STREETS FOR PEOPLE

COMPENDIUM FOR SOUTH AUSTRALIAN PRACTICE.

Government of South Australia

Heart Foundation

http://saactivelivingcoalition.com.au

ACKNOWLEDGEMENTS

South Australian Active Living Coalition

The SA Active Living Coalition consists of key government departments and other agencies whose core business includes fulfilling targets for improving the health and well-being of South Australians. The Coalition is a collaborative forum for the planning and coordination of active living initiatives and policies.

The development of this Compendium was funded and led by SA Active Living Coalition partners:

- Heart Foundation (SA Division)
- Department for Health and Ageing
- Department of Planning, Transport and Infrastructure
- Urban Renewal Authority

Other members of the SA Active Living Coalition include:

- Planning Institute of Australia, SA Division
- Office of Recreation and Sport
- Local Government Recreation Forum

For further information visit:

http://saactivelivingcoalition.com.au

The SA Active Living Coalition gratefully acknowledges the consulting authors: Natalya Boujenko, Paul Morris and Professor Peter Jones.

We would also like to thank the individuals and organisations who provided invaluable input and expertise into the development and review of this document. We are also grateful to the individuals and organisations that have provided images.

Cover image courtesy of the City of Adelaide (Splash Adelaide).

CONTACT

For further information regarding this Compendium please contact:

CYCLING AND WALKING SECTION

Department of Planning, Transport and Infrastructure
GPO Box 1533 Adelaide SA 5001
Telephone: +61 (08) 8343 2222
Email: DPTI.CyclingandWalking@sa.gov.au

SA ACTIVE LIVING COALITION

C/– Heart Foundation (SA Division)
155 Hutt Street, Adelaide SA 5000
Telephone: +61 (08) 8224 2888
Email: activeliving.sa@heartfoundation.org.au

ISBN Number 978–1–74243–329–5

Dewey Number: 711.74

This is not about being anti-vehicle but rather about being pro-people

Fred Hansen, Adelaide Thinker in Residence, 2011

Putting people first and creating pedestrian and cycle friendly environments will make our communities more vibrant and healthy.

With around 40 per cent of car trips being less than three kilometres, many of us have plenty of opportunities to walk or cycle instead of driving. This will help reduce not only our waistlines but also greenhouse gas emissions and air pollution.

Street design has long been focussed around motorised transportation. We want to reclaim streets as not solely the domain of motor vehicles but also of pedestrians and cyclists, and as public spaces for social and commercial interaction.

The South Australian Government is committed to building safe and healthy communities in both urban and regional areas and creating a revitalised, vibrant Adelaide. *The 30-Year Plan for Greater Adelaide* outlines a vision for significant growth in existing urban lands, with a focus on higher-density, mixed-use developments that are walkable and connected.

The Streets for People Compendium for South Australian Practice provides information and guidance for the development of pedestrian and cycle friendly environments that promote health and strengthen communities. It condenses the knowledge, skills and policy agendas of a broad community of practitioners into one multi-faceted design resource, making the design and approval of innovative streets for people both easier and more desirable.

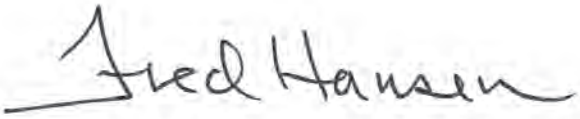
Streets for People is useful to policy makers, transport planners, traffic engineers, urban designers, landscape architects, urban planners, developers and other professionals, and also provides an excellent introduction to best practice street design for members of the public.

Streets for People is the product of multiple government and non-government agencies working together as the *South Australian Active Living Coalition*. The Coalition was established by the Heart Foundation to bring together interests in health, urban and regional planning and transport.

We wish to acknowledge the extensive, positive engagement with many built environment and transport professionals during the development of this compendium.

We are proud to have been a part of this unique collaborative effort and we invite you to create, use and support streets for people across South Australia.

Rod Hook, Chief Executive
Department of Planning, Transport and Infrastructure



Fred Hansen, Chief Executive
Urban Renewal Authority

David Swan, Chief Executive
Department for Health and Ageing

Amanda Rischbieth, Chief Executive
Heart Foundation (SA)

CONTENTS

CHAPTER A
PURPOSE AND BACKGROUND

CHAPTER B
STREET DESIGN APPROACH

CHAPTER C
STREETS FOR PEOPLE IN PRACTICE

CHAPTER D
CASE STUDIES

CHAPTER E
FURTHER RESOURCES

CHAPTER A / PURPOSE & BACKGROUND

STREETS FOR PEOPLE

COMPENDIUM FOR SOUTH AUSTRALIAN PRACTICE.

A1 ABOUT THIS COMPENDIUM

Why do we need this Compendium?

Being active is good for the health of South Australians, our economy and our environment. But the reality of our modern lives is that many struggle to reach healthy levels of daily physical activity.

This Compendium supports a South Australian practice of designing people-friendly streets that promote cycling and walking.

The *30-Year Plan for Greater Adelaide* actively encourages a greater share of new development into existing urban lands, with a focus on higher density mixed use developments that are walkable and connected.

Built environment professionals and developers must thus consider the role of streetscapes as not solely the domain of motor vehicles but of all people using the street. Our streets will become increasingly important as public spaces for social and commercial interaction. There has been considerable enthusiasm for a re-think of conventional approaches and this Compendium aims to provide guidance and support for this.

Street environments that promote low car speeds and are supportive of pedestrians and cyclists are frequently under design consideration in South Australia. There is support for these projects but there are barriers to implementation. Issues identified include inconsistency of design approaches, varying understandings of good practice and uncertainty about approvals in the South Australian context. Current traffic and road design standards and guidelines primarily address street environments of higher speeds (above 50 km/h) however there are identified gaps in design advice for local residential and lower-trafficked streets.

This comprehensive resource aims to make the design and approval of innovative pedestrian and cycling friendly designs such as 'shared streets' easier. Extensive engagement with key South Australian built environment and transport professionals informed development of this Compendium. The Compendium builds on national and international best practice and focuses particularly on lower trafficked street environments.

What is the purpose of this Compendium?

The Compendium:

- gives strategic policy imperatives for increasing levels of cycling and walking in our community
- explains the rationale for why we need to re-think conventional approaches to street design
- identifies key issues and barriers to implementing people friendly streets (focussing particularly on lower trafficked streets in South Australia)
- clarifies the approval process, and provides assistance in addressing common barriers such as risk and liability issues for street design in South Australia
- draws from the best national and international practice (including case studies) in street design
- presents key principles to shape pedestrian and cycling friendly street designs in the South Australian context
- introduces the Link and Place street design approach
- presents case-studies on the application of the Link and Place approach to South Australian, interstate and international examples
- links to further useful resources.

Who will use this Compendium?

The information and guidance in this Compendium will be useful to a wide group of professionals: transport planners, traffic engineers, urban designers, landscape architects, urban and regional planners, policy makers and developers. It may also be useful to members of the general public interested in best practice street design approaches.

How can this Compendium be used?

AS PART OF A STREET DESIGN PROCESS

Chapter C was successfully trialled in consultation workshops using a variety of street examples during preparation of this Compendium. It also guided the process of street design for the Bowden development and street cross-section designs for the City of Charles Sturt.

Chapter C can be used by an individual but the trial revealed that an initial workshop between relevant stakeholders to reach a consensus on the street design approach can have many significant benefits, including clarity of vision and assistance with approvals processes.

FOR DOCUMENTATION TO SUPPORT A STREET DESIGN

Underpinning information, rationale and statistics (Chapters A and B) can help support a street design developed with the Compendium's street design approach.

The rationale of transport, health and environmental benefits of the Compendium's approach also links to South Australian government strategic plans and policies, and can be supplemented with links to Local Government plans and policies where appropriate.

Material on the safety of low speed and shared street designs responds to concerns of liability and insurance coverage for non-standard street designs.

TO GAIN CLARITY ON THE APPROVALS PROCESS FOR 'NON–STANDARD' STREETS

Consultation for Compendium development revealed various understandings of the approvals process for low speed and non–standard street design, which were a barrier to new and innovative design. The Compendium clarifies the approvals process for new street designs, and helps professionals address common queries and barriers such as risk and liability.

AS A REFERENCE TOOL

The wealth of statistics and case studies, and the comprehensive list of further resources in Chapters D and E, will support new street designs and be a useful reference for professionals, educators and students.

How will this Compendium respond to new emerging best practice?

This document won't remain static. Your feedback can inform additional design guidance that can be added in revisions. The collection of material in this Compendium will be expanded with good emerging street design examples from South Australia, Australian national practice and from further afield.

A2 WHY 'STREETS FOR PEOPLE'?

"The one public service we all use everyday are the streets where we live."

Tony Blair,
UK Prime Minister, 2001

There are numerous health, environmental and financial benefits of making our streets more cycling and walking friendly.

Impact of current travel patterns

South Australians' car dependence has significant implications for our health, environment and economy.

Car travel is by far the most dominant mode of travel for South Australians, accounting for over 90% of the total kilometres travelled. This is the case even though 40% of all private car trips made in Australia are less than 3 km.[1] In Adelaide the combined mode share for cycling and walking to work makes up only 8% of journeys.[1] However, this figure does not account for the walking component of all public transport trips and journeys from where people park their car.

Car ownership gives us efficiency, flexibility and convenience, but the Australian Government's *Our Cities* discussion paper[2] attributes the negative consequences of our heavy car dependence as:

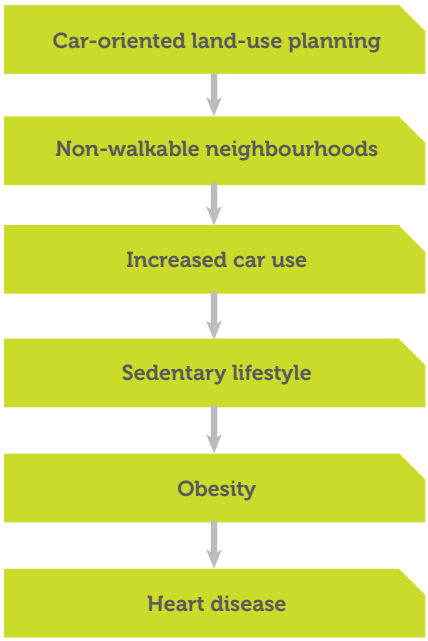
- traffic congestion
- carbon emissions and other pollutant emissions
- increased obesity and morbidity due to sedentary lifestyles
- vulnerability to increased petrol prices
- social isolation.

Our high dependence on private cars has significantly influenced the design of South Australian streets:

- in most cases, carriageway width is a dominant feature of a typical street cross–section
- footpaths are interrupted by every side street, where pedestrians have to give way to traffic
- pedestrian waiting times at traffic signals are long, at times in excess of 2 minutes
- footpaths are frequently cluttered by traffic signs and infrastructure, leaving less space for movement and kerb side activities
- the provision for car parking is generous.

Many cities are directly tackling this problem, by redesigning street spaces to favour pedestrians and cyclists and by investing in public transport infrastructure. Jan Gehl's *Cities for People*[3] cites positive examples:

- Mode share of traffic into central London was reduced by 41% as a result of a Congestion Charging Scheme introduced in 2002.
- By prioritising investment into cyclist infrastructure and public spaces over the last 35 years, Copenhagen increased mode share of cyclists commuting to work to 37% and reduced car mode share to 31%.
- An extensive program to improve public spaces in Melbourne since 1994 resulted in an increase of 39% of pedestrians staying in the city.



Health benefits

Emerging policy directions now aim to support and improve the ongoing health of the Australian population with preventative measures, such as healthy and active lifestyle, which includes substituting cycling and walking for car journeys. This is because obesity and inactivity are causing increasing levels of chronic disease across the population, much of which could be prevented by a healthy lifestyle.

In Australia physical inactivity is now second only to tobacco as the leading risk factor associated with ill health. It is a risk factor for cardiovascular disease and a range of other chronic diseases, including diabetes, cancer (colon and breast), hypertension, bone and joint diseases and depression.[4]

Only half of the Australian population is sufficiently active to achieve health benefits.[4] The most recent SA Health data shows that nearly 25% of children are overweight or obese. Promotion of higher population-wide activity levels through walking and cycling-friendly streets is an urgent health imperative.

BUDGETARY IMPLICATIONS

The implications of poor health for the SA State economy are shown in Figure A1. At current projections the health budget is set to overtake the entire State budget by approximately 2034. More money for health and hospitals will leave less money for all other areas of budget.

Government has recognised that multi-level interventions that target individuals, the social environment and the built environment are more likely to be effective than interventions that target only one of these factors.

The Compendium's guidance on both design and an approval pathway will help ensure that in South Australia the public realm can be designed to support cycling, walking and social interaction for all ages and abilities.

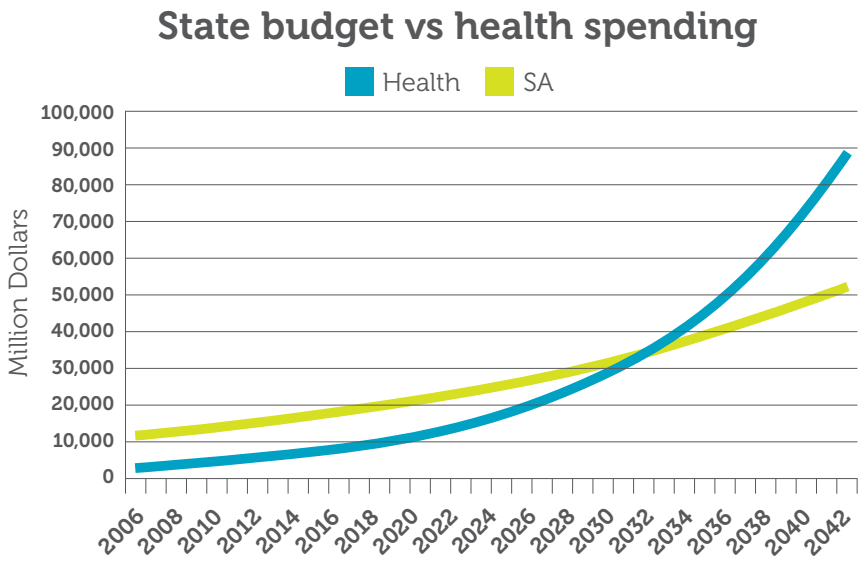


Figure A1. SA state budget vs health spending[6]

Economic benefits

The significant economic benefits of making streetscapes more pedestrian and cycling friendly are becoming increasingly recognised. In 2011, the Heart Foundation commissioned a discussion paper to bring together the evidence on the financial benefits to retailers and residents in making commercial streets more pedestrian and cycling friendly.[7]

A recent Living Streets UK report[8] also highlights that improvements to the walking environment:

- significantly increase pedestrian activity
- support safety, leading to fewer road casualties, injuries to pedestrians and traffic collisions
- reduce vehicle speeds
- increase opportunities for social interaction, which can facilitate the development of social capital, and lead to more people taking part in outdoor activities
- deliver economic value in increased sale prices of nearby homes and increased retail rents
- encourage more physical activity, particularly in more children walking to school
- reduce noise levels
- reduce the number and distance of car trips, implying a modal shift away from the car to walking.

Environmental benefits

Changing street design to promote a change in travel mode will help meet government targets on the environment. Reducing greenhouse gas emissions from transport is a key element of *South Australia's Greenhouse Strategy 2007–2020.*[9]

Greenhouse gas emissions from transport comprise nearly 20% of the state's total emissions. Increasing the number of trips by zero emission forms of transport such as walking and cycling is critical.

Leigh Street, **Adelaide**

A3 SOUTH AUSTRALIAN STRATEGIC CONTEXT

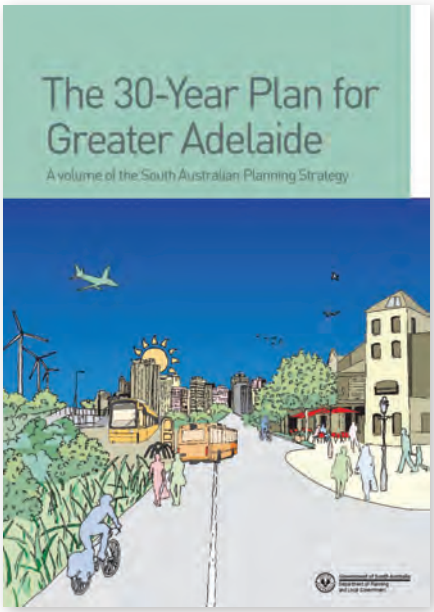
The Compendium supports a number of Government plans and policies.

South Australia's Strategic Plan

The State's ongoing commitment to community health and wellbeing is reflected in *South Australia's Strategic Plan.*[10] Targets of particular relevance to the built environment include:

- increase the use of urban spaces (T1)
- double the number of people cycling by 2020 (T2)
- reduce road fatalities and serious injuries by at least 30% by 2020 (T22)
- increase South Australia's population to 2 million by 2027 (T45)
- develop regional climate change adaptation plans by 2016 (T62)
- increase the use of public transport to 10% of metropolitan weekday passenger vehicle kilometres travelled by 2018 (T63)
- increase the healthy life expectancy of South Australians to 73.4 years for males and 77.9% for females by 2020 (T78)
- increase by 5 percentage points the proportion of South Australian adults and children at a healthy body weight by 2017 (T82)
- increase the proportion of South Australians participating in sport or physical recreation at least once per week to 50% by 2020 (T83).

Figure A2. South Australian strategic policy context relating to the built environment

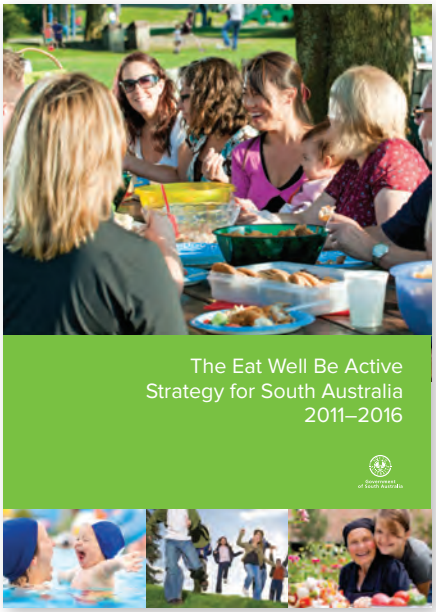


The 30-Year Plan for Greater Adelaide

The 30-Year Plan for Greater Adelaide[11] is a volume of the South Australian Planning Strategy, which is the spatial representation of South Australia's Strategic Plan. It serves to guide land use planning and development as well as the delivery of services and infrastructure.

Over the next 30 years, the population of South Australia is expected to change demographically and grow by almost 560,000 people. To house greater numbers of South Australians, the 30-Year Plan encourages a greater share of new development into existing urban lands, with a focus on developments that are walkable, connected and mixed use, incorporating medium to high density residential housing.

A centerpiece of proposed new urban development is the establishment of substantial transit-oriented developments that are walkable, cycle friendly, mixed use developments incorporating medium to high density residential housing.



Eat Well Be Active Strategy for South Australia

The Eat Well Be Active Strategy for South Australia 2011–2016[12] highlights the significant role that land use planning and the built environment have in enabling a physically active and sociable lifestyle to be a convenient and enjoyable choice. The underpinning 'Health in All Policies' approach is based on the understanding that the health of individuals and the wider population is shaped by broad societal factors that often lie outside the influence of the health sector.

A4 STREET DESIGN – KEY ISSUES & CONSTRAINTS

In compiling guidance and case studies for this Compendium, the project team invited industry practitioners to express their views and recommendations (see section E5). This inclusive approach guided the structure of the Compendium, its content and case studies.

The stakeholder workshops discussed influences on street design in South Australia. Concept design for streets is influenced by Australian Standards, strategic State Government and/or Council documents, such as development plans, precinct plans, manuals and codes of practice.

Table A1 outlines the key issues raised on the support and guidance available when designing streets in South Australia. It also highlights the scope and role of the Compendium in responding to these issues.

Table A1. KEY STREET DESIGN GUIDANCE ISSUES

No.	Key Issues	
1	**Dispersed guidance**	
	– There is no single reference point for the planning and design of streets in South Australia. Required parameters for street design are dispersed among many guideline and standard documents, including over 20 Australian Standards, 30 guidelines and several SA specific codes of practice.	
	ROLE OF COMPENDIUM	**REFERENCE**
	Has references to traffic standards and guidelines relevant to street design.	Section E1
2	**A gap in guidance for low trafficked and local streets**	
	– Australian Standards and guidelines generally address major road conditions, suitable for highways and provide limited advice for streets below 50 km/h. There are no provisions for street speed limits below 40 km/h except a declared 25 km/h School Zone in SA or a 10 km/h Shared Zone. Although referenced, there is no information on the application of speed environments for 20 or 30 km/h. – The suitability of standards for areas with desired speed environments of 10–40 km/h is frequently questioned. There is little consensus on how people-friendly streets that prioritise pedestrians and cyclists should be designed. – The traffic-led design approach (covered well by current standards and guidelines) and urban design/place-making recommended approaches are fundamentally different. There is a lack of design frameworks and guidelines in South Australia that advocate more sustainable and people-oriented design practices. – Separation of users is perceived as the best approach for safety and priority for efficient motor vehicle movements. Separate facilities are generally recommended with footpaths, shared use paths, bicycle lanes and traffic lanes. It is now not considered to be the best practice for all conditions. – The standards and guidelines generally permit pedestrian crossings only when deemed warranted in demonstrated high pedestrian demand areas (except school crossings). Well known 'zebra' crossings are not permitted on roads in South Australia. Higher specification on-street 'wombat' crossings are the available minimum type. – Current data and statistics on pedestrian and cyclist uses of street environments and their needs, is limited yet data on vehicular traffic is abundant.	
	ROLE OF COMPENDIUM	**REFERENCE**
	Guides how to design people-friendly streets building on national and international best practice, focusing particularly on lower trafficked street environments.	Chapters B and C

3	Complexity and uncertainty associated with standards, guidance and approvals processes	
	– The separate Development Act 1993 and Road Traffic Act 1961 have limited links for provision of public infrastructure. The Development Plan of an area often contains desired objectives and principles, including for walking and cycling, but current standards and guidelines under the Road Traffic Act limit the application and resultant inclusion of these principles into designs. – Shared Zones (10 km/h) Guidelines are very prescriptive and limiting, and require specific project by project approval by the Minister for Transport through the Department of Planning, Transport and Infrastructure as well as Council approval. – Lack of certainty and delays in an approval process for non–standard, context–sensitive designs can act as a deterrent to developers, local councils and consultants alike.	
	ROLE OF COMPENDIUM	**REFERENCE**
	Clarifies the approvals process for traffic control devices.	Sections B8 and C8

4	Limited South Australian exemplar street designs	
	– South Australia has few low speed and pedestrian priority examples, having only about 15 Shared Zones. Our state thus lacks experience and confidence in street design for lower speed environments that mix people with motor vehicles. Practice has been directed towards local area traffic management principles and 40 km/h speed limit precincts. – A liability risk is perceived for the relevant approving authority where there is no standard or guideline to reference. An incident will result in comparison of practice to available standards and guidelines in South Australia, and the absence of guidelines for 20–30 km/h speed environments has limited practice to date. The lack of local experience and understanding of low speed environments can be reflected in road safety audits, which commonly refer back to traditional design approaches and standardised methodology and practice.	
	ROLE OF COMPENDIUM	**REFERENCE**
	Includes best practice national and international examples of implemented street designs. Includes a number of street design studies with more detailed evaluation (Chapter C).	Chapters B and C

A5 WHAT MAKES OUR STREETS UNFRIENDLY TO PEDESTRIANS & CYCLISTS?

"Every road tells a story. It's just that so many of our roads tell the story poorly, or tell the wrong story."

Hans Monderman, Dutch traffic engineer, pioneer of shared spaces

The following visual examples of streets in South Australia demonstrate the issues for people using them. The images are from specific locations but the problems are common throughout South Australia.

Congestion on footpaths at busy bus stops
Grenfell Street, City, Adelaide

Pedestrian street clutter, **Military Road, Grange, Adelaide**

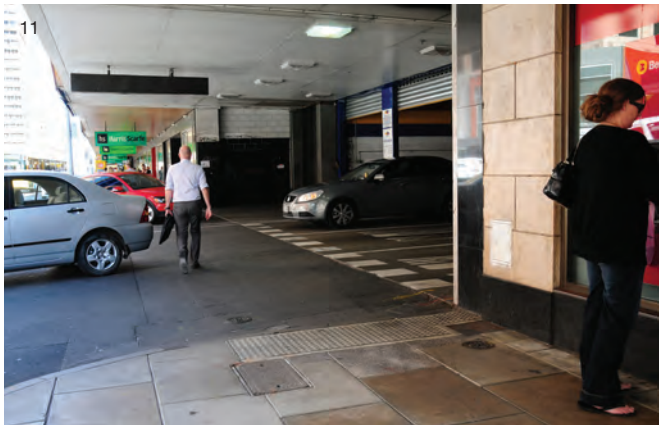
Poor quality of pedestrian pavement
Grenfell Street, City, Adelaide

Narrow footpaths (even along 'no through road')
Chesser Street, City, Adelaide

No footpaths, **Eyre Highway, Town Centre, Port Augusta**

Footpath on one side only, **Eyre Highway, Town Centre, Port Augusta**

High vehicular speed in a busy pedestrian environment; big speed difference between cars and bicycles, **North Terrace, City, Adelaide**



Cars appear to have priority for accessing a car park over people walking on a footpath, **Grenfell Street, City, Adelaide**

Long pedestrian waiting times (120 seconds) and pedestrian push buttons at crossings, **North Terrace, City, Adelaide**

Poor personal security and inactive frontages, **Blyth Street, City, Adelaide**

Footpaths too narrow in a harsh pedestrian environment **David Terrace, Kilkenny, Adelaide**

Car priority at slip lines with cars able to turn left into pedestrian path at any time, **Intersection North Terrace and King William Street, City, Adelaide**

Local residential street environments promoting car dominance and priority, **Eton Street, Unley, Adelaide**

City centre side streets promoting car accessibility and priority **Gawler Place, City, Adelaide**

Dominant car parking provision along main streets with blank frontages and large impenetrable blocks, **Hanson Road, Kilkenny, Adelaide**

Dominant car parking provision in city centre, **City, Mount Gambier**

Unattractive inactive frontages-garage doors
Mills Street, City, Adelaide

Unattractive inactive frontages–covered up commercial property windows **Grote Street, City, Adelaide**

Lack of consideration during construction, **James Schofield Drive, Adelaide Airport**

Pedestrian fencing, **Unley Road, Unley, Adelaide**

Cars encroaching into pedestrian environment
Port Road. Beverley, Adelaide

Lack of climate protection (shade), **Port Road. Beverley, Adelaide**

Lack of bicycle parking, **Coromandel Place, City, Adelaide**

Cars allowed to park on bicycle lanes all day apart from 1.5 hour evening peak **Prospect Road, Prospect, Adelaide**

Buses allowed to stop on bicycle lanes, King William Road **Victoria Square, City, Adelaide**

Abrupt end to bicycle paths, **Mount Gambier**

Cars merging through a bicycle lane, **King William Road, Victoria Square, City, Adelaide**

Cars queuing through a bicycle lane, **King William Road, Victoria Square, City, Adelaide**

Figure A3. South Australian examples of pedestrian and cyclist unfriendly streets

Cars turning through a bicycle lane, **Morphett Street, City, Adelaide**

Narrow poor quality bicycle lanes, **King William Road, Victoria Square, City, Adelaide**

Illogical, inconvenient and unsafe bicycle path, **Mount Gambier**

No cycling lane along a desirable route with fast moving traffic **O'Connell Street, North Adelaide, Adelaide**

Poor road surface within a metre of the kerb, **Thomas Street, Unley, Adelaide**

REFERENCES

1. Transport Data Centre. 2008/09 Household Travel Survey Summary Report, NSW Government. 2010.
2. Department of Infrastructure and Transport. Our Cities – building a productive, sustainable and liveable future: discussion paper. Australian Government, Canberra. 2010. www.infrastructure.gov.au/infrastructure/mcu/urbanpolicy/ourcities.aspx
3. J Gehl. Cities for People. Island Press, Washington DC. 2010.
4. Australian Bureau of Statistics. 2011. Overweight and Obesity in Adults in Australia: a snapshot, 4842.0.55.00.1 www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/7DC7186F4A9950DECA25789C0023DCEF/$File/4842055001_200708.pdf
5. Population Research and Outcome Studies. 2011. South Australian Target Report: Children aged 5 to 17 years, January 2011 to December 2011. The South Australian Monitoring and Surveillance System.
6. SA Health. Health in All Policies: The South Australian Approach. 2006. www.sahealth.sa.gov.au/wps/wcm/connect/4034df0043aee36bb5f7fded1a914d95/infopamphlet–hiap–phcc 1004.pdf?MOD=AJPERES&CACHEID=4034df0043aee36bb5f7fded1a914d95
7. National Heart Foundation of Australia and R Tolley. Good for Busine$$: the benefits of making streets more walking and cycling friendly. 2011. www.heartfoundation.org.au/SiteCollectionDocuments/GoodforBusinessFINAL_Nov.pdf
8. D Sinnett, K Williams, K Chatterjee and N Cavill. Making the case for investment in the walking and cycling environment. Living Streets. 2011. www.livingstreets.org.uk
9. Department of the Premier and Cabinet. Tackling Climate Change: South Australia's Greenhouse Strategy 2007–2020. Government of South Australia. 2007. www.climatechange.sa.gov.au
10. Government of South Australia. South Australia's Strategic Plan. 2011. www.saplan.org.au
11. Government of South Australia. The 30-Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy. 2010. www.dplg.sa.gov.au/zplan4adelaide/index.cfm
12. Department of Health. Eat Well Be Active Strategy for South Australia 2011–2016. Government of South Australia. 2011.

Image	Source
01	Adelaide City Council
02, 04–18, 20–21, 23–27	Natalya Boujenko (Intermethod)
03	Paul Collins
22, 35–36	DPTI
19, 29, 34	Michael Silvy and Daryl Morgan (City of Mount Gambier)
28, 30–33	GTA

01

CHAPTER B / STREET DESIGN APPROACH

STREETS FOR PEOPLE

COMPENDIUM FOR SOUTH AUSTRALIAN PRACTICE.

B1 ENSURE BEST-PRACTICE INTEGRATED DESIGN APPROACH

Introduction

Streets are designed or redesigned for different reasons, such as:

- completely new neighbourhoods are being designed
- a street's strategic role has changed, warranting a new physical design response
- a street's layout does not correspond with or does not support desired activities
- street renewal is planned as part of an asset management program
- safety is a specific concern, or a street design does not include all users.

Street design is normally initiated by the authorities who own or are responsible for managing the road reserve, for example local councils, state transport departments or private land developers. Every authority has its own design process to be followed, guided by financial and design approvals. The design of streets is also frequently part of a larger planning project, which has its own process steps.

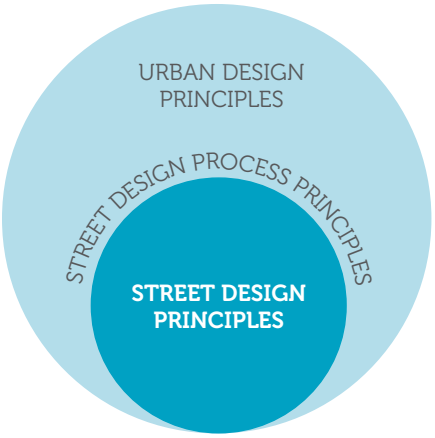
This Compendium does not propose a model step-by-step process to fit all possible cases. It offers a series of process–related considerations, based on best practice.

Streets are not isolated elements in the urban landscape; they are integral components of larger street networks, the urban fabric and neighbourhoods. Therefore, street design principles should be directly related to broader urban design principles of neighbourhoods and precincts.

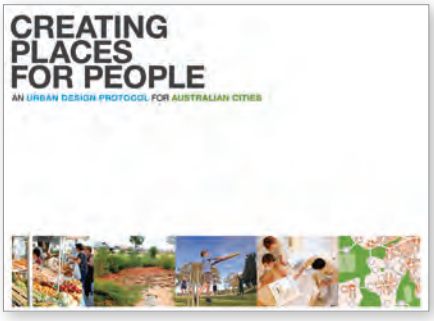
Creating Places for People: An urban design protocol for Australian cities

This Compendium recommends a street design process that follows the key leadership and governance principles outlined in *Creating Places for People: An urban design protocol for Australian cities*.[1]

This protocol is a commitment to best practice urban design, developed in a two-year collaboration of peak community and industry organisations, states, territories, local governments, and the Australian Government. The Government of South Australia, Integrated Design Commission, Planning Institute of Australia, Heart Foundation, Australian Institute of Landscape Architects, Australian Institute of Architects, Property Council of Australia and several councils have so far adopted these principles.



Street design considerations are nested with urban design considerations of wider neighbourhood areas



This best-practice integrated approach means:

– working within the planning, physical and social context
  Context

– engaging with relevant stakeholders
  Engagement

– fostering excellence, innovation and leadership
  Excellence

– considering custodianship and maintenance over time.
  Custodianship

These process steps need to be tailored to the nature and complexity of each street design project.

Figure B1 shows examples of urban design charters, guides and handbooks in South Australia and highlights where the Streets for People Compendium fits.

