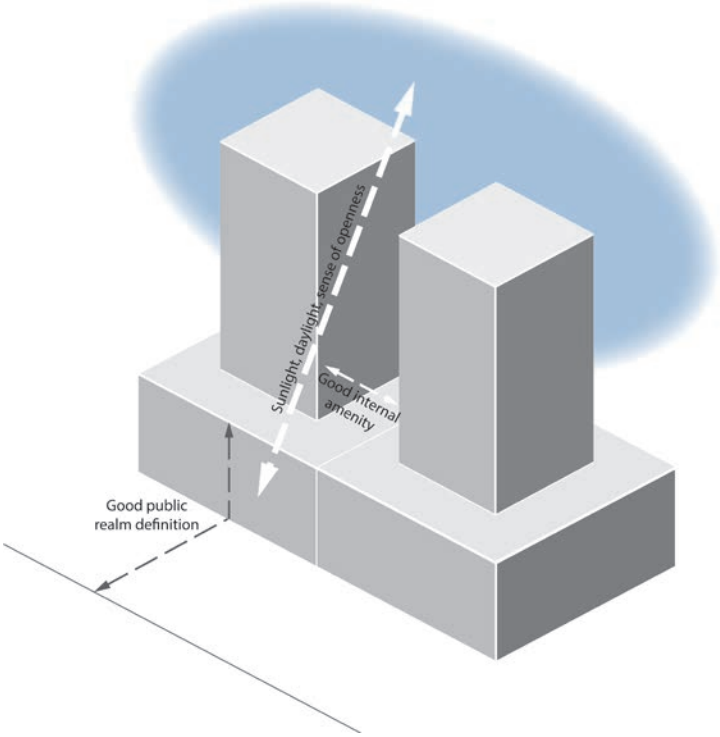
Where a building adjoins a place with significant heritage values, its scale may adversely affect those values. Advice should be sought from a heritage architect about an appropriate response.

## Wind

Tall buildings can create uncomfortable wind effects, requiring assessment by specialists and ameliorating measures. (Where buildings have a facade oriented towards a dominant wind, setting the upper form back from a *podium* or incorporating projections such as awnings can deflect downdrafts before they reach the footpath.)

## Podium-tower format

Podium-tower buildings (which have a broad base and a narrower tower form above) provide good public realm definition while lessening loss of sunlight, daylight and the sense of enclosure compared with buildings without upper-level setbacks. They also tend to offer better internal amenity.




*Podium-tower benefits.*

## Neighbouring properties

Building scale affects the following aspects of neighbouring properties:

- **solar access** – see section *1.19 Overshadowing neighbours*;
- **outlook** – see section *1.20 Visual bulk*;
- **daylight access** – see section *1.21 Building separation*;
- **redevelopment potential** – see section *1.21 Building separation*.

So designing or assessing the scale of a building must balance consideration of a wide range of factors: the existing or desired future character, urban consolidation, the amenity of the public realm and private properties, and neighbouring development potential.

### Rule of thumb

Where there is no valued existing character or identified desired future built form character, design building heights to be between half and equal to the distance to the opposite side of the street, or one-third to half the distance for a larger public open space.

# 1.15 Balancing urban consolidation and character

Urban consolidation can threaten local character. The design of development often needs to strike a balance between contributing to each of these apparently competing aspirations.

## Minimal change

In areas where planning policy seeks to retain the existing character, the form of new buildings should appear to fall within the range of existing heights and setbacks in the character area, ignoring any anomalously high or low buildings. Additional height above the prevailing scale should be set back from the front of the building so that it is barely visible from within the public realm.

Where the existing character includes slightly taller buildings on corners or larger sites, this pattern should be reinforced by new development.

## Substantial change

In areas where planning policy encourages substantial change, development should respond to the desired future character, including preferred building form.

## Moderate change

In areas where planning policy provides for moderate change to the character, development should respond to any desired future character that has been defined. Where there is no defined future character, the design techniques shown in Table 1.4 should be adopted.

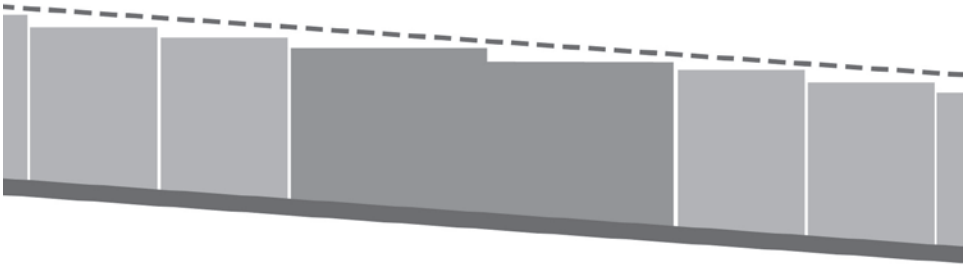

*Matched street wall height and visually recessive upper level.* Image: Alastair Campbell.

*Matched street wall height and architecturally distinct upper form.*

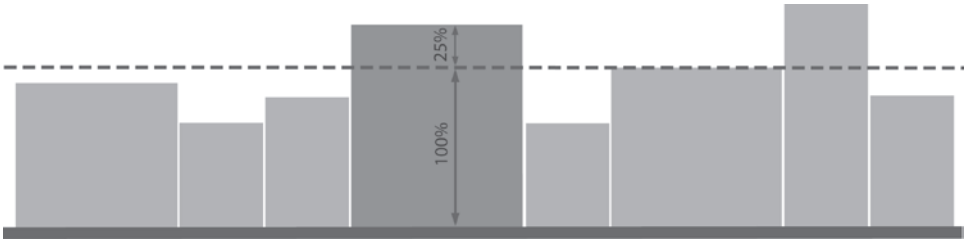
| Table 1.4: Design techniques for balancing urban consolidation and character in moderate change areas | |
|---|---|
| Where there is a relatively consistent height | Approximately match the prevailing height at the front setback line. Where the street slopes noticeably, incorporate steps in height along the front of unusually wide buildings to follow the slope.<br>Set back any taller built form further from the street and give it a distinctive architectural expression, so that the part of the building closest to the street (the street wall) is read as a clearly separate form. The amount of additional height that is acceptable and the extent of additional setback that is required depends on how much value is placed on existing character compared with accommodating growth. In heritage areas, additional height may need to be limited and sufficiently set back that it is visually subservient to the lower form. In areas well suited to higher densities without a particularly notable character, additional height need not be visually subservient to the lower form, but it should still be sufficiently set back and architecturally distinct that it is read as a separate form. |
| Where heights are relatively inconsistent | A building height anywhere up to 25% above the range of existing heights may be adopted, ignoring anomalously tall buildings. |
| Where setbacks above the street wall are relatively consistent | Match the prevailing upper-level setbacks. |
| Where setbacks above the street wall are relatively inconsistent | Adopt setbacks at the lower end of the range of existing setbacks. |
| Where buildings are separated and their widths are relatively consistent | Subdivide the facades of buildings that are noticeably wider than the prevailing width into distinct 'modules' that generally match typical building widths, with recessive sections in between generally matching the typical spacing between buildings. |
| Where buildings are separated and their widths are relatively inconsistent | A building facade width anywhere up to 25% above the range of existing widths may be adopted, ignoring anomalously wide buildings. Wider buildings should be divided into distinct modules as above. |
| Corner sites | Follow the techniques above for the primary street, because it is appropriate for secondary frontages to express their difference in a streetscape. This 'bookends' a side street, marking the presence of higher-order streets at each end. |

## Rule of thumb

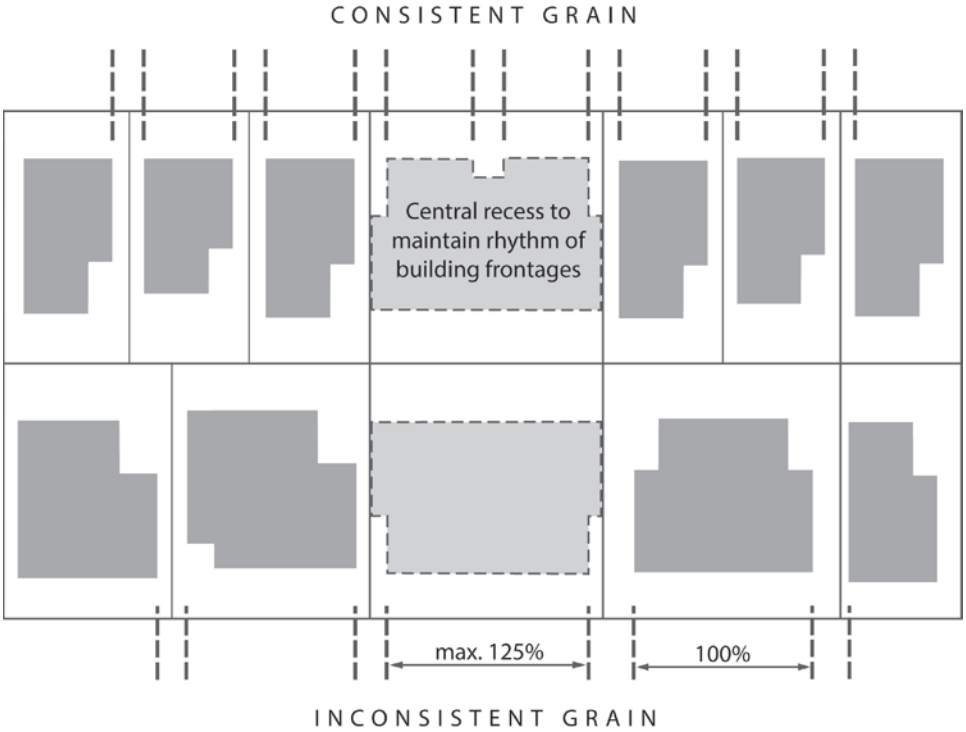
Set back single upper levels at least 3 m from the street wall and two or more upper levels at least 5 m from a street wall.



*Step wide buildings in sloping streets.*




*Responding to inconsistent building heights.*




*Responding to building grain.*

# 1.16 Medium-density housing

Medium-density housing comes in many forms (see Table 1.5). Some contribute more to urban consolidation, some fit more comfortably with the character of detached housing, some contribute more to the social and visual experience of the public realm, and some provide better amenity and more adaptable homes.

*Semi-detached houses.* *Image: Alastair Campbell.*

## Minimal change

In areas with a detached housing character where a modest contribution to urban consolidation is sought, semi-detached houses and 'big houses' provide an increase in density while comfortably fitting that character, including its backyard character (see section *1.13 Backyard character*). Semi-detached houses also offer private backyards and good flexibility for alterations and additions, because each dwelling has its own, dedicated piece of land. However, car parking associated with semi-detached houses can dominate the street if there is no rear access (see section *1.8 Rear lanes and car courts*). Big houses typically offer greater density than semi-detached houses.

*Big house.*

Another way of making a modest contribution to urban consolidation is by introducing secondary dwellings at the rear of properties that benefit from a rear lane, typically above a garage. This does not affect the character perceived from the primary street. It also contributes to housing diversity. Notably, it offers a more affordable form of housing, along with the potential for supplementary income for the property owner if it is not subdivided from the main house.

*Secondary dwelling.*

Villa units and dual occupancies are a traditional method of increasing density. These forms fit comfortably within detached housing areas. However, they are a poor fit with the backyard character of detached housing areas. They also offer limited private backyard amenity and have little flexibility for alterations and additions.

*Villa units.*

*Dual occupancy.* *Image: Alastair Campbell.*

## Moderate change

Attached townhouses are more disruptive to the *grain* of a detached housing streetscape, and typically require larger sites. However, their contribution to urban consolidation is commensurate with that of big houses. They also provide good spatial definition of the public realm, particularly open spaces.

Attached townhouses can maintain the prevailing building height of detached housing areas. Where they are on deeper lots, they can also provide private backyards which respect the backyard character of detached housing areas and maintain flexibility for alterations and additions. However, even more than semi-detached houses, they need rear access to avoid car parking dominating the street. Where the site is not deep enough to allow for a rear lane, care should be taken to ensure garages do not dominate the street frontage.

## Substantial change

Where a greater increase in density is sought, apartment buildings are the most efficient form of medium-density housing. However, they tend to require larger sites and to be a poor character fit in areas of detached housing, including backyard character. They do not offer private backyard amenity and have limited flexibility for alterations and additions.

*Attached townhouses.* *Image: Alastair Campbell.*

*Apartment building.* *Image: Alastair Campbell.*

**Table 1.5: Medium-density housing attributes**

| | | Density | Fit with detached housing character | Impact on public realm amenity | Fit with conventional backyard character | Private backyards | Adaptability |
|---|---|---|---|---|---|---|---|
| **Semi-detached houses** | Two self-contained dwellings facing the street on individual lots attached only to each other | Low | Good | Positive if rear access, negative if no rear access | Good | Yes | Yes |
| **Big house** | Three or more dwellings in a single building designed to appear as a single detached house facing the street | Moderate | Good | Positive | Good | No | No |
| **Attached townhouses** | Row of three or more attached, self-contained dwellings facing the street on individual lots | Moderate | Moderate | Positive if rear access, negative if no rear access | Good | Yes | Yes |
| **Apartment building** | Several mainly single-level dwellings in a single, multi-level building with a common entrance and common parking area | High | Poor | Positive | Poor | No | No |
| **Secondary dwelling** | Small apartment associated with separate dwelling, located above garage facing rear lane | Low | Good | Positive | Acceptable | Yes | Limited |
| **Villa units** | Three or more attached or detached dwellings arranged along the length of a lot served by a common driveway | Moderate | Good | Positive if front house faces street | Poor | Limited | Limited |
| **Dual occupancy** | Two detached dwellings on a single lot, one behind the other | Low | Good | Positive | Poor | Limited | Limited |

# 1.17 Legibility


*Development maintains view of a natural marker.*

Good urban places are easy to navigate. This is called 'legibility'. It includes the ability to work out where you are and how to get where you want to go (without relying on signage).

Places are legible when they have a clear street hierarchy, reinforced by their land use and built form patterns, creating an integrated and intelligible *urban structure*. Individually recognisable features also assist by acting as markers. Sometimes markers can be natural; for example, a prominent mountain or a coastline that always lets you know where you are. Mostly, however, this is not enough, and additional building, use and open space markers are needed. An intelligible urban structure and distinct markers (particularly where they lie at its important nodes) help people create a *mental map* of the area, which they use to navigate around it. They also create more memorable places with a distinctive identity.

## Aiding navigation

Development should contribute to a legible place. For example:

- buildings should maintain valued views towards key natural and built features;
- building scale can emphasise notable topographic features (e.g. through taller forms on significant hilltops);
- if they are at a key place in the movement network (e.g. a railway station or major intersection) and particularly if they terminate a vista along a major street, buildings should be taller than surrounding buildings, have a distinctive design and, ideally, a publicly relevant use to create a landmark;
- buildings should be taller on more significant streets and open spaces, and in centres, to emphasise their importance;
- if they are not at a significant location, buildings should reinforce the distinct existing or desired future character of their street and neighbourhood in terms of scale and detailed design.

*Development maintains and frames view of a built marker.*

The value of built markers in the right location inherently means that not all properties are equal in terms of their development potential.

*Civic building terminating a vista.*

*Landmark building at a major intersection.*

## City image

Development can also contribute to a distinct and memorable form for a whole urban precinct that, seen from afar, reinforces its identity. A widely recognised example of this is the 'pyramid' pattern often found in a major central business district where buildings step up in height from its edges to the tallest buildings at its centre. Infill development should reinforce an existing or planned precinct-wide built form shape.

*CBD with pyramid building pattern.*

# 1.18 Public realm overshadowing

Sunshine is sometimes sought and sometimes shunned. In places that are hot year-round, shade is desirable in footpaths and public spaces. In contrast, sunshine contributes to pedestrian amenity for at least half the year in places with a cool or temperate climate.

Buildings in hot climates should be sited and designed to provide shade in the public realm. The remainder of this section relates to cool and temperate climates.

Solar access to 100% of the public realm is possible only if significant constraints on development are accepted. For example, buildings more than one storey high on the north side of an east–west aligned street would need to be substantially set back in order to maintain solar access to the northern footpath (or *vice versa* in the northern hemisphere).

Therefore, the desire to achieve good solar access in the public realm needs to be tempered and targeted to places and times where it is most important.

## Where is sunshine important?

Sunshine is most important in places where pedestrians stop to rest and interact, such as open spaces and outdoor dining areas, although some solar access is important anywhere in the public realm to encourage walking. In parks or on beaches, where people lie down, sunshine is important right down to ground level. Beaches are used throughout the day and year, so there should be no limit on the period during which sunshine is protected.

The proportion of a park that should have good solar access depends on its use. Sunshine should be maximised in a sports ground or heavily used passive park, whereas a park that is only ever likely to be relatively lightly used (e.g. a conservation area) may be substantially or more frequently overshadowed without major detriment, provided solar access is maintained to main walking tracks. In other words, a careful study is needed of the current and likely future use of a park in order to determine the extent to which its solar access should be protected.

Sunshine is important to all parts of plazas and outdoor dining areas. These spaces tend to be most used from mid-morning onwards, rather than in the early part of the day.

*Sunny park.*

Sunshine is valuable on all footpaths, although it is most important in streets that form key pedestrian routes. Where the overshadowing of footpaths is a determining factor for building height, overshadowing of the northern footpath of an east–west street (or the southern footpath in the northern hemisphere) may be acceptable (because otherwise it would represent a significant constraint), and shadowing of the outer edge of any footpath (closest to the kerb) is acceptable because people don't walk immediately next to the kerb and sun isn't needed on the lower half of a pedestrian's body.

## When is sunshine important?

The desire and potential for solar access varies from place to place and throughout the year. In places with a temperate climate, it is most desirable around spring and autumn, when sunny days are frequent and it is not too hot. In many places, it is too hot to be in the sun in summer, and shade is desired instead. Where overshadowing is a determining factor for building height, some overshadowing in winter may be acceptable because there are too few mild days to enjoy being outside to warrant limiting development.

*Sunny plaza.* *Image: Alastair Campbell.*

## Summary

In summary, buildings should be limited in height in cool or temperate climates to ensure:

- year-round sunlight to beaches;
- sunlight to parks according to their use;
- sunlight in plazas and outdoor dining areas during busy periods of the day, all year round but particularly at the equinoxes;
- sunlight to part of one footpath in each street all year round but particularly at the equinoxes.

Solar access standards may be reduced in areas with the greatest suitability for urban consolidation, particularly in streets.

### Rules of thumb

- Maintain sunlight to at least two-thirds of a park, plaza or designated outdoor dining area between 11am and 2pm at the equinoxes, and at least one-third of a local park or plaza between 11am and 2pm at the winter solstice.
- Maintain sunlight to at least one footpath of streets that form key pedestrian routes, excluding the outer 1 m, at the equinoxes.

# 1.19 Overshadowing neighbours

Solar access is valued in most residential environments. It is also important in most outdoor spaces of education facilities.

In cool or temperate climates, the height and massing of a building should consider its overshadowing of neighbouring residential properties' main indoor and outdoor living spaces, and key outdoor spaces of neighbouring education facilities. (Commercial buildings generally seek to avoid direct sunlight to minimise heat gain.)

As with the public realm, 100% solar access is possible only if significant constraints on development are accepted. For example, buildings more than one storey high to the east or west of a backyard would need to be substantially set back in order to maintain solar access to it in the early morning or late afternoon. Therefore, the desire to maintain good solar access to residential and education properties needs to be tempered and targeted to places and times where it is most important.

## When is sunshine important?

The desire and potential for solar access varies throughout the year. In places with a temperate climate, it is most desirable around spring and autumn, when sunny days are frequent and it is not too hot. In many places, it is too hot to be in the sun in summer, and shade is desired instead. In some places, there are few days in winter mild enough to enjoy being outside.

## How much sunshine?

There is no absolute measure of an acceptable level of solar access because reasonable expectations of direct sunlight vary from place to place. For example, in an area dominated by multi-storey apartment buildings positioned relatively close together, most residents can expect to be overshadowed for much of the day, or even all of the day if they are at lower levels or face south (or north, in the northern hemisphere). In a more conventional suburban area of low-rise houses, residents can expect to receive direct sunlight for most of the day. Different densities of development carry different expectations of overshadowing, and solar access standards need to be varied accordingly.

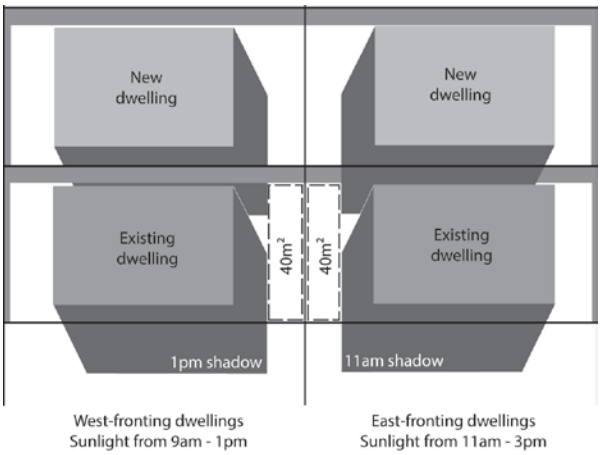
In general, development should not overshadow open spaces within neighbouring education facilities at the equinoxes, other than any utilitarian spaces such as parking areas. However, limited overshadowing may be appropriate in areas with the greatest suitability for urban consolidation.

### Rule of thumb

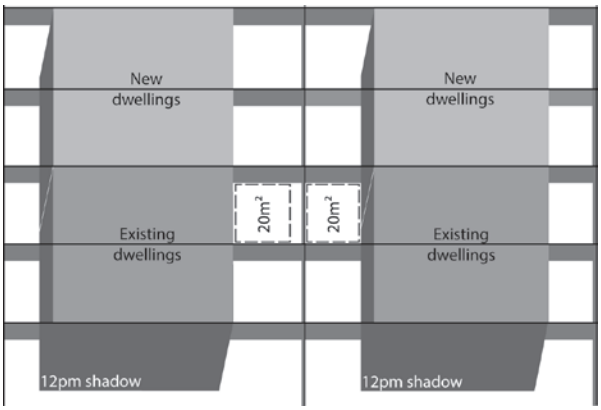
Many planning jurisdictions have controls over the allowable extent of overshadowing. However, where these do not exist, the standards shown in Table 1.6 are a guide to acceptable levels of overshadowing in residential areas of different densities.

| Table 1.6: Acceptable overshadowing in residential areas | |
|---|---|
| Detached housing | Avoid reducing solar access to north-facing* living room windows and at least 40 $m^2$ of the main outdoor living area of each neighbouring dwelling below 4 h of sunlight between 9am and 3pm at the equinoxes. |
| Attached housing | Avoid reducing solar access to north-facing* living room windows and at least 20 $m^2$ of the main outdoor living area of each neighbouring dwelling below 3 h of sunlight between 9am and 3pm at the equinoxes. |
| Apartment buildings up to four storeys high | Avoid reducing solar access to:<br>▪ 75% of neighbouring north-facing* living room windows or main outdoor living areas, and<br>▪ at least 5 $m^2$ of the main outdoor living area of 50% of any neighbouring east or west-facing apartment<br>below 2 h of sunlight between 9am and 3pm at the equinoxes. |
| Apartment buildings over four storeys high | Avoid reducing solar access to:<br>▪ 50% of north-facing* living room windows or main outdoor living areas, and<br>▪ at least 5 $m^2$ of the main outdoor living area of 35% of any neighbouring east or west-facing apartment<br>below 1 h of sunlight between 9am and 3pm at the equinoxes. |

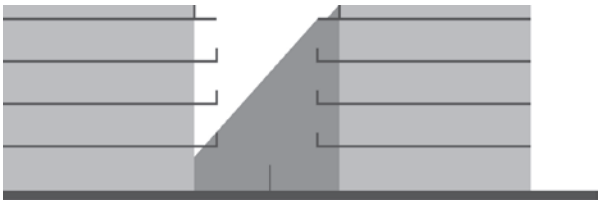
** In the northern hemisphere, read 'north' for 'south' and vice versa.*



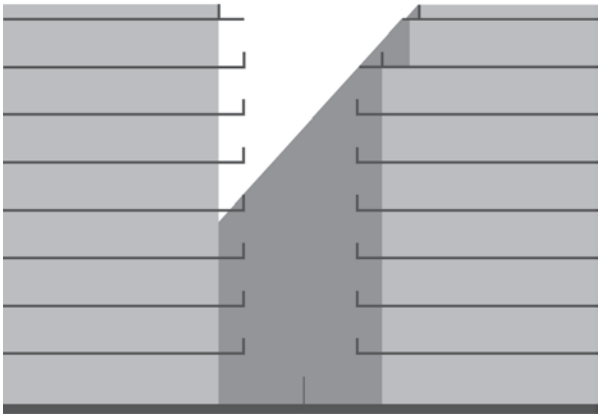

*Solar access to detached houses.*




*Solar access to attached dwellings.*



*Solar access to low-rise apartments.*



*Solar access to medium–high rise apartments.*

# 1.20 Visual bulk

Buildings can visually overwhelm neighbouring properties. This is sometimes referred to as *visual bulk*.

Visual bulk is a relevant consideration wherever neighbouring residential properties' main private open space or the main windows of their regularly inhabited rooms face the site. It can also affect the amenity of office buildings.

Visual bulk is the impact of a development on the character perceived from neighbouring properties; that is, whether it maintains the sense of openness and view of the sky typically experienced in the area, or feels like it is uncharacteristically crowding in on them.

Like overshadowing, there is no absolute measure of acceptable visual bulk because acceptable levels of visual bulk vary from place to place. For example, in an area dominated by multi-storey apartment buildings positioned relatively close together, residents can expect their outlook to be dominated by built form, while in a more conventional suburban area of low-rise houses, residents can expect to see a lot more sky and perhaps vegetation. Every different built form character carries different expectations of what can be seen from a private property, and visual bulk standards need to be calibrated accordingly.

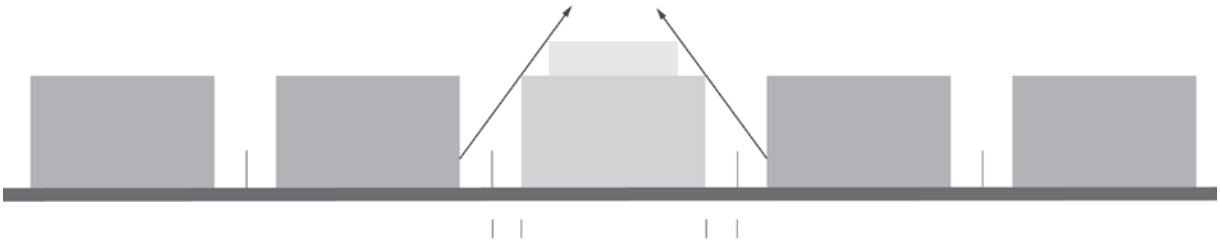
## Interfaces

The first step in considering visual bulk is to analyse the existing building interface character – how adjacent buildings typically relate to one another in the area. This involves identifying characteristic setbacks, building separation distances and heights, and how the setback area is treated. The parts of neighbouring properties from which it would be possible to see the proposed building should also be identified – any *habitable room* windows facing the site and main open spaces with an aspect towards it.

## Minimal change

In areas where policy seeks to retain the existing character, the form of new buildings should adopt side and rear setbacks within the range of those found in the area, ignoring any anomalously small or large setbacks. Additional height above the prevailing scale should be set back from side and rear setback lines so that it is barely visible from adjacent properties.

Where the land has a noticeable slope along a boundary with a neighbouring property, consideration should be given to stepping the height of the building to follow the slope, reducing



*Minimal change areas – maintain side setbacks and hide additional height.*

the visual impact of development at a higher ground level than its neighbours.

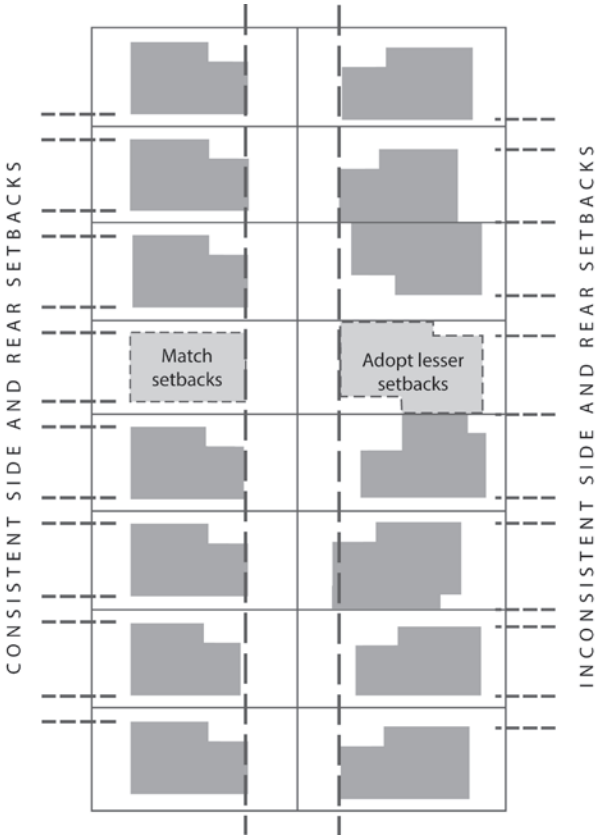
*Step buildings to follow the slope along a common boundary.*

## Substantial change

In areas where planning policy encourages substantial change, development should respond to the desired future character, including preferred building form.

## Moderate change

In areas where planning policy provides for moderate change to the character, development should respond to any desired future character that has been defined. Where there is no defined future character, the design techniques shown in Table 1.7 should be adopted.



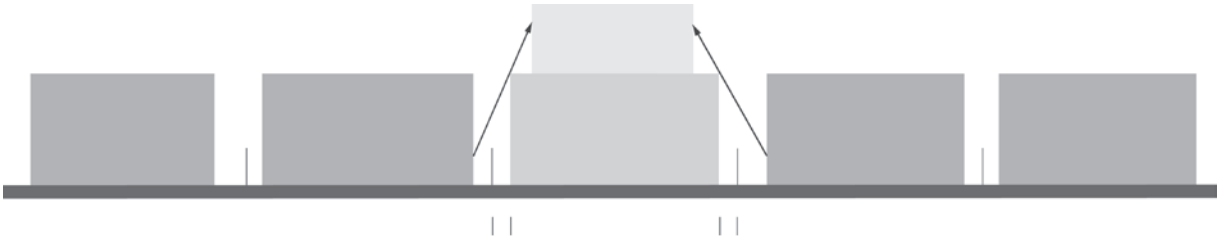

*Responding to characteristic side and rear setbacks.*

## Building design

In addition to setbacks, visual bulk is influenced by the design of the building and landscaping. Curved building forms tend to have less visual impact, because of the way the edges recede from view. The visual impact of larger buildings can also be reduced by breaking their overall mass into smaller components. This may be achieved by stepping the building line, introducing recessed sections between modules, or varying the cladding material or finish. Some architectural treatments also have less visual impact than others. For example, large solid walls with limited openings can increase the visual impact of a building

**Table 1.7: Design techniques for avoiding unreasonable visual bulk in moderate change areas**

| | |
|---|---|
| Where side and rear setbacks are relatively consistent | ▪ Match the prevailing setbacks. |
| Where side and rear setbacks are relatively inconsistent | ▪ Adopt setbacks at the lower end of the range of existing setbacks. |
| All areas | ▪ Consider lesser setbacks in places that will not be visible from neighbouring habitable room windows or private open spaces.<br>▪ Additional height may be glimpsed. |



*Moderate change areas – adopt lesser side setbacks and partially hide additional height.*

compared with a more permeable facade dominated by balconies, windows and lightweight elements such as louvred screens.

Vegetation can also ameliorate visual bulk by partially or completely screening views of the building. Even partial screening softens the visual impact of a building.

*Permeable facades dominated by lightweight balconies have less visual bulk. Image: Jenny Donovan.*

*Curved, lightweight facades have less visual bulk. Image: Alastair Campbell.*

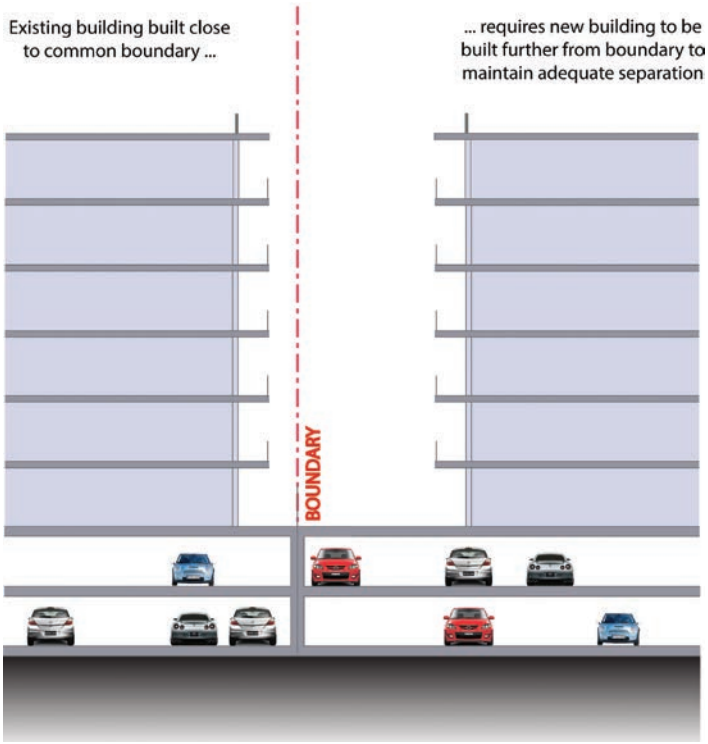
*Varying the line of a building facade can reduce its visual bulk.*

*Vegetation can ameliorate visual bulk.*

# 1.21 Building separation

Buildings rely on gaps between them for outlook and natural daylight and ventilation.

The way a building is sited and oriented affects its own amenity and that of its neighbours. It also affects the extent to which neighbouring properties can be redeveloped in the future. For example, if a building is built close to a neighbouring property and contains windows or balconies facing it, future development on the adjoining property will be constrained by the need to ensure each building does not unreasonably compromise the amenity of the other.

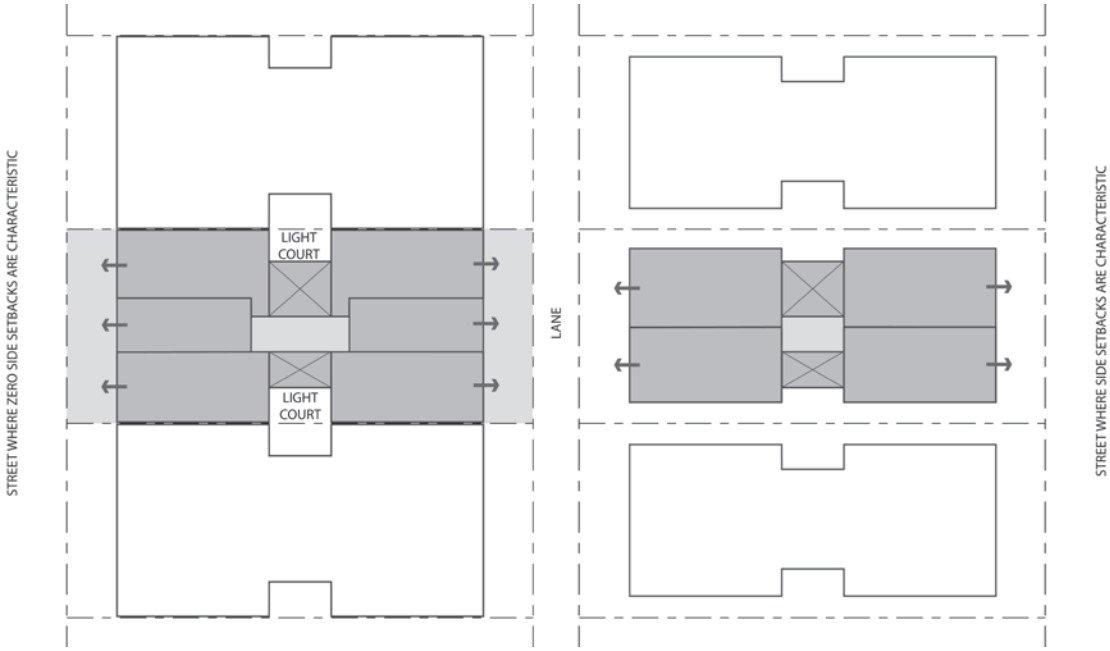



*Inequitable building setbacks.*

In order to provide adequate access to outlook and natural daylight and ventilation, both for itself and for existing or future neighbouring development (*equitable development*), development should adopt the following principles.

## Orientation

- Development should be configured to maximise the amount of accommodation whose primary outlook is towards the front or rear, where it is more likely to be well separated from development opposite. (The primary outlook of a dwelling is the aspect of the main living room window.)
- Where the primary outlook of development is towards the front and/or the rear of a property, in places and at heights where zero side setbacks are an appropriate character response, new development may incorporate blank walls on side boundaries because this enables efficient future neighbouring development by allowing it to be built to the same boundary.




*Maximise accommodation facing the front or rear.*

## Lightcourts

- Natural daylight and ventilation to secondary windows (e.g. any window to a dwelling other than the main living room window) may be provided via *lightcourts* on side boundaries. Where the neighbouring building already incorporates one or more lightcourts on the common boundary, new development should match these where possible to provide enhanced amenity to both buildings. Lightcourts on boundaries should be sized to ensure sufficient daylight and ventilation will be received even if the adjoining property is redeveloped.

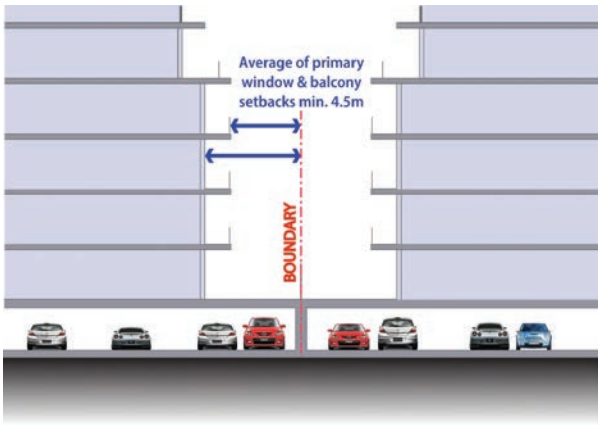
## Boundary windows

- Where the chance of neighbouring development is relatively low, additional amenity can be provided via windows in boundary walls provided there is an agreement with the neighbour that they may be blocked up by future adjoining development. In this instance, the boundary windows cannot be the only source of natural daylight and ventilation for habitable rooms.

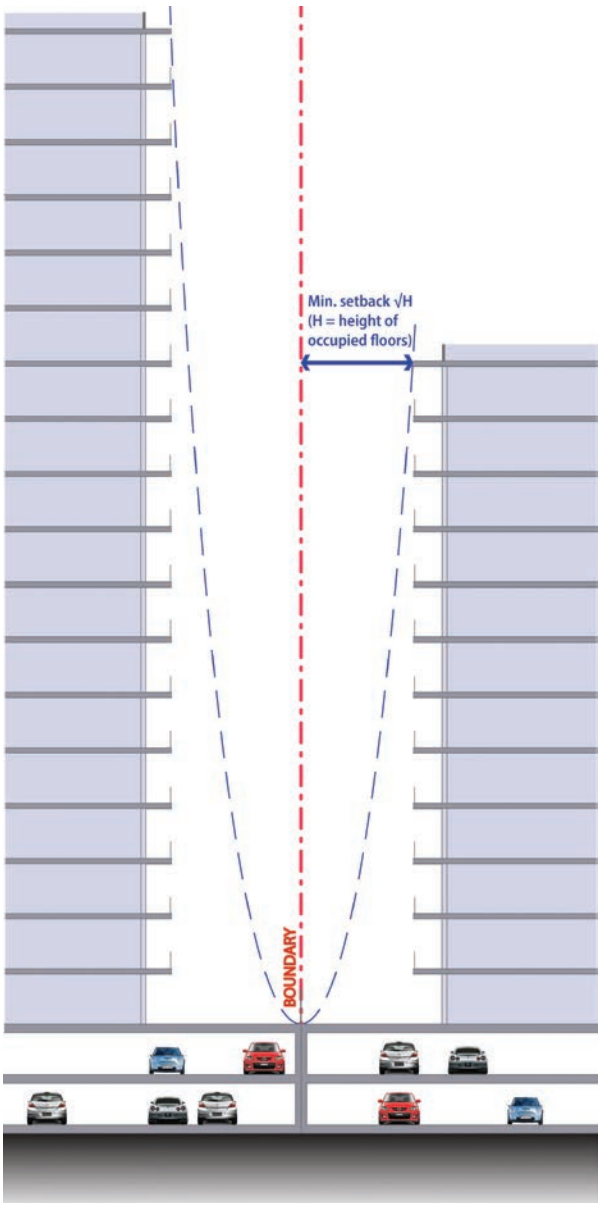
## Side and rear windows

- Accommodation may have its primary orientation towards an adjacent property provided the building is set back sufficiently to ensure that primary rooms (living rooms and office space) have adequate access to natural daylight and ventilation, a sense of visual separation, and privacy without relying on the use of translucent glass or screens (see section *1.29 Visual privacy*).
- Secondary windows may face an adjacent property provided the building is set back sufficiently to ensure adequate access to daylight and ventilation.

- Where there are existing windows or balconies opposite proposed secondary windows, translucent glass or screens may be needed to avoid *intervisibility* between them (see section *1.29 Visual privacy*), but this is acceptable for secondary windows from which an outlook is not a requirement.
- Where a building has windows facing an adjacent property which has reasonable potential for redevelopment, the building should be set back at least half the distance of an appropriate separation between facing accommodation or secondary windows, to ensure that a future neighbouring building does not have to be set back an inequitably larger distance from the common boundary. Where the two properties are separated by a lane, the minimum setbacks should be measured from the centreline of the lane.
- The setbacks referred to above may be adjusted in response to factors that facilitate or inhibit development on the adjoining property. For example:
  - an adjoining property with redevelopment potential that is much wider is correspondingly more able to accommodate a setback, so a lesser setback may be provided on the development site;
  - where the redevelopment of an adjoining property is unlikely due to factors such as narrow dimensions, great heritage values or strata titling, and/or it is difficult to accommodate the setback suggested above on the development site because of its own relatively narrow dimensions, a lesser setback may be acceptable.




*Minimum building separation to avoid unreasonable overlooking.*




*Minimum building separation where apartments face each other.*

## Multiple towers

- Where a development incorporates multiple buildings or multiple forms above a podium, they should be separated from each other to ensure adequate access to outlook, daylight and ventilation.

### Rules of thumb

Where a window forming the primary outlook of accommodation faces an adjacent property:

- set back any part of the building (including balconies) from the common boundary with that property (or the centreline of an intervening lane) at least the square root of the building's height measured from the lowest level of residential or office accommodation; and
- set the window back at least 4.5 m from the common boundary with that property (or the centreline of an intervening lane).

Where the accommodation incorporates balconies projecting forward of the window, ensure the window and balcony setbacks add up to at least 9 m. (As a result, the closest viewing point from the proposed or future adjacent building to the window opposite would be 9 m, which is considered to be sufficient separation to avoid unreasonable overlooking – see section *1.29 Visual privacy*. Balconies are not generally expected to be secluded. This avoids a need for adjoining development with matching setbacks to have privacy screens, which would compromise its internal amenity.)

Where development incorporates secondary windows facing an adjacent property, set back any part of the building (including balconies) from the boundary (or the centreline of an intervening lane) at least half the square root of the building's height measured from the lowest level of residential or office accommodation.

Where development incorporates multiple buildings or multiple forms above a podium, separate them double the dimensions defined above.

These setback dimensions may be reduced where:

- the existing building on the neighbouring property is set back a greater distance from the boundary, or is lower than the proposed building and does not have primary outlook towards it, and is unlikely to be redeveloped;
- the adjoining property is much wider than the site and it is difficult to accommodate the setbacks suggested above on the development site because of its own relatively narrow dimensions;
- the community benefit of achieving development on the site is such that a compromised amenity standard is considered acceptable.

# 1.22 Public realm edge

Urban spaces crave clear delineation.

A well-defined public realm is more memorable and, provided it has active frontages, more vibrant. The coherence of the public realm is lessened by gaps between buildings or in boundary treatments that demarcate the public and private realms.

## Access and maintenance

Clear definition between the public realm and private land makes it apparent where the general public may go and where they may not. It assists the security of private property by making it plain when someone is trespassing. Clear definition also establishes who is responsible for the maintenance of open space. Open space that is not obviously public or private is often little used, because people are unsure whether they are invited to or not, and poorly maintained, because of confusion over whose responsibility it is.

## Forecourts and plazas

In situations where buildings are set back from the front boundary to create space for public use, such as a plaza in a centre, this space should be treated as public and the boundary between it and the remaining private realm clearly defined, irrespective of whether its ownership is transferred to a public body or remains privately held.

## Security

Discontinuities in the definition of the public realm (e.g. gaps in fences or deeply recessed entries to buildings) can create security issues when sightlines into them are poor, by offering opportunities for people with criminal or anti-social intentions to conceal themselves. They also tend to collect rubbish.

Shallow recesses in a building facade (e.g. deep window reveals) add to the visual richness of the streetscape. Recesses in the ground level of a building facade or gaps in the fence line on the front boundary are appropriate ways to articulate the entry to a property (see section *1.27 Entry design*). However, clear sightlines should be maintained from the public realm into the space. This can be achieved by:

- ensuring the recessed space is not too deep;
- angling the edges of the recessed space;
- ensuring the external corners of the recess are clear-glazed;
- ensuring any boundary walls, fences or planting on either side are low enough to see over.

Where deep gaps or recesses are desired in the ground level of a building facade on the front boundary as part of its aesthetic design, care should be taken to maintain clear definition of the


*Well-defined public realm edge in centre.*

*Well-defined public realm edge in residential area.*

*Poorly defined public realm edge results in confusion about access.*


*Broad, recessed entry with clear sightlines.*

boundary between the public and private realms in some other way. This can be achieved by a fence, filling the gap or recess with dense planting or, at the very least, changing the surface treatment.

## Rule of thumb

Limit the depth of recesses in the ground level of a building facade or fence line on the front boundary to half their width. Where recesses are deeper than 300 mm, angle or clear-glaze their edges.

# 1.23 Front and side setback design

Front and side setbacks shape the amenity and character of the public realm.

## Front fences

Where a residential building is set back from the front boundary and the setback is not intended to be used by the public, a front fence or landscape treatment should be provided to create a more usable space and clearly define the public realm (see section *1.22 Public realm edge*). It should be positioned on the front boundary to clearly demarcate the public and private realms.

If a front fence is set back from the boundary the setback area effectively becomes part of the public realm, even if it is landscaped. In that event, there needs to be a clear agreement about who will maintain the landscaping.

## Fence design

The design of front fences should respond to the existing or desired future character of the area. Where there is a relatively consistent fence type, new fences should match or adopt a contemporary interpretation of it. Where there is no consistency, any design may be adopted for the fence.

## Fence height

Irrespective of the existing character, the height of front fences should be low enough to allow pedestrians on the footpath and people at ground-floor level within the property to see each other. This enhances the social experience of the public realm and provides passive surveillance. The importance of an inviting and safe public realm outweighs the need to match characteristic fence heights.

## Front and side setback treatment

In minimal change areas (in which planning policy seeks to retain the existing character) where the design of front and side setbacks is considered an important part of the character, development should match the characteristic setback treatments. Typically, this is a question of landscape character.

*Moderate-height front fence maintains street engagement.* *Image: Alastair Campbell.*

*Consistent front setback treatment.*

In moderate change areas (where it is considered appropriate for development to respond to changing social preferences), the design of front and side setbacks should still match those typically found in the area where it is considered an important part of the character, unless it is incompatible with the function of the space. For example, where the primary private open space of a dwelling is in the front setback, it may need to be designed differently from front yards that provide secondary open space.

In substantial change areas (where planning policy seeks an increase in density to accommodate growth), the treatment of the front and side setbacks should respond to the desired future character.

## Rules of thumb

- Limit the height of front fences to 1.2 m, and an absolute maximum of 1.5 m.
- Ensure front fences over 1.2 m in height are visually permeable.

# 1.24 Active frontages

Building facades form part of the public realm. Their contribution to a more interesting, engaging and safe environment is a key measure of the success of urban places.

Active frontages are building facades facing the public realm that enable people outside the building to see what's inside it, including people. Infill development should incorporate active frontages at ground-floor level facing all abutting streets, public open spaces and pedestrian links. Active frontages are not required in service or rear access lanes, because people are not expected to be walking in them.

The classic active frontage is a shopfront that allows people to see each other through the glass and to window-shop. Even more active frontages are provided by uses that spill out onto the footpath, such as outdoor dining and footpath trading.


*Active retail frontage.*

It is not possible to line every street and pedestrian link with shops and cafes. But other forms of development can provide active frontages too, albeit less active. The type of active frontage that is appropriate depends on the nature of the area and street (and not the proposed ground-floor use, which may change).

## Key measures

Key measures of a building frontage's 'activeness' include the extent of glazing (and whether it is clear or not), the frequency of doors, the building's ground-floor use and whether it extends into the public realm, the setback of the facade and the design of that setback, the level of the ground floor relative to the footpath, the presence and design of front fences, and the presence of breaks for vehicle access. Porches, verandahs, projecting bay windows, balconies and corner windows also contribute to frontage activeness by providing a wider angle of view.

## Safety

Active frontages contribute to the safety of the public realm by providing passive surveillance. In the case of uses that only operate during normal business hours, this is offset by the fact that they are closed in the evening and night-time when passive surveillance is more critical to compensate for a lower level of activity in the public realm itself. Developments with a commercial lower-level active frontage should be complemented by residential uses at upper levels in the vicinity to create life in and passive surveillance of the public realm outside business hours.

## Rules of thumb

In a centre, building frontages should incorporate:

- 65–80% clear-glazing between a height of 0.5 m and 2.4 m above the footpath offering unobstructed views into the building (note: too much glazing can preclude sufficient visual interest in the facade);
- pedestrian entries at least every 15 m;
- footpath trading or outdoor dining where possible (taking care to avoid obstructing the footpath);
- openable facades, where appropriate;
- a zero setback;*
- a ground-floor level no more than 300 mm above footpath level;
- no vehicle access;
- openable windows and balconies at upper levels.

In an employment area, building frontages should incorporate:

- 50–80% clear-glazing between a height of 1 m and 2.4 m above the footpath, offering unobstructed views into the building;
- pedestrian entries at least every 30 m;
- a maximum setback of 3 m,* with no front fence and any setback treated as an extension of the public realm or, if landscaped, maintenance of clear views from the footpath to ground-floor windows;
- a ground-floor level no more than 750 mm above footpath level;
- no more than one vehicle access every 30 m;
- openable windows at upper levels.

In a residential area, building frontages should incorporate:

- 25–65% clear-glazing between a height of 1.2 m and 2 m above internal floor level;
- pedestrian entries facing the street and/or primary private open spaces overlooking the street at least every 15 m;
- porches or verandahs;
- a maximum setback of 5 m, with no closed-sided structures higher than 1.2 m within the setback and any landscaping maintaining clear views from the footpath to ground-floor windows;
- a maximum height of 1.5 m for any front fence;
- a ground-floor level no more than 0.9 m above footpath level;
- no more than one vehicle access every 15 m;
- openable windows and balconies at upper levels.

* Larger setbacks may be acceptable on a street corner if they are treated as an extension of the public realm.

*Active office frontage.*

*Active residential frontage.*

# 1.25 Awnings and colonnades

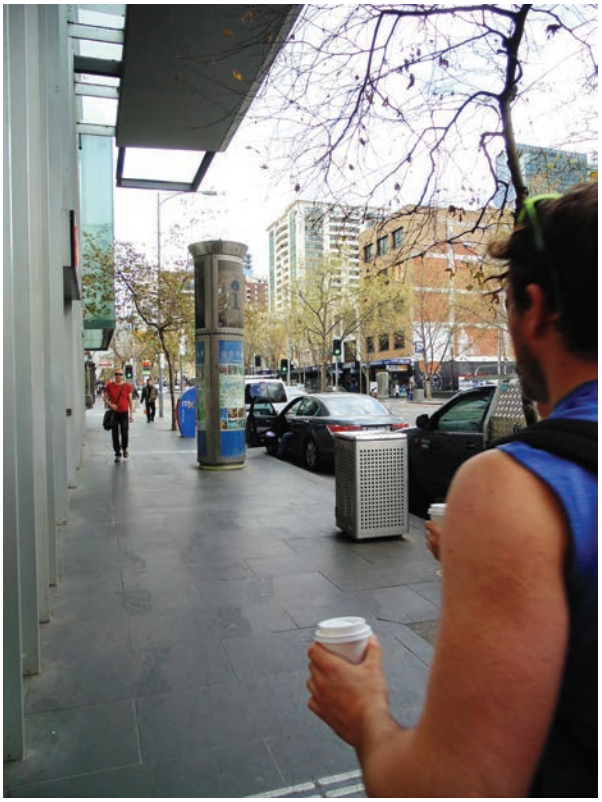
Awnings or colonnades are an essential ingredient of an inviting centre. Shelter from the sun and rain is important where a high level of pedestrian activity is wanted. Awnings and colonnades also create a more intimately scaled pedestrian environment, add visual richness, contribute to building identity and deflect downdrafts.

Awnings and colonnades should:

- be continuous with adjoining awnings or colonnades, to avoid gaps for rain to get through;
- be high enough to maintain an open outlook but low enough to provide shelter from normally angled sun or rain;
- be integrated with the overall design of the building;
- complement the design of other awnings or colonnades in the street where these are considered to have a valued and consistent character.

*Continuous and broad awning.*

*Colonnade.*

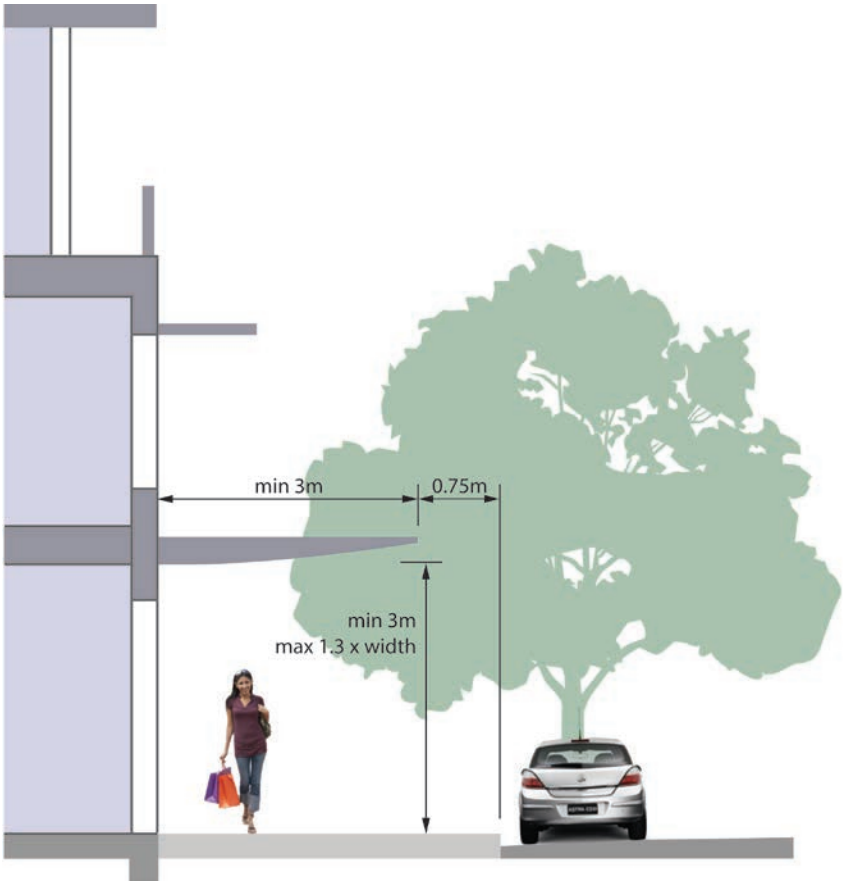


*Discontinuous and narrow awning.* *Image: Leo Sheppard.*

In addition, awnings should:

- be fixed;
- extend as close to the kerb as authorities will allow but be set back sufficiently to avoid damage by vehicles and to provide for service poles and trees;
- incorporate transparent or semi-transparent sections to let daylight through where they are particularly deep;
- be designed to provide for the growth of existing and proposed trees;
- not be provided where it would be detrimental to heritage values.

Colonnade columns should be slender to minimise physical and visual obstruction but thick enough to lean against.