EXAMPLES OF URBAN DESIGN CHARTERS, GUIDES AND HANDBOOKS IN SOUTH AUSTRALIA

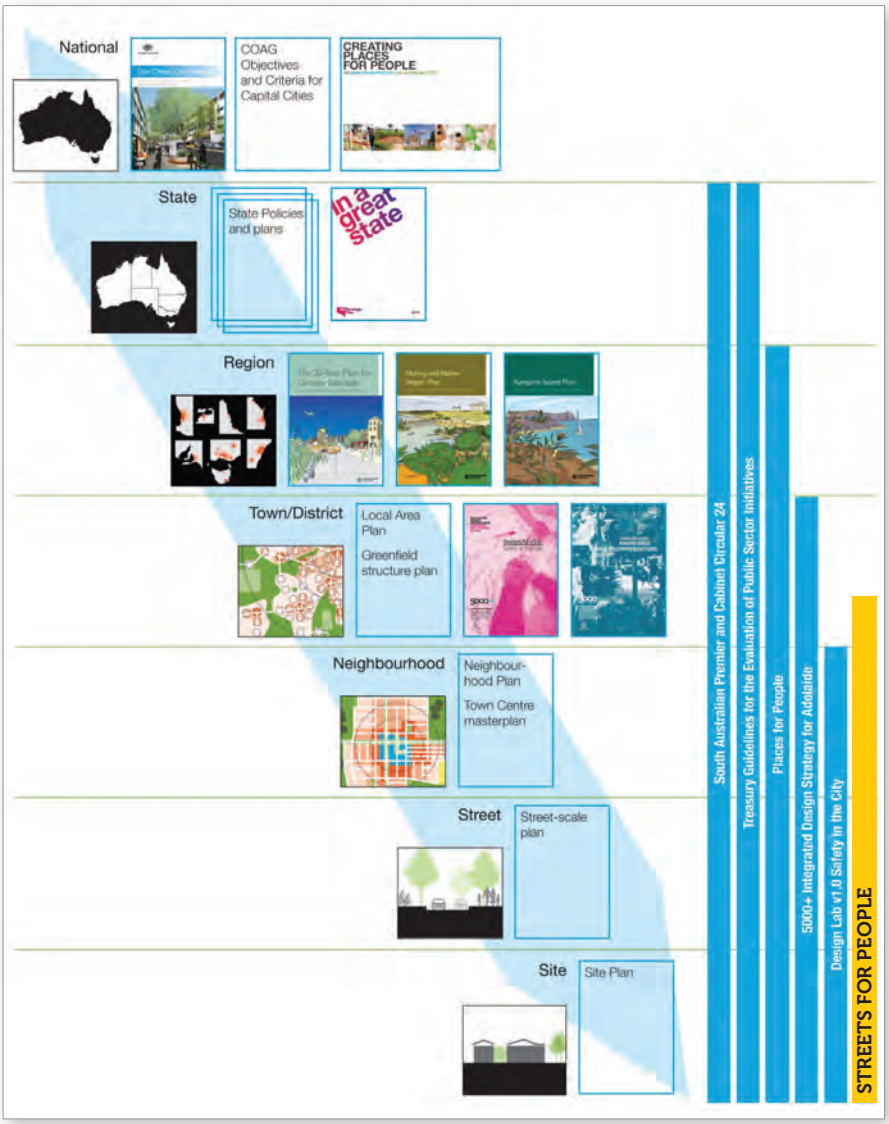


Figure B1. Line of sight from national to local level (South Australia)[2]

Context

Creating Places for People: An urban design protocol for Australian cities[1]

Creating Places for People recommends a government and leadership process that:

- sets, or works within, the strategic planning framework
- integrates with the physical environment, including its topography, biodiversity, landscape and views, existing streets and buildings, and infrastructure
- incorporates the heritage, culture and historical context of surrounding communities and places
- is compatible with surrounding social and economic activities.

A successful street design works within existing planning, physical, and social contexts.

DESIGN BASED ON EVIDENCE

A key component of a street design process is to gather available evidence and policy documentation to set the context that guides street design.

It is advisable to identify gaps in information and evidence at the onset, and thus the additional assessment needed before starting a design. This includes information or evidence that may need to be collected through community consultation and engagement.

Street redesign often aims to address specific issues and/or poor performance for one or more user groups. However, making improvements for one user group can make conditions less favourable for others. Reaching consensus in problem definition is crucial for steering the design process.

Before design concepts are considered, establish an 'evidence base' to document and agree on the current performance of various aspects of street performance. This will then lead to problem definition and development of a 'design brief': a set of requirements that a design should address.

Typically an evidence base may contain:

- objective data sets for various user groups and factors contributing to street performance (e.g. vehicle volumes and speeds, accident statistics, pedestrian and cyclist movements, staying activities, use types)
- street user perception surveys identifying problem types
- professional assessment.

EXAMPLE: Establishing an evidence base for Canberra City Central

Source: Movement and Places: Canberra City Central[3]

A number of city streets in Canberra City Central are being redesigned to support economic growth and meet the needs of the increasing number of residential and commercial uses. To establish a common understanding of issues and opportunities, the ACT Government collated an evidence base for the central street network (Figure B2). This information is being used to develop a common understanding of the street network performance and issues of concern, and to set a direction for development of the city's public realm.

Please refer to Chapter D1 for an Adelaide City Council case study.

Figure B2. Selected maps from the Canberra City Central evidence base[3]

HUMAN-CENTRED DESIGN

Human-centred street design starts by observing how people use streets and studies human behaviour to understand current limitations and opportunities.
The key design consideration for human-centred design is its users, people. The implications for street design practice are:

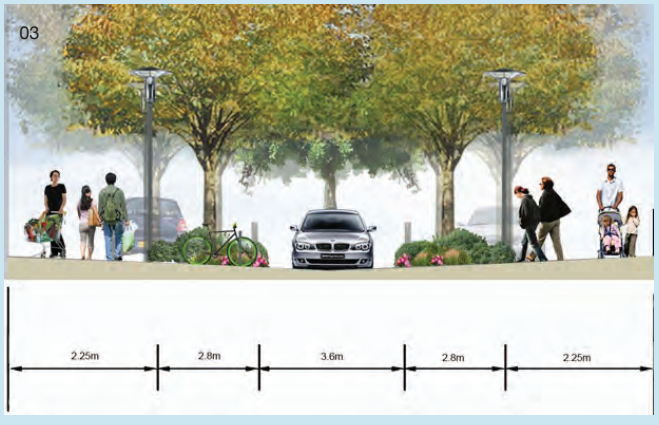
- start the design process by developing an understanding through observations of how people use the space or could be using it under optimal conditions
- draw inspiration for design from human stories
- in streets and places where human interaction is desired, design to human scale (e.g. relate distances, heights, angles, speeds to a pedestrian)
- activate existing site knowledge of the community and bring this out through local stories and heritage
- use 'prototypes' (2-dimensional cross sections, visualisations or any other scenario-testing tools) to 'test' and imagine the human experience for the design option (Figure B3)
- make people the basis for street performance assessment and project appraisal (see Figure B4).

EXAMPLE: Visualising how designs will look and feel to users

Figure B3. Examples of 3-dimensional cross section and visualisation from initial street design concepts.

Leigh Street, **Adelaide**

Bowden Development, Bowden, **Adelaide**



Bowden Development, Bowden, **Adelaide**

USING A HUMAN CENTRED APPROACH TO ASSESSING EVIDENCE

The traditional evidence base has been primarily concerned with vehicle numbers, congestion and mode share. This has led to streets of poor urban quality for non-vehicular users that prioritised and primarily catered for traffic on the vast majority of the street network. A human centred approach looks at the same statistics from a human experience perspective. It also recognises and values a place-making dimension of streets. The Compendium has adopted the Link and Place approach (see Chapter B2), which simultaneously considers movement and place-making needs in street environments.

EXAMPLE: Grenfell Street (Adelaide) assessment

In 2010 the Department for Transport, Energy and Infrastructure (now Department of Planning, Transport and Infrastructure, DPTI) investigated performance and design possibilities for Grenfell Street, a main carriageway and major bus route in the Adelaide Central Business District. An early project stage assessed the street's performance and uses (Figure B4). The street's use as a movement conduit for different modes appeared to indicate car traffic as the dominant mode. Further detailed work based on human-centred considerations, and numbers of people using each mode, led to the different conclusion that bus passengers were the dominant mode. This has different implications for design possibilities.

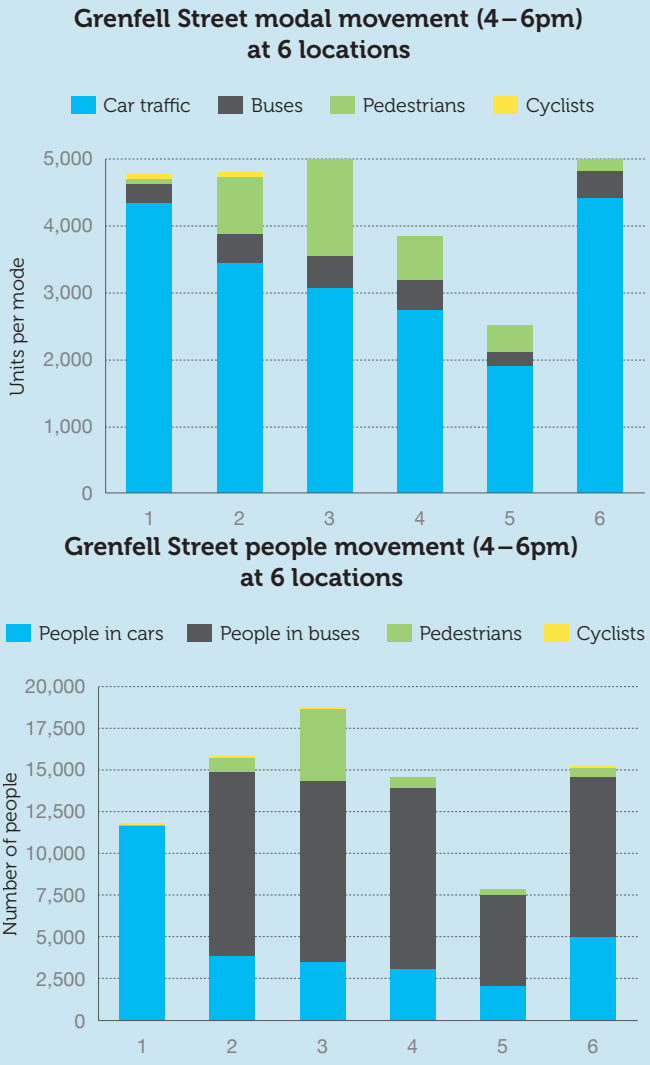


Figure B4. Grenfell Street performance and use[4]

Engagement

Creating Places for People: An urban design protocol for Australian cities[1]

Creating Places for People recommends a government and leadership process that:

- acknowledges urban design as primarily about creating places for people
- engages people in the development of their community
- adopts a multidisciplinary and collaborative approach to planning and design.

04

Local community artist painting electricity pole **Hawker Street, Adelaide**

The Compendium takes the approach that:

- people should be at the centre of design considerations, and
- engaging relevant stakeholders in the design process will enhance the final outcome.

The degree of community engagement and consultation will depend on the nature and complexity of the project, and previous community engagement undertaken for the site/project. Relevant stakeholders (such as residents, community groups, business groups, local businesses and other street users) contributing input and feedback at key stages of the street design process will help:

- fill gaps in the evidence base
- develop an understanding of the local context, the feeling of place and community
- draw out aspects of local identity
- reconcile different opinions and conflicting objectives between planners, business and street users
- establish a common vision for the scheme
- confirm local priorities and needs
- identify the key issues to be addressed through design
- broaden ideas and possibilities
- encourage ownership and local expression in detailing of the streetscape and longer–term maintenance and use (e.g. by enabling the community to personalise and manage verge planting or local art installation)
- build a consensus as the project moves on, assuring greater success in support of the emerging scheme.

The many techniques for community engagement can range from visioning workshops and focus groups to design charrettes, where hands-on design input is sought from the community. Develop a consultation strategy or plan that will consider long-term community involvement in the project, from inception to installation.

Successful engagement starts early in the process; genuine engagement influences design outcomes and decisions. It is vital to have an adequate evidence base for discussion at the start of community consultation, and to be clear about which aspects of the project can be influenced through the consultation.

05

Community engagement with traders regarding proposed Leigh Street and Bank Street upgrades **Leigh Street, Adelaide**

Excellence

A VISION-LED APPROACH

"A process that embraces design excellence requires visionary leadership."

Urban Design Protocol, 2011.[1]

Every street design project should start with a vision and a set of guiding principles, which set an overall direction for the project. Smaller street upgrades need to support the overall vision of larger precincts.

The vision is typically one sentence that captures the desired strategic role (see Section B2) and character of the street. Guiding principles are a number of statements (2–20) on the qualities and performance of various elements of the space, congruent with the vision. Chapter C has a list of expanded street design guiding principles for low-speed street environments.

A vision and guiding principles should be adopted collaboratively by stakeholders and street users.

Creating Places for People: An urban design protocol for Australian cities[1]

Creating Places for People recommends a government and leadership process that:

- prioritises best practice planning, design, engineering, procurement and maintenance
- champions universal design and accessibility
- integrates design, and design expertise, from the earliest stages of a plan or project to completion
- engages competent, skilled professionals to design and deliver on projects.

EXAMPLE: Victoria Square vision and guiding principles

Victoria Square, Tarndanyangga, at the heart of the city of Adelaide, was designed by Colonel William Light as the focal point for the city. Currently the square does not fulfil this role; it is carved up by roads and offers little reason for people to visit and stay. Numerous proposed redesigns over the last 50 years have yet to achieve stakeholder and community consensus.

In 2009 a new effort began to develop a design for the square. At the beginning of the project, a vision and guiding design principles were developed in collaboration with stakeholders and published as a booklet. This step enabled a shared goal for the space to be developed, before design exploration began. The vision of the square is:

'To be an accessible and vibrant public square that is internationally recognised as a symbol of South Australia's unique culture and lifestyle.'

The 16 guiding principles for the square relate to:

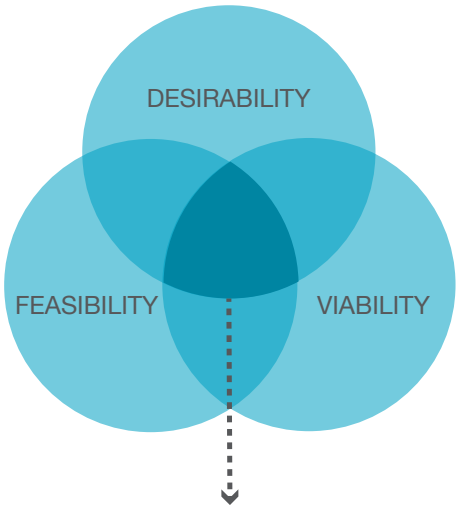
- Principles of a Great City
- Image and identity
- Design excellence
- Historic reference
- Residential population
- Cultural diversity and unity
- Accessibility
- Pedestrian linkage
- Vehicle traffic
- Events, activities and attractions
- Flexible, adaptive and dynamic
- Integrated public art
- Conversation and sustainability
- Bold, water-wise planting
- Management and maintenance
- Funding partnerships[5]

INNOVATION

A street design process should be adventurous and open-ended where possible. It should not start by focusing on actual or perceived limiting factors (e.g. what the authority may not 'like' as a solution, or designs that are 'difficult' to receive approval for or expensive to implement). At the beginning of the process, explore and consider various options. Start by establishing what the optimum street solution is, (before restricting or limiting it with other considerations) and explore ways of unblocking constraints or unlocking new possibilities to achieve the optimum.

Design teams should be cross-disciplinary, drawing on expertise across various fields and from the community sector.

Through experimentation, innovation emerges. The street design process should invite experimentation into the design and into the process itself, looking at new and fresh ways of engaging, presenting information, forging implementation partnerships, incorporating new materials and building technologies.



Custodianship

Creating Places for People: An urban design protocol for Australian cities[1]

Creating Places for People recommends a government and leadership process that:

- recognises that communities, environments and cities are continually evolving and adapting
- considers the wider environmental, social and economic costs and benefits of development, operations, maintenance and disposal
- ensures that the design of a place is appropriate for its ongoing maintenance, operation and upkeep
- incorporates strategies to reduce and adapt to climate change.

Community gardens in street verges
Freemantle, Sydney

MAINTENANCE

In a successful street design process, discussion of longevity and maintenance forms part of the brief to the designers and informs the final designs. All parties should be clear on who has responsibility for maintenance and upkeep, including discussions on broader community involvement with personalising and maintaining the street.

EVALUATION

It is important to establish agreement on a method for appraising the proposed street design project and, subsequently, its success after implementation. It is also important to recognise the difficulty in delivering benefits to all user groups; thus during, and even after, implementation there can be a lack of consensus on how successful the project is. An agreed approach to measuring success sets an objective basis for assessment and dialogue.

EXAMPLE: Project identification, appraisal and prioritisation of small street redesign schemes in Transport for London

To assess impacts of proposed street design schemes, Transport for London developed and established Project Identification, Appraisal and Prioritisation, a project appraisal tool for projects below £2 million. It works by assessing project impacts across an agreed set of criteria on the basis of objective (quantitative) data and qualitative professional judgement.

One of the outputs of the tool (Figure B5) illustrates the degree (vertical point scale) to which a scheme design impacts on a number of considerations.

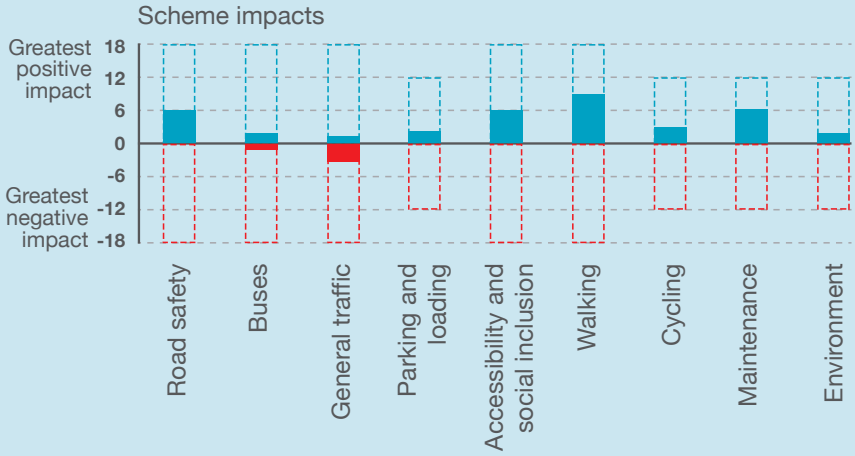


Figure B5. Scheme impacts on a number of considerations (Transport for London data)

B2 ESTABLISH THE STRATEGIC ROLE OF A STREET

Typical/conventional road hierarchy

Introduction

Each street in a street network has its specific role: not all can be popular destinations, just as not all should prioritise vehicular movement. Before the design process begins, establish what the role of the street is within a wider street network hierarchy.

The vision for a street design (B1) should reflect the strategic role of a street in the wider street network. Once the street's strategic role has been determined, the vision and guiding principles will guide and shape the design process. Functional considerations, such as speed, street space allocation, volumes for the modes of traffic, frequency of crossings, width of footpaths, are also related to the street's strategic role.

RETHINKING CONVENTIONAL HIERARCHIES

Road traffic engineering has emerged in Australia as a discipline since the automobile became a widely owned commodity in the 1950s. The discipline has defined road functions on the basis of traffic movement needs alone. Typically, a road hierarchy expressed the relative importance of a road depending on the vehicular flow it carried: from a highway right down to local access roads. Planning for access needs was deemed strategically opposite to movement needs. This approach for classifying roads was reflected in road designs with carriageway widths optimised for vehicle movement in most cases.

A 'road' is mostly defined as a 'way by which people, vehicles and animals pass between places'. It is therefore primarily a carriageway space. A 'street' is a space between buildings, including a carriageway, footpaths and access to frontages. We now recognise the role that streets play as destinations in their own right, as places we visit to enjoy for leisure, recreational or other 'unnecessary' activities, not just to access 'necessary' places of work or residence or to move through. This led to a re-think of the road hierarchy concept. For example *Road Classification in South Australia*[6] states that 'Roads have a number of functions that can be conveniently grouped into: movement function (traffic) and access function (abutting land use)'.

The Link and Place approach

One method for establishing the strategic role of a street that balances the need for movement and accommodates destination requirements is the Link and Place approach.[7] The European Commission funded Arterial Streets Towards Sustainability (ARTISTS)[8] between 2001 and 2004. Academic and government organisations from nine European countries took part in developing the Link and Place concepts, now used widely in the UK, Australia and New Zealand and included in the UK's *Manual for Streets*[9,10] and *Shared Space*.[11]

During development of this Compendium, South Australian practitioners who attended workshop sessions supported adoption of the Link and Place concept as the basis for all street advice in this document. Therefore this methodology underpins the Compendium.

What is 'Link and Place'?

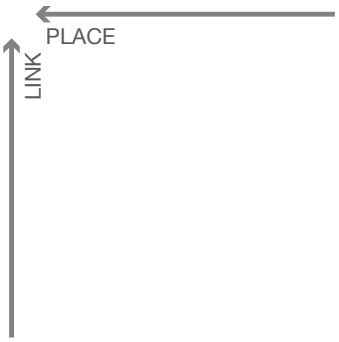
Urban streets provide the setting for a wide range of urban street activities, which can be grouped under two broad types of street functions: 'Link' and 'Place' (Figure B6).

As a Link, a street forms a conduit for through movement, and an integral part of the wider urban street network and other, more specialised, urban transport network (e.g. on-street light rail network). A Link user may travel by a variety of modes, from private car or truck to bus, bicycle or on foot. Their essential need is to follow a continuous, linear path through the street network, with minimum disruption and a seamless connection from the beginning to the end of their journey. In general, they seek to minimise travel time along each section of street.

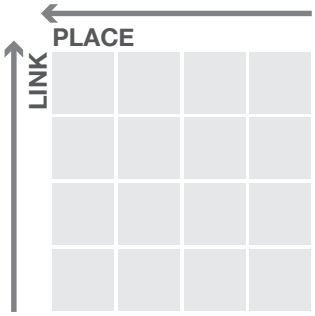
As a Place, a street is a destination in its own right: a location where activities occur on, or adjacent to, the street. A Place user wants to make use of some of the features on that particular street, and will usually do so on foot. Such people are classified as 'pedestrians' but they are not all passing through the area – many are spending time in the area on a wide variety of activities (e.g. shopping, talking, waiting, resting, working). They are particularly affected by the noise and air pollution produced by vehicular traffic and the general severance effect of heavy traffic volumes in inhibiting their movement between places on opposite sides of the street.

Not all traffic and transport-related activity observed on urban streets is part of that street's Link function. Some types of Place-related activities are directly connected with traffic and transport, and occur in and adjacent to the carriageway (e.g. accessing homes, loading/unloading, parking by employees, customers, and buses and trams stopping to drop off/pick up passengers).

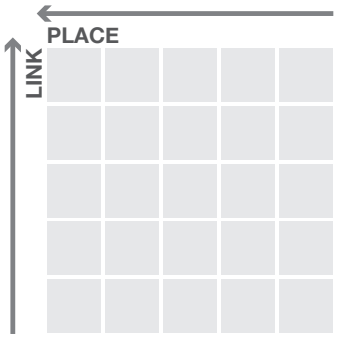
Figure B6. The two types of street function



Two–dimensional Link and Place street classification



For regional towns (e.g. Port Augusta), a 4x4 matrix is recommended



For the complex street network system in metropolitan Adelaide, a 5x5 matrix is recommended

Figure B7. The Link and Place matrix applied to urban areas of different size

The Link and Place matrix

The concept of Link and Place sets the basis for developing a two-dimensional street classification, into which every kind of urban street can be located within a matrix which balances Link-related and Place-related activities.

Link status is shown on the vertical axis in Roman numerals and Place function is shown on the horizontal axis in capital letters. Every cell in the matrix describes a street type with a different combination of Link and Place requirements. Table B1 demonstrates Link status levels in relation to traffic volumes, and figure B8 shows a completed matrix.

In applying the Link and Place classification system, the size of the matrix depends on the size of the city; the larger the urban area and complexity of the street network system, the greater the size of the Link and Place matrix (Figure B7).

In South Australia, Adelaide warrants the largest size matrix to be adopted (5x5 is recommended) when compared with regional towns. This allows for five status levels for Links and Places, and 25 distinct street types for an Adelaide–wide context. Partial application trials (DPTI and Adelaide City Council) confirmed that the five possible status levels for Links and Places are sufficient to capture the breadth of complexity in Adelaide's street network.

Cities with population above 3 million people are likely to have more complex street network systems and, like London, may adopt a 6x6 matrix. A 4x4 matrix size may be more appropriate for small regional towns.

In the next step, label the status levels, and possibly individual cells. Figure B8 shows a matrix that has been successfully applied in parts of Adelaide, Canberra and Birmingham (UK) and advocated in the *Manual for Streets 2*.[10] Each status label indicates from which area most street users are coming. For example, III–E implies that Link users driving through the street are from a wider district origin, while Place users are from the immediate locality.

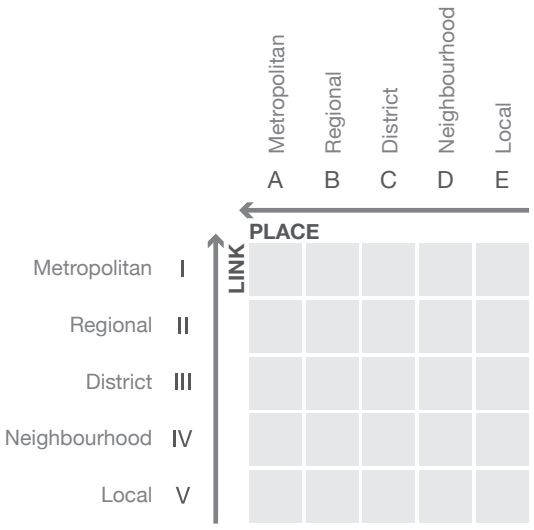


Figure B8. Link and Place matrix advocated in *Manual for Streets 2*[10]

EXAMPLE

Figure B9 shows how a number of Adelaide streets would be mapped onto a conventional linear road classification and onto a two-dimensional Link and Place matrix. The linear road hierarchy places a busy city bypass route such as West Terrace (carrying over 60,000 vehicles per day, [vpd]) close to the city's most significant boulevard and a place of state importance, North Terrace (carrying over 30,000 vpd), implying a similar strategic role. However, the Link and Place matrix positions them much further apart, giving regard to the difference in Place function of the two streets

Figure B9. Conventional and Link and Place matrix mapping

1. West Terrace, **Adelaide**

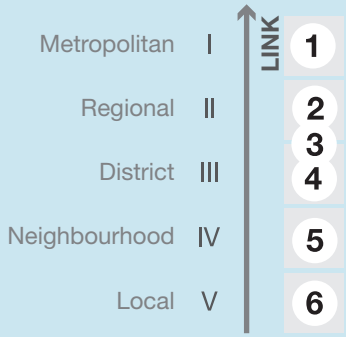
2. North Terrace, **Adelaide**

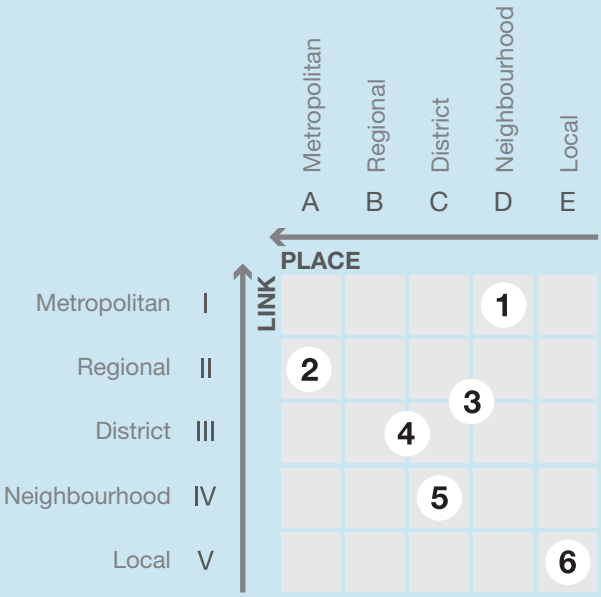
3. Fullarton Road, **Highgate**

4. Prospect Road, **Prospect**

5. Elizabeth Street, **Croydon**

6. Torrens Street, **Mawson Lakes**





CONTEXTUALISING A STREET TO THE WIDER AREA

Decide on the Link and Place status of a particular street in the context of what is happening in the whole urban area. Apply the Link and Place classification strategically, by preparing a wider precinct plan to set Link and Place designations for a wider area.

DETERMINING LINK AND PLACE STATUS LEVELS

For determining both Link and Place status level, the decision is based on how far from the street (and from which areas) the origins of the journeys are for both Link and Place users (i.e. the catchment area for the street users). For example, if more than 50% of street users staying within the street environment come from the surrounding district, then Place designation in a 5x5 matrix would be District (C).

For Link status, as a starting point the current road classification level can be used as a guide. But many streets carry other transport networks too, including: tram, bus, bicycle, heavy goods vehicle. The final Link status should be based on the highest value from the individual modal networks.

EXAMPLE: Establishing Link and Place status for streets in Adelaide

Table B1 shows an indicative (not definitive) relationship between:

– Link status levels and volumes of cars and buses
– Place status levels and volumes of people on the streets and in public spaces.

Strategic Link and Place designations may aim to change (increase or decrease) current volumes and therefore should be based on the desired volume of people moving through or accessing places. Alternatively, two Link and Place designations may need to be determined, current (reflecting on how the street performs now) and desired/ future designation.

This table was developed through application work by the Department of Planning, Transport and Infrastructure and Adelaide City Council, led by Intermethod.

NOTES:

1. Nominal label given to status levels reflecting the likely catchment from which Link or Place users are arriving.
2. The average number of vehicles in both directions recorded on a typical day from 7 am to 12 midnight.
3. Average distance of journeys undertaken to reach destination.
4. Staying activities associated with the enjoyment of Place, such as sitting, playing sport, recreation uses, outdoor dining, lying down, etc.
5. Visual range: A 100 m length of a street or a 50 m radius for the Park Lands and open spaces.'Typical number of people' here refers to everyday number of people staying in peak periods and for public spaces excludes one–off special events.
6. If different status level is implied through tests (3) and (5), the lower of the two is taken.

Link and Place	Determining Link hierarchy level		
Status label(1)	**Status level**	**Movement characteristics**	**Average daily traffic(2)**
Metropolitan	I	Carries traffic of metropolitan-wide origin.	Above 35,000
Regional	II	Carries traffic of regional-wide origin.	20,000 to 35,000
District	III	Carries traffic of district-wide origin.	8,000 to 20,000
Neighbourhood	IV	Carries traffic of neighbourhood-wide origin.	3,000 to 8000
Local	V	Carries local traffic from immediate streets.	Below 3,000

Determining Place hierarchy level			
Status level	**Level/intensity of on–street staying activities**	**Average distance travelled(3)(6)**	**Typical number of people "staying"(4) in the place within a 100m visual range(5)(6)**
A	Very high and/or of state/ metropolitan significance (due to cultural or tourist value).	Above 15km	Above 100
B	High, with city–wide interest and large numbers of on–street staying users within a large precinct.	7km to 15km	50 to 100
C	Moderate, with visible on–street staying activities like public seating, outdoor dining, or concentration of public transport stops.	3km to 7km	20 to 50
D	Low, with few attractors like corner shops or businesses that generate low levels of activity.	1km to 3km	5 to 20
E	Used by local residents and workers only.	Up to 1km	0 to 5

Table B1. Determining Link and Place status level

PLACE STATUS

Place status should be based on the degree of significance of that part of the street network in the city or regional/national context. This may be characterised in terms of the extent of the catchment area of visitors to the street, or the historical or cultural significance of the buildings or the street space itself. A primarily retail street will already have a hierarchy set out in planning documents than can be adapted for this purpose. Otherwise, 'rules of thumb' can help, such as a street with a:

- primary school is of at least Neighbourhood (D) importance
- secondary school is of at least District (C) importance.

Even though some buildings or land uses may themselves be significant, the street environment immediately in front of them may not reflect that designation, so it may not attract visitors to stay longer in the area.

SEGMENTS AND THEIR ROLE/STATUS

A street network may need to be divided into street segments, with a new segment being formed where either the Link or Place status changes, or where the modal priority or predominant land use changes (Figure B10).

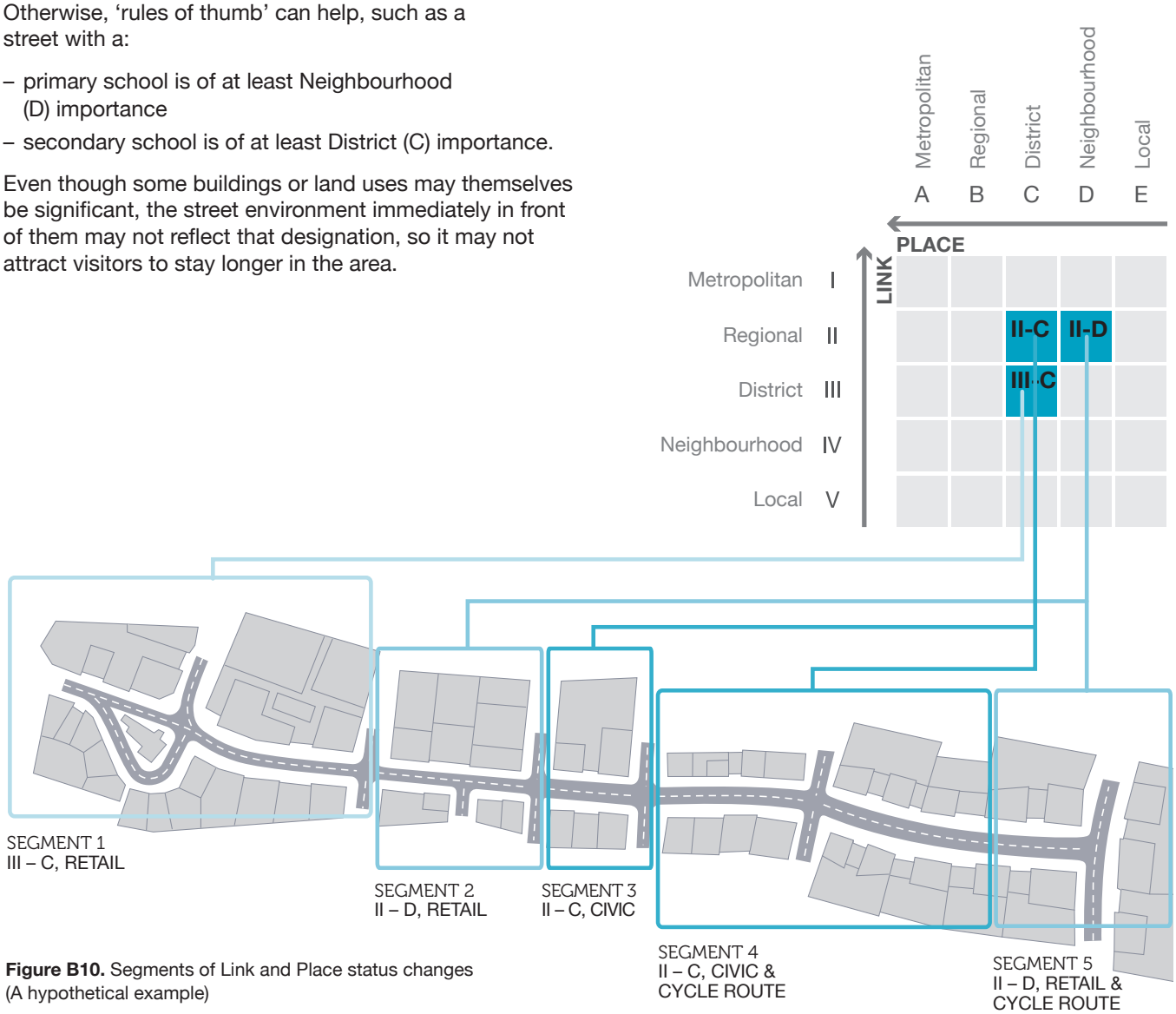


Figure B10. Segments of Link and Place status changes (A hypothetical example)

EXAMPLE: Segmentation of London's arterial street network

Source: Transport for London

Figure B11 illustrates the outcome of segmenting London's arterial road network (Transport for London's Road Network, TLRN). The arterial road network spans only two Link status rows in a 6x6 Link and Place matrix but a rich variety of Places (from A to F) can be found along it.

The Link and Place approach enabled Transport for London to translate the strategic roles of the streets it manages into a consistent and rich classification system. Transport for London assesses the performance of each street segment annually and applies the Link and Place matrix as a performance weighting mechanism to prioritise streets for design or remedial works.