*Good awning parameters.*

## Rules of thumb

Awnings and colonnades should:

- be at least 3 m wide;
- have a clear height of at least 3 m but no more than 1.3 times their width;
- extend no closer than 750 mm from the kerb.

# 1.26 Building facades

Interesting buildings contribute to the urban experience. However, buildings can also be too 'busy' or 'flamboyant'. Good building facades provide visual interest without drawing too much attention to themselves. This creates streetscapes and public open spaces with enough complexity to be engaging and enough order to be cohesive.

## Character

The right type and level of 'facade animation' varies from place to place, and depends on whether a regular or landmark building is called for. Some places have a character of lively, individualistic facades, while others are typified by more restrained designs with a common personality. In highly consistent streetscapes, a building with a distinctly different style can detract from the valued coherence of the environment.

## Landmarks and infill buildings

Landmarks (e.g. public buildings) should be emphatic, standing out from their surroundings through height, form, use or detailed design. However, most buildings are not landmarks and require a high degree of fit with the prevailing architectural character to emphasise the broader streetscape as a recognisable element, rather than the individual building.

## Small infill buildings

A small infill building should generally seek to merge into its setting rather than draw attention to itself. A simple form articulated by windows, ideally with deep reveals, provides enough interest. One primary wall material and, at most, one feature material is usually sufficient, and more variation is often too much. The use of an external material that is locally characteristic will assist in tying a building to its context. In older areas, a contemporary form or application of this material can be used to bring it up to date.

*Small infill building.*

## Larger infill buildings

Larger buildings typically require more variation in their form to avoid a bulky, monolithic appearance. This can be achieved by introducing three-dimensional relief into the facade, which creates a pattern of light and shade; for example projecting and indented elements, recessed terraces or integrated architectural features such as sunshades. Care should be taken not to introduce too many materials, colours or finishes, which can detract from the coherence of the overall architectural composition.

## Ordered facades

Arranging the elements of a facade into a comprehensible composition can create a pleasing sense of order. This is usually most successful when the pattern is an expression of the internal layout, such as the structural grid of an office building or the arrangement of dwellings in an apartment building. But too many repeated elements can result in monotony. Where a facade inherently has a large number of repeated elements, such as high-rise apartment frontages or office windows, these should be grouped to create a larger-scale pattern.

*3D relief avoids a monolithic appearance.* *Image: Alastair Campbell.*

*Comprehensible facade composition creates a pleasing sense of order.*

## Lower-level articulation

The lower part of a street facade, up to a height equal to around half the distance to the far side of the street, can be seen by a pedestrian on the opposite footpath without tilting their head. Therefore, it makes the most important contribution to the pedestrian experience. This part of a street facade should be relatively flat to contribute to the spatial definition of the public realm. However, it needs fine-grain variation to provide visual interest and to break up the scale of large buildings in close views. The *articulation* of lower building facades should have a vertical emphasis to enrich the visual experience of pedestrians (who have a horizontally oriented field of vision), with sufficient frequency to be engaging at a walking pace. Even highly active ground floor facades should have strong vertical articulation integrated with the facade above. (Curtain walls do not engage passing pedestrians.)

The design of lower-level building facades should make reference to the surrounding pattern of facade articulation, such as a regular vertical delineation, common cornice and parapet lines, and typical window proportions. This is particularly important for achieving a degree of formality around the edges of civic spaces. Where the surrounding subdivision pattern results in a relatively regular 'rhythm'

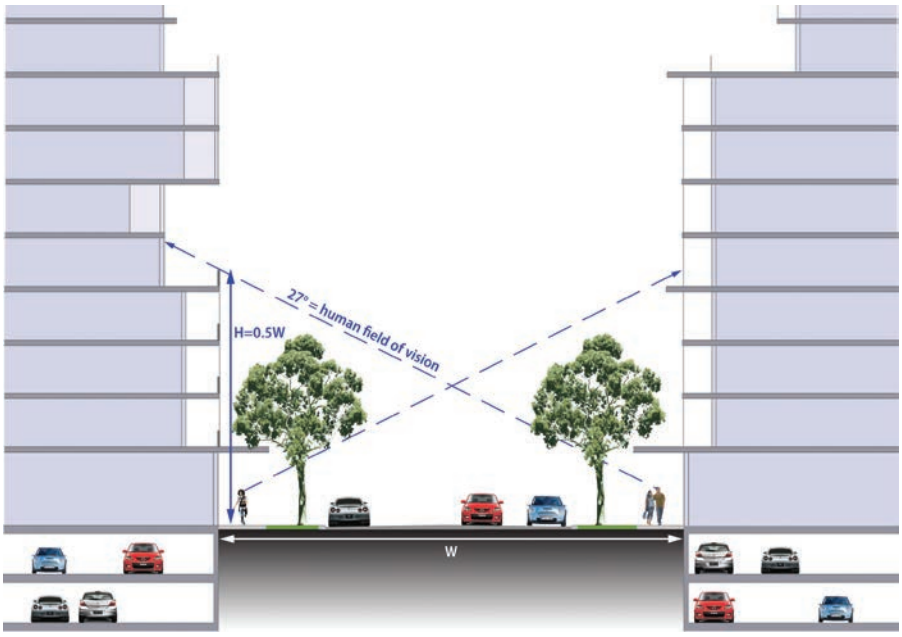
of buildings, the development of unusually wide sites should mimic this pattern through vertical articulation or recesses to match the spaces between buildings.

The part of a street wall up to a height equal to half the distance to the far side of the street should be treated as a distinct part of the facade, so that pedestrians can appreciate this element in its entirety without tilting their head. In other words, the top of this element should be delineated by a strong horizontal feature, such as a cornice, balcony, shadow line or a parapet with the facade above set back, to clearly define its upper limit.

*Vertical articulation in lower facades provides visual richness at a pedestrian scale.* *Image: Alastair Campbell.*

## Upper levels

The upper levels of taller buildings are mainly seen in more distant views. Therefore, a coarser grain of variation is appropriate. This can be achieved by the use of architectural frames or a common expression or finish to group elements across several floors, breaking up the overall scale of the facade. An alternative solution is a sculptural or multi-faceted form, clad in a unifying (though potentially visually textured) skin distinct from the base of the building.




*Distinct facade module within pedestrian field of vision.*

*Organising a tall building facade into distinct modules can break up its scale.*

*Sculptural tower forms can make a positive contribution to the visual experience of an urban area.*
*Image: Lukas Nott.*

## Detailed design

Blank boundary walls that are exposed to view from the public realm present a particular design challenge, because they cannot easily incorporate openings or variation in building line. In addition, they may only be exposed to view until neighbouring sites are redeveloped. In this case, sufficient visual interest can be achieved through the use of textured or patterned materials, or variation in materials, finishes or colour. In some situations they can provide a canvas for an engaging artwork.

External building services should be concealed within an enclosure that forms an integrated part of the building design. This may include roof features which contribute to the visual interest of the skyline.

### Rules of thumb

- Divide building facades into five to nine repeated elements (each of which may be further subdivided into five to nine repeated elements).
- Incorporate strong vertical articulation spaced no more than 10 m apart along lower-level facades.

Where a single architectural style dominates a street, this should dictate the design of new development. Where streets feature buildings from a range of eras, the question of which style to adopt is largely a matter of personal taste.

Many planning schemes encourage contemporary design and discourage historical mimicry. This promotes architectural innovation and allows building technology and expression to evolve, rather than stagnate. However, current architectural fashion will eventually become dated just like any other style, and be just another contribution to the eclectic character of a mixed area.

The appearance of buildings should reflect their use. For example, apartment buildings should look like apartment buildings, and office buildings should look like office buildings.

Buildings (other than landmarks) should adopt external materials commonly found in the streetscape, to ensure they contribute to a cohesive frame for the public realm. Innovative use or treatment of traditional materials can facilitate the managed evolution of a character.

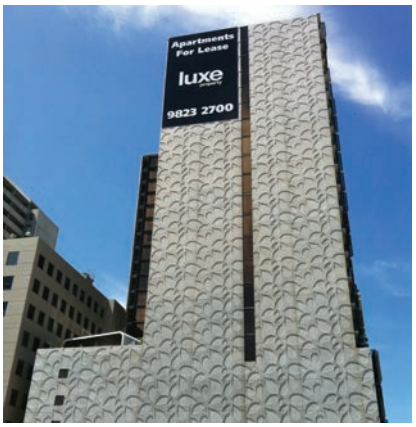
External materials that age well should always be used.

## Summary

Ultimately, the successful design of building facades cannot be prescribed or formularised. However, the simple principle of balancing visual interest (particularly at lower levels) and architectural coherence can provide a valuable guide. A limited palette of high-quality materials and integrated features is usually more successful than a rash of applied elements, while a distinctive form is appropriate for taller buildings.

*Prominent but untreated boundary wall detracts from the visual experience of an urban area.*

*A graphic pattern can provide visual interest in a blank boundary wall.*




*Textured cladding can provide visual interest in a blank boundary wall.*

*Image: Alastair Campbell.*

# 1.27 Entry design

Building entries play an important role in urban places. Pedestrian entries should be easy to find, easy to access for all and safe. They should also be welcoming and provide a sense of transition between the public realm and the private domain. Vehicle entries should be easy to find and access.

## Entry location

Ideally, pedestrian entries should be in the front facade, where they face and can be directly accessed from a street or public open space. However, where buildings are located on a main road corner, the side street may provide a more appropriate location for a residential entry, particularly if the main road has a commercial character. Pedestrian entries should not be located on rear service or access lanes.

## Entry expression

The architectural and landscape expression of the entry should clearly identify it and welcome people in. This may be achieved by techniques such as:

- a porch, pergola, awning or a variation in the design of an awning that extends across the whole building frontage. This can also contribute to the identity of the building and foster social interaction;
- a slightly recessed doorway where the building is built to the front boundary, provided the recess is broad or has splayed edges that allow for good sightlines from oblique angles;
- providing a generous forecourt between the street and the door where the building is set back from the front boundary, and widening it towards the street, with attractive landscaping alongside.

In contrast, superficial measures such as a change of colour may identify the entry, but they do not contribute to the spatial experience or add much to the visual interest of the facade in oblique views.

*Easily identifiable entry.*


*Generous, accessible entry.* *Image: Alastair Campbell.*

## Access

The path to a front door should be well lit and comply with disability access requirements. Cover should be provided at the doorway so that people can pause to find their key or speak into an intercom without getting wet.

## Side entries

It is not always possible for pedestrian entries to be in the front facade of a residential building, particularly on narrow and deep properties, where the stair and lift core needs to be set well into the site and the use of the frontage for accommodation needs to be maximised. In this situation, the entry may be down the side of the building provided it is clearly identified from the street. This may be achieved through measures such as:

- a distinctive entry gate;
- an awning or pergola over the path within the front setback;
- a lobby that projects into the side setback;
- a distinctive canopy over the front door.

The path to side entries should sit within a generously proportioned space to ensure it is inviting to visitors. It should be overlooked by windows for security, unless access to it is controlled by a secure gate.

*Clearly identifiable and generous side entry.*

## Mixed-use buildings

In mixed-use buildings, each use should have a separate pedestrian entry, stairway and lift (if required) to maintain their distinct identities and security. Cafes in foyers may share an entry with office or residential uses.

## Vehicle entries

Where vehicle access needs to be from the same street frontage as the pedestrian entry, they should be separated to avoid adverse impact on the actual and perceived safety of pedestrians. Drop-off facilities should be on-street. If they need to be on-site, they should be down the side of the building to avoid detracting from on-street pedestrian amenity.

### Rule of thumb

Ensure any side entry path is within a setback at least 2 m wide. This space may accommodate low planting.

# 1.28 Parking

Poorly located on-site parking can undermine the public realm. Where parking abuts or is visible from the public realm, it takes the place of accommodation that could contribute to the social and visual experience of the urban environment.

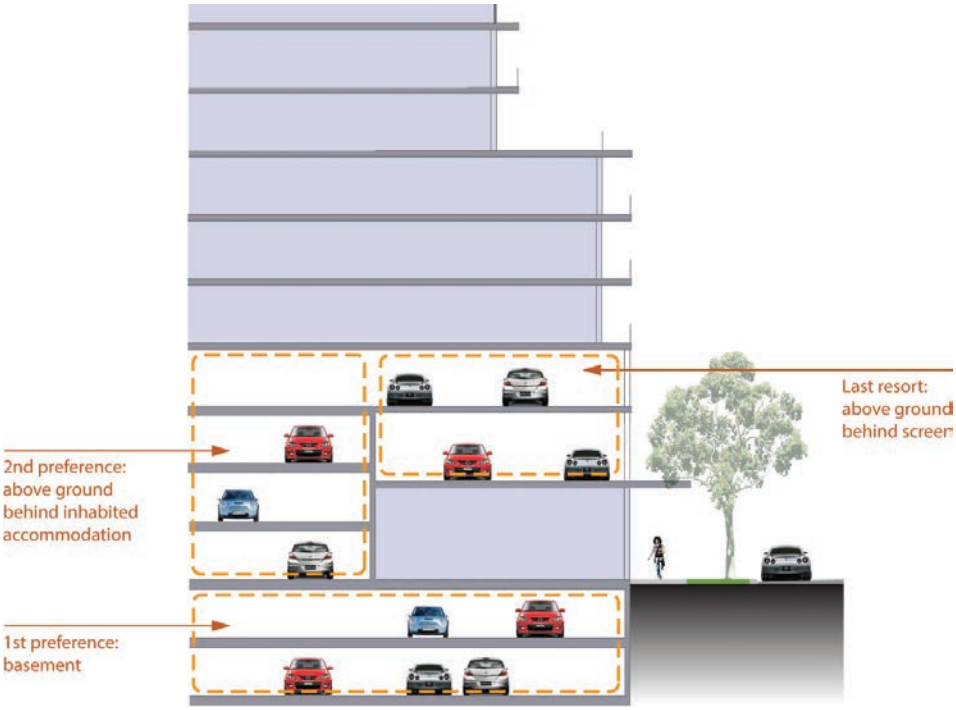
## Parking location

In order to minimise its detrimental impact on the public realm, the best locations for parking are as follows, in order of preference.

1 **In a basement**. In developments incorporating ground-floor retail and community uses, basements should be fully below natural ground level, to allow the ground floor to be level with the footpath for maximum engagement. In office or residential developments, basements may project partially above natural ground level. However, the 'ground' floor level should not be too high above natural ground level, to maintain some engagement between people inside and outside the building.

2 **Behind regularly inhabited ground- or upper-level accommodation** that provides an active frontage. Above-ground parking may be necessary because of ground conditions or small lot dimensions that do not allow an efficient basement.

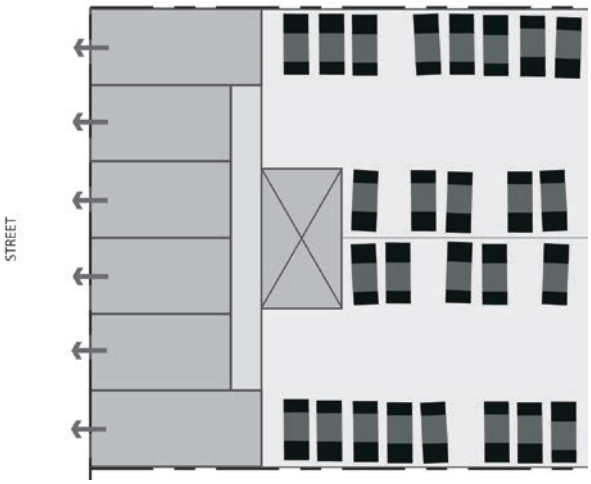
As a last resort, when neither of the two options above is feasible, parking can be located at upper levels behind an attractively treated wall or screen.




*Preferred parking locations.*

*Attractively screened upper-level parking.* *Image: Alastair Campbell.*

*Attractively screened upper-level parking.* *Image: Alastair Campbell.*




*'Sleeved' upper-level parking.*

*Attractively screened upper-level parking.* *Image: Alastair Campbell.*

## Bicycle parking

Bicycle parking should be located where it is easily accessible from the street and internal circulation. Access from a rear lane may be appropriate provided it is an inviting and safe space. If bicycle parking is provided internally at the front of a building, windows should be incorporated in the facade to give the impression of an active frontage and to provide daylight and ventilation.

### Rule of thumb

Limit the height of the ground floor to 0.9 m above the level of the public realm.

# 1.29 Visual privacy

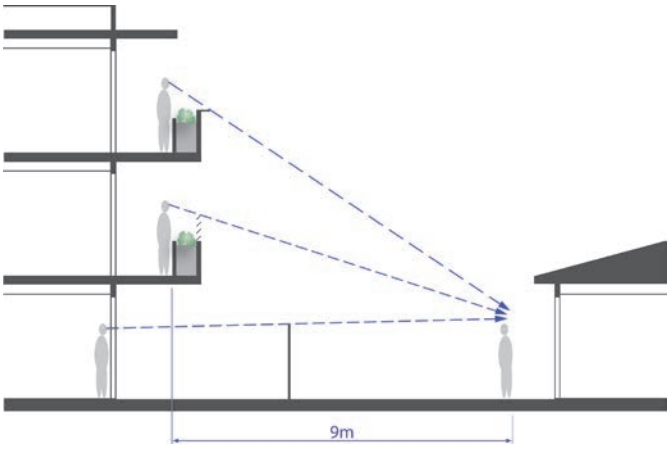
Privacy is prized in most residential environments. It should be possible to enjoy use of the main indoor living space of any dwelling and the main outdoor space of a house unobserved by neighbours without having to close blinds or have high screens.

This expectation need not extend to non-habitable rooms, whose use does not suffer significantly from lack of privacy. Nor does it apply to apartment balconies, which are often open to view from the surrounding public realm.

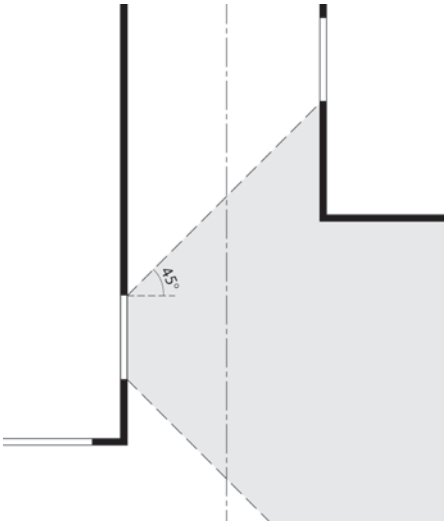
## Overlooking prevention

New development should avoid compromising the privacy of neighbouring living rooms and the main outdoor living spaces of houses through techniques such as:

- boundary fence – a boundary fence with a height of at least 1.7 m above internal and external ground-floor level will prevent overlooking of neighbouring properties from ground level;
- distance – beyond 9 m, overlooking is not considered to be unreasonably intrusive because the distance is sufficient to attenuate the ability to make out detail;
- orientation – where the private area is more than 45° from the central axis of the view (i.e. a line perpendicular to the window or edge of an open space) it is considered sufficiently oblique to avoid unreasonable intrusion;
- translucent glass – translucent glass up to a height of 1.7 m above floor level can be used to prevent views from windows;
- screens – privacy screens can be used to prevent views from windows or balconies. These can be vertical screens rising to 1.7 m above floor level, or angled or horizontal 'blades' to prevent overlooking from an upper level to a neighbouring private area at a lower level.




*Overlooking prevention techniques.*




*Offset windows.*

## 1.30 Checklist

- Has a comprehensive urban context analysis been undertaken, including a character analysis? (See sections 1.1–1.6.)
- Is there a need and potential for one or more mid-block links? (See section 1.7.)
- Is there a need and potential for a rear lane? (See section 1.8.)
- Does the development address the street appropriately? (See sections 1.9 and 1.23.)
- Have the vehicle access and services cabinets been located appropriately? (See section 1.10.)
- If the development contains apartments at ground floor facing the street, has an appropriate balance been struck between privacy and street engagement? (See section 1.11.)
- Are the front and side setbacks appropriate? (See section 1.12.)
- In residential areas, is there a need for a rear garden? (See section 1.13.)
- Do the height and upper-level setbacks appropriately balance urban consolidation and character aspirations, and contribute to legibility? (See sections 1.15 and 1.17.)
- Has the most appropriate form of medium-density housing been utilised? (See section 1.16.)
- Is reasonable solar access maintained to the public realm and adjoining private properties? (See sections 1.18–1.19.)
- Are the visual impacts on adjacent properties acceptable? (See section 1.20.)
- Does the development provide for adequate daylight access to the proposed building and adjacent properties? (See section 1.21.)
- Does the development maintain equitable development potential on adjacent properties? (See section 1.21.)
- Is there a clear demarcation between the public realm and private land? (See section 1.22.)
- Is the design of any front setback appropriate? (See section 1.23.)
- Are the street frontages designed to suitably animate the public realm? (See section 1.24.)
- In centres, is an awning or colonnade provided and designed appropriately? (See section 1.25.)
- Are the building facades well designed? (See section 1.26.)
- Are the building entries appropriately located and designed? (See section 1.27.)
- Is parking appropriately located? (See section 1.28.)
- Does the development maintain the visual privacy of neighbouring properties? (See section 1.29.)

# Centres and large retail developments

## 2.0 Introduction

Urban *centres* form focal points for human exchange. Unlike other parts of a town or city, they are used by everyone. This makes their design particularly important for the identity and appeal of the broader area.

Centres are concentrations of commercial uses. However, they often include civic and even residential uses too. Centres range from small neighbourhood strips to central business districts. They include enclosed regional shopping centres, bulky goods or 'homemaker' centres and 'enterprise corridors' (strips of commercial uses along main roads that rely on high levels of exposure, such as showrooms and car yards).

This chapter explains how to design or assess new centres and large retail developments from an urban design perspective. It begins by establishing an appropriate development framework – the overall configuration of streets and lots – then outlines how individual buildings, streets and spaces should be designed.

The appropriate location for local centres in new residential and employment areas is discussed in sections 7.2 and 8.2 respectively, and the appropriate location for higher-order centres in urban growth areas is discussed in section 5.9. Guidance for individual buildings is provided in Chapter 1.

### Laurimar Town Centre

The design principles in this chapter are illustrated by the plan for the Laurimar Town Centre. Laurimar is a new residential village in the northern suburbs of Melbourne, Australia. The plan for the centre was designed by Lend Lease Communities and David Lock Associates.

# 2.1 Centre formats

Centres have evolved dramatically over the last century. The traditional street-based form has been challenged by new, stand-alone formats, fuelled by the Modernist zeal for reinvention.

## Traditional centres

Traditionally, centres evolved along main roads where they could benefit from passing trade and easy accessibility by all modes of travel and passing trade – patronage that results from the ease of stopping *en route* and the customer being reminded of businesses as they pass by. They typically contained a diverse range of uses – not only shops but also other types of business, community facilities and *shoptop housing* – providing a range of employment opportunities, multiple reasons to visit and the opportunity for multi-purpose trips. The street was the focus of the centre, tying it together and providing a relatively unfettered stage for economic and social exchange. Car parking was provided on-street, later supplemented by surface car parks behind the buildings.

**Table 2.1: Characteristics of centre formats**

| Traditional street-based centres | Modern stand-alone shopping centres |
|---|---|
| Traditional street-based centres typically grew incrementally, resulting in multiple properties in different ownership. This has several consequences.<br>▪ It allows each property to be developed and managed independently, giving rise to a diverse range of building types and styles, and a broad mix of shops and services.<br>▪ It leads to a variety of building ages, which creates opportunities for a wide range of businesses.<br>▪ It reduces the ability to accommodate larger stores.<br>▪ It means there is no organisation with a dedicated interest in and the resources to manage and develop the common interests of the centre (although some traditional centres have associations that coordinate promotions and advertising, and liaise with the local authority).<br>The presence of cars within a street-based centre increases both the perceived and actual personal security outside shopping hours by providing a source of casual surveillance. This supports an 'evening economy' of restaurants, bars and so on.<br>Street-based centres are focused on a genuinely public domain. This creates the potential for unexpected and surprising human behaviour, resulting in more diverse opportunities for people-watching and social interaction. It also brings greater exposure to the elements. | Stand-alone shopping centres are typically in single ownership. As a result:<br>▪ they have a more homogenous built form *character*;<br>▪ they are under single management, which can coordinate the mix of tenants and develop the common domain in the interests of the whole centre.<br>Enclosed centres offer a controlled and weather-protected environment. This results in:<br>▪ higher rents to pay for the cost of a climate-controlled internal environment, which tends to limit the businesses that can afford them to chain-stores;<br>▪ more uniform and well-maintained pedestrian facilities, including the floor surface, furniture and toilet facilities.<br>Stand-alone centres are usually patrolled by security guards, reducing the opportunity for unexpected behaviour. This is more likely to result in a somewhat sterile environment. |


*Traditional, street-based centre.*

## Modern centres

The mid-20th century brought stand-alone shopping centres. These were often located alongside, but rarely straddling, main roads. They were dominated by retail and, more recently, entertainment uses, with few if any other types of business, or community or residential uses. These centres featured pedestrian malls – both internal and external – which provided an easier and more efficient place to shop through a car-free and somewhat climate-controlled domain. Car parking was provided in dedicated surface car parks at the front.

Traditional street-based centres and modern stand-alone shopping centres offer different experiences, and both have their devotees. In essence, street-based centres provide a more diverse and unpredictable experience and a wider range of employment, while stand-alone centres incline towards a more standardised and reliable experience, and a narrow range of low-value jobs (see Table 2.1).


*Modern stand-alone centre.* *Image: Alastair Campbell.*


*Hybrid centre – Laurimar Town Centre.*

## Hybrid centres

The recognition that both street-based and stand-alone centres have their benefits and enthusiasts has led to new forms of hybrid centre that target the best of both worlds through a combination of street-based settings and malls.

## 2.2 Surrounding street network

The street pattern surrounding a centre is critical to its economic success.

All centres are assisted by passing trade to sustain their shops and businesses. Therefore, the street network within the catchment of a centre should feed it with traffic (of all modes) by providing direct routes to and through the centre. (This is sometimes referred to as capitalising on the *movement economy*.) Aligning surrounding streets with the centre and ensuring they cross any arterial roads without deviation also ensures that the neighbouring communities have convenient access to it. This is particularly applicable within a comfortable walking distance of a centre – typically 400–800 m.

Bypasses to *mainstreet*s (see section *2.3 Urban structure*) should be avoided, except where they would otherwise carry extremely heavy or inappropriate traffic, such as trucks. Bypasses remove all-important passing movement and create barriers around the centre. However, in large centres, traffic levels in mainstreets may reach the point where they are no longer compatible with a high-quality pedestrian environment. Therefore, the opportunity should be preserved for parallel streets to offer alternative routes through the centre.


*Supportive surrounding street network – Laurimar Town Centre.*

### Rule of thumb

Design street networks so that mainstreets have a traffic volume of 10 000–18 000 vehicles per day (to appropriately balance the imperatives for passing trade and a pedestrian-friendly environment).

# 2.3 Urban structure

Successful centres have an intelligible structure. An intelligible *urban structure* is founded on a clear hierarchy of busier and quieter thoroughfares. This is reinforced and enriched by special places – key public spaces, civic facilities, transport hubs, institutions and major commercial attractions. These often adopt *landmark* forms and mark significant locations such as important nodes in the movement system or key topographical features.

Individual uses, buildings and even travel preferences come and go, but the network of streets and spaces rarely changes. So the urban structure must provide a flexible framework for growth and change over time.

## Street hierarchy

The busiest route through a centre is likely to attract the highest-value shops and services which can afford the highest level of passing trade. This will reinforce its busy-ness. Properties that front this street tend to be the most valuable, leading to taller buildings. These streets are known as mainstreets.

Successful mainstreets inevitably have relatively high levels of traffic congestion. Counter-intuitively, this enhances pedestrian amenity by creating more opportunities for them to cross the street wherever they want.


*Urban structure – Laurimar Town Centre.*

Quieter side and back streets provide opportunities for businesses that cannot afford high-street rents and other uses that do not rely on passing trade. Their properties usually have lower values and lower buildings.

Small centres may comprise only a single mainstreet. Medium-sized centres may have a mainstreet and one or two secondary streets. Large centres may have a series of mainstreets, secondary streets and laneways. The key to an intelligible structure is ensuring each thoroughfare has a clear function and character that relates to its place in the movement hierarchy, and designing the land use and built form patterns to reinforce that function.

An integrated movement, land use and built form pattern provides a *legible* urban structure. Within this broad framework, each street should have a distinct character to contribute to a memorable and legible place.

## Special places

'Special' elements, such as squares and parks, civic facilities and landmark buildings, reinforce the urban structure if they are located at key places in the movement network (e.g. major intersections or entries to the centre) or significant natural features such as high points, water bodies or waterways. Placing open spaces where pedestrian routes converge ensures they are lively and reinforces *legibility*. Locating a space at a high point offers expansive views.

Main routes should be punctuated by relatively frequent special places to provide memorable 'incidents' along journeys within the centre.

Most centres rely on one or more major attractors, which are their main drawcard. These include not only anchor stores such as supermarkets and department stores, but also train stations, markets, major entertainment facilities and so on.

Dispersing major attractors and larger car parks throughout a centre supports smaller businesses in between by generating pedestrian flows past their front door. Those with a more civic character (e.g. a station or market) should be located at a key node, to reinforce the urban structure.

## Size

Centres should be no bigger than necessary to ensure their 'energy' is not dissipated. Compact centres are more vibrant, which is a key part of their attraction.

Where centres are bounded by residential or employment precincts, the boundary should not be formed by a street. Streets with different uses on each side have a confused identity and can have functional conflicts such as traffic and noise. Interfaces between different uses are easier to manage back-to-back or side-to-rear.

### Rule of thumb

Provide a memorable 'event' created by a unique open space and/or building at least every 200 m along principal thoroughfares.

## 2.4 In-centre street network

Centres depend on a well-connected network of public thoroughfares. Common centre uses need frontage to an easily accessible, inviting *public realm* to attract visitors.

### Gridded streets

A well-connected network of inviting streets and lanes promotes walking, cycling and public transport for access to and circulation around the centre, and reduces journey lengths by all travel modes. A gridded street pattern without one-way or dead-end streets distributes traffic relatively evenly, minimising heavy traffic flows and congestion, and provides alternatives if a street is blocked.

### Street spacing

Centres tend to evolve faster than other urban areas. An appropriately spaced, genuinely public street and lane network provides a highly flexible framework for a wide range of developments to occur and evolve over time. Streets and lanes should be spaced to ensure that:

- traffic is sufficiently distributed to avoid unacceptably congested streets and intersections;
- there are opportunities for a range of different land uses (only a relatively narrow range of businesses will be able to afford a location on the main street; side streets and back streets offer opportunities for other shops and businesses to have their own street address, ensuring a diverse centre);
- there are relatively direct routes between any two points within the centre by foot, cycle and car;
- there is a range of possible bus routes and potential for dense public transport coverage;
- each *block* can accommodate conventional commercial buildings fronting all bounding streets with a rear access lane (see section *2.8 Service access*) through the middle;
- anchor uses (e.g. a large supermarket, department store or major entertainment facility) and any associated parking and smaller 'wrapping' premises (see section *2.10 Building frontages*) can be accommodated where necessary.

Where a large anchor use and associated surface car parking cannot be accommodated within one of the resulting blocks, arrange it so that a car park access or service lane bisects the larger block and has the potential to become a fully fledged street with building frontages in the future if the centre intensifies.

**Rule of thumb**

Space public thoroughfares in the core of a centre 80–100 m apart in each direction, with fully fledged streets no more than 200 m apart in each direction.

## Street alignment

Well-connected street networks need not be an orthogonal grid (where all the streets are parallel or perpendicular to each another). In fact, variations from an orthogonal pattern contribute to a memorable *sense of place* by closing vistas and creating greater spatial definition (see section *2.5 Spatial structure*). Non-rectilinear corners also tend to produce more interesting and memorable buildings or public spaces.

Streets should be aligned to funnel or deflect cooling breezes depending on the climate.

## One-way streets

One-way streets should be avoided because the lack of 'friction' between opposing vehicles encourages faster traffic – which detracts from the pedestrian environment and discourages walking – and because they add to the length and lessen the legibility of vehicular journeys.

## Pedestrian links

Pedestrian thoroughfares such as arcades and malls can be added to a street network to offer a choice of experiences and opportunities. However, other than in city centres, pedestrian-only connections should not take the place of a link in a well-spaced street network or be positioned so that they become a main pedestrian route. In most centres, shops struggle to survive on longer pedestrian malls and arcades. Malls can also generate security issues and traffic problems in surrounding streets (see section *2.12 Pedestrian malls*).

Pedestrian bridges across and tunnels under a street should generally be avoided because they rob activity from the public realm. Street life is crucial to the attractiveness of a centre to visitors and, consequently, its economic vitality.

*Modified street grid – Laurimar Town Centre.*

*Future street grid – Laurimar Town Centre.*

# 2.5 Spatial structure

The experience of a centre is part of its attraction.

## Memorable spaces

An urban experience is enhanced by memorable streets and spaces. Each street should have a distinct character to contribute to a memorable and legible place. The character of a street is influenced by a range of factors including its width, the height of the buildings alongside, how it is divided into separate zones for different uses (e.g. footpaths and traffic lanes), trees, furniture, lighting and so on.

## Promenades

'Promenades' are particularly important in centres. Promenades are streets that invite people to stroll for the pleasure of exercise and social interaction, whether active meeting and greeting or passive people-watching. Promenades add life to a centre.

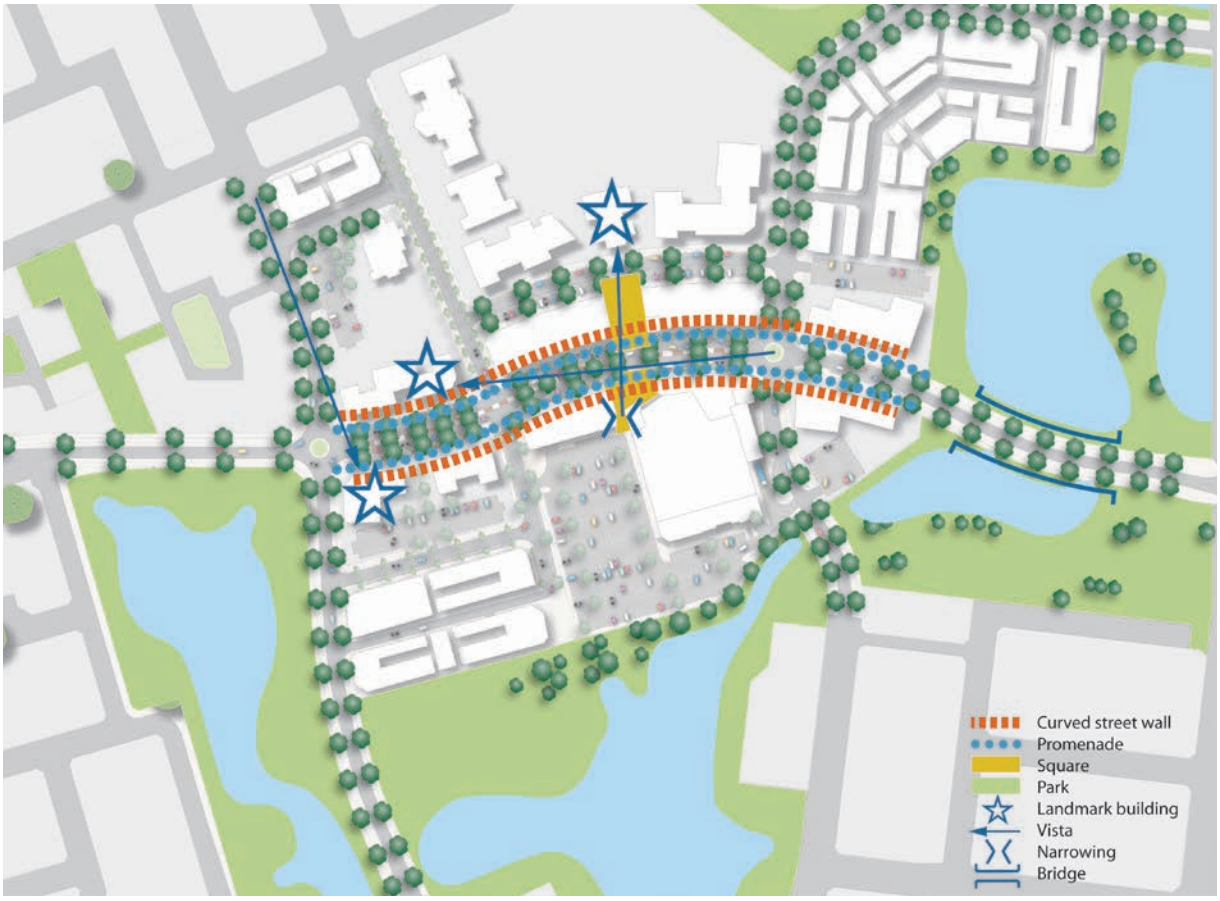
Ideally, the mainstreet should be a promenade so that it acts as a focal point for the centre. Streets with an attractive natural setting, such as waterfronts, also present ideal locations for promenades. Promenades require wide footpaths, a very pedestrian-friendly environment without trucks or fast-moving cars, and an anchor at each end such as a major entertainment use or cluster of eating places.

## Urban drama

The network of streets and public spaces in a centre can be configured to create memorable experiences. This means giving priority to the shape of the public realm, with buildings sited


*Views from higher vantage points create a memorable experience.*


*Narrowings create a sense of anticipation and discovery.*




*Spatial structure – Laurimar Town Centre.*

and designed to reinforce the definition of streets and open spaces. The shape of any street longer than a single block should be designed to create 'urban drama' – the spatial effects that evoke a sense of anticipation, surprise, delight, awe and so on. Each street should be planned as a sequence of spaces and each open space as the culmination of an arrival sequence. For example:

- gently curving or 'facetted' streets gradually reveal views of what's ahead, creating a sense of anticipation and discovery;
- narrowings, archways and topographic saddles withhold views of the next space then reveal it suddenly, creating a sense of surprise (but take care to avoid Venturi wind effects);
- the exploitation of slopes and bridges to juxtapose spaces at notably different levels provides an unusual perspective, creating a sense of delight;
- hilltops and ridgelines offer a broad prospect over surrounding land;
- thoroughfares aligned with landmark buildings or natural features frame memorable vistas;
- streets and spaces that are subtly narrowed towards civic buildings and monuments magnify their apparent scale, creating a sense of awe.

Cross-street intersections and streets aligned with each other on the opposite sides of an open space should be minimised, because this weakens the definition of the space where they meet. Instead, streets should be off-set or angled so that the vista along each one towards their intersection is terminated by built form.

# 2.6 Land uses

The best centres are not limited to shops and services. They contain a wide range of uses including civic facilities, medical and health centres, offices, places to eat and drink, entertainment venues, leisure facilities, visitor accommodation and housing. Good centres also offer a variety of shops and services.

*Mixed-use development.* *First image: Alastair Campbell.*

## Use diversity

A wide range of uses brings many benefits:

- it supports economic development by providing diverse opportunities for local business and employment;
- it supports the economic vitality of the centre by attracting more people for different reasons;
- it fosters social cohesion by bringing more people together and providing a more vibrant community focal point;
- it supports public transport by providing demand for travel to and from the centre at different times;
- it enables trip combining, reducing the environmental and economic costs of travel;
- it enables car parking to be shared;
- it creates a more visually diverse environment.


*Shops with apartments above.* *Images: Alastair Campbell.*

## Housing

Housing in centres meets an increasingly popular lifestyle choice. It also helps create a more vibrant environment outside business hours, supporting an evening economy – restaurants, bars, entertainment venues and so on – and enhancing safety for staff walking to public transport or their cars after work. Home-offices in a centre provide an opportunity for people to work from home while having an appropriate address for business.

## Employment

The inclusion of housing should not be to the exclusion of employment space, particularly in centres that are well served by higher-order public transport. Businesses are attracted to centres because of the services they provide and the amenities they offer staff. Employment also concentrates trip-generation, which makes centres that are well served by public transport highly suitable.

*Home offices.*

## Interim uses

Where a centre is to be developed incrementally, consideration should be given to interim uses of land to be developed in later stages, to avoid a disconnection between the centre and surrounding urban area.

## 2.7 Subdivision and building pattern

Specific uses cannot be controlled within most centres. However, the way blocks are subdivided into individual lots and the form of development on them can facilitate the desired range and pattern of uses.

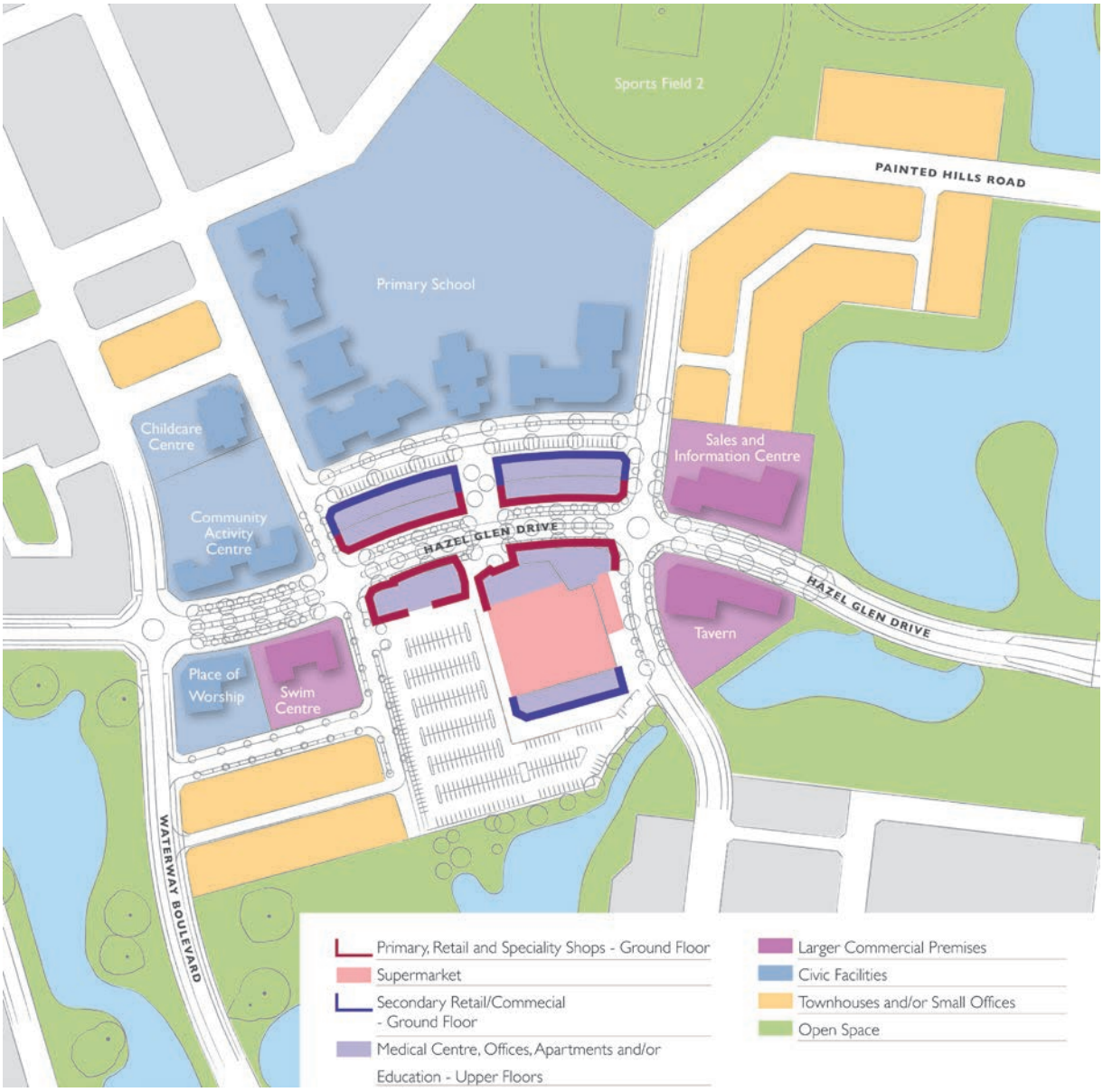
As demonstrated by mixed-use places that have evolved without regulation, different but compatible uses can be comfortably accommodated within the same area by employing a variety of techniques such as placing them at different levels and facing them towards different streets. The subdivision and building pattern should facilitate visual interest, and use-diversity and flexibility, by providing premises as shown in Table 2.2.

### Property ownership

To preserve the range of goods and services on offer within centres, it is important to discourage the assembly of too much property into single holdings, which often results in the development of larger buildings and a reduction in the diversity of uses.

**Table 2.2: Preferred subdivision and building pattern**

| Location | Premises |
|---|---|
| **Lining both sides of mainstreet(s) and secondary streets** | Buildings with small premises at ground floor able to accommodate speciality shops and a range of services, along with a small number of medium-sized premises for larger shops and businesses. Ideally, each block frontage should contain multiple buildings in separate ownership to provide greater diversity. Where viable, space for office, community, health, entertainment or residential uses should be provided at upper levels. |
| **Behind mainstreet premises** | Up to one large lot per block able to accommodate a major attractor and its car parking. The main pedestrian entry should be from the mainstreet. |
| **Main roads at the edge of larger centres** | Large lots able to accommodate larger commercial uses (e.g. office buildings and showrooms) and apartment buildings. |
| **Prominent intersections and hilltops (particularly terminating mainstreets)** | Civic facilities (e.g. community centres, libraries, performing arts centres and places of worship). |
| **Edge of the commercial core** | Primary schools, kindergartens and childcare centres.<br>Apartment buildings.<br>Flexible buildings able to be used as townhouses or workplaces (e.g. small offices or medical clinics).<br>Land for other, less predictable commercial uses (e.g. light industrial businesses, play centres and leisure halls). |




*Subdivision and building pattern that facilitates use diversity – Laurimar Town Centre.*

# 2.8 Service access

*Rear service lane contains ugly 'back of house' activities away from the public realm.* Image: Bing.

*Discreet storage, loading and refuse collection at the rear.*

Discreet service access safeguards public realm quality.

Staff parking, delivery access, goods storage and refuse collection areas should be provided at the rear of buildings where possible, because they detract from the quality of the public realm. They also reduce the ability to provide convenient on-street parking for shoppers. This is particularly important for large shops, which tend to have large and frequent delivery vehicles.

## Rear lanes

In the case of a strip of small shops, vehicle access to the rear of properties is most efficiently provided by a rear lane. However, pedestrians should not be encouraged to use such rear lanes nor businesses to front them, as they do not provide a safe, comfortable or attractive environment.

# 2.9 Built form

Centres merit higher development densities.

This is because:

- locating housing close to employment, shops and services reduces the need to travel;
- higher densities provide greater 'in-built' support for the viability of shops and services;
- centres are less sensitive to the amenity effects of bigger buildings than purely residential neighbourhoods;
- centres are typically well served by public transport;
- higher densities generate a livelier environment, enhancing the vibrant character which is part of centres' attraction.

*Increased density in a centre brings many benefits.*

## Taller buildings

A simple but effective way of increasing density is by providing taller buildings. Taller buildings in centres enhance the legibility of the broader urban structure and contribute to a more memorable sense of place.

*Taller buildings in centres reinforce the urban structure.*

*Spatial containment can be achieved with high parapets.*

*Key intersection marked by taller buildings.* *Image: Alastair Campbell.*

*Setting upper levels back helps to manage character and public realm impacts.*

Where upper levels are not viable, spatial containment can be achieved through high parapets and other architectural means. Alternatively, upper levels can be used for temporary uses such as a sales office, project office, interim school or childcare centre, until commercial uses are viable.

Within a centre, the pattern of building heights can be shaped to reinforce legibility. For example, key intersections and entries to the centre should be marked by taller buildings, and more important streets should be emphasised by taller buildings. The tallest building should mark the heart of the centre.

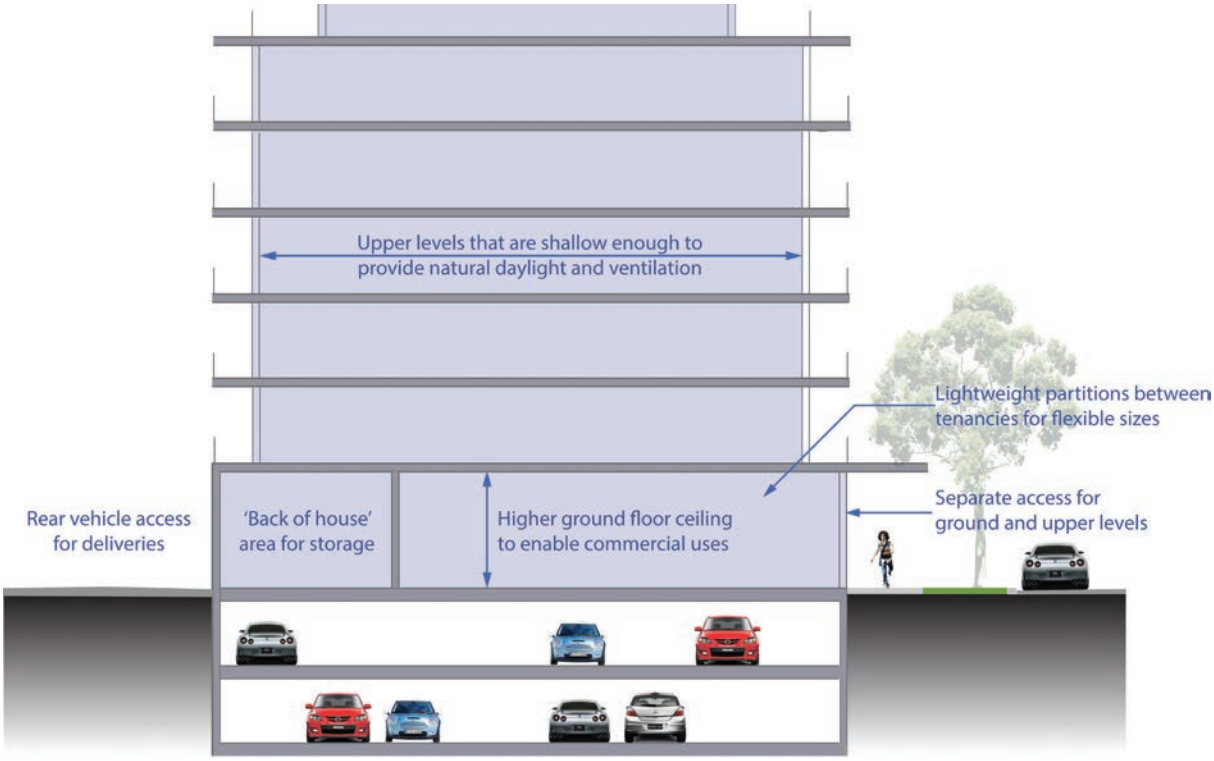
## Managing built form impacts

Taller buildings can also adversely affect built form character and public realm amenity. These impacts can be managed in several ways, including setting back upper levels (see sections *1.14–1.15* and *1.18*). Building heights may need to step down towards the edge of centre to avoid a marked contrast in height with the surrounding area.

## Adaptable buildings

Given the propensity for building occupants in centres to change in response to varying economic circumstances, buildings should be adaptable to minimise the risk of blight. The varied floor-to-floor height requirements of different uses means that cost often prohibits the ultimate flexibility of buildings. However, the following measures can increase adaptability:

- lightweight internal partitions to enable varied commercial tenancy sizes;
- a higher ceiling at ground floor to enable retail, commercial and civic uses requiring larger spaces;
- rear vehicle access and a back-of-house area at ground floor for storage and deliveries, to enable a full range of retail and hospitality uses;
- separate access to ground and upper floor levels, both from the street, to provide convenient and legible access for visitors to different uses;
- upper levels that are shallow enough to provide natural daylight and ventilation to most of the floor area, ensuring they are suitable for residential uses.




*Key elements of an adaptable building.*

### Rule of thumb

In centres, ensure street facade heights are at least half the width of the street they front.

# 2.10 Building frontages

Appealing centres are made of inviting streets and spaces. An engaging, comfortable and safe public realm attracts visitors, for whom visiting a centre is as much about the experience as the business they wish to conduct.

## Active frontages


*Well-defined, active and visually interesting frontages.* *Image: Alastair Campbell.*

Buildings can contribute to the appeal of the public realm in several ways. Most importantly, they should have *active frontages* – facades that enable people outside to see what's inside the building, particularly people (see section *1.24 Active frontages*). This is mainly achieved by windows and doors. Uses which spill out into the street (e.g. footpath dining and trading) contribute further to the safety and interest of the street. However, these activities need to be managed to avoid obstructing the footpath (see section *2.11 Street design: layout*).

Opaque security shutters should be avoided because they contribute to the perception of an unsafe environment. Instead, if necessary, open grilles and lighting should be used to secure premises and discourage vandalism outside business hours.

Upper-level facades can contribute to the amenity of the public realm through windows and balconies. However, the ability to make eye contact is lost above about five storeys.

## 'Big box' developments

'Big box' buildings (e.g. supermarkets, department stores, multiplex cinemas, 'bulky goods' stores and enclosed shopping centres) are often introverted, with little active frontage. Multi-storey car parks do not offer active frontages either. Therefore, where these buildings do not present an active frontage, they should be 'wrapped' with smaller, outward-facing shops that present both active and attractive frontages to the surrounding public realm. This is sometimes called 'sleeving'.


*Small shops 'wrapping' large stores.* *Image: Alastair Campbell.*

## Public realm definition

Building facades should be built on or close to the street boundary and extend across its full width, to create good definition of the public realm and avoid creating a potential place of concealment and entrapment (see section *1.22 Public realm edge*). This requires on-site car parking to be located below, behind or above ground floor, so that there is a direct relationship between the building and the street(s) (see section *1.28 Parking*). Where window sill heights allow, the incorporation of ledges provides informal seating that helps to animate the centre.

## Visual interest

Building facades should provide visual interest at a walking pace. This requires a richly detailed facade at lower levels with frequent vertical articulation. For example, the *grain* created by a row of traditional 5–6 m wide shopfronts satisfies this need. (See section *1.26 Building facades*.)

## Awnings and colonnades

The inclusion of a colonnade or an awning over the footpath provides a sense of enclosure for pedestrians and strengthens the relationship between shops and the adjoining public realm. It also provides protection from the weather. (See section *1.25 Awnings and colonnades*.)


*Ledges provide informal seating.*


*Awnings provide a sense of enclosure and weather protection.*

# 2.11 Street design: layout

Centres are a focus for community life. Not just somewhere to purchase goods and services or do business. Therefore, it is critical that the streets are public places which support a wide range of planned and spontaneous social interaction, in contrast with the restricted behaviour allowed in private spaces.

## Pedestrian-friendliness

Almost all visitors to a centre get around it on foot. Walking also fosters spontaneous social interaction. Therefore, vehicular access should not be at the expense of pedestrian convenience, comfort and safety.

However, pedestrian malls are usually unsuccessful except at the heart of major cities (see section *2.12 Pedestrian malls*). So streets need to be designed to achieve the optimum balance of convenience to all users, including not only pedestrians and cars, but also cyclists, trams, buses, taxis, delivery vehicles, outdoor diners and so on. In essence, this can be achieved by:

- minimising the space given over to moving traffic (without making streets one-way or removing turning options);
- slowing traffic down;
- providing short distances and as many opportunities for pedestrians to cross as possible, e.g through the provision of *kerb outstand*s.

## Footpaths

Footpaths should be wide enough to provide comfortable space for pedestrians, furniture, services, canopy trees and outdoor trading. The appropriate width will increase with the density of the centre and how busy the street is. Furniture, trees and above-ground infrastructure should be placed in a zone alongside the kerb, leaving unobstructed passage alongside the buildings for pedestrians. However, space should be maintained for opening parked car doors.

Footpaths should be extended into the parking lane at intersections and other key pedestrian crossing points to shorten crossing distances. Kerb outstands can also provide valuable ‘pause places’ – room for a seat under a tree in a good place for watching people.

## Traffic lanes

The width of vehicular lanes should be minimised, to slow traffic. Streets that may form a bus route need slightly wider lanes.

## On-street parking

On-street parking should be maximised (see section *2.15 On-street parking*).

## Cycle lanes

Cycle lanes should be provided in busier streets. These can double as manoeuvring space for cars entering and exiting kerbside parking spaces.

## Street width

In accommodating all these uses, streets should not be allowed to get so wide that each side loses visual contact with the other, and that the sense of containment and intimacy that contributes to a strong sense of place cannot be achieved. The ability to make out people's faces and building detail on the opposite side of the street contributes to the intensity of the experience. Street widths should also be varied (both along a street and between different streets) to contribute to the memorability and legibility of the centre.

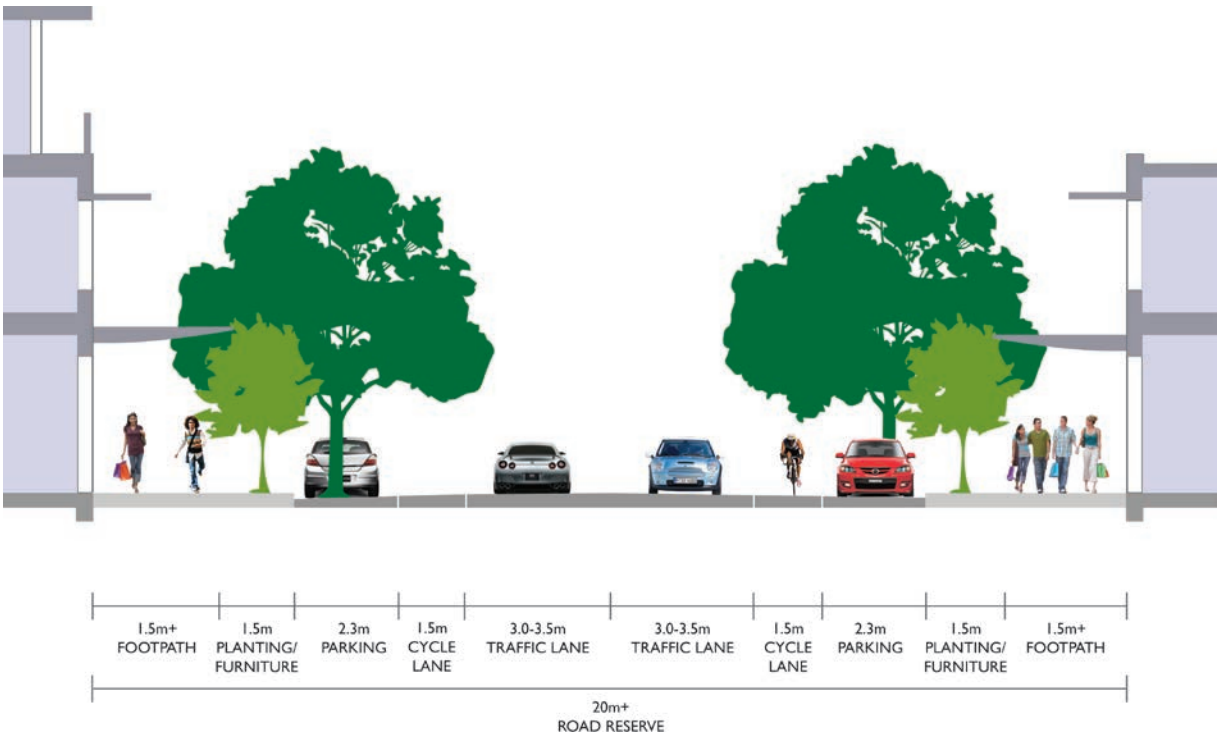

*Mainstreet.*

*Mainstreet with central median.*

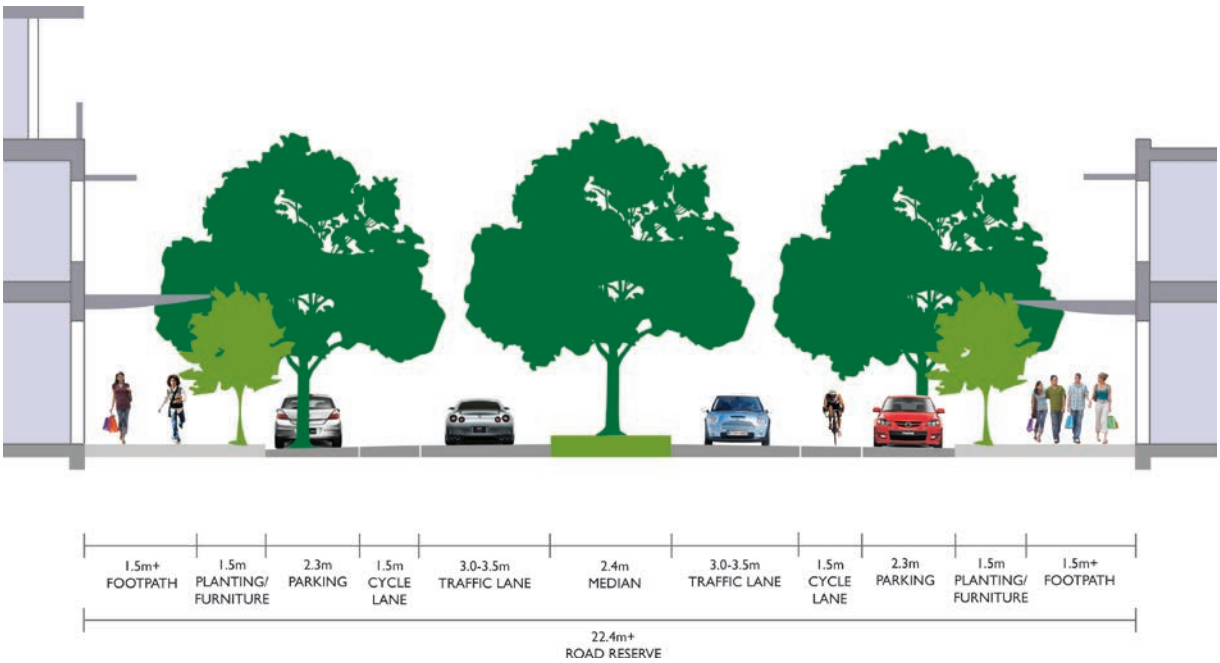
## Major roads

The edges of centres abutting major roads are often unable to have kerbside car parking or to gain vehicle access direct from the street. In this case, service lanes may be appropriate to allow abutting developments to address the street.

*Service lanes enable development to front main roads.*




*Mainstreet cross-section – Laurimar Town Centre.*

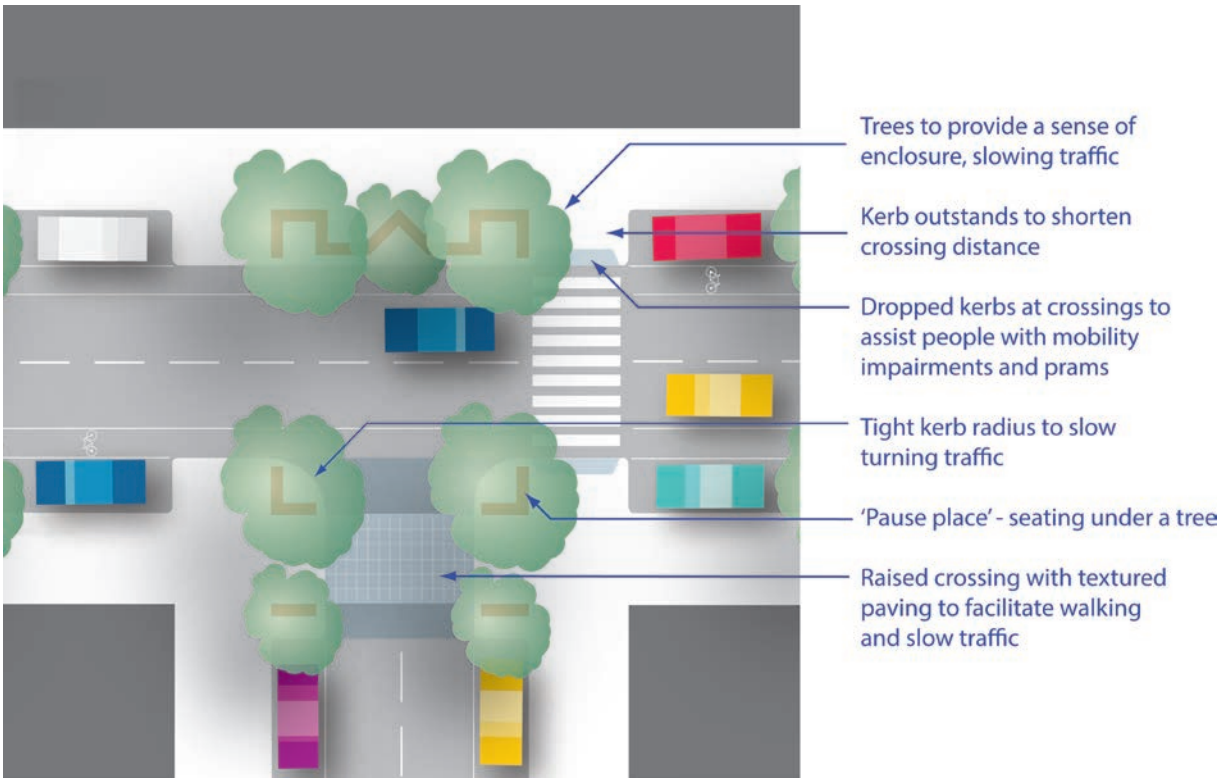



*Typical mainstreet cross-section with central median.*

## Intersections

Roundabouts should be avoided, because they typically require a substantial amount of space, force pedestrian crossings away from the *desire line*, are unsafe for cyclists and create smooth traffic flows downstream, which removes opportunities for both drivers and pedestrians to enter or cross the traffic stream. Traffic lights provide a better solution for pedestrians and cyclists where uncontrolled junctions are not adequate.

Generous curves and dedicated slip lanes for turning traffic at intersections should also be avoided because they facilitate faster movement, reducing pedestrian and cyclist safety and amenity, and deflect pedestrians and cyclists from their desire line.




*Key elements of an amenable intersection for pedestrians and cyclists.*

### Rules of thumb

- Ensure footpaths are at least 3 m wide plus 0.5 m for each level of building height typically anticipated above ground-floor (e.g. 4 m for a three-storey area or 6.5 m for eight storeys). Increase the width by 1.5 m on the south or east sides of streets intended for outdoor dining. Maintain a clearance of 0.5 m between the kerb and any trees, furniture or above-ground infrastructure.
- Limit traffic lanes to a maximum width of 3 m, or 3.5 m on bus routes.
- Design cycle/parking manoeuvring lanes 1.5 m wide.
- Limit the total *road reserve* width (the space between properties on either side) to a maximum of ~20 m where possible.

## 2.12 Pedestrian malls

As many outdoor pedestrian malls fail as succeed. They were a feature of early stand-alone centres, and were introduced into many traditional centres by closing streets in an attempt to create more pedestrian-friendly shopping centres. However, traffic has since been reintroduced into many and others are struggling for survival.

A pedestrian-friendly environment is one factor in the attractiveness of a centre, and therefore its economic success. However, it is not the only factor. The following qualities of centres are also important for their success and provide clues as to why many pedestrian malls fail:

- Many people drive to centres, so convenient access and car parking is important for their competitiveness. The importance of handy parking increases after dark, when people are less comfortable walking from a restaurant or cinema down inactive streets or lanes to their car.
- A regular flow of cars through centres generates passing trade. This explains the prevalence of traditional centres along main roads.
- Traffic provides 'eyes on the street' in the evening, when most centres have less pedestrian activity.
- A permeable street network distributes traffic. Closing a street to create a pedestrian mall increases traffic in surrounding streets, creating a barrier around the mall.

### Location and design

Pedestrian malls can work. Larger centres attract customers despite being less convenient to drive to, because of their bigger range of shops and more distant competition. Pedestrian malls in larger centres are often anchored by a major attractor such as department store with associated parking (accessed from another street). Popular *al fresco* dining areas can also support pedestrianised streets provided car parking is close by. But most smaller centres need to offer convenient access by all travel modes to compete with each other and with bigger centres. So pedestrian malls in smaller centres should be limited to short, secondary connections, rather than links in the primary street network.

### 'Calmed' and flexible streets

There is an alternative to pedestrian malls. Streets can be designed to be very pedestrian-friendly but still allow cars through. Techniques for achieving this include very narrow lanes for vehicles, slow speed limits, pedestrian-style paving, pedestrian priority and limited distinction between vehicular and pedestrian spaces. Another solution is to close streets to traffic during daytime business hours and open them during the evening.

Pedestrian malls have their place, but they rarely work in smaller centres except for very short, secondary links. Instead, more creative approaches are required to create pedestrian-friendly environments.


*Destination* al fresco *dining areas can support pedestrianised streets.*

*Street closed for event.*

*Calmed street.* *Image: Alastair Campbell.*

*Shared surface street.* *Image: Lukas Nott.*

*Shared surface street.* *Image: Alastair Campbell.*

# 2.13 Street design: floorscape and furniture

Well-designed floorscapes and street furniture enrich a centre.

## Footpaths

Footpaths are only a stage for public life and should not compete with people for attention. A simple, consistent and unobtrusive but good-quality treatment should be adopted. For example, a single, dark footpath surface provides a cohesive and neutral backdrop, with distinctive treatments in key locations such as major intersections or thresholds to add character and reinforce local identity.

Footpaths should be even and non-slip. Dropped kerbs should be provided at key crossing points. Guard rails and staggered or staged pedestrian crossings (involving a dog-leg or pause at a central median) should be avoided because they send a message that pedestrians are less important than cars, reducing the centre's appeal.


*Multi-purpose poles reduce clutter.*

## Furniture

The siting and design of furniture, lighting and signage should be integrated to avoid physical and visual clutter. This can be achieved by using a coordinated suite of furniture and, where possible, multi-purpose elements such as seats and bicycle hoops that also act as tree guards, and poles that support lighting, signage and traffic signals.

A simple, timeless design avoids furniture becoming dated. This does not preclude the potential for distinctive designs for each precinct or artistic features at key locations.


*Simple paving and furniture as public art.* *Image: Alastair Campbell.*

*Flexible seating.* *Image: Alastair Campbell.*

## Seats

Seats should be provided to invite people to rest, stay and add to the vitality of the centre. They should be located where there is an interesting view – including places with lots of pedestrian activity – and shelter from sun, wind and rain.

## Maintenance

Maintenance should be considered when selecting footpath surfaces and furniture. Expensive footpath materials and furniture are less likely to be replaced after repairs, and easily cleaned surfaces are more likely to be well maintained. Durable materials that will grow old gracefully are critical.

## Planting

Trees add significantly to the appeal of a centre. They should be sufficiently close to each other and large enough to create the sense of a 'roof' over the street, or at least the footpath, except in cool climates. Deciduous trees or those with a relatively sparse canopy should be selected to allow sunlight through in winter, except in hot climates where the need for dense evergreen canopies is greater. Trees with seasonal colour add to the distinctiveness and attractiveness of the centre.


*Canopy trees create a 'green roof'.*

Grassed nature strips (the unpaved area between the road pavement and footpath) are not robust enough for a centre and should be avoided. Garden beds and planter boxes should be installed only if there is a reliable maintenance regime. Otherwise they often become little more than rubbish bins. In any case, all foliage should be well above head height or below knee height to avoid obscuring views of people, shopfronts and signage.

## Lighting

Lighting is important for safety and can also add to the beauty and identity of a centre. Lighting can be mounted on poles, bollards, buildings or within the footpath, and include spotlights highlighting feature elements such as building facades, monuments and trees. Street lighting should be white rather than yellow, for better colour perception.

## Cabled services

All cabled services should be located underground to avoid visual clutter and prevent the need to prune tree canopies around them.

*Lighting can add to the beauty and identity of a centre.*

### Rules of thumb

- Provide a seat at least every 50 m along main pedestrian routes.
- Avoid foliage between 0.5 m and 2.5 m above footpath level.

# 2.14 Public transport

Centres cannot rely on private and *active transport* alone. Not only does public transport bring to the centre people who are unable or unwilling to drive, it also exposes passengers passing through to the range of goods and services on offer.

Light rail, tram and bus stops, and taxi ranks should be located close to the core of centres wherever possible. However, successful mainstreets are typically relatively congested. So bus stops should be located in secondary streets or main roads close to the mainstreet to minimise delays to services.

Buses at bus stops impede the view of shops and can emit unpleasant fumes. Therefore, bus layovers should not be located within a centre.

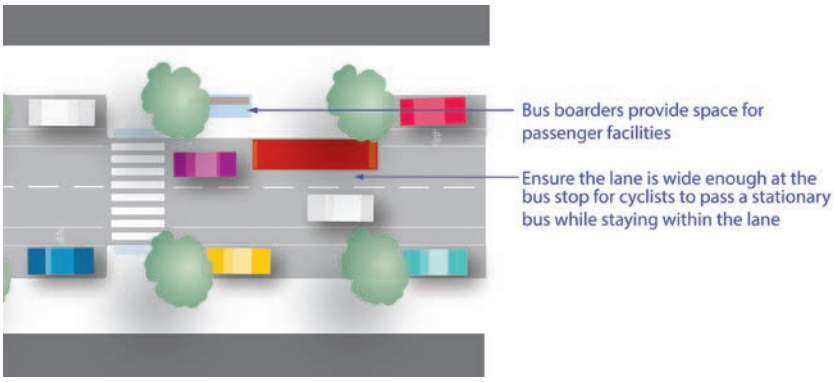
Bus stops take up valuable kerbside parking space. Therefore, multiple bus routes should share stops as much as possible.


*Light rail stop.* *Image: Alastair Campbell.*

## Bus boarders

Bus boarders – bus stops where the vehicle halts in the traffic lane and the footpath is extended to it across any parking lane, also known as bus bulbs – minimise delays to bus services by avoiding them having to wait for a gap in the traffic to depart, and preventing other vehicles from parking in the bus stop. They have several other benefits, including:

- reducing the loss of kerbside parking spaces, as there is no need for buses to have an angled approach and departure;
- providing space in the footpath extension for facilities for passengers and visitors to the centre, avoiding obstructions in the footpath;
- facilitating level boarding for low-floor buses by providing easier full-length alignment of the bus with the bus stop and a raised platform;
- reducing the crossing distance for pedestrian crossings located at a bus boarder.




*Bus boarder.*

# 2.15 On-street parking

On-street parking should be maximised. Not only does it provide convenient visitor parking, but it also contributes to more compact and pedestrian-friendly centres.

On-street parking has many secondary benefits over off-street car parks in centres:

- it contributes to the efficient use of land in the centre, by utilising existing road infrastructure and being shared by many different users over time;
- it assists in calming traffic to create more pedestrian-friendly streets by interrupting flows;
- it creates a buffer between the footpath and moving traffic, further enhancing pedestrian-friendliness;
- it activates the street by generating pedestrian activity;
- it adds valuable 'eyes on the street' at night-time;
- it minimises the need for off-street car parks, which can fragment centres and be unsafe and unattractive public spaces;
- it provides for deliveries to businesses fronting the street;
- it draws visitors searching for a park past shops and services.

## Design

Kerbside parallel parking is the best form of on-street parking in most streets, because it is efficient, does not intimidate pedestrians and can be accommodated within a modest street width. Angled and right-angle parking requires wider traffic and parking lanes, and entering and exiting cars can be intimidating for pedestrians and cyclists respectively. Where angled parking is employed, wheel stops should be installed to ensure parked cars do not overhang the footpath.

*Kerbside parking.*

*Centre-road parking.*

## Parking streets

In secondary streets, kerbside parallel parking can be combined with right-angle parking in the centre of the road to provide a substantial amount of parking without creating an unattractively wide and vehicle-dominated street. Large canopy trees can be provided within the central zone to break up the scale of the street.

## Layout

Long rows of on-street parking should be broken up by kerb outstands to facilitate informal pedestrian crossing and provide an opportunity for trees where these cannot be accommodated on the footpath.

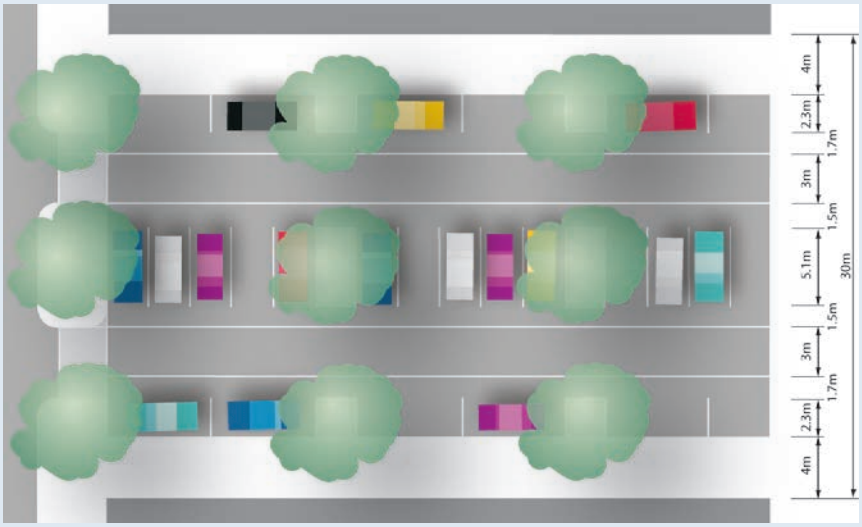
## Management

Kerbside parking spaces should be limited to short-term use to ensure they are not used by staff but are available for visitors, contributing to the appeal of the centre. Restricting the length of time they can be used ensures high turnover in the most central areas, increasing availability to those with the least time.

Clearways (where kerbside parking is banned to provide an additional traffic lane in peak commuting periods) should be avoided because they reduce the convenience of shops and businesses, adversely affecting their viability.

### Rule of thumb

Design 'parking streets' in accordance with the figure.




*Indicative centre-road parking layout.*

# 2.16 Off-street parking

Poorly located or designed off-street car parks undermine a centre.

Even after maximising the potential for on-street parking, off-street surface car parks are usually required in medium–large centres where land values do not warrant basements or upper-level parking. Surface car parks should be sited and designed to:

- use land efficiently;
- provide convenient access to the centre;
- contribute to retail vitality;
- provide safe and attractive public spaces;
- provide development opportunities as land values rise.

## Location

Large off-street car parks act as anchors that generate pedestrian activity. Therefore, off-street parking should be dispersed through the centre to contribute to the viability of businesses that rely on passing footfall (without creating such small car parks that they are inefficient or unable to be developed in the future). This also avoids very large surface car parks, which detract from the safety and amenity of the centre.

Off-street surface car parks should not be located along the edges of primary streets, because they interrupt the built form, which is key to a strong sense of place, pedestrian amenity and retail continuity. They may be located on secondary streets, or in the middle of blocks behind buildings fronting the surrounding streets, with clear pedestrian linkages to those streets.

Buildings between a street and surface visitor car park should contain separate ground-floor premises facing each way, or individual premises that can be relied upon to face both ways. It is essential that businesses are prevented from choosing the car park frontage and presenting an inactive facade to the street.

## Design and access

Off-street car parks are essentially public spaces, and should be designed as inviting and safe spaces just like the rest of the public realm. They should be designed to enable them to be closed to cars and used as a marketplace or a space for an event. Their edges should be designed like streets, with active frontages, footpaths, trees, awnings or colonnades, lighting and no concealed spaces.

The parking areas themselves should be well-lit, and sheltered and beautified by regularly spaced, clean-stemmed trees. Sheltered paths should be provided through large car parks, along the busiest desire lines.

Off-street car parks should be directly linked to the streets they serve by streets or pedestrian links lined by active frontages. (While walk-through shops offer a connection, they are accessible only during the hours of that business and do not provide a clear visual connection.)

There should be multiple vehicle access points to off-street car parks to distribute traffic and maximise convenience. In smaller centres more reliant on passing trade, this should include at


*Well-landscaped and active-fronted car park.* Image: Alastair Campbell.

*Sheltered, well-lit and flexible car park.*

least one from the mainstreet, so that drivers are exposed to its retail offer and can search for an on-street parking space first.

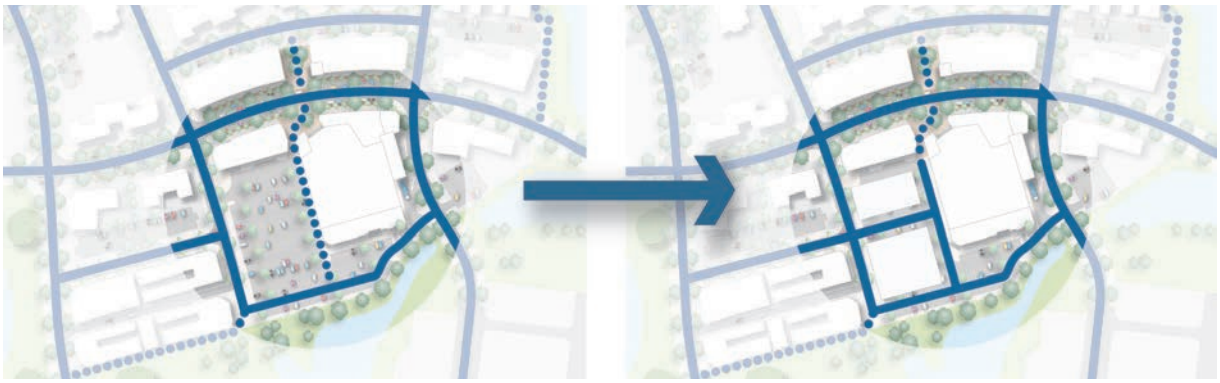
As land values rise, surface car parks become an uneconomic use of land and it is viable to incorporate public parking within development at a basement or upper level. Therefore, off-street surface car parks should be configured to provide efficient development sites when this occurs.

## Management

Off-street surface car parks in centres should be shared facilities rather than dedicated to a particular business. This maximises the efficient use of land, contributing to a compact centre.

In most successful centres there is a high level of demand for car parking spaces. Left uncontrolled, parking spaces close to the centre tend to be taken by workers. Instead, those spaces should be made available for visitors to help attract them to the centre.

So that parking availability responds most efficiently to user needs, a graded approach should be applied to time restrictions, with the shortest-term parking at the heart of a centre and the longest-term parking on its periphery. This will ensure high turnover in the most central areas, increasing availability to those with the least time. Longer-term users, including staff, will be compelled to use the car parks located towards the edge of the centre (unless they have on-site staff parking).



*Potential development of car park – Laurimar Town Centre.*

# 2.17 Open space: siting and scale

Public open spaces reinforce and enrich the centre experience, provide gathering points and support social, cultural and commercial exchange. Open spaces provide a range of opportunities and experiences not available within the predictable and sterile environment of enclosed spaces.

## Size

The provision of open space must be balanced with the need to maintain a compact commercial core. Large open spaces can detract from the convenience of the centre. They can also be windswept and desolate, detracting from the sense of vibrancy. Better to be smaller and have a highly active character.

Larger centres should have enough life to animate a generous town square, supplemented by smaller pocket plazas and a town park at their edge. A more intimate plaza is more appropriate in smaller centres, potentially complemented by a village green at their edge. Even larger town squares should not be so large that people on one side cannot recognise someone passing through the space, or so wide that someone in its centre cannot make out activity at the edge.

## Shape

Open spaces should be conceived as outdoor rooms – deliberately designed places with a distinct and definite shape and a sense of enclosure, rather than leftover space. To create a memorable place, open spaces should have convex shapes defined by buildings. (In simple terms, a convex shape is one in which every side faces towards the middle. In more technical terms, it is a shape in which every internal angle is less than 180˚.)

Where open spaces provide a setting for a significant civic building, the primary facade of that building should define a shorter side of the space with the longer axis of the space perpendicular to it.

*The size of an open space should suit the size of the centre.* *Image: Alastair Campbell.*

*Outdoor room with strong, cohesive frame and a pedestrian desire line along each edge.* *Image: Alastair Campbell.*

Each edge of an open space should form a pedestrian desire line, to ensure it is animated. Internal corners can create dead spaces and should be avoided, unless they are occupied by a raised terrace. However, too many openings in a space weakens its spatial definition. In particular, two or more streets leading away from the same corner of a space should be avoided.

Structures that bridge over streets or lanes where they enter an open space give it greater spatial definition and drama (see section *2.5 Spatial structure*).

## Surrounding buildings

Buildings around the edges of a public open space should be tall enough to ensure good spatial definition and relatively similar in height to provide a cohesive frame. Building heights should be managed to ensure most of the space receives direct sunlight year-round.

### Rules of thumb

- Limit town squares in larger centres to a maximum of 80 × 40 m.
- Limit public open spaces in the core of smaller centres to a maximum of 40 × 25 m.
- Ensure the width of a public open space is at least half of its length.
- Ensure building heights along the longer sides of a public open space are at least one-third of the width of the space, and preferably higher.
- Shape buildings around a public open space to ensure that at least two-thirds of the space receives sunlight between 11am and 2pm at the equinoxes and one-third receives sunlight between 11am and 2pm at the winter solstice.

# 2.18 Open space: edges and layout

Good open spaces provide a stage for diverse pursuits. This includes informal day-to-day activities such as resting, people-watching, eating lunch, meeting friends, children's play, reading, chatting, busking and street art, along with planned activities such as markets, scheduled performances, festivals, parades and other events.

## Character

Each open space should have a distinct character that relates to the uses around it; for example, a civic square, market square, *al fresco* dining plaza, children's playground, performance space or pocket park.

## Edges

*Open spaces should have animated edges. Image: Alastair Campbell.*

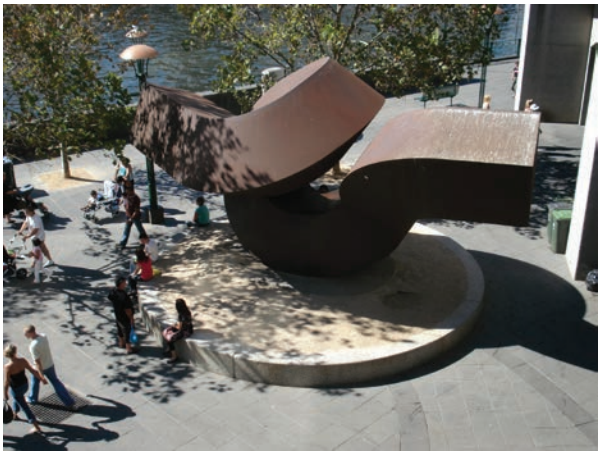
Open spaces should be animated by appropriate uses at their edges. Cafes, restaurants and bars with a direct interface to the space and provision for outdoor dining are particularly effective in adding life. Shops that lend themselves to footpath trading (e.g. florists) are similarly successful. Not only do these activities add life, they also contribute to the richness of the experience through sounds and smells. In very large spaces, or where a space is separated from surrounding buildings by a busy street, free-standing kiosks can provide animation. However, care must be taken that the space is not so dominated by commercial uses that visitors who do not wish to eat or drink feel excluded.

Where the function of an edge building precludes a highly active frontage at ground floor, it should incorporate ledges for people to sit or lean on. Balconies and windows at upper levels also help to animate a space.

## Through-movement

Open spaces should facilitate pedestrian through-movement. Paths need to generally follow desire lines, or people will simply take a more direct route.

*Distinct active and passive zones.*



*Informal seating facing pedestrian desire lines to facilitate people-watching.* *Image: Alastair Campbell.*

## Zones

Larger open spaces should be divided into several distinct 'rooms'. These should include flexible spaces able to support a range of activities, and more passive areas for resting and people-watching. Pedestrian desire lines offer a logical delineation between different zones. Changes of level can also form effective boundaries.

Flexible spaces need to be relatively uncluttered by permanent furniture or other fixtures to enable them to accommodate larger events. Power and water is needed for some activities. In larger spaces, a simple platform (possibly sheltered) facilitates performances or presentations to mass gatherings.

Passive areas should be located in places that offer sun and protection from wind in cool climates, and shade and light breezes in hot climates. A choice should be provided in temperate climates. Passive areas should also be designed to face a pedestrian desire line to facilitate people-watching.

# 2.19 Open space: floorscape and furniture

Floorscapes and furniture are essential props of a vibrant open space.

## Floor

*Raised lawn, seating ledges and varied floorscape.*

The floor of open spaces should be finished with simple, robust materials that can be easily cleaned and maintained. A hard surface is required for pedestrian routes and as a base for seating areas. Natural lawn is unlikely to be robust enough for the principal surface of an open space in a centre. However, raised lawns that do not lie on pedestrian desire lines can provide an attractive resting place and, when shaded, a cool oasis in a hot climate.

Varied flooring textures can contribute to the richness of the experience. Intensely used spaces require a sealed surface. However, softer surfaces such as granitic sand may be appropriate for relatively passive spaces.

Where there are changes of level, broad steps or a ledge can be incorporated to provide informal seating. At bigger changes of level, benches can be set against retaining walls. Open spaces may be lower than the surrounding streets where there is good visual and physical access. But where they are too much higher or lower they lose contact with the surrounding public realm and can become lifeless.

## Furniture

Seating is the most important factor in the appeal of an open space. Like paving, seating should be robust and easily cleaned and maintained. It should be configured to suit individuals and a range of group sizes, and include some with backrests. Seating should be sited to enable people-watching and provide sun, shade or a choice, depending on the climate. Movable seating provides the ultimate flexibility for people to respond to different social situations and climatic conditions.

Where possible, structures such as fountains, pools, statues, tree surrounds, sculpture, playgrounds, stages, raised planters and lawns, and even buildings should incorporate plinths that provide informal seating or stages for planned and impromptu performances. Similarly, installations should form play equipment where possible.

Other furniture that should be considered includes bins, water bubblers and game tables (e.g. chess and table tennis).

*Movable seating provides the ultimate flexibility for people to respond to different social situations and climatic conditions.*

*Tree surround provides informal seating or stage for an impromptu performance.* *Image: Alastair Campbell.*

## Structures

Shade structures may be appropriate where there is insufficient shade from trees, particularly in hot climates.

People tend to congregate around fixed objects. This can be used to attract people into the middle of larger spaces by introducing a structure such as a fountain, monument, sculpture, stage or canopy tree.

*Central tree provides shade and attracts people into middle of space.*

### Rules of thumb

- Ensure an open space is not more than 1 m above or below the level of surrounding streets around at least half of its perimeter.
- Design outdoor steps with treads at least 380 mm deep and risers no more than 150 mm high. The depth of the tread plus twice the height of the riser should equal around 680 mm.
- Provide at least 1 m of seating length (including informal seating) for every 10 $m^2$ of open space.
- Design seating ledges 300–500 mm high and at least 400 mm deep, or 750–900 mm deep to enable seating on both sides.

# 2.20 Open space: beautification and lighting

Open spaces should be beautiful and stimulate the senses. This can be achieved through landscaping, water, urban art and lighting.

*Trees add beauty, enhance comfort and stimulate the senses.* *Image: Alastair Campbell.*

## Landscaping

Trees add beauty, shade, a different light quality, wind amelioration, different sounds and smells, and wildlife. They also provide an inviting place to sit. However, trees with low-hanging canopies and mid-height shrubs should be avoided because they obscure views and compromise the clear sightlines needed for real and perceived safety. Joined-up canopies can provide an attractive effect, particularly in hot climates. However, where extensive tree cover is proposed in cool or temperate climates, deciduous trees or those with a sparse canopy should be selected to allow sunlight penetration in winter.

*Water enriches the experience of an open space.*

## Water

Water adds to the experiential richness of an open space. The ability to touch water offers a particularly memorable experience and enjoyable children's play. Moving water creates particular light and sound effects.

*Art as play equipment.* *Image: Alastair Campbell.*

## Urban art

Urban art can contribute to the character and identity of open space, interpret the area's history and stimulate debate. It can also serve as a seat or play equipment.


*Creative use of lighting can enhance a space's visual experience.*

## Lighting

Open spaces should be well-lit to ensure their safety – particularly pedestrian routes through them. Lighting should generally be white rather than yellow, for better colour perception. Creative use of lighting can enhance the space's visual experience. Lighting can be mounted on buildings and integrated within furniture and the footpath. It can be used to highlight features such as building facades, monuments and trees.

# 2.21 Signage

There is a fine line between visual richness and visual clutter. Successful signage walks this line.

There are three types of signage: directional, traffic and business identification. All are important to the successful function of a centre. However, left uncontrolled, signage can create a visual cacophony, generating more confusion than assistance. Unless this forms part of the desired character, signage should be coordinated to reduce clutter and ensure its effectiveness. It should also be designed and located to best suit the audience's needs, whether pedestrians, cyclists, passengers or drivers.

## Integrated directional signage

The visual clutter of directional signage for pedestrians can be reduced by integrating it into the floorscape, furniture and buildings. For example, special pavers can be used to lead to key destinations and directional maps can be fixed to furniture.

## Wayfinding


*Integrated wayfinding signage.* *Image: Alastair Campbell.*

*Wayfinding* is assisted by providing maps at key locations in the pedestrian network and signs along key pedestrian routes that provide the walking time to popular destinations. Symbols and images can be a more effective way to communicate information than words, particularly in areas where people may not all speak the same language.


*Integrated business signage.*


*Coordinated business signage.*

## Integrated business signage

The visual clutter of business identification signage can be reduced by coordinating its location and size, and controlling its illumination and animation. Signage that is integrated with buildings generates less physical and visual intrusion by avoiding the need for supporting structures. Where a development comprises multiple internalised tenancies, signage should be consolidated into a single sign at each major entry. The scale of signage should be just big enough to provide clear identification without overwhelming the streetscape.

Artistic signage can be a positive way to treat a blank wall.

## 2.22 Checklist

- Have the attributes of different centre formats been considered? (See section 2.1.)
- Has the development been sited and designed to ensure surrounding streets will feed it with passing trade? (See section 2.2.)
- Is the design based on an intelligible urban structure? (See section 2.3.)
- Does the internal street network comprise a well-connected, appropriately spaced grid of streets and lanes? (See section 2.4.)
- Will the design provide a memorable experience? (See section 2.5.)
- Has appropriate provision been made for a wide range of uses? (See sections 2.6–2.7.)
- Has appropriate provision been made for service vehicle access? (See section 2.8.)
- Will the built form scale contribute to a lively, sustainable, legible and inviting place? (See section 2.9.)
- Have building frontages been designed to contribute to an engaging, comfortable and safe public realm? (See section 2.10.)
- Have the streets been laid out to be inviting to pedestrians while also accommodating other users? (See section 2.11.)
- Has the likely success of any proposed pedestrianised spaces been carefully considered? (See section 2.12.)
- Has the paving and furnishing of streets been designed to contribute to an attractive and functional public realm? (See section 2.13.)
- Has appropriate provision been made for public transport? (See section 2.14.)
- Has car parking been located and designed to maximise convenience and support a high-quality public realm? (See sections 2.15–2.16.)
- Has open space been appropriately provided for, sized and shaped to maintain a vibrant centre and contribute to its identity? (See section 2.17.)
- Have open spaces been appropriately designed to provide a lively, safe, inviting and stimulating environment? (See sections 2.18–2.20.)
- Has signage been located and designed to avoid visual clutter and provide effective information? (See section 2.21.)

# Public transport interchanges

## 3.0 Introduction

Public transport interchanges are a hub of public activity. This calls for high-quality urban design.

Public transport interchanges include train stations, key light rail (including tram) stops, bus stations and ferry terminals. This chapter explains how to design or assess a design for a public transport interchange to ensure that it:

- contributes to a lively urban environment;
- contributes to a positive image for public transport;
- encourages public transport use by providing inviting, safe and attractive places and connections between different forms of public and *active transport*;
- provides a *landmark* that will contribute to the *legibility* and visual experience of the urban area.

### Grovedale Station

The design principles in this chapter are illustrated by a plan for Grovedale Station and the surrounding precinct. Grovedale Station is a planned new railway station in the Armstrong Creek urban growth area on the south-west edge of Geelong, Australia. The plan for the station precinct was designed by David Lock Associates.

## 3.1 Analysis

Careful analysis is the foundation of good urban design. In this case, it is the interchange's functional requirements and context which must be understood.

### Functional requirements

Functional components include the following elements.

- What will the platform configuration be?
- How big does the station or terminal building need to be?
- How many connecting bus or light rail bays are required?
- How many taxi bays are required?
- How many drop-off ('kiss'n'ride') spaces are required?
- How much bicycle storage is required?
- How much car parking is required?

This information should be sought from a specialist transport planner and, in the case of a building, an architect. Future growth in patronage should be considered.

### Context

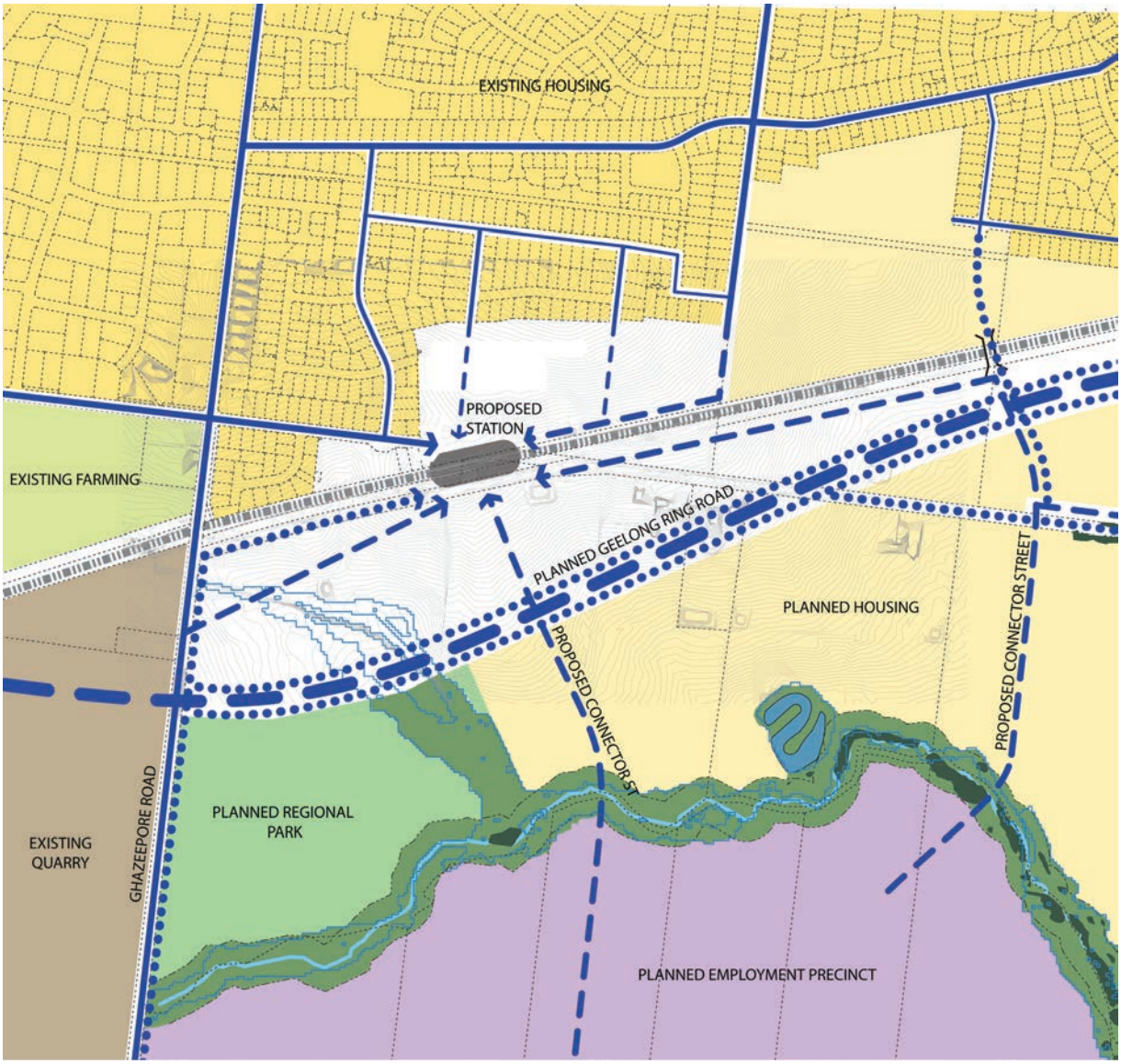
Key aspects of the physical context include:

- the street and path network around the interchange, including the hierarchy of connections;
- the bicycle network around the interchange;
- the direction from which the majority of passengers will arrive, by each mode (this information should be sought from a transport planner);
- the existing or planned pattern of uses and building forms around the interchange;
- the visual catchment of the interchange – where it will be visible from.

In addition, information should be gathered about:

- what commercial uses are likely to be viable in and around the interchange – this will require input from a property economics specialist;
- what community uses are needed that could be provided in or around the interchange – this will require input from the local council.

Finally, a good survey plan is required, including the location of existing infrastructure, buildings, levels, large trees, property boundaries and so on.




*Context analysis – Grovedale Station, Geelong.*

# 3.2 Station and terminal buildings

Stations and terminal buildings should form landmarks. This celebrates public transport and contributes to the legibility of the area.

*Locating a station on the axis of an approach street enhances its visibility and landmark quality.*

## Location

The visibility of stations and terminal buildings should be maximised by placing them on the axis of streets leading to the interchange, and maximising their height.

Where a train station is alongside a street that passes over the railway line, locating the station building over the line at the level of the street enables it to provide convenient access from both sides of the line to all platforms by all modes.

*Stations should be designed as a civic landmark.*

## Architectural expression

The design of stations and terminal buildings should be distinctive and of high architectural quality so that they form attractive civic landmarks. The architecture of station and terminal buildings is characterised by broad, sculptural roof forms. New station and terminal buildings should utilise this language to reinforce their legibility.

*A vaulted roof identifies a station and enhances amenity in subterranean stations.*

## Internal design

Internally, the focus of station and terminal buildings should be on *legible* and inviting passenger waiting environments with clear views of the platforms, an open character and, where possible, good daylight. Direct, convenient and dedicated footpaths should be provided within bus interchanges.

## Other uses

The safety of interchanges and the vibrancy of the surrounding area can be enhanced by incorporating other uses in and around the station or terminal building. This may include retail, commercial, community or residential space. Where possible, shops and cafes should have an external frontage as well as any internal face, to maximise their viability through passing trade.

## Forecourt

Station and terminal forecourts offer an appropriate location for a public open space, which can provide an attractive place for people to wait for public transport services, or for arriving friends or family. Forecourts should be located on pedestrian *desire lines*, including those to the station or terminal and across a railway line. They should also be sited to provide a clear view of approaching buses, trams and/or taxis.

Forecourts should be no larger than necessary, to avoid a desolate appearance when there are no or few people within them. Further guidance on the design of urban spaces is provided in sections *2.17–2.20*.

*Station forecourts should provide an attractive place to wait.*

## Railway crossings

Train stations need to provide railway crossings for pedestrians and cyclists to access platforms. These should be located outside ticketed areas so that they are available to the general public too.

Level crossings are most convenient when train frequencies are low. Otherwise, bridges are usually more inviting than underpasses. However, underpasses are more convenient where rail lines are elevated. In order to be safe and inviting, underpasses should:

- be as short as possible;
- have clear sightlines into and through them;
- be open in character, with generous dimensions and light-coloured finishes;
- incorporate openings in the structure overhead to provide natural daylight and ventilation, where possible;
- be well-lit.

Both bridges and underpasses require disabled access at either end, which can also provide for cyclists.

### Rule of thumb

Ensure underpasses are at least 3–4 m wide (depending on their length) and have a ceiling height of at least 3 m.

# 3.3 Access

Interchanges inherently involve the meshing of multiple travel modes. This requires careful consideration of access by foot, cycle, bus, light rail, taxi and car.

## Pedestrian connections

The first step is to identify the pedestrian desire lines to the interchange from the surrounding urban area. Broad paths should be provided along these routes. Where possible, they should form part of conventional streets or public spaces, edged by buildings with *active frontages*, so that the interchange is integrated within the surrounding urban area. Where a street must be crossed, a generous pedestrian crossing should be provided.

*Broad and convenient pedestrian access to station.*
*Image: Alastair Campbell.*

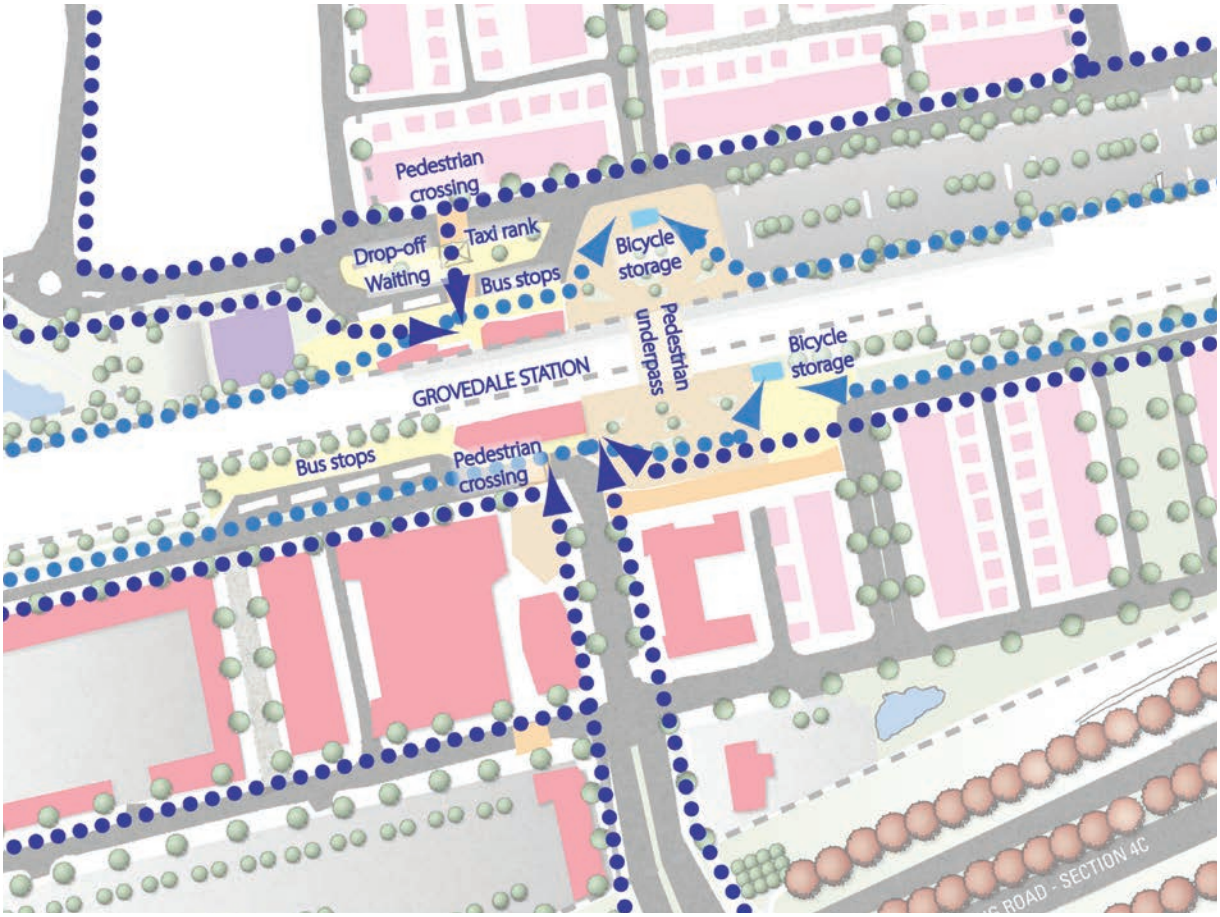
*Roadside bus stops with covered pedestrian access opposite station.*

If the interchange incorporates a station or terminal at a notably different level from the surrounding area, each path leading to it should incorporate a ramp that meets disabled access requirements, or a broad stairway and a lift should be provided at the interchange itself.

## Connecting transport modes

Bus and/or light rail stops, taxi ranks, passenger drop-off spaces and secure, covered bicycle storage should be provided close to and within clear sight of station or terminal entries, but not so as to completely block views of the station from surrounding streets (particularly if they are bus or light rail layover spaces). Direct, continuous, covered paths should link them with the station or terminal. The ideal location for buses, taxis and drop-off is at the edge of a conventional street, to avoid the creation of an additional barrier to pedestrians and to capitalise on the existing footpath network.

Where possible, bus and light rail stops and taxi ranks should be designed so that the parked vehicles face the station or terminal entry. This enhances their legibility to passengers leaving the station and contributes to safety through *passive surveillance*. The sharing of bus and light rail stops by different services should be maximised, to reduce the land given over for this purpose.




*Direct and convenient station access for multiple modes – Grovedale Station, Geelong.*

Sheltered seating and waiting areas should be provided at light rail and bus stops and taxi ranks.

## Cycling connections

Dedicated cycle lanes or off-road paths should be provided to cycle storage areas along the primary cyclist desire lines.

## Signage

Clear directional signage should be provided at station or terminal entries, bus and light rail stops, taxi ranks, drop-off areas and bicycle storage areas.

*Cycle storage.*

## 3.4 Car parking

Car parking should not take prime position in front of an interchange. Parking does not deserve such valuable land in a highly accessible location, because it contributes little life to the *public realm* during the day and is unattractive.

### Location

Commuter parking is often needed within comfortable walking distance of an interchange in a primarily residential area. However, car parking right in front of an interchange segregates it from the surrounding area, and detracts from the vibrancy and attractiveness of the precinct. This undermines the experience of those who arrive by other means, encouraging them to drive to the station rather than using other, more sustainable and active modes, by giving priority to drivers.

A more appropriate location for parking may be along the edge of a rail line near a station, or a block or so away behind more active uses. This will maintain good accessibility while giving priority to those that arrive by public or active transport modes, and enable a more vibrant public realm.

### Type of car park

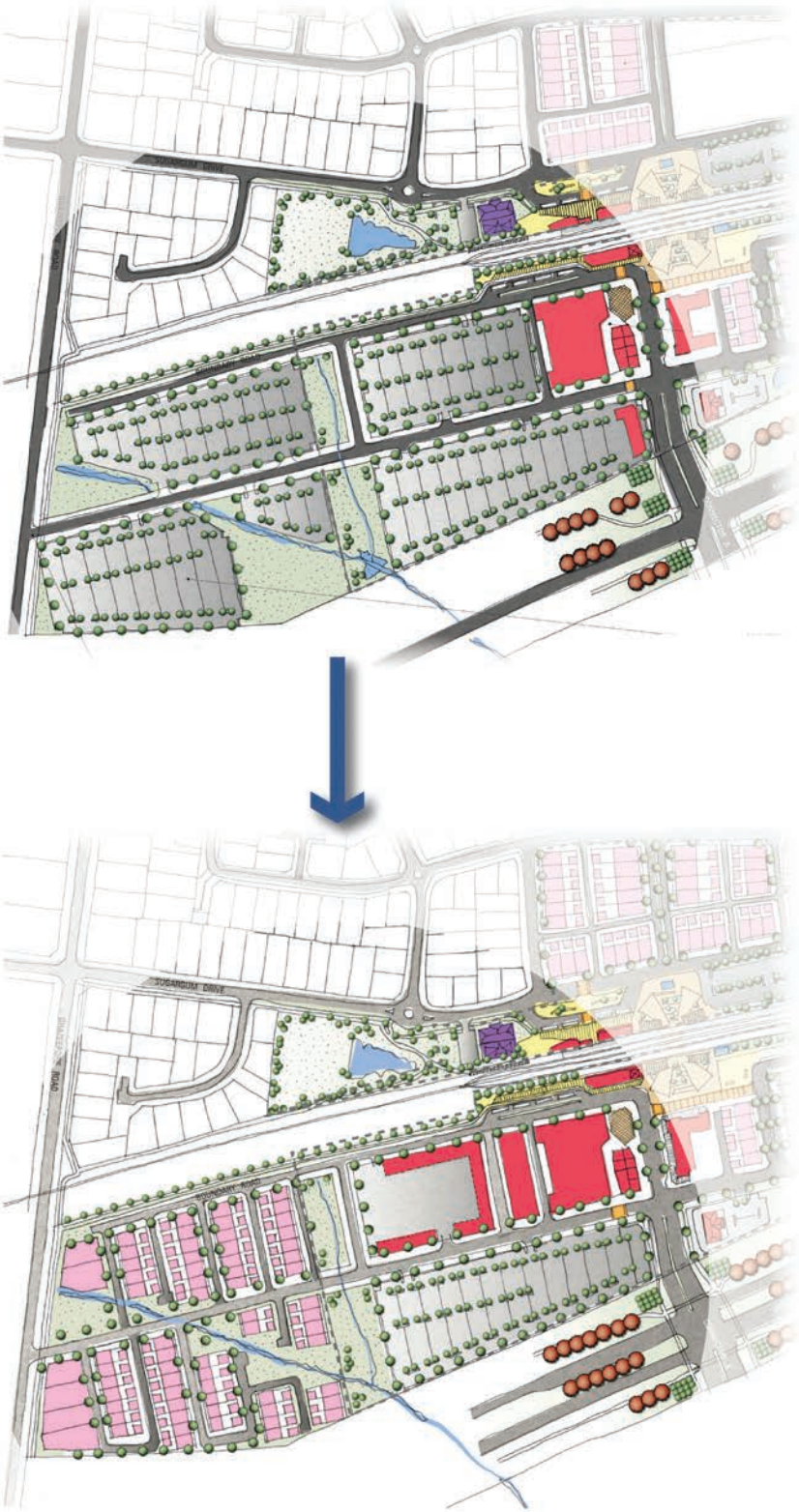
Where possible, car parking should be provided in basement or multi-level car parks, to minimise its landtake and impact on the vibrancy and appearance of the public realm. Where land values are not sufficient to warrant basement or multi-level car parks, surface car parks should be designed to facilitate their future redevelopment.