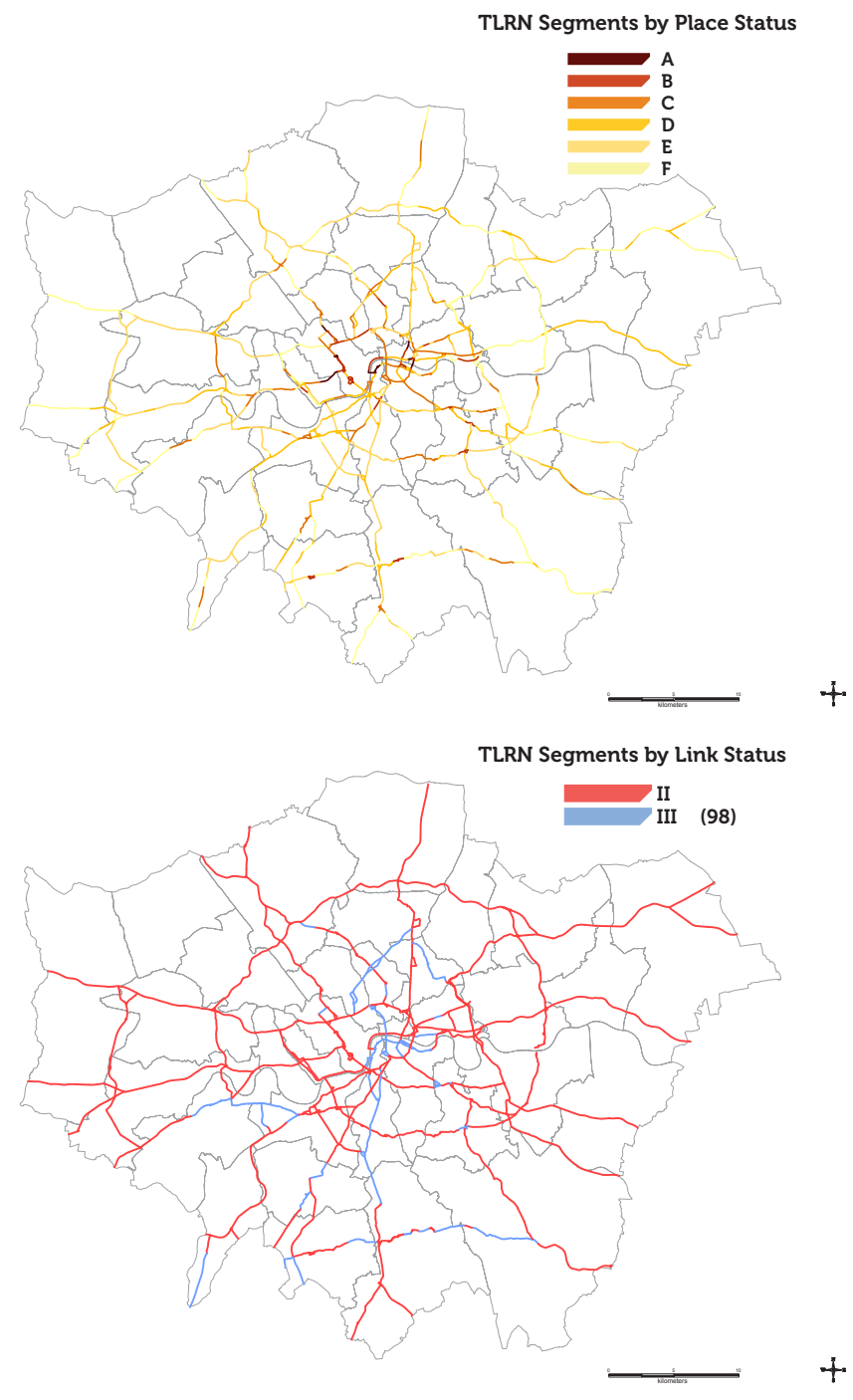


Figure B11. Link and Place status of London's arterial road network

CURRENT VS STRATEGIC (FUTURE) ROLE OF THE STREET

Street redesign often requires a rethink of the strategic role that the street is assigned. If the change proposed triggers a different designation in the Link and Place matrix, this should be agreed to ensure a shared vision for the project is established, before design work begins.

A shift from one cell to the next in the Link and Place matrix implies a different design response and, if implemented, is likely to transform the environment.

EXAMPLE: Link and Place status of Port Road (Adelaide) at the Entertainment Centre

In 2010, the area outside the Entertainment Centre was transformed: the tram line was extended to a new tram stop in front of the Centre and its forecourt area was redesigned. New cafes, restaurants and businesses have now opened up in the immediate area. More people are now commuting to the destination and staying longer when events are on.

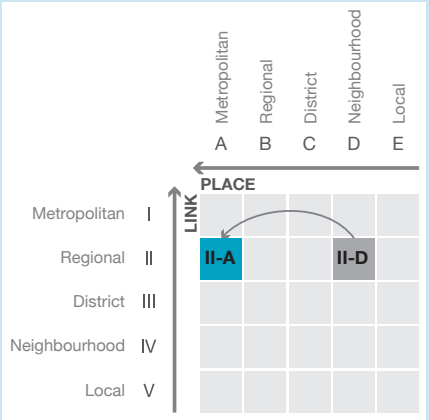
Before these works took place, Place activities in the immediate area were limited to shoppers from the neighbourhood; concert goers mainly travelled through the area. The much more visible staying activity from visitors following the redesign work has increased Place status from Neighbourhood (D) to Metropolitan (A) (Figure B12).

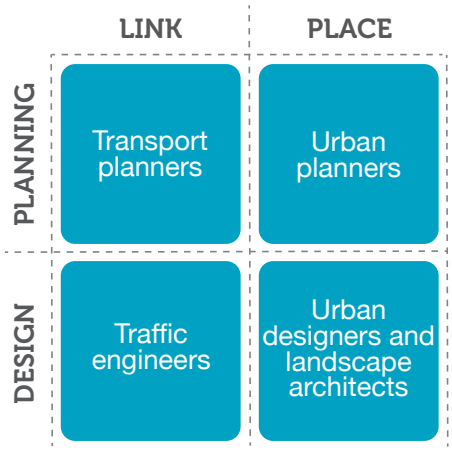
Figure B12. Adelaide Entertainment Centre: outside area Place status change

Using Link and Place in a street design process

This Compendium recommends the use of the Link and Place as part of a street design process (see Chapter C). The process of applying the Link and Place classification to a street is best carried out in a collaborative workshop with broad stakeholder representation. A good knowledge of the street is essential and useful supporting information for the workshop includes:

- land uses and character of the area
- how people move through the street (modes and indicative numbers/volumes)
- distance from the street to the origin of the journeys for both Link and Place users (i.e. the catchment area for street users)
- knowledge of any strategic designations for Link (e.g. a priority bicycle network) and Place (e.g. a regional centre).





Benefits of the Link and Place approach

Classifying streets using the Link and Place approach has a number of benefits:

- Link status and Place status are measured using the same units, which helps ensure that both dimensions are given equal consideration. In conventional approaches, Link measures of importance tend to be grounded in quantitative data, while Place considerations may derive from more qualitative data, thereby giving greater implicit emphasis to the Link function of the street. Within this two-dimensional classification, both status levels are informed by professional judgement.
- The Link function and the Place function of a street are independent of each other, not inversely related as in the conventional assumption. This independence allows the approach to cater for street types (e.g. arterial streets that are also main city shopping streets) that have both significant Link and Place functions. It also removes the danger that its Link role dominates a street's primary function and the Place role is assumed to be secondary – and therefore only assigned space not needed for Link purposes.
- Thirdly, the recognition of Link and Place as two street functions encourages an interdisciplinary approach to deciding on a street's strategic role. Thus, while transport planners or traffic engineers are experts on the Link aspects of a street (as conventionally happens), expertise associated with the Place aspects would be handled by urban planners and urban designers – all working as an interdisciplinary team.

Adopting Link and Place thinking for a project means that both needs will be studied and considered for balance in this street segment: to what extent should movement needs, and street-as-a-destination needs, be met?

The Link and Place approach is known to be understandable to, and supported by, a wide range of stakeholders, both professional and representatives of local businesses and residents. In particular, local groups strongly welcome the inclusion of Place considerations alongside those of Link, and are able to engage constructively in discussions about how to strike the right balance between the two.

The tools and techniques of the Link and Place approach enrich projects by:

- determining strategic street requirements from a balanced point of view, by applying a Link and Place street classification matrix
- assessing street performance in an integrated way, for all people using streets (not just by studying traffic congestion when addressing a project funded by a transport authority)
- using people-centred criteria for assessing and prioritising street user needs
- carrying out street design with stakeholders and involving stakeholders throughout the process
- determining maintenance performance standards
- appraising street design with the aid of people-centred criteria.

Its holistic framework serves to integrate land use policy and planning with transport and traffic needs.

Applying the Link and Place approach to a project creates solutions that generate a better fit for purpose and are more likely to meet stakeholder approval.

Though leading to greater results if adopted in full for an urban area, selecting a few Link and Place street applications will benefit any project.

B3 CONSIDER OPPORTUNITIES FOR SHARED STREETS


19

Berne, Switzerland, shared level surface city centre streets


20

Jan Meijenstraat, Woonerf, Utrecht, **The Netherlands**

Introduction

Strong demand for a Compendium came from industry professionals, local government, and state government personnel who had visited shared street environments overseas and were keen to try some new approaches in South Australia. Chapter C identifies street types in the Link and Place matrix suitable for 'shared street' design (Figure B13). This section of the Compendium explains what is meant by shared streets, the success and safety data from overseas experience, and some important design consideration for shared streets. Issues of risk, liability and disabilities that have made non-standard road designs difficult to implement are also discussed.

Emergence of shared space philosophy

Before the automobile became a dominant transport mode in westernised countries, most street environments were shared between all users (e.g. pedestrians, horses and carts and cyclists). In developing countries, where car ownership is much lower, it is still evident that streets are predominantly shared spaces. Similarly, many street surfaces in European historic town centres have preserved their original physical attributes and do not have any vertical level differences (kerbs).

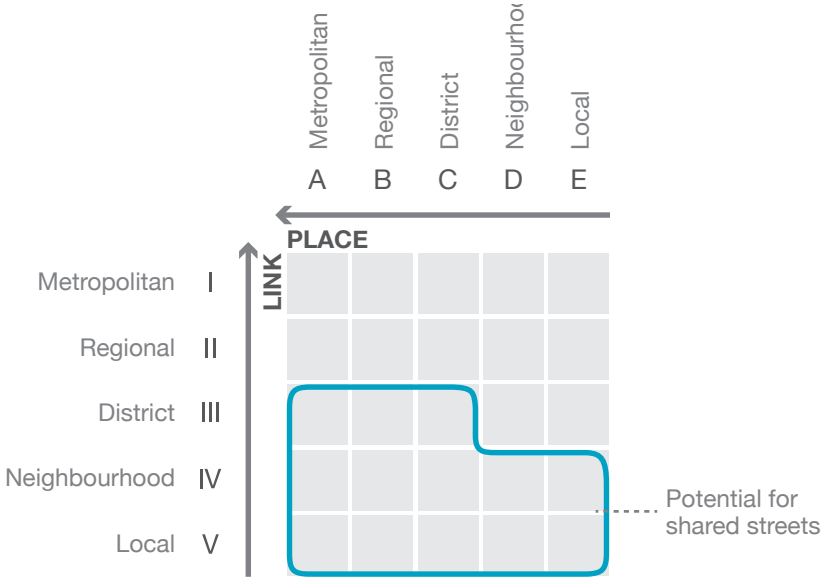


Figure B13. Street types identified as most appropriate for consideration of a shared street approach (see Chapter C).

The term 'shared space' or 'shared street' can mean:

– equal shared rights of use of all of the street space and/or
– street surface level without a vertical separation.

Shared space describes an emerging approach to urban design, traffic engineering and road safety that focuses on integrating the range of users rather than separating them. Shared space removes the traditional separation of motor vehicles, pedestrians and cyclists. The devices of conventional street layouts, such as kerbs, lines, signs and signals, are replaced with an integrated, people orientated design approach, allowing walking, cycling and driving to become integrated activities.

For this Compendium, the terms 'shared space' or 'shared street' apply to a space or street that usually has no vertical level difference and a high degree of integration between all street users.

Compulsory separation of modes of traffic in the street environment became a common solution during the 1950s for resolving high casualty tolls and conflicts between motorists and other street users. It introduced devices such as kerbs, guard rails (pedestrian fencing), and traffic signs and controls. Traffic engineering evolved as a discipline. It introduced codes of practice and standards to separate cars from other road users, in an attempt to design out risk and decrease delays for motorists.

The trend of designing for vehicle traffic has become commonplace in the USA, Canada and Australia, where even residential streets were typically designed to accommodate fast moving traffic along wide straight roads. However, as early as the 1960s, Dutch traffic engineers and planners (notably Nick De Boer) focused their attention on the relationship between mobility and space and how to create public spaces suitable for meeting and playing.[10] This gave rise to the concept of 'woonerf', a residential zone suitable for visiting and living, which integrates traffic with other street users.

The concept of shared streets was reinforced as an alternative design philosophy by the Dutch traffic engineer Hans Monderman. Much of his career was spent implementing the shared street approach in Dutch towns. Shared spaces in residential streets and busier activity centres have emerged since in many European countries, USA, Canada, Australia and New Zealand. Now, numerous worldwide examples can be drawn upon.

"All of those signs are saying to cars, 'this is your space, and we have organised your behaviour so that as long as you behave this way, nothing can happen to you'. That is the wrong story."

Hans Monderman[14]

EXAMPLE: Widespread international uptake of shared streets in residential neighbourhoods

Many European countries have implemented an equivalent of the Dutch 'woonerf' approach to residential areas (Figure B14), most incorporating shared level surfaces. Designated speed environments in each country are different: for example, in Germany, vehicles are expected to move with pedestrian speeds of below 6 km/h, in Russia and Switzerland a 20 km/h speed limit applies, and in the UK the maximum legal speed limit is 20 mph.

Figure B14. Signs for shared streets in residential neighbourhoods

Shared street design approach

The shared space philosophy is built on the idea of integrating, rather than segregating, street activities. David Engwicht[15] builds on the work of Hans Moderman and describes the two activities:

"The traffic world is a predictable, uniform world, which is highly governed by rules and regulations. The social world is unpredictable, full of diversity and democratic."

The aim of shared streets is to create a social, rather than traffic, world that encourages social interaction, and civil, considerate use of street spaces.

TRAFFIC WORLD	SOCIAL WORLD
Uniform	Diverse
Predictable	Unpredictable
Planned	Spontaneous
Compulsory	Voluntary
Anonymous	Personal
Technical orientated	Relationship orientated
Government oriented	Community oriented
Avoids conflict	Embraces conflict
Speed orientated	Savours the moment

Perception of risk and uncertainty for motorists driving through the shared spaces is promoted as a positive aspect that contributes to drivers taking greater care in navigating the space.

Shared spaces do not focus on regulating car traffic and speeds; they promote voluntary behavioural change of all street users through greater consideration and integration.[16,17] In creating the right environment for a desired behaviour, the shared space philosophy is more reliant upon the character of a place more so than conventional street design measures. It promotes greater visibility of activities and freedom of paths for pedestrian and cyclists. Visibility and greater numbers of on-street activities have been found to have a higher impact on traffic speeds than physical traffic speed reduction measures, such as signage and speed humps.

EXAMPLE: Shared Space Project in Europe (2004 to 2008)

Sources: Shared Space[16,17]

Shared Space was a European project that tested the principles and outcomes of a shared space philosophy by implementing seven pilot shared space projects in five countries: Germany (Bohmte), Denmark (Ejby), The Netherlands (Fryslan, Emmen and Haren), the UK (Ipswich) and Belgium (Oostende).

The many significant benefits reported for all projects included: major improvements to conditions for pedestrians and cyclists, reshaping of neighbourhoods to create a sense of community and significant improvements to the public realm. The project provides a wealth of information on the processes for implementing the schemes and on the obstacles encountered.

The Hague city centre, **The Netherlands,** with shared streets (minimal traffic signage and no line markings)

"Shared space is a compelling concept, there is no doubt about that. The main return from the projects is a substantial improvement of spatial quality. Shared space is a reaction to the ugliness that resulted from an exaggerated problem solving oriented approach of traffic and transport engineering: the many painted signs, sign posts, speed humps, central islands, fences, etc. Shared space capitalises on this situation."

Doctor Rob Methorst[18]

THE DEGREE OF 'SHAREDNESS' OF SHARED SPACES

Sara Andrews[19] notes that the absence of a formal definition of shared space sees much variation between different shared space schemes. She proposed a scoring system (Figure B15) for rating the extent to which a street is shared, where the following features (or their absence) are awarded points as contributing to making the spaces more shared.

4	Absence of kerbs OR >>>	2	Low kerbs
4	Absence of demarcation (other than kerbs, e.g. stormwater gully)		
4	No contrasting surface colours OR >>>	2	Subtle contrasting surface colours
1	Presence of cafes or stalls		
1	Presence of benches		
1	Greenery/landscaping		
1	Street art		
4	Absence of formal crossing points		
4	Absence of road markings		
4	Absence of traffic lights		
4	Absence of bollards OR >>>	2	Few bollards only
4	Absence of any guard railing/pedestrian fencing/planters to delineate road users		
4	Free standing lamps (rather than positioned to delineate road users)		
4	High pedestrian flow		
4	Low vehicular flow		

Figure B15. Scoring system for establishing the degree to which a street (or proposed design) is a shared space (after Understanding shared space[19])

Andrews used this scoring system to rate the degree of 'sharedness' of 13 shared street sites in the UK and examined in closer detail three shared space redesign schemes. The study found that:

- the more shared the street, the more vehicular speed is reduced
- in shared spaces, pedestrians take more direct routes, making their journeys more convenient
- the more shared the street, the more pedestrians were observed within a notional carriageway space
- crossing points and delineation by bollards (or other physical infrastructure) do not need to be introduced if critical pedestrian mass is present.

Shared surface Seven Dials intersection in **Soho, London** scored the highest possible 48 points

On the basis of implemented redesign schemes throughout the world, suggested typical traffic conditions accompanying degrees of sharedness are:

- for pedestrians and vehicles fully sharing space (e.g. people walking down the middle of the street, or standing), daily traffic volumes are approximately 1,000–1,500 vehicles (vpd) or fewer (around 100 vehicles per hour (vph))
- for streets with freedom to cross the road at any point, with vehicles regularly giving way, typical traffic volumes are under 10,000 vpd
- for streets with regular informal crossing points (using raised tables) with vehicles regularly giving way at those points, traffic is up to 20,000 vpd
- junctions, with no priority markings and full vehicle/pedestrian interaction at the junction, seem to work up to 25,000 vpd, which is typical of minor arterial roads
- traffic speed environments of 25 km/h and below (achieved through various design measures) are typical for all successful shared street types.

Kensington High Street in **Kensington, London** scored 9 out of possible 48 points.

Benefits of shared streets

Based on overseas experience, direct benefits attributed to shared spaces are:

- equity among street users in using street space
- better environment for supporting social community context
- better environment for encouraging walking, cycling and staying activities (e.g. playing, verge plantings/gardens)
- better accessibility for all users (especially wheelchair users and prams)
- greater opportunity for reflecting local context and identity through street design (e.g. street art, street furniture, creative use of paving) as limitations of typical street alignments are abolished
- significantly less vertical clutter, as the need for traditional traffic regulatory signage is reduced significantly
- typically a reduction of traffic speeds and greater interaction between drivers and other street users
- typically reduced numbers and severity of accidents (primarily due to decreased speed limits)
- greater flexibility in the use of street space with the ability to incorporate multiple and varying uses at different times
- better aesthetic qualities of the street and better public spaces.

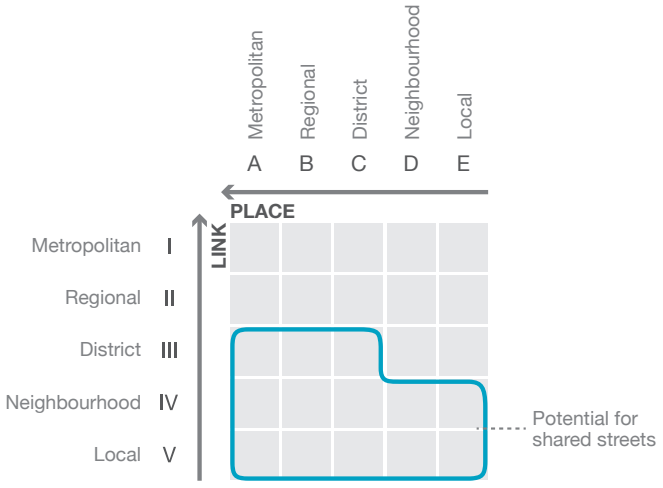
These benefits typically lead to:

- increased numbers of people on foot walking through and staying in the area
- more social interaction and activities happening in public spaces
- increased customer expenditure in adjacent businesses
- increased community confidence and a sense of pride in their local environment, leading to greater ownership and engagement
- increased property values
- saving of lives and traumas, due to the reduction in accidents
- reduced on-street crime rates.

LINK AND PLACE AND THE SHARED STREET APPROACH

Mapped to the Link and Place matrix, shared streets are best applied to streets with local and neighbourhood Link status and sections of minor arterial roads (district Link status) that traverse busy activity centres (metropolitan, regional or district Place status). This approach aligns with successful international examples for speed profiles, traffic volumes and activity levels.

The design of shared streets should not reintroduce standard traffic infrastructure (e.g. traffic signs). It sends mixed messages to the road users and can erode the potential benefits of shared spaces. However, safety risk perceptions and/or political or community pressures may force some measures to be introduced, such as line demarcation (by paint or a strip of different materials), crossing points and bollards



Safety, risk and liability

Issues and fears of safety, risk, liability and insurance coverage have been key barriers to the installation of shared streets in South Australia. Removal of traffic control and regulation from streets seems to many practitioners and community members to be a radical approach, going against the conventional approaches of traffic engineering. Perceptions are that such radical designs of street spaces are unsafe and simply will not work. However, evaluation of the actual safety, speed and congestion outcomes in implemented case studies (some included in this Compendium), show no evidence that the greater perceived risks materialise in practice. For example, recent Shared Space guidance[11] states:

"Available evidence indicates a comparable number of casualties in shared space streets and conventional streets. This is despite the fact that some of the schemes studied experienced increased use by pedestrians and cyclists after conversion to shared space."

User perception, especially among visually impaired user, is an important consideration to be addressed. The Appraisal of Shared Space report for the UK Department for Transport[20] identified typical concerns as:

- risk from vehicles because of the difficulty in identifying different parts of the street
- difficulty in navigating through the space in the absence of a line to follow or clear landmarks
- lack of confidence in appropriate driver behaviour
- lack of a clearly defined comfort space free from vehicles in which to, for example, rest or reorientate.

In the UK, a number of focus groups and workshop sessions to investigate the issue[21,22] showed diverse views. Participants were often equally split in response to questions on whether or not shared spaces are hard to navigate, making it difficult for the design community to develop an appropriate response.

"From the data available, there is no evidence that shared space schemes, including those with level surfaces, as implemented in the UK, have more casualties than conventional layouts, or that particular groups, including disabled people, are injured more frequently following their introduction."

MVA Consultancy[20]

Addressing ageing and disability issues

In addressing the concerns associated with shared spaces, measures recommended in many of the reviewed publications and adopted in some of the implemented shared space schemes include:

- creating 'comfort space', where vehicles are very unlikely to go, made evident by introducing such cues as intermittent street furniture or landscaping, contrasting colour strips and/or tactile paving
- carefully siting appropriate crossing points
- marking clear gateways to promote understanding of entry into a shared space zone and the different 'rules' that apply
- clearly identifying paths for vehicular traffic and parking zones
- ensuring good lighting levels (20–50 lux recommended in residential shared zones).

In 2009 the Department for Transport, Energy and Infrastructure (now DPTI) released *Guidelines for Disability Access in the Pedestrian Environment,*[23] which explain how to legally accommodate those with disabilities, when constructing road and transport infrastructure. The guidelines make reference to applicable national policy context. They give an overview of disability types and set out design principles for situations faced by people with disabilities as they attempt to negotiate the pedestrian and public transport environment.

The Commission for Architecture and the Built Environment's *Sight Line*[24] highlights how visually impaired users rely on difference in level surfaces, strong tonal contrast and well-defined kerbs to navigate streets. Thus, shared street environments present a particular challenge and discomfort. It acknowledges that a range of technologies, such as radio frequency identification, which are becoming readily accessible, will be of great assistance to visually impaired users, preventing the need for physical changes to the streetscape.

Some leading shared street design practitioners and advocates, however, have a concern that excessive demarcation and physical features separating pedestrians from other road users erode the overall benefits of shared spaces and should be minimised.

Engage with visually impaired user groups as soon as possible in a project and develop a local context sensitive response that achieves the best possible compromise.

KEY DESIGN PRINCIPLES FOR CREATING SHARED SPACES

- reduce vehicular speeds below 25 km/h through physical measures
- provide same level surface across the street (allowing gentle sloping for stormwater drainage)
- reduce the distinction between vehicular and pedestrian spaces, though vehicular paths should be legible
- remove physical barriers separating street users and different modes of transport
- remove traffic signs and minimise line markings
- avoid conventional traffic measures (e.g. signs, chicanes, traffic islands, road markings) in favour of visual cues in the street design
- encourage local expression of the space through urban design.

SHARED STREET EXAMPLES

At the start of 2012, Adelaide had no more than 20 shared streets, all of which carry only local levels of traffic (Link status Local (V); Figure B16). This highlights South Australia's conservative approach to implementing shared streets in low trafficked environments with low levels of pedestrian flows. International practice presents many examples of shared streets in more challenging environments of higher Link and Place status (Figure 16)

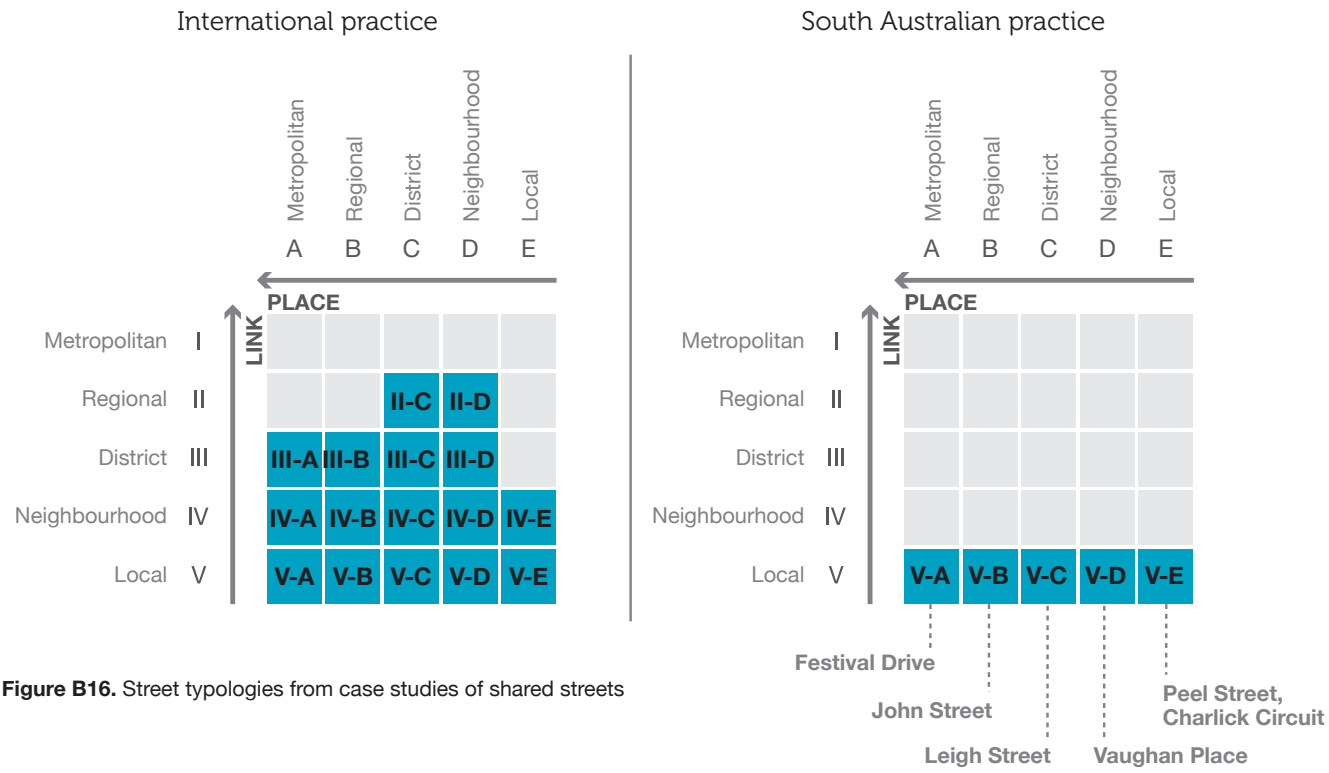


Figure B16. Street typologies from case studies of shared streets

The selection of shared street examples from around the world in Figures B17, B18 and B19, mostly focuses on more recent redesign cases.

Figure B17. International examples of shared streets

London Road, Southampton (IV–C)
Neighbourhood collector road in a district activity centre with asphalt carriageway and paved pedestrian areas (also accommodating angled car parking)

Cowley Rd, Oxford (UK) (III–C)
District shopping centre street located on a secondary route into the centre, which accommodates two lanes of traffic, limited parking and level surface crossing points for pedestrians

Walworth Road, London (UK) (II–C)
District mixed–use activity centre located along a radial route into London with shared level surface streets accommodating c.20,000 vpd and 60 buses per hour

Newland Avenue, Kingston–upon–Hull (UK) (III–C)
Minor arterial street in an important local shopping centre with shared level surfaces in core pedestrian areas

New Road, Brighton (UK) (V–B)
Redesign focused on promoting Place significance of this local street lined with cafes and restaurants

Stainer St, Northmoor, Manchester (UK)(V–E)
Northmoor in Manchester redesigned as a home zone with a number of shared level surface residential streets

Elwick Road, Ashford (UK) (II–D)
City centre of Ashford, including ring road carrying over 10,000 vpd, redesigned as a shared level surface environment with distinct pavement patterns and stormwater treatment

Charlotte Street, Morice Town, Plymouth (UK) (IV–D)
Morice Town redesigned as a home zome with a number of shared level surface streets

Osnabrück roundabout, Bohmte (Germany)
Continuous shared surface installed through a number of streets in the town of Bohmte includes roundabout, which has no formal line markings and traffic signage, and carries c.13,000 vpd

Amsterdam, Dam Square (III–A)
The City Square, an important city destination with hotels, civic buildings and shops and cafes, features level surfaces throughout and minimal traffic infrastracture

Dockan, Malmö (Sweden) (III–D)
Dockan (the Dock) in Västra Hamnen (Western Harbour), near the University College of Malmö, is a mixed residential/office street with shared level surface

De Drift/Kaden intersection, Drachten, The Netherlands (III–A)
This busy intersection adjacent to the town's main shopping mall links with many different activities; redesigned as a shared space in 1998 with other locations in Drachten following

Kompagnistræde, Copenhagen, Denmark
Over the last 20 years, many streets in Copenhagen have been redesigned as shared spaces, accommodating all street users

Rue de la Lainerie, Dinan, France
A number of streets in historical city centre of Dinan were returned to their original shared level surfaces; design featured: staggered street alignment, blister bollards to demarcate pedestrian areas in some sections and similar paving frontage to frontage

Figure B18. Australian examples of shared streets

Clarence Street, Port Macquarie, NSW (III–A)
Port Macquarie's city centre, redesigned in 1995 as a shared level surface street, carries up to 800 vehicles per hour in peak periods and is a civic heart of the town with c.800 pedestrians per day

Hargreaves Mall, Bendigo, NSW (IV–A)
Shared level surface city centre mall carrying c.3,200 vpd includes rumble strips, water features and unlined two-way carriageway spaces

Bouganville Street, Manuka, Canberra, ACT (IV–B)
Busy mixed-use centre in Canberra with at-grade crossing points and side road entry treatments

Palmerston Lane, Manuka, Canberra, ACT (V–C)
Shared surface laneway in a busy mixed-use precinct

Childers Street, Canberra, ACT (V–C)
A local street with mixed uses including medium density student accommodation, offices, car parking, cafes, restaurants and university buildings, has shared level surfaces, rumble strips, water sensitive urban design landscaping and one-lane 'pinch points' for traffic

Hastings Street, Noosa, Qld (IV–A)
The main shopping and restaurant strip of this resort town incorporates shared level surfaces at a number of crossing points, landscaping and street infrastructure that encourages staying activities

Figure B19. South Australian examples of shared streets

Peel Street, Adelaide (V–E)
Single lane for vehicles delineated by large bollards and parking areas

Vaughan Place, Adelaide (V–D)
Very low traffic volumes, medium density residential and commercial uses (pub, shops and offices) with no line markings and minimal bollards

Charlick Circuit, Adelaide (V–E)
Medium rise residential development in the city's West End

Festival Drive, Adelaide (V–A)
Key access road for Festival Centre and associated car park has 2-lane vehicular traffic delineated with bollards and line markings

Freemasons Lane, Adelaide (V–E)
Straight and relatively short dead-end section of a lane accessed from Pirie Street to adjacent commercial buildings

Exchange Place, Adelaide (V–D)
Straight laneway with high volume of pedestrian access between Pirie Street and Grenfell Street and commercial (mainly office) uses, high density residential and restaurants/café

Leigh Street, City, Adelaide (V–C)
One-way traffic street has a shared single surface in the middle section, vehicular path separated by spoon drains and street furniture (lamp columns, planters, bins and bollards and popular destinations including cafes, restaurants and offices

University of Adelaide access lane off North Terrace (V–A)
Single vehicular lane path to access university grounds


52

Green Lane/Park Lane/The Walkway (old MFP demonstration project), Osborne (V–E)
Residential precinct for some 60 dwellings with shared zone roadways for 2-way traffic access, no separation of road users in roadway, marked angled parking and many plantings


53

John Street, Salisbury (V–B)
20 km/h shared zone in Salisbury's town centre providing access to a large on-street car park and variety of mixed uses with carriageway, also containing angled car parks, separated from pedestrian area by many bollards

B4 ESTABLISH CONDITIONS FOR SAFE SPEED ENVIRONMENTS

Introduction

Consultation with industry and professionals confirmed that speed limits have been part of contested discussions when designing for lower speed streets and shared environments. There was desire for an evidence-based approach to use in discussions between designers, approving authorities and insurance agencies. This section looks at the general approach to vehicle speeds in South Australia, current research and safety data on suitable speeds for different street types, which then inform the desirable speeds in the Link and Place matrix (Figure B20).