### Car park design

Surface car parks should be sited and designed to form safe and attractive public spaces, with active frontages along their edges to provide passive surveillance (see section *2.16 Off-street parking*). Multi-level car parks should be lined with other, more active uses at public realm edges.

### Pedestrian links

Direct, continuous pedestrian paths should be provided between car parking areas and each station or terminal entry. Clear directional signage should also be provided.




*Car park set back from station and designed to facilitate development – Grovedale Station, Geelong.*

## 3.5 Checklist

- Have the functional requirements of the interchange been understood? (See section 3.1.)
- Have the relevant aspects of the physical context been analysed? (See section 3.1.)
- Has the potential for other uses been explored? (See section 3.1.)
- Has any station or terminal building been designed to provide an attractive civic landmark? (See section 3.2.)
- Has any station or terminal building been designed to provide a high level of passenger amenity? (See section 3.2.)
- Has the potential to incorporate a public space in the forecourt been explored? (See section 3.2.)
- Has direct, legible and inviting access by foot and cycle been provided? (See section 3.3.)
- Have bus, light rail, taxi and drop-off access points been appropriately located and designed? (See section 3.3.)
- Has car parking been appropriately located, designed and connected? (See section 3.4.)

# Urban renewal strategies

## 4.0 Introduction

Urban areas can experience rapid transformation. This may be due to changing social preferences, strategic planning imperatives or economic forces.

Urban renewal areas include:

- conventional residential neighbourhoods experiencing the introduction of denser forms of housing;
- public housing estates requiring upgraded housing and a 'normalised' environment;
- traditional town *centres* into which taller mixed-use buildings are being inserted;
- stand-alone shopping centres and first-generation business parks becoming more diverse and intense;
- declining town centres requiring revitalisation;
- redundant port or industrial land identified for change to higher-order employment or mixed-use outcomes.

Without an overarching plan or strategy, there is a danger that individual redevelopments in an urban renewal area will miss opportunities to contribute to a distinct and successful new place.

This chapter explains how to prepare or assess urban design strategies and plans to guide the transformation of urban renewal areas. It begins with the process of formulating a vision for the future of the area. Then it identifies the types of analysis needed to inform a successful strategy. This is followed by guidance on how each of the physical ingredients of urban places can be improved or established to suit the new purpose of the area. Finally, advice is provided on estimating the resulting development capacity of the area, engaging stakeholders in the preparation of a renewal strategy and implementation.

Urban renewal is highly unpredictable due to the multiplicity of physical conditions, economic forces and agents of change, and the length of time over which it usually occurs. As a result, urban renewal strategies should provide flexible frameworks for development, able to adapt to changing circumstances, rather than rigid blueprints.

### Montague

The design principles in this chapter are illustrated by the plan for Montague, an industrial area in South Melbourne, Australia, intended for mixed-use, higher-density renewal. The plan for the renewal area was designed by David Lock Associates and Port Phillip City Council.

# 4.1 Vision

The first requirement of an urban renewal strategy is a clear vision. What kind of place is wanted? Key attributes to be determined include the range of uses, the built form *character*, and the nature of the streets and spaces.

## Motive

Like a murder conviction, a successful urban renewal vision requires a clear motive, and the opportunity and the means to realise it. The motive may be a desire to accommodate more or different types of housing in the area, to facilitate the modernisation of employment in response to economic change, to strengthen the retail offer, to enhance the quality of the *public realm* or simply to make better use of existing infrastructure.

*Clear motive to connect city to water – Cockle Bay, Sydney.*

Importantly, the vision must be consistent with strategic planning aspirations. A vision that is at odds with the strategic plan for the area is likely to meet with resistance from planning authorities. But this does not preclude inventing a new future for a renewal area, provided it will contribute to overarching planning ambitions.

## Opportunity

The opportunity for renewal relies on the nature of the place and its ownership. Are there sufficient properties with potential for redevelopment? Are their owners interested? Would the existing community accept change? Without the ability and willingness to change, an urban renewal vision is just 'pie in the sky', or at least a very long-term proposition. Consequently, consultation with the existing community to both elicit and inform its opinion is critical to the success of an urban renewal project. Of course, if there is a strong enough motive, governments may overcome a lack of development-ready sites and owners by acquiring and reconfiguring land into more appropriate sites.

*Clear motive to expand CBD – Melbourne Docklands.* Image: Alastair Campbell.

*Opportunity for higher-density housing – Arden-McCauley, Melbourne.*

## Means

The means for renewal is largely in the hands of the market. A vision that relies on a particular use or form of development that is uneconomic will fail. Sometimes, the market is already clamouring to provide something new,

such as higher-density development in well-connected places. Successful urban renewal visions harness this energy. But they may seek to be selective or to shape the types of development the market delivers to achieve good planning and urban design outcomes.

Where there is no development pressure, renewal must be stimulated. This can be done by loosening planning controls, upgrading infrastructure (particularly the streets and spaces that provide a setting for development) and actively promoting the new vision to the market. High-quality development of publicly owned land can act as a catalyst, transforming perceptions, and government agencies can become anchor tenants in new developments to help them get off the ground.

*Harnessing of market energy – Forrest Hill, Melbourne.*

## Market assessment

Before locking in expectations for new uses or forms of development, it is important to be sure that the property market is likely to deliver them. While this inevitably involves a degree of crystal-ball gazing, there are ways of testing the validity of a vision for change. Economists can identify the supply and demand for a particular use or form of development across the wider area, and compare the attractiveness of the renewal area with alternative locations to determine its likely share of the market. Similarly, key players in the property and development industry can be consulted to provide a coalface opinion on the appeal of the renewal area for development.

## Scenarios

The process of formulating a vision sometimes benefits from the development and testing of various land use and development scenarios. These may be based on varying levels of intervention such as changes to the planning framework, major investments in transport infrastructure, or the introduction of key public facilities such as a hospital or higher education campus.

## Uniqueness

Successful urban renewal visions are unique, because they seek to capitalise on what is special about the renewal area. This might include its natural setting, accessibility (e.g. to jobs, a workforce or retail catchment), major attractions (e.g. a university, business cluster or *mainstreet* centre) or built form character.

An appealing identity can be a powerful tool for garnering interest and enthusiasm in the project, attracting new residents, businesses, investors and visitors, and evaluating the appropriateness of individual proposals.

*Unique identity based on dockside setting and history – West Silvertown, London.*

## 4.2 Area and context analysis

Successful urban renewal is founded on thorough analysis.

The following aspects of the renewal area and its context should be analysed in order to inform the urban design strategy:

- **strategic context** – where the renewal area lies in relation to regionally significant movement corridors, attractions and precincts, particularly other areas where renewal is occurring and which may compete with the study area for market demand;
- **policy context** – current planning strategies, policies and controls for the renewal area, including overarching planning strategies for the whole city, town or region;
- **development potential** – the likelihood of each property being redeveloped (see section *4.3 Development potential*);
- **sense of place** – the elements of the renewal area that contribute to a unique identity, such as its natural setting, built form character, heritage fabric and major attractions (see section *4.4 Sense of place*);
- **urban evolution** – the creation and loss of key structuring elements through the history of the urban area (see section *4.5 Urban structure*);


*Strategic context analysis – Montague, Melbourne.*

- **urban structure** – the foremost physical features of the renewal area and its immediate context, including notable natural features, main public transport nodes, key thoroughfares and intersections, major barriers to movement, important attractions, distinct land use or character precincts, significant open spaces and *landmark* structures (see section *4.5 Urban structure*);
- **street network** – the *permeability* of the street network and its ability to support the desired uses and forms of development (see section *4.6 Street network: grid*);
- **open space** – the amount, distribution, diversity, appropriateness, condition and safety of public open space (see section *4.8 Open space*);
- **public realm quality** – the degree to which the streets and spaces are inviting for pedestrians (see section *4.9 Public realm quality*);
- **edges** – the use and character of adjoining land (see section *4.12 Edges*);
- **development capacity** – the likely amount of new development within the renewal area within particular timeframes (see section *4.17 Development capacity*).

Urban renewal strategies should also be informed by investigations by appropriate specialists into:

- the existing and forecast demographic profile;
- Land use supply and demand (see section *4.1 Vision*);
- flooding;
- the capacity of existing and planned physical services;
- the capacity of existing and planned public transport services;
- the capacity of existing and planned community infrastructure and services;
- heritage values (see section *4.4 Sense of place*);
- tree values (see section *4.4 Sense of place*);
- ecological values of open spaces, including water bodies and waterways;
- existing capital works budgets and funding opportunities.

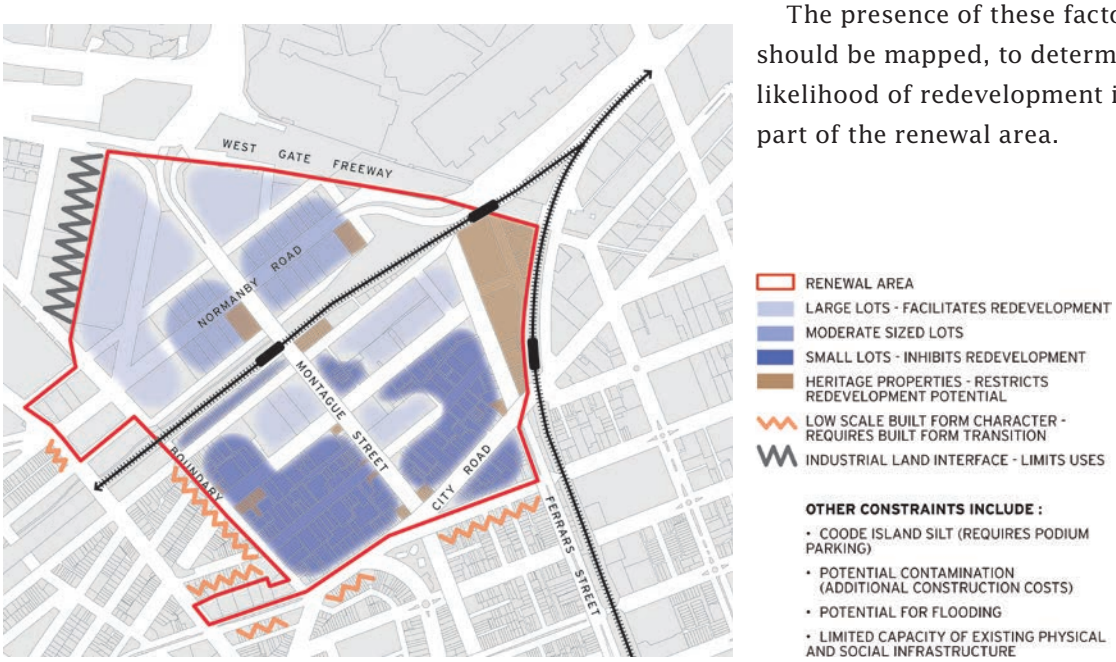
# 4.3 Development potential

A credible vision is grounded in a realistic appreciation of the potential for redevelopment. This will inform the renewal strategy and how long it is likely to take to come to fruition.

Redevelopment potential is influenced by several factors, including:

- **lot size and shape** – small, narrow and awkwardly shaped lots are more difficult to develop, unless neighbouring properties are in the same ownership;
- **strata titles** – properties in multiple ownership are less likely to be developed;
- **heritage** – properties with heritage values are likely to have less redevelopment potential;
- **protected trees** – properties with protected trees are likely to have less redevelopment potential;
- **character** – properties in an area of valued, low-rise character have less redevelopment potential unless the benefits of intensification clearly outweigh the character values;
- **building age** – newer buildings are less likely to be redeveloped;
- **building height** – taller buildings that are already close to the future height envisaged for the area are unlikely to be redeveloped;
- **flooding** – properties affected by flooding may be difficult to develop;
- **contamination** – properties affected by contamination are more expensive to develop;
- **significant slope** – properties with significant slope may be more difficult to develop;
- **sensitive neighbours** – sensitive neighbouring uses (e.g. housing) may restrict redevelopment;
- **vacancy** – vacant sites and buildings are more likely to be redeveloped;
- **public ownership** – properties in public ownership can be developed by the owner as a catalyst project.

The presence of these factors should be mapped, to determine the likelihood of redevelopment in each part of the renewal area.




*Development potential analysis – Montague, Melbourne.*

# 4.4 Sense of place

A unique and appealing *sense of place* stimulates urban renewal. Typically, this involves a combination of existing and introduced features.

## Placemaking elements

Other than the current range of common uses, which is likely to change in a renewal area, existing features that may contribute to a place identity include:

- its people – their age and cultural profile;
- its natural setting – e.g. water bodies, waterways, topography, views, parks, trees;
- major attractions – e.g. centres or other significant civic, retail, education, health, tourism, entertainment or recreation uses;
- major public transport nodes – e.g. railway station or ferry terminal;
- the street and subdivision pattern;
- landmark buildings or structures;
- characterful or heritage buildings;
- memorable streetscapes.

## Water and open space

Water features and parks can be major assets to an urban renewal area, forming attractive settings for development and public space. Urban renewal strategies should seek to enhance and maximise access to them. There may be a need for the ecology of these features to be investigated to set parameters for development and public access.

## Topography and views

Where the renewal area has notable topography, this can be highlighted in long views towards it by locating landmarks or taller buildings on higher ground. New development should also be shaped to protect significant views and vistas where possible, including views towards landmark structures, hills and water bodies.

## Trees

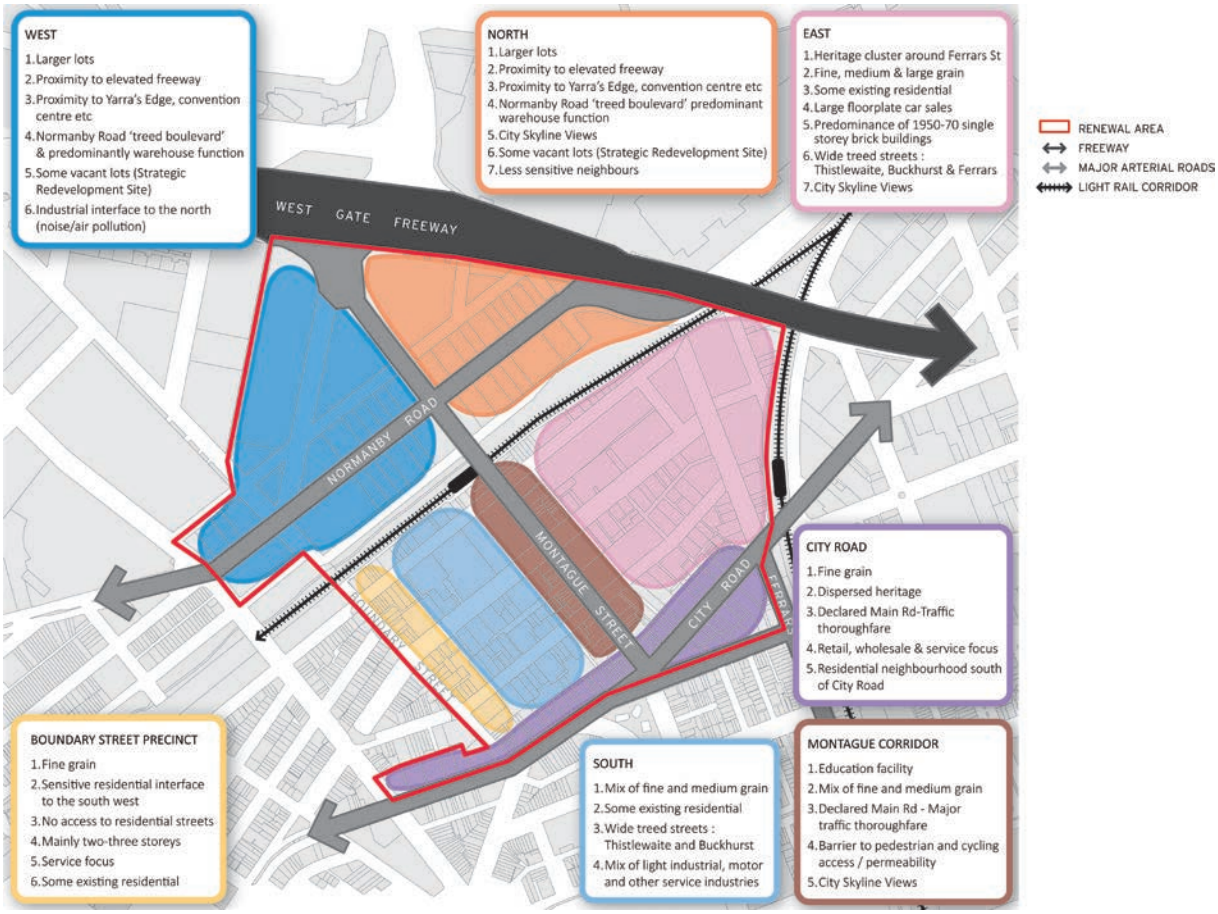
Beautiful mature trees can make a positive contribution to sense of place. Where possible, renewal strategies should seek to retain them. To determine which trees to retain, a study should be undertaken to determine their health, safety, ecological and amenity values, and suitability for a more intensely developed area. The retention of trees should also be balanced with the effect this has on the efficiency of development.

## Major attractions

Every effort should be made to retain major attractions that bring people to the area. This part of the area's identity can be strengthened by enlarging the attraction(s) and/or adding complementary uses.

## Streets and subdivision

Areas developed in a short period of time tend to have a comparatively consistent street and subdivision pattern. For example, the street network may comprise an orthogonal grid or curvilinear configuration, while the size and frontage width of lots may be quite uniform. Maintaining these aspects of the street and subdivision pattern can reinforce the area's sense of place. In the case of a fine-*grain* subdivision pattern, new wider buildings may be required to have vertical facade *articulation* that reflects the prevailing building rhythm.




*Existing features – Montague, Melbourne.*

## Heritage and character

Significant heritage fabric (and even the history of the area that has little or no physical manifestation), or consistent or unusual built form character can form the basis of a strong identity. The area's history or heritage fabric can be celebrated by interpretive material, special lighting, retaining large artefacts (e.g. industrial equipment) as features within the public realm, and heritage trails. An urban renewal strategy may seek to limit change in parts of the renewal area that have character or heritage values, to maintain their contribution to the special identity of the area, directing most change to the remainder of the area. Alternatively, the characteristics of the valued built fabric may be identified and form the basis of controls over new buildings. For example, in centres dominated by two-storey period buildings, new development may be required to incorporate a *podium* that emulates the height of these buildings and is designed to reflect their typical width and detailed design features.

## New features

In addition to building on existing features, the sense of place of a renewal area can be enhanced through the introduction of new features, such as:

- a new centre, providing a focal point for the community and attracting visitors;
- major new attractions;
- significant public transport nodes;
- new iconic buildings in prominent locations;
- distinctive new open spaces, providing memorable settings for individual precincts;
- development controls that seek to establish common building themes such as heights, setbacks, styles, materials or colours;
- distinctive streetscape treatments, including trees, paving, furniture and lighting;
- urban art.

# 4.5 Urban structure

The existing *urban structure* is the foundation for an urban renewal strategy. It forms part of the unique identity of the area and contributes to its *legibility*.

The urban structure of an area comprises its foremost physical features. These include notable natural features, main public transport nodes, key thoroughfares and intersections, major barriers to movement, important activities, distinct land use or character precincts, significant open spaces and landmark structures.

## Urban evolution

Urban areas evolve through waves of growth, major infrastructure interventions and, sometimes, destruction by natural forces. Careless urban renewal or post-disaster reconstruction can erase unique characteristics of an area. Key aspects of the existing fabric should be identified for retention and new development integrated with it. This may include the route of main thoroughfares and traces of major structures and open spaces that have been destroyed.

Studying historical maps can reveal important structural features such as landmarks and vistas that have been lost. The restoration of these features through urban renewal can add to legibility and sense of place.

## Reinforcing the urban structure

The existing urban structure can be celebrated in several ways:

- the street hierarchy should be reinforced through a distinctive design for each type of street, including different landscaping and a different balance between provision for cars and pedestrians, e.g. formal avenue planting on main roads, and equal-priority shared surfaces in minor streets;
- the built form pattern should reinforce the legibility of the area by placing taller buildings along major thoroughfares and at gateways to important precincts such as centres, and reflecting the natural landform. The tallest building should be at the point of most importance to the community as a whole, typically the heart of a centre;
- landmark buildings, significant civic uses and major new open spaces should be located at main public transport nodes and key intersections to reinforce the movement hierarchy, or at significant natural features such as hilltops or waterfronts to emphasise the area's setting;
- the pattern of uses, siting and design of buildings, and design of streetscapes should define and reinforce the distinct character of each precinct, along with barriers and topography.

*Landmark on street axis.*

## Enhancing the urban structure

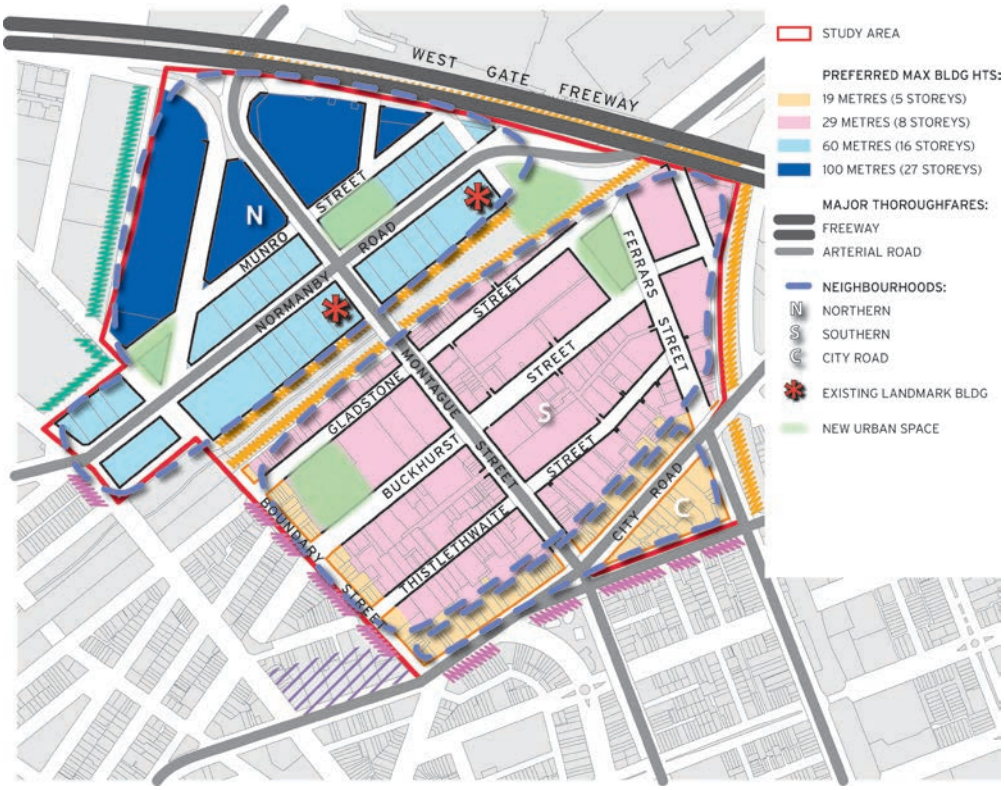
The identity and legibility of a renewal area can be further enhanced by the introduction of new structural elements. For example:

- a new centre can create a memorable focal point;
- a major new thoroughfare to a key destination can create a clearer street hierarchy;
- new streets aligned with landmark features can create memorable vistas.

## Spatial structure

Consideration should be given to the pedestrian experience created by the streets and spaces that make up the public realm. Unique spaces should be developed that form memorable incidents on a journey through the area.

Where possible, and unless there are striking long views, streets and spaces should be designed to terminate views on key buildings or gradually reveal themselves through gently curving or facetted alignments.




*Proposed urban structure – Montague, Melbourne.*

### Rule of thumb

Introduce a memorable 'event' created by a unique open space or building every 200 m or so along each major route.

# 4.6 Street network: grid

The street network is the 'skeleton' of an urban area. It is as important to the health and wellbeing of an urban place as a human skeleton is to the health and wellbeing of its inhabitant. Urban renewal strategies should analyse the existing street network and consider opportunities to improve it.

The street network affects the functionality of an urban area in several important ways:

- it provides access to buildings and public spaces;
- its connectedness determines how convenient and *legible* it is to get around;
- the frequency of streets influences their level of congestion;
- the street spacing determines lot sizes, which in turn determines what uses and types of development are possible.

## Street pattern

Street networks should take the form of a closely spaced grid of interconnected streets. A gridded street pattern without one-way or dead-end streets is more *permeable* and legible. It also distributes traffic relatively evenly, avoiding heavy traffic flows and congestion. By contrast, street networks that rely on a small number of main roads serving culs-de-sac tend to create barriers for all travel modes.

Street networks need not be a regular or even an orthogonal grid (where all the streets are parallel or perpendicular to each other). In fact, variations from an orthogonal pattern contribute to a memorable sense of place by closing vistas and creating greater spatial definition. Non-rectilinear corners also tend to produce more interesting and memorable buildings or public spaces.

## Block size

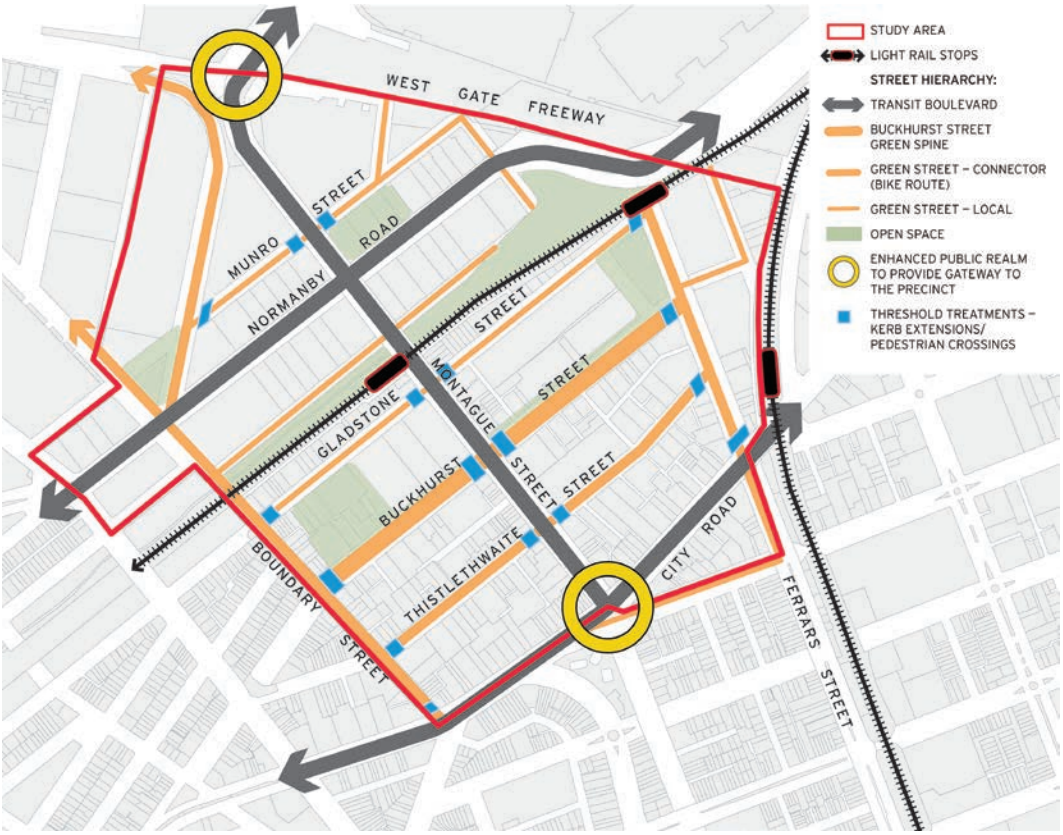
The appropriate spacing of streets and resulting *block* size depend on the types of development wanted. However, as it is relatively permanent, the street network should be designed to allow for a range of future land uses and building types, including those not currently foreseen.

Blocks should be at least two properties wide, to ensure each street is fronted by buildings. Blocks containing retail uses or townhouses should also contain a rear lane at the back of each property to avoid the need for vehicle access to them from the primary streets.

Block length should be limited to ensure a permeable street network that offers reasonably direct and convenient routes across the area, and distributes traffic, reducing congestion. Shorter blocks should be provided in denser areas and those with greater traffic generation, such as commercial precincts.

Provide block widths of around 70–80 m in areas where a range of uses is desired. This will also provide flexibility for changes in use over time. However, some diversity of block sizes is desirable to maximise the range of uses that may find a home in the area.

Limit block lengths to around 100 m in centres and alongside significant attractions (e.g. public transport nodes, parks and water bodies), and 200 m in other areas, to provide a permeable street network.




*Permeable and flexible street network – Montague, Melbourne.*

## Rule of thumb

Space streets according to the block widths identified in Table 4.1.

**Table 4.1: Lot depths and block widths for different types of development**

| Development type | Lot depth | Rear lane | Block width |
|---|---|---|---|
| **Shops** | 20–40 m | 7 m | 45–85 m |
| **Offices** | 30–60 m | - | 60–120 m |
| **Apartments** | 35–45 m | - | 70–90 m |
| **Townhouses** | 20–30 m | 6 m | 45–65 m |
| **Houses** | 30–40 m | - | 60–80 m |

*Refer to sections 2.4 and 8.5 for lot sizes and block widths in centres and employment areas.*

## 4.7 Street network: missing links

Missing linkages weaken the structure of an urban area. The street network should be analysed to identify the need for additional links to enhance connectivity and permeability, create more appropriate block sizes and/or provide rear access. Industrial areas, stand-alone shopping centres and first-generation business parks often have relatively coarse-grained street networks which need amplifying as part of their transformation.

### New streets

Urban renewal areas are commonly segregated from surrounding neighbourhoods because of a different historic use. Urban renewal offers the potential to reintegrate them by creating additional connections. This is particularly important where the renewal area is intended to provide shops, services or another attraction for the wider area, homes or workplaces that rely on facilities outside the area, or where it carries a stigma.

The introduction of new streets in established areas is not easy. However, it can be achieved as part of the redevelopment of large sites or through public acquisition of private land.

### Redundant streets

Street network analysis should identify any redundant streets that can be converted into open space (see section *4.8 Open space*).

### New street alignments

The integration of a renewal area can be enhanced by extending surrounding streets that currently terminate at its boundary to a primary street within the renewal area or on the far side, ideally via a key attraction.

Where the need for a new street is identified, it should be aligned along property boundaries or through a large property that is ripe for redevelopment, to minimise its impact on development. If possible, its exact alignment should be left flexible so that it can respond to the configuration and timing of adjoining development. Where the implementation mechanism dictates that a reserve for a new street be defined, it can straddle the boundary between two properties if it is likely that both will be redeveloped within a short time of each other, or if the street can be developed in two side-by-side stages. Otherwise, it should be contained within one property that is most likely to be developed and is most able to accommodate the street without unreasonably constraining its development.


*Introduction of new links to integrate different parts of renewal area – Highpoint, Melbourne.*

## Blockages

Large enclosed shopping centres, hospital or university campuses, rail lines, arterial roads and waterways can form blockages in the movement network, particularly for vehicles. Renewal strategies should seek to minimise such blockages by encouraging the creation of clear and legible links across them, at least for pedestrians and cyclists. This can form a requirement for future development of centres or campuses.

Where rear lanes are required, they can be created incrementally through redevelopment, beginning with corner sites or existing discontinuous lanes.

# 4.8 Open space

Public open space underpins the liveability of urban areas. It supports physical activity and social interaction, both important for personal wellbeing.

In higher-density residential areas, public open space compensates for reduced private open spaces and helps to attract a wider range of households. In employment areas, it provides a place of respite from the workplace. In retail areas, it provides a resting, meeting and gathering place, a place for festivals, markets and performance.

## Location and attributes

Public open spaces in a renewal area should be:

- distributed so that they are within an easy walk from all parts;
- diverse and flexible, to provide for a range of different active and passive activities, for people of all ages;
- designed for the demographic and cultural profile of the envisaged community;
- robust enough to cope with intensive use;
- safe, through *passive surveillance* and lighting.

Locating open space at the edge of a renewal area can assist in integrating it with the adjoining precinct.

An urban renewal strategy should analyse the amount, distribution, diversity, appropriateness, condition and safety of public open space. It should also identify nearby public open spaces and the ease of access to them. Where there is insufficient open space, or its design is poor, the strategy should identify opportunities for new or improved open space.

## New open space

New open spaces are most easily created on publicly owned land. Examples may include:

- converting landscaped areas in the forecourts of public buildings into usable open space;
- converting redundant roads or parts of *road reserve*s into open space including *kerb outstand*s to create pause places;
- utilising open land within rail or light rail reserves and alongside waterways;
- restoring natural waterways where stormwater drainage has been channelised;
- seeking shared use of school sports fields and courts;
- enhancing access to and the amenity of cemeteries.

Where there is insufficient opportunity on public land, new public open space can be created as part of the redevelopment of large sites or through public acquisition of private land.

Access to existing open space should be improved by enhancing connections.


*Distributed open space – Montague, Melbourne.*

## Open space improvements

The appeal and usability of existing open spaces may be improved by better access, new development alongside and new landscaping, furniture and lighting. Behaviour patterns within existing open spaces should be studied before determining any improvements.

*Open space as outdoor room.* Image: Alastair Campbell.

*Community gardens can provide valuable social and food production opportunities.*

*Playgrounds for the young and not-so-young.*

*A cafe can enliven open space.* *Image: Alastair Campbell.*

*Distinctive linear space for promenading.*

## Design

Most open spaces should be conceived as outdoor rooms – deliberately designed places rather than leftover space. Further guidance on the design of these spaces is provided in sections *2.17–2.20* (centres and mixed-use precincts), *7.16–7.17* (residential neighbourhoods) and *8.8* (employment precincts). The exception is linear spaces (e.g. along rail or light rail lines, waterways or water bodies, and broad paths along main streets), which can provide attractive recreation trails and promenading opportunities.

Each open space should have a distinct character that supports its purpose. This will enhance the sense of place of the area around it.

The safety of open spaces can be enhanced by:

- introducing new buildings that overlook them;
- encouraging greater use through more access points and well-lit paths to them;
- removing low vegetation that can create hiding places near main areas of activity.

### Rules of thumb

- In renewal areas with a significant residential component, dedicate a minimum of 10% of the development as public open space and ensure there is at least 10 $m^2$ of open space per resident and worker within or easily accessible from the renewal area.
- In other areas, 5% and 5 $m^2$ per person may be sufficient.
- Provide at least one local park within 400 m or a five-minute walk of all dwellings without crossing a main road.

# 4.9 Public realm quality

The quality of the public realm determines the appeal of a place. It influences the interest of residents, workers, visitors and investors.

The public realm includes streets: the best streets are places, not just thoroughfares. It provides a visual setting for development, affecting property values. It also influences whether people are willing to walk and socialise in public, which in turn contributes to the appeal of the setting and the success of commercial enterprises.

## Quality factors

The quality of the public realm is influenced by a number of factors:

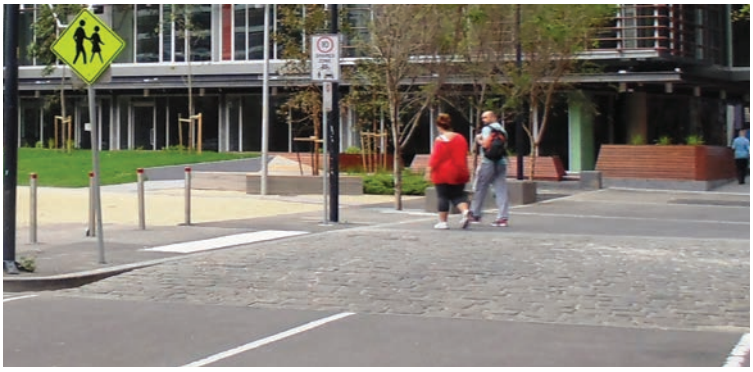
- the width of footpaths (not too narrow and not too wide);
- the quality, uniformity and condition of its pedestrian paving (including drainage);
- the frequency of footpath crossovers (or crossings) and presence of rear lanes;
- the presence of trees and other landscaping, and their appropriateness (e.g. high canopy trees and low shrubs forming part of a coordinated landscape strategy);
- the provision, quality, coordination and condition of street furniture, and whether it is well located, particularly for people-watching;
- the provision and type of lighting;
- slope (slopes greater than 1:14 are a deterrent for people with some mobility impairments);
- the speed of traffic and its proximity to pedestrians (i.e. separation by kerbside parking, tree and furniture zones, or outer separators);
- the amount of truck traffic;
- provision for pedestrians to cross busy roads at grade, including pedestrian priority in signal phasing, kerb outstands, raised crossings across side streets where they meet main streets, etc.;
- the presence of pedestrian railings, staggered pedestrian crossings or other measures that prioritise traffic over pedestrians;
- the degree to which there are buildings alongside that provide good spatial definition (i.e. minimal setbacks, continuity and appropriate ratio of height to street width), *active frontage*s by day and night, and visual interest;
- vacant properties and buildings;
- the provision of open spaces and groundwater recharge areas (see section *4.8 Open space*);
- views and vistas;
- urban art;
- *wayfinding* information;
- overhead cables.

*New street trees and pedestrian refuge.* *Image: Alastair Campbell.*

*Lighting.* *Image: Alastair Campbell.*

*Well-located and flexible street furniture.* *Image: Alastair Campbell.*

*Public art.*



*Raised crossing.* *Image: Leo Sheppard.*


*Wayfinding.*

The quality of the public realm should be analysed as part of an urban renewal strategy and, where it is lacking, rectification initiatives identified. A preferred character should be identified for each street and space that reinforces its function. A high-quality public realm is most important around key destinations such as public transport nodes, centres, high-density employment clusters, major entertainment, leisure and recreation facilities, parks, and education and health facilities.

Early in the renewal process, a program of events and temporary use of vacant buildings and spaces (including pop-up installations) can help to improve public realm quality.

## Further guidance

Further guidance on the design of streets, lanes and pedestrian links is provided in sections *2.11–2.13* and *2.15* (centres and mixed-use precincts), *5.12* (arterial boulevards), *7.10–7.15* (residential neighbourhoods) and *8.7* (employment precincts).

*Traffic calming.*

*Pop-up installations can animate emerging public spaces.*

*High-quality bus stop.* *Image: Alastair Campbell.*


*Bus and cycle lane.* *Image: Alastair Campbell.*

*Cycle racks.* *Image: Alastair Campbell.*


*Copenhagen cycle lane.* *Image: Alastair Campbell.*

# 4.10 Transport

Urban renewal generally generates more travel. A transport planner should be engaged to consider the implications of this and identify improvements required for all modes of travel.

A well-connected street network (see section *4.6 Street network: grid*) will provide for vehicular access and, in combination with a high-quality public realm (see section *4.9 Public realm quality*), it will provide for walking. However, urban renewal strategies should also consider the potential to improve provision for public transport, cycling and car parking.

## Possible initiatives

This is the realm of specialist transport planners. However, as a guide, some of the initiatives that may be relevant include:

- new train stations, light rail or bus routes, or ferry terminals;
- bus and light rail priority measures, such as dedicated lanes or traffic signal phases;
- bus and light rail stop enhancements (e.g. improved seating, shelter, real-time information and lighting);
- improved public transport services;
- better integration of different transport modes;
- cycle lanes and priority measures at intersections;
- bicycle racks and secure storage at stations;
- on-street parking, controlled to give priority to short-term visitors and loading;
- taxi ranks.

# 4.11 Land use

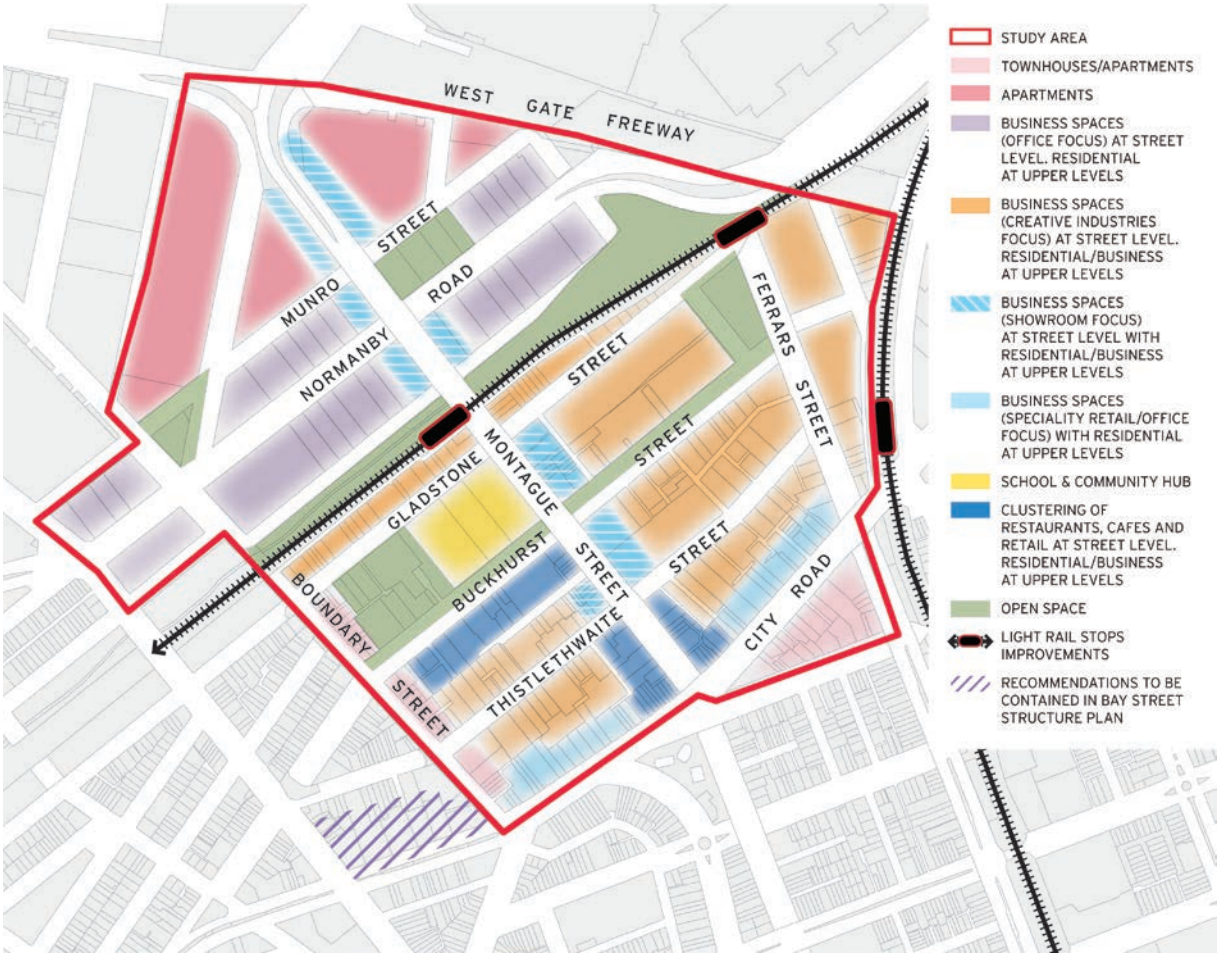
The only certainty about uses is that what is envisaged will not eventuate. There can be no guarantee about how the market will respond over time and which uses will prove to have the strongest demand. Consequently, a renewal strategy that is flexible about land use will be more robust as it can adapt to changing markets.

The key to flexibility is an appropriately spaced street network (see section *4.6 Street network: grid*) and adaptable buildings (see section *4.16 Built form: detail*).

## Mixed use

A flexible land use strategy will also facilitate a mixed-use place, which brings several benefits:

- it offers the potential for people to work close to home, reducing the environmental, economic and social costs of commuting;
- it enhances the safety of the public realm by contributing to its vibrancy for a greater proportion of the day, week and year;




*Mixed use – Montague, Melbourne.*


*Vertical mixing of uses.*

- it creates a more diverse and therefore interesting, memorable and socially inclusive place;
- it increases support for a greater variety of supporting shops and services (including public transport) by providing patronage across the day and evening.

Vertical mixing of uses should be encouraged to allow more active uses such as shops and services at street level, with more private uses such as apartments above.

## Housing

Housing provides life outside business hours and patrons for local shops and services, including the evening economy of restaurants, bars and entertainment venues. Housing types and tenures should be mixed to contribute to social and cultural diversity and a balanced community. Urban renewal is also an opportunity to provide for social and affordable housing.

## Employment

Where the creation of employment is a primary aim within a mixed-use precinct, care should be taken to avoid it being pushed out by a stronger residential market. Some businesses are deterred by the presence of residential uses.

*Protect opportunities for employment.* *Image: Alastair Campbell.*

## Transit-oriented development

Employment and higher-density residential accommodation should be located in and immediately around higher-order centres well served by public transport, in line with the principles of *transit-oriented development*.

## Precinct boundaries

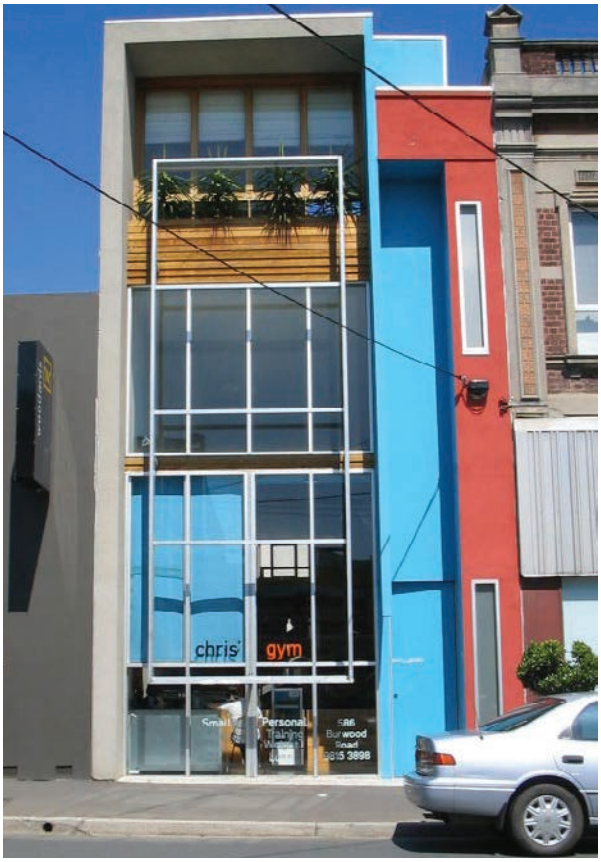
Adjoining precincts with different uses should meet along the rear of properties rather than at a street. Streets should have relatively consistent activities on each side to ensure a coherent character. Apart from the visual difference between contrasting forms of development, different uses on opposite sides of a street can create functional conflicts such as traffic and noise.

*Transit-oriented development.*

## Supporting shops and services

Larger urban renewal areas can sustain their own shops and services, creating a more self-contained place and supporting an urban lifestyle. In addition to retail, retail services, entertainment and commercial leisure uses, consideration should be given to the need for community facilities and services. These may include:

- childcare;
- kindergartens and schools;
- medical and health services;
- family support services;
- youth facilities;
- aged and disability support services;
- recreation facilities;
- libraries.




*Supporting uses.*

New shops and services should be located in the most lively locations within the renewal area – essentially the busiest streets and intersections, other than those that are too busy to be inviting for pedestrians – which are also reasonably central to their catchment. Active parkland and water bodies are also attractive settings for shops and services. If a larger centre is planned, its location and design should follow the principles outlined in Chapter 2.

## Older buildings

Older buildings may provide affordable space for community facilities and embryonic businesses.

# 4.12 Edges

Urban edges need careful attention. Some of the conditions commonly found at the edges of renewal areas and appropriate design responses are outlined below.

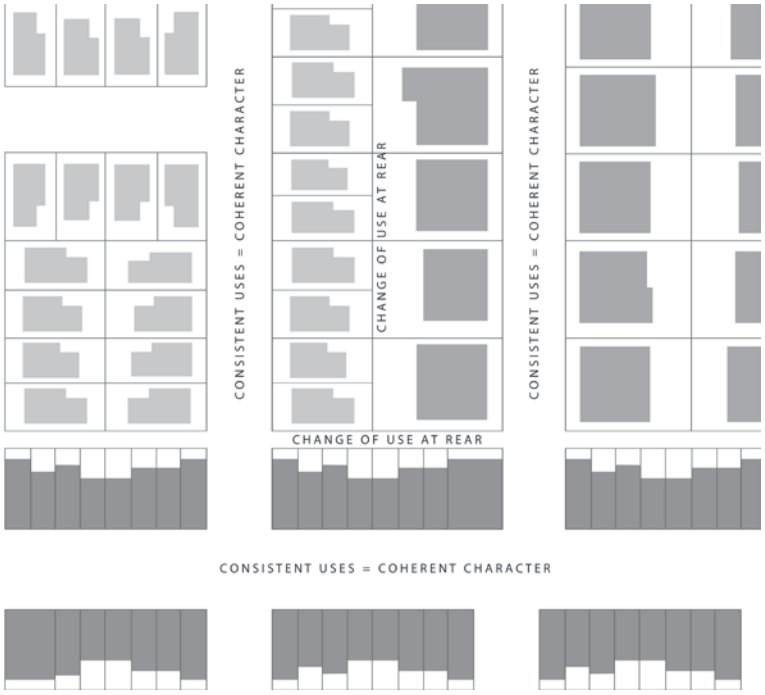
*Step down in scale.* *Image: Leo Sheppard.*

## Lower-scale development

Building heights should step down towards lower-scale development surrounding the urban renewal area to avoid visually overwhelming it. This is particularly important when the surrounding area is residential.

## Different land use

In general, notably different uses should not face each other across a street, because this results in a confused identity, incoherent character and functional conflicts such as traffic and noise. Where the edge of an urban renewal area is defined by a street, the uses proposed should be compatible with those opposite. If a different use is sought within the renewal area, the change in use should occur at the rear of properties facing the bounding street so that it retains a coherent character. Perpendicular streets can comfortably accommodate different uses.




*Join precincts at rear of properties, not at the street.*

## Railway lines

Railway lines are part of the public realm. Unless they are in a cutting, trains offer views into adjoining land. They also generate noise and vibration (particularly if they are diesel trains).

Certain types of development have an attractive front and a less attractive back; for example, retail and industrial uses often have loading and storage areas at the rear. Conventional housing also has a different condition at the rear, which requires a level of privacy. Where these types of development abut a railway line (other than one in a cutting), they should either be screened from it by dense planting, or front a street alongside the railway line.

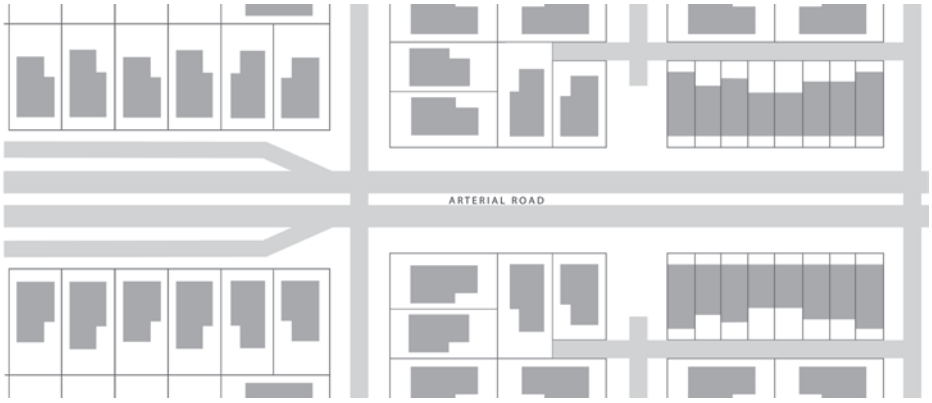
*Rail corridors form useful linear parks.*

Railway lines serving diesel trains should be buffered by sound walls or buildings with walls that provide a noise and vibration barrier.

Railway corridors can form useful linear parks for walking, cycling and jogging.

## Arterial roads

Properties abutting arterial roads are often unable to have direct vehicular access from them. However, it is a poor outcome for development to turn its back on any street, because this creates an unattractive environment, particularly for pedestrians. Vehicle access to properties abutting an arterial road can be provided by a service road alongside the main carriageway, side streets, a rear access lane or car court, or a battle-axe driveway from the next street, allowing them to address the main road. The environmental impacts of heavy arterial road traffic can be ameliorated by landscaped setbacks.




*Don't turn your back on arterial roads.*

## Natural edges

Parkland, waterways, water bodies and other natural areas at the edge of a renewal area are a major asset that should be capitalised upon by providing easy public access and views, and ensuring that abutting development contributes to a high-quality public realm. This means providing frequent, straight streets that lead towards the space and protecting the view corridors along them. It also means locating streets, public promenades or parks alongside the space and lining them with active-fronted buildings, ideally occupied by a mix of shops, hospitality and residential uses. Pedestrian spaces that step down to meet the natural space or project into it as a path, boardwalk or pier provide a different, more immersive experience.

The ecological values of natural areas should be considered in the detailed design of their edges.

*Provide inviting access to natural edges.*

# 4.13 Built form: character

Determining the character of the future built form can be challenging.

Like land use, built form character is principally driven by the vision for the area – it must be based on the type of development wanted. And, like land use, the plausibility of the preferred built form character and the speed at which it is likely to be realised should be tested by market and feasibility assessments. Infrastructure capacity may also limit density, although the value generated by additional floorspace will almost always warrant upgrading services.

Determining appropriate building form (particularly height) involves carefully weighing several factors, including the benefits of increased density and the impacts of built form on the existing built form character (including heritage values) and amenity (see section *4.14 Built form: amenity*).

## Density

Larger building footprints (through lesser setbacks) and/or greater height results in higher density, which brings several benefits:

- it provides more support for local shops and services, including public transport;
- it provides a more vibrant and safe public realm;
- it contributes to a more compact town or city, bringing reductions in travel distances and therefore environmental, economic and social benefits;
- it reduces pressure to develop in valued suburbs and on greenfield land.

*Increased density brings many benefits.*

Higher densities should be provided close to centres and public transport to maximise the number of people within walking distance of jobs, shops and services (see transit-oriented development).

## Existing character

However, building height, massing and siting should respond to existing and surrounding built form values. For example:

- built form should respect the essential characteristics of a valued streetscape that is unlikely to undergo comprehensive change (e.g. a fine-grain period commercial strip with fragmented ownership) through matching setbacks and additional setbacks to parts of a development higher than the prevailing scale (see sections *1.12* and *1.15*);
- built form should step down in height towards sensitive (e.g. residential) low-rise surroundings to reduce its impact on their character and amenity.


*New development designed to respect existing heritage and character values.*


*New development designed to complement existing building scale.*

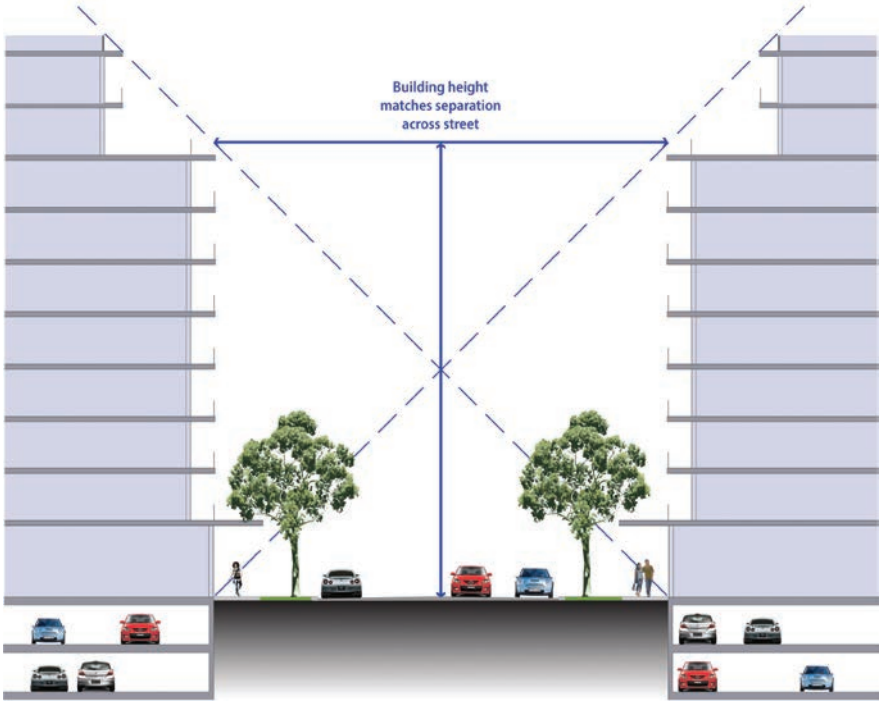
# 4.14 Built form: amenity

Amenity outcomes should shape the built form pattern. Importantly, the amenity of the public realm and neighbouring properties are affected by the scale and massing of buildings.

## Public realm amenity

Built form influences the quality of the public realm in several ways.

- Taller buildings have greater shadow impacts. An urban renewal strategy should determine what level of solar access is desired for each street and open space (see section *1.18 Public realm overshadowing*). Shadow impacts can be reduced by careful building placement and setbacks, and separation of taller forms (e.g. podium-tower formats – see section *1.14 Building scale*). However, the impact of imposing solar access requirements on the level of development that will be possible should be taken into account.
- Taller buildings at the edge of streets and spaces frame them or create spatial containment, which contributes to memorable places. However, too much enclosure can lead to concern about a canyon effect or loss of sky views. A balance is required. Building height should relate to the width of the street. Where street widths vary with their place in the hierarchy, maintaining a relatively consistent height to street width ratio will express the legibility of the area's structure and deliver diverse experiences. However, streets with varied height-to-width ratios (e.g. tall and narrow secondary commercial lanes, and lower, broader residential streets) may also be appropriate to provide diverse spatial experiences.




*Balance between spatial containment and openness.*

- Taller buildings increase land value, which precludes uses that cannot afford high rent, reducing the diversity of the area.
- Taller buildings have a greater impact on the skyline in long-range views. This can reinforce the legibility of the broader urban area (e.g. the ability to identify a CBD from afar).
- Buildings can impede views of surrounding hills and water bodies.
- As noted in section *4.5 Urban structure*, taller buildings can contribute to a legible urban pattern within the renewal area by being generally located at more important places in the movement network, including key intersections and corridors (i.e. all properties do not have equal development potential).
- Buildings that line the edge of streets and public open spaces, rather than being set back behind or separated by car parking or landscaping, create more memorable, safe and inviting places (see section *1.22 Public realm edge*).

## Neighbouring amenity

Building height and spacing can affect the amenity of adjoining developments (see sections *1.19–1.21*). The impacts of a particular built form scenario on the amenity of adjoining properties should be tested as part of the process of determining the preferred character. This may lead to a need for controls over the placement and design of taller forms.

## Street integration

Above about five storeys, building occupants lose the ability for social interaction with people in the adjoining street or open space. This lessens their amenity. However, it is offset by better sunlight, daylight and views.

### Rules of thumb

- Where a new character is to be created, encourage new buildings to adopt a height approximately equal to the horizontal distance between them and the opposite side of the street (a 1:1 building height to street width ratio) to achieve a balance between spatial containment and a sense of openness. Parts of a building that are set back from the street boundary can be higher provided their height maintains a 1:1 ratio with the distance to the opposite side of the street.
- A more intense character with greater building heights may be appropriate where *urban consolidation* imperatives are strong. Similarly, a less intense character with lower building heights may be appropriate in areas that cannot be well serviced.
- Building heights along the longer sides of a public open space should be no less than one-third the width of the space, and preferably higher.

# 4.15 Built form: unity and diversity

Urban renewal can create a more consistent built form. This is an appealing proposition, because places with a homogenous built form character are particularly memorable and controls seeking consistency are easy to administer. However, uniformity can also be dull and built form diversity can contribute to attractive urban environments.

More importantly, homogenous characters often result from a single integrated development, whereas renewal areas are typically in multiple ownerships and their lots have widely varying dimensions and contexts. This means that, with the best will in the world, a completely consistent built form character will never emerge because of the varying development potential across the area.

The best outcome is usually some level of consistency to create a degree of coherence, combined with some scope for diversity to respond to individual site conditions and provide visual interest. For example, a relatively common building height may be possible at the street edge along a given street (with just enough flexibility to allow for the differing ceiling height requirements of different uses), and some aspects of the design of the street facade may be controlled to achieve consistency (see section *4.16 Built form: detail*), while upper levels set back from the street facade may vary in height and detailed design.

The design of all the buildings in a precinct by a single architect should generally be avoided, to ensure visual interest through diversity of architectural expression.

## Future built form character

Ultimately, the desired built form character for a renewal area should be driven by a combination of what strategic land use outcomes are sought for the area, existing character values, what the market will support, development potential (see section *4.3*) and what public realm and private amenity standards are desired.

There are no universally right or wrong built form characters – different characters simply offer different experiences. In general, a very intense character based on tall buildings is just as valid as an arcadian, low-rise character. Manhattan is no less legitimate than a leafy suburb.

Like land use precincts, different character precincts should meet along the rear of properties, to avoid creating a street with an incoherent character.

Examples of different built form characters from successful places can be used to help visualise and determine the preferred character of an urban renewal area.

*Cohesive but varied built form.*

# 4.16 Built form: detail

The design of street facades can be more important than building height or use. Street facades, particularly at lower levels, have a major influence on the quality of the public realm. While the height of buildings influences the character and amenity of a place, the design of street facades determines whether it is an inviting place to be.

Key aspects of street facade design include:

- how active the facade is, particularly at ground-floor level;
- whether weather protection is provided over the footpath;
- the level of visual richness in the design of the facade experienced at pedestrian pace;
- the architectural style of the facade.

## Active frontages

*Active frontages.* *Image: Alastair Campbell.*

Urban renewal strategies should seek to enhance the quality of public areas lacking active frontages (e.g. pedestrian links lined by blank walls, streets edged by surface car parks and parks edged by high back fences) by encouraging existing development to open out onto them, or new development with active frontages. Renewal strategies should also define what degree of activeness is required at each public realm edge (see section *1.24 Active frontages*).

## Weather protection

*Awning.*

Urban renewal strategies should identify where weather protection is sought, whether it should take the form of an awning or colonnade, and any key design requirements (see section *1.25 Awnings and colonnades*). In areas that are already characterised by one form of weather protection, this should be continued. In streets with heavy traffic and narrow footpaths, colonnades can provide a more inviting experience by providing a greater sense of separation from vehicles.

## Facade design

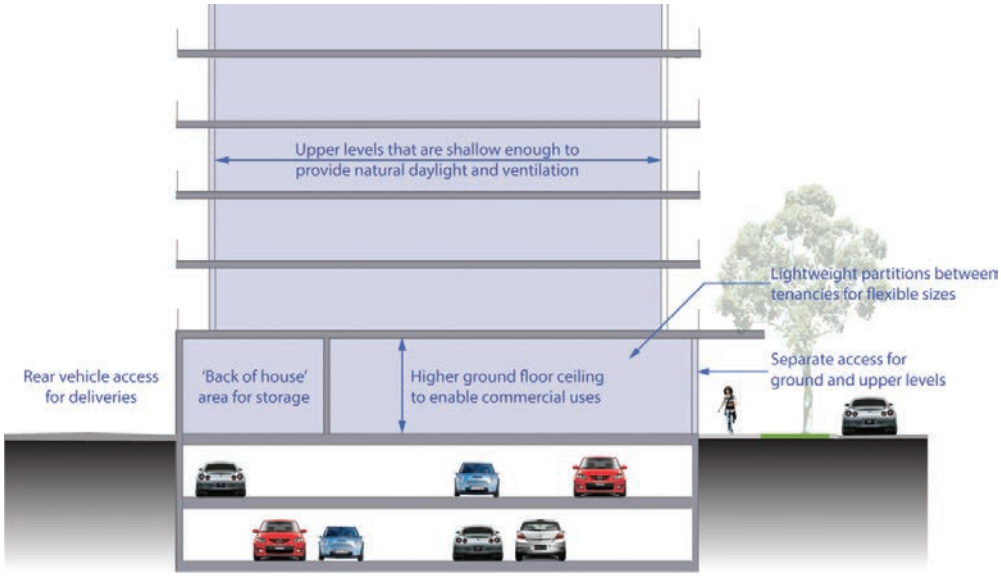
Consideration should also be given to specifying preferred facade design parameters, to reinforce the existing character or create a new character. These may include architectural style, materials and colours, design elements (e.g. projecting windows, porches or sunshades), landscaping and so on (see section *1.26 Building facades*).

*Consider specifying facade parameters.*

## Adaptability

Buildings in mixed-use areas should be designed to facilitate changes of use. The varied floor-to-floor height requirements of different uses means that cost often prohibits the ultimate flexibility of buildings. However, the following measures can increase adaptability:

- lightweight internal partitions to enable varied commercial tenancy sizes;
- a higher ceiling at ground floor to enable retail, commercial and civic uses requiring larger spaces;
- rear vehicle access and a back-of-house area at ground floor for storage and deliveries to enable a full range of retail and hospitality uses;
- separate access to ground and upper floor levels, both from the street, to provide convenient and legible access for visitors to different uses;
- upper floors that are shallow enough to provide natural daylight and ventilation to most of the floor area, ensuring they are suitable for residential uses.




*Adaptable building.*

## 4.17 Development capacity

Renewal strategies are measured by how much development they release. A development capacity assessment allows the impact of different planning and infrastructure investment scenarios to be tested. For example, changing the planning regime may allow denser development, and investing in improved transport infrastructure may attract a different type of development or increase the take-up rate.

The process of estimating development capacity can also provide an indication of the likely volume of development within short-, medium- and long-term time-frames.

Therefore, a renewal strategy should include an estimate of the number of homes and jobs that might be generated, along with the floorspace for any other uses. A development capacity assessment is based on an identification of the land within the renewal area with redevelopment potential (see section *4.3 Development potential*). It requires assumptions to be made about factors such as take-up rate (how quickly development will occur), vacancy rates, dwelling mix and sizes, and employment densities (the number of workers per square metre of floorspace). Historic information for most of these factors can be ascertained from real estate agents, but future rates may vary (particularly with a successful renewal strategy), requiring the input of a specialist property economist.

### Rule of thumb

Use the process shown in the numbered list below to estimate the amount of development that is likely to occur within a given time-frame. This is best set out in a spreadsheet.

1. Measure the land area of each property that is likely to be developed. For large renewal areas, groups of properties with the same likelihood of development and the same proposed land use mix and development form may be measured as a whole.
2. Based on the current or proposed planning framework, determine the likely floorspace generated on each property (or group of properties). The ease of this task will vary between planning jurisdictions. For example, where there are floor space ratios (FSRs) or plot ratios, these can simply be applied to the land area to calculate the floorspace. Where there are prescriptive height and setback controls, the likely floor area at each level will need to be calculated, taking into account appropriate floor-to-floor heights and building depths for the intended use(s). Where there are performance-based planning provisions, judgement about the acceptable scale of development will be required. Be clear about whether the floorspace is gross building area (GBA), gross floor area (GFA) or net floor/lettable area (NFA/NLA), because this will affect how that space is further analysed below.
3. Divide the total floorspace for each property between the different uses envisaged.
4. Divide the floorspace for residential use by the average dwelling size and divide the floorspace for employment uses by the average worker density, to determine the number of homes and jobs. Be careful to use an appropriate dwelling size figure or worker density factor based on whether the total floorspace is GBA, GFA or NFA, and the type of job or activity.
5. Total the number of dwellings, jobs and other floorspace generated for the whole area.
6. Discount the quantity of each form of development based on projected vacancy rates.
7. Distribute the potential quantity of each form of development across time-frames according to the projected take-up rate.

## Typical building area definitions

**Gross building area (GBA)** The total floor area measured between the outside face of external walls or balustrades.

**Gross floor area (GFA)** The total floor area, sometimes measured from the inside face of external walls (depending on the jurisdiction). For planning purposes it excludes basements, parking and loading areas, and sometimes excludes common and service areas such as lifts, stairwells, passageways, along with balconies. GFA is typically around 90% of GBA after parking and any other basement levels have been discounted.

**Net floor/lettable area (NFA/NLA)** The total usable floor area measured between the finished surfaces of permanent walls that is for the exclusive use of single occupiers, excluding service areas such as toilets and cupboards. NFA/NLA is typically around 85% of GFA.

Definitions of these terms vary between different planning jurisdictions and between different disciplines within the property industry.

### CLAYTON CAPACITY CALCULATOR

03.11.14

DAVID LOCK ASSOCIATES
TOWN PLANNING & URBAN DESIGN

| | | |
|---|---|---|
| **Scenario** | **Medium Term** | **4 levels (maximum height)** |
| **Office proportion at upper levels** | **25%** | |
| **Take-up** | **50%** | |

| **PRECINCT** | **PROPERTY DIMENSIONS** | | | **POTENTIAL FLOORSPACE** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Property | | | | **Ground Floor** | | | **Upper level office** | | | **Upper level residential** | | | |
| | Average width | Average depth | Site area | GBA | GFA | Jobs | GBA | GFA | Jobs | No. of apts | NFA | GFA | GBA |
| **COOKE STREET** | | | | | | | | | | | | | |
| 2 Cooke Street | 62.6 | 37.2 | 2329 | 606 | 485 | 13 | 703 | 562 | 28 | 47 | 2700 | 3375 | 4218 |
| 16 Dunstan Street | 22.9 | 42.6 | 976 | 209 | 167 | 4 | 257 | 206 | 10 | 17 | 988 | 1234 | 1543 |
| 6 Cooke Street | 116 | 48.5 | 5626 | 1140 | 912 | 30 | 1303 | 1042 | 52 | 87 | 5003 | 6253 | 7816 |
| 20 Cooke Street | 38.5 | 48.5 | 1867 | 365 | 292 | 10 | 432 | 346 | 17 | 29 | 1660 | 2075 | 2594 |
| 1389-1391 Centre Road | 59.1 | 48.7 | 2878 | 571 | 457 | 15 | 664 | 531 | 27 | 44 | 2549 | 3186 | 3982 |
| **Precinct Subtotal** | | | **13,676** | **2,891** | **2,313** | **73** | **3,359** | **2,687** | **134** | **224** | **12,899** | **16,123** | **20,154** |
| **CENTRE ROAD** | | | | | | | | | | | | | |
| 1336-1340 Centre Road | 17.3 | 35.1 | 607 | 153 | 122 | 3 | 194 | 155 | 8 | 13 | 746 | 933 | 1166 |
| 1342-1356 Centre Road | 44.8 | 35.1 | 1572 | 428 | 342 | 9 | 503 | 403 | 20 | 34 | 1932 | 2415 | 3019 |
| 1358-1360 Centre Road | 42.1 | 38.2 | 1608 | 401 | 321 | 11 | 473 | 378 | 19 | 32 | 1816 | 2269 | 2837 |
| **Precinct Subtotal** | | | **3,788** | **982** | **786** | **23** | **1,170** | **936** | **47** | **78** | **4,494** | **5,617** | **7,021** |
| **TOTAL** (100% take-up) | | | 70,775 | 15,007 | 12,077 | 535 | 16,796 | 13,437 | 672 | 1,275 | 73,330 | 91,662 | 114,578 |
| **TOTAL** with selected take-up | | | 35,387 | 7,504 | 6,039 | 268 | 8,398 | 6,719 | 336 | 638 | 36,665 | 45,831 | 57,289 |

*Development capacity calculation.*

# 4.18 Consultation

The realisation of a renewal strategy relies on many players. These include the planning authority, transport and other public agencies, landowners, residents, developers and traders. All stakeholders should be involved at each stage of the preparation of the strategy.

## Stakeholders

Stakeholders can be divided into four groups:

- **technical stakeholders** – key officers of the local government and relevant state government agencies, including those responsible for planning, transport and so on;
- **politicians** – local councillors or aldermen, and government MPs;
- **occupiers** – residents, workers and business owners, including people living or working near the renewal area who may use its facilities and/or be affected by its redevelopment, and groups which represent them such as progressive associations, chambers of commerce, traders' associations, civic or heritage societies, and so on;
- **property and development interests** – owners of key potential development sites (public and private), local real estate agents and locally active developers, who are critical to the implementation of redevelopment plans.

## Timing

Stakeholder engagement is important at the following points in the process:

- **appreciation of strengths, weaknesses, opportunities and threats** – existing stakeholders are best placed to identify the assets that should be built upon and the problems that need to be tackled;
- **establishment of the vision and overarching objectives** – a vision and objectives that are shared by all stakeholders and that represent their concerns and aspirations have the greatest chance of success;
- **review of draft strategies** – preliminary ideas should be tested by seeking the comment of all key stakeholders;
- **communication of the final strategy** – once it is finalised, the strategy should be clearly communicated to all key stakeholders so that their actions are aligned with it.

## Methods

There are different ways of engaging with each of these groups.

- The most effective way of engaging with technical stakeholders is often to form small focus groups of related officers (e.g. all those with an interest in transport) so that they can work together to provide coordinated input.
- There may be a need for different techniques to ensure engagement is both broad and deep. There are many methods for broad engagement with a community (e.g. community events,

*Community workshop.*

*Community event.* *Image: Alastair Campbell.*

*Street stall.* *Image: David Klingberg.*

*Interactive engagement.*

newsletters and street stalls) although interactive consultation through the internet is emerging as one of the most effective. One way of delving deeper into the concerns and aspirations of the community is to establish a community reference group comprising a representative of each community interest, such as someone from a traders' group, community action group, heritage society and so on. Capacity-building – upskilling key stakeholders through training or study trips – should be considered to enable them to participate more effectively.

- In addition to discussions at council meetings, key politicians may be invited to form part of a community reference group and participate in capacity-building exercises.
- People involved in the property development industry are an important source of input in relation to the likelihood of different development scenarios being realised. A useful technique is to convene forums with property interests, such as key landowners, real estate agents and locally active developers.

In all cases, the purpose of the engagement and its influence on the final strategy should be made clear to stakeholders to manage their expectations. It may be appropriate to appoint engagement specialists for large or controversial projects.

# 4.19 Implementation

A renewal strategy is of little use without a clear 'road map' – an action plan setting out the steps required to realise the strategy.

## Action plan

For each step or task, an action plan should identify:

- who is responsible for leading the action;
- who are the other key stakeholders that need to be engaged;
- when it should happen, or what its priority is (e.g. high, medium or low);
- if it relies on or is a prerequisite for another action;
- how much it will cost (unless it falls within the remit of existing organisations);
- how it will be funded (if funding is required);
- what aspect of the strategy it is primarily designed to implement.

Action plans should be divided into the following types of action, which tend to align with different implementers, so that they are easy to use:

- **planning provisions** – e.g. changes to land use and built form requirements and public acquisition provisions;
- **capital works** – e.g. streetscape improvements, open space improvements, traffic and cycle infrastructure, wayfinding improvements and undergrounding power lines;
- **public transport** – e.g. infrastructure upgrades, additional services and better information;
- **advocacy** – e.g. promoting particular development outcomes or travel behaviour;
- **development of public land –** e.g. catalyst or demonstration projects;
- **public facilities and services –** e.g. new or upgraded public buildings, and enhanced or reconfigured community services;
- **public realm management** – e.g. maintenance, cleaning and car parking management;
- **organisational** – e.g. town centre management and area improvement organisations;
- **further investigations –** e.g. heritage studies, detailed design of new or upgraded streets, public spaces or transport interchanges, and feasibility studies for public building or infrastructure projects.

## Early wins

Action plans should identify initiatives that can be carried out immediately in order to demonstrate commitment to the strategy, generate confidence in it and build momentum.

## Marketing

An urban renewal strategy can be used to promote the area to potential residents, businesses, developers, investors and visitors.

## 4.20 Checklist

- Has a unique and credible vision been developed for the renewal area? (See section 4.1.)
- Has the strategic and policy context of the renewal area been analysed? (See section 4.2.)
- Have appropriate specialist investigations been undertaken? (See section 4.2.)
- Has the likelihood of redevelopment within the renewal area been carefully analysed? (See section 4.3.)
- Has a distinct sense of place been defined for the renewal area? (See section 4.4.)
- Has the strategy been informed by an understanding of the existing urban structure? (See section 4.5.)
- Have opportunities to improve the street network been identified? (See sections 4.6–4.7.)
- Have opportunities to improve open space provision within and near the renewal area been identified? (See section 4.8.)
- Have opportunities to improve the quality of the public realm been identified? (See section 4.9.)
- Have opportunities to improve the provision for public transport, cycling and car parking been identified? (See section 4.10.)
- Has a clear but flexible land use strategy been developed? (See section 4.11.)
- Have appropriate responses to the edges of the renewal area been identified? (See section 4.12.)
- Has a built form strategy been developed that responds to the strategic land use aspirations, the market, development potential, and the character and amenity of the public realm and neighbouring land? (See sections 4.13–4.15.)
- Have requirements for active frontages, weather protection over footpaths, facade design and adaptable buildings been clearly identified? (See section 4.16.)
- Has the development capacity of the renewal area based on the strategy been calculated? (See section 4.17.)
- Have all stakeholders been appropriately involved in the development of the strategy? (See section 4.18.)
- Has a clear implementation plan been developed? (See section 4.19.)

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PART II

# Greenfield Development

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# Urban growth frameworks

## 5.0 Introduction

Greenfield development is that beyond existing city or town boundaries. Planning for greenfield development includes high-level frameworks for whole urban growth regions, precinct structure plans for new districts, and master plans for individual residential neighbourhoods or employment precincts.

This chapter explains how to design or assess a development framework for a whole growth area that includes multiple residential neighbourhoods and is large enough to have higher-order facilities, such as a sub-regional *centre* and, potentially, employment areas. It begins by outlining how to prepare a brief for the growth area. This is followed by advice on the establishment of primary open space and movement networks, the positioning of higher-order facilities and the organisation of residential neighbourhoods. Finally, guidance is provided on the design of arterial roads, high-voltage power lines and staging.

Chapters 6 to 8 provide more detailed guidance on the design or assessment of individual districts, residential neighbourhoods and employment precincts.

A framework for an urban extension should also identify and prioritise opportunities for urban consolidation within the existing urban area (see Chapter *4 Urban renewal strategies*).

The process of formulating a framework for an urban growth area is iterative rather than linear, and involves the simultaneous consideration of a wide range of inputs from experts in numerous fields along with multiple stakeholders. As a result, the 'first cut' of a development framework for an urban growth area is best formulated through a workshop process involving all key specialists and stakeholders. 'Enquiry by design', which develops a plan by testing design ideas, is one such method.

### Armstrong Creek

The design principles in this chapter are illustrated by the plan for Armstrong Creek, an urban growth area to the south-west of Geelong, Australia. The plan for the growth area was designed by David Lock Associates.

## New towns

Urban growth areas are typically urban extensions, attached to a host city or town. Very occasionally they take the form of new towns.

Other things being equal, urban extensions are more sustainable than new towns. However, a new town offers the following benefits over an urban extension:

- it provides a stronger *sense of place*;
- it adds to lifestyle choice;
- it maintains access to nature, food-growing areas and water sources for the urban area that the growth area would otherwise have been attached to;
- it provides services to the surrounding rural areas;
- it provides a labour force for surrounding agricultural businesses.

In order to be socially sustainable, new towns should have excellent access (particularly by rapid public transport) to a larger metropolis, a match between the number of potential workers and jobs, and sufficient size to support higher-order services. This requires them to be far enough from existing conurbations to allow the development of a distinct local economy but close enough for access to metropolitan-scale jobs, services and facilities.

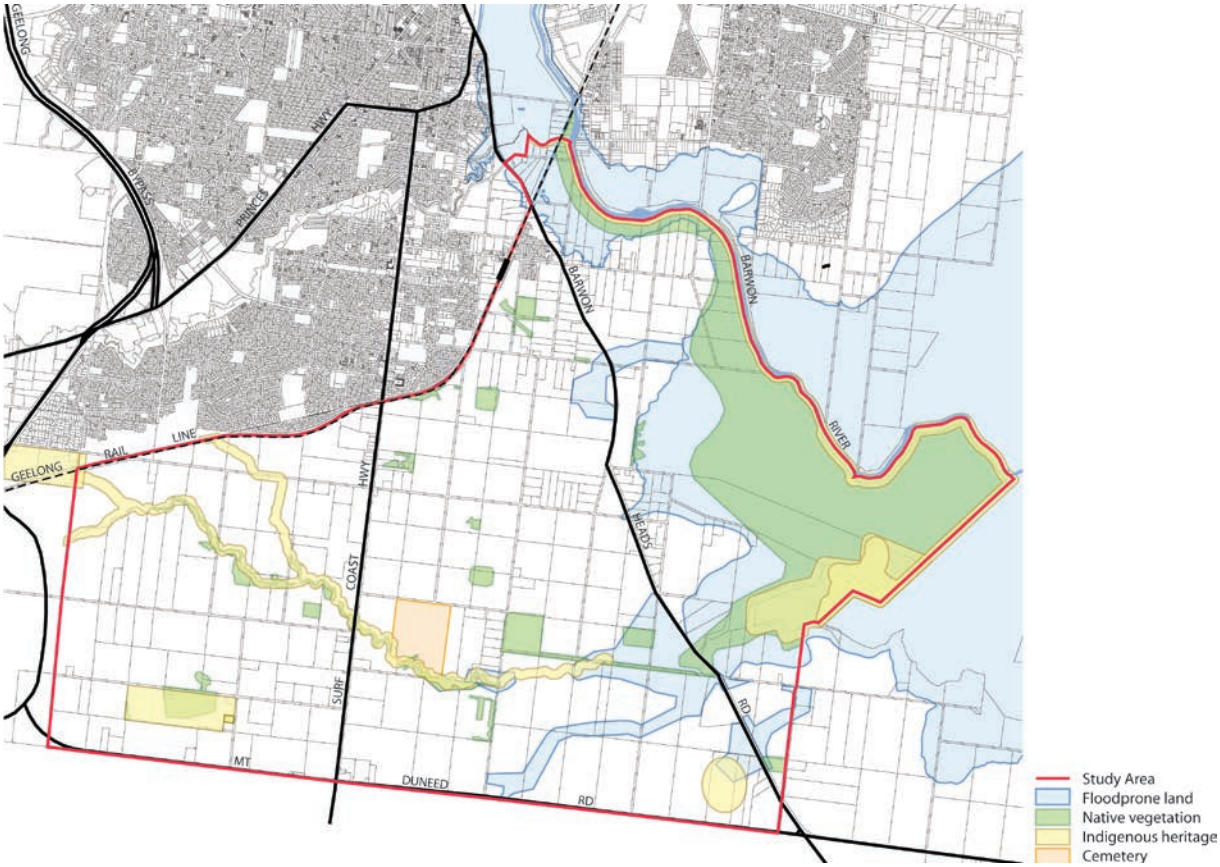
# 5.1 Development area

Growth area design should begin by understanding the site's intrinsic nature. This determines which land is to be developed and which is not.

## Undevelopable land

Land may be left undeveloped for several reasons:

- it forms part of the stormwater management system (e.g. natural waterways and their riparian corridors);
- it is not capable of urban development due to:
  - flood risk;
  - bushfire risk;
  - contamination;
  - steep slopes;
  - erosion or landslip risk;
  - acid-sulphate soils;
  - shallow water table;
  - high salinity risk;
- it is too close to unfriendly uses or infrastructure, such as:
  - airports;
  - quarries;
  - offensive industry;
  - broiler farms;
  - high-voltage power lines;
  - major gas or oil pipelines;
- it is too valuable for other purposes, such as:
  - potable water supply;
  - farming;
  - flora and/or fauna conservation (including buffers);
  - cultural heritage;
  - minerals extraction;
  - aquifer recharge;
  - tidal surge protection (e.g. dunes);
  - scenic value (e.g. hilltops, ridges, valleys, waterways, bays and coastlines);
- it is too expensive to develop due to:
  - shallow soil;
  - rock outcrops;
  - poor drainage;
  - cost of servicing;
- it comprises rural residential lots that are unlikely to be redeveloped at urban densities.



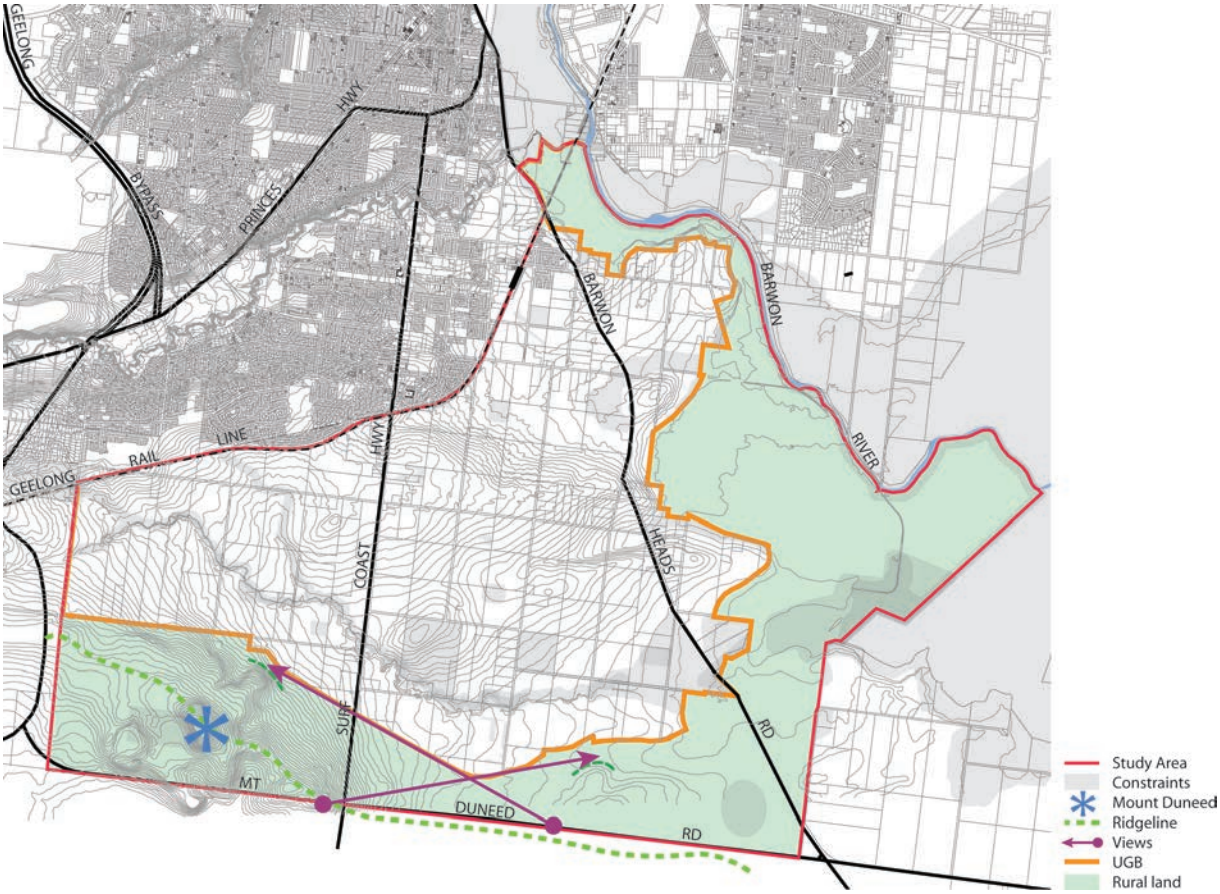

*Key constraints – Armstrong Creek, Geelong.*

These factors may indicate that some land is not best suited to urban development while not completely ruling it out. This land should be held in reserve in case the unconstrained land is insufficient, or identified for future growth.

Most of the land to be left undeveloped will be identified by technical background studies. A high-level stormwater management strategy also needs to be developed early in the design process, to identify the land needed for drainage corridors, retention and detention basins, and wetlands. While the layout of the stormwater management system will generally follow the natural topography, there is usually scope for the alignment and position of its components to be shaped as part of the subsequent design of urban development. However, the land areas required need to be calculated at this stage in order to inform the land use budget (see section *5.3 Land use budget*).

## Development area

Once the areas to be left undeveloped have been mapped, the land that remains is the developable area. However, it may not make sense for all of it to be developed. Small pockets of land caught between areas of undevelopable land may prove too isolated to be economically serviced. These can be identified by services engineers and social planners. It may also be necessary to join up isolated habitat conservation areas to enhance their resilience.




*Landscape character constraints – Armstrong Creek, Geelong.*

Where there is more developable land than is needed to satisfy growth projections, development should be focused:

- along a corridor that is most easily served by higher-order, high-capacity public transport, such as an existing or potential rail or light rail line;
- away from low-lying land, which is valuable for stormwater management, well-irrigated farming, flora and fauna habitat, and recreation.

This will ensure the urban area has a coherent form, defined by natural features.

Consideration should also be given to leaving an area of undeveloped land between the growth area and nearby urban areas, to maintain a distinct identity for the new place and existing urban edge.

## Rules of thumb

- Leave land with a slope greater than 15° undeveloped.
- Locate all development within 1 km (a reasonable walking or cycling distance) of higher-order, high-capacity public transport, such as heavy or light rail.

# 5.2 Vision

Before design can start, a clear vision is needed. What kind of place is wanted? What will give it a special *character* or unique identity distinct from other places?

## Placemaking elements

Elements that may contribute to a unique place identity include:

- a feature of its natural setting, such as a coastline, hilltop, valley, long views or stands of mature trees;
- an aspect of its strategic location, such as a train station providing access to a CBD;
- the history of the area;
- a major existing or new facility, such as a university campus, industry cluster or regional recreation facility;
- new standards of urban development, such as environmentally sustainable housing or utility services.

## Community profile

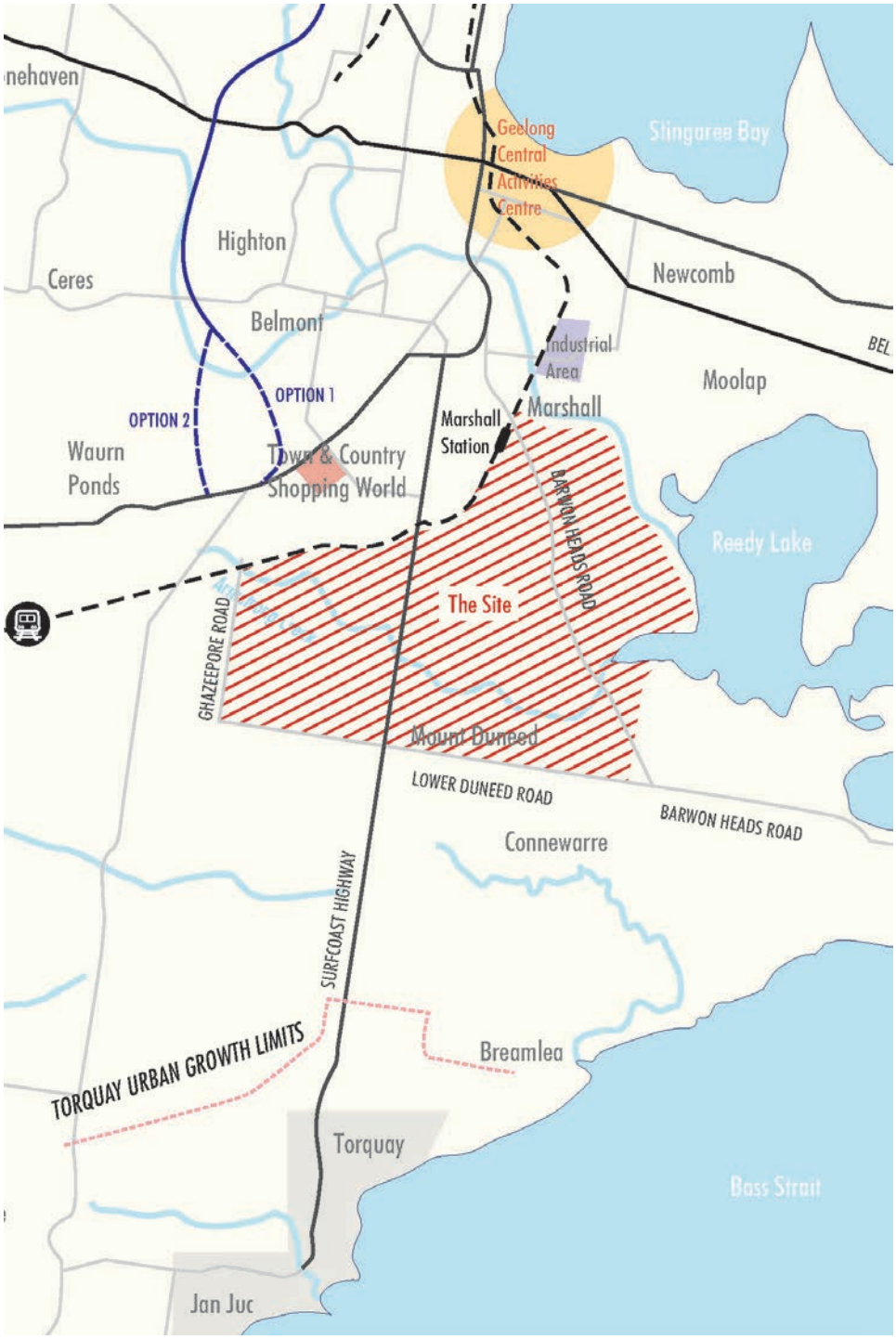
The vision should include a forecast of the future community's personality, including its demographic and socio-economic profile and resulting housing and employment needs. It should also consider likely changes in lifestyle preferences and development demands over the long term.

## Consultation

The vision should be informed by consultation with key technical stakeholders, the broader community, politicians and the local development industry. A useful technique for helping people to visualise the future community is to consider existing urban areas of a similar size and situation.

*Visioning 'board game' – Armstrong Creek, Geelong.*

Another technique for helping stakeholders to understand the needs and options for growth is a board game in which the 'board' is a map or aerial photo of the growth area, with constraints identified, and the 'pieces' are tiles representing specific quantities of different land uses and densities. The 'players' are tasked with mapping their preferred configuration of development and open space that accommodates the desired number of dwellings, employment land and supporting facilities, informing a discussion about the benefits and drawbacks of different spatial strategies.




*Armstrong Creek, Geelong – between the city and the coast.*

## 5.3 Land use budget

The brief is completed by estimating development quantities. This informs structural decisions, such as how many residential neighbourhoods there will be, how many centres and how big they should be, how many schools, how much employment land, and so on.

Preparing a land use budget is an iterative process, beginning with approximate calculations which are progressively refined as each component of the growth area becomes more accurately quantified, until a balance is reached between the size of the residential community and the facilities needed to support it.

### Regional infrastructure

First, any regionally significant uses and facilities that are not directly proportional to the amount of residential development within the growth area must be identified. Growth areas offer an opportunity to provide for regional facilities and uses required for the broader area. This may include:

- employment;
- regional civic facilities, such as council service centres, libraries, hospitals, tertiary education campuses, major events/performing arts centres, sports grounds, aquatic centres, aged care facilities, emergency services stations and cemeteries;
- regional services infrastructure, such as wastewater treatment plants, and waste and recycling centres;
- regional parks;
- arterial roads;
- rail reserves.

The need for such facilities will be identified by broader employment, social, recreation and transport infrastructure needs analyses. Section *5.4 Green infrastructure* discusses regional parks.

### Sub-regional infrastructure

Large growth areas may also need higher-order uses (those that serve more than one neighbourhood) to provide for their own residential population, such as employment land, sub-regional centres, libraries and secondary schools. These are discussed in sections *5.9 Higher-order centres* and *5.10 Higher-order community facilities*.

### Neighbourhoods

The remaining land area can then be divided into neighbourhoods incorporating dwellings and local facilities such as primary schools, parks, shops and community hubs. This is discussed in section *5.11 Walkable neighbourhoods*.

| Land use | Land area (ha) | Dwellings | Population |
|---|---|---|---|
| Activity centres (incl. primary schools & local sporting facilities) | 90 | | |
| Secondary schools | 30 | | |
| Employment land | 270 | | |
| Mixed use corridor | 30 | | |
| Shoptop apartments | | 660 | 1,620 |
| Higher density housing | 60 | 1,760 | 4,330 |
| Medium density housing | 205 | 4,060 | 9,990 |
| Conventional density housing | 1,100 | 15,450 | 38,010 |
| Regional sports facilities | 20 | | |
| Biodiversity corridor/ passive parkland | 390 | | |
| Detention basin/ wetland | 95 | | |
| Cemetery | 20 | | |
| East-west link road reserve | 40 | | |
| **Total** | **2,350** | **21,930** | **53,950** |

*Land use budget – Armstrong Creek, Geelong.*

Initially, the area needed for sub-regional infrastructure is unlikely to be known. If the growth area is large enough and well enough located to provide employment land to serve its residential population, and this has not been accounted for as a regional need, allow ~20% of the net development area for employment purposes. (This is a rough estimate of the land needed to provide a jobs–homes balance.) Section *5.8 Employment* provides guidance for undertaking a refined employment land calculation.

The need for other higher-order uses generated by the growth area is determined by retail demand and community needs analyses, using the estimated residential population and taking into account any existing oversupply or shortfall of facilities in the surrounding area. So the initial calculation above may need to omit these facilities. However, this calculation should be repeated once the land required for them has been determined. This will confirm the need for higher-order facilities and provide a more precise estimate of the quantity of residential development. This process should be repeated until the budgeted facilities match the budgeted residential demand.

## Rule of thumb

In order to estimate the need for higher-order uses to serve the growth area, estimate the residential population as follows:

*Gross development area*[1] *– regional infrastructure = net development area*

*Net development area – sub-regional infrastructure = gross residential development area*

*gross residential development area × gross residential density*[2] *= total no. of dwellings*

*total no. of dwellings × household size*[3] *= residential population*[4]

[1] See section *5.1 Development area*.

[2] For the purpose of this first-cut, broad-brush calculation, the gross residential density can be assumed to be 85% of the net residential density.

[3] The household size will be forecast as part of a community profile which is a component of the vision for the growth area.

[4] For fine-grain calculations, the population should be discounted according to the projected occupancy rate.

### Residential density definitions

**Gross residential density** The number of dwellings per hectare of land including internal streets, half of any bounding roads and neighbourhood-level facilities such as local centres, primary schools, kindergartens, community hubs (clusters of local community facilities and services) and open space. Gross residential densities of about 12.5 or 17 dwellings per hectare equate to net residential densities of 15 or 20 dwellings per hectare.

**Net residential density** The number of dwellings per hectare of land including internal streets and half of any bounding roads, but excluding non-residential uses. Average net residential densities of 15 or 20 dwellings per hectare (which equate to average lot sizes of about 450 or 350 $m^2$ respectively) are common targets for a growth area.

# 5.4 Green infrastructure

'Green infrastructure' is a key organising feature of urban growth areas. The term for all types of open space within or associated with urban development, it connects them to their natural setting and contributes significantly to their identity.

Green infrastructure includes:

- undevelopable land identified when defining the development area, such as flood-prone land, steeply sloping land, habitat conservation areas, areas of valuable cultural heritage and areas of great natural beauty (see section *5.1 Development area*);
- the stormwater management system, such as drainage corridors, retention and detention basins, and wetlands;
- parks.

Some areas of undevelopable land may have restricted access, such as fragile habitat conservation areas.

## Regional parks

An urban growth framework may need to provide for regional parks. This includes:

- **passive parkland** to provide for informal recreation and a counterpoint to the urban experience through access to nature. Passive parkland can incorporate areas of undevelopable land. Urban forests are an important component of passive recreation. They provide a meaningful outdoor experience through bushland walking trails and can provide valuable wildlife habitat and corridors, supporting the resilience of wildlife communities and offering an education resource;
- **active parkland** to provide for district or higher-level sporting competition.

The need for regional parks will be determined by an open space needs analysis, drawing upon statutory planning controls and an assessment of the existing provision of open space in the broader area.

Advice should be sought from an ecologist on the minimum width necessary for urban forests to provide effective wildlife corridors.

## Green web

Where possible, larger open spaces should be connected to each other (including those beyond the site) by linear open spaces. These connections should be aligned to incorporate remnant vegetation. They may include riparian corridors along waterways, and former rural roads lined with significant vegetation whose reuse as greenways dedicated to walking and cycling enables the trees to be retained.

*An interconnected green web provides attractive recreational trails and wildlife corridors.*

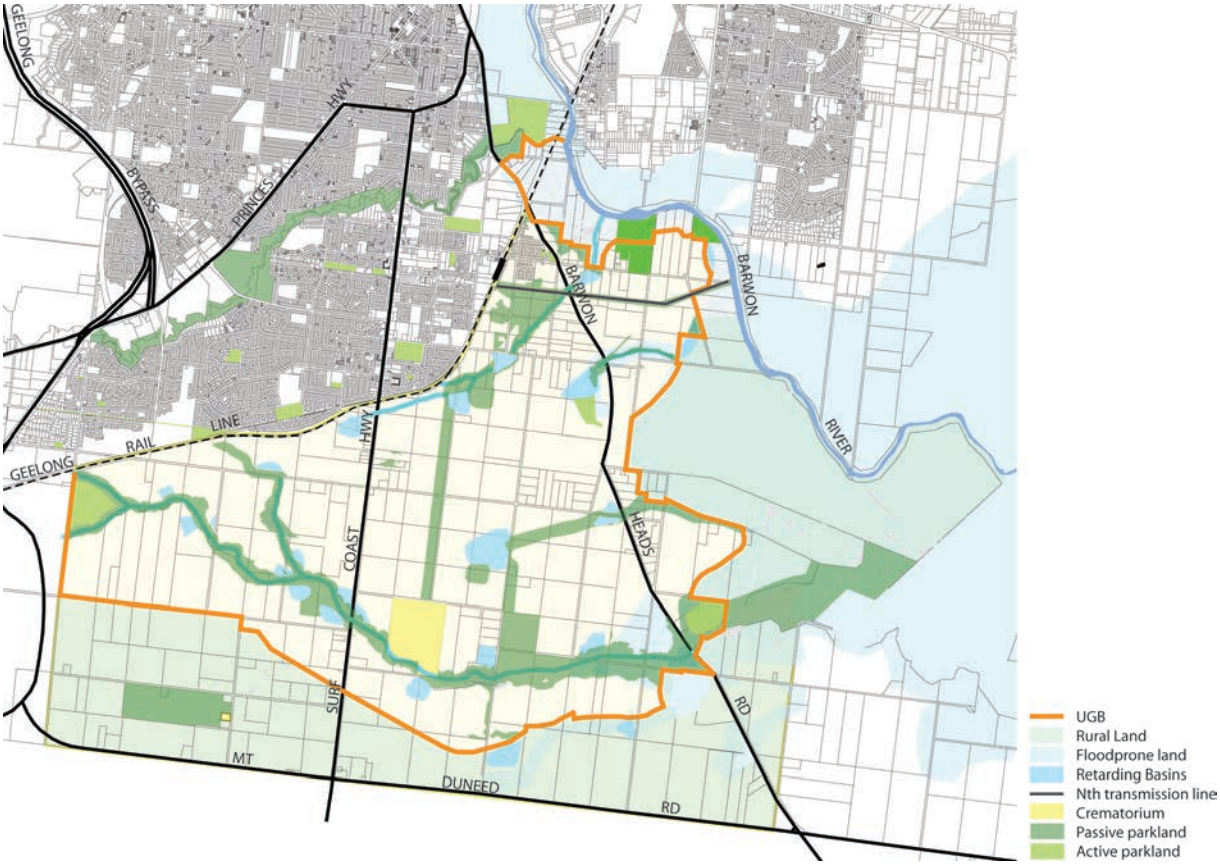
The creation of an interconnected green web of open space has a number of significant benefits:

- it provides an alternative means for getting around using *active transport*, offering a different experience from the street network;
- it provides attractive opportunities for recreational walking, jogging, cycling and horse riding;
- it can provide valuable wildlife corridors, which enhance the resilience of flora and fauna habitat;
- it provides a strong natural frame for a growth area that reinforces its distinct identity, potentially including its separation from adjacent urban areas;
- it defines separate neighbourhoods within the growth area, reinforcing their identity as unique places;
- it forms connections with open spaces outside the growth area, integrating it with the existing urban area.

## Location

The following factors should also be considered when positioning regional parks:

- **co-location** – co-locating parks with other areas of undeveloped land contributes to a connected web of open space and provides a richer experience. The location of playing fields alongside schools offers the potential for shared use;
- **accessibility** – placing regional sporting facilities on or close to the primary public transport network (see section *5.5 Public transport network*) and recreational trail networks (see section *5.7 Primary walking and cycling network*) maximises their accessibility;
- **conservation** – incorporating remnant vegetation and cultural heritage places within parks ensures their conservation. Revegetation within passive open spaces (including riparian corridors) can restore their natural landscape character and ecologically functional habitat;
- **water bodies and waterways** – locating open space alongside water bodies and waterways ensures public access to and enjoyment of them;
- **placemaking** – open spaces contribute to the distinctiveness and *legibility* of a neighbourhood by creating memorable markers. Locating open spaces on connector streets (see section *6.4 Primary street network*) optimises their contribution to *placemaking* as more people will experience them incidentally along their journey. Alternatives to consider include positions offering great views (e.g. hilltops) and the creation of a setting for distinctive features (e.g. distinguished old buildings, public facilities, beautiful trees or rock outcrops), which can reinforce their memorability;
- **topography** – playing fields should be located on flat land. Higher ground can enhance passive open space by offering panoramic views. Linear open spaces that follow ridgelines or valleys reinforce the development's sense of place and help to maintain long views towards key features such as hilltops;
- **water conservation** – open spaces requiring irrigation should be located close to retention or detention basins where possible, to facilitate the reuse of stormwater;




*Green infrastructure – Armstrong Creek, Geelong.*

- **buffers** – open space may be used to separate industrial and residential areas;
- **wind** – linear open spaces should be aligned to take advantage of cooling winds in hot climates or cleansing breezes where air quality is poor. In cooler climates, linear open spaces should be oblique to prevailing winds.

Cemeteries should also be considered part of green infrastructure, because of their value as informal recreation spaces.

## Rule of thumb

Dedicate 10% of the net development area (see section *5.3 Land use budget*) as public open space. This includes regional open space (discussed in section *5.10 Higher-order community facilities*), neighbourhood-level open space (discussed in section *7.1 Community facilities*) and local open spaces (discussed in sections *7.16–7.17* – residential neighbourhoods and *8.8* – employment precincts).

A lesser provision for open space may be appropriate where there is existing higher-order open space close by.

Provide an urban forest forming part of a regional trail network within 800 m – or a comfortable 10 min walk – of all homes, to ensure good access to 'wild' nature. Where possible, incorporate existing remnant vegetation within urban forests.

## 5.5 Public transport network

Public transport planning is central to growth area design. A preliminary public transport network should be sketched early in the growth area design process and adjusted to suit the land use pattern as it is devised.

### Types of public transport

Large growth areas offer the opportunity to plan a comprehensive public transport system. Transport planners can provide advice on the types of public transport that are appropriate for different purposes and the catchments and densities needed for them to be feasible. This may include:

- heavy rail for longer-distance trips;
- light rail or bus rapid transit (express buses) for regional and sub-regional trips;
- conventional buses for local trips;
- specialised buses for special needs groups such as 'night-rider' buses and community buses for the frail, mobility-impaired, youth or other groups who cannot access alternative means of getting around.

### Design measures

An urban growth plan should facilitate convenient, fast and reliable public transport by:

- identifying locations for new train stations alongside or close to the growth area;
- providing for extensions of neighbouring public transport systems into the growth area;
- providing corridors for new primary public transport services (e.g. rail, light rail or bus rapid transit) that connect to major existing interchanges such as train stations;
- aligning and spacing higher-order public transport corridors to maximise accessibility;
- locating employment areas and higher-order centres and facilities along potential extensions of existing primary public transport services or new primary public transport corridors;
- providing for high-quality public transport interchanges at key locations, such as employment precincts and higher-order centres;
- providing a well-connected and spaced network of arterial roads and connector streets that can provide corridors for light rail, bus rapid transit and local buses within comfortable walking distance of most homes;
- separating broad arterial roads from train stations and major light rail and bus rapid transit so that they don't act as a barrier to a walkable catchment around them;
- embedding measures that provide for fast and reliable public transport, and signal its precedence over private transport, such as dedicated corridors and lanes, and priority measures at intersections.

**Rules of thumb**

- Provide light rail or bus rapid transit services within 800 m of 90% of homes.
- Provide local bus or tram services within 400 m of 90% of homes.

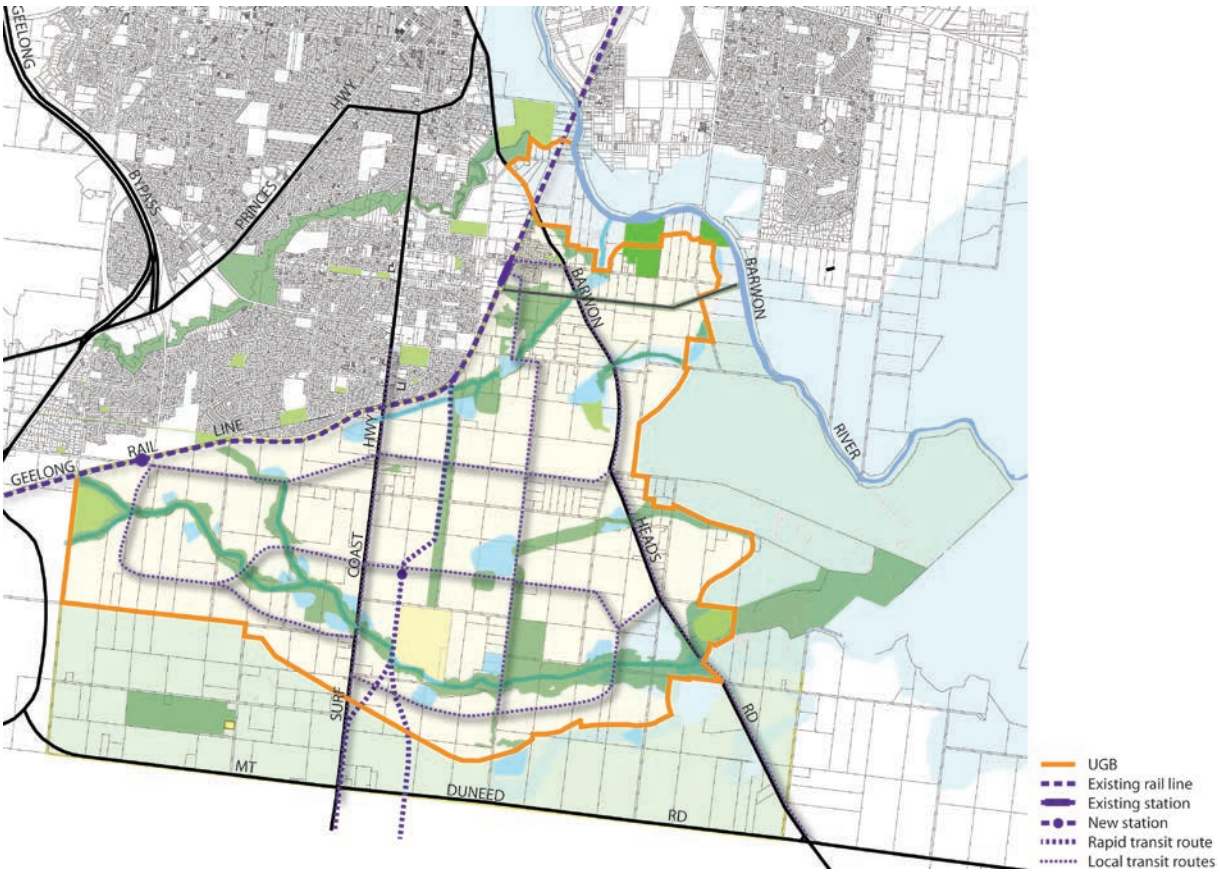
*Light rail.* *Image: Alastair Campbell.*


*Bus rapid transit.* *Image: Alastair Campbell.*

## Implementation

Public transport services should be provided early in the life of the growth area to capture residents before they develop car-based habits.

Where funding does not yet exist for higher-order public transport, corridors should be reserved to facilitate its realisation when funding becomes available.




*Public transport network – Armstrong Creek, Geelong.*

# 5.6 Primary road network

The primary road network is another key structuring element of urban areas. It influences sense of place and legibility, as well as accessibility.

A preliminary network should be defined early in the design process and refined as the land use pattern forms.

## Alignment

Primary roads should be aligned to contribute to the sense of place and legibility of the growth area. Main roads can connect the place to its setting by providing vistas of significant natural features such as hilltops and water bodies. They can also reinforce the intelligibility of the *urban structure* by providing vistas of *landmark* civic buildings.

Where there is significant slope, main roads should follow contour lines to minimise their impact on the landscape.