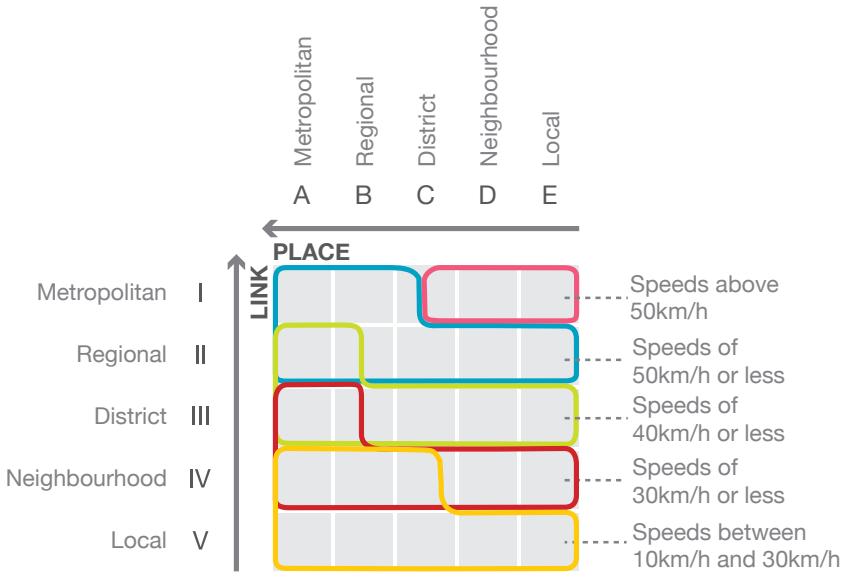


Figure B20. Desirable street network speeds for the Link and Place matrix

Traffic speeds

CURRENT RESEARCH

The safety of road users on any street is critically dependent upon appropriate management of vehicle speeds. The relationship of vehicle speed and impact on potential injury outcomes has been the subject of many studies in recent years, in particular associated with the application of lower general urban speed limits including 40 km/h and 50 km/h.

Garrard[25] concluded that lower traffic speed in urban areas (preferably based on a speed limit of 30 km/h) will improve pedestrian and cyclist safety and community liveability, and is likely to contribute to increased rates of walking and cycling.

Archer et al[26] highlighted a number of studies that attempted to estimate the probability of a vulnerable road user being fatally injured given the impact speed of the collisions. Most studies concluded that the probability of fatality rapidly increases for accidents with vehicles travelling above 30 km/h (see Figure B21). There is a convergence of views that lower speeds of 30 km/h will improve pedestrian and cyclist safety and community liveability.

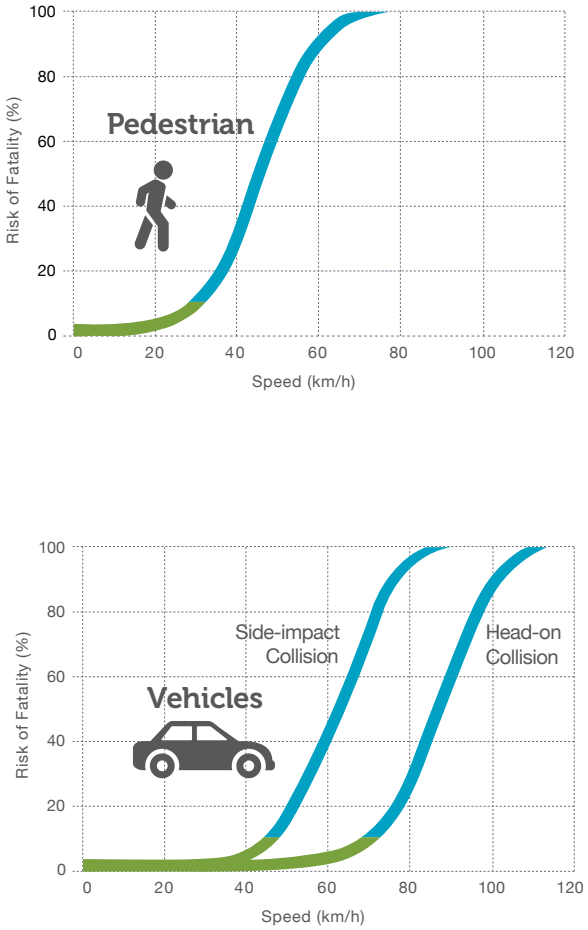


Figure B21. Collision – force and risk of fatality[27]

Research into the capacity of the human body to absorb crash energy indicates that speeds would ideally be less than 30 km/h where conflict with people walking and cycling is possible, less than 50 km/h where vehicle side-impacts are possible and less than 70 km/h where head on collisions are possible.

Archer et al[26] further found that lowered average travel speeds brought about by a reduction in speed limits in urban and metropolitan areas will bring about considerable reductions in road trauma, with relatively minor impact on average door-to-door travel times. Further, vulnerable road users are likely to benefit most from reductions in average travel speeds.

In turn, lower speed limits encourage better and safer forms of interaction between road users resulting in a more attractive and liveable environment. The research confirmed that in order to ensure a safe environment in which pedestrian and cyclists can avoid serious injury or death from conflicts with motor vehicles, the speed of motor vehicles should not exceed 30 km/h in areas of significant pedestrian and cyclist activity on or near roads.

Many studies, focusing on making improvements to public spaces and urban environments, came to the realisation that this can only be achieved if the speed environments are lowered. As shown in these example quotes:

"One would expect the likelihood of death or serious injury to increase with speed, but the statistics suggest a very sharp upward movement in the graph at around 32 km/h (20 mph). From 5% fatalities at 32 km/h, fatalities increase to 45% at 48 km/h (30 mph), and 85% at 64 km/h (40 mph). A similar kink in the graph at around 32 km/h occurs when comfort levels of pedestrians and cyclists are plotted against speed."

Hamilton–Baille and Jones[28]

"From the point of view of traffic safety, research in the U.S. and Europe has long shown that 20 mph is an important threshold. Below 20 mph the chance of being severely injured in a traffic accident is relatively low. But 20 mph also is the threshold speed at which people are able to interact and maintain eye contact and pedestrians and bicyclists feel comfortable in a mixed-use environment."

Garrick[29]

"Theoretical research combined with practical observations suggests a critical qualitative change in the use and quality of public space at speeds around 30 km/h (19 mph)... Whereas many streets have conventionally been developed on the basis of design speeds of around 50 km/h (30 mph), there would appear to be significant spatial and behavioural benefits from working to speeds closer to those within the evolutionary range of human abilities."

Shared Space Project[16]

"European experience in Denmark and Norway has shown that urban speeds cannot be managed by speed limits alone, and must be implemented in conjunction with other safety and speed reduction measures."

Corben and Duarte[30]

In evaluating chances of survival during crashes, the National Road Safety Strategy 2011–2020[31] references the following speed data from the study by Austroads[32]:

The chances of surviving a crash decrease rapidly above certain impact speeds, depending on the nature of the collision:

- car/pedestrian: 30 km/h
- car/motorcyclist: 30 km/h
- car/tree or pole: 40 km/h
- car/car (side-impact): 50 km/h
- car/car (head-on): 70 km/h.

The National Road Safety Strategy[31] put forward three main directions: speed limits that reflect a better balance between safety and mobility, improved compliance with speed limits and network-wide alignment of speed limits with inherent risk and road function.

GENERAL URBAN APPROACH

For many years the general speed limit in South Australia was 60 km/h on all roads and streets in urban areas. Following significant consideration of the safety benefits and desire for safer local streets, the 50 km/h general urban speed limit was introduced in South Australia on 1 March 2003 to all local streets and some arterial roads, with most arterial roads retaining a higher speed limit (60 km/h and above). Speed surveys and crash analyses[34] 12 months after the new speed introduction found that:

- on average, mean speeds on streets posted at 50 km/h fell by 2.2 km/h and on arterial roads posted at 60 km/h, by 0.7 km/h
- casualty crashes reduced by 20% on 50 km/h streets and by 5% on arterial roads.

O'Hare[35] estimated crash savings on streets with a speed limit reduced from 60 km/h (Table B2).

These estimates, based on the South Australian road network, support the conclusion that a reduction of the default speed on local streets represents a worthwhile road safety benefit. However, a reduction of the speed limit on all streets and roads that currently have a 60 km/h limit would produce very substantial benefits.

While 50 km/h speed limits are capable of achieving reductions in crash outcomes between motor vehicles, it is still unsafe for local neighbourhood communities, preventing social functions of streets to flourish. Based on current research, the speed environment should desirably be less than 35 km/h in order to reduce serious injuries from conflicts between people and motor vehicles and make a significant contribution to improving urban environments.

Situation	Reduction (%)
10 km/h speed reduction from 60 km/h	38
5 km/h speed reduction from 60 km/h	26
Limit 60 km/h with total compliance	29
Limit 50 km/h with compliance as at present	33
Limit 50 km/h on local streets only with compliance as at present	6

Table B2. Hypothetical situation reduction in the number of casualty crashes[36]

LOCAL SPEED PRECINCTS

Implementation of precincts with 40 km/h speed limits requires specific approval by DPTI. Approval is based upon the area meeting specific criteria for mean speeds of traffic on most of the area's road network, as well as demonstrated community support for a lower speed limit.

– Twenty 40 km/h speed limit precincts operate in Adelaide in primarily residential areas that were implemented between 1998 and 2001.

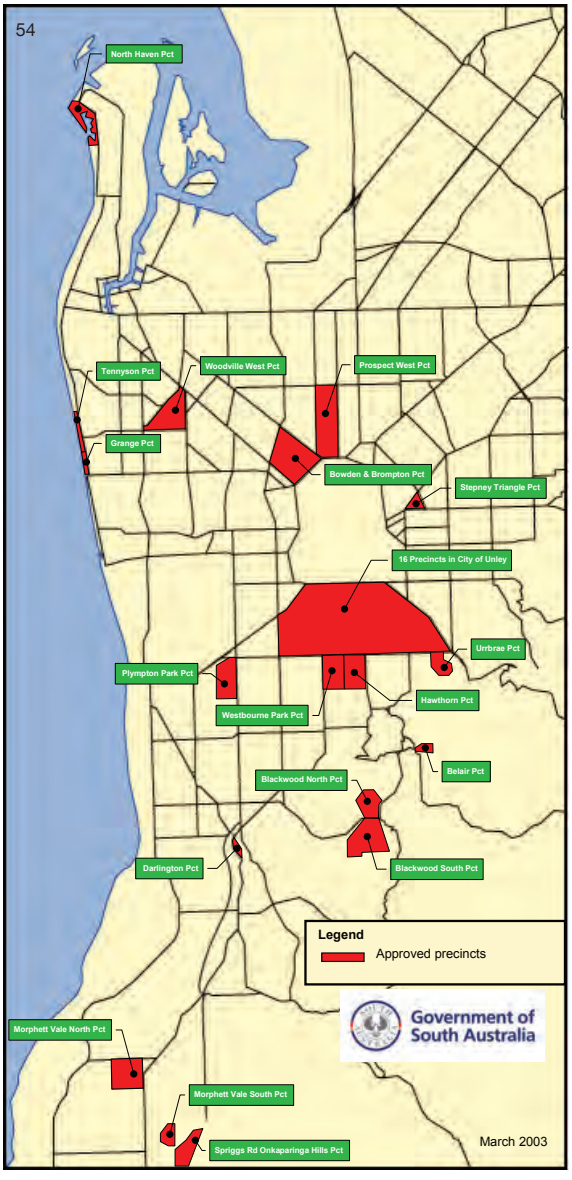
Lower speed limit precincts have generally operated successfully with reduced vehicle speeds on streets within the networks. No further 40 km/h precincts have been implemented since the application of the 50 km/h general urban speed limit in South Australia in 2003.

A study of the impact of the 40 km/h speed limit in Unley[36] concluded that the 40 km/h scheme in Unley had been responsible for reducing total crash numbers by 17% in absolute terms on streets whose speed limits had been reduced to 40 km/h. Serious injury crashes on Unley streets had decreased, coincident with the 40 km/h scheme. Across all severity levels, road trauma in Unley from 1999 into 2002 was 15–20% lower than projected without the 40 km/h scheme.

The study concluded that crash reduction in Unley was far greater with the 40 km/h limit than it would have been if a 50 km/h limit had been adopted in 1999.

A 40 km/h 'linear' speed limit applies to Jetty Road and Colley Terrace in Glenelg to support the high pedestrian and commercial precincts in this town-centre area.

The 40 km/h speed limit, like the area–wide 50 km/h speed limit, is a step in the right direction in reducing the potential for serious injury on roads. However, areas where people and motor vehicles share or mix the street space require further speed reductions.



LOCAL AREA TRAFFIC MANAGEMENT

Traditional approaches to local area traffic management (LATM) are based on systematic use of devices to control traffic speed along an individual street or throughout network of streets, with resultant impacts on traffic volume and potential crash risk. Vehicle speeds are reduced to 20 km/h at each device, traditionally spaced at 80 – 120 metres along a street.

Vehicle speeds vary between devices with drivers accelerating and decelerating along the road (Figure B22). Typically, vehicle speeds reach over 40 km/h between devices. Devices spaced at less than 80 metres restrict drivers to a maximum speed of 30 km/h between devices.

The traditional LATM approach can create a maximum vehicle speed close to the desired speed for mixing with people. However, the variation in speed between devices creates an undesirable speed profile for vehicles of frequent acceleration, noise and air pollution, and for pedestrian activity in the street.

Typical carriageway chicanes
Wood Street, Unley, Adelaide

Typical flat top speed humps
Mitchell Street, Unley, Adelaide

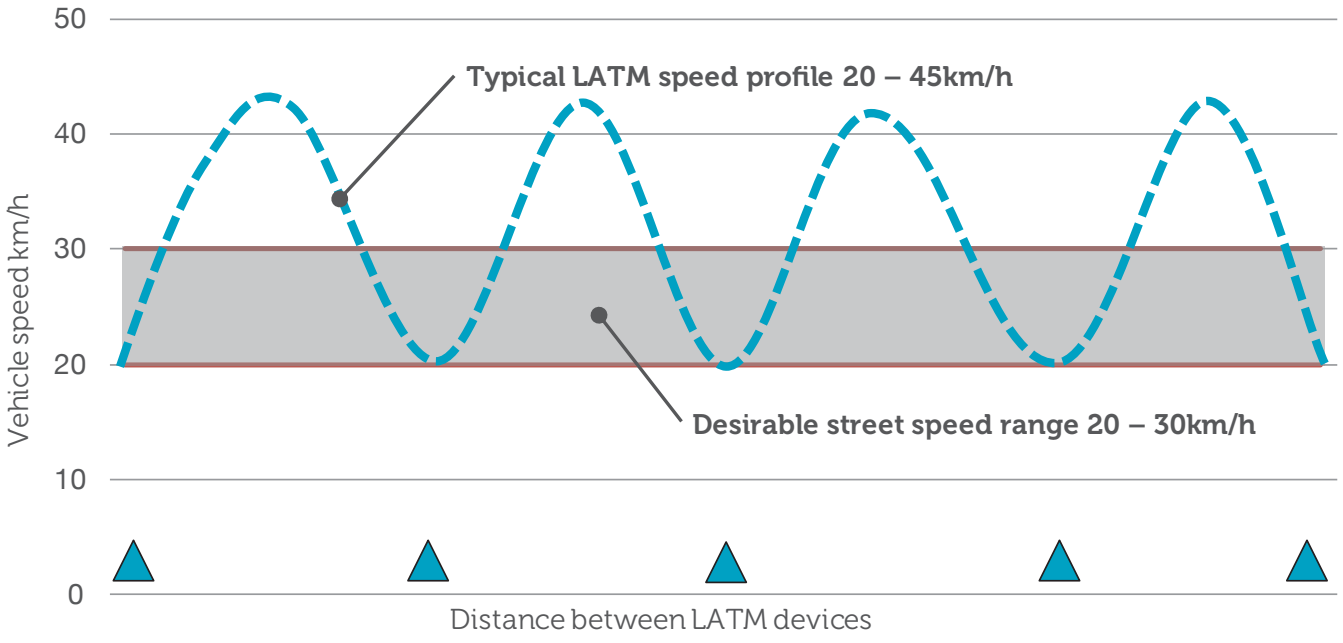


Figure B22. Typical vehicle speed profile in areas with LATM devices (after Guide to Local Area Traffic Management[37])

INTEGRATING SPEED BASED DESIGN

Integrated design principles create a speed profile that has little variation between 20 and 30 km/h along local and neighbourhood streets. This profile will be suitable for street types with Link status level of IV and V and some streets of high Place status streets with Link status III (see Figure B21). A smoother speed profile helps create an appropriate environment for people.

Speed management using LATM focuses on retrofitting devices to achieve slow or near stop conditions along a street. Traffic calming on a street through an integrated street redesign and reconstruction can create a continuously slower street environment. Key principles for an integrated approach to managing vehicle speeds along a street include:

- reducing freedom of motor vehicles to speed by limiting total street length, and limiting street carriageway width
- limiting the lengths of straight sections (by introducing low-speed bends in the design)
- introducing slow or stop conditions along the street length to simulate shorter street section lengths or lower-speed alignments
- limiting forward sight lines and driver's field of vision.

Figure B23 displays a range of techniques for integration of speed based design.

These design techniques are the key to developing best practice in design of streets for pedestrians and cyclists.

Traffic volume

There is relatively little information on appropriate levels of traffic to manage safety for people. Conventional traffic engineering principles[38] suggest up to 2,000 vpd is acceptable on local streets, with fewer than 300 vpd for shared zones or access places. These thresholds are considered acceptable in the context of traffic management and residential amenity. Many local streets have traffic volumes much lower than 2,000 vpd.

The UK's Manual for Streets[9] suggests a self-limiting factor on pedestrians sharing space with motorists of around 100 vehicles per hour (vph), and up to 1,000 vpd. Above this level, pedestrians treat the general path taken by motor vehicles as a 'road' to be crossed rather than as a space to occupy. The speed of vehicles also had a strong influence on how pedestrians used the shared area.

The European Shared Space Project[16] research suggests traffic volumes of up to 20,000 vpd can be managed effectively as shared spaces, if an appropriate speed environment is developed for the safety of vulnerable road users.

However, the documents are not always clear about the precise nature and degree of pedestrian and vehicle interaction. Based on the best available practice advice, in streets with vehicle volumes under 10,000, shared conditions can be achieved where pedestrians cross the street freely. With traffic volumes in excess of 10,000, crossing points should be considered. Further advice is included in chapter B3.

"Planners will not be able to effect much change in creating new places or rejuvenating existing ones unless they alter the long-standing priority given to the automobile. Any attempt to fix up streets will be handicapped until municipal authorities and private developers stop thinking of streets only as means of getting somewhere else and begin re–embracing the concept of the street as a place."

Eric Uhlfelder[39]

Figure B23. Examples of various measures for achieving low vehicular speed

Side road entry treatments in different materials, **Peninsula Drive, Mawson Lakes, Adelaide**

Painted intersection treatment **Drayton St, Bowden, Adelaide**

Rumble strips at intersections raise awareness of vehicular speeds **Childers St, Canberra**

Examples of design approaches for achieving low vehicular speed

Achieve appropriate car volumes and speeds through integrated design, rather than retrofitting local traffic management devices.

The examples in Figure B23 illustrate some measures for achieving appropriate environments for low vehicular speeds, volumes and a relative priority to non-motorised street users. Assess each site individually for local context and conditions and thus the appropriateness of design measures.

Parking spaces visually in Place (rather than Link) space and minimal road markings **Maud Street, Unley, Adelaide**

Horizontal deflection (traffic island bending the car path) and visual carriageway narrowing through landscaping **Lightsview, Adelaide**

Horizontal deflection (bending road) and visual carriageway narrowing through landscaping **Lochiel Parkway, Campbelltown, Adelaide**

Pocket park landscaping creating a meandering local street **Robsart Street, Unley, Adelaide**

Position of trees shortening the line of sight and bending the vehicular path **Torrens St, Mawson Lakes, Adelaide**

Variation in surface materials across the carriageway **Englebrecht Lane, Mount Gambier**

Median strip reducing car dominance and offering pedestrian refuge opportunities, **Lochiel Parkway, Campbelltown, Adelaide**

Raised carriageway profile at crossing points **Flinders St, Manuka, Canberra**

Shared and naked street designs that encourage sharing of the street space amongst all users **Elliott Street, Auckland (New Zealand)**

Reduced carriageway width at pedestrian crossings **Hastings Street, Noosa**

B5 ESTABLISH CONDITIONS FOR CYCLING

Introduction

The Link and Place matrix can be a useful tool to determine the most appropriate provisions for cycling. The suitable speed environment for cyclists sharing the street with general traffic will be for street typologies operating at less than 30 km/h and with traffic volumes of less than 5,000. This would apply generally to all five street types with Link status V and potentially to Neighbourhood Links of higher Place status (see Figure B24).

For a number of areas in the matrix, assess the need for separation on a case-by-case basis. For example, if shared street design is adopted for street typologies III–A and III–B, bicycle lanes may not be necessary; in typical street design approaches bicycle lanes are warranted. For streets with Neighbourhood Link status D, traffic volumes above 5,000 may call for bicycle lanes; mixing of cyclists and vehicles is warranted for lower volumes. When in doubt, use designs that attempt to achieve the lowest possible target speed that maximises safety for cyclists on streets mixing with motor vehicles.

The Link and Place status can help suggest the appropriate bicycle facility for a street but take care in developing appropriate design for street cross sections (see chapter B4).

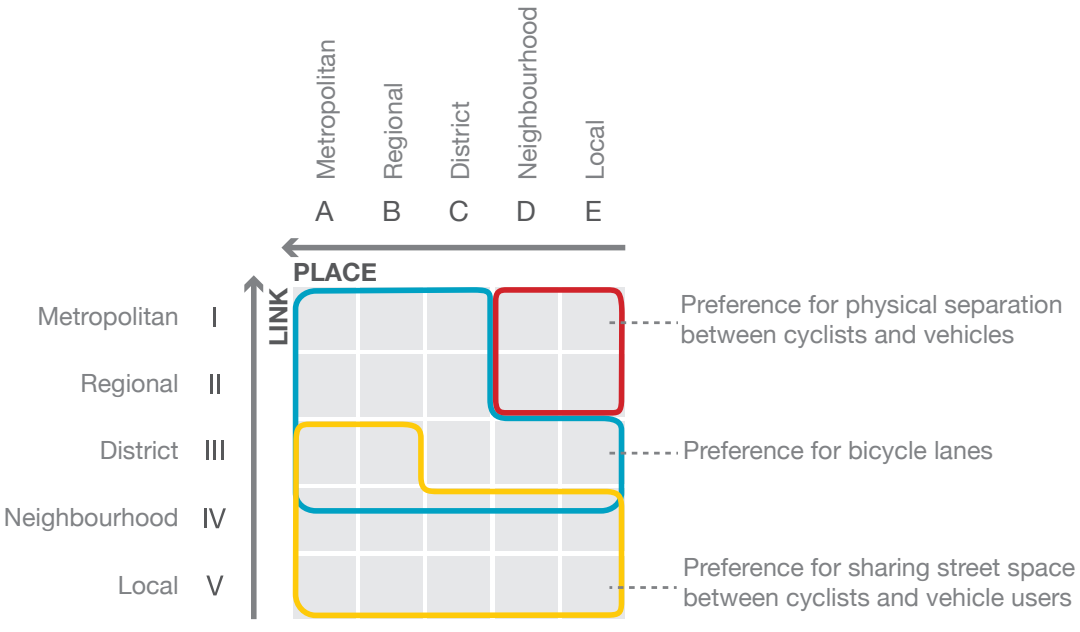


Figure B24. Indicative street typologies for mixing and segregating on–road cyclists with general traffic, in desirable speed environment (see Figure B21)

Provision for cycling on streets was traditionally focused on separating cyclists from motor vehicles. Specific facilities such as bicycle lanes are often considered to be required for a safe cycling environment. Various guides and references for management of a bicycle network, most notably Cycling Aspects of the Austroads Guides[40] guide the provision of appropriate cycling facilities on streets and road networks.

There is little advice on developing appropriate cycling conditions on local street environments without installing specific bicycle facilities. Austroads[37] consider the provision of cycling on streets as part of a hierarchical road network, in conjunction with the needs of motor vehicles. The guides comment on the need for a safe environment for cyclists but their focus is toward separate facilities for cyclists and other users of the street.

Guidance for bicycle facilities[40] states that bicycle lanes may be appropriate or highly desirable (depending on site conditions) where:

- bicycle traffic is concentrated (e.g. near schools or along major routes near city or town centres)
- existing or future significant demand for bicycle travel can be demonstrated (e.g. where traffic volumes and speeds deter cyclists from using an otherwise favourable route)
- they are needed to provide continuity within a bicycle route network
- a road is carrying or is likely to carry more than 3,000 vpd and/or a significant percentage of heavy vehicles.

The focus of Austroads Local Area Traffic Management[41] is typically on streets with speeds higher than 50 km/h. There is little advice on facilities for streets with lower speeds.

Mixing cyclists with motor vehicles

The key to best practice in street design for cyclists is a safe environment on all streets in a local area for cyclists to use, regardless of specific facilities. Austroads[40] states that 'by implication the important objective of a safe environment for cyclists must exist, given the provision of space to ride, a smooth surface, adequate sight lines and the ability of cyclists to maintain their speed'.

Cyclists usually mix with motor vehicles by default rather than design. Local area bicycle plans typically focus on bicycle lanes as a key facility to give cyclists a right to allocated space on a roadway.

It is neither practical nor desirable to separate facilities on local streets where most streets provide good connectivity and access for cyclists. Separated facilities are not necessary in the appropriate speed environment. A higher order bicycle route may warrant a separate facility to prioritise cyclists along the route; they should be considered specifically in this context. Figure B25 and Table B3 indicate a guide for mixing of bicycles and motor vehicles.

Figure B25 suggests that bicycle lanes are not required below a vehicular speed environment of 40 km/h and volume of 5,000 vpd. Table B3 indicates a similar threshold for the provision of bicycle lanes on roads but suggests that a dedicated separate bicycle path is warranted for strategic bicycle routes with cyclist volumes above 2,000 per day.

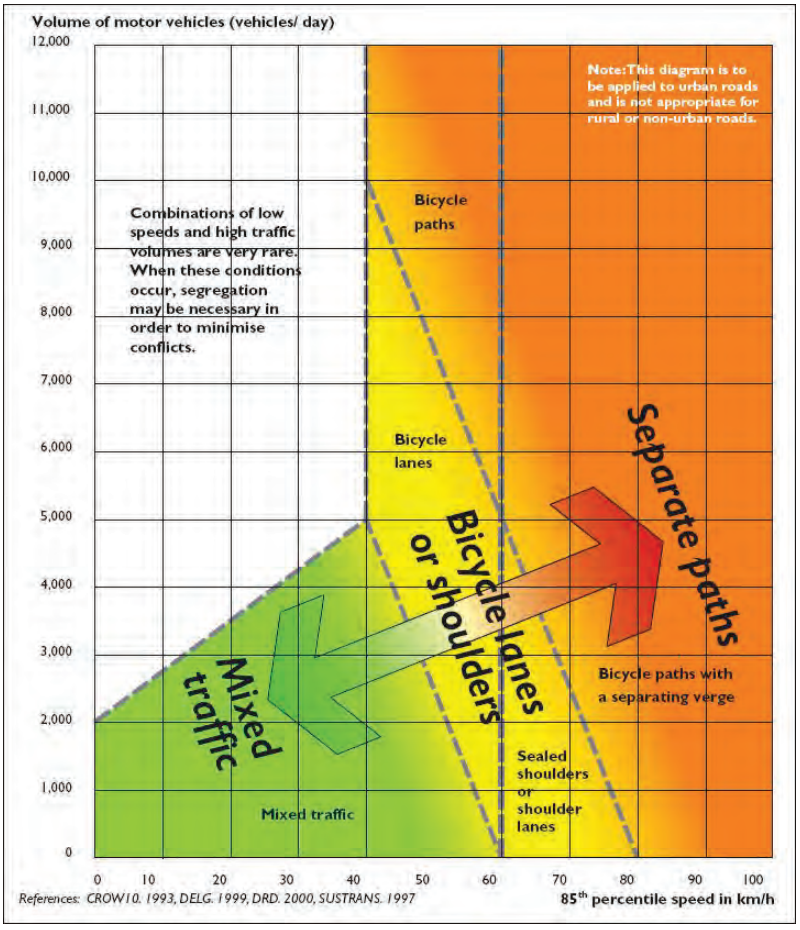


Figure B25. Mixing of bicycles and motor vehicles according to traffic speed and volume [40]

<table>
<tr><th rowspan="2">Road category</th><th rowspan="2">Max. speed of motorised traffic (km/h)</th><th rowspan="2">Motorised traffic intensity (pcu/day)</th><th colspan="3">Cycle network category</th></tr>
<tr><th>basic network ($I_{bicycle}$ > work 750/day)</th><th>cycle route ($I_{bicycle}$ 500-2500/day)</th><th>main cycle route ($I_{bicycle}$ > 2000/day)</th></tr>
<tr><td></td><td>n/a</td><td>0</td><td colspan="3">solitary track</td></tr>
<tr><td rowspan="3">Estate acces road</td><td rowspan="3">walking pace or 30 km/h</td><td>1 - 2.500</td><td colspan="2">combined traffic</td><td rowspan="2">cycle street or cycle lane (with right of way)</td></tr>
<tr><td>2.000 - 5.000</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>> 4.000</td><td>cycle lane or cycle track</td></tr>
<tr><td rowspan="3">District acces road</td><td>50 km/h</td><td>irrelevant</td><td colspan="3" rowspan="2"></td></tr>
<tr><td>70 km/h</td><td colspan="3">cycle track or parallel road</td></tr>
<tr><td colspan="5">cycle track,moped/cycle track or parallel road</td></tr>
</table>

Table B3. Dutch design guidance for road sections inside built–up areas[43]

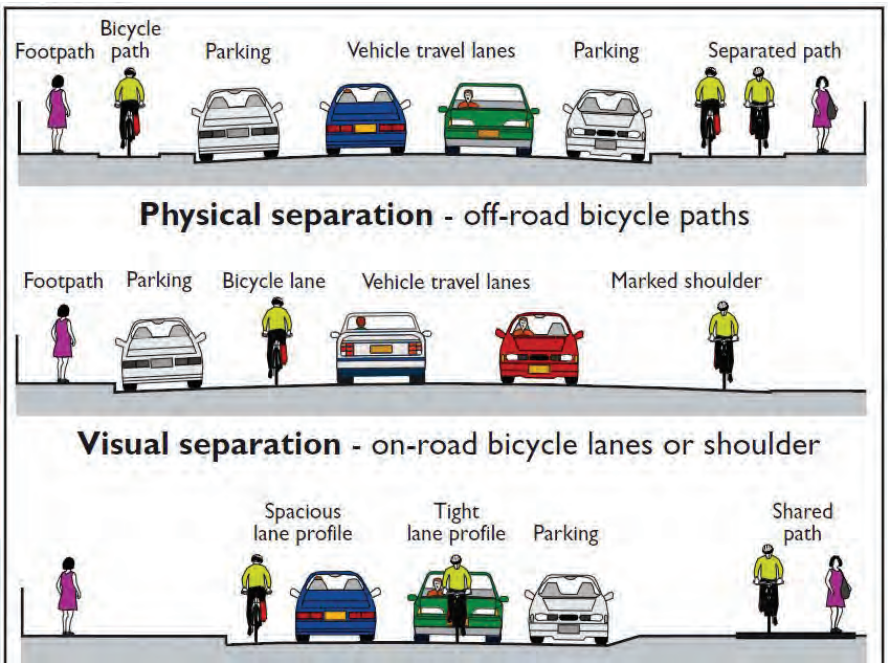


Figure B26. Methods of managing cyclists in traffic[44]

Both Figure B25 and Table B3 suggest that bicycle lanes are not needed in local areas where the speed environment is low and the mixture of bicycle and vehicle traffic works well together. Local streets with traffic volumes below 5,000 vpd would traditionally not warrant bicycle lanes unless the street is part of a strategic bicycle route (with high volumes of cyclists).

The NSW Bicycle Guidelines[44] advise that in very low speed environments, such as residential streets and on very narrow inner-city streets where the aim is to keep all vehicle speeds low, it is preferable to restrict the traffic lane width so that all vehicles must follow one another in turn. This type of treatment can be used for bicycle network routes in low speed, low volume environments where high visibility and a high level of network connectivity is necessary. The concept of mixed traffic and shared paths is shown in Figure B26.

Where a low speed environment can be achieved through effective design of the street, CROW[43] suggests considering a very narrow carriageway of less than 6.0 metres for combined traffic. This does not include space for parking where parking demands are high, in which case parallel parking bays should be considered. A narrow carriageway on a street also increases space in the verge for other activities, including walking, parking and off-road cycling.

Focus on creating a suitable environment for cyclists to mix with motor vehicles where cyclist safety is managed through effective design that limits vehicle speeds.

SUITABLE ENVIRONMENT FOR MIXING CYCLISTS AND MOTOR VEHICLES

A suitable environment for mixing cyclists and motor vehicles is developed by creating a low speed environment where differences in speeds between these users are minimal. For methods to reduce the speed of motorised traffic on streets see chapter B4.

Local street environments are typically created using LATM principles. Austroads Local Area Traffic Management guidelines[37] set key principles for cycling facilities in local areas. It advises that LATM focuses on redevelopment of existing street networks to attain a safe and pleasant road network for people living in and travelling through an area.

An underlying principle of LATM is that conditions should be made better for pedestrians and cyclists, by virtue of its intentions (particularly speed reduction). However, poorly designed LATM schemes are more likely to impact negatively on cyclists than on pedestrians. Even some good LATM designs can reduce the suitability of some streets for cyclists because of the general nature of traffic calming devices applied on existing streets.

Hence an integrated design approach is recommended for new streets using these key principles:

- Develop an integrated design approach where cyclist needs are treated as an integral part of the planning and design process rather than a supplementary or post-design check, and avoid the need for traditional speed reduction devices.
- Keep target speeds low (< 30 km/h) to enable mixing of bicycle traffic with motor vehicles.
- Aim for separation for cyclists (at least on the designated bicycle network) where speeds are higher than 30 km/h or volumes are greater than 5,000 vpd.
- Carry mid-block bicycle lanes through to busy intersections and devices that deflect the travel path (e.g. slow points) where separation is more critical than at mid-block locations.
- Maintain connectivity across busy roads with facilities to assist cyclists to cross these roads where traffic volumes are higher than 5,000 vpd.
- Use on-road bicycle lanes rather than off-road paths for cyclists in local areas, especially where direct access to abutting development puts cyclists entering or crossing roads, especially the young, at increased risk.
- Ensure that treatments that narrow the road carriageway width do not create safety problems for cyclists.
- Make lane widths either wide enough to allow the safe passage of cyclist and vehicle side by side (4.0 m or more) or narrow enough to permit the passage of a vehicle or bicycle only (3.0 m or less) – widths between these two extremes create squeeze points and result in conflicts. For a narrow lane width, provide an off-road option for young cyclists who can ride on the footpath legally.

Combining cyclist and pedestrian paths

Austroads[40] provides information about types of off-road cycling paths, including shared (with pedestrians) and exclusive paths used only by cyclists. It states that shared paths may be appropriate where:

- demand exists for both a pedestrian path and a bicycle path but the intensity of use is not expected to be sufficiently great to warrant separate facilities
- an existing low-use path can be satisfactorily modified (e.g. by appropriate width and signage) to provide for cyclists.

SEPARATED PROTECTED BICYCLE LANES

Separated protected bicycle lanes are warranted for:

- Link status I or II (i.e. arterial and primary distributor roads)
- strategic busy bicycle routes with typical volumes above 2,000 cyclists per day (or are planning for this capacity).

Separated protected bicycle lanes, recently used in various locations nationally and internationally, aim to improve the safety for cyclists by (physically) separating them from motor traffic, including parking, while maintaining directness of travel and priority at intersections. These lanes can be one or two-way depending upon the space available and characteristics of the road. They have an advantage in providing for all levels of cyclist ability with a high level of safety and comfort for users along sections of busy roads.

The many implications to consider with these facilities include pedestrian access, property access, bus stops and side road intersections. Two recent examples of these types of facilities follow.

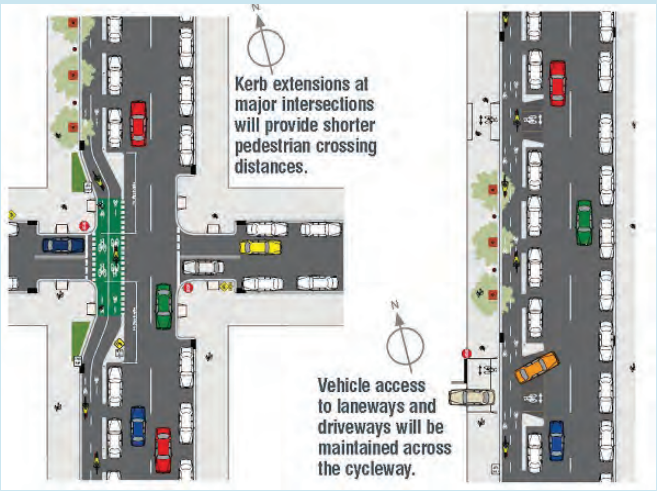


Figure B27a. Bourke Street bicycle route typical layouts[45]

Figure B27b. Northern end of Bourke Street Bicycle Lane at **Campbell Street, Surry Hills**

EXAMPLE: Bourke Street Sydney bicycle route[45] (2010)

The Bourke Street cycleway forms part of an important 7-kilometre cycling corridor from Cowper Wharf Road in the north to Gardeners Road, Roseberry in the south. The roads in the corridor range from 3,000 to 15,000 vpd. The upgraded corridor includes separated bicycle lanes and traffic signal improvements for cyclist movements (Figure B27).

From Cowper Wharf Roadway to Phillip Street in Redfern/ Waterloo a protected two-way bicycle lane has been positioned between the footpath and parked traffic lane on the western side of the street. The bicycle lane is separated from parked traffic by a median strip.

From Phillip Street to Elizabeth Street, Zetland there is a shared bicycle/pedestrian path on the footpath, on both sides of Bourke Street.

Parking was maintained along both sides of Bourke Street, although some parking and loading zones were relocated. A 40 km/h speed zone remained on Bourke Street to further improve pedestrian and cyclist safety. Access to buses was also managed with passenger zebra crossings from the footpath to the bus across the bicycle route.

The works also included new trees and landscaping, kerb extensions at some intersections, traffic calming measures and improvements for pedestrians including new crossings.

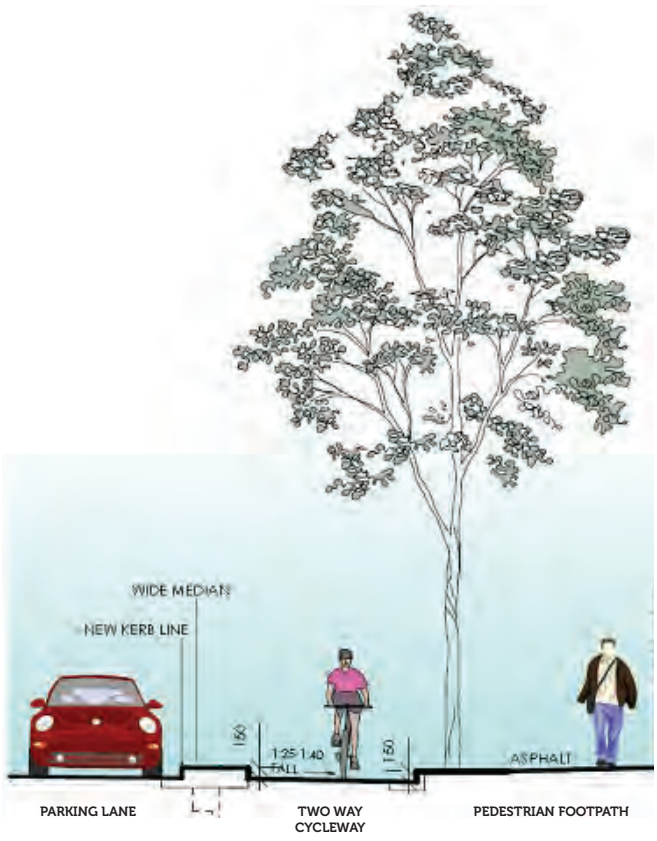


Figure B27c. Typical cross section adjacent parking
Source: Bourke Street Bicycle Route[47]

Recent bike counts show the cycleway is already well used with bike rider numbers rising steadily. In the afternoon period since operation, riders have increased from 130 to 431(230%.).

The Bourke Street Cycleway traverses a significant length of inner-southern Sydney. It links a number of streets that are discontinuous for the motor vehicle traffic network to provide a strategic link for cyclists. Existing streets may carry low Link and Place status (III–C to IV–E), the intended strategic status for this cycling link implies a separate facility for cyclists buffered from motor vehicle traffic.

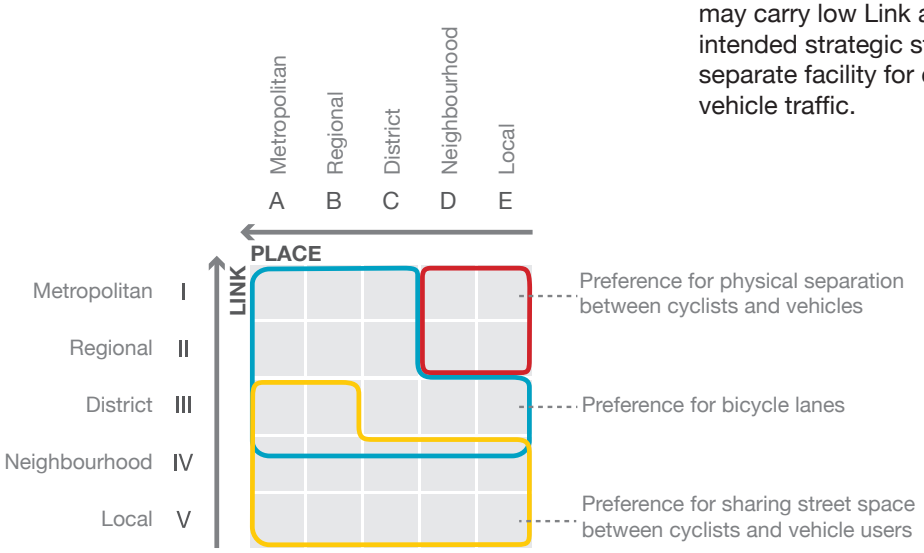


Figure B28. Accomodating cyclists on different street types

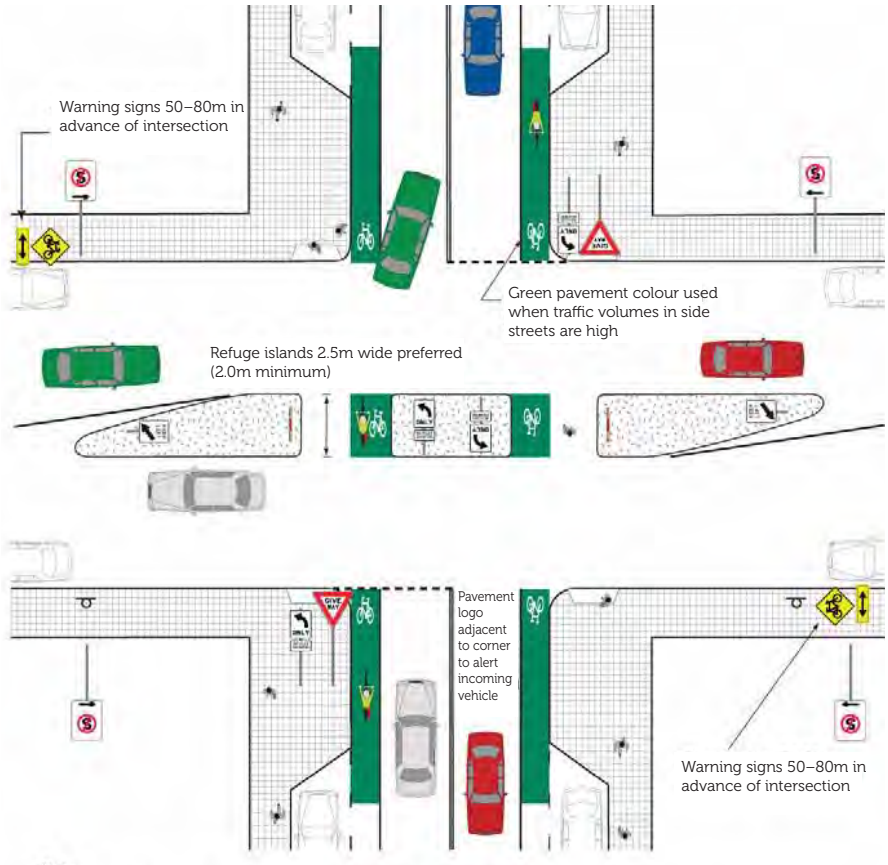


Figure B29. Cyclist refuge at an unsignalised intersection
Source: Local Area Traffic Management[41]

Connectivity across areas

Providing connectivity across busy roads can be challenging in key cycle routes and appropriate crossing facilities are needed. The ability for cyclists to safely and efficiently cross must be carefully considered, as must the types of users (e.g. school children who frequently cross the road).

Types of crossing facilities[40] are:

- grade separation (bridge or underpass)
- a signalised crossing with bicycle detection and lights
- median refuge
- road narrowing of excessively wide roads that also allows for cyclist needs along the road
- on-road bicycle lanes or off-road path connections to nearby traffic signals, to be supplemented with bicycle detection and lanterns
- a crossing that gives priority for cyclists in accordance with relevant road rules.

Cyclist median refuges located on a busy road at an existing intersection (Figure B29) require a restriction to motor vehicle movements at the intersection, with right turns generally prohibited from all directions.

Refuges can also be located at mid-block locations where off-road paths intersect a road or near to intersections so cyclists can make a deviated turn in close proximity to the intersection. Options for crossing busy roads need to be carefully explored and resolved to maintain safe and efficient connectivity.

Bicycle parking

End of trip facilities support cycling as a transport option. Parking, a key facility for cyclists to store their bicycle for the duration of their visit, is often forgotten in planning of new development. Bicycle parking is critical for supporting the objective of increased bicycle use in the transport system.

Parking for cyclists falls into three categories:

- all-day parking at trip destinations (e.g. for employees and students)
- all-day/part-day parking at public transport stations or interchanges
- short-term parking at shopping centres, offices and other institutions.

Austroads[40] gives detailed information on bicycle parking facility locations, security and amount of parking. In particular, short-term bicycle parking needs to be convenient, and in close proximity to destinations, if it is to be effective. Otherwise, other street furniture, such as signs, trees and handrails, may be used if closer than the short-term parking. Parking under shelter is desirable.

Examples of bicycle parking are shown in Figure B29.

In 2001 Planning SA (now the Department of Planning, Transport and Infrastructure, DPTI) identified the amount of parking to be provided at various types of residential and commercial land uses in South Australia.[46] This information is often applied to new developments and is also a useful guide for retrofitting where required. DPTI plans to review these guidelines in 2012 and this Compendium will be amended accordingly.

Figure B30. Bicycle parking examples

Covered bicycle parking, **New York City, USA**

On–street parking retro–fitted from a car space
Pirie Street, Adelaide

Cycle pods – Innovative cycle parking stations
Brisbane, Australia

Bicycle parking as a public art installation
Lochiel Park, Campbelltown SA

B6 ESTABLISH CONDITIONS FOR WALKING

Introduction

Walking is fundamental to human beings. It is not just a practical, low cost and enjoyable approach to exercising; it is also a sustainable movement mode. Walking is also often a key part of any public transport or car trip. A growing body of evidence supports the association between features of the built environment and walking.[48]

- The built environment is directly associated with physical activity particularly walking and it can either facilitate or discourage walking.
- Walking for transport is associated with living in neighbourhoods that have good access to destinations (including public transport), connected street networks and higher residential development.
- Neighbourhood aesthetics (including access to public open space) tend to be associated with increased walking for recreation.

"For Adelaide to be successful it has to be liveable. To be liveable it must be walkable."

Dr Rodney Tolley, 2009


75

Creating better streets for pedestrians

Pedestrians should be prioritised in most street environments, by providing a high quality walking and activity experience (Figure B30).

Conventional street environments commonly offer conditions that favour and prioritise the movement of vehicles (e.g. pedestrian paths with very frequent interruptions, long waiting times at crossings, lack of crossing places and poor quality surface materials.

Key principles for prioritising pedestrian movement are:

- good quality pedestrian surfaces
- waiting times at signalled pedestrian crossings of less than 60 seconds (90 seconds the maximum across the busiest links)
- crossovers and ingress/egress points across footpaths minimised in width with priority right of way to pedestrian users
- continuity of materials across pedestrian walking paths, and across crossovers and ingress/egress points
- frequent crossings located at desire lines
- refuges and medians within wide carriageways
- traffic speeds below 40 km/h.

For some routes serving a strategic Link function and a low Place function, emphasis may be placed on minimising disruption to the throughput of vehicle, public transport and cyclist traffic (Link and Place matrix street typologies of I–D, I–E, II–D and II–E).

In the South Australian context, all streets, without exception, should make basic provision for pedestrians.

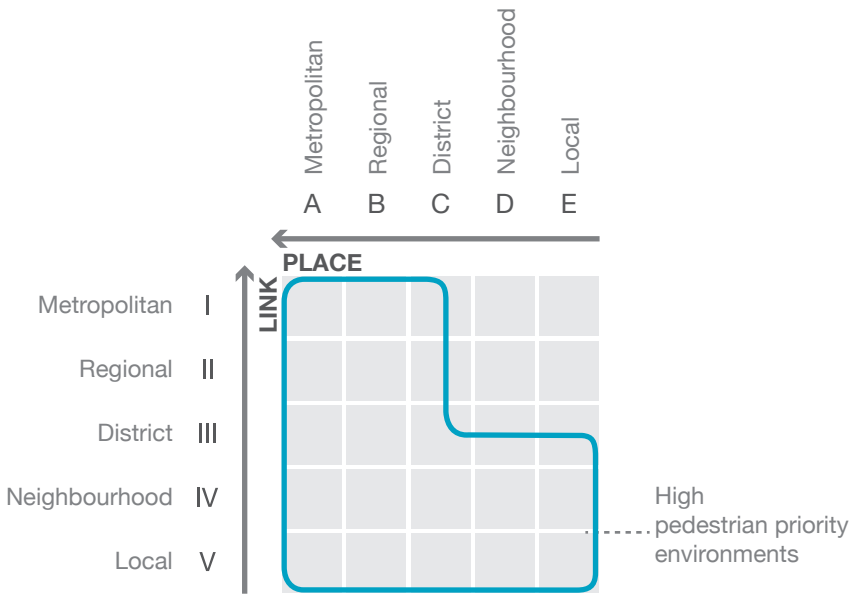


Figure B31. Street types warranting high pedestrian priority environments

Reduced surface traffic capacity in **Boston** with provision of a tunnel (Big Dig Project)

Reduced traffic capacity through removal of the Embarcadero Freeway in **San Francisco**

Reduced traffic capacity through pedestrianising **Broadway in New York**

Figure B32. Examples of reducing traffic capacity in **Boston, San Francisco and New York**

CONNECTED AND INTEGRATED PEDESTRIAN ENVIRONMENTS

This Compendium promotes the inclusion of pedestrians in all street designs. Most streets, as illustrated by the Link and Place matrix, should give pedestrian movement and/or activity the highest priority.

Pedestrian priority means:

- providing pedestrian footpaths on both sides of the street
- making pedestrian paths continuous and connected, with minimal interruptions
- providing pedestrian amenity e.g. shading and greenery
- maximising permeability by providing additional routes through large allotments
- making routes and accessibility to destinations clear, legible, signed (where appropriate) and with passive surveillance
- installing spaces for place-related activities on streets of Place status D or above.

Busy movement conduits with few Place–related activities (in cells I–D, I–E, II–D and II–E; see Figure B31) can act as severance barriers to communities on either side of the road and decrease local connectivity substantially.

Pedestrian subways and bridges are often installed to improve connections but are still a major inconvenience to users (e.g. increased journey times, often unpleasant environments with personal security issues).

A strong trend in cities around the world is to reconnect areas severed by major highways by installing surface level crossings and slowing down traffic in areas heavily used for pedestrian street activities.

In some cases severance by traffic in places of highest significance was drastically addressed by reducing their traffic capacity. Figure B31 shows examples of the Big Dig project in Boston, reduced capacity of Broadway in New York, and removal of a major highway in San Francisco.

PEDESTRIAN SCALE

Jan Gehl[49] puts strong emphasis on the importance of the human dimension and scale in street design. People on foot and people in cars process information and streetscape detail differently, because of the difference in travel speed and angle of observation. For example, signs for pedestrians need not be nearly as large as traffic signs, and pedestrians can be much more drawn by the detail of frontages and displays that may not be noticed by people in cars. Scale also refers to the height of the buildings and relationship of street width to building height (with recommended proportions of 1:1 to 1:2). Gehl recommends street elements be designed on a pedestrian scale to promote the walkability of neighbourhoods.

ACTIVE FRONTAGES

Frontages of visual interest to pedestrians correlate with higher pedestrian use.

A study of facades and public life in Copenhagen[50] reported that:

- 75% of the people passing active facades turned their heads; only 21% of those passing unattractive inactive frontages did so
- 25% of pedestrians stopped in front of active and attractive facades; only 1% stopped in front of inactive, unattractive facades.

Facade designs are key determinants in creating a sense of place, attracting people to the area, and increasing walking and staying activities.

For strips of commercial activity, facade design should have:

- high activation, mediating between inside and out (e.g. City of Melbourne's policy requires 80% of street frontages in the retail core to be active)
- articulation with physical detail
- high levels of personalisation and individuality
- compositions of rhythm, character and coherence
- defined continuous edge.

These principles may not be applicable in all cases but frontages should:

- provide good mediation between private and public space
- have a high degree of personalisation and individuality
- offer a sense of rhythm and unity to the observer.

Active frontages also help reduce vandalism and other low level crime.

DIVERSITY OF CHOICE

Streets can support a wide variety of uses and contribute to the vibrancy and diversity of the surrounding area.

This is particularly relevant to streets of Neighbourhood (D) and higher Place significance. These types of places should serve more than one function, incorporate local services and offerings that encourage walking from nearby residential areas and decrease the need for long-distance trips.

Healthy, walkable neighbourhoods should offer access to basic services, open spaces, public transport and shops. Recommended maximum distances to such destinations are illustrated in Figure B32.

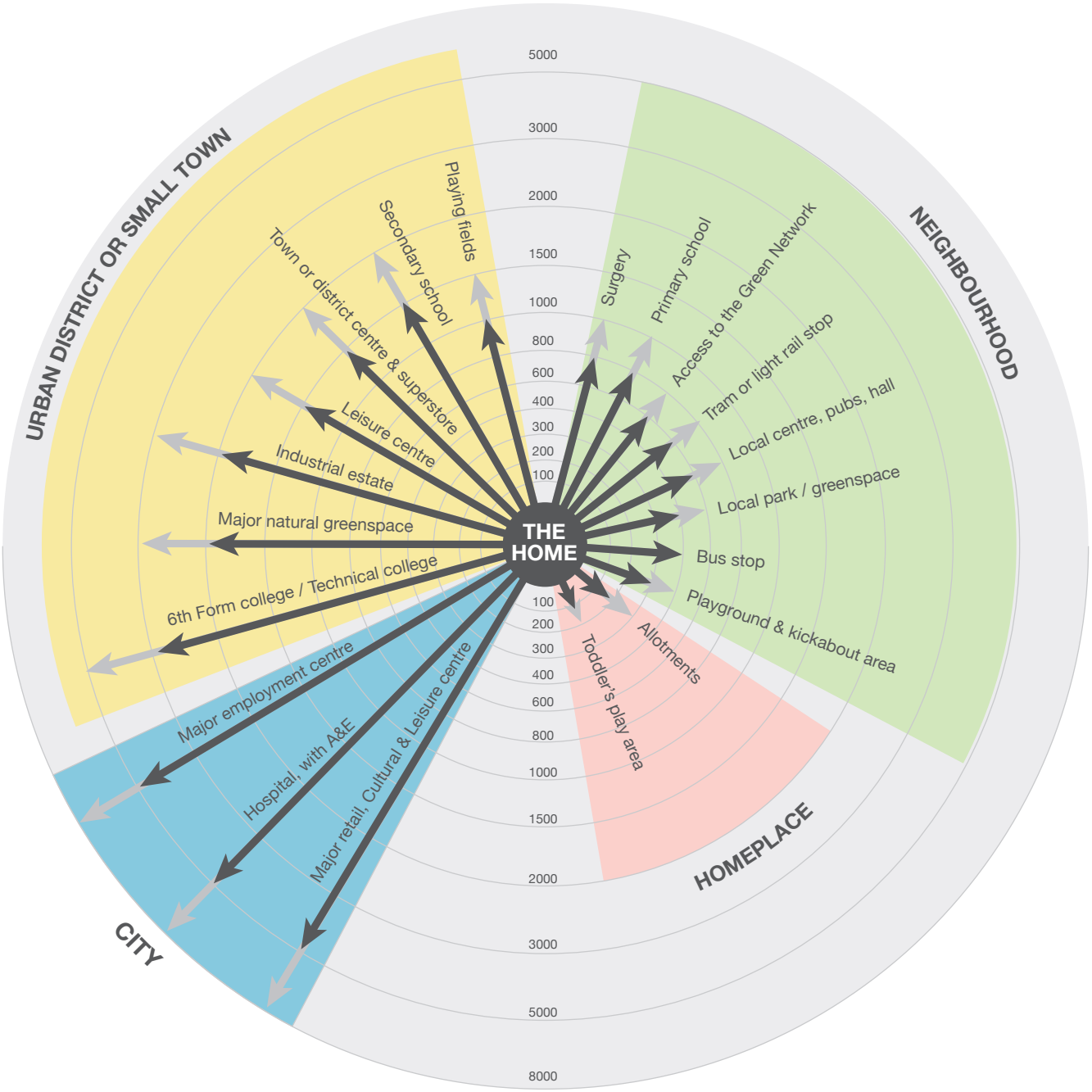


Figure B33. Recommended distances to key destinations
Source: Barton et al[51]

MICROCLIMATE

Streets should be oriented to receive maximum sunlight, and include features for climate protection for users, such as awnings, overhangs or canopies, and trees. During winter in an Australian climate, people can be found enjoying the sunshine, but in summer months, most people seek out shade.

Wind effect is another important consideration in street design: the impacts of strong wind are particularly pronounced in street environments with multistorey buildings or unsealed surfaces.

In creating the right microclimate, consider factors such as sun angle and the orientation of streets, massing and grouping of buildings, landscape planting, orientation of entrances and access points.

ROOM FOR WALKING

Comfortable, obstruction-free paths are essential to encouraging walkability. Recommended unobstructed walking widths are:

- 3.5 metres or wider along busy shopping strips
- 3 metres alongside bus stop areas
- 2 metres for two wheelchairs to pass one another
- 1.5 metres for a wheelchair user and accompanying guiding person.

The recommended minimum pedestrian path width for movement is 2 metres or greater, according to flow. Place-related pedestrian activities on the footpath require additional width.

DISTINCTIVENESS

Streets are public spaces in their unique geographical settings. They have a rich association of local meaning and symbolism, cultural traditions, architectural building style, history, local distinguished businesses and people.

Popular and well-used streets typically owe their popularity to an 'anchor' business or use, which often acts as a catalyst in attracting other businesses to join in its success.

Local context and distinctiveness enhance what is special and unique about places. In the process of identifying and utilising local distinctiveness in design, consider:

- researching historical context
- involving residents/local communities in the design process
- inviting residents and/or community to directly participate in street design elements
- encouraging public realm stewardship by local communities
- encouraging personalisation of the private domain visible from the public domain (e.g. dressing shop fronts, creating unique artworks or installations).

ENCOURAGING STAYING ACTIVITIES AND 'PLACEMAKING'

Place-making in street environments is now considered best practice for creating liveable communities. Staying activities are often associated with great streets, offering interest and interaction to their users. Distinctive and meaningful places attract pedestrian users, stimulate social exchange and develop a sense of community. Places are a combination of physical settings, activity, meaning and perceptions, with many factors contributing to each of these functions.

Gehl[49] provides measures for expanding staying and non-necessary activities on streets and squares (Figure B34). Mehta[52] reported that seating was one of the most important factors contributing to staying activities. Mehta's observational research (based on 13,000 people) reported that over 90% of staying activities were carried out next to physical artefacts, such as street furniture, steps and tree trunks.

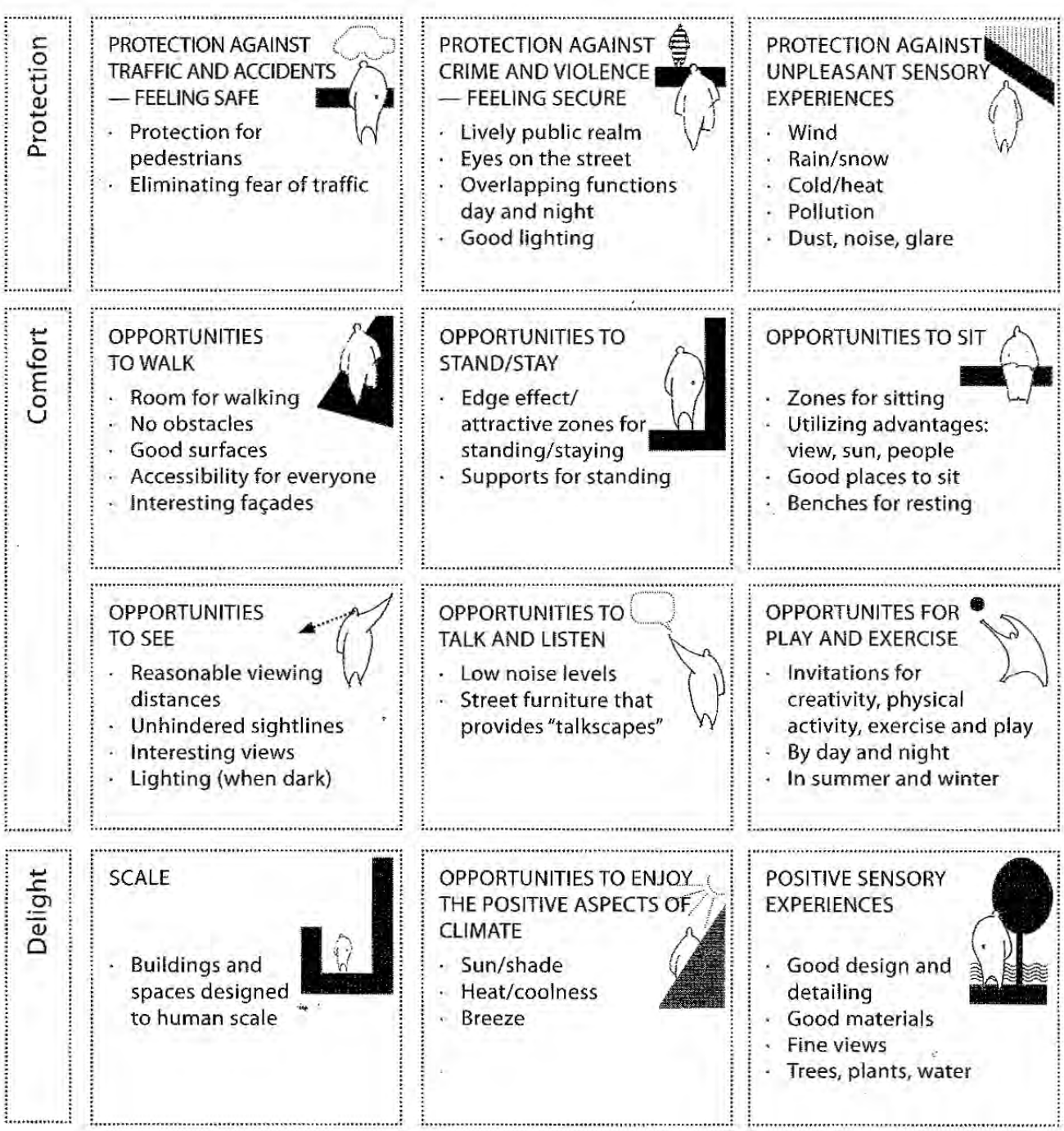


Figure B34. 12 quality criteria concerning the pedestrian landscape[49]
Source: Gehl 2010

LEGIBILITY AND 'IMAGE' OF PLACES

Kevin Lynch was one of the first urbanists to recognise the importance of the cognitive image of neighbourhoods and cities formed by people.[53]

Lynch argued that the ease with which we can form a mental map of the urban environment had a direct impact on the ease with which we can intuitively navigate through urban spaces, a quality called legibility.

Lynch identified five key important elements in forming the overall image:

- paths (channels along which observers move)
- edges (other than paths, linear elements of the landscape that often form boundaries)
- districts (areas of common identifying character)
- nodes (strategic points of reference or concentration)
- landmarks (identifiable points of reference).

Specifically important in the context of streets are distinct edges, comfortable and convenient paths, and landmarks that contribute to local distinctiveness and identity of the neighbourhoods.

79

WELL-MAINTAINED ENVIRONMENT

Well-maintained streets add to the quality of the street environment and reduce trip hazards.

SAFE AND SECURE ENVIRONMENT

Good lighting is of benefit to all street users. It enhances personal security and reduces crime, and improves conditions for visually impaired street users and for road safety. Several comprehensive crime prevention through environmental design (CPTED) guidelines are available from:

- Australian Local Government Association, National Heart Foundation of Australia and the Planning Institute of Australia's Safety and Surveillance Fact sheet (www.healthyplaces.org.au/site/safety_and_surveillance.php)
- Australian Institute of Criminology (www.aic.gov.au/events/aic%20upcoming%20events/1989/cpted.aspx)
- International Association for Crime Prevention through Environmental Design (www.cpted.net/.)

ACCESSIBILITY, INCLUSIVITY AND AGE FRIENDLINESS

Well-designed streets and places are inviting to users of all ages, cultural backgrounds and genders.

Four million people in Australia (18.5%) reported having a disability in 2009 according to the Australian Bureau of Statistics.[54] A vast majority of them reported specific limitations and restrictions caused by their disability.

Australian Standard 1428 parts 1 and 2 defines the features of a continuous accessible path of travel. Street environments should always cater for cyclists, pedestrians, wheelchairs and gophers, and avoid the need for exclusion rules in public spaces. Street environments should be equitable towards users, barrier free and simple, requiring low physical effort to navigate them.

Designing for all ages and all levels of physical ability, to make streets inclusive, considers that:

- older adults and disabled people typically require frequent rests along their journey; seating every 150 m is recommended
- crossfalls above 2.5% (1 in 40) are difficult for navigation of manual wheelchair users and above 5% (1 in 20) are too difficult (or restricted to very short distances) and should be avoided
- paths have no vertical drops/steps and 'at grade' crossings where they are interrupted
- barriers are avoided that artificially increase distances to destinations (e.g. pedestrian fences, bulky street furniture, obstructions on paths)
- character sizes for signage are appropriate: above 15 mm for close up reading and above 50 mm for medium range reading
- pedestrian crossing points are safe.

Over the past five decades, play activities by young people in street environments have slowly disappeared. A street hierarchy approach promoted in this Compendium identifies streets of low traffic volumes and speeds, where on-street play activities are safe and should be encouraged. Special dedicated play areas adjacent to the street (e.g. playgrounds, reserves, skate parks) are also an important factor in street environments, particularly in residential areas.

A large body of literature indicates that public spaces do not take gender perspectives into account, although women make up half of the population. Some factors bearing specific impact on women (frequently with young children) are:

- obstruction by barriers
- poor public toilet provision
- lack of availability of rest areas
- poor lighting and natural surveillance
- fear for personal safety and security
- lack of climate protection
- streets overwhelmed by fumes and traffic
- roughness of pavement surfaces
- lack of opportunities for safe crossing
- vertical steps/grade separation.

B7 CONSIDER SUSTAINABLE STREET ENVIRONMENTS


80

Pocket park **Robsart Street, Unley, Adelaide**

Introduction

A well–designed street can help create sustainable communities, by encouraging walking and cycling, facilitating community interaction and offering safe play for children. Sustainable street design also takes into account the management of water, temperature and biodiversity.

The Compendium provides for setting speed and integration between transport modes to make an environment suitable for all street users. Streetscape elements such as seating, bike parking, using CPTED principles and other facilities can support cycling and walking (see sections B5 and B6, and C6 for specific suggestions). The Heart Foundation's Healthy by Design guidelines[55] includes guidance on other aspects of street design to promote active lifestyles, vibrant places and social inclusion.

Ely[56] suggests that:

"streets have significant potential to provide a range of ecological services in the form of urban greening, climate change adaptation, urban heat island amelioration and sustainable stormwater management (water sensitive urban design) as well as encouraging 'active transport modes' which minimise greenhouse gas emission."

Building the case

In developing this Compendium the South Australian Active Living Coalition identified a gap in evidence on the role of landscaping in streetscape design and commissioned, Building the Case for the Role of Landscaping in Urban Street Design.

This as-yet unpublished report investigates the range of benefits of a well-landscaped street including pedestrian and vehicle safety, engineering, environmental and climatic benefits, economic and human health and well-being benefits. The report will be available mid–2012 and the Compendium will link directy to it.

In order to make walking and cycling the preferred modes for many people, high levels of amenity are needed in the street, especially to key destinations such as workplaces, schools and shops. As walking is a primary mode of transport of the very young and the elderly, facilitating walking for these groups is especially important.

South Australia is also currently taking steps to become accredited by the World Health Organization as an 'Age-Friendly' state, and as Australia's first Child and Youth Friendly accredited region based United Nations Children's Fund framework for Child and Youth Friendly Cities.

B8 APPROVALS, RISK & LIABILITY

Introduction

Difficulty and extra time for approvals, and issues of risk and liability, were the two key barriers raised by professionals for not pursuing non-standard street designs. The consultation process for this Compendium revealed widely varying levels of understanding, opinion and uncertainty among different professions and authorities of the practicalities of getting designs approved. In some cases, barriers were perceived that do not exist.