## Spacing

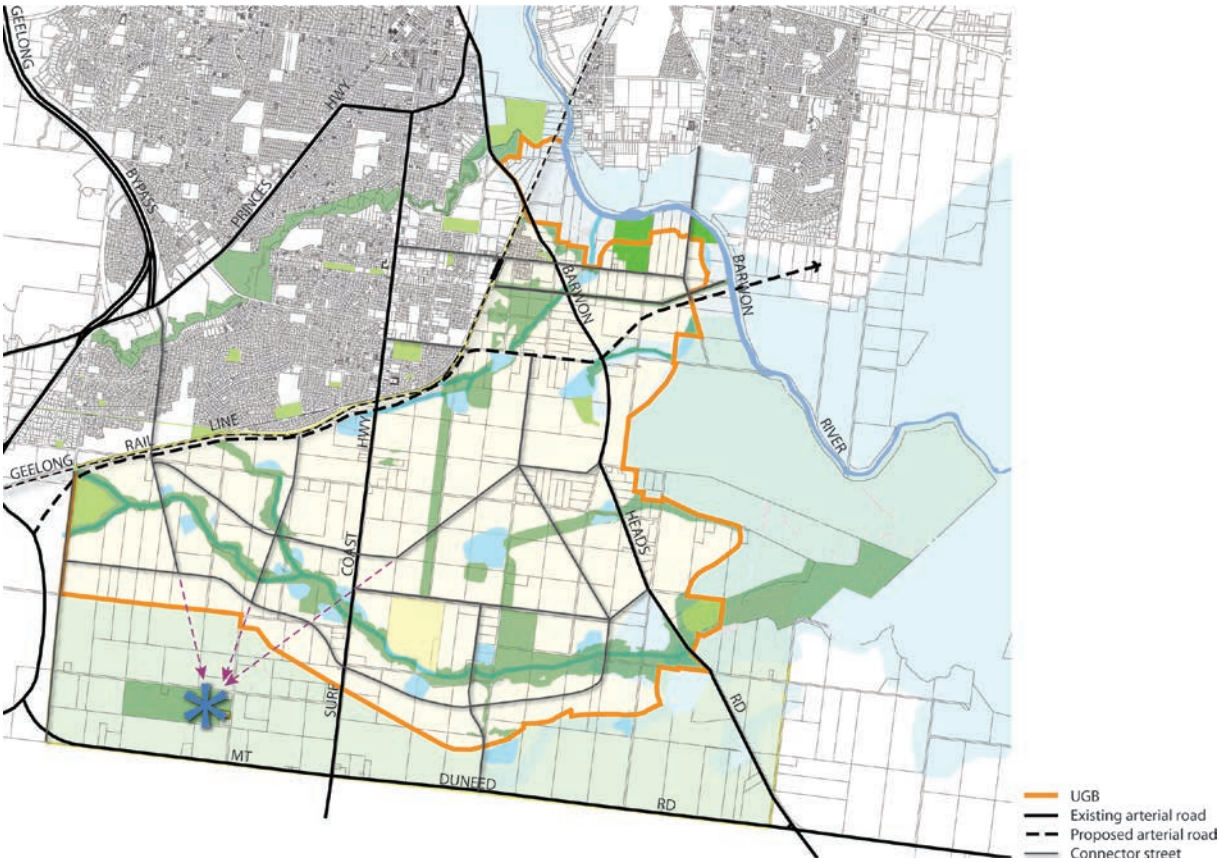
The primary road network should provide efficient access to all parts of the growth area. High-speed roads with more than one vehicle lane in each direction should be minimised because they divide communities. This can be achieved by designing the primary road network to disperse traffic into a large number of roads across the area, rather than concentrating it into a small number of very busy roads.

The number of road connections between an urban extension and the existing urban area should also be maximised to integrate the growth area with its host and avoid very busy roads.

## Rural roads

*Rural road retained as greenway.*

Existing rural roads may not be suitable for upgrading to main roads, due to the presence of valuable roadside vegetation. These roads may be better suited to remaining as local roads, being used as transitways dedicated to public transport or becoming greenways dedicated to walking and cycling as part of the green web (see section *5.4*).




*Primary road network – Armstrong Creek, Geelong.*

## Rule of thumb

Space main roads (arterial roads and connector streets) ~800 m apart in each direction, to minimise the need for them to be more than two lanes wide.

# 5.7 Primary walking and cycling network

The primary walking and cycling network completes the tapestry of structural movement systems. It is critical for encouraging *active transport* as a genuine alternative to the car.

Large growth areas offer the opportunity to plan a comprehensive walking and cycling system. Like the public transport network, the primary walking and cycling network should provide direct and convenient access to major destinations such as employment, schools, centres, major parks and public transport nodes.

The primary walking and cycling network should be mapped early in the design process, then fine-tuned to better serve the pattern of land uses.

## Network layers

The walking and cycling network should incorporate three layers, of which the first two form the primary network:

- a network of off-road paths through open space forming part of the green web (see section *5.4*). (This may include vegetated rural roads converted to greenways – see section *5.6*.) These are primarily for recreational purposes, but may suit some commuter purposes;
- a network of shared walking and cycling paths alongside arterial roads and connector streets, potentially supplemented with on-road cycle lanes. These are primarily for journeys to work and school;
- footpaths and on-road cycling on local streets. A *permeable* grid of local streets (see sections *7.5–7.6* and *8.5*) ensures that traffic levels are compatible with safe cycling. Local streets provide for local movement and access to higher-order walking and cycling networks.

## Crossings, bridges and underpasses

Pedestrian crossings should be provided across busy roads. These should be at surface level unless topography makes bridges or underpasses more convenient, because changes of level can deter use, particularly by people with mobility impairments.

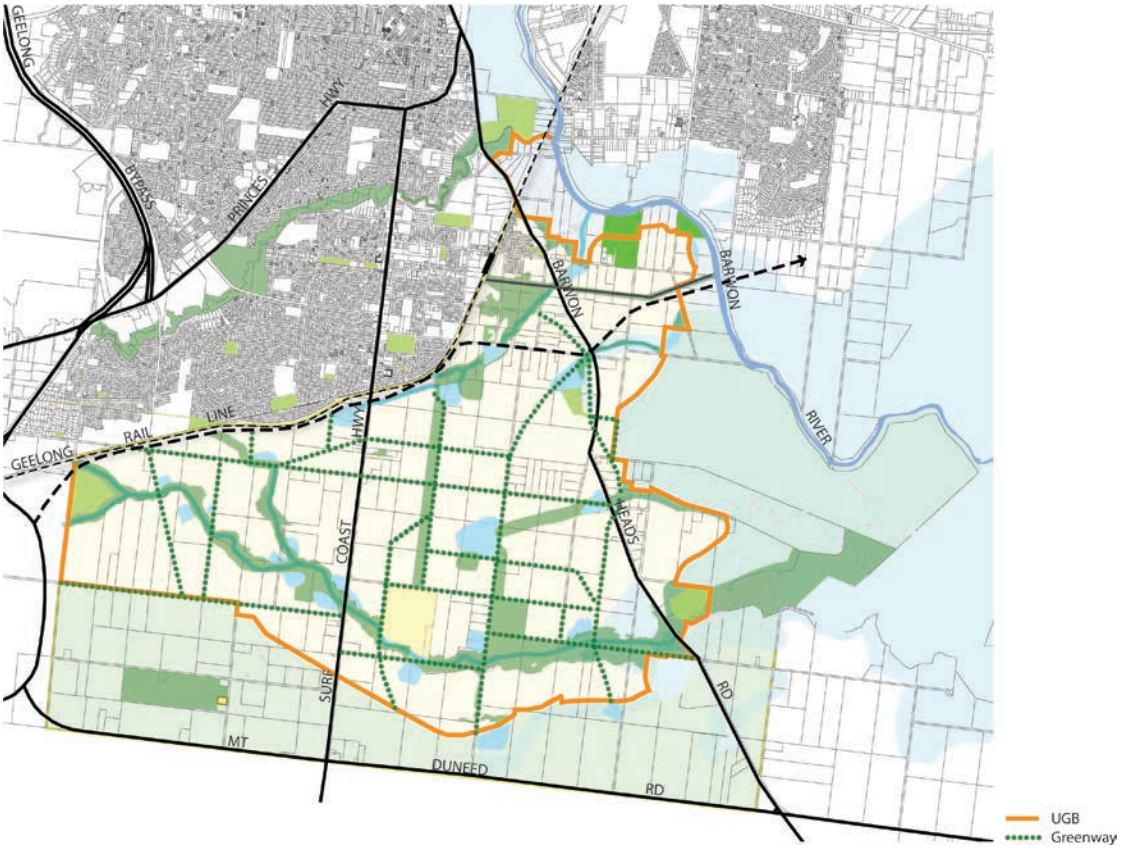
*Shared path through open space.*

*Shared path alongside arterial road.*

Pedestrian and cycle bridges or underpasses should be provided across barriers such as rail lines, motorways and waterways. Bridges are generally preferred unless the barrier is raised above the level of the surrounding land. In order to be safe and inviting, any underpasses should:

- be as short as possible;
- have clear sightlines into and through them;
- be open in character, with generous dimensions and light-coloured finishes;
- incorporate openings in the structure overhead to provide natural daylight and ventilation, where possible;
- be well lit at night.

*Safe and inviting underpass.*




*Greenway network – Armstrong Creek, Geelong.*

## Rules of thumb

- Provide pedestrian and cycle crossings of barriers separating urban areas (e.g. rail lines, motorways and waterways) at least every 400 m.
- Ensure underpasses are at least 3–4 m wide (depending on their length) and have a ceiling height of at least 3 m.

# 5.8 Employment

Employment is fundamental to a balanced urban area. It enables people to work close to home, reducing the environmental, economic and social costs of commuting.

Commercial and community facilities that directly serve residential areas (e.g. schools, shops, local businesses and medical centres) provide important employment opportunities. Home-based businesses provide additional employment. However, this does not provide enough jobs for a residential community.

## Number of jobs

A key decision to be made when planning a growth area is how many jobs are to be provided within it. Only those generated by supporting commercial and community facilities? Enough jobs to match the employment needs of the new community (one job per worker)? Even more jobs, to meet a shortfall in neighbouring areas?

Creating jobs is not simply a question of providing employment land. While residential development provides the demand for schools, shops, local businesses and medical centres, additional employment will occur only if the conditions are attractive to businesses. Employers are attracted to locations with good accessibility to an appropriate labour force and/or to customers. (The only exception to this is some government facilities, which can be located in growth areas to generate employment.) Therefore, if the aim is to provide more jobs than those that directly serve the residential population, an economic development study is needed to identify the likelihood of additional employment land being taken up and, if so, by what types of business.

Maximising the diversity of job types will increase the opportunity for people to work close to home.

## Location

Once the potential for additional employment land has been identified, its preferred location and extent should be determined. This should be guided by the following characteristics.

**All employment areas:**

- large property sizes able to accommodate larger buildings;
- relatively flat land;
- locations where employment can act as a buffer between 'unfriendly' uses (e.g. quarrying) and residential development;
- places less attractive to residential development and less efficient to provide with community services (e.g. a primary school and community hub);
- interfaces between the growth area and undevelopable land, so if take-up is slower than anticipated, the growth area is not adversely affected by gaps in the urban structure and tracts of vacant land.

**Business parks:**

- proximity to a higher-order centre, or proximity to a local centre and good transport links to a higher-order centre;
- proximity to a university or research facilities;
- proximity to higher-order and high-capacity public transport;
- adjacency to one or more main roads, for access and exposure;
- proximity or good transport links to existing employment uses.

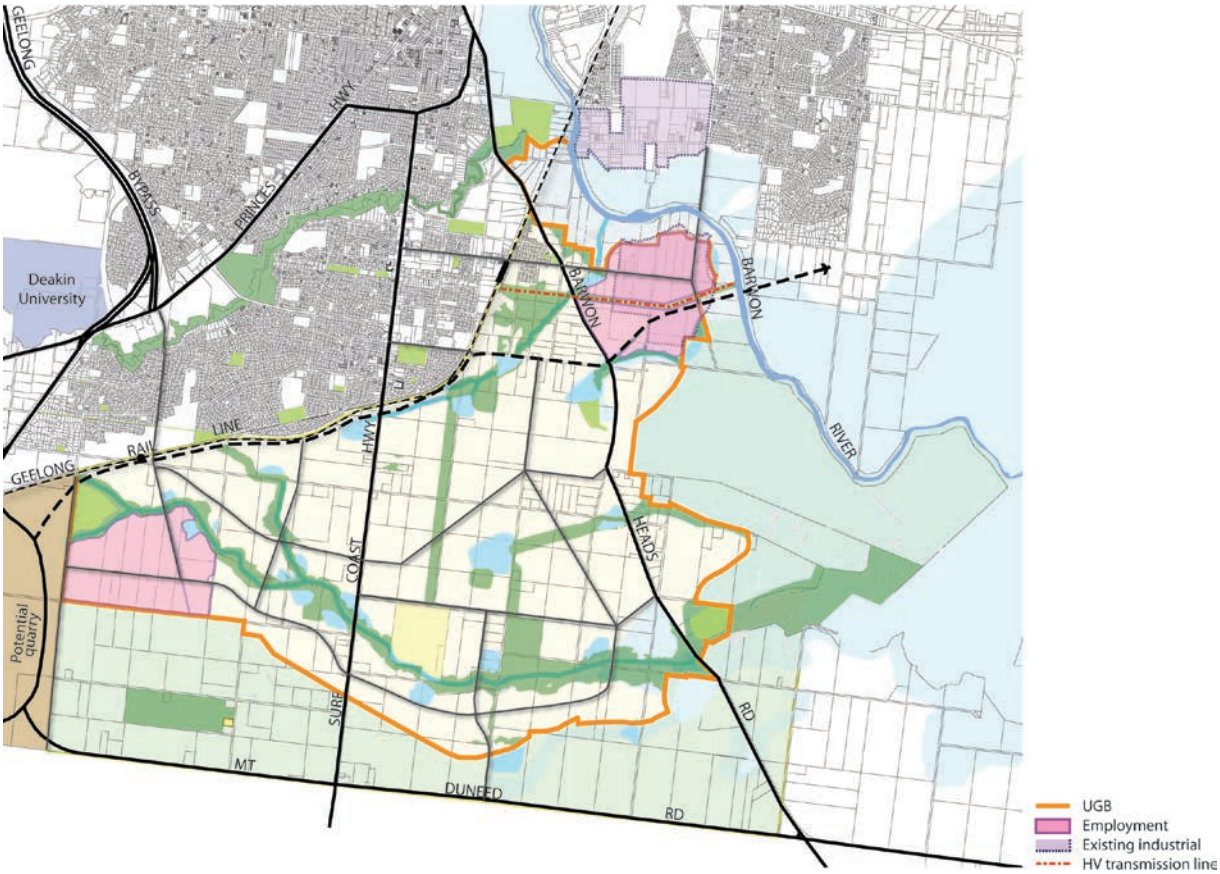
**Industrial and distribution estates:**

- adjacency to a motorway or at least an arterial road, for easy access to a workforce, easy distribution of goods, and exposure;
- access to a freight rail line;
- limited interface with residential areas (unless a light industrial estate).

**Enterprise corridors:**

- along main roads;
- proximity to a larger centre.

(Enterprise corridors are strips of commercial uses along main roads that rely on high levels of exposure, such as showrooms and car yards. They provide a vital part of the employment matrix of cities and should be planned for in new urban areas.)




*Employment areas – Armstrong Creek, Geelong.*

Another way of enabling growth area residents to work close to home is through the provision of telecentres, which provide the services and facilities necessary for a number of people to work remotely from their office, along with opportunities for social interaction. These should be located in a centre.

The preliminary primary movement networks may need to be adjusted to better serve the location of proposed employment areas.

The location of centres is discussed in sections *5.9 Higher-order centres*, *7.2 Local centres* (residential neighbourhoods) and *8.2 Locating amenities and services* (employment precincts).

## Design

See Chapters 6 and 8 for more detail on the design of employment precincts.

# 5.9 Higher-order centres

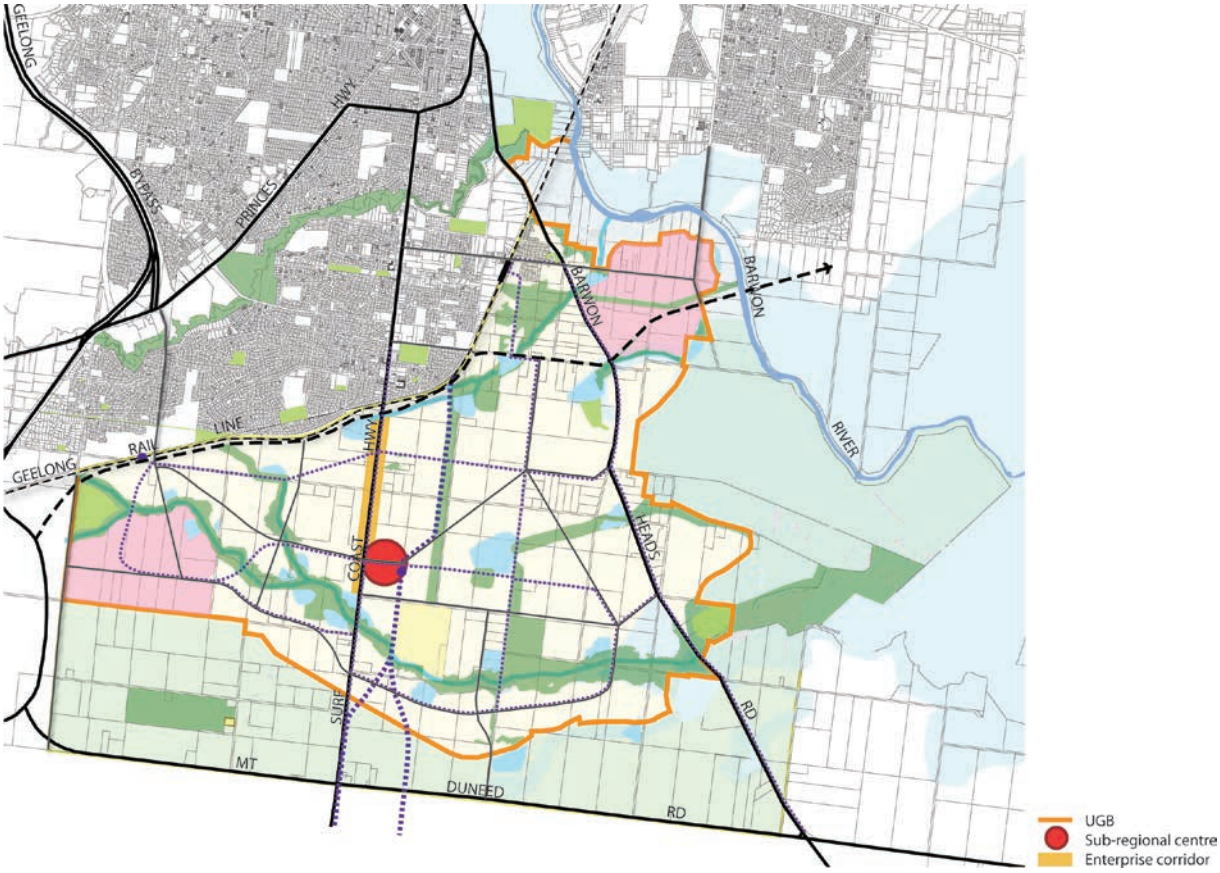
Higher-order centres strengthen the identity and sustainability of growth areas.

Higher-order centres are those that serve more than one neighbourhood. The need for them is determined by analysis of retail and office demand, and community needs. This also identifies the extent of commercial space and civic facilities required. These analyses are based on the estimated residential population (see section *5.3 Land use budget*), and any existing oversupply or shortfall of facilities in the surrounding area.

## Location

Higher-order centres should be located according to the following principles:

- centres containing a significant amount of employment should be located adjacent to higher-order public transport (e.g. a train station or light rail, bus rapid transit or ferry stop) to maximise accessibility for workers;
- larger centres should be located on main roads relatively central to their catchment to maximise their accessibility, facilitate efficient public transport services and avoid drawing traffic through residential neighbourhoods;




*Sub-regional centre location – Armstrong Creek, Geelong.*

- larger centres should be spaced just far enough apart from each other to minimise overlaps between their catchments and avoid poorly served residential areas;
- larger centres should be located at significant natural features (e.g. a hilltop, bay or waterway) that will contribute to their sense of place;
- larger centres should be focused on a connector street, adjacent to an arterial road, to provide the opportunity for an inviting pedestrian environment and on-street parking.

The preliminary alignment of the primary movement networks may need to be adjusted to suit the location of higher-order centres.

## Uses

In addition to shops, services, entertainment and civic facilities that serve more than one neighbourhood, commercial offices and higher-density residential accommodation should be located in and immediately around higher-order centres well served by public transport, in line with the principles of *transit-oriented development*.

## Design

The design of centres is discussed in Chapter 2.

## 5.10 Higher-order community facilities

Socially inclusive growth areas offer easy access to higher-order community facilities. Higher-order community facilities may include:

- regional civic facilities, such as a local government service centre, hospital or large medical centre and allied health services, tertiary education campus, justice precinct, major events facility, arts centre and library;
- places of worship;
- residential aged care facilities;

*Higher-order community facilities.* *Right images: Alastair Campbell.*

- regional recreation facilities, such as a sports ground and indoor leisure and aquatic centres;
- secondary schools and non-government primary schools;
- emergency services stations;
- a cemetery;
- a waste management centre.

The need for these facilities within the growth area will be determined by social and recreation infrastructure needs assessments.

## Location

Regional civic and recreation facilities, secondary and non-government primary schools, and places of worship should all be located where they will be well served by all primary movement networks, and at significant natural features that will contribute to their sense of place. In addition:

- regional civic facilities should be located within or adjacent to higher-order centres (see section *5.9*);
- regional recreation facilities should be located to form part of the green web (see section *5.4*);
- secondary schools should be co-located with regional recreation facilities to facilitate shared use of indoor and outdoor sporting facilities.

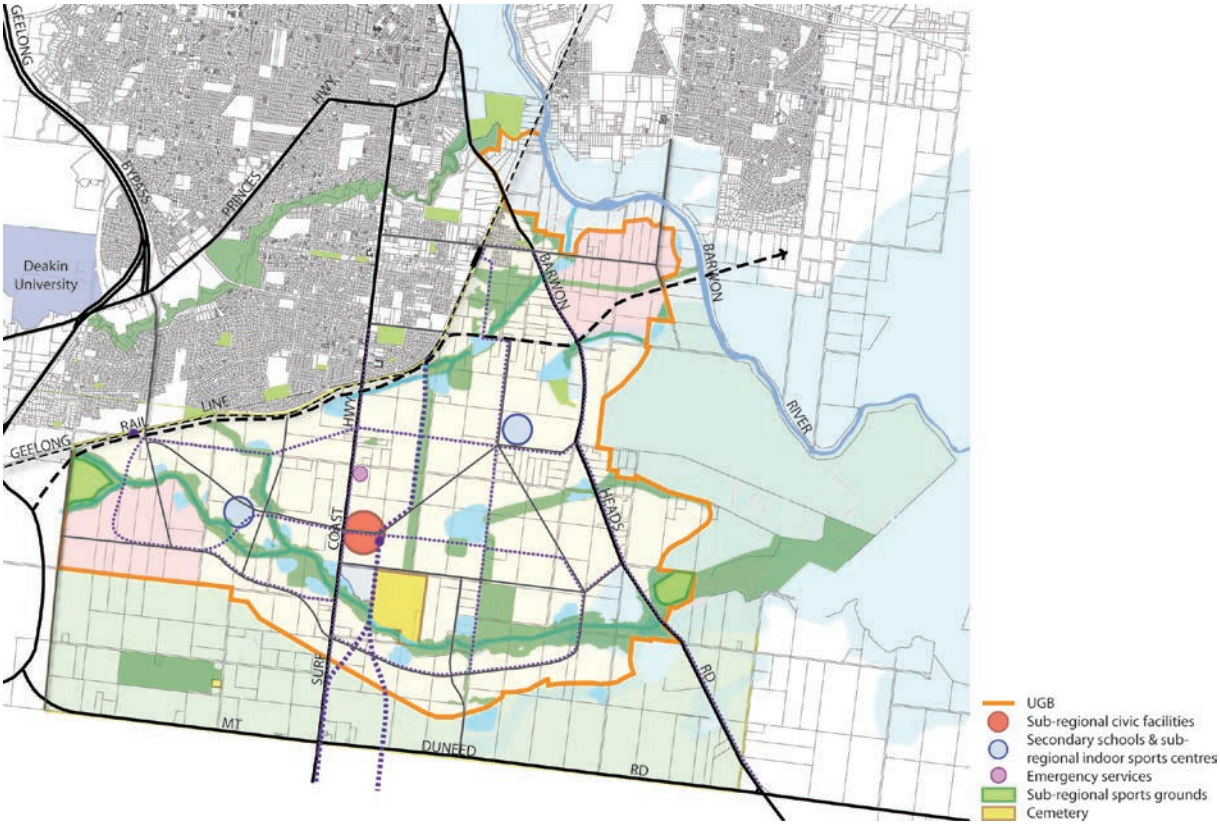
Residential aged care facilities should be located close to a local centre and public transport to provide convenient access for able residents.

Emergency services should be located central to their catchment and with excellent access to the road network, away from areas of likely congestion such as higher-order centres or employment precincts.

Cemeteries should be considered as part of the open space network, as they are valuable areas of passive recreation. They should form part of the green web (see section *5.4 Green infrastructure*). Ideally, they should be located at or just outside a permanent urban edge where there is an attractive setting for contemplation. The same factors that lead to land being left undeveloped (see section *5.1 Development area*) preclude cemeteries, except cost of servicing and scenic values. Cemeteries should not be located near sources of potable water.

Waste management centres should be located in industrial areas.

The preliminary configuration of the primary movement networks should be adjusted to support higher-order community facilities.




*Higher-order community facilities – Armstrong Creek, Geelong.*

# 5.11 Walkable neighbourhoods

Walkable neighbourhoods are the basic building blocks of sustainable and liveable growth areas.

Walkable neighbourhoods are areas of residential development large enough to support the provision of most weekly and daily needs – basic convenience shops and services, a primary school, essential community and health services, and local parks – but compact enough that it is possible to walk comfortably from any part of the neighbourhood to those daily needs if centrally located.

Once the areas of green infrastructure, employment and higher-order facilities have been allocated (see sections *5.4* and *5.8–5.10*), the remaining land should be divided into walkable neighbourhoods.

## Benefits

By enabling people to walk (or cycle) to meet their daily needs, walkable neighbourhoods:

- reduce car dependency and, therefore, the social exclusion of those not able to drive or without access to a car;
- foster community spirit or social cohesion and capital through increased social interaction between the residents in a neighbourhood;
- improve personal health, through increased physical exercise;
- improve personal security in the *public realm*, through more 'eyes on the street';
- reduce the environmental, economic and health impacts of car use.

Walkable neighbourhoods also foster a sense of community and a sense of belonging by providing clear definition of local places.

## Location

Wherever possible, walkable neighbourhoods should not straddle large open spaces or features that create barriers to local movement such as rail lines, escarpments, broad waterways, water bodies, and wide and high-speed arterial roads. Instead, these features should be used to define the edge of neighbourhoods to reinforce their individual and unique identities. Otherwise, there need not be strongly defined boundaries between neighbourhoods.

### Rules of thumb

Divide residential land into compact neighbourhoods up to a maximum breadth of ~1.6 km in any direction (preferably closer to half that). This ensures centrally located facilities are no more than a 10 minute walk (~800 m) from the majority of the neighbourhood, which is the maximum most people are willing to walk to reach local facilities even if it is a pleasant journey.

At contemporary residential densities, neighbourhoods sized on this basis can contain up to ~3000 dwellings or 7500 people. This provides sufficient catchment to support a primary school, a community hub of maternal and child, family and youth support services, and local shops including a medium-sized supermarket and several convenience shops and services. Neighbourhoods with a significantly smaller area need higher densities to be able to support local facilities. (Additional patronage for shops can be provided by passing trade on a busy road, although this inevitably reduces the patronage of one or more other centres.)

Walkable neighbourhoods should be centred on one or (preferably) more connector streets and, ideally, the primary public transport network, to support centrally located shops and services. This may require an adjustment in the preliminary primary public transport and road networks.

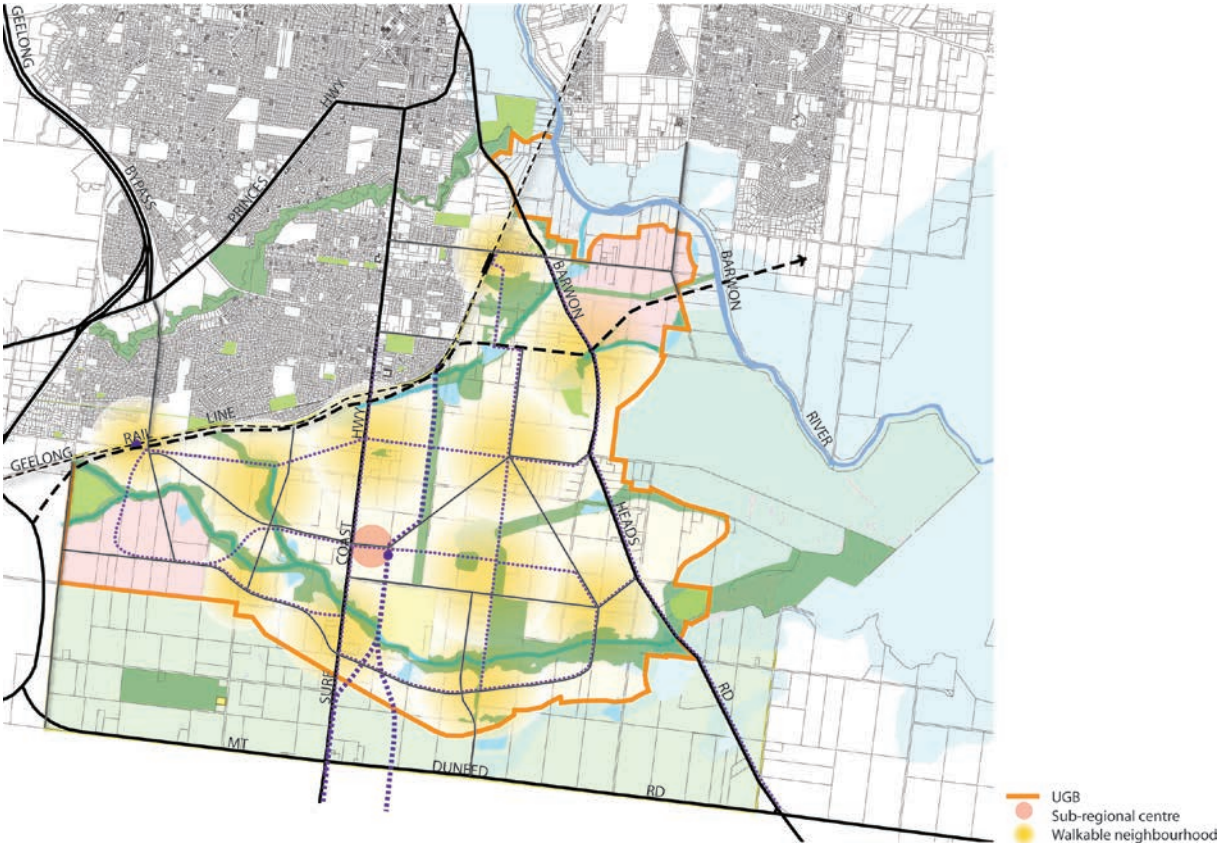
Where the growth area abuts an incomplete neighbourhood (one that is not large enough to support the provision of daily needs) it should be structured to complete that neighbourhood.

## Residential densities

Minimum average residential densities should be prescribed in order to ensure catchment thresholds are reached for higher-order facilities and services, including public transport. Typically, higher densities are sought close to higher-order centres and public transport opportunities (e.g. train stations), to maximise the number of people within walking distance of them, to support local shops and services (including public transport) and to support more vibrant environments (see *transit-oriented development*). This contributes to the creation of distinctive neighbourhoods.

## Design

The design of an individual residential neighbourhood is addressed in Chapters 6 and 7.




*Walkable neighbourhoods – Armstrong Creek, Geelong.*

# 5.12 Arterial boulevards

*Poor arterial road.*

Conventional, engineering-driven arterial road design begets poor urban design outcomes.

Characterised by a single, broad road pavement relieved, at best, by a concrete median, with little or no access between widely spaced intersections, conventional arterial road design:

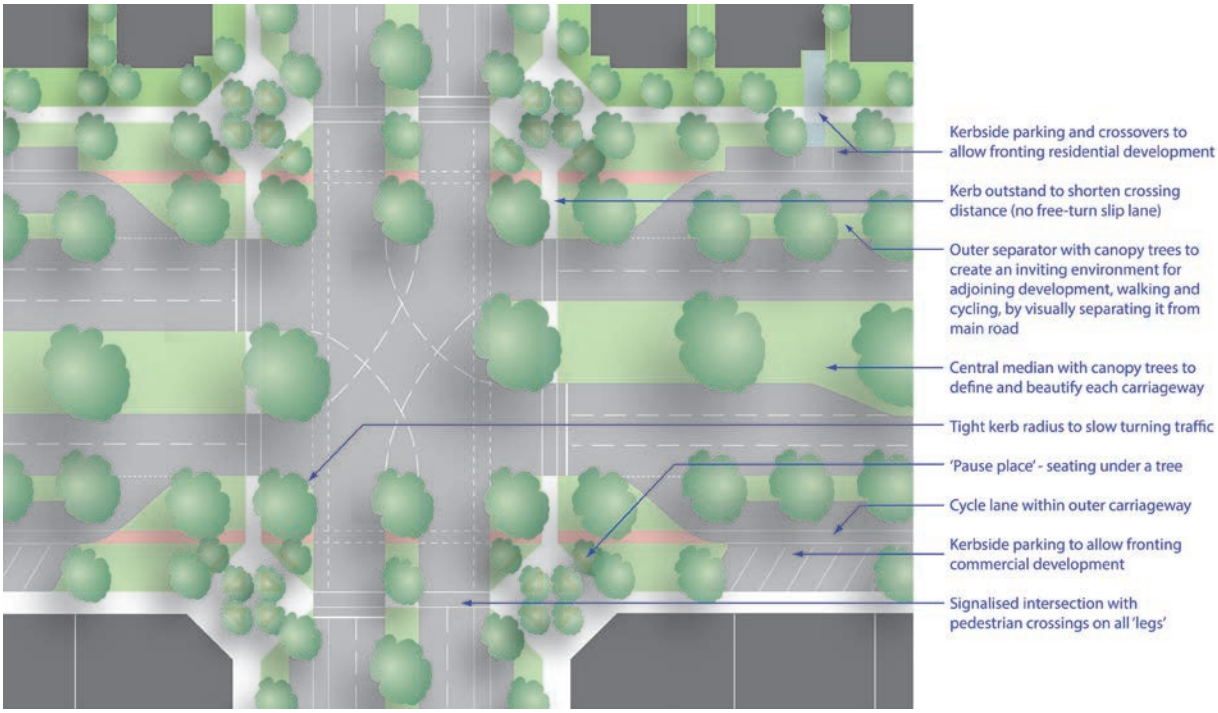
- provides an uninviting environment for pedestrians and cyclists, particularly at intersections, and an unattractive experience for vehicle drivers and passengers;
- creates a barrier to people seeking to cross the road (by whatever mode of travel), segregating communities and people from facilities;
- limits the ability of people to enter or exit the road;
- precludes development from fronting the road, which represents a lost economic opportunity and missed potential for a more visually and socially interesting experience.

## Boulevards

*Boulevard.*

There is an alternative design for heavily trafficked arterial roads, commonly referred to as a boulevard, which should be adopted where possible. The key difference of the boulevard is that it incorporates raised outer separators and sometimes a broad central median, which divide the road pavement into separate carriageways. The separators and median are wide enough to allow for large canopy trees, beautifying the road, providing stronger spatial definition and visually separating adjoining development from through traffic. They can also accommodate dedicated public transport corridors and provide staging posts for crossing pedestrians.

Importantly, outer separators divide traffic into two carriageways in each direction – an inner carriageway for through traffic, and an outer carriageway for local traffic. As the outer carriageway is only for local traffic, it can be designed like a local street rather than an arterial road. In particular, it can have kerbside parking and footpath crossovers (or crossings), allowing it to be fronted by development. This is particularly valuable for enterprise corridors (see section *5.8 Employment*). The increased distance of properties from the central carriageway also reduces




*Key elements of boulevard design.*

traffic impacts such as noise and safety concerns, which enhances their suitability for residential purposes. An outer carriageway is not necessary where the road borders a large open space, unless it is needed for parking.

Trees on the outer separator define a separate, more intimate space for the outer carriageway. The combination of development frontages, kerbside parking and a more intimate space creates an inviting environment for walking, cycling and social interaction. Local streets can connect to the outer carriageways, minimising the barrier effect of the main road.

An additional benefit of boulevards over conventional arterial roads is that their distinctly different design enhances the legibility of the growth area by emphasising the street hierarchy. This can be further reinforced by giving them a formal character through measures such as regular tree planting, and consistent kerblines and built form.

## Intersections

Where boulevards intersect with other main roads, their design should limit any barrier effect by:

- minimising the road pavement width;
- incorporating signals (rather than roundabouts) with pedestrian crossings on all 'legs' of the intersection, to assist crossing pedestrians and cyclists;
- avoiding free-turn slip lanes;
- avoiding grade separations unless absolutely necessary, because they blight the surrounding land through their visual impact and restrictions on access.

# 5.13 High-voltage power lines

Great care is needed around high-voltage power lines. The electromagnetic radiation emitted by overhead high-voltage electricity transmission lines (greater than 200-kV) can be harmful to the health of those who are exposed to it on a regular basis.

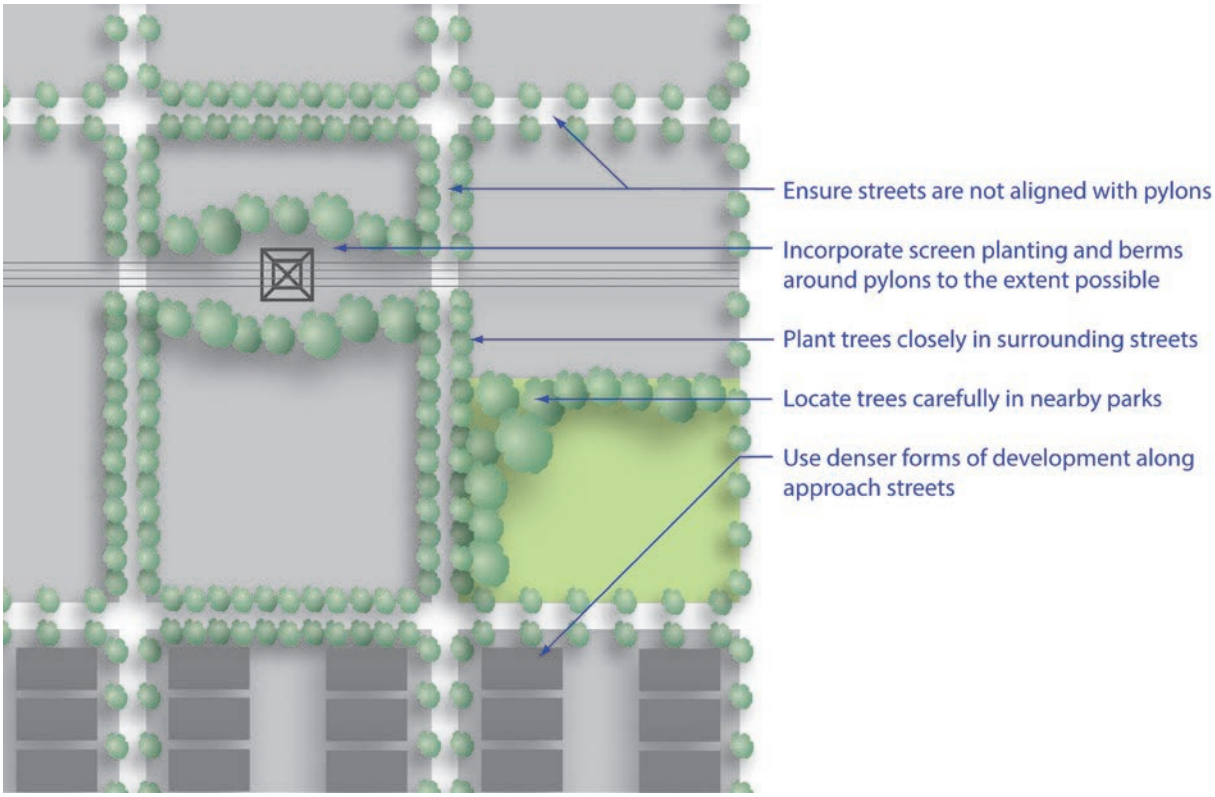
One solution is to preclude sensitive development (principally dwellings, schools and hospitals) from being within a certain distance of the lines. The buffer distance depends on details such as the voltage, number of circuits, configuration of conductors and so on.

## Ameliorating visual impact

Where existing overhead high-voltage power lines are to remain in urban growth areas, they can be accommodated within the open space network or incorporated into larger industrial or rural residential lots. Their visual impact is mainly caused by the pylons that support them. The visual impact of pylons can be minimised by:

- ensuring streets and off-street paths are not aligned with them for some distance from the power lines;
- incorporating screen planting and berms around them as much as possible within the planting restrictions imposed in high-voltage power easements;
- locating trees carefully in surrounding streets and open spaces to screen them in longer views;
- using denser forms of development, such as attached two-storey townhouses, to screen views of them.

*Vegetation screening pylons.* *Image: Alastair Campbell.*




*Techniques for screening pylons.*

## 5.14 Staging

Identifying a preferred development sequence helps to ensure orderly growth. Staging is generally driven by efficient infrastructure provision and expediting the creation of sufficient critical mass to support essential transport and social infrastructure.

The preferred staging of urban growth should be based on the following principles.

**Community infrastructure** (schools, kindergartens, childcare centres, community hubs, public transport and public open space)**:**

- early development should occur close to existing community infrastructure, to maximise the accessibility of services until new facilities can be sustained and to complete existing catchments;
- subsequent stages of development should extend from previous stages to provide access to community services until the new neighbourhoods are big enough to support their own;
- development should be focused in a small number of neighbourhoods at any time, to minimise the time taken to grow whole neighbourhoods and reach the level of support necessary to sustain retail, community and public transport services;
- new community infrastructure should be provided as early as possible, to ensure new residents are not socially excluded, establish a sense of community and instigate a habit of using local services (particularly public transport).

**Roads:**

- development should begin close to existing arterial roads and grow away from them, to provide good accessibility and minimise upfront investment in new roads.

**Drainage infrastructure:**

- early development should capitalise on existing drainage infrastructure to minimise upfront investment in new infrastructure;
- in areas where major new stormwater management infrastructure is required before development can commence, development within its catchment should be developed in as short a period as possible, to expedite financial contributions from the developer(s).

**Utility services infrastructure:**

- development should extend out from existing urban areas to minimise the upfront cost of major utility services.

**Housing market:**

- there should be multiple residential development fronts, to provide competition between housing developers and builders and increase the rate of housing supply;
- a range of housing types and price points should be provided at all stages to appeal to as many sectors of the market as possible, while delaying the release of sites for housing types that rely on a more advanced market (e.g. medium-density housing) until local demand for them has developed.

**Identity:**

- development should be staged to expedite the creation of a distinct identity for the new community;

- where a new higher-order centre is planned, development should be staged to provide support for its first stage as soon as possible, in order to quickly establish a focus for the new community.

**Employment land:**

- employment areas should be staged to maintain flexibility over the final boundary between them and adjoining residential development.

**Land ownership:**

- early development stages should be located on land in larger ownership parcels, to facilitate more comprehensively master planned development and allow time for fragmented land to be amalgamated for later stages.

**Rezoning and land release:**

- no more than 15 years' supply of residential land should be rezoned at any one time, to avoid flooding the market with lots.

Some of the principles set out above may conflict with each other. In particular, the principles to do with locating early development close to existing community infrastructure and public transport may conflict with those to do with establishing a new identity for the community. Therefore, identifying the preferred staging strategy may require the balancing of different factors.

## Out-of-sequence development

Flexibility should be maintained for variation from the preferred staging strategy to respond to emerging opportunities such as land amalgamation or a developer with a long-range vision. In particular, most of the principles to do with utilising established infrastructure can be overcome by a developer willing to fund physical and community infrastructure (including public transport services) upfront, allowing out-of-sequence development in more distant parts of the growth area.


*Indicative staging – Armstrong Creek, Geelong.*

## 5.15 Checklist

- Has all the non-developable land within the growth area been identified? (See section 5.1.)
- Has a unique vision been developed? (See section 5.2.)
- Has a land use budget been carefully calculated? (See section 5.3.)
- Have all green infrastructure components been appropriately planned for? (See section 5.4.)
- Has public transport been comprehensively planned? (See section 5.5.)
- Has a primary road network been designed that will contribute to sense of place and that balances efficient access and the avoidance of barriers? (See section 5.6.)
- Has a comprehensive walking and cycling network been provided for? (See section 5.7.)
- Has the provision of employment been appropriately considered? (See section 5.8.)
- Have any higher-order centres and community facilities been appropriately located? (See sections 5.9–5.10.)
- Has the residential land been organised into walkable neighbourhoods? (See section 5.11.)
- Have arterial roads been designed as integrated urban roads? (See section 5.12.)
- Has the visual mitigation of high-voltage power lines been considered? (See section 5.13.)
- Has an appropriate preferred staging strategy been defined? (See section 5.14.)

# Precinct structure plans

## 6.0 Introduction

Precinct structure plans oversee the creation of new urban districts. They define the *urban structure* for clusters of greenfield residential neighbourhoods and/or employment precincts, within the development area, broad land use pattern, neighbourhood structure and higher-order transport infrastructure defined by a growth area framework (see Chapter *5 Urban growth frameworks*).

This chapter explains how to design or assess the networks that provide the overarching structure of greenfield developments – stormwater management, primary streets and primary open space. But first, guidance is provided on undertaking context and site analysis.

The concepts outlined in this chapter are largely common to residential and employment developments. Chapters 7 and 8 provide more detailed guidance specific to the master planning of residential and employment areas. Along with the overarching networks outlined in this chapter, the higher-level elements of Chapters 7 and 8 complete the urban structure that makes up a precinct structure plan.

### Hume Country Estate

Some of the design principles in this chapter are illustrated by a plan for the Hume Country Estate. The Hume Country Estate is a new residential neighbourhood in the north-western suburbs of Albury, Australia. The plan was designed by David Lock Associates.

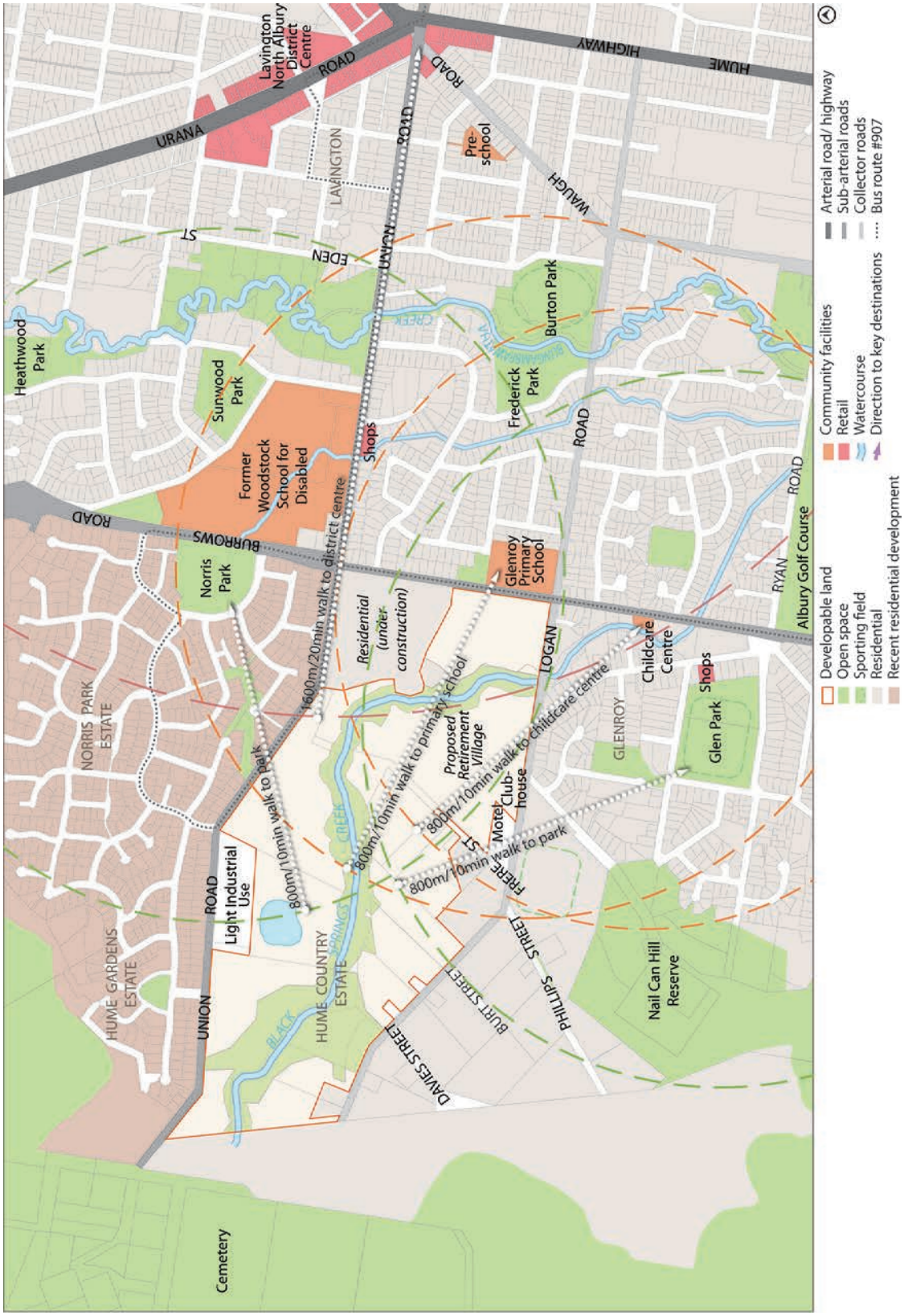
## 6.1 Context analysis

Comprehensive context analysis is the springboard for a successful master plan. The key features of the site's context must be understood to enable development to capitalise on the opportunities and tackle the challenges inherent in its setting.

The following features of the site's context should be identified and mapped:

- the closest *centre*s to the site of each type (i.e. the nearest local, district and regional centre);
- the closest schools of each type to the site;[1]
- the closest community facilities (e.g. community and child care centres) of each type to the site;
- the closest medical centres and clinics to the site;[1]
- the closest parks to the site of each type (e.g. local park, neighbourhood playing fields, regional park);[1]
- any other significant destinations close to the site, such as a university, hospital or employment area;
- the broad pattern of land uses near the site;
- indicative *walkable catchment*s around the centres, schools and community facilities identified above, represented by a circle with an 800 m radius;[1]
- major visual *landmark*s, such as hills, ridgelines or distinctive buildings;
- waterways near the site;
- the pattern of roads around the site;
- public transport services within walking distance of the site;
- cycling routes near the site (including on-road cycle lanes and off-road paths);
- nearby uses that require environmental buffers, such as airports, quarries and broiler farms.[1]

[1] These analyses are only required for developments incorporating residential uses.




*Context analysis – Hume Country Estate, Albury.*

## 6.2 Site analysis

A thorough site analysis reveals the *sense of place* inherent in the land. It also uncovers constraints that need to be addressed and, potentially, turned to advantage by the master plan.

The following features of the site should be identified and mapped:

- property boundaries and ownership;
- orientation (north point);
- topography, including high points, ridges, low points, valleys, particularly steep slopes[2] and flat areas;
- water bodies, waterways and drainage lines;
- flood-prone land;[2]
- prevailing summer and winter winds;
- key views and vistas;
- important habitat for flora or fauna;[2]
- location and species of other trees in reasonable health and with aesthetic or amenity value (unless they are considered weeds);
- historic use and development of the site;
- places of cultural heritage importance;[2]
- any other structures that may form a positive feature of the new development;
- contaminated land;[2]
- high-voltage power lines;[2]
- all vehicular and pedestrian/cycle access points, and whether they are major or minor roads or paths;
- roads and paths;
- land required for road widening or other purposes;
- rail lines;
- easements;
- fuel pipelines;
- utility services available to the site and trunk services within the site;
- the uses and subdivision pattern immediately abutting the site on all sides.

Site analysis requires a range of technical studies. These may include a features and levels survey, a flora and fauna study, an arboricultural study, a heritage study and a building condition survey. If the development forms part of a larger urban growth area, some or all of these studies may already have been undertaken. In that case, all that is required is to draw together the relevant information from those documents.

[2] This land will usually have already been identified and removed from the development area. However, any isolated pockets within the site should be identified so that the design can respond appropriately.


*Site analysis – Hume Country Estate, Albury.*

# 6.3 Stormwater management

The laws of nature dictate that stormwater management is a major determinant of urban structure.

Best practice in urban stormwater management – labelled *water sensitive urban design* (WSUD) – seeks to minimise the impact of urban development on the quality, quantity and flow rate of water in the natural water cycle. Depending on the climate and ground conditions, this may involve stormwater reuse, existing and new natural waterways (including riparian corridors to protect their environmental integrity), retention and detention basins, wetlands, swales in lower-density areas and rainwater tanks. This approach removes or at least reduces the need for expensive stormwater drains.

## Layout

The design of the stormwater management system is the job of a hydraulic engineer. However, the location of its elements is largely determined by topography – waterways following valleys and drainage lines, and retention and detention basins and wetlands at the bottom of catchments, and sometimes along the drainage line too. This helps development to express the underlying topography of the site, which is part of its inherent place identity.


*Stormwater drainage system – Hume Country Estate, Albury.*

The size of stormwater management elements is determined by stormwater modelling. However, their location and shape may be adjusted later in the design process to better suit the movement network and land use pattern.

## Benefits

Existing and introduced waterways and water bodies form part of the open space network, which is a key structuring element of greenfield development. With good design, their value goes well beyond drainage to include:

- attractive focal points and passive open space opportunities for the community;
- recreation trails, particularly where linked to other linear open spaces to form complete circuits;
- valuable habitat for flora and fauna, when designed in an ecologically sensitive way;
- access to nature, including a resource for education about natural processes.

*Wetlands can provide attractive recreation spaces.*

# 6.4 Primary street network

Major streets form an indelible and highly influential organising element of urban areas.

The varying roles and character of major streets create a movement hierarchy. In broad terms:

- **arterial roads** provide connections across a region;
- **connector streets** (sometimes called collector or distributor roads) provide the main thoroughfares within residential neighbourhoods or employment precincts, and connect adjoining neighbourhoods;
- **local streets** provide access to individual properties.

Arterial roads tend to divide areas into separate neighbourhoods or precincts. Their alignment is usually determined by a broader urban growth framework (see section *5.6 Primary road network*).

Local street networks in residential neighbourhoods are discussed in sections *7.5–7.9* and local street networks in employment areas are discussed in sections *8.5–8.6*.

## Connector streets

Connector streets are important elements of the urban structure because they link residential and employment areas to key destinations such as train stations, centres, schools and parks. As they carry more traffic (of all modes) than local streets, connector streets also have a significant influence on the overall *legibility* and identity of the area. In employment areas, connector streets spanning the development will typically become the premium corporate address within the precinct, because they are the easiest to find and have the greatest exposure to passing traffic.

Sites that are less than 800 m across may not need a connector street, depending on the presence of existing or planned connector streets close to their edges and easily accessible from within the site.

## Layout

The following process should be used to establish or assess a network of connector streets.

1. Identify any existing roads within the site that are already connector streets or that could be upgraded to become connector streets. These roads should form part of the new primary street network to capitalise on existing infrastructure, provide a link to the site's history and enable the retention of any vegetation alongside them. However, rural roads may be better suited to becoming local streets or even 'greenways' dedicated to walking and cycling, in order to retain their vegetation. Historic but vanished road alignments should also be considered.
2. Identify any additional site access points that provide the most direct routes to nearby facilities. Ignore any connections to surrounding streets that are unable to accommodate significant additional traffic (particularly trucks generated by employment areas) or that cannot be upgraded to cater for it. Where there is non-urban land beyond the site that is likely to be developed in the future, identify potential access points into that land too.


*Step 1 – Identify existing connector streets.*


*Step 2 – Identify additional access points.*

3 Define preliminary connector street alignments that join the access points identified above on opposite sides of the site, using existing roads where appropriate. Where these routes form the continuation of existing streets beyond the site, they should maintain a generally similar alignment where possible, to contribute to their legibility.

4 Refine the preliminary connector street network to ensure that, along with nearby connector streets and arterial roads, it provides a grid of routes within a comfortable walking distance of the majority of the site. Apart from ensuring good and *legible* vehicle and bicycle access to the main street network, this enables it to provide a convenient public transport service through accessible bus routes. This step may require the addition of new connector streets, the downgrading of previously identified connector streets to local streets or their realignment, to create a more regular grid, particularly where the site has an extensive abuttal to a non-urban area which offers no opportunity for access or likelihood of future development. However, logical connections between main roads on either side of the site should be maintained.

## Rule of thumb

Space connector streets and arterial roads a maximum of ~800 m apart in each direction, and ~400 m from barriers such as rail lines, waterways and motorways. This ensures they are within around 400 m of any part of the site, the maximum distance most people will walk to a bus (about a five-minute walk). In employment areas, where the density of workers is low, the lesser viability of bus services combined with larger lot sizes means that an arterial road and connector street spacing of closer to 1600 m may be more appropriate.


*Step 3 – Define preliminary connector street alignments.*


*Step 4 – Refine alignments to form a relatively regular grid.*

5 Adjust the connector streets to respond to key natural or introduced features within the site where this is possible without substantially departing from their alignment. Ridges, hilltops, valleys, waterways, water bodies, parks, significant trees, distinguished old buildings and so on form memorable features that help to create a distinctive and legible place. Aligning connector streets with them maximises their *placemaking* benefit. Intersecting connector streets at key features creates an even more memorable place. Similarly, the benefits of key views can be maximised by aligning connector streets with them. Responding to topography avoids the dull visual experience created by long straight streets. In employment areas containing factories and warehouses, the benefits of non-orthogonal connector street alignments in contributing to a distinctive sense of place should be weighed against the need to provide large and regularly shaped lots.

6 Where a connector street crosses a rail line, waterway or motorway, consider refining its alignment to take advantage of a natural rise or valley that would minimise its vertical deflection, such as where the rail line or waterway is in a cutting.

7 In locations where strong winds are common, consider varying the alignment of connector streets away from the direction of the prevailing wind to mitigate its effect.

The alignment of connector streets may be adjusted later in the design process to better suit the detailed design of the development.


*Step 5 – Respond to natural and introduced features.*


*Step 6 – Refine crossing alignments.*


*Step 7 – Align streets away from strong winds.*

# 6.5 Primary open space network

Open space is the 'lungs' of urban development. It is as critical to urban health as breathing is to human health. Vegetated open space cleans the air and facilitates enhanced physical and mental wellbeing.

The primary open space network is a key organising feature of greenfield development. It is formed by larger areas of undeveloped land and linear open spaces connecting them. The overarching structure of open space in a growth area is discussed in section *5.4 Green infrastructure*. Local parks in residential subdivisions are discussed in sections *7.16–7.17* and local parks in employment precincts are addressed in section *8.8*.

## Types of open space

The primary open space network can be divided into land whose primary purpose is for recreation and land that is left undeveloped for another reason. Larger recreation spaces include:

- regional parks;
- district parks such as sports fields and courts;
- school playing fields.

Other reasons why land may be left undeveloped include:

- stormwater management;
- natural values, such as flora and fauna conservation (including riparian corridors along waterways), heritage conservation, groundwater recharge and landscape character;
- land capability factors, such as slope or the potential for flooding (see section *5.1 Development area*);
- local food production.

Where appropriate, these areas should be designed for recreation too.

## Need for parks

The need for larger parks will usually be determined by a broader urban growth framework, a regional or municipal open space strategy, statutory planning controls and/or the market position sought by the developer(s).

The broad 'green web' defined by the urban growth framework should be refined in response to the site analysis (see section *6.2*), stormwater management system (see section *6.3*), the primary street network (see section *6.4*) and any open space strategy. The refined primary open space network should remain consistent with the principles outlined in section *5.4 Green infrastructure*. In particular, additional open spaces should form part of an interconnected network. Now that connector streets have been defined, consideration should be given to:

- linking open spaces through the use of overlapping broad canopies along major streets with generous paths beneath;
- placing parks on connector streets (particularly intersections of connector streets) to maximise their accessibility.


*Primary open space – Gordons Rd, South Morang.*

## Rule of thumb

Dedicate at least 10% of the site area as public open space (including local parks). This may be reduced where there is easily accessible public open space near the site. In purely employment precincts, 2% may be sufficient.

## 6.6 Checklist

- Has a comprehensive context analysis been undertaken? (See section 6.1.)
- Has a comprehensive site analysis been undertaken? (See section 6.2.)
- Has a stormwater management system been designed with a view to its potential placemaking, recreation, habitat and education value? (See section 6.3.)
- Has a primary street network been designed that maximises connectivity and considers its placemaking value? (See section 6.4.)
- Has a primary open space network been designed that provides appropriately for recreation and active transport, contributes to placemaking and considers topography? (See section 6.5.)

# Residential neighbourhoods

## 7.0 Introduction

Residential neighbourhoods make up the majority of a town or city. They are where people spend most time. This elevates the importance of their design.

Residential neighbourhoods primarily comprise homes. However, good neighbourhoods also contain local facilities such as a school, convenience shops and community centres.

This chapter explains how to design or assess plans for new residential areas large enough to require several new streets. It provides advice on the design of the land use pattern, the configuration of the local street network, and the detailed design of streets, parks, lots, houses and gardens.

This chapter assumes that the development area, broad land uses, neighbourhood structure and higher-order transport infrastructure have already been defined by a growth area framework (see Chapter *5 Urban growth frameworks*). The master planning of a residential neighbourhood should commence with context and site analysis, and the delineation of the overarching organising features of greenfield development – the primary stormwater management, street and open space networks – as outlined in Chapter *6 Precinct structure plans*.

### Tower Hill

The design principles in this chapter are illustrated by the plan for the Tower Hill development. Tower Hill is a new residential neighbourhood in Swan Hill, Australia. The plan was designed by David Lock Associates.

# 7.1 Community facilities

Local community facilities form neighbourhood focal points. The way in which local residents bump into each other at community facilities creates a sense of community and belonging.

Community facilities include schools, kindergartens, community centres, health centres, childcare centres, and sports grounds and clubs. The location of all new community facilities should take into account existing community facilities near the site and their *walkable catchment*s (see section *6.1 Context analysis*). New facilities should be located to minimise the overlapping of catchments.

## Primary schools

*Primary schools are important neighbourhood structuring elements.*

Of all local facilities, primary schools are the most important structurally. They generate two trips every weekday from households with primary school-age children. Residential neighbourhoods should be designed to facilitate walking or cycling to school for environmental, social, safety, health and developmental reasons. This is best achieved by locating schools centrally within their catchment (and ensuring catchments are not dissected by arterial roads), so that the greatest number of children are within a comfortable walking or cycling distance.

The location of primary schools should be considered in tandem with the design of the stormwater management, open space and connector street networks, to reinforce their accessibility by all travel modes and to contribute to a distinctive *sense of place*.

*Village greens act as a community focal point.*

## Neighbourhood green

A 'village green' should be located centrally within the neighbourhood to act as a focal point for the community. Its contribution to social cohesion can be reinforced by sports fields and courts, associated clubhouses and a community garden.

Playing fields should be co-located with primary schools to facilitate shared use, and located on relatively flat ground. Where the broader open space strategy proposes sharing of sports grounds between neighbourhoods, they should form a seam between the neighbourhoods.

## Pre-school

Pre-school centres, kindergartens and childcare centres should also be co-located with primary schools and/or local parks to enable trip-combining for school and kindergarten drop-off.

*Kindergartens and childcare centres should be co-located with primary schools and/or local parks.*

## Community hubs

Best practice in community service provision is to provide multipurpose community hubs. Typically, these offer maternal and child health nurses, family and youth services, and community meeting rooms.

The clustering of community facilities and services enables:

- joint use of facilities;
- trip-combining;
- development of social networks and cohesion;
- coordinated provision of services to children and families;
- reduced isolation of staff;
- more flexible and efficient use of space.

Distinguished old buildings can form memorable homes for community hubs.

## Integration with centres

Integrating local community facilities with a local *centre* creates a stronger and more diverse focal point for the community, and facilitates trip-combining. The location of local centres is discussed in section *7.2 Local centres*.

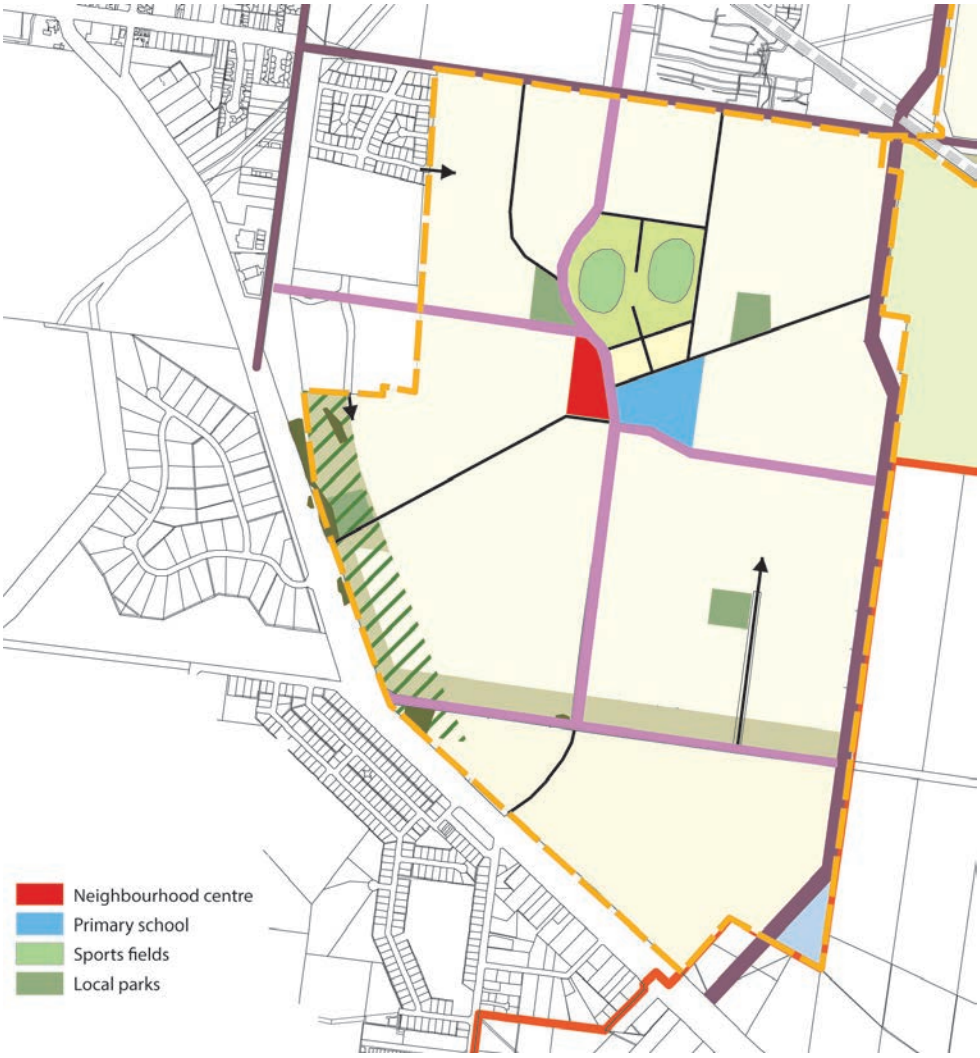
# 7.2 Local centres

Local centres are key neighbourhood-shapers. Like community facilities, they act as focal points for activity and social interaction, fostering a sense of community.

A local centre containing convenience shops and services should be provided within each neighbourhood to minimise the need to travel for daily provisions.

## Location

The broad location of local centres is usually established by a strategic plan, such as an urban growth framework (see Chapter *5 Urban growth frameworks*). However, the specific location of a local centre is determined as part of the master planning of its neighbourhood. The careful location of a local centre is important not only for the economic viability of its businesses, but also to maximise its contribution to the sense of community.

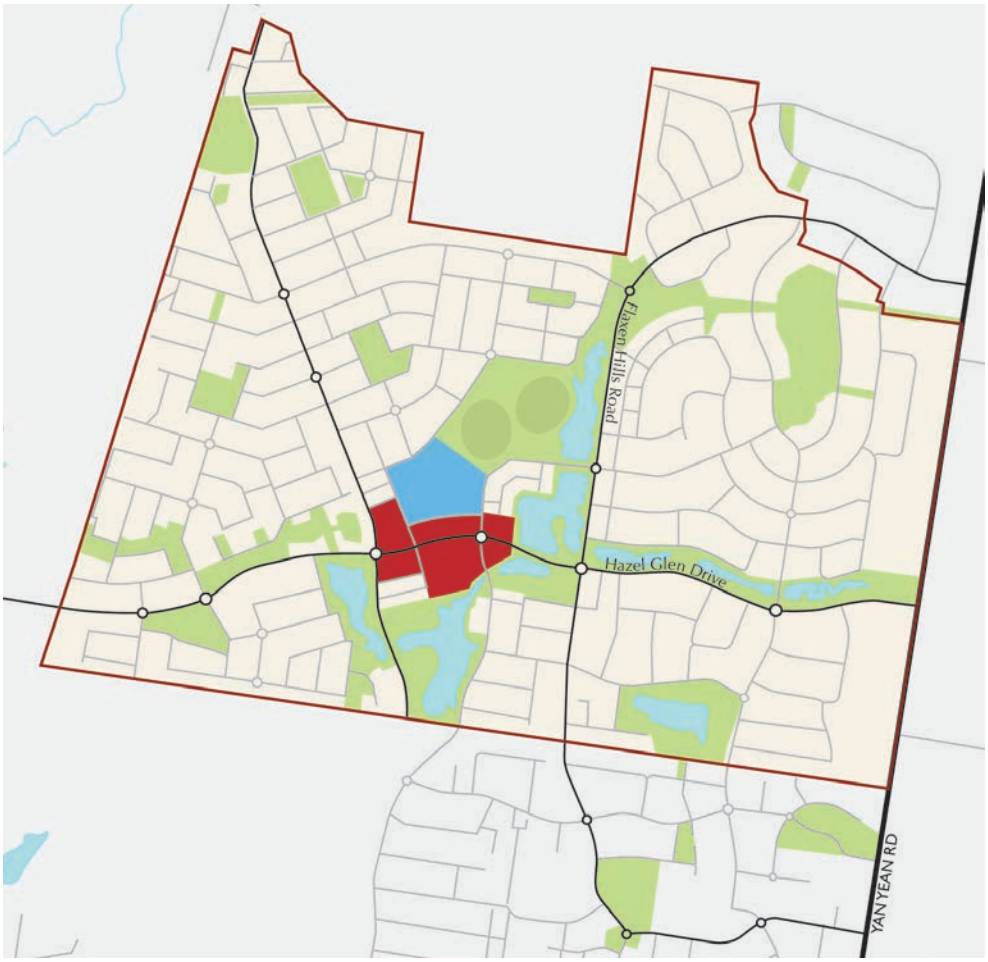



*Centre co-located with community facilities – Cranbourne East.*


*Centre on routes into neighbourhood – Tower Hill, Swan Hill.*

Several factors need to be considered in determining the location of a local centre:

- co-locating shops and commercial services with local community facilities creates a stronger and more diverse focal point for the community and facilitates trip-combining;
- busy streets (particularly intersections of busy streets) provide more passing trade to support small commercial centres. But where those streets are at the edge of the neighbourhood, positioning local centres on them can cannibalise nearby centres by taking trade that would otherwise be theirs. Instead, the busiest street *within* the neighbourhood – usually the most direct route for commuters to and from the surrounding main road network – maximises passing trade without weakening other centres;
- a central location within a neighbourhood maximises accessibility by foot and cycle to a local centre. This is particularly important where the centre incorporates or is co-located with a primary school, to facilitate walking and cycling to school;




*Central centre – Laurimar.*

- nearby employment strengthens the vitality of a centre;
- locating a centre at a significant natural or introduced feature (e.g. a water body, waterway, hilltop, a distinguished old building or even an interesting bend in the road) contributes to its sense of place. (Bends in the road create a stronger sense of enclosure and place than long straight sections.) The importance of centres to the life of the residential community justifies their location at such significant places;
- minimising the overlap between catchments of neighbouring centres (see section *6.1 Context analysis*) supports their viability;
- larger areas of open space near a centre detract from its walkable catchment.

Considered individually, these factors may suggest a range of different locations. For example, a location towards the edge of a neighbourhood that is nearest to the largest concentration of employment may be most convenient for the greatest number of residents dropping in on the way to or from work, whereas a central location is most likely to enable co-location with community facilities and maximise accessibility by foot and cycle. These competing imperatives may be resolved by establishing a mixed-use corridor along a connector street that leads from the edge to

the heart of the neighbourhood, and which integrates the local centre and community facilities, along with higher-density housing.

A significant feature such as a lake that could contribute significantly to the sense of place may not be centrally located. However, the connector street grid can be distorted to support a centre at an eccentrically located distinctive feature.

The varied location and configuration of local centres within each residential neighbourhood contributes to distinct identities.

## Design

Guidance on the design of centres is provided in Chapter 2.

In addition to neighbourhood centres, provision should be made for corner shops, cafes and local parks (see section *7.16 Local parks*) within 400 m of all homes.


*Centre at placemaking feature – Jetty Rd, Clifton Springs.*

### Rule of thumb

Position local centres on at least one street with a traffic volume of 10 000 vehicles per day or greater, unless there are additional supporting factors such as an adjoining employment area or major recreation attraction.

# 7.3 Housing types

Mature communities embrace a wide range of household types. For example, they include families of all different sizes and configurations, couples and singles of all adult ages without live-in children, and shared houses. Among any community there is also a range of income levels and lifestyle preferences.

Providing for a wide range of demographic and socio-economic groups within a neighbourhood is socially healthy, because it builds tolerance and understanding between them. It also ensures affordable homes are available for key workers close to their jobs in all areas, and allows home-leavers to stay close to their family network.

## Range of housing

This means that a wide range of housing types is required within a town or city: conventional houses set back from the street with a backyard, larger 'lifestyle' blocks, low-maintenance townhouses with a small courtyard, granny flats, apartments close to the 'action', and specialist residential developments such as retirement villages and aged-care facilities.

No single neighbourhood can provide this full range of housing, or even close to it, primarily because the land value in each location automatically limits the forms of development that are financially feasible. However, some variety is possible and preferred in all but the smallest neighbourhoods to contribute to housing diversity. A healthy range of housing types and price points helps the developer's sales rate by increasing the number of potential purchasers. It also provides choice within an area, enabling the community to 'age in place' – the ability for people to find an appropriate new home in their area when their housing circumstances change, allowing them to maintain their social and family networks. Ultimately, this creates a more diverse and therefore interesting place.

## Density

The appropriate density for a residential neighbourhood is generally set by planning policy and/or an urban growth framework (see Chapter *5 Urban growth frameworks*). Typically, densities increase towards facilities and services (including public transport). Increasing density towards higher-order centres via distinct steps, one neighbourhood at a time, emphasises the distinct *character* of each neighbourhood, enhancing the *legibility* and sense of place of the broader area. However, the specific types of housing in a new residential area and the location of different types are determined as part of its master planning.

In well-serviced locations, density should be maximised within the constraints set by character and amenity expectations. Increased densities have multiple benefits:

- increased viability of local facilities and services (including public transport);
- reduced transport costs (environmental, economic and social), by locating more residents close to facilities and services;







*Providing a range of housing facilitates a socially healthy community.* *Images: a–d Alastair Campbell, e Jenny Donovan.*

- more efficient use of land, reducing urban sprawl;
- increased affordability (by reducing the cost of land associated with each dwelling);
- a better match for falling household sizes.

Housing types that achieve a higher density than conventional residential areas, but that are compatible with their character and offer good amenity, are identified in section *1.16 Medium-density housing*.

# 7.4 Housing configuration

The way housing types are arranged is a primary *placemaking* device. It can reinforce the legibility and sense of place of a neighbourhood.

## Location

Most new residential areas occur at the outskirts of a town or city, where land values will support most housing types other than a significant proportion of apartment buildings. Conventional and medium-density residential types can be mixed freely. However, the following principles are a useful guide to their location:

- aged-care facilities, retirement villages, and social and affordable housing should be located close to centres and public transport, to ensure that those without the ability to drive are not socially excluded;
- medium-density housing (e.g. townhouses and semi-detached houses) should be located close to centres, public transport and parks, to maximise the number of people who can benefit from ready access to them and to strengthen the identity of those places. Medium-density housing can be unviable on sloping land;
- townhouses and apartment buildings can also be used to reinforce the distinctiveness of key places within the neighbourhood (e.g. open spaces and connector streets) because they have a stronger built form;
- lifestyle blocks should be located at a permanent urban edge, because they reduce the density of people who benefit from more central facilities and tend to reduce the *permeability* of their area. They are also suited to areas with extensive existing vegetation whose retention is desired;
- social and affordable housing should be inter-mixed with private housing and indistinguishable with it, to avoid the development of a stigma, and the anti-social and criminal behaviours that sometimes result from concentrations of low income.

## Character

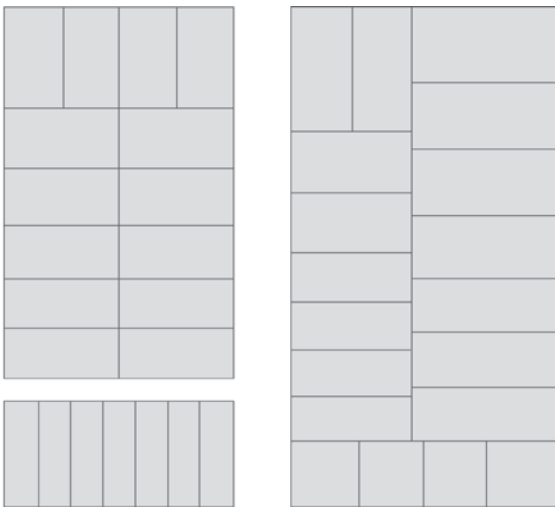
Limiting the number of housing types within a particular area to one or two can reinforce its distinct character. However, a range of types should still be provided across the broader neighbourhood.


*Housing configuration – Tower Hill, Swan Hill.*

# 7.5 Street network: grid

The street network is the fundamental framework for urban development. It is the frame which endures as buildings, uses and even modes of travel change.

## Gridded streets



*Blocks should be two lots wide and short enough to maintain permeability.*

The main purpose of local streets in a residential neighbourhood is to provide access to individual lots. The most effective way of achieving this is a regular grid of streets in which the width of each *block* is designed to accommodate two typical lot-lengths, and the length provides a reasonably permeable street network while ensuring the efficient use of land. A permeable street network provides for convenient access and efficient movement, encouraging walking and cycling, and is more *legible* because it avoids convoluted journeys.

Grids are preferred over 'tree-like' systems comprising main roads with branching dead-end streets and culs-de-sac for several reasons (see section *7.6 Street network: culs-de-sac*).

## Alignment

Aligning the street grid approximately north–south/east–west provides the best orientation for passive solar performance of dwellings in temperate climates. The street network should be designed to maximise the number of blocks whose long side is oriented north–south, because this results in mainly east–west oriented lots, which provide the best solar orientation for both wider and narrower lots.

In warmer climates, the street network should be oriented to capitalise on cooling breezes. In locations where strong winds are common and unwanted, aligning streets away from prevailing flows mitigates their effect.

## Hierarchy

Street networks should generally include a combination of longer streets that run for several blocks and shorter cross-streets that run for only one or two blocks. This creates a clear hierarchy of more and less important streets, reinforcing legibility. It also minimises cross-road intersections, which can be unsafe without signals or roundabouts.

*Regular street grid with good solar orientation – Tower Hill, Swan Hill.*

## Schools

Streets should be provided on at least three sides of a school, to disperse school-related traffic by maximising access opportunities, and to reduce conflicts with adjoining uses.

### Rules of thumb

- Size residential blocks around 150–200 m long and 50–70 m wide.
- Align streets between 20˚ west and 30˚ east of north, or between 20˚ north and 30˚ south of east.

# 7.6 Street network: culs-de-sac

Culs-de-sac, or dead-end streets, have gone out of favour. Although they were popular in the late 20th century, subsequent research has shown that they have significant shortcomings.

## Impermeability

A key drawback of culs-de-sac is the resulting lack of permeability for pedestrians and cyclists, which discourages *active transport* and disadvantages those without access to a car. This can potentially be overcome by the introduction of paths extending the ends of culs-de-sac to the next street (providing those paths are sufficiently open, overlooked and well-lit to be inviting routes – see section *7.15 Mid-block links*).

## Traffic volumes

More difficult to overcome is the adverse impacts of culs-de-sac on traffic volumes. The attraction of culs-de-sac is their lack of through-traffic. However, the lack of ability for cars to enter and leave culs-de-sac from both ends increases traffic on the surrounding streets. The lack of permeability for vehicles also results in a less legible and efficient movement system, increasing overall traffic movements with consequent impacts on the environment and road safety.

## Turning heads

Finally, the need for large vehicles such as refuse and removalist trucks to access all homes results in large turning heads at the end of each cul-de-sac, to avoid potentially dangerous reversing manoeuvres. The land required for such turning circles reduces any potential land saving by not connecting the street through to the next.

## Quiet streets

The use of culs-de-sac should be limited to land that cannot be efficiently subdivided by connected streets, or where streets cannot be connected at both ends due to topography. However, the quiet character of culs-de-sac is replicated in the shorter streets of a gridded street pattern, due to the way traffic is attracted to longer streets. This quality can be reinforced by designing those streets to discourage through-traffic (e.g. by bending them to remove the ability to see from one end to the other, or narrowing and/or weaving the road pavement) without disconnecting them at either end.

**Rule of thumb**

Limit culs-de-sac to a maximum of 10 dwellings.

*'Quiet' streets – Tower Hill, Swan Hill.*

*Curved streets discourage through-traffic.*

# 7.7 Street network: integration

Streets are the 'stitches' that knit urban places together. The number of connections between the new street network and surrounding streets should be maximised.

This will:

- integrate the new community with the existing neighbourhood;
- provide direct and legible connections to surrounding destinations such as centres and bus stops;
- disperse traffic, avoiding heavily trafficked streets.

However, care should be taken to ensure the surrounding streets are able to accommodate the additional traffic and/or to determine what improvements will need to be made to them to cater for it.

## Streets near edges

Where sites abut the rear of a row of existing lots, a new street should generally be located one lot length inside and parallel to the boundary, to enable new dwellings to back onto the boundary

*Integrated street network – Tower Hill, Swan Hill.*

and front the street, providing a conventional back-to-back arrangement (see section *1.9 Fronts and backs*).

## Future growth

Where it is likely that there will be future growth beyond the site, the street network should be designed to provide for regular connections with it.

## Gated communities

Gated communities, which exclude the public from passing through large areas, should be avoided because they tend to result in homogenous groups of residents who interact less with the broader community. They also reduce permeability, creating greater traffic volumes on surrounding streets and reducing the ability for residents to walk or cycle to local facilities.

## Barriers

Where there are barriers to a continuous street network (e.g. rail lines, motorways and waterways), pedestrian and cyclist bridges or underpasses should be provided to maintain permeability for active transport. Bridges are generally preferred unless the barrier is raised above the level of the surrounding land. In order to be safe and inviting, any underpasses should:

- be as short as possible;
- have clear sightlines into and through them;
- be open in character, with generous dimensions and light-coloured finishes;
- incorporate openings in the structure overhead to provide natural daylight and ventilation, where possible;
- be well-lit at night.

*Safe and inviting underpass.*

### Rules of thumb

- Provide pedestrian and cyclist crossings of barriers separating urban areas (e.g. rail lines, motorways and waterways) at least every 400 m.
- Ensure underpasses are at least 3–4 m wide (depending on their length) and have a ceiling height of at least 3 m.

# 7.8 Street network: legibility and placemaking

Legibility and sense of place are essential urban qualities. The design of the local street network can make a significant contribution to legibility and sense of place through the creation of a clear hierarchy and varied visual experiences.

## Hierarchy

Varying street lengths and widths creates varied connectivity and capacity, resulting in a pattern of more and less important thoroughfares. Places are more legible when this pattern forms a clear hierarchy, with shorter and narrower local streets accessed via longer and wider local streets, in turn accessed via connector streets (see section *6.4 Primary street network*). (Another way to think about this is that only two turns should be needed to get from any local street to a connector street.)

Streets offering greater connectivity attract more traffic, warranting a different design which reinforces the hierarchy.

## Existing character

The nature of the street pattern (e.g. whether it is an orthogonal grid, where all streets are either parallel or perpendicular to each other, or is made up of curvilinear streets) contributes to the character of an area. Small residential developments that will form part of an existing neighbourhood should be designed to reinforce the character of the existing street pattern.

*Clear street hierarchy – Tower Hill, Swan Hill.*


*Streets oriented on landmarks – Tower Hill, Swan Hill.*

## Deformed grids

The distinctiveness and legibility of a neighbourhood can be enhanced by creating varied and therefore memorable visual experiences. The design of the street network can contribute to this by varying street alignments from the perfectly orthogonal. Such street networks are called 'deformed grids'.

Varied street alignments can be designed to respond to existing features or simply be an invented pattern. Care should be taken not to distort the grid so much that it becomes disorienting, except where it responds to a notable natural feature, such as a street circling a water body.

Common design techniques include:

- aligning longer streets with a *landmark* natural or built feature (e.g. a hill, significant tree or distinctive building, open space or water body), so that it terminates the vista along the street;
- running longer streets (including connector streets) along the edge of open spaces, waterways or water bodies, so that those features contribute to the memorability of the street (the additional cost inherent to single-sided streets is offset by the increased value of all lots in the development);
- aligning streets along or perpendicular to contours, to reflect the topography (see also section *7.9 Street network: hilly sites*);
- subtly curving streets, introducing bends in them or running them over topographic saddles, to create memorable sequences of incrementally revealed views;
- changing the angle of a street either side of an intersection, so that it terminates on a building or open space;
- varying a street alignment to accommodate existing valued trees within a verge or centre-median, enabling their retention as distinctive features of the new development.

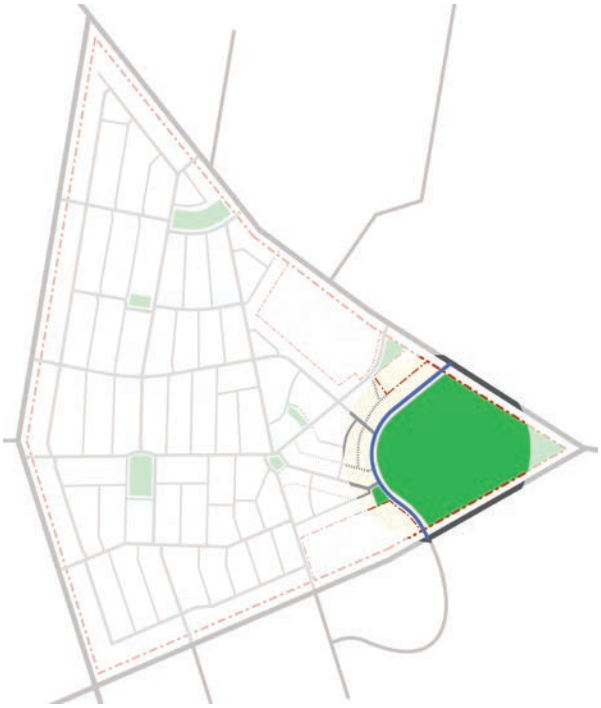
The street and open space network should be designed to create a series of memorable places along any journey. This contributes to a legible *urban structure*.

Varying the alignment of streets affects the overall efficiency of the neighbourhood if a consistent lot size and shape is sought. However, it can present logical opportunities for different housing types where irregular lots are created.

Streets that are aligned well off north–south or east–west can make achieving optimum solar orientation more difficult. However, provided the short streets are aligned with the cardinal points good solar orientation remains possible for most lots.

Local streets should be aligned to take advantage of cooling winds in hot climates or cleansing breezes where air quality is poor. In cooler climates, streets should be oblique to prevailing winds.

Ultimately, the design challenge is to find the right balance between varying street alignments to achieve a legible and distinctive place, and achieving an efficient layout. Some variation can be accommodated without significant loss of efficiency provided a degree of lot diversity is accepted. Greater variation is possible where the development is aimed at a higher-end market where the payoff for a more distinctive sense of place outweighs the cost of less efficiency.



*Memorable street alongside park – Tower Hill, Swan Hill.*

*Streets aligned to contours – Tower Hill, Swan Hill.*

*Curved and bending streets – Tower Hill, Swan Hill.*

*Streets terminating on buildings – Tower Hill, Swan Hill.*

*Medium-density housing with rear lanes – Tower Hill, Swan Hill.*

*Maintaining good solar orientation with diagonal streets.*

## Rear lanes

Where medium-density housing with narrow lot widths is to be developed, access lanes should be incorporated along the rear of the lots so that the streets are not dominated by garages. The additional cost of the lanes is offset by the reduced landtake of compact housing.

The process outlined above creates a preliminary street layout, to be refined as the more detailed neighbourhood design emerges.

### Rules of thumb

- Bend streets every 100 m or so, to create contained visual catchments of ~10–20 dwellings. This will also assist in managing traffic speeds by shortening sightlines.
- Provide a rear access lane where the garage would otherwise occupy more than 50% of the dwelling frontage.

# 7.9 Street network: hilly sites

Topographic features should be celebrated. Working with contours not only contributes to legibility and sense of place but also avoids unattractive earthworks and simplifies servicing.

## Key topographic features

Streets along ridgelines, around parks on hilltops and over topographic saddles contribute to the distinctiveness and legibility of the neighbourhood by reinforcing the perception of topography and offering long views. Similarly, streets along valleys, which typically incorporate a permanent or ephemeral waterway, reinforce the perception of topography and create a distinctive and therefore memorable experience.

## Working with contours

Streets that run along or diagonal to a contour part-way up a hill result in the lots on one side being higher than the street and those on the other side being lower. These level differences are exacerbated by cut and fill within the *road reserve* to create a level pavement, and within each lot to create a platform for a building and associated open space. Consequently, such streets tend to be dominated by engineered earthworks (and sometimes garages cut into the slope), which are expensive, generally unattractive and reduce the connectivity between the dwelling and the *public realm*.

Lots on streets along or diagonal to a contour are also less efficient to service with gravity-fed services such as water, stormwater and sewerage. Self-evidently, stormwater and sewerage cannot flow uphill from lots on the low side to the street, so drainage pipes need to be provided at the rear of the lots on the low side as well as within the road reserve. Such streets cannot easily act as overland flow paths either, due to the need to protect properties on their low side from flooding.

Perhaps for these reasons, lots on the low side of a street often have lower values.


*Street along valley.* *Image: Alastair Campbell.*

*Street along contour resulting in dominant earthworks.*
*Image: Alastair Campbell.*

The alternative – streets running perpendicular to the contours, up and down the hill – avoids the need for earthworks within the street and lessens their need at the front of each lot. It allows all gravity-fed services to run down the road reserve, and enables the street to act as an overland flow path and/or contain *water-sensitive urban design* measures such as swale drains.

In very hilly areas, streets along or diagonal to a contour may be unavoidable. However, in this situation, the drawbacks of downhill lots are offset by the availability of long views. Where streets along or diagonal to a contour cannot be avoided, the introduction of a sloping central median can reduce the level differences on either side.

*Street perpendicular to contours.* *Image: Alastair Campbell.*

# 7.10 Street design: connector streets

Good streets establish an equilibrium between the needs of different users. This includes the passage of pedestrians, cyclists, cars, trucks and buses. But streets are not only for movement. They also provide a forum for social interaction, perform a stormwater management function and accommodate a range of utility services.

## Design

Street design provides another opportunity to contribute to the distinctiveness and legibility of the neighbourhood. The design of connector streets should reflect their context and particular combination of users. For example, while they may all be connector streets, main streets through local centres, primary thoroughfares through residential areas and parkways along the edge of large open spaces should each have a distinctive design. The design of connector streets may be varied along their length to reinforce the pattern of memorable places generated by the street network (see section *7.8 Street network: legibility and placemaking*).

Where connector streets are spaced with each other and arterial roads to disperse traffic (see section *5.6 Primary road network*), no more than one traffic lane should be needed in each direction and kerbside parking should be possible. This makes them more inviting for cyclists and pedestrians. Kerbside parking may be provided in indented bays between trees to minimise the visual width of the road pavement.

## Public transport

Appropriately spaced connector streets provide valuable public transport routes. Therefore, traffic lanes should be wide enough for buses.

## Cyclists

Connector streets also provide valuable connections for cyclists. Their potential traffic volume warrants dedicated cycle lanes. These may be in the form of conventional on-road cycle lanes, between the vehicle lanes and kerbside parking, Copenhagen lanes (i.e. separate pavements between the footpath and road pavement, protected from moving traffic by a raised separator and sometimes by parked cars) or shared paths in busier streets. Copenhagen lanes may be less safe for cyclists where there are frequent footpath crossovers (or crossings) and side streets. Consideration should be given to priority measures for cyclists at intersections to encourage cycling and enhance safety.

## Pedestrians

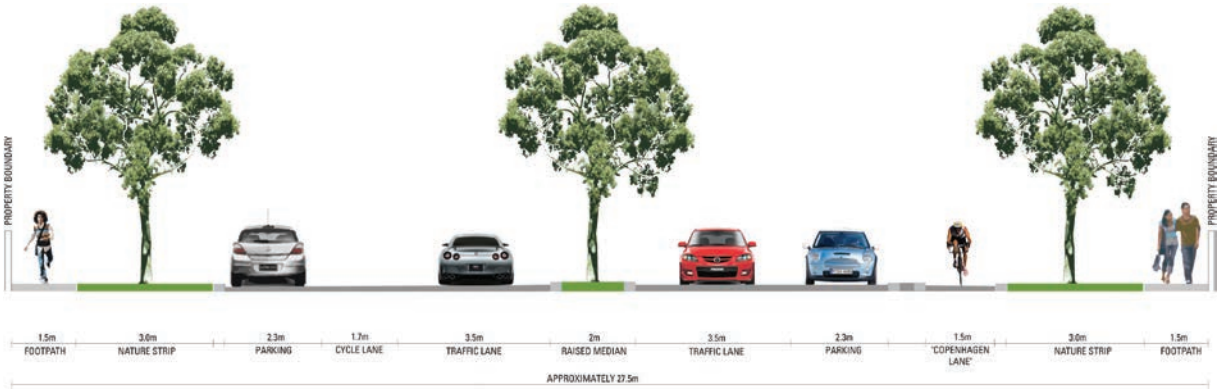
Footpaths should be provided on both sides of the street to encourage walking. They should be wide enough to allow two people to walk abreast comfortably and to cater for more pedestrian activity close to schools and centres.

*Copenhagen lanes provide safe routes for cyclists where there are few crossovers and side streets.*

*Provide shared paths in busier connector streets. Image: Alastair Campbell.*

Formal pedestrian crossings should be provided at connector street intersections, and turning traffic should be slowed by minimising the radius of turns in the road and avoiding free-turn slip lanes.

Seating – ideally below a shady tree – should be provided at sufficiently regular intervals to form useful resting points for less physically able pedestrians.




*Typical connector street cross-section with central median showing cycle lane options.*

## Rules of thumb

- Design traffic lanes 3 m wide, or 3.5 m if they may carry buses.
- Design on-road cycle lanes 1.7 m wide, or 2.5 m wide along busy routes.
- Design Copenhagen lanes 1.5 m wide.
- Design footpaths a minimum of 1.5 m wide, or 2 m in busy areas such as near schools or centres.
- Design shared pedestrian and cycle paths 3 m wide.
- Design nature strips at least 3 m wide. Greater width may be needed to accommodate existing trees. Design the verge (the space between the road pavement and abutting properties, including the footpath and nature strip) at least 4.5 m wide to provide for underground services.
- Provide a seat at least every 100 m along connector streets.

## Trees

Trees are a key ingredient of beautiful and inviting streets. Not only are they attractive, they also provide shade and mitigate wind effects. A generous unpaved nature strip should be provided between the road pavement and footpath on each side of the street to allow for canopy trees. Regular and consistent tree planting unifies a long connector street. More important connector streets, such as those leading to a centre, can be further distinguished by introducing a row of trees in a central median, a double row of trees along one or both sides of the street, or a signature tree species.

*Trees are a key ingredient of beautiful and inviting streets.*

## Crossovers

Given the greater importance of movement in connector streets, compared with local streets, the number of footpath crossovers (or crossings) along them should be minimised to reduce disruption to movement along the street. This can be achieved by:

- frequent side streets, increasing the number of corner lots that can be accessed from the side;
- rear lanes;
- rear access via 'battle-axe' driveways from side streets.


*Techniques for avoiding crossovers.*

# 7.11 Street design: local streets

Arguably, the most important role of local streets is as social places. While they provide access to individual lots, they are also a setting for informal social interaction, including children's play.

## Road pavement

The low level of traffic in local streets means that it can share use of the road pavement with cyclists and parked cars. Kerbside parking has several benefits:

- it provides convenient parking close to each lot;
- parking and unparking manoeuvres create 'friction', which acts as a traffic-calming device;
- it provides a buffer between pedestrians and moving traffic.

The road pavement in a quiet local street should be no wider than necessary to allow a vehicle (including larger vehicles needed to serve residential areas, e.g. refuse and removalist trucks) to pass a parked car or one coming in the other direction at slow speed. In busier local streets, it should be wide enough for a vehicle to pass a parked car *and* one coming in the opposite direction. This requires parking on opposite sides of the street to be staggered, which slows traffic. Minimising road pavement widths reduces crossing distances for pedestrians and provides a more sociable environment by allowing people to communicate across the street easily.

Local streets can also incorporate chicanes and pinch points (short sections of pavement that are narrowed to allow traffic in only one direction at a time) to slow traffic and accommodate larger trees and pocket parks.

*Chicanes and pinch points slow traffic and provide space for larger trees.* *Right image: Alastair Campbell.*

*Provide for water-sensitive urban design measures such as swales.*

*Trees add to the beauty and identity of a street, reduce wind impacts, provide shade and habitat, and help to create a more intimate scale.*

## Intersections

Intersections should be designed to slow traffic and encourage walking and cycling. In essence, this means minimising the road pavement area and the radius of bends to encourage drivers to drive cautiously and to reduce the distance to be crossed by pedestrians.

Roundabouts are generally not preferred in local streets, because the space they require tends to push pedestrians away from their *desire line* and they are less safe for cyclists. However, mini-roundabouts that can be accommodated without deflecting pedestrians from their desire line, in combination with pedestrian-priority crossings on all 'legs', can be an effective way to slow traffic.

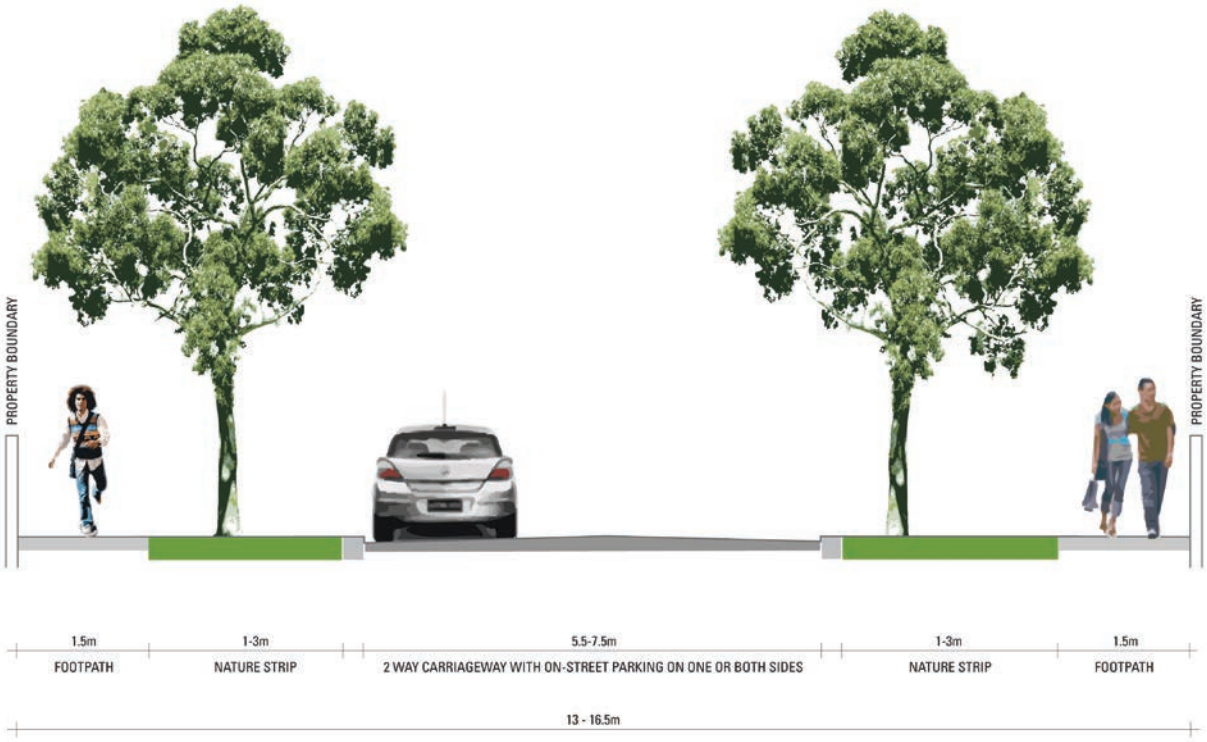
## Footpaths

Continuous and level footpaths should be provided on both sides of the street to encourage walking. They should be wide enough to allow two people to walk abreast comfortably and to cater for more pedestrian activity close to schools and centres.

## Trees, furniture and services

A strip should be provided between the road pavement and footpath to accommodate street trees, furniture, the ramped section of driveway crossovers (or crossings), and water-sensitive urban design measures such as swales, bio-retention systems and rain gardens. Typically, this takes the form of an unpaved nature strip. Together with the footpath, it provides a zone for underground services.

Trees add to the beauty and identity of a street, reduce wind impacts, provide shade and habitat, and help to create a more intimate scale. Trees should be spaced to form joined-up canopies when mature.




*Typical local street cross-section.*

## Pause places

'Pause places' (seating, ideally below a shady tree) should be provided within local streets to facilitate informal social interaction. They should be spaced at sufficiently regular intervals to form useful resting points for less physically able pedestrians. Locating pause places at pinch points and *kerb outstands* provides more space and reinforces legibility.

*Pause places facilitate social interaction.*

## Rules of thumb

- Design road pavements approximately 5.5 m wide, or 7.2 m in busier local streets.
- Design footpaths at least 1.5 m wide, or 2 m in the vicinity of schools or centres.
- Design verges at least 4.5 m wide to provide for underground services. Greater widths may be needed to accommodate existing trees, contributing to the diversity of the neighbourhood.
- Provide at least one pause place within each block of a street.

# 7.12 Street design: shared surfaces and pedestrian streets

Shared vehicle and pedestrian surfaces support greater social activity. Slowing vehicles to walking pace encourages pedestrian occupation.

Shared surfaces are possible only in streets with low traffic volume, which tends to occur when they are relatively short and not on a desire line for through traffic.

## Benefits

*Shared surface with distinctive paving.*

Shared surfaces offer multiple benefits:

- they slow traffic to not much more than a walking pace, creating safe environments;
- they provide valuable play spaces for children;
- they foster social interaction by providing more intimate, attractive environments for people and space for seating;
- they provide more opportunities for landscaping, creating attractive settings for development and contributing to a distinctive sense of place;
- they provide a potential location for a community garden;
- they encourage walking and cycling;
- they can be accommodated in narrower road reserves, allowing more efficient use of land.

## Features

Various types of shared surface street have evolved around the world, including *woonerven* in the Netherlands, and mews and home zones in the UK. Key features of shared surface streets include:

- a clear threshold at each end created by elements such as trees or furniture that narrow the road pavement, and a ramp to raise it to footpath level;
- a distinctive surface treatment including changes in colour and/or texture;
- very slow speed limits and pedestrian or equal priority;
- indirect and generally narrow vehicle routes with short sightlines and a course that weaves between trees, furniture, parked cars and bollards, including periodic one-lane-wide pinch points;
- vehicle routes defined by changes of surface, planting and furniture rather than kerbs;
- a wider central space for social activity, supported by seating and shade.

*Shared surface with narrow, winding vehicle route defined by planting.*

*Shared surface with wide, central play space.*

## Pedestrian streets

Local streets without any provision for vehicles should generally be avoided in conventional residential areas. Although vehicular access for residents can be provided via rear lanes or car courts, these do not provide a legible or inviting place for car-borne visitors. There are also several services that need to be able to drive close to the front of each property, such as emergency and delivery vehicles. And vehicular activity provides valuable *passive surveillance*.

Shared surfaces provide a better solution where traffic volumes are low, even where there is rear vehicle access. However, short streets without vehicular access may be acceptable if an opportunity is provided for vehicles to park at each end, and the housing density is sufficient to overcome the lack of passive surveillance from traffic.

### Rules of thumb

- Consider shared surfaces in streets with a traffic volume of less than 100 vehicles per hour at peak times.
- Provide a 5 m wide space for moving vehicles in two-way shared surfaces, with periodic sections that are only 3 m wide.
- Limit local streets without any provision for vehicles to 50 m in length, or 25 m if they are connected at only one end.

# 7.13 Street design: detail

Detailed street design can reinforce legibility and distinctiveness. A different design should be developed for each level in the street hierarchy, and streets should be varied between different areas to reinforce their distinct character.

The design of the verge (the space between the road pavement and abutting properties, including the footpath and nature strip) is a key opportunity to give different areas or streets a distinctive character. Verges can be distinguished by varied widths, surface treatments and landscaping.

## Tree species

Selection of tree species should consider:

- the local climate and soil conditions;
- the urban ground conditions to be created;
- locally indigenous and characteristic species, particularly where existing trees are to be retained within the road reserve;
- the desirability of evergreen species with dense foliage in hot climates, and sparser deciduous foliage in temperate and cool climates;
- the need for trees to be clean-stemmed to a height of ~2.5 m when mature, to maintain clear sightlines beneath their canopies;
- the size of the canopy, which should ideally enable the creation of relatively continuous cover across the street;
- the use of different species in connector and local streets, and in different areas, to reinforce the legibility of the neighbourhood;
- the use of a signature species with a distinctive shape and/or colour to highlight key places such as major intersections, parks or centres.

*Tree selection can reinforce the legibility of the neighbourhood.*

*Signature tree species with distinctive seasonal colour.*

## Water-sensitive urban design

Nature strips and centre medians also offer an opportunity for water-sensitive urban design measures, such as swales, bio-retention systems and rain gardens.

## Kerbs

Upright (barrier) kerbs should be used, rather than mountable kerbs. This provides clearer definition of the carriageway and discourages car parking on the verge.

*Tree selection and spacing should consider the potential to form a continuous canopy.*

## Lighting and services

Street lighting should generally be white rather than yellow, for better colour perception. Up-lighting of street trees can add to the beauty and legibility of a neighbourhood.

All cabled services should be underground to avoid visual clutter and prevent the need to prune tree canopies around overhead cables.

# 7.14 Street design: rear lanes and car courts

The success of narrow-lot townhouses is contingent on rear vehicle access. This ensures that the primary street is not dominated by garages.

Rear access can be provided by a rear lane, or a car court at the back of a group of properties accessed via a driveway between two houses.

## Secondary dwellings

Initially, the purpose of a rear access lane may only be to provide vehicle access to adjoining properties. However, as the area evolves, additional dwellings may be introduced that front onto it, such as studio apartments above the garage, granny flats at the rear of the properties, or even separate lots created through subdivision.

This means that rear lanes should be designed with pedestrians in mind, not just cars. They should be straight, connected at both ends and not too long, to provide a safe and inviting pedestrian environment. The low traffic volumes in rear lanes will ensure that separate footpaths are not needed. However, the surface should be designed to contribute to an attractive and comfortable environment for pedestrians, and landscaping should be provided where possible.

*Well-surveilled rear lane.*

*Landscaped rear lane.* *Image: Alastair Campbell.*

*Car court with flexible surface.*

### Rules of thumb

- Provide a lane or car court at the rear of residential lots narrower than 12 m if they have double garages, or narrower than 6 m with single garages.
- Avoid rear lanes more than 100 m long.
- Design rear access lanes at least 6 m wide to allow vehicles to turn into abutting properties.

# 7.15 Mid-block links

Long blocks should be dissected by pedestrian/cycle links. This enhances permeability for pedestrians and cyclists where there is no need for a vehicle connection. Care should be taken to ensure that these paths are inviting and safe.

## Design

A key factor in the safety of pedestrian routes is the potential to be seen by others, which discourages criminal and anti-social behaviour. 'Eyes on the street' (passive surveillance) can be provided by people in adjacent buildings and other people passing along the same or intersecting thoroughfares. Narrow lanes between high fences are not inviting or safe because they do not allow for passive surveillance.

To ensure that they are inviting and safe, mid-block links should:

- be direct and have a clear line of sight from one end to the other;
- not be too long;
- not be too narrow;
- be lined with buildings that address them with windows;
- have clearly defined edges that do not offer potential places of concealment;
- be well lit at night.

*Well-surveilled mid-block link.*

*Inviting mid-block link.*

### Rules of thumb

- Introduce a mid-block link into any block longer than 200 m to improve permeability.
- Limit pedestrian/cycle links to 80 m in length between streets.
- Design mid-block links at least 4.5 m wide.

# 7.16 Local parks: location and shape

Local parks cultivate community life. They provide important focal points for social interaction.

A local park should be provided near all homes. This complements larger active open spaces (see sections *5.4 Green infrastructure* and *5.10 Higher-order community facilities*), larger passive open spaces (see section *6.5 Primary open space network*) and neighbourhood sports grounds (see section *7.1 Community facilities*).

## Need and size

The need for and size of local parks will usually be determined by an open space strategy, statutory planning controls and/or the market position sought by the developer(s). In general, a greater number of smaller parks enhances access to open space and their contribution to local identity, compared with a small number of larger parks.

## Location

Parks contribute to the legibility and sense of place of a development. This can be reinforced by locating them at key natural or introduced features such as:

- notable hills or depressions;
- significant trees (incorporating remnant vegetation within a local park is also a way of ensuring its retention);
- distinguished old buildings (helping their retention);
- where there are long views;
- key intersections in the primary street network;
- bus stops;
- alongside community facilities such as a school or kindergarten.

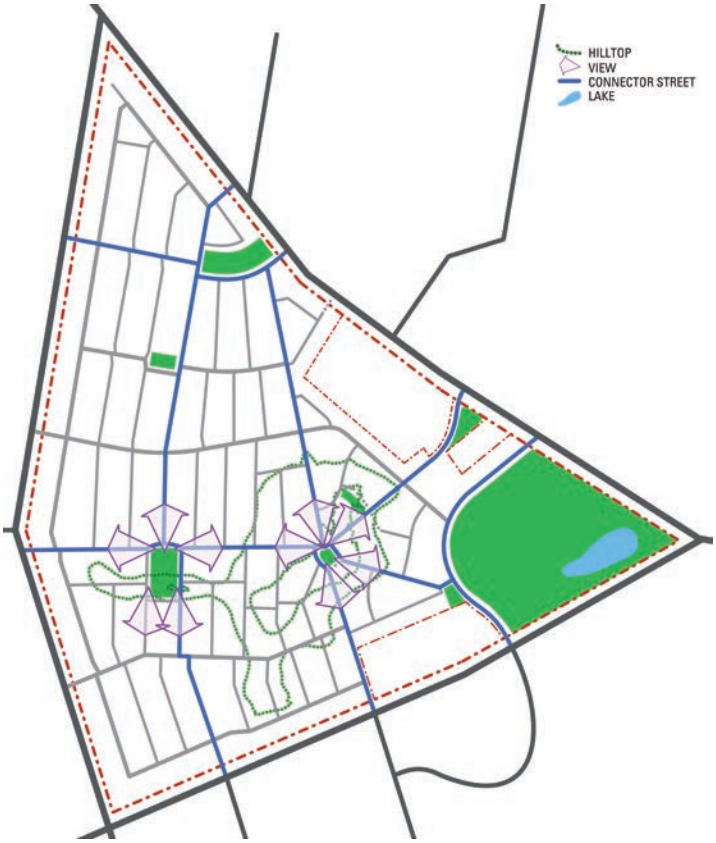
The placemaking value of parks can be enhanced by aligning streets to terminate on the space.

Placing local parks alongside waterways, water bodies, conservation areas or other areas of undeveloped land provides a richer recreational experience. At the same time, parks should be located on relatively flat land for usability and not rely on flood-prone land (although this can provide useful supplementary open space).

## Shape

Parks should be conceived as 'outdoor rooms' – deliberately designed places rather than merely leftover space. To create a memorable place, local parks should have convex shapes. (In simple terms, convex shapes are those in which every side faces towards the middle. In more technical terms, they are shapes in which every internal angle is less than 180°.)

Local parks should be bounded by streets on at least 50% of their perimeter, and preferably three sides, to ensure an adequate level of animation. Internal or 're-entrant' corners (where there is no thoroughfare separating the properties either side of the corner) can create dead spaces and should generally be avoided.