The approach advocated by the Compendium of a multidisciplinary and inclusive process for street design should help clarify permissions needed, and provide the appropriate documentation to have street designs approved.

Approvals

APPROVAL FOR THE DESIGN OF LOCAL ROADS

New roads are usually created with the development of land. Under the Development Act 1993 and associated Regulations, development applications are assessed by Local Councils in their role as assessment authorities. This includes development applications for residential land divisions that include new roads. Councils can approve development applications containing new roads that are designed to the appropriate standards for the development.

Following completion of the development, the roads are normally handed over to Councils as public roads. Councils therefore have a vested interest in ensuring that all design issues for local roads are well documented and resolved before taking ownership.

Roads can also be changed outside of development applications. Councils may approve the changes under the Local Government Act 1999. Essentially the same process is required for ensuring relevant standards and guidelines are met for the design of the road. This process is often used where the Council itself is modifying or upgrading the road but private entities may also seek to modify a road as part of external works to a development nearby.

TRAFFIC CONTROL DEVICES

Traffic control devices are controlled by specific requirements of the Road Traffic Act 1961, which defines a traffic control device as a: sign, signal, marking, structure or other device or thing, to direct or warn traffic on, entering or leaving a road, and includes:

(a) A traffic cone, barrier, structure or other device or thing to wholly or partially close a road or part of a road; and

(b) A parking ticket-vending machine and parking meter (Preliminary Part 1 Part 5 Interpretations, pp 12 & 13)

The Road Traffic Act requires a road authority to have approval from the Minister for Transport to install, maintain and remove traffic control devices on, above or near a road. For management of local roads, the Minister for Transport delegates authority to Councils for installation, maintenance and removal of traffic control devices subject to specific conditions under a formal instrument of delegation issued to each Council in 2009 and amended from time to time. Figure B35 shows the hierarchy of approval delegations for traffic control devices.

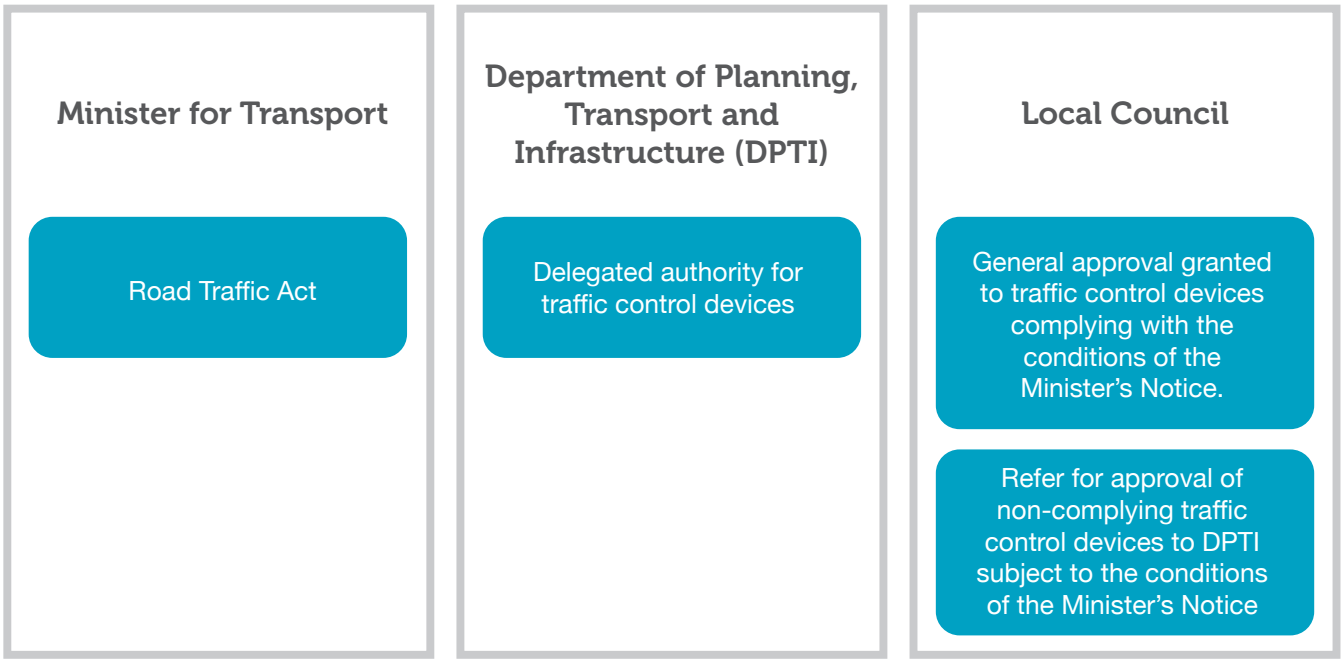


Figure B35. Hierarchy of approval delegations for traffic control devices

REGULATORY REQUIREMENTS

Councils have general approval through the Minister's Notice to Council[57] to manage the use of traffic control devices based on:

- authorisation of officers 'for and on behalf of Council'
- conformity with the Road Traffic Act
- conformity with the Code of Technical Requirements[58] (Part 2 of the Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices)
- notification to adjoining councils where there is an impact on them[59]
- notification to DPTI, where there is an impact on a Commissioner of Highways's road
- consultation with DPTI for traffic signals where proposed on local roads
- provision of a Traffic Impact Statement to confirm the traffic management and road safety impacts of any proposed device.

The first step in confirming the approval required for a traffic control device is to discuss the proposal with the relevant Councils. They can confirm the approval process (see Figure B36) and specify the information required to gain approval.

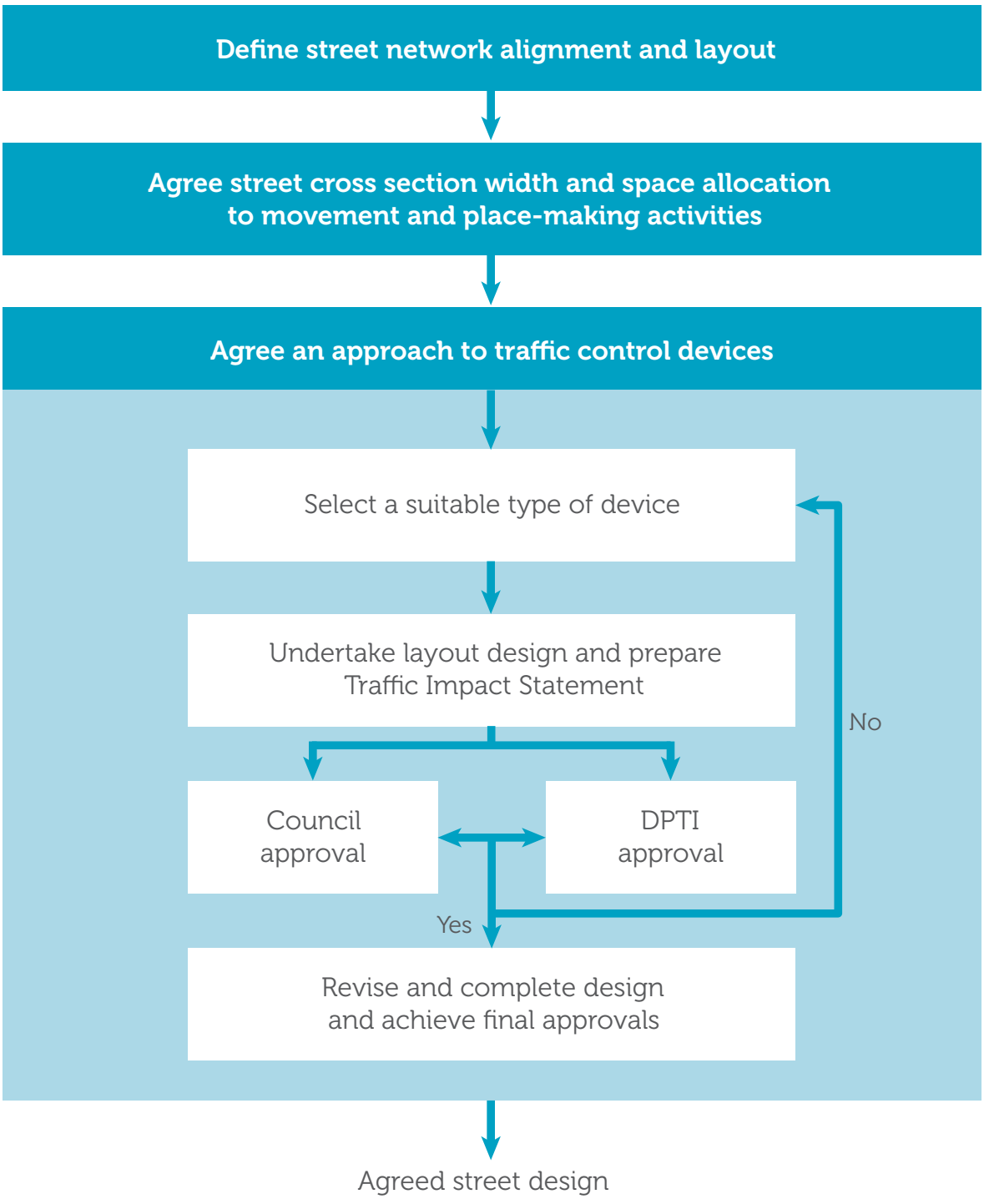
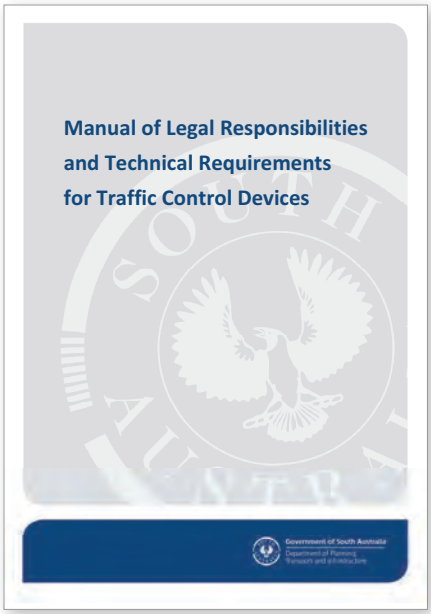


Figure B36. Typical approvals process for street design with traffic control devices



APPROVALS FOR TRAFFIC CONTROL DEVICES

Generally, the types of traffic control devices that have general approval and may be installed without approval from DPTI are proven devices which are commonly used by Councils, such as:

- give way and stop signs
- wombat crossings, koala crossings and emu crossings
- 25 km/h school zones
- roundabouts
- traffic signals, including pedestrian crossings
- bicycle facilities
- pedestrian refuges
- road humps and road cushions
- slow points and centre blisters
- contrasting pavements and raised pavements
- perimeter thresholds
- riveway entries and links
- road closures.

The *Australian Standards*, *Austroads Guides*, and the *Code* specify the details of many of these devices. The *Code* does not contain a complete list of all traffic control devices available under general approval; it only specifies the variations from the *Australian Standards* and Austroads *Guides*. Where the *Code* varies from the requirements of the *Australian Standards* or *Austroads Guides*, the *Code* takes precedence.

Council's general approval, through the Minister's Notice to Council, requires traffic control devices to be installed in accordance with the *Road Traffic Act*, the *Australian Standards*, and the *Code*.

The Minister's Notice to Council also lists devices which are excluded from Council's general approval, which therefore require DPTI approval. This list includes:

- mini roundabouts
- shared zones
- clearways
- bus lanes
- speed limit signs (except for road works, school zones and crossings)
- various traffic signs
- traffic control devices not conforming to the Minister's Notice
- non-standard use of traffic control devices.

Traffic control devices must be installed in accordance with the Minister's Notice. If a device does not conform it must be re-designed or special approval obtained from DPTI where appropriate. Further information may be obtained from the relevant Council or DPTI.

Seeking special approval will require careful consideration and liaison with DPTI to determine if the traffic control device is appropriate. The use of a non-standard or non-permitted device must be specifically justified with careful consideration of its traffic management and road safety impacts.

Integrated design approach

The design of an appropriate street environment should deal with traffic management as an integrated part of the design and not be contingent on the need for specific or non–conforming traffic control devices. A design process using the guiding principles for the key areas set out in this section will help deliver an integrated design for all users of a street.

By developing an integrated design to create a desired street environment, the need for specific traffic control devices and the associated separate approvals can be eliminated.

Separate approval will need to be sought where street designs include traffic control devices that do not meet the required design standards of the Code, as Council cannot issue approval.

Liaison with DPTI or adjoining Councils is required when changes to a street may affect the operation of an arterial road or neighbouring Council street. DPTI or the neighbouring Council must agree on the soundness of the design that impacts of their road.

This Compendium advises street designs based on holistic and integrated considerations, which achieve:

- a people-centred approach
- an appropriate speed environment
- best practice for considering movement and accessibility needs of all road users
- objectives set for the street within its wider context.

This approach will help in obtaining relevant approvals.

Risk and liability

The design of streets must manage risks present in the street environment through road users interacting with each other and the surrounding built form. The issue of risk in the street environment is paramount when considering the design of a street.

In 2001 the Australian High Court removed the immunity of road authorities from non-feasance, meaning Australian road authorities were no longer immune from liability if they failed to take action on a known deficiency on their roads. Although the doctrine of non-feasance immunity for road authorities was restored by legislation in South Australia, there is still a duty of care owed to road users by the Minister for Transport, DPTI and Councils. Breach of that duty of care could result in legal liability.

The main legal concern in traffic management on streets is the perceived risk of litigation in the event of damage or injury sustained by a road user, where it is often alleged that the authority has failed in its duty of care. Essentially this occurs where a street is considered unsafe through inaction or inadequate design, or lack of installation of appropriate traffic controls or street layouts.

Adherence to current standards and guidelines is typically the norm for street design and traffic management. In litigation, reference is made to the Standards and Guidelines of the day for the design of the street environment including the use of traffic control devices. Traffic control devices are often used on local roads to manage risks identified with the street layout, or included as part of an approved traffic control layout, which could include a single or many devices. Street design may not require specific traffic control devices but will require integrated design features regulating traffic operation to maintain a safe street environment.

The current standards and guidelines do not specifically provide advice for the design of low speed environments for safe walking and cycling, that is design for below 30 km/h, except for Shared Zones (10 km/h). The principles of street design for walking and cycling are very similar to those of Local Area Traffic Management which is now a well-established process in South Australia.

Austroads guide to local area traffic management[38] suggests a process by which road authorities can reduce their vulnerability to litigation for LATM:

- Clearly document the objectives and need for a street design including the alternatives, the anticipated effects and the consultation undertaken. A collaborative workshop approach is recommended.
- Understand Australian and New Zealand standards, guidelines and best practice when designing streets including documenting the applicable design characteristics and relationship to these documents.
- Develop an integrated design that considers the responses and behaviour of reasonable drivers exercising ordinary care, and all other users of the street including those walking and cycling. Gaining community acceptance is central to managing future risks and liabilities for any street design.
- Consider road safety audits at all stages as part of a risk management strategy.
- Seek relevant approvals where required, in particular for traffic control devices. Non-standard or non-conforming devices may be appropriate if the design process is clearly understood and documented.
- Ensure that implementation of the design is accurate and correct to the required specification. Document pre-opening reviews and acceptance, and commissioning dates and times.
- Develop an appropriate monitoring program after implementation to record usage, identify potential risks and allow for required modifications. Collect appropriate data on the use of the street, such as volumes of traffic, pedestrians and cyclists.

Integrating these steps into the street design process will help minimise the potential for risk and liability following implementation and use for relevant road authorities.

REFERENCES

1. Creating Places for People: An Urban Design Protocol for Australian Cities. 2011. www.urbandesign.gov.au
2. South Australian Urban Design Protocol Fact Sheet. 2011. www.urbandesign.gov.au/downloads/files/SouthAustralia_Urban_Design_Factsheet.pdf
3. Intermethod and Tract. Movement and Places: Canberra City Central. ACT Government. 2011.
4. N Boujenko, T Bacic, N Avery, J Devney and T Wilsonl. O–Bahn City Access: Scoping Report. Department for Transport, Energy and Infrastructure. 2010.
5. Adelaide City Council. Victoria Square/Tarndanyangga: Vision and Guiding Principles. 2009.
6. Local Roads Advisory Committee. Road Classification Guidelines in South Australia' Department for Transport, Energy and Infrastructure. 2008. www.dtei.sa.gov.au/__data/assets/pdf_file/0020/34283/Road_Classification_Guide_Final.pdf
7. P Jones, N Boujenko and S Marshall. Link and Place: A Guide to Street Planning and Design. Local Transport Today, London. 2007. www.transportxtra.com/shop/books/?id=19
8. ARTISTS Consortium (A Svensson, ed). Arterial Streets for People. Lund University, Lund. 2004. lup.lub.lu.se/luur/download?func=downloadFile&recordOId=1038972&fileOId=1039047
9. Department for Transport. Manual for Streets. Thomas Telford Publishing, London. 2007.
10. Department for Transport. Manual for Streets 2: Wider Application of the Principles. Chartered Institution of Highways and Transportation, London. 2010.
11. Department for Transport. Shared Space. Local Transport Note 1/11. 2011. www.dft.gov.uk/publications/ltn–01–11
12. Department for Transport. Manual for Streets 2: Wider Application of the Principles. Chartered Institution of Highways and Transportation, London. 2010.
13. D Passmore. Evolving Streets: a review of contemporary approaches to street design. 2005. dylanpassmore.com/Passmore_%282005%29_EvolvingStreets.pdf
14. H Monderman. Project for public spaces website. www.pps.org/articles/hans–monderman
15. D Engwicht. Mental Speed Bumps: the smarter way to tame traffic. Envirobook. 2005.
16. Shared Space Project. Shared Space: room for everyone, The Netherlands. 2005. www.shared–space.org/download.asp?link='/files/18445/SharedSpace_Eng.pdf'&linkID=130472
17. Shared Space Project. Shared Space: Final Evaluation and Results, The Netherlands. 2008. www.shared–space.org/files/18445/Opmaak_boekShEngels2007_def.pdf
18. JMU Access Partnership, KBC Bright Consultants and TRL. Designing for Disabled People in Home Zones. UK. 2007. www.homezones.org.uk/public/guidance/documents/finalreport30–06–07.pdf
19. S Andrews. Understanding Shared Space: a definition and study of its operation. MSc Special Study, Imperial College and University College London. 2009.
20. MVA Consultancy. Department for Transport Shared Space Project, Stage 1: Appraisal of Shared Space. UK. 2009. www2.dft.gov.uk/pgr/sustainable/sharedspace/stage1/pdf/stage1.pdf
21. E Beasley. Kerb Your Enthusiasm: Why shared spaces doesn't always mean shared surface, and other stories. Parliamentary Advisory for Transport Safety, UK. 2009. www.pacts.org.uk/docs/pdf–bank/Kerb%20Your%20Enthusiasm.pdf
22. D Tooby. Shared Street Performance Analysis, Port Macquarie, NSW. no date. www.aila.org.au/lapapers/papers/Port–Macquarie/default.htm
23. Department for Transport, Energy and Infrastructure. Guidelines for Disability Access in the Pedestrian Environment. Government of South Australlia. 2009.
24. R Atkin. Sight Line: Designing better streets for people with low vision. CABE and Royal College of Art UK. 2010.

25. J Garrard. Safe Speed: promoting safe walking and cycling by reducing traffic speed. Safe Speed Interest Group, Heart Foundation, Melbourne, Vic. 2008. www.thinkingtransport.org.au/sites/www.thinkingtransport.org.au/files/EXT%20–%202008%20Dec%20–%20Safe%20Speed%20FULL%20Report.pdf
26. J Archer, N Fotheringham, M Symmons, and B Corben. The Impact of Lowered Speed Limits in Urban and Metropolitan Areas. Monash University, Accident Research Centre, Victoria. 2008.
27. Government of South Australia. Towards Zero Together – South Australia's Road Safety Strategy 2020. 2011. hwww.dpti.sa.gov.au/__data/assets/pdf_file/0003/73335/South_Australias_Road_Safety_Strategy_2020.pdf
28. B Hamilton–Baillie and P Jones. Improving Traffic Behaviour and Safety Through Urban Design. Proceedings of ICE, Civil Engineering 158, Paper 14014, pp.29–47. 2005. acocksgreenfocusgroup.org.uk/wp–content/uploads/2010/08/Ben–Hamilton–Baillie–Improving–Traffic–Behaviour–and–Safety–Through–Urban–Design.pdf
29. N Garrick. Care to Share? Roads and Bridges, 42(9). 2005. www.engr.uconn.edu/~garrick/articles/Care%20to%20Share%20–%20road%20and%20bridges.htm
30. B Corben and A Duarte. Injury Reduction Measures In Areas Hazardous to Pedestrians, Report No 169. Monash University, Accident Research Centre, Victoria. 2006. www.monash.edu.au/muarc/reports/muarc169.pdf
31. Australian Transport Council. National Road Safety Strategy 2011–2020. 2010. www.atcouncil.gov.au/documents/atcnrss.aspx
32. Austroads. Balance Between Harm Reduction and Mobility in Setting Speed Limits: a Feasibility Study, Report AP–R272/05. Austroads, Sydney. 2005.
33. Australian Transport Council. National Road Safety Strategy 2011–2020. 2010. www.atcouncil.gov.au/documents/atcnrss.aspx
34. CN Kloeden, JE Woolley and AJ McLean. Evaluation of the 50km/h default urban speed limit in South Australia. Road Safety Research, Policing and Education Conference, Perth, Australia, 14–16 November 2004. 2004.
35. M O'Hare. Road Safety Benefits of 50 km/h Urban Speed Limits. Austroads. 2005.
36. JE Woolley and C Dyson. Further insights in to an urban area with lower speed limits: the Unley case study. Proceedings of Road Safety Research, Policing and Education Conference, pp.295–302. 2003. casr.adelaide.edu.au/casrpubfile/208CASRUnleyEnforcementCrashes448.pdf
37. Austroads. Guide to Traffic Management – Part 8: Local Area Traffic Management. AGTM08–08. 2008. www.onlinepublications.austroads.com.au/collections/agtm/guides
38. Planning SA. Good Residential Design SA: A Resource for Planning, Designing and Developing Neighbourhoods and Homes. Government of South Australia.1999.
39. E Uhlfelder. The Downtown Street as a Place. Urban Land, Urban Land Institute, Washington DC. 1997.
40. Austroads. Cycling Aspects of the Austroads Guides. AP–G88–11. 2011. www.onlinepublications.austroads.com.au/items/AP–G88–11
41. Austroads. Guide to Traffic Management – Part 8: Local Area Traffic Management. AGTM08–08. 2008. www.onlinepublications.austroads.com.au/collections/agtm/guides
42. Austroads. Guide to Traffic Management – Part 4: Network Management. AGTM04–09. 2009. www.onlinepublications.austroads.com.au/collections/agtm/guides
43. CROW. Design Manual for Bicycle Traffic. Ede, The Netherlands. 2007.
44. Roads and Traffic Authority NSW. NSW Bicycle Guidelines. 2005. www.jcu.edu.au/soc/bug/resources/Cycling%20specific%20resources/NSW%20Bicycle%20Guidelines%20ON–LINE%20v1–2.pdf
45. City of Sydney. Bourke Street Bicycle Route. 2008. www.cityofsydney.nsw.gov.au/AboutSydney/ParkingAndTransport/Cycling/CycleNetwork/SurryHills/BourkeStreet.asp
46. Planning SA. Planning Bulletin: Parking Provisions for selected land uses (Suburban Metropolitan Adelaide). 2001.

47. R. Tolley. Good for Busine$$: The benefits of making streets more walking and cycling friendly. 2011. www.heartfoundation.org.au/SiteCollectionDocuments/GoodforBusinessFInal_Nov.pdf
48. National Heart Foundation. Position statement: The built environment and walking. 2009. www.heartfoundation.org.au/SiteCollectionDocuments/Built–environment–position–statement.pdf
49. J Gehl. Cities for People. Island Press, Washington DC. 2010.
50. J Gehl, L Kaefer and S Reigstad. Close Encounters with Buildings. Urban Design International, 11, 29–47. 2006. www.indydt.com/Close_Encounters_with_Buildings.pdf
51. H Barton, M Grant and R Guise. Shaping Neighbourhoods For Local Health and Global Sustainability. Routledge, Oxford. 2010.
52. V Mehta. Look Closely and You Will See, Listen Carefully and You Will Hear: Urban Design and Social Interaction on Streets. Journal of Urban Design,14(1), 29–64. 2009.
53. K Lynch. The Image of the City. The MIT Press, MA. 1960.
54. Australian Bureau of Statistics. Disability, ageing and carers, Australia: summary of findings, 4430.0. 2009. national.carersaustralia.com.au/uploads/SDAC%202009%20summary.pdf
55. National Heart Foundation of Australia (Victorian Division). Healthy by Design: a planners' guide to environments for active living. 2004.
56. National Heart Foundation and M Ely. Building the Case for the Role of Landscaping in Urban Street Design. Unpublished report to the National Heart Foundation. 2012.
57. Minister for Transport. Notice to Council to Use Traffic Control Devices and to Close Roads and Grant Exemptions for Events. 2009.
58. Department for Transport, Energy and Infrastructure. The Code of Technical Requirements for the Legal Use of Traffic Control Devices. 2011. www.dpti.sa.gov.au/standards/tass
59. Department for Transport, Energy and Infrastructure. The Code of Technical Requirements for the Legal Use of Traffic Control Devices. 2011. www.dpti.sa.gov.au/standards/tass

Image	Source
01, 10, 11, 18, 54, 55, 74, 75, 78, 80	DPTI
02, 03	Taylor Cullity and Lethlean
04, 05, 12–14, 16, 17, 19, 40-44, 50, 53, 55–64, 66-69	Natalya Boujenko (Intermethod)
06	Adelaide City Council
07, 08, 15	Peter Jensen (Jensen Planning and Design)
09	http://communitygarden.org.au/blog/2010/04/09/verge–gardens/
20, 25, 29, 31, 35, 37	www.googlemaps.com
21	Frans de Wit on www.flickr.com
22, 23	Paul Vivian (URS)
24	Southampton City Council
26	Erica Blennerhassett
27	Tony Kirby (Local Transport Projects Ltd)
28	Jim Mayor, Brighton and Hove City Council
30	Kent County Council
32	http://www.gruene–mutterstadt.de/Wordpress/wordpress/?p=432
33, 36	James Hurley
34	Allan Akbar
38	David Tooby
39	Patricia Mendham (City of Marion)
45, 46, 47, 48, 49, 51, 52	GTA
65	Michael Silvy and Daryl Morgan (City of Mount Gambier)
70	City of Sydney
71	http://www.treehugger.com/bikes/nyc–bicycle–shelter–parking–iphone–photos–how–street–it–is.html
72, 74	http://www.adelaidecyclists.com/forum/topics/bike–parking–bp–issues
73	http://cyclepods.co.uk/
76	http://www.massdot.state.ma.us/Portals/8/Images/bigdig/kennedyblvd.jpg
77	Inter211 on www.flickr.com
78	Moonman82 on www.flickr.com
79, 80	City of Unley

01

CHAPTER C /
STREETS FOR PEOPLE IN PRACTICE

C0 GETTING STARTED

Purpose

This chapter outlines the key Compendium guiding principles to consider when designing a cycling and pedestrian friendly street. It is designed to be a 'stand-alone' component of the Compendium that can be used in a very practical way to guide a street design process.

Using this approach will assist the practitioner to:

- define a strategic role for each street based on the Link and Place methodology
- identify the high level design considerations which can be translated into cross-sections and detailed designs to suit specific developments.

This chapter can be used by an individual; however a workshop involving all stakeholders to reach a consensus on a street design approach has many benefits.

Reaching a consensus on a street's strategic role and key design considerations before significant resources are invested into detailed design can help steer a design and approvals process.

This Compendium helped guide the street design process for an urban revitalisation project at Bowden (on the north-western edge of the Adelaide Park Lands). Examples from this case study are included throughout and at the end of this chapter.

Who should be involved?

The participants will vary depending on the nature of the site and complexity of the project. Experience is showing that including all relevant decision makers and stakeholders helps obtain consensus on the vision for the street and a street design approach. Participants can include:

- ☐ traffic engineers
- ☐ planners/social planners
- ☐ landscape architects/urban designers
- ☐ representatives from the approval authority such as council (if not a council initiated project)
- ☐ relevant staff from the Department of Planning, Transport and Infrastructure (e.g. staff from Cycling and Walking, and Traffic and Access Standards sections)
- ☐ community or peak body representatives.

For large or complex projects with a substantial number of stakeholders it may be advisable to use a facilitator and provide a dedicated scribe to ensure that accurate notes are taken.

What information is needed?

Collate all relevant information and data to ensure that the mapping of the street and the resultant design respond to the site. If using a workshop approach, ensure that all participants in the workshop have access to all relevant information, such as:

- ☐ vehicle, pedestrian, and bicycle numbers – current and projected if available
- ☐ existing road hierarchies or Link and Place assessments relevant to the site
- ☐ current or proposed planning and strategic policies that apply to the site, including both state and local government level plans and policies
- ☐ results of any relevant community consultation or engagement already in progress or completed
- ☐ demographics – including identification of any groups in particular that use the streets, such as children, aged, commuters and/or heavy vehicles; and any other information that assists in mapping the Link and Place functions of the street.

Further guidance and support

For further guidance, supporting information, rationale and statistics underpinning this Compendium's street design approach, see Chapters A and B.

Case studies using the Link and Place methodology as part of a street design process, and resources with national and international guidance, are given in Chapters D and E.

C1 BEST-PRACTICE INTEGRATED DESIGN APPROACH

All streets are public spaces and typically make up approximately 80% of the overall public realm in cities and towns. Streets shape urban fabric and how people use and access what cities and towns have to offer. The street design process should be integrated, holistic and centred on improving human experience.

The philosophy underpinning the Compendium is to adopt a best-practice integrated design approach (such as the *Places for People: An Urban Design Protocol for Australian Cities*).[3] It means:

Work within the planning, physical and social context

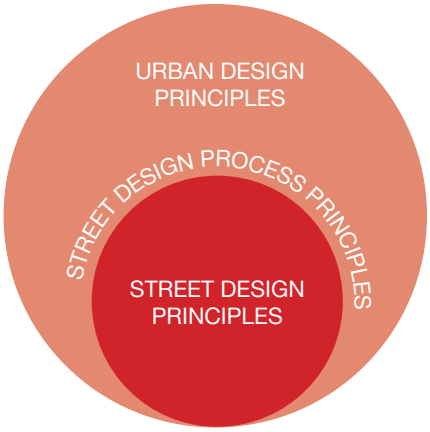
- ☐ Reference urban design and/or planning principles for wider neighbourhoods and precincts, to ensure an integrated approach to street design.
- ☐ Establish an evidence base for the study area, that objectively identifies key issues and seek consensus from stakeholders.

Engage with relevant stakeholders

- ☐ Develop an approach to engagement for the project, ensuring it happens early in the process, it is inclusive and meaningful.

Foster excellence, innovation and leadership

- ☐ Lead the design process with a vision and a set of guiding principles that give an overall direction to the project.
- ☐ Encourage experimentation and innovation and consider emerging best practice.
- ☐ Start with the highest optimal aspiration and work through considerations, before limiting an outcome by any constraints.
- ☐ Design streets to a human scale, guided by optimal dimensions for people walking or cycling.



Street design considerations are nested within urban design considerations of wider neighbourhood areas

Consider custodianship and maintenance over time

- ☐ Agree measures of success for appraising project impacts and evaluating outcomes.
- ☐ Ensure that systems are in place for ongoing operation, management and upkeep.

For further information see section B1.

C2 STRATEGIC ROLE OF A STREET

Streets in a network perform different roles: some may prioritise access to important destinations and encourage staying activities; others may need to prioritise a strategic movement function. An approach to street design should reflect the diversity of street roles within a street network to allow different uses and roles to flourish.

USE AN INTEGRATED STREET NETWORK HIERARCHY APPROACH (THAT CONSIDERS BOTH MOVEMENT AND PLACE-MAKING NEEDS)

- ☐ Recognise that streets are both movement conduits (Links) and destinations in their own right (Places).
- ☐ Adopt and use a street hierarchy system that can equitably consider movement and place-making needs of the street within a wider street network context.

Link and place matrix

Source: Link and Place: A Guide to Street Planning and Design[1]

The Link and Place approach for designating a street's strategic role within the network is recommended. This approach is based on a two-dimensional matrix for assigning a strategic hierarchy for movement function (Link: vertical axis in Roman numerals) and place function (Place: horizontal axis in capital letters). Every cell in the matrix describes a street type with a different combination of Link and Place requirements.

For further information on the Link and Place matrix see section B2.

For a redesign project, assess Link and Place for both the current situation and the proposed vision. A Link and Place matrix for South Australia is shown in Figure C1.

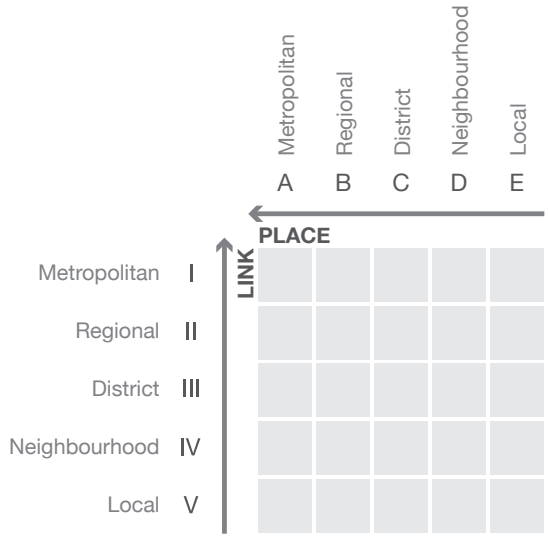


Figure C1: Link and Place matrix adapted for use in South Australia

Adelaide Entertainment Centre – increase in both movement and place status to this section of **Port Rd.**

ESTABLISH A STRATEGIC ROLE FOR EACH STREET SECTION IN THE STUDY AREA AS A DESTINATION IN ITS OWN RIGHT (PLACE) WITH THE DIVERSITY OF ACTIVITIES THAT THE STREET IS ACCOMMODATING

Factors influencing Place status:

- ☐ numbers of people accessing the street for staying activities and average distance travelled
- ☐ average distances people travel to access the Place
- ☐ existing hierarchical classification for Places
- ☐ strategic importance of the main land uses, or the architectural significance of the buildings, or cultural significance of the street itself.

To allocate Place boundaries, identify changes in Place characteristics that are triggered by a change in Place status level or a change in a predominant land use or character type (Figure C2).