*Parks on hilltops with notable views, at key intersections and alongside water bodies – Tower Hill, Swan Hill.*

*Parks should be conceived as outdoor rooms, bounded by streets on at least 50% of their perimeter.*

## Rules of thumb

- Provide at least one local park within 400 m or a five-minute walk of all dwellings without crossing a main road.
- Size local parks between 0.3 ha and 1 ha in area.
- Ensure the width of a park is at least half of its length.

# 7.17 Local parks: design

Merely providing space does not create a successful park. The design of the edges, layout, furniture and landscaping are critical to its success.

## Edges

Where they are not bounded by a street, parks should still be overlooked by buildings to provide passive surveillance. This can be achieved by fronting dwellings onto the park with vehicle access provided from a rear lane or nearby street. Alternatively, dwellings on the corner of a park and street may orientate windows and balconies towards the park.

*Houses overlooking park.*

Buildings whose primary address is to a park should not be located far from the nearest street. A path should be provided along that edge of the park to provide access to the buildings. The path should be designed to allow for small delivery and emergency vehicles, to ensure legible and convenient access to each dwelling.

A corner shop or cafe can provide valuable animation of a local park and have a strong synergy with passive recreation.

## Furniture

In addition to children's play and private gatherings, local parks should be designed to provide for community events such as markets, festivals and celebrations. They should also cater for people with sensory or mobility impairments.

Local parks should incorporate children's play equipment, seating, picnic tables, BBQs and open space for informal ball-play and other activities. They may also incorporate formal gardens, sports courts, fitness equipment and toilets. Outdoor rooms (covered spaces with open sides) provide a place to retreat to in inclement weather, a stage for performances and a place to meet. Where possible, structures such as fountains, statues, sculpture and playgrounds should incorporate plinths that provide informal seating or stages for planned or impromptu performances.

Seating should be robust, easily cleaned and maintained, and configured to suit individuals and a range of group sizes.

## Landscaping

Trees are important for shade, wind protection, beauty and children's play, and because they add to the sensory richness of the space. In cool and temperate climates, the creation of extensive,

*Local park with supportive furniture.*

*A place to meet and retreat, a stage.*

dense evergreen canopies should be avoided, to ensure good daylight and sunlight in winter. Foliage between knee and head height should also be avoided, to maintain clear sightlines for safety. Landscaping should be low-maintenance, appropriate to the climate and characteristic of the area where appropriate. Additional shade structures may be needed over playgrounds and seating areas.

## Character

Local parks within a residential neighbourhood should each have a distinctive character to contribute to the sense of place. This can be achieved through variation in size, variation between a formal and informal character, the use of different tree species and landscaping styles, and varied relationships with surrounding development. The use of a distinctive local material such as stone can also reinforce sense of place. Where the site has cultural heritage values, its history should be revealed through interpretive material and/or public art.

### Rule of thumb

Ensure any dwelling whose front door is accessed directly from a park is no further than 30 m from a public parking area in direct line of sight, to ensure convenient and legible access for visitors and deliveries.

# 7.18 Lot layout

Variation in lot shape and size contributes to memorable places. In contrast, a lot layout driven solely by efficiency and the most popular lot size and shape can result in a monotonous neighbourhood of uniform dwellings, households and streets, and a lack of housing choice.

Non-orthogonal street networks (where the streets are not all parallel or perpendicular to each other) will automatically produce a variety of lots. Orthogonal street grids can also provide lot variety through varying lot widths and corner configurations.

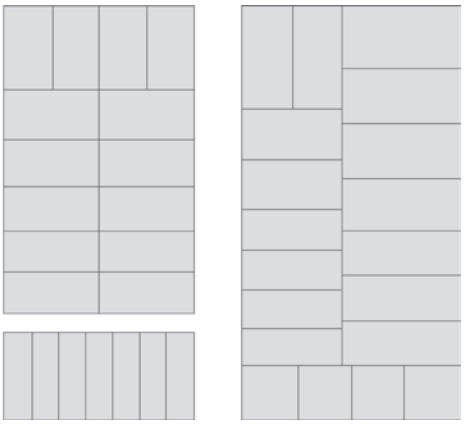
## Adaptability

The street network and lot layout should be designed to facilitate change over time in response to evolving social preferences and planning policy. In particular, lots close to centres should be designed to enable future intensification.

## Solar access

The street network and lot layout should be configured to facilitate good solar access to each lot. The number of lots fronting the south side of an east–west street should be minimised (or the north side in the northern hemisphere), because their private open space needs to be located between the house and the street to have good solar access: this presents a challenge in achieving both privacy and an *active frontage*. Where they cannot be avoided, lots fronting the south side of an east–west street should be wide enough to allow for a side garden or be occupied by townhouses whose private open space is in the form of a terrace at an upper level.

East–west detached house lots should be wide enough to allow for a garden on the north side of the house.



*Orthogonal blocks with lot variety and good solar access.*

*Even main roads should be addressed by houses.*

## Main roads, motorways and freight rail lines

Vehicle access to individual lots from main roads is often prohibited. However, backing lots onto main roads results in high fences, which present an unattractive edge and prevent any passive surveillance. Alternative design solutions include:

- providing a service road that the dwellings can front onto;
- providing a rear access lane or car courts accessed from the street behind (see section *7.14*);
- battle-axe lots, whose vehicle access is via a driveway from the street behind;
- configuring lots to have a side-on relationship with the main road and to front a side street, with high fences limited to a modest proportion of the main road boundary.

Lots can present a high side or rear fence alongside main roads provided they do not form likely pedestrian routes and they are well landscaped.

Where residential properties are located alongside motorways or freight rail lines, they should back onto the transport corridor and be protected by a sound wall.

## Character

Lot sizes and shapes can contribute to distinct identities in different parts of a neighbourhood. For example:

- areas close to a centre or school may be characterised by smaller lots to create a more urban character;
- areas in environmentally sensitive settings such as heavily treed areas may be characterised by larger lots, able to accommodate canopy trees to maintain the leafy setting;
- hillier areas may have larger lots to allow benching to provide a level building platform.

*Smaller lots near centre create a more urban character.* *Image: Alastair Campbell.*

*Large lots allow for large trees to maintain leafy setting.* *Image: Alastair Campbell.*

### Rules of thumb

- Provide rear lanes behind lots close to centres (to enable medium-density development or secondary dwellings in their backyard) and/or lot widths of around 18 m (to allow efficient basement parking layouts for future apartment developments).
- Ensure east–west detached house lots and those fronting the south side of an east–west street are at least 13 m wide to allow for good solar access.

# 7.19 House and garden design

Areas with a cohesive character are valued by their residents. This is because they contribute to a distinct identity, fostering a sense of belonging.

The design of individual houses and gardens can have a significant effect on the character of an area. House design is particularly significant in places with smaller lots, because the lesser opportunity for landscaped setbacks means that built form is more dominant.

## Character guidelines

One approach to ensuring a cohesive character is to build all the homes in a neighbourhood in a common, integrated style, and sell them with the lots. Where lots are sold independently of homes, a cohesive character can be achieved by imposing controls over the design of the homes. This is usually achieved through design guidelines, enforced through a covenant or the contract of sale.

Design guidelines may address:

- building height;
- front and side setbacks;
- architectural style (e.g. contemporary or period features);
- roof type;
- wall, roof and driveway materials and colours;
- passive environmental control measures (e.g. deep eaves or sunshades);
- front garden landscaping;
- front fence design.

Care is needed with design guidelines to strike an appropriate balance between establishing a sense of coherence and providing the ability to personalise individual homes. The ability for the area to change in response to evolving social preferences and planning policy should also be maintained. In essence, this involves fixing some aspects of design (typically setbacks,

*Individuality within coherence.*

*Porches and balconies promote street interaction.*

architectural style, a palette of materials and colours, and sometimes architectural details) while leaving the overall building form flexible.

In larger neighbourhoods, guidelines may be varied between different areas, to create distinct character precincts. This may be driven by varied settings, such as waterside, hillside, rural and so on.

## Street interface guidelines

Design guidelines can also be used to ensure inviting streets. Examples of such guidelines include:

- maximum front setbacks (e.g. not more than 5 m);
- requiring front porches, verandahs, pergolas, bay windows and/or balconies to promote interaction with the street;
- requiring houses on corner lots to address both streets, at least in part, and prohibiting high fences along more than half of the secondary street frontage;
- encouraging home offices at the front;
- requiring garages and carports to:
  - avoid dominating the streetscape by being limited in width and set back from the primary front wall of the house;
  - be integrated with the design of the house;
- requiring driveways to be as narrow as possible at the footpath crossover (or crossing);
- requiring low fence heights within the front setback.


*Corner house addressing both streets.*

*Garage integrated with house and width minimised.*

### Rules of thumb

To avoid dominating the streetscape, ensure garages and carports:

- are not more than 6 m wide or do not occupy more than 50% of the width of the house;
- are set back at least one-third of their width from the forwardmost primary wall of the house.

Limit fences within the front setback to a maximum height of 1.2 m.

## 7.20 Checklist

- Have community facilities been appropriately provided? (See section 7.1.)
- Has a local centre been provided in a location that ensures economic viability while also maximising community accessibility and its contribution to placemaking? (See section 7.2.)
- Has an appropriate mix of homes been provided for? (See section 7.3.)
- Have different housing types been appropriately located? (See section 7.4.)
- Has a permeable and legible street network been provided? (See sections 7.5–7.6.)
- Is the street network well-connected to existing and potential future surrounding streets? (See section 7.7.)
- Has the street network been designed to contribute to legibility and a distinctive sense of place? (See section 7.8.)
- Does the street network respond appropriately to steep slopes? (See section 7.9.)
- Are the streets designed to provide appropriately for different users and encourage social interaction? (See sections 7.10–7.13.)
- Have rear lanes or car courts been provided where appropriate? (See section 7.14.)
- Are mid-block links provided where necessary and designed to be inviting and safe? (See section 7.15.)
- Have local parks been appropriately located and designed? (See sections 7.16–7.17.)
- Has the street network and lot layout been designed to contribute to a distinctive sense of place, to facilitate future intensification, to ensure good solar access and to support an inviting and attractive public realm? (See section 7.18.)
- Have houses been designed or guidelines been prepared to strike a balance between a cohesive sense of place and the ability to personalise individual homes, and to contribute to an inviting public realm? (See section 7.19.)

# Employment precincts

## 8.0 Introduction

Employment areas are changing. No longer merely functional industrial estates or sterile business parks, they are becoming much more diverse and attractive places.

Employment areas include:

- office-dominated business districts;
- enterprise corridors containing a mix of commercial activities;
- business parks containing office buildings and small–medium factories and warehouses with a significant proportion of associated office or research and development space;
- industrial estates with small–medium lots, usually occupied by service industry;
- industrial estates dominated by larger factories and warehouses;
- logistics or distribution parks.

Business districts are really a form of *centre*, typically incorporating shops and services as well as office space. Centres are discussed in Chapter *2 Centres and large retail developments*.

This chapter explains how to design or assess plans for areas intended primarily for employment (excluding centres). It provides advice on the design of the land use pattern, the configuration of the local street network, and the detailed design of streets, open spaces and buildings.

This chapter assumes that the development area, broad land uses, neighbourhood structure and higher-order transport infrastructure have already been defined by a growth area framework (see Chapter *5 Urban growth frameworks*). The master planning of an employment precinct should commence with context and site analysis, and the delineation of the overarching organising features of greenfield development – the primary stormwater management, street and open space networks – as outlined in Chapter *6 Precinct structure plans*.

### Estate One

The design principles in this chapter are illustrated by a preliminary plan for Estate One. Estate One is a new employment precinct in Dandenong, Australia. The plan for the centre was designed by David Lock Associates and The Buchan Group.

## 8.1 Supporting amenities and services

Employees are becoming more discerning about where they work. In order to attract businesses, employment areas need to incorporate a much wider range of retail, hospitality, leisure, health and transport facilities to entice their workers.

### Worker amenities

Workers want somewhere to get coffee, a choice of places to eat and shop at lunchtime, convenient hairdressing, drycleaning and medical services, attractive open spaces to provide a break from the workplace, restaurants and bars to go to after work, and recreation and health facilities nearby. They want to live somewhere nice close to where they work, a choice of ways to get there and convenient childcare.

### Business services

Non-industrial businesses rely on a range of support services, ranging from consultants such as accountants and lawyers to business services such as printers, couriers, banks and post offices, and suppliers such as stationery and IT. They also want places for conferences, training and exhibitions, and hotels and serviced apartments for visitors to stay in. Business parks need to provide for these services.

### Common technical facilities

Technology precincts often need common facilities such as laboratories. Shared facilities can foster innovation by providing a forum for the informal exchange of ideas and knowledge.

### Residential accommodation

In addition to hotels and serviced apartments, permanent residential accommodation enhances business parks by contributing to a more vibrant and safe environment, particularly at night, and adding to the viability of shops and services. However, care must be taken to maintain an attractive environment for businesses which may be concerned about 'reverse amenity' impacts associated with residential development. (Reverse amenity impacts occur when a sensitive use such as housing is introduced into a business area, leading to restrictions on business activities to protect the amenity of the new use.)

### Identifying amenities and services

The extent and range of supporting amenities and services appropriate in a particular employment area is based on the likely demand from workers within the precinct and, potentially, people and businesses in surrounding areas. Determining this will require input from property





*Employment areas need to offer convenient shops and services to attract skilled workers.*

agents or analysts and economists, based on the proposed mix of business accommodation (see section *8.3 Business accommodation*).

While industrial estates have a lower density of workers and, as a result, are less able to support shops and services, they still generate demand for places to eat, and convenience shops and services.

# 8.2 Locating amenities and services

Amenities and services should be concentrated into centres. This creates a focal point, fostering innovation through informal interaction between workers.

The broad location of new centres is usually determined by a strategic plan, such as an urban growth framework. However, the specific location of centres forming part of a new employment area is determined as part of its master planning.

## Smaller employment areas

The supporting amenities and services in a smaller business park or industrial estate rely on easy accessibility and passing trade for their viability. They are best located at the main entry to the precinct, whether this is from a main road, train station or other public transport interchange, because this will maximise passing trade as people are on their way to and from work. A main road location will also supplement the patronage of workers with passing trade along the road. However, this course should be taken only if it is necessary to ensure a viable centre, because it may cannibalise the trade of another centre.


*Centre close to entry to precinct – Estate One, Dandenong.*

## Larger employment areas

Centres in larger employment areas should be more central to the site to maximise accessibility by foot. An intersection of two connector streets will ensure good passing trade.

*Central centre – Keystone Business Park, Geelong.*

## Sense of place

All centres should be located to take advantage of the *sense of place* created by a topographic or introduced feature, such as a water body, hilltop, an existing distinctive building or a bend in the road. (Bends in the road create a stronger sense of enclosure and place than long straight sections.) This may require distorting the connector street grid to bend it towards such a feature. The importance of centres to the life of the business community justifies their location at such significant places.

## Existing centres

The location of new amenities and services should take into account the location of existing centres and other facilities around the site, and their *walkable catchment*s (see section *6.1 Context analysis*). New facilities should be located to minimise the overlapping of catchments.

## Design

Guidance on the design of centres is provided in Chapter 2.

# 8.3 Business accommodation

The success of employment areas relies on the breadth of their appeal. Varied lot and building types and sizes ensures they appeal to a wide range of new and mature businesses, and can retain them as they grow (or shrink). This equips employment areas for fluctuations in the property market.

## Business mix

The particular range of accommodation that is appropriate in each location is a balance between what is known to be in demand (based on historic sales, leases and enquiries) and what is wanted from an economic development perspective. Determining this will require input from property agents or analysts and economists.

### Rule of thumb

Design lots and buildings in accordance with Table 8.1.

**Table 8.1: Accommodation for different business types and ages**

| Accommodation type | Occupier | Typical size |
|---|---|---|
| **Multi-tenanted office building: small–medium tenancies in flexible, standard-quality spaces, sometimes with shared facilities and/or administrative or business support services (e.g. serviced offices and business innovation centres)** | Start-up, youthful and mature, small- to medium-sized businesses | 15–500 m² tenancies<br>150–3000 m² buildings<br>400–4000 m² lots |
| **Incubator units: simple, independent, medium-sized, cost-effective spaces, often clustered** | Youthful businesses in development phase | 100–500 m² units<br>500–1500 m² buildings<br>1000–3000 m² lots |
| **Small–medium, attached office/warehouses** | Small service businesses | 500–1500 m² lots |
| **Bespoke, stand-alone office building** | Medium to large, established businesses | 500–5000 m² lots |
| **Industrial units** | Service industry | 500–2000 m² lots |
| **Retail 'shed'** | Trade supplies | 2000–15 000 m² lots |
| **Medium-sized factory** | Advanced manufacturing | 1000–5000 m² lots |
| **Large factory** | Offensive manufacturing | 15 000–25 000 m² lots |
| **Large warehouse** | Large production, assembly and/or logistics businesses with integrated sales and admin space | 4000–50 000 m² lots |



*Varied lot and building types and sizes ensure employment areas appeal to a wide range of new and mature businesses.* *Images: top left Leo Sheppard, top right Alastair Campbell.*

# 8.4 Locating business accommodation

The importance of 'location, location, location' is no less true for businesses than it is for homes.

## Locational principles

Each type of accommodation has its own locational requirements:

- multi-tenanted office buildings should be located in or at the edge of a centre because their occupiers are generally most reliant on external services;
- existing older buildings present an ideal opportunity to provide affordable space suitable for start-up enterprises;
- accommodation with the highest worker density, generally office buildings, should be located closest to a centre to maximise support and convenience for shops and services (including public transport), and contribute to a more urban *character*;
- accommodation that requires regular access by larger trucks (e.g.those with a significant production or warehouse function) should generally be located on the primary street network away from any centre and residential neighbours;
- office buildings for businesses that benefit from exposure to passing traffic should be located on main roads at the edge of the precinct or primary streets within it offering a high-exposure corporate address;
- lots for bespoke stand-alone office buildings should be located in the most prestigious locations – either high-profile streets such as main roads at the edge of the precinct and primary connector streets, or overlooking attractive natural features such as waterways, water bodies and open space;
- research and development organisations should be located close to any higher education or research institutions;
- lots for businesses that require high security should be located at the edge of the precinct.

## Technology parks

Technology parks with a focus on knowledge-based industries (e.g. information and communications technology (ICT), biotechnology and aerospace, automotive or other specialist engineering) rely on innovation for their success. Innovation often occurs through the fusion of knowledge and ideas from people in related fields or different steps in the supply chain. Therefore, plans for technology parks should provide for industry clusters that accommodate organisations spanning research, development and production (except where there is already sufficient provision for one or more of these sectors in the broader area).

## Suppliers

Large businesses typically contract out services to smaller businesses but seek to retain close relationships and short supply chains with them. This can be facilitated by providing a range of different types and sizes of accommodation in each part of an employment area.

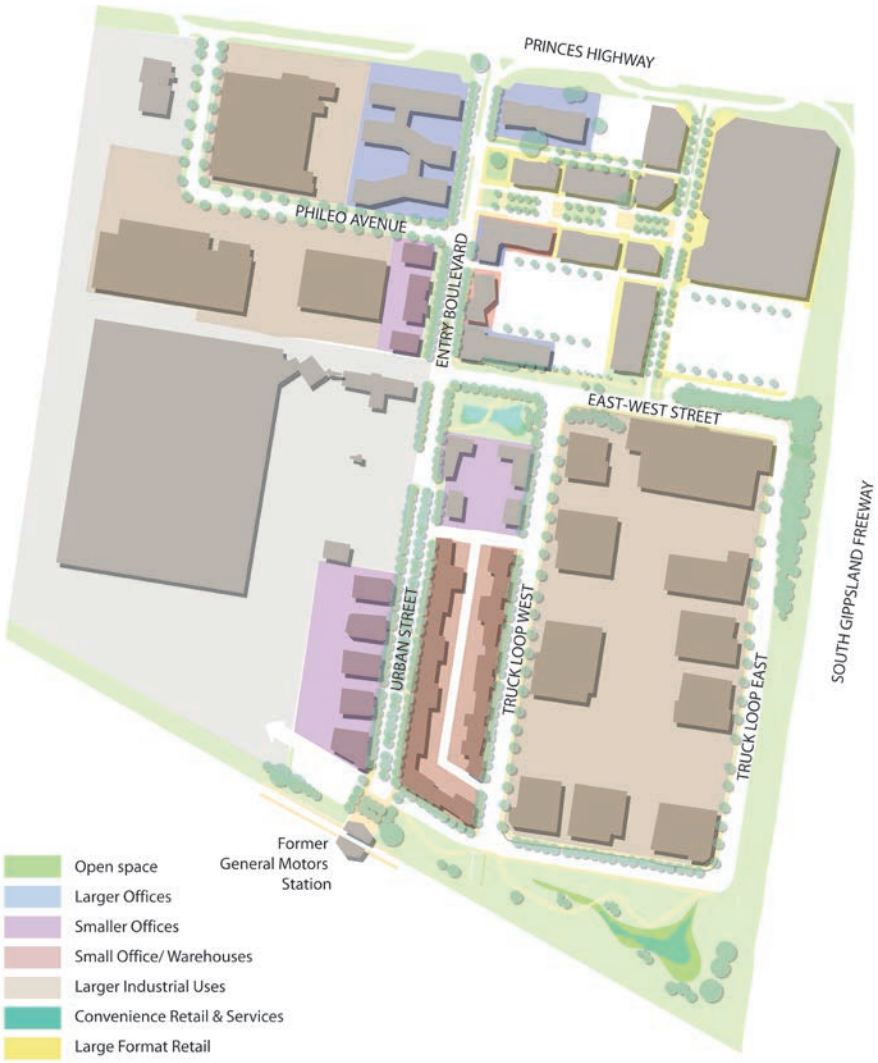
## Residential interfaces

Where employment areas abut residential or other sensitive uses, care should be taken to minimise environmental impacts such as noise, odour, vibration and lightspill. This can be achieved by locating quieter accommodation types such as lower-density offices or a landscaped acoustic wall along the interface.

## Residential accommodation

Any residential accommodation should be located to capitalise on one or more of the following:

- an adjoining residential area from which it can gain an immediate residential character;
- significant natural features;
- a centre.




*Business configuration – Estate One, Dandenong.*

# 8.5 Local street network: grid

The design of the street network underpins the success of an employment area. A well-connected, appropriately spaced and genuinely public street network provides a flexible framework for a wide range of business developments to occur and evolve over time.

## Gridded streets

Joined-up and high-quality streets promote walking, cycling and public transport for access to and circulation around the area. A well-connected street network also disperses traffic, avoiding heavily congested intersections, and provides multiple options for bus routes. By contrast, street networks that rely on a small number of main roads serving culs-de-sac tend to create barriers to both vehicular and pedestrian movement.

Therefore, the local street network within an employment area should be a fully connected grid without one-way or dead-end streets. This does not require it to be an orthogonal grid (where all streets are either parallel or perpendicular to each other). However, the creation of irregular lots should be avoided where possible – particularly in industrial or logistics estates where simple building forms are required – to allow optimal use of the land and avoid leftover spaces.

## Integration

Where it is likely that there will be future employment development beyond the site, the potential should be provided for regular street connections with it.

## Street spacing

The appropriate spacing of local streets, and resulting *block* sizes within an employment area, will vary with the type of accommodation.

In areas where flexibility is desired, a network of streets with spacings of 80–100 m will allow for most accommodation types. This will maximise the area's ability to respond to changes in the market over time.

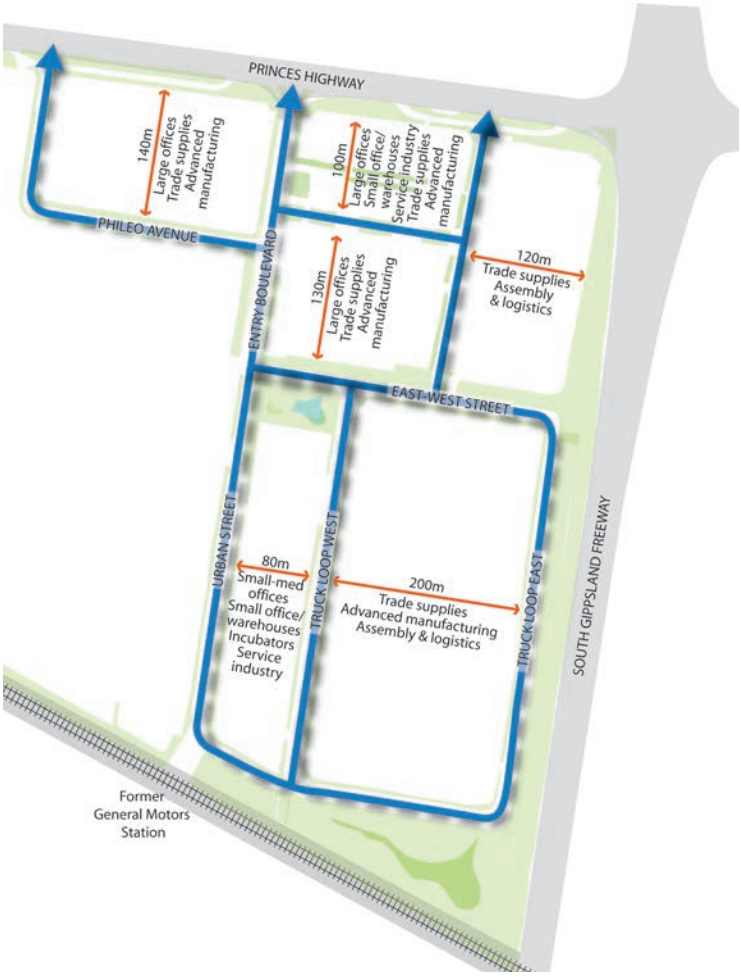
In small-lot industrial areas, rear lanes should be incorporated to provide vehicle access without detracting from the *public realm*.

### Rule of thumb

Space streets according to the lot depths and block widths identified in Table 8.2.

| Table 8.2: Lot depths and block widths for different business types | | |
|---|---|---|
| **Accommodation type** | **Lot depth** | **Block width** |
| **Shops and services** | 25–35 m* | 50–70 m* |
| **Multi-tenanted office buildings** | 30–60 m | 60–120 m |
| **Stand-alone office buildings** | 40–90 m | 80–180 m |
| **Incubator units** | 25–50 m | 50–100 m |
| **Small, attached office/warehouses** | 30–50 m | 60–100 m |
| **Industrial units** | 40–60 m | 80–120 m |
| **Retail 'shed'** | 50–200 m | 100–400 m |
| **Medium-sized factory** | 50–100 m | 100–200 m |
| **Large factory** | 200–250 m | 400–500 m |
| **Large warehouse** | 100–300 m | 200–600 m |

** Unless the centre is to incorporate larger stores and/or surface car parking at the rear, in which case the lot depths and block widths may need to be larger.*




*Flexible street network – Estate One, Dandenong.*

## 8.6 Local street network: legibility and placemaking

Sense of place can provide a decisive competitive advantage for a business park. *Legibility* is also a vital quality of all employment areas. The design of the local street network can make a significant contribution to legibility and sense of place through the creation of a clear hierarchy and memorable visual experiences.

### Hierarchy

Varying street lengths and widths creates varied connectivity and capacity, resulting in a pattern of more and less important thoroughfares. Places are more *legible* when this pattern forms a clear hierarchy, with shorter and narrower local streets accessed via longer and wider local streets, in turn accessed via connector streets (see section *6.4 Primary street network*). (Another way to think about this is that only two turns should be needed to get from any local street to a main road.)

Streets offering greater connectivity attract more traffic, warranting a different design which reinforces the hierarchy.

### Memorable streets

Compared with residential neighbourhoods, employment areas offer less flexibility to vary the alignment of streets away from an orthogonal grid to enhance legibility and sense of place because of the need to maintain regular lot shapes. However, a range of other techniques can be used to create memorable places:

- aligning longer streets (including connector streets) along the edge of open spaces, waterways or water bodies, so that those features contribute to the memorability of the street;
- aligning longer streets with a *landmark* natural or built feature (e.g. a hill, significant tree, distinctive building, open space or water body), so that it terminates the vista along the street.

Where practical, streets should converge on a centre to enhance its pedestrian accessibility and reinforce its *placemaking* value.

### Truck routes

The street network should also distinguish between primary truck routes to larger factories and warehouses, and more pedestrian-friendly routes in and around a higher-density core and centre, to minimise conflict between different road users. Where trucks need to service businesses in a higher-density area, a lane at the rear of the properties can be used to minimise conflict.


*Legible street network – Estate One, Dandenong.*


*Functional street network – Estate One, Dandenong.*

# 8.7 Street design

Successful 'new economy' employment areas are distinguished by a high-quality environment. In the new economy, business success relies on the ability to attract and retain skilled workers. Therefore, business precincts that are attractive to skilled workers have an advantage over their competitors.

A high-quality urban environment is one of the factors that attract skilled workers. The design of streets is an important ingredient in the quality of the urban environment.

## Objectives

Key objectives for street design include:

- creating a visually attractive environment;
- fostering innovation through social exchange;
- encouraging walking and cycling;
- contributing to legibility and sense of place.

## Ingredients

In order to achieve these outcomes, streets in employment areas should incorporate:

- generous footpaths on both sides to support walking and informal social interaction;
- canopy tree planting to contribute to an attractive and distinctive public realm, provide shade and habitat, and mitigate wind effects;
- kerbside car parking to provide for visitors, activate the street by generating pedestrian activity, calm traffic and enhance pedestrian-friendliness by creating a buffer between the footpath and moving traffic (in connector streets, kerbside parking may be provided in indented bays between trees, to minimise the visual width of the road pavement);
- bicycle lanes, or off-road paths in connector streets and truck routes, to support cycling;
- underground rather than overhead services, to contribute to an attractive environment;
- pedestrian-oriented lighting, to contribute to security after dark.

*Treed and pedestrian-friendly streets are important for attracting skilled workers.*

## Trees

Selection of tree species should consider:

- the local climate and soil conditions;
- the urban ground conditions to be created;
- locally indigenous and characteristic species, particularly where existing trees are to be retained within the *road reserve*;
- the desirability of evergreen species with dense foliage in hot climates, and sparser deciduous foliage in temperate and cool climates;
- the need for trees to be clean-stemmed to a height of ~2.5 m when mature, to maintain clear sightlines beneath their canopies;
- the size of the canopy, which should ideally enable the creation of relatively continuous cover across the street.

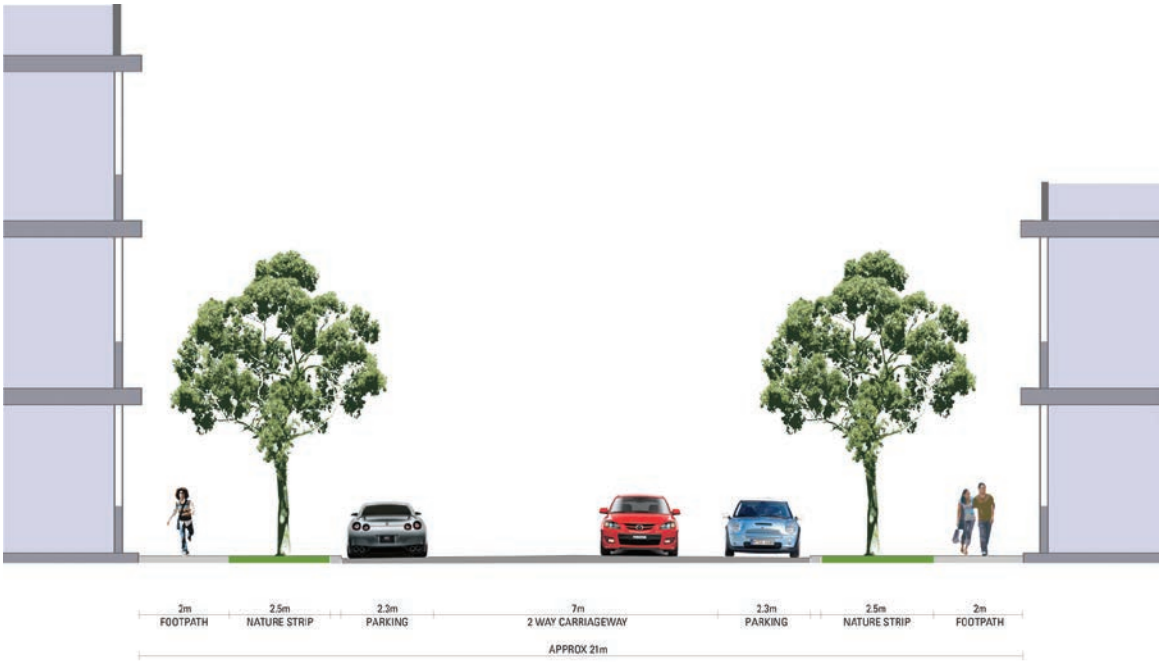
Nature strips (the unpaved area between the road pavement and footpath) and centre medians also offer an opportunity for *water sensitive urban design* measures such as swales, bio-retention systems and rain gardens.

## Variation

The design of streets should be varied to contribute to legibility and sense of place. This can be achieved through varying pavement and nature strip widths, and tree species. Trees with a distinctive shape, colour and/or smell make a particularly valuable contribution to identity. Different species can be used to distinguish different types of street, and signature species can be used to highlight key places such as major intersections, parks or centres.

Particularly important streets, such as those forming the entry to the development, can be further distinguished through a row of trees in a central median, a double row of trees along one or both sides of the street, or a signature tree species.

*Treed central median marking entry street.*




*Typical street dimensions.*

## Rules of thumb

- Design footpaths a minimum of 2 m wide.
- Design nature strips (unpaved strips between the road pavement and footpath) at least 2.5 m wide. Greater widths may be needed to accommodate existing trees, contributing to the diversity of the area.
- Ensure the verge (the space between the road pavement and abutting properties, including the footpath and nature strip) is at least 4.5 m wide to provide for underground services.

# 8.8 Open spaces

Open space is a key ingredient of employment areas. It provides places for lunchtime passive and active recreation, and informal social interaction – a catalyst for innovation.

Larger and linear open spaces, as discussed in section *6.5 Primary open space network*, provide for jogging and structured sports. Smaller pocket parks are also needed close to all workplaces to provide for passive lunchtime activity and active pursuits requiring a lesser area such as basketball half-courts.

## Location

Parks contribute to the legibility and sense of place of a development. This can be reinforced by locating them at key natural or introduced features such as:

- notable hills or depressions;
- significant trees (incorporating remnant vegetation within a local park is also a way of enabling its retention);
- distinguished old buildings (helping their retention);
- where there are long views;
- key intersections in the primary street network;
- bus stops;
- alongside facilities such as a childcare centre.

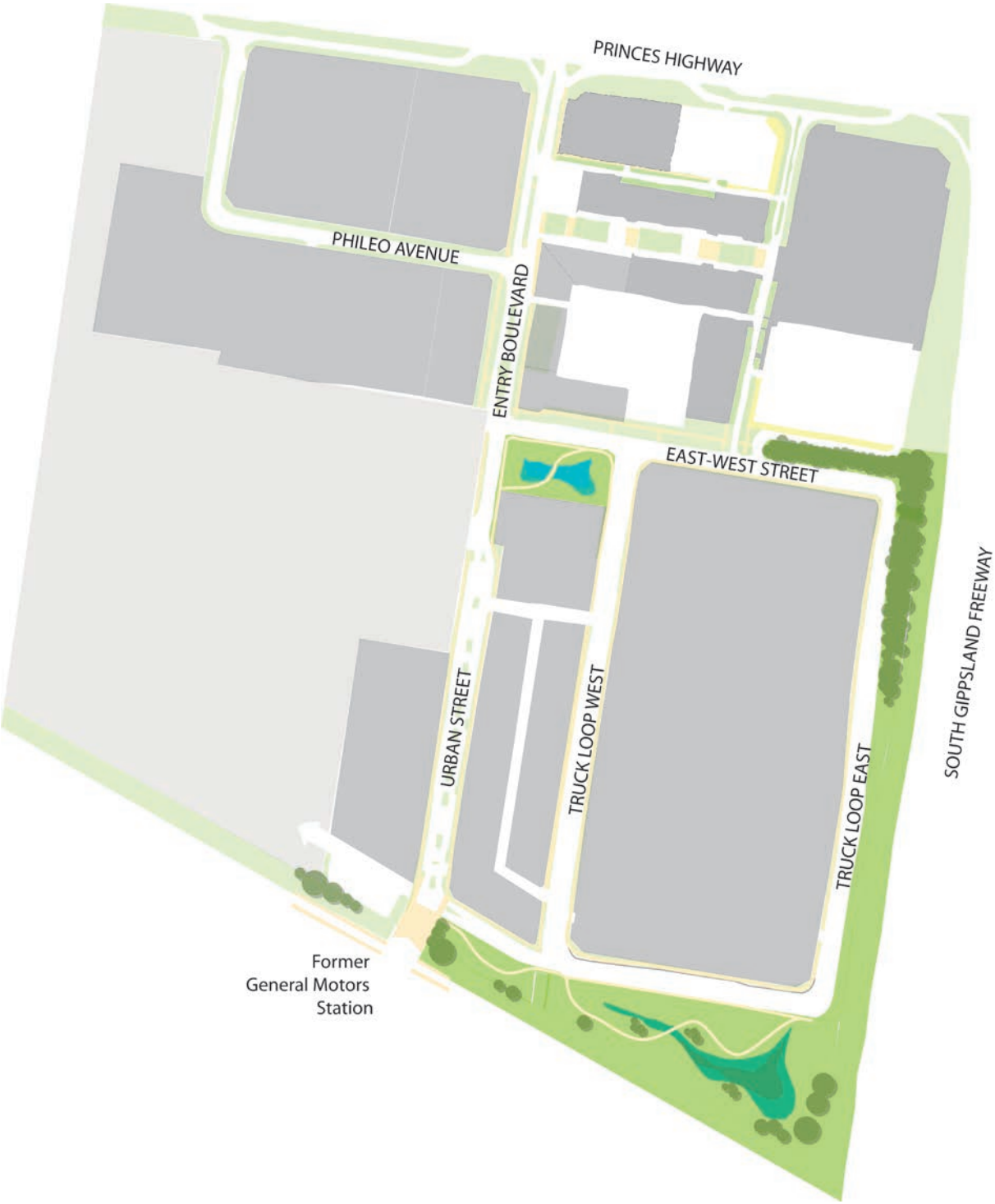
The placemaking value of parks can be enhanced by aligning streets to terminate on the space.

Locating parks alongside waterways, water bodies, conservation areas or other areas of undeveloped land provides a richer recreational experience.

## Shape

Parks should be conceived as outdoor rooms – deliberately designed places rather than merely leftover space. To create a memorable place, open spaces should have convex shapes. (In simple terms, convex shapes are those in which every side faces towards the middle. In more technical terms, every internal angle in a convex shape is less than 180˚.) Open spaces should also be bounded by streets on at least three sides to ensure an adequate level of animation. Internal or re-entrant corners – those where there is no thoroughfare separating the properties either side of the corner – can create dead spaces and should generally be avoided.

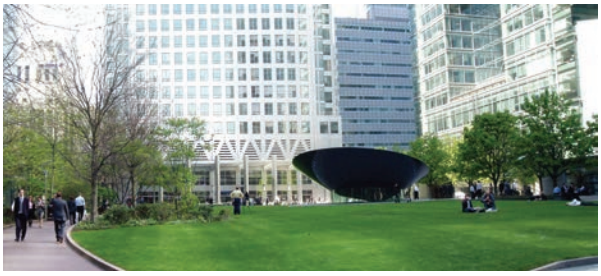
*Open space designed as outdoor room.*




*Parks located to accommodate significant trees and water bodies – Estate One, Dandenong.*

## Offices fronting parks

Where they are not edged by streets, parks should be overlooked by buildings to provide *passive surveillance*. This can be achieved by ensuring they are edged by offices rather than by warehouses or factories.



*Office buildings providing passive surveillance of park.*

## Design

Parks in employment areas should incorporate seating, BBQ areas, picnic tables, attractive landscaping, shade structures and, where possible, equipment for more active pursuits, such as basketball hoops. In cool and temperate climates, the creation of extensive dense evergreen canopies should be avoided, to ensure good daylight and sunlight in winter. Foliage between knee and head height should also be avoided, to maintain clear sightlines for safety.

Seating should be robust, easily cleaned and maintained, and configured to suit individuals and a range of group sizes. Where possible, other structures should incorporate plinths that provide informal seating. Landscaping should be low-maintenance and appropriate to the climate.

*Informal seating supports activity.*

*Open space with distinctive character.*

## Character

Local parks within an employment area should have a distinctive character to contribute to the sense of place. This can be achieved through variation in size, variation between a formal and informal character, the use of different tree species and landscaping styles, and varied relationships with surrounding development. The use of a distinctive local material such as stone can also reinforce sense of place. Where the site has cultural heritage values, its history should be revealed through interpretive material and/or public art.

### Rule of thumb

Provide a pocket park within 200 m of all lots.

# 8.9 Building siting and design: business parks and enterprise corridors

The quality of the environment is pivotal in attracting 'footloose' skilled workers (and, therefore, businesses). Attractive and striking buildings are an important part of a high-quality environment. However, more important is a vibrant public realm.

Business parks with isolated buildings set in a forest of landscaping and a sea of car parking are not attractive to today's employees. They seek a lively, urban experience.

## Street interface guidelines

A high-quality environment can be assured through design guidelines for the siting and design of buildings. In particular, the public realm can be animated by:

- buildings at or close to the street edge and parallel to it, rather than set behind large landscaped setbacks or car parking areas;
- minimal gaps between adjacent buildings;
- multi-level buildings;
- outward-facing buildings, with offices, showrooms or cafes fronting the street and pedestrian entries in the street facade.

This will result in higher densities, which will add more life to the street and, importantly, contribute to support for local shops and services, including public transport. A more vibrant and pedestrian-friendly public realm will also stimulate innovation in technology parks by increasing the likelihood of chance encounters that provide opportunities for the exchange of ideas.

Setting buildings closer to the street and each other also reduces the land cost associated with development, increasing its cost-effectiveness.

Where land values are not high enough to warrant the cost of basement car parking, it should be placed behind buildings, along with any loading areas.

If opportunities for a more spacious, landscaped building setting are desired to widen the appeal of the development, they should be located towards the edge of the precinct, to minimise

*Continuous, outward-facing buildings close to the street edge create a more appealing public realm.*

*Prominent locations should be reserved for iconic buildings.* *Image: Alastair Campbell.*

*Cafes activate the street edge.*

the effect of the resulting lower density on the vibrancy of the core.

## Image and identity

The most prominent locations within the development (e.g. entries and major intersections) should be reserved for iconic buildings with high-quality architecture that will contribute to a positive and memorable image.

Design guidelines can also establish a coherent identity for the development through common design features such as building heights, setbacks, materials, colours and architectural style.

# 8.10 Building siting and design: industrial and logistics estates

The quality of the urban environment is less important for industrial estates than business parks. However, buildings should still be sited and designed to contribute to attractive streets and enhance the pedestrian experience.

## General design guidelines

A functional and attractive environment can be assured through design guidelines for the siting and design of buildings. Key aspects of good industrial building siting and design include:

- locating office and/or showroom components at the front of the building, and investing in the architecture of this part of the building (while ensuring it remains integrated with the design of the rest of the building);
- separating vehicle and pedestrian access to the site;
- providing legible pedestrian access direct from the street;
- locating visitor parking in front of the building or to its side near the front, to provide convenient and legible access;
- locating large staff parking areas to the side of the building (screened by landscaping) or behind it;
- establishing a common street setback for each street (or a range of acceptable setbacks);
- incorporating high-quality landscaping in any front setbacks, including visitor parking areas;
- locating loading areas, truck queuing and parking, and outdoor storage areas to the side or rear of the building;
- specific provision for rubbish bin storage in a concealed location;
- incorporating landscape buffers at interfaces with other uses, including buildings with a higher proportion of office space;
- employing good-quality external materials that are durable and low-maintenance;
- integrating service equipment within the building design or screening it from view;
- avoiding visually dominant business identification signage and ensuring it is integrated within the design of the building or, if freestanding, ensuring it conforms to a common theme established for the precinct;
- adopting an attractive fence design, or screening fences through landscaping.

## Special design guidelines

High-quality building design should be required for the most visible locations within the development, such as entries and major intersections. Design guidelines can also establish a cohesive identity for the development through common design features such as materials, colours, architectural style and fencing type.


*Office component fronting street.*


*Parking to side and loading at rear.*


*Architectural investment in front of building.*

*Legible entry and high-quality landscaping.*

## 8.11 Checklist

- Have appropriate supporting amenities and services been provided for? (See section 8.1.)
- Have supporting amenities and services been appropriately located? (See section 8.2.)
- Has an appropriate mix of business accommodation been provided for? (See section 8.3.)
- Have different types of accommodation been appropriately located? (See section 8.4.)
- Has a well-connected and appropriately spaced local street network been established? (See section 8.5.)
- Has the local street network been designed to support legibility and a distinctive sense of place? (See section 8.6.)
- Have the streets been designed to create an attractive, pedestrian-friendly, legible and distinctive environment? (See section 8.7.)
- Have appropriate open spaces been incorporated? (See section 8.8.)
- Have building siting and design guidelines been established? (See sections 8.9–8.10.)

# Glossary

**Active frontage** Building facade facing the public realm that facilitates visual and/or social interaction between people outside and people and goods inside, through proximity to the public realm, ground-floor windows and doors, rooms behind that are occupied for extended periods of time, and/or activities that spill out onto the footpath. *See section 1.24 Active frontages.*

**Active transport** Walking and cycling.

**Articulation** Elements that visually break up the facade of a building, such as windows, balconies, sunshades, projecting or indented elements, steps in the building form, changes of material, joints between cladding units, texture intrinsic to a cladding material and so on. *See section 1.26 Building facades.*

**Block** An area of contiguous lots bounded by the public realm, typically streets, on all sides. These can vary substantially in size and shape.

**Centre** A retail-based precinct, which may also include a range of other commercial, entertainment, civic and residential uses. Centres can range from small neighbourhood strips to enclosed regional shopping centres, bulky goods or homemaker centres, and central business districts. *See Chapter 2 Centres and large retail developments.*

**Character (also neighbourhood, local or urban character)** The physical elements of an area (and relationships between them) that contribute to the area's unique identity. Often divided into built form and landscape character. Everywhere has a character, but it is often more valued where there are particularly consistent or unusual elements. *See section 1.6 Local character.*

**Crime prevention through environmental design (CPTED)** Refers to ways of designing the built environment to reduce the incidence and fear of crime, such as providing clear definition between the private and public realms (*see section 1.22 Public realm edge*), clear sightlines, passive surveillance and vibrant environments.

**Desire line** The most convenient route used for a common journey, which people will take unless the way is blocked. Most often used in relation to pedestrian movement, but can apply to vehicle movement.

**Equitable development** Buildings designed so that they do not compromise the reasonable development opportunity of adjacent properties. This is a key principle in urban renewal areas, where it is important that the development potential of each property is optimised. *See section 1.21 Building separation.*

**Grain** The rhythm created by a repeated urban element. Can apply to building widths and spacings along a street, building facade elements or street spacings. Closely spaced buildings, elements or streets are often referred to as fine-grain.

**Habitable room** A room within a dwelling that is inhabited frequently and for extended periods of time, including a living room, kitchen, bedroom and study. Non-habitable rooms include bathrooms, toilets, laundries and hallways.

**Human scale** The building height that is visible within the human field of view (without tilting one's head) while being close enough that detail can be made out – about three to four storeys at a distance of 20 m and four to five storeys at 30 m. This is where greatest effort is needed to ensure active and visually stimulating facades. Can also refer to the degree of facade articulation that is visually satisfying at a walking pace.

**Infill development** Development within an established urban area. Can be contrasted with greenfield development outside existing urban areas. *See Part I, Infill Development*.

**Intervisibility** The potential for people in adjacent buildings to compromise the visual privacy of each other through proximity and unimpeded views. *See section 1.21 Building separation*.

**Kerb outstand** A widening of a footpath into the road pavement, typically to provide an opportunity for street furniture or trees, or to reduce the distance pedestrians are exposed to traffic when crossing the road. Sometimes referred to as a kerb extension. Can also be used to provide a tram or bus boarder (*see section 2.14 Public transport*).

**Landmark** A natural or built element that stands out from its surroundings. Usually a tall building or one with a particularly notable use, such as a railway station.

**Legible, legibility** How easy it is for people to work out where they are and how to get where they want to go, without the use of signage. This relies on an intelligible urban structure and memorable built or natural elements that act as markers, aiding navigation. *See* **mental map** *and section 1.17 Legibility*.

**Lightcourt** A space between a building and a side or rear boundary designed to provide natural daylight and ventilation to the adjoining rooms.

**Mainstreet** Quite literally, the main street in a centre. In larger centres, it is where the more well-known shops and businesses are usually located. Often the busiest street in a street-based or mainstreet centre, where most movement routes are conventional streets rather than pedestrian malls. *See section 2.3 Urban structure*.

**Mental map** The simplified map people form in their mind to help them navigate around an area. Typically constructed from easily recognisable elements such as landmarks, major thoroughfares and intersections, significant open spaces, precincts with a distinctive use or character and barriers. *See* **legibility** *and section 1.17 Legibility*.

**Movement economy** The way in which busier streets support commercial activity through accessibility and passing trade. The street network can be designed to reinforce the movement economy in a centre. *See section 2.2 Surrounding street network*.

**Passive surveillance** The potential for people in the public realm to be informally observed by others in adjoining buildings or passing by on foot, cycle or in a vehicle. This enhances safety by discouraging criminal and anti-social behaviour. Sometimes referred to as casual or natural surveillance, or eyes on the street.

**Permeable, permeability** The ease of moving through an area in any direction. Permeability is increased by more closely spaced and connected streets. Permeable street networks enable efficient movement, enhance legibility and disperse traffic, minimising congestion.

**Placemaking** The creation of distinctive, memorable and inviting places. Placemaking increases the appeal of a place and fosters a sense of belonging in its inhabitants. All aspects of urban design contribute to placemaking, from the initial conception of a project to its detailed design. *See also* **sense of place**.

**Podium** The base of a building, above which upper levels are set back from the front edge, and often the side and rear edges too. The front of a podium forms a street wall that defines the edge of the public realm. Podium-tower buildings are those with a broad base and a narrower tower form.

**Public realm** Land that is freely accessible by the public. Principally publicly owned streets and public open spaces, but can include privately owned plazas and thoroughfares that the public are invited to use. Public realm considerations are usually focused on the pedestrian experience.

**Road reserve** A linear allotment of land provided for a public street. Spanning between the lots on either side, this includes not only the land occupied by the road pavement, but also footpaths and unpaved nature strips.

**Sense of place** The unique identity of a place, generated by its setting and most memorable natural and introduced features. A strong sense of place fosters a sense of belonging. Individual spaces and streets can have a distinctive sense of place, as well as whole neighbourhoods or precincts. *See also* **placemaking**.

**Shoptop housing** Housing above shops. Traditionally occupied by the shopkeeper, housing above shops is making a comeback as a form of medium-density housing that enables an urban lifestyle. Contemporary shoptop housing is not associated with the shop below, and requires independent access.

**Smart growth** The name given to an approach to designing urban areas that minimises adverse environmental, social, economic and health impacts principally through sensitivity to the natural setting and a focus on public transport, pedestrians and mixed-use.

**Street wall** The facade of a building facing (and closest to) the street. This term is usually used where buildings are built on or close to the street boundary, so that they define the public realm. The street wall makes the most important contribution of a building to the experience of the public realm.

**Townscape** The way in which the physical elements of the town or city are arranged to create a memorable experience. Relies on recognisable elements (*see* **mental map***)* and three-

dimensional compositions of buildings and space that evoke emotional reactions such as delight, awe, anticipation, surprise and so on.

**Transit-oriented development** Urban development designed to maximise access to and support for public transport by increasing density and mix of uses, and providing a walkable environment close to public transport interchanges.

**Urban consolidation** The direction of development to places within an established urban area, rather than to its outskirts. Urban consolidation is commonly promoted in larger cities to reduce the environmental, social and economic impacts of urban sprawl. It can also enhance the liveability and sustainability of established neighbourhoods by increasing housing choice and support for local shops and services.

**Urban structure** The foremost physical features of an urban area, including notable natural features, main thoroughfares and intersections, major barriers to movement, key public transport nodes, important activities, distinct land use and built form character precincts, significant open spaces and landmark structures.

**Visual bulk** The visual impact of development on neighbouring properties. The visual bulk of a building is influenced by its height and setbacks, and by its detailed design and landscaping. The degree of visual bulk that is acceptable varies with the existing or desired future character of the area. *See section 1.20 Visual bulk*.

**Walkable catchment** The area that is within a comfortable walking distance of a destination, such as a centre or railway station. Generally considered to be defined by a radius of 400–800 m (approximately five to 10 minutes walk), depending on how inviting the route is and how important the destination. A comprehensive walkable catchment analysis should include consideration of the length of actual routes (rather than 'as the crow flies'), delaying factors such as busy roads to be crossed and whether the routes are inviting.

**Water-sensitive urban design** Environmentally conscious urban water management. Minimises the impact of urban development on the quality, quantity and flow rate of water in the natural water cycle through measures such as stormwater retention and detention basins, wetlands, stormwater reuse, natural waterways, water-efficient landscaping and so on. It includes capitalising on these features as recreational, placemaking, habitat and educational assets. Sometimes called sustainable urban drainage system (SUDS). *See section 6.3 Stormwater management*.

**Wayfinding** The way in which people navigate their way around using clues within the urban environment. More than just signage, urban wayfinding is about building a wider range of visual, audible and tactile cues into streetscapes and buildings.

# Further reading

The following books provide a more comprehensive rationale for many of the urban design principles contained within this book.

| | |
|---|---|
| **Bentley I *et al*. (1985) *Responsive Environments: A Manual for Designers*. Architectural Press, London.** | Landmark publication from the teachers of a ground-breaking urban design course at Oxford Polytechnic. A practical book that explains in easy-to-understand terms how to design large developments to ensure a positive public realm experience. Focuses on the qualities of permeability, variety, legibility, robustness, visual appropriateness, richness and personalisation. |
| **Bosselmann P (2008) *Urban Transformation: Understanding City Design and Form*. Island Press, Washington.** | Presents key methods used in analysing and guiding the renewal of urban areas. Provides detailed examples of how each process can inform a better understanding of an urban area and its positive transformation. |
| **Calthorpe P (1993) *The Next American Metropolis: Ecology, Community and the American Dream*. Princeton Architectural Press, New York.** | Advocacy for the principles of New Urbanism – mixed use, diverse housing, walkable neighbourhoods, public transport orientation, sufficient density to support local services, designed open spaces close to all homes, buildings that define and address the public realm and locally relevant architecture and landscaping. Includes design guidance and project examples, ranging from the scale of whole-city regions to single neighbourhoods and station precincts. |
| **Cullen G (1961) *The Concise Townscape*. Architectural Press, London.** | Argues for a broadening of the functional approach to the design of the urban environment to include consideration of the experience that is created. Catalogues and explains the spatial and visual qualities of the urban environment that create a memorable and stimulating experience – the fundamental ingredients of placemaking. Introduces the concept of serial vision – the drama and sense of place created by a unique sequence of spaces that reveal themselves along a journey. |
| **Duany A *et al*. (2010) *The Smart Growth Manual*. McGraw-Hill, New York.** | A comprehensive summary of the principles that make up Smart Growth, a philosophy of urban development focused on creating liveable, sustainable, affordable, equitable and sociable environments with a strong sense of place. Valuable resource for urban growth and urban renewal. |
| **Gehl J (2010) *Cities for People*. Island Press, Washington.** | Brings together 40 years of research and practice from the modern guru of inviting streets and spaces. Presents principles and techniques for creating a lively, safe, sustainable and healthy public realm, taking all five human senses into account. Includes numerous case studies. |

| | |
|---|---|
| **Jacobs J (1961) *The Death and Life of Great American Cities*. Random House, New York.** | Seminal work that championed the qualities of traditional urban places over mid 20th-century urban planning. Provides a passionate and well-reasoned case for many urban design concepts now taken for granted, including mixed-use and mixed communities, higher densities that support convenience, varied building ages, fine-grain street networks, streets in which children can play, clearly demarcated public and private realms, eyes on the street, and flexible and active-edged open spaces. |
| **Lynch K (1960) *The Image of the City*. MIT Press, Cambridge.** | The original and most influential book about legibility, imageability and wayfinding. Explains how people understand the structure of cities and introduces the key elements they recognise to aid navigation: paths, edges, nodes, landmarks and districts. |
| **Town and Country Planning Association (2014) *The Art of Building a Garden City: Garden City Standards for the 21st Century*. TCPA, London.** | Updates the Garden City ideals first established by Ebenezer Howard in the formative *To-Morrow: A Peaceful Path to Real Reform*. Outlines the key principles for designing and delivering sustainable, resilient, sociable, inclusive, healthy and attractive new towns in the 21st century. |

# Index