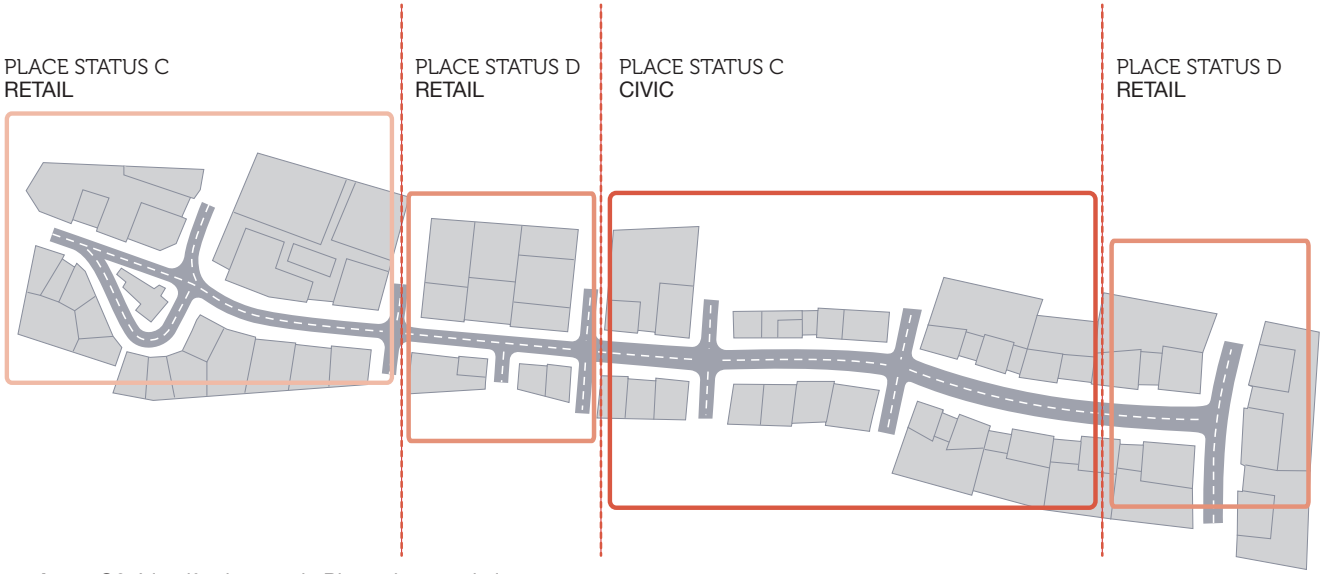


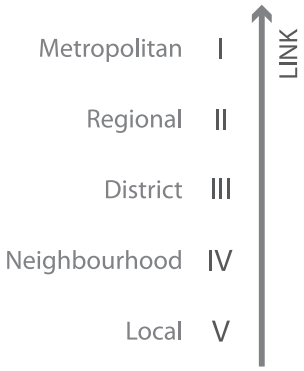
Figure C2. Identify changes in Place characteristics

ESTABLISH STRATEGIC MOVEMENT FUNCTION (LINK) FOR ALL MODES IN THE STUDY AREA STREET SECTIONS

Factors influencing Link status:

- ☐ volumes of people using the Link function of the street in cars, buses, on bicycles and by foot
- ☐ existing current road classification system for all modes, reflecting strategic importance of the routes
- ☐ length of the journeys for commuters using the route.

A general guide to vehicle numbers for Link status allocations is given in table B1 of Chapter B2. To allocate Link boundaries, identify changes in functional role in the movement of people through the street and any modal priority (Figure C3).



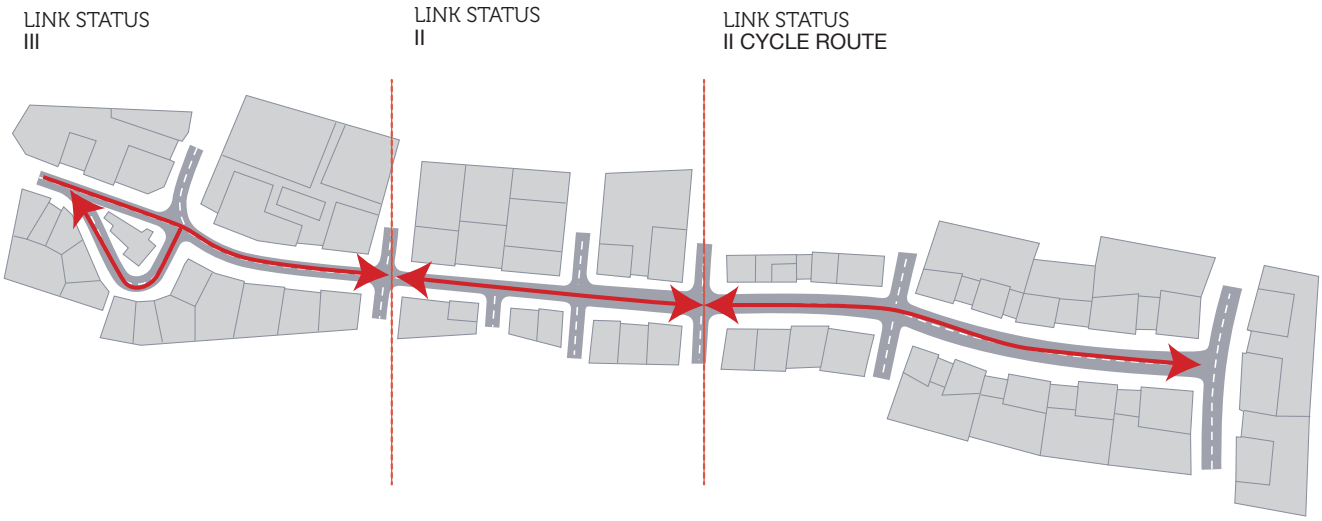


Figure C3. Identify changes in Link functions

ESTABLISH WHETHER THE STREET ROLE/STATUS CHANGES THROUGHOUT A WEEK AND WHETHER THE CURRENT AND FUTURE STREET ROLE/STATUS WILL REMAIN THE SAME

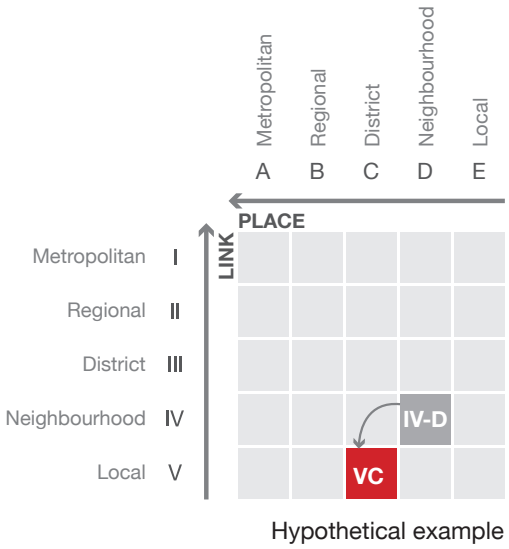
Some streets may be used differently during weekends or on public holidays than during a typical weekday (e.g. street closure for a street market). This may warrant a different status for a street segment for each significantly different time period.

Street redesign often requires a re-think of the strategic role that the street performs. If the change proposed triggers a different designation in the Link and Place matrix, make sure everyone agrees.

ESTABLISH SEGMENTS AND THEIR ROLE/STATUS

Divide the street network into street segments: each new segment forms where the Link or Place status changes, or where the modal priority or predominant land use changes (Figure C4)

For further information see Chapter B2.



Hypothetical example

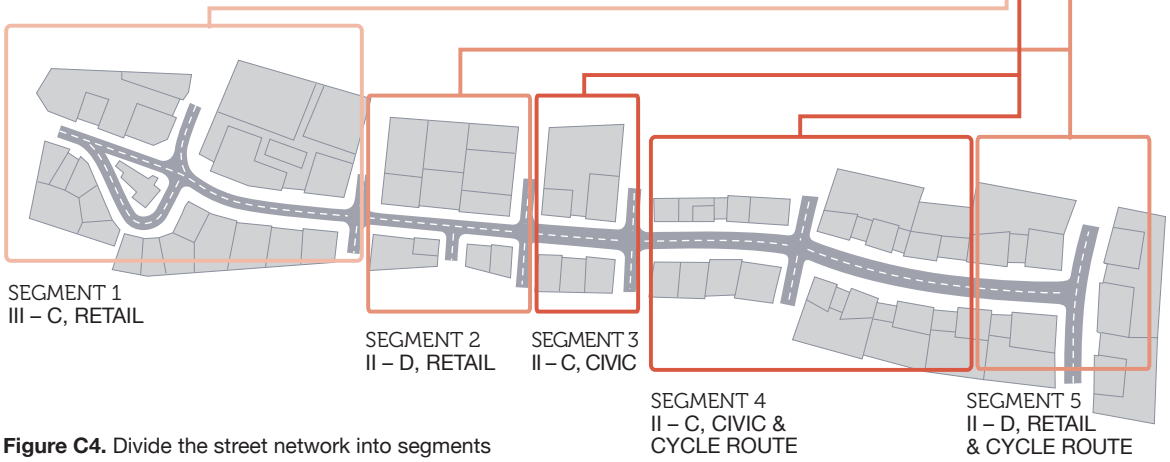
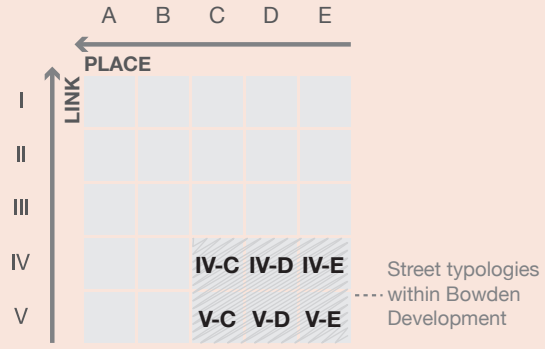


Figure C4. Divide the street network into segments

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN, SOUTH AUSTRALIA

An integrated street network hierachy approach (that considers both movement and place making needs) has been used for the Bowden development.

In determining and designing street typologies for the Bowden development, the Link and Place classification was applied to the proposed grid street network (Figure C11), yielding six street types within the site boundary of Link levels Neighbourhood (IV) and Local (V) across three Place levels: District (C), Neighbourhood (D) and Local (E). Back alleyways in Bowden were distinguished by a sub-category within Link level V and marked in a different colour on plans. Similarly, shared use paths (cyclists and pedestrians) were differentiated from a standard local street, warranting a unique design and consideration.



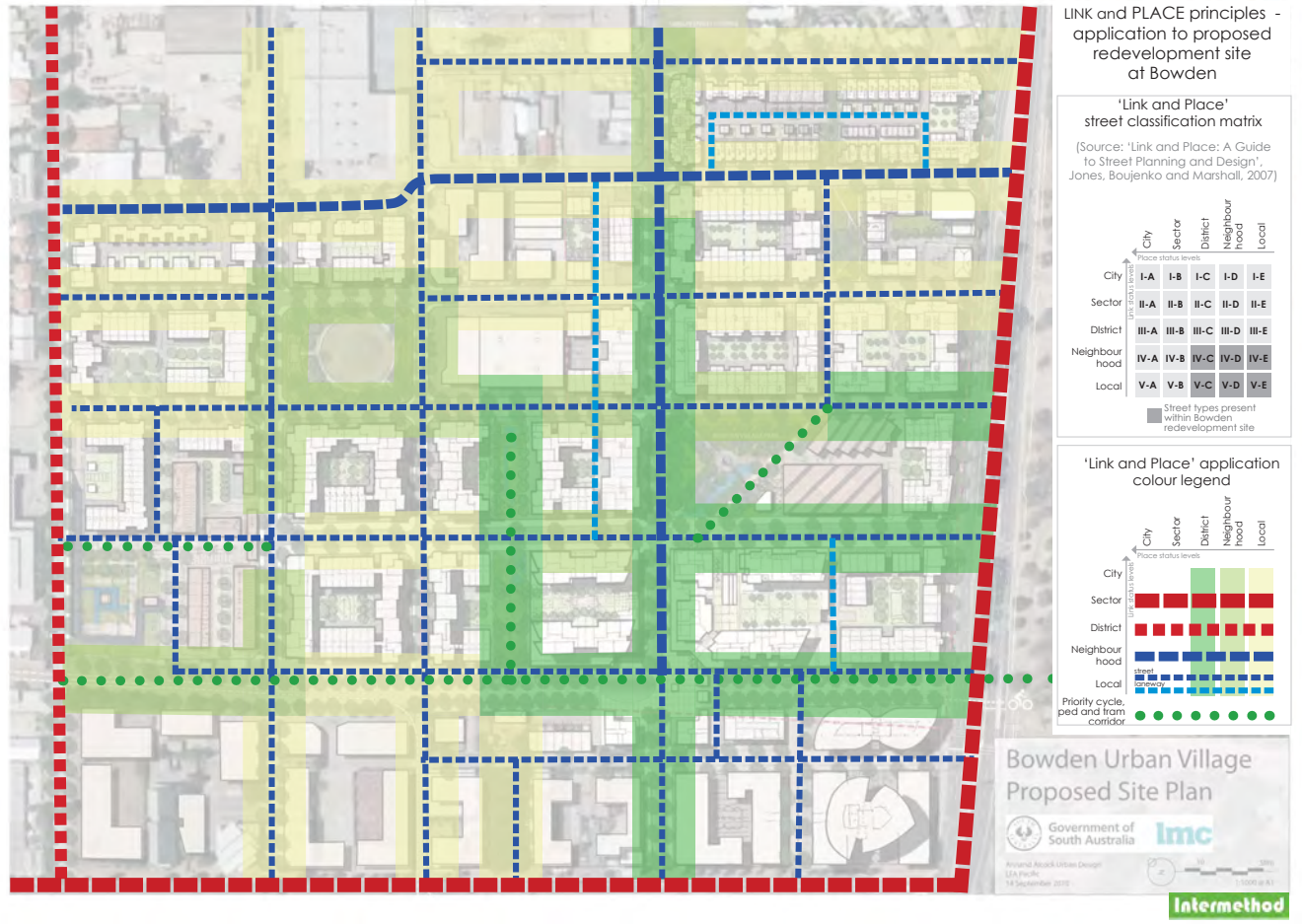


Figure C5. Bowden development: Link and Place assessment map[5]

C3 SHARED STREETS

Consider the use of shared level surface streets in appropriate contexts, for an alternative design approach that encourages street activity and reduces speed by facilitating greater engagement of Link users with their surroundings and with other street users (Figure C6). For the principles behind shared streets see section B3.

ESTABLISH APPROPRIATENESS OF INTRODUCING A SHARED STREET CONCEPT BASED ON THE STRATEGIC ROLE OF THAT STREET

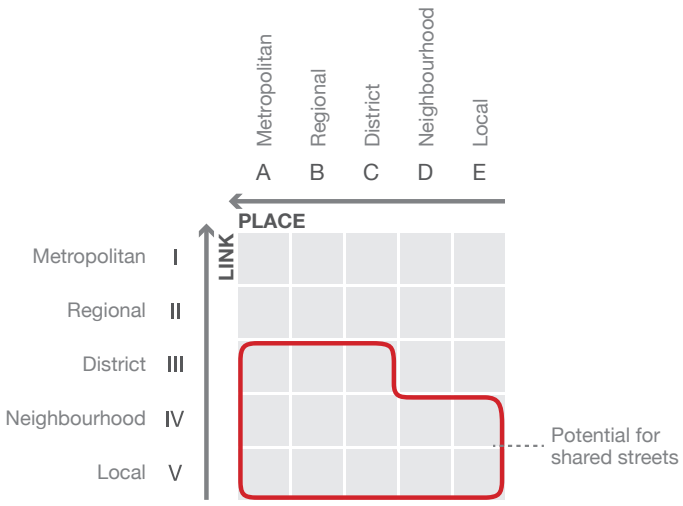


Figure C6. Street types identified as most appropriate for consideration of a shared street approach (see Chapter B).

ESTABLISH FUNCTIONAL AND DESIGN CHARACTERISTICS

Key design principles for creating shared spaces are:

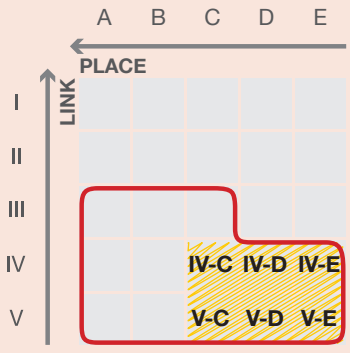
- ☐ reduce vehicular speeds below 25 km/h
- ☐ provide a level surface across the street wherever possible (allowing gentle sloping for stormwater drainage)
- ☐ reduce dominance of vehicle paths (e.g. by visual narrowing, reducing forward visibility, introducing tighter geometry, making it difficult to drive quickly)
- ☐ remove traffic signage and minimise line markings
- ☐ avoid conventional traffic measures (e.g. chicanes, traffic islands, road markings) in favour of visual cues in the street design
- ☐ pay specific attention to landscaping for climate protection
- ☐ encourage enhanced local expression of the space through urban design features.

For further information see Chapter B3.

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

Opportunities for shared streets were considered for the Bowden development.

Street typologies in the Bowden development all fall within a zone where shared single surface streets are appropriate. Two stakeholder workshops discussed best practice examples and possibilities for the Bowden development. The conclusion was that the right vehicular environment could be achieved in the Bowden development through design that would enable successful introduction of shared surfaces.



C4 SAFE SPEED ENVIRONMENTS

Street design should create an appropriate speed environment for all Link users, which will allow appropriate Place use and activities to flourish.

ESTABLISH AN APPROPRIATE SPEED ENVIRONMENT GUIDED BY THE STRATEGIC ROLE AND STATUS OF THE STREET

The speed environment should be appropriate to the street's strategic role, as both a Link and a Place (Figure C7).

Vehicular traffic, and associated car parking, should not dictate built form and prevent the use of streets as public spaces.

ESTABLISH DESIGN APPROACH

- ☐ The 'slow' network can generally only function effectively if there are good connections (typically within 500 m) to higher status Link streets that are part of a higher speed network.
- ☐ On lower speed streets, give preference to passive speed control measures integrated into the street design, which prioritise movement of people on foot and by bicycle, provide priority for people crossing streets and encourage social interaction.
- ☐ Avoid traditional retrofit style devices, such as road humps or chicanes, unless absolutely necessary.

Avoid traditional chicanes and road humps

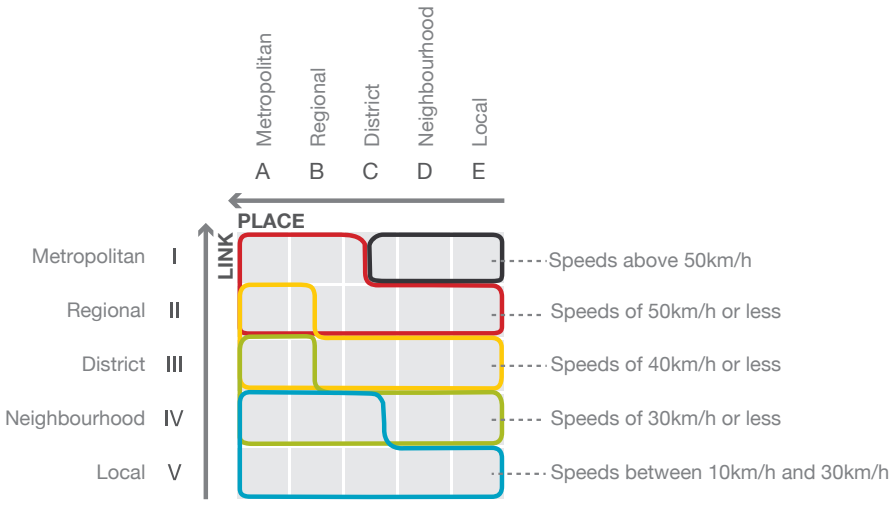


Figure C7. Recommended target speed environments

ACHIEVE THE DESIRED SPEED THROUGH DESIGN

Design principles for accommodating motorised vehicles include building speed restraint into the design of the street and using design techniques to create a lower speed environment. For example:

- ☐ keeping uninterrupted street section lengths to a minimum to achieve the desired speeds (less than 100 m for 30 km/h and less than 150 m for 40 km/h)
- ☐ limiting real or visual length of street segments through urban design, which restricts sight distance for motor vehicles, according to the design speed (e.g. by introducing a horizontal deflection/curvature in the carriageway or landscaping or place-making build outs)
- ☐ reducing the width of carriageway for motor vehicles (e.g. by landscaping or tighter geometry)
- ☐ introducing a change in materials across the carriageway (e.g. at crossing points or at intersections)
- ☐ minimising traditional traffic controls such as signs and pavement markings, reducing the need for traffic control signage and pavement markings through effective street urban design and emphasising street activities to provide appropriate cues to drivers of motor vehicles.

For further information, see sections B4.

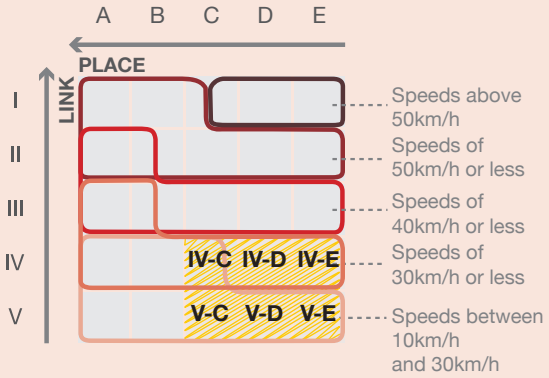
Side road entry treatments in different materials

Horizontal deflection (bending road) and visual carriageway narrowing through landscaping
Lochiel Parkway, Campbelltown, Adelaide

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

Achieving low vehicular speeds of 30 km/h or less was seen as a priority for streets in the Bowden development. The designed environment would not enable car drivers to drive much above 30 km/h by employing the following features:

- tree plantings along the edges of pedestrian environments and in the centre of the street
- landscaping areas protruding unevenly into the vehicular space, thus deflecting what would otherwise be a straight vehicular path
- frequent slow points introduced (by extending landscaping plantings even further) where a vehicle has to give way to on-coming traffic
- vehicle travel zones on 'local' link streets was limited to 5–6 metres width
- kerbside place activity encouraged by 'street meeting places' and plentiful seating.



C5 CYCLING

Consider and incorporate cycling movement requirements into all streets in urban areas. The nature of that design will vary according to the Link and Place status of the street segment (Figure C8).

ESTABLISH AN APPROACH FOR SEPARATION OR SHARING OF CYCLING FLOW WITH THE GENERAL TRAFFIC

ESTABLISH DESIGN APPROACH AND FUNCTIONAL CHARACTERISTICS

- ☐ Consider cyclists (and pedestrians) as priority Link users to be encouraged in all street types.
- ☐ Integrate cyclists with other movement modes in speed environments of 30 km/h or below (Link status levels Local (V) and Neighbourhood (IV) with high status Place designation).
- ☐ In low speed environments (below 30 km/h), reduce carriageway widths to promote mixing and sharing of the road space.
- ☐ Use bicycle lanes on higher order faster streets, generally at 40 km/h or above and/or volumes above 5,000 vehicles per day.
- ☐ Consider separated protected bicycle lanes along high strategic priority bicycle routes with high volumes of cyclists or for streets with high Link status (I or II) that have lower Place status (C and below).

Example of a segregated cycle path, **King Street, Sydney**

Cycling within a shared street environment

Planning for protected two–way bicyce lane
Wentworth Avenue, Sydney

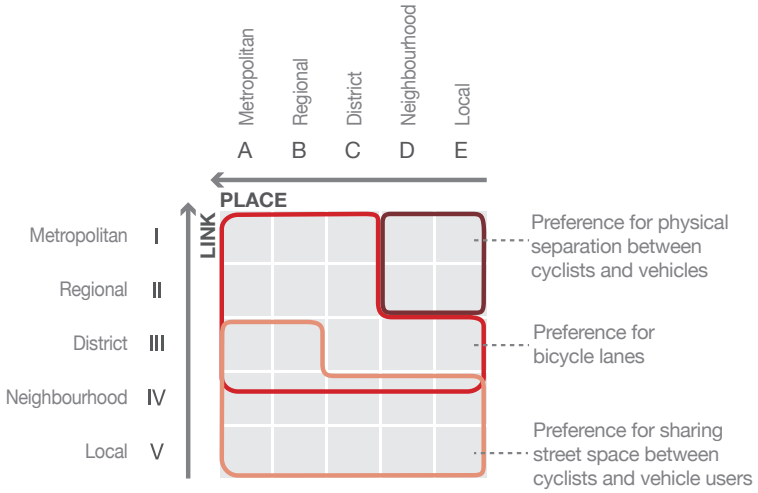


Figure C8. Accomodating cyclists on different street types.

ESTABLISH DESIGN CHARACTERISTICS

- ☐ Bicycle paths should be direct, continuous, smooth and barrier-free.
- ☐ Bicycle routes should connect to important destinations without interruptions.
- ☐ Safe crossing points across busier roads enable cyclists to continue their journeys with minimum disruption (may include measures to slow down other traffic at intersections).
- ☐ The optimum location for a bicycle lane is alongside the kerb. Where there is parking, the lane can be located to the right or left of parked vehicles with an allowance for opening car doors (Figure C8). Bicycle lanes located to the left of parked vehicles need particular care in the design of intersections.
- ☐ Contra-flow bicycle lanes give cyclists high priority and safety and should be considered for one-way roads.
- ☐ Provide end of trip facilities, including high quality, secure bicycle parking.
- ☐ Include design elements that legitimise and raise awareness of cyclist's presence – particularly at intersections.

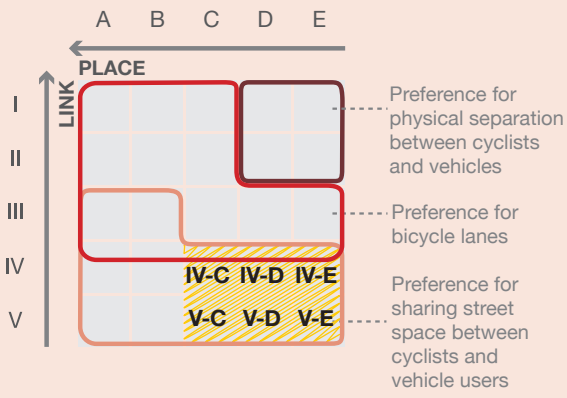
For further information see section B5.

Figure C10. Cyclists incorporated between pedestrian and car parking spaces **Albert Street, East Melbourne**

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

Establishing a cycle friendly street environment for the Bowden development was a priority.

With design speeds of 30 km/h, suitable conditions for mixing cyclists with vehicular traffic have been achieved with no necessity for bicycle lanes. Four priority shared use paths (cyclists and pedestrians) have also been provided where cyclists and pedestrians are separated from vehicular traffic.



C6 WALKING

Example of a Pocket park, **Unley**

Inclusive environments of shared single surface streets, **Germany**

Public space enjoyed by all age groups
Nicholson Street Mall, Victoria

Streets should encourage pedestrian use in all locations, both for movement and place activities. Street design should prioritise pedestrian needs in street types of high Place and/or low Link status (Figure C10).

ESTABLISH PRIORITY FOR PEDESTRIANS

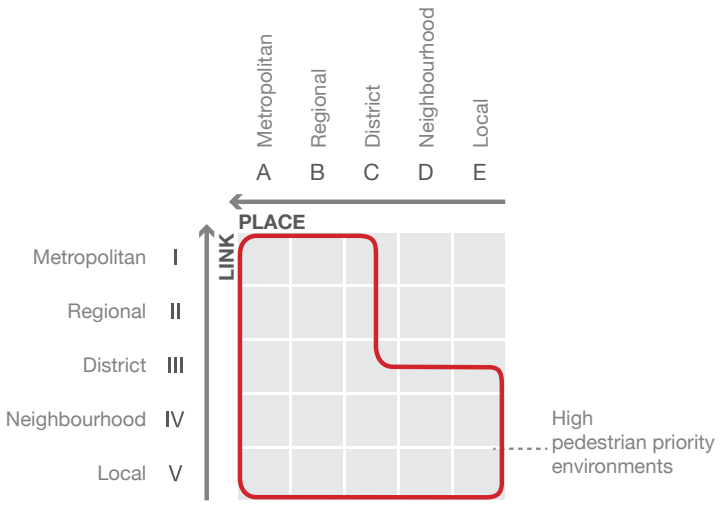


Figure C10. Pedestrian priority areas

ESTABLISH DESIGN CHARACTERISTICS

- ☐ Prioritise pedestrians in most street environments, with a high quality walking and street activity experience.
- ☐ Do not exclude pedestrians from any streets in cities.
- ☐ Offer well-connected walking networks through neighbourhoods, with additional pedestrian (and cycling) connections penetrating large building blocks or streets closed to vehicular traffic.
- ☐ Ensure footpaths are continuous and uninterrupted on both sides of the street; eliminate, wherever possible, or minimise, interruptions to walking paths (e.g. from side streets).
- ☐ Establish a width of pedestrian footpaths and other spaces that comfortably accommodates the numbers of pedestrians they serve – for both movement and stationary activity – with the aim of preventing overcrowding. Provide at least a 2 metre width free of obstructions for Link movement. (No maximum is set, as widths should cater for specific street activities and pedestrian volumes.)

- ☐ Locate safe crossing places for pedestrians at intervals (and at specific locations) guided by proximity to popular destinations and according to the Place status of the street.
- ☐ Along streets with busy, wide carriageways, median and pedestrian refuge, include islands wherever possible, and minimise crossing distances.
- ☐ Set standard waiting times of 60 seconds and below for all 'high pedestrian priority environments' with 90 seconds being the maximum delay in all other cases.
- ☐ Consider pedestrian crossing routes using overpasses and underpasses only as a last resort, where surface pedestrian crossings are impossible, and restrict them to streets with Link status I or II with Place status IV or V. Ensure they are wide, well lit and accessible to wheelchair users.
- ☐ Clear walking paths of obstruction so pedestrians do not have to deviate from their desire lines; avoid pedestrian fencing. Stop street furniture and advertising boards (permanent or temporary) from obstructing walking paths.
- ☐ Design streets catering for 'high pedestrian priority environments' on a pedestrian scale, responding to the speed of walking and pedestrian lines of sight and requirements for Place activities.
- ☐ Install adequate levels of lighting for: increased safety from traffic accidents, reduced fear of crime, and enhanced appearance of the public realm by highlighting building facades.
- ☐ Incorporate comfortable seating at frequent intervals, especially on busy pedestrian routes and activity spaces, and in areas where significant numbers of disabled or elderly pedestrians are found.
- ☐ Offer climate protection (continuous canopy of trees or awnings) on busier streets.

Design street environments to:

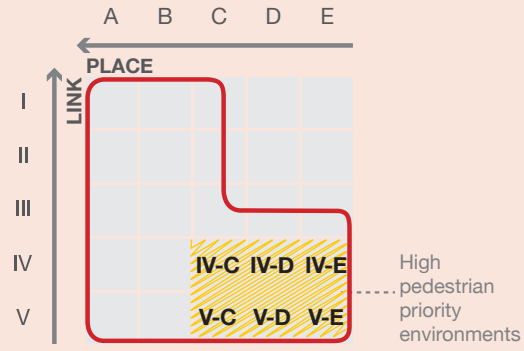
- ☐ accommodate a diversity of street uses and users, and support activities for all age groups, ethnic and cultural backgrounds
- ☐ offer a high level of accessibility in all cases to people with disabilities, considering both mental and physical impairment
- ☐ be flexible and adaptable, incorporating changes in use (as required) at different times of the day/week and offering opportunities for special uses during festivities or holidays and for community uses
- ☐ encourage social interaction
- ☐ ensure good accessibility to emergency and service vehicles, yet at the same time not allow extreme situations to dictate the physical form.

For further information see Chapter B6.

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

All streets in the Bowden development fall within a 'high priority environment zone'. Shared single surfaces and no kerbs or vertical grade drops across streets will enable unobstructed movement of pedestrians on desire lines. By minimising carriageway widths, pedestrian widths on both sides of streets vary between 2 metres (for 'local' street types of V–E) and above 4 metres (for main street type IV–C). A continuous tree canopy and frequent seating provision will be incorporated into all streets.

In addition, place-related activities and social interaction is encouraged in 'street meeting places' in street environments and a series of interconnected public open spaces throughout the site.



C7 SUSTAINABLE STREET ENVIRONMENTS

Streets should be sustainable environments, maximising opportunities for sustainable mobility, for landscaping, habitats, sustainable drainage, recycling, food production, reducing heat island effects and conserving water.

PROMOTE SUSTAINABLE MOBILITY AND SOCIAL INCLUSION

For example:

- ☐ promote and prioritise sustainable modes of transport, such as on foot and by bicycle
- ☐ use trees, shelter and seating with backs and arms (especially on key routes) to promote walking and provide a socially inclusive environment from children to the aged.

CREATE WATER SENSITIVE ENVIRONMENTS

For example:

- ☐ maximise the use of semi-pervious and pervious surfaces
- ☐ capture, store and treat as much stormwater as possible at source (e.g. through water sensitive urban design).

CREATE CLIMATE SENSITIVE ENVIRONMENTS

For example:

- ☐ be sensitive to climate conditions (e.g. through the use of awnings, continuous tree canopies, orientation of buildings)
- ☐ reduce the heat island effect (e.g. by increasing plantings on streets, incorporating green rooftops and green walls)
- ☐ incorporate native drought-resistant plants, thus minimising irrigation needs.

SUPPORT COMMUNITY-OWNED AND PRODUCTIVE LANDSCAPES

For example:

- ☐ enable community ownership and management of public land pockets and promote productive landscapes.
- ☐ if supported by interest from community groups/associations, promote productive landscapes (e.g. fruit trees).

Pervious surface on section of the road adjacent significant native trees Charles Lane, **Unley**

Permeable paving on graded crushed rock drainage layers, **Watson Terrace, Mount Gambier**

Extensive streetscaping watered by recycled water **Strand, Mawson Lakes, Adelaide**

Local parks and plantings, **Garden Street Park, Mawson Lakes, Adelaide**

MINIMISE WASTE TO LANDFILL AND ENCOURAGE SUSTAINABLE USE OF RESOURCES AND MATERIALS

For example:

- ☐ minimise waste disposal and recycle materials wherever possible
- ☐ make use of recycled and recyclable materials
- ☐ source building materials sustainably
- ☐ base infrastructure on whole lifecycle principles, taking into account durability of materials and replacement and recycling implications
- ☐ incorporate the use of renewable energy (e.g. on rooftops of buildings such as roof shelters).

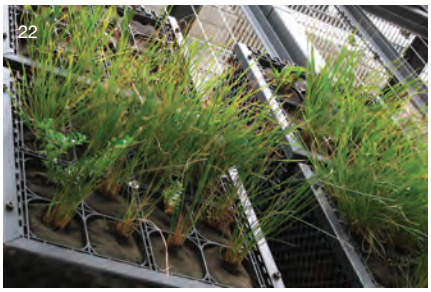
Benches made from recycled plastic materials **Childers Street, Canberra**

ENCOURAGE AND SUPPORT NATURAL ENVIRONMENTS IN URBAN AND SUBURBAN AREAS

For example:

- ☐ encourage and support natural environments
- ☐ maximise landscaping opportunities with local and native plant species
- ☐ maintain existing natural watercourses wherever possible
- ☐ maintain and enhance local habitats, encouraging and supporting biodiversity
- ☐ support fauna biodiversity by incorporating such features as bird and bat boxes.

Native vegetation of Glen Osmond Creek linear park supporting local habitats **Windsor Street, Unley**



Vertical green walls
Franklin Street, City, Adelaide

Citrus orchard amongst mature eucalypts
Glandore, Adelaide

Native grasses filtering stormwater runoff
Shoalhaven Circuit, Adelaide

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

The Bowden development has adopted numerous innovative features to support achievement of several sustainability targets in South Australia's Strategic Plan[5], relating to greenhouse gas emissions, use of public transport, ecological footprint, zero waste, sustainable water supply and healthy lifestyles.

The following features relate specifically to the street environment:

- Bowden development is planned as a transit-orientated development to minimise car dependency
- street design prioritises pedestrian and cycling movement and incorporates high quality spaces for seating and social interaction
- extensive street planting will provide climate protection to pedestrians and cyclists and reduce heat island effect
- solar access considerations guided the layout of streets and open spaces
- stormwater retention and biofiltration is incorporated into stormwater collection from streets
- recycled and salvaged materials from the site's previous uses will be incorporated
- Bowden development aims to use public art at key locations in streets and open spaces to highlight the history of the site and interpret environmental initiatives.

C8 APPROVALS, RISK & LIABILITY

The design of a street should be developed from a thorough and rigorous methodology that clearly defines the objectives and achieves best practice to the acceptance of the intended users.

DEFINE CLEAR OBJECTIVES

Clearly document the objectives and desired outcomes for a street design including the anticipated effects of the scheme.

CONSULT STANDARDS, GUIDELINES AND REVIEW BEST PRACTICE

- ☐ Understand Australian and New Zealand standards, guidelines and best practice applicable to the proposed street design.
- ☐ Avoid applying standards not intended for the particular street environment (e.g. don't apply design parameters for highway speeds when designing for local roads) and refer to best practice to establish an approach for design parameters not covered by the guidelines.
- ☐ Use this Compendium to establish references to relevant guidelines, standards and best practice.

ENSURE INTEGRATED CONSIDERATIONS ARE TAKEN INTO AN ACCOUNT

- ☐ Develop an integrated design that takes into account the responses and behaviour of reasonable drivers exercising ordinary care and all other users of the street including walking and cycling.
- ☐ Ensure that a design reflects the importance of creating an appropriate place, guided by the role of the street.
- ☐ Avoid the use of traffic control devices to artificially change user behaviour where the same objectives can be achieved through appropriate design of the street environment.

UNDERTAKE A REVIEW

- ☐ Undertake progressive road safety audits and review of decisions as part of a risk management strategy
- ☐ Seek independent advice to ensure the street environment is well understood and appropriate for the surrounding land use environment.

OBTAIN APPROVALS

- ☐ Identify and seek relevant approvals where required, including those for traffic control devices (Figure C10).
- ☐ Where traffic control devices are proposed, use devices that conform to *Australian Standards*, *Austroads Guides*, and the *Code* to enable approval Council, or seek separate approval from DPTI for non-standard devices.

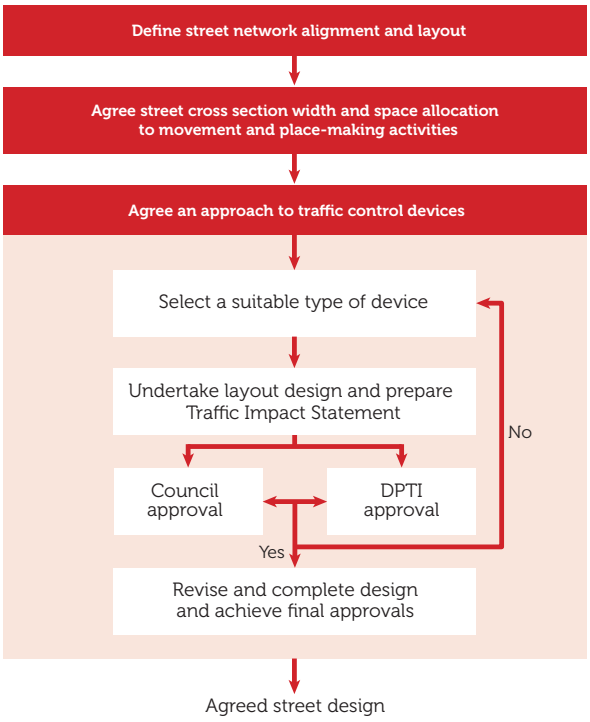


Figure C10. Typical approvals process for street design with traffic control devices

CONTINUOUS MONITORING

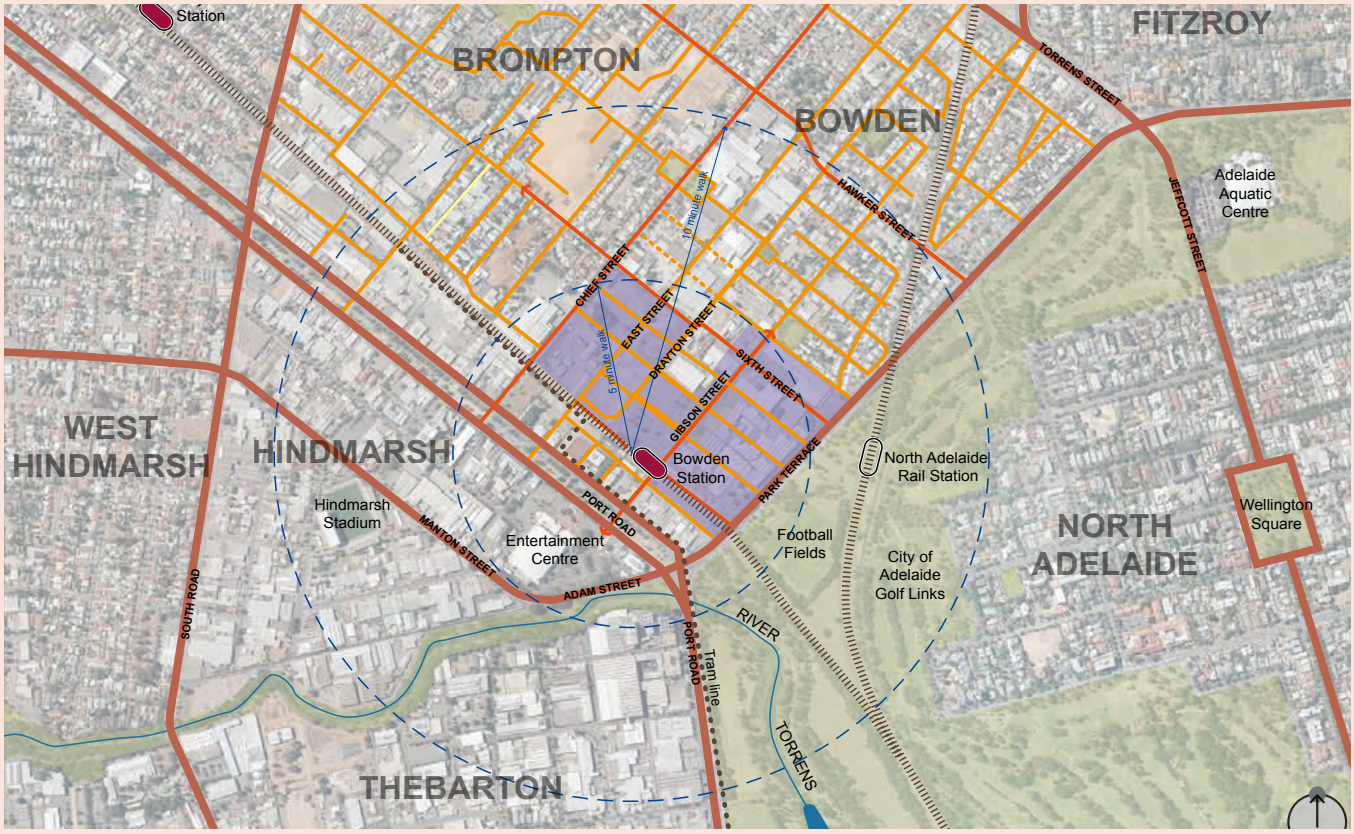
- ☐ Develop an appropriate monitoring program after implementation to record usage, identify potential risks and allow for required modifications.
- ☐ Include in monitoring: collection of appropriate data on use of the street, such as volumes of traffic, pedestrians and cyclists where applicable, and data on user perceptions.

For further information, see section B8.

C9 BOWDEN DEVELOPMENT CASE STUDY

CASE STUDY: BOWDEN DEVELOPMENT, ADELAIDE, SOUTH AUSTRALIA

Sources: Urban Renewal Authority; all street sections and photomontages by TCL and Jensen Planning; background information sourced from LMC and 'Bowden Urban Village: Revised Master Plan Report.[2]



Bowden development – site context (site shown in purple)

The Bowden development is an urban revitalisation project on the north-western edge of the Adelaide Park Lands. The project covers 16 hectares of former industrial and commercial land including the Clipsal and Origin Energy sites.

The development is intended to be a high-quality, mixed-use development delivering sustainable, transit-focused living and working for this new community on the CBD fringe.

At the direction of the Land Management Corporation (now the Urban Renewal Authority), a master plan for this site was developed during 2009–2011. The master plan incorporated retail, commercial and community activities and a series of interconnected public spaces.

Placemaking is at the heart of the Bowden development. It was recognised that the success and desirability of higher density living would be strongly enhanced by the delivery of high quality streets, public spaces and successful integration of land use and transport.

A formal traffic study was commissioned for the masterplan and then a street redesign process was undertaken, using the Compendium as a guiding tool. This involved a series of workshops with key stakeholders and decision makers.

Street design concepts for the Bowden development are explained against the guiding principles recommended in this Compendium.

CASE STUDY: BOWDEN DEVELOPMENT, BOWDEN

The Bowden development will ensure a best practice intergrated street design approach.

Specific achievements of the Bowden development design process are that:

- the site design reflects extensive market research work that established people's lifestyle priorities for neighbourhoods
- open spaces and streets in the Bowden development are considered vital in supporting community fabric
- the master plan and proposed design builds on the history and heritage of the site
- the site is planned around walking and cycling distances, centred on human dimensions for movement and accessibility
- design of streets and squares was represented by 3-dimensional design tools (photomontage work and fly-throughs) that enabled consideration of the human experience.

ENGAGEMENT

At the beginning of the master planning process, a series of community engagement sessions between May and September 2009, attracted approximately 250 people. Community ideas were further discussed in an intensive three-day charrette, with representatives from key community groups.

A Community Reference Group was also formed, which included representatives from local community groups, interest groups, ward councillors and key stakeholders. The Community Reference Group were part of a design review process for the new street designs.

EVIDENCE BASE

Early market research with current stakeholders and potential future residents revealed priorities and key considerations that were used in the design process. Formal traffic studies on Bowden and surrounds fed into the street design process along with more qualitative studies.

VISION–LED

Early stakeholder engagement led to the production of *Bowden Urban Village: Urban Design Guidelines* [4] which established vision and guiding design principles for the street typologies. This vision helped inform the application of the Link and Place matrix and final designs as part of the street design process

INNOVATION

The Bowden development focused on implementing numerous innovative features to achieve one of the first high density urban neighbourhoods in Adelaide. Innovative features include: mix of building heights and densities, low car parking provision, streets that promote walking and cycling shared single surface streets, social interaction areas in street environments, reuse of salvage materials from the site's previous uses and environmental measures including stormwater retention and treatment.

LINKED TO WIDER PLANNING CONSIDERATIONS

Wider precinct planning principles were established for the Bowden development site which fed into the street design process.

CUSTODIANSHIP

The design process included the eventual custodians, the City of Charles Sturt, which helped to get agreement on materials and maintenance.

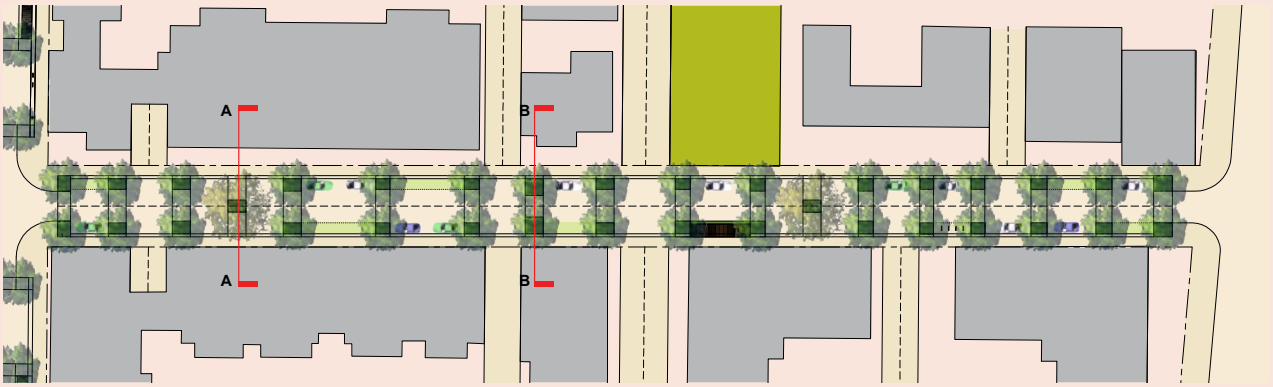
An evaluation of the success of the new street designs is currently under discussion between the Urban Renewal Authority, Department of Planning Transport and Infrastructure and the City of Charles Sturt.

CASE STUDY:
BOWDEN DEVELOPMENT, BOWDEN

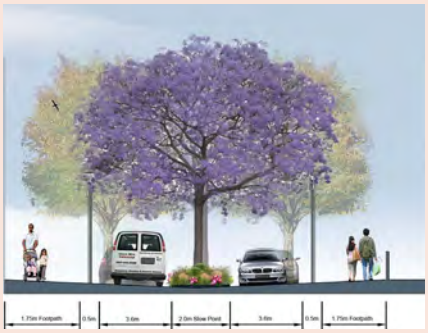
Bowden development street design-application of Compendium principles

At the first workshop, international best practice and lessons from local and national examples were presented and discussed and an overall concept and vision for street design was established by all parties. Best practice review proved an inspiration for new types of streets in Bowden that promote people movement and social interaction. Adoption of a shared street philosophy in Bowden meant that approvals were to be sought both from the Council and DPTI.

Subsequent workshops steered the evolution of design work. A specific workshop focused on accessibility issues had representatives from the Royal Society for the Blind, Guide Dogs SA/NT and the Physical Disability Council, and was able to refine design detailing. For example, on streets of higher order Link and Place, planter boxes were positioned at the four corners of intersections to further protect pedestrians and guide vision impaired or blind people.



Section A



Section B

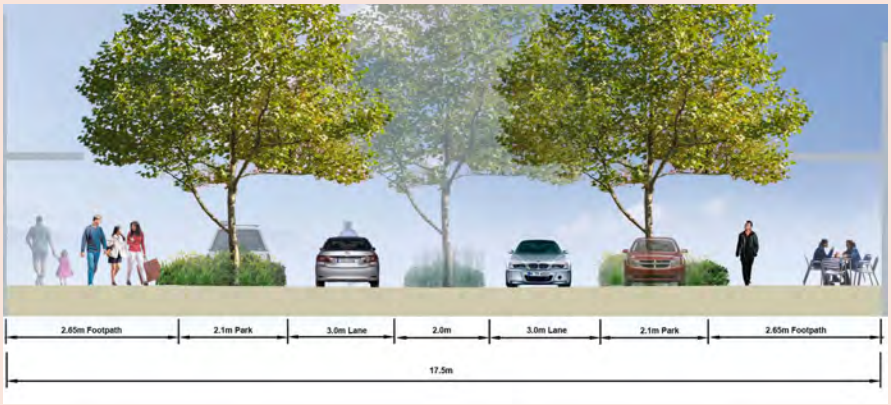
Specific design response to a street typology of V–E:

CASE STUDY: BOWDEN DEVELOPMENT (CONTINUED)

The Bowden development streetscape design was new and innovative for the local Adelaide context. Therefore, City of Charles Sturt and DPTI were involved early in the process to contribute to the design development and to enable necessary approvals.

Section A

Section B



Specific design response to a street typology of IV–C (Bowden development mainstreet):

REFERENCES

1. P Jones, N Boujenko and S Marshall. Link and Place: A Guide to Street Planning and Design. Local Transport Today, London. 2007. www.transportxtra.com/shop/books/?id=19
2. Annad Alcock Urban Design and LFA Pacific. Bowden Urban Village: Revised Master Plan Report. 2011.
3. Creating Places for People: An Urban Design Protocol for Australian Cities. 2011 www.urbandesign.gov.au
4. Hassell. Bowden Urban Village: Urban Design Guidelines. 2010.
5. Government of South Australia. South Australia's Strategic Plan. 2011. saplan.org.au

Image	Source
01, 02	DPTI
03–09, 14, 16, 18–22, 24, 25	Natalya Boujenko (Intermethod)
10	http://www.cityofsydney.nsw.gov.au/aboutsydney/parkingandtransport/cycling/CycleNetwork/CityCentral/WentworthAvenue.asp
11, 12	GTA
13	City of Unley
14	Ian Radbone (Adelaide City Council)
15	HASSELL
23	http://communitygardens.org.au
17	Michael Silvy and Daryl Morgan (City of Mount Gambier)

01

CHAPTER D / CASE STUDIES

D1 SOUTH AUSTRALIAN CASE STUDIES

City of Charles Sturt typical street cross-sections

Source: Draft Transport Study: City of Charles Sturt[1]

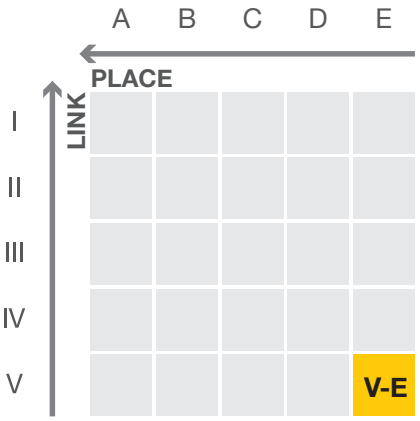
In 2011, the City of Charles Sturt reviewed its approach to street design, to improve liveability of the neighbourhoods, especially those located in the growth corridors. As an outcome of this work, a series of desirable street design cross-sections were developed with reference to the Link and Place street typologies.

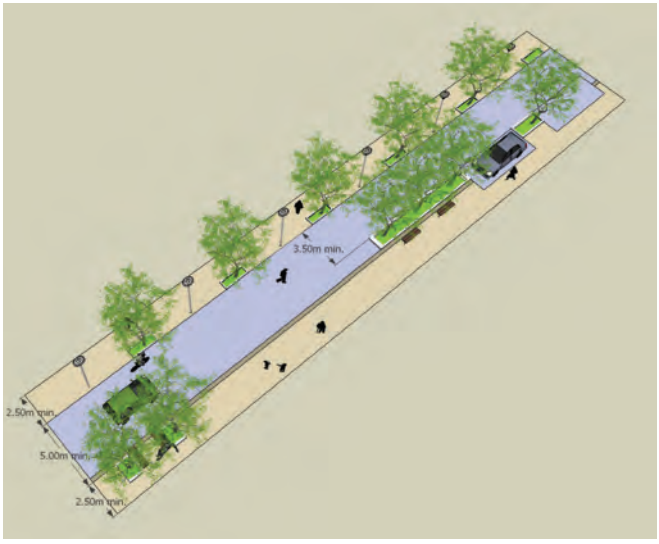
This work recognises that each street is unique and has its own specific local context. Therefore the cross–sections are conceptual ideas only and still need to be considered within specific local circumstances.

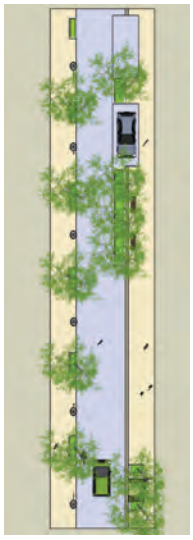
Woodville Road, **Woodville**

V–E Local Link and Local Place

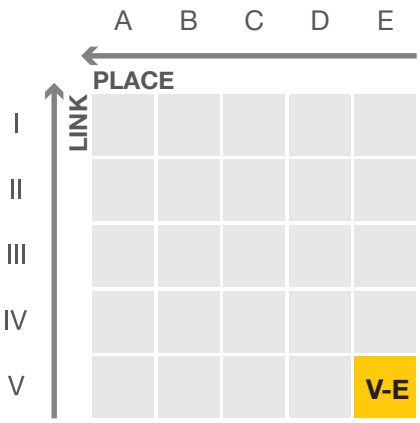
- Primarily access for local adjacent destinations
- Focus should be on safe slow speed environments, pedestrian and cycling priority and accessibility, good informal surveillance and personal security
- As a local Link, street design should prevent throughput of any ‘unnecessary’ traffic, catering for local access only with target design speeds below 30 km/h
- Measures appropriate to create the right speed environment could target carriageway width and alignment, short lines of sight and changes in surface materials (for example, at crossing points)
- V–E street types should promote community interaction and cohesion and should cater for local playing activities for children
- Shared level surface environments would be appropriate



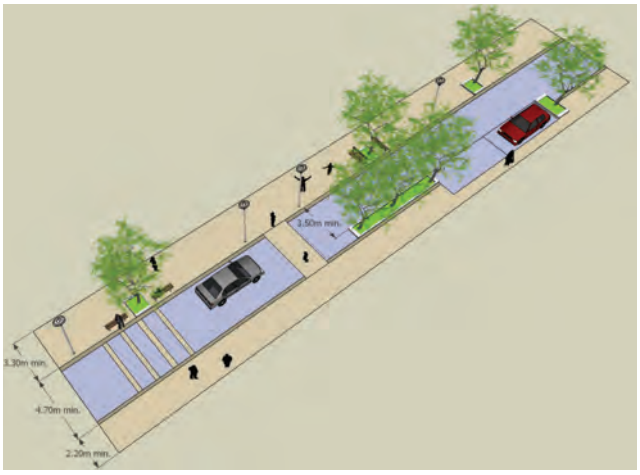




V–E Local Link and Local Place (no through road)

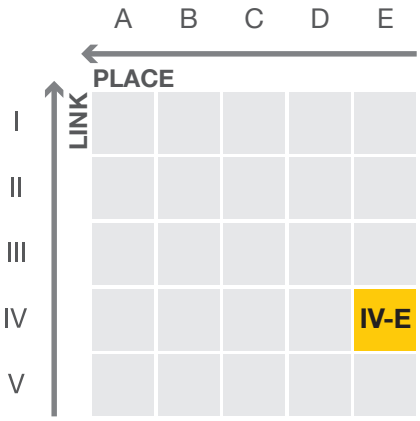


- "No Through Road" or Laneway
- Primarily access for local adjacent destinations
- Focus should be on safe slow speed environments, pedestrian and cycling priority and accessibility, good informal surveillance and personal security
- Staying activities should be promoted and encouraged (for example, through pocket parks, seating areas, space for playing activities, etc)
- Target design speeds should be below 20 km/h
- Measures appropriate to create the right speed environment could target carriageway width and alignment, short lines of sight and changes in surface materials (for example, at crossing points)
- Shared level surface is highly applicable

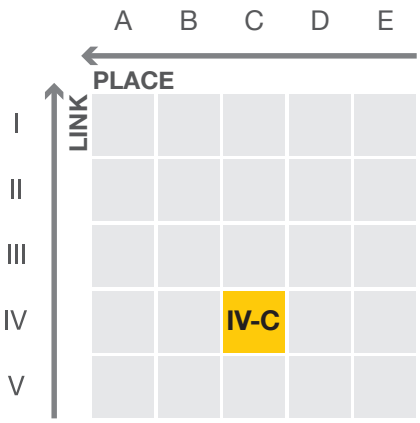


IV–E Neighbourhood Link and Local Place

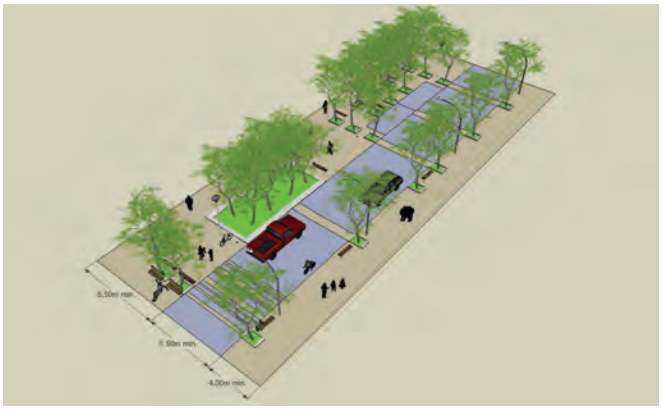
- Neighbourhood collector providing for local accessibility
- Lack of significant destinations and moderate to low traffic volumes
- Focus should be on safe slow speed environments, pedestrian and cycling priority and accessibility
- Promote journeys by walking and cycling
- Target design speeds should be below 30 km/h
- Shared level surface could be appropriate



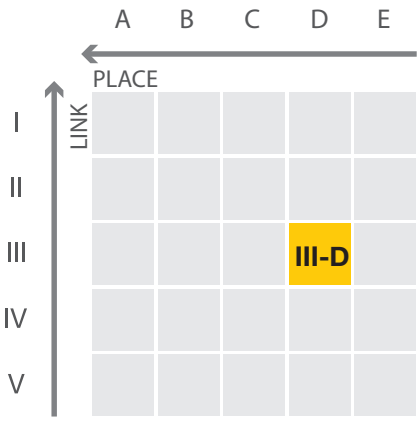
IV–C Neighbourhood Link and District Place



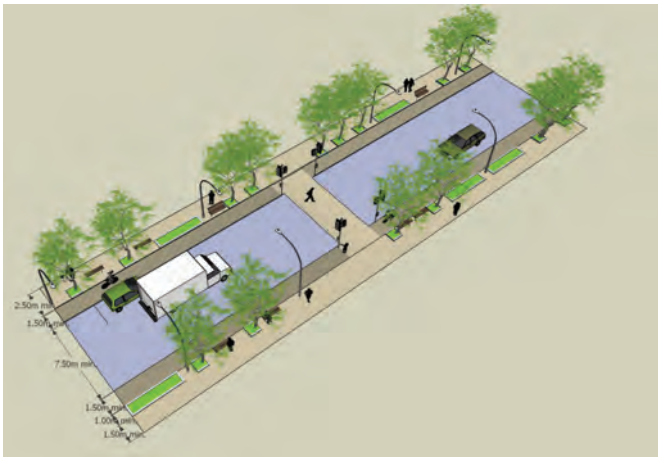
- Neighbourhood collectors that are also ‘main street’ significant destinations
- Focus should be on safe slow speed environment below 30 km/h and pedestrian and cycling priority and accessibility
- Focus should be on supporting operation and development of destinations should be enabled
- Appropriate treatments: tight turning radii at all intersections, incorporating staying activities for adjacent land uses within footways, minimised carriageway width, etc
- Shared level surface environments would be appropriate here

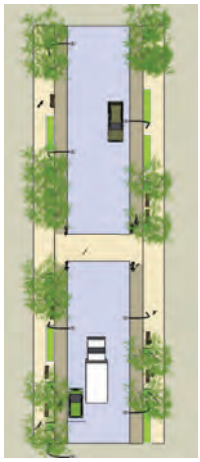


III–D District Link and Neighbourhood Place



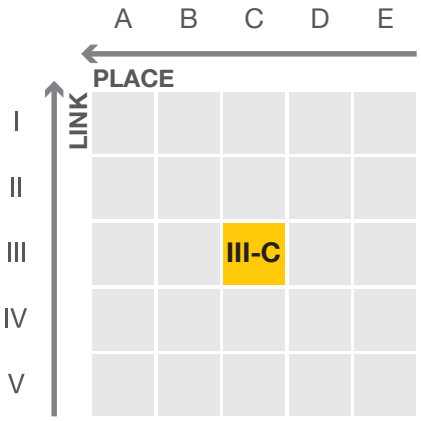
- With Link status higher priority than Place, disruption to commuters should be minimises
- Encourage low speeds below 40 km/h
- Safe crossing opportunities for pedestrians should be provided
- Focus should be on safe slow steady speed environments, pedestrian and cycling priority and accessibility
- Promote journeys by walking and cycling with frequent safe crossings
- Short-term on-street parking
- Separated cycle facilities are appropriate
- Shared level surface streets may not be appropriate
- District collector for movement with district level of activity





III–C District Link and District Place

- Significant destinations
- Focus should be on safe slow speed environments, pedestrian and cycling priority and accessibility
- Promote journeys by walking and cycling
- Short-term on-street parking
- Target design speeds should be below 40km/h
- Segregated cycle facilities are desirable where average speeds are 40 km/h and higher



Link and Place strategic designation, Adelaide city centre

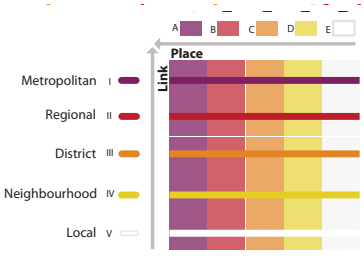
Source: Adelaide City Council

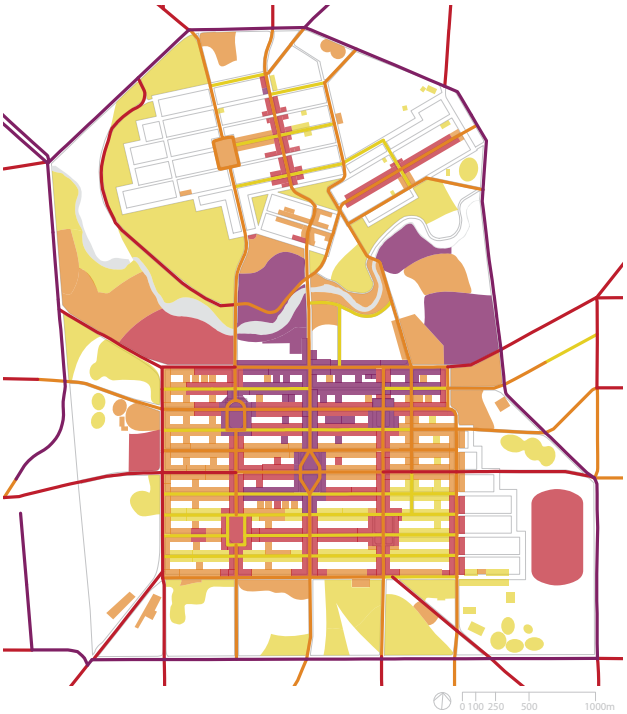
In 2012, Adelaide City Council applied Link and Place street classification to the entire street network in the City square mile and in North Adelaide. Separate assessment and designations were established for:

- existing weekday Link and Place status levels, based on current volumes of people travelling through the streets and on how busy streets (and other public places) were as destinations (Table B1 was used as a guide)
- existing evening Link and Place status levels
- future weekday Link and Place classification for a 30 year horizon
- future evening Link and Place classification for a 30 year horizon

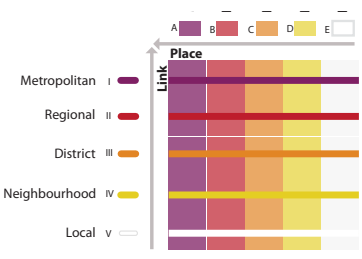
The maps below capture this assessment.

Current daytime Link and Place Classification (DRAFT)





Future daytime Link and Place Classification (DRAFT)

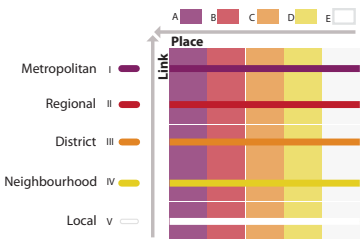


This work is being used to establish an approach and to prepare strategies for future street redesign projects and transport policy for development of the City's street network. Strategic Link and Place designations will:

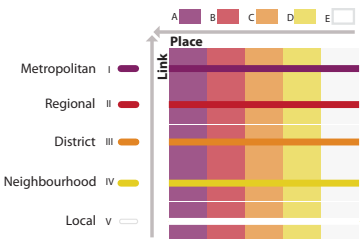
– guide the role of streets in the City
– guide prioritisation of street redesign projects in the City
– steer streets' physical redesign characteristics

Examples of the potential street space reallocations for two City streets of different widths (30m and 20m) illustrate how the strategic Link and Place designation and 'streets for people' principles could steer final outcomes on the ground. Note that redesign examples are hypothetical and represent one of many design possibilities, rather than specific design proposals.

Current evening Link and Place Classification (DRAFT)



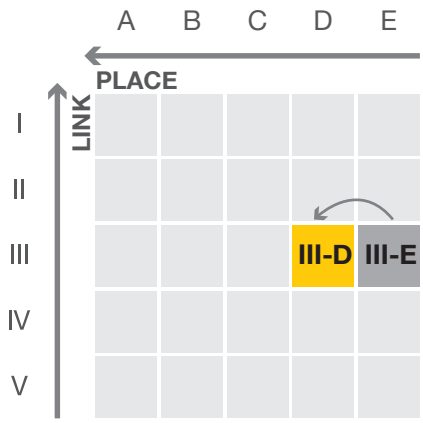
Future evening Link and Place Classification (DRAFT)



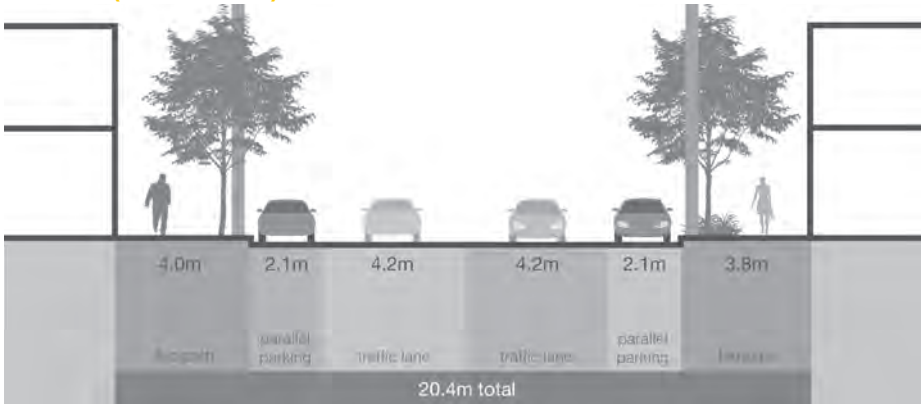
EXAMPLE street space reallocation for a 20m wide street

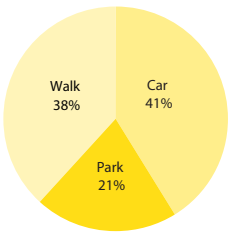
For this 20m wide street, opportunities were identified to:

- create a more flexible shared street environment
- provide greater opportunities and amenities for on-street staying activities
- through design, slow down vehicle speed to enable cyclists to share the road space safely with other drivers
- reduce overall parking provision while still supporting local businesses
- install pedestrian lighting
- encourage continuous eaves and canopies over footpaths
- encourage greater intensity of land uses.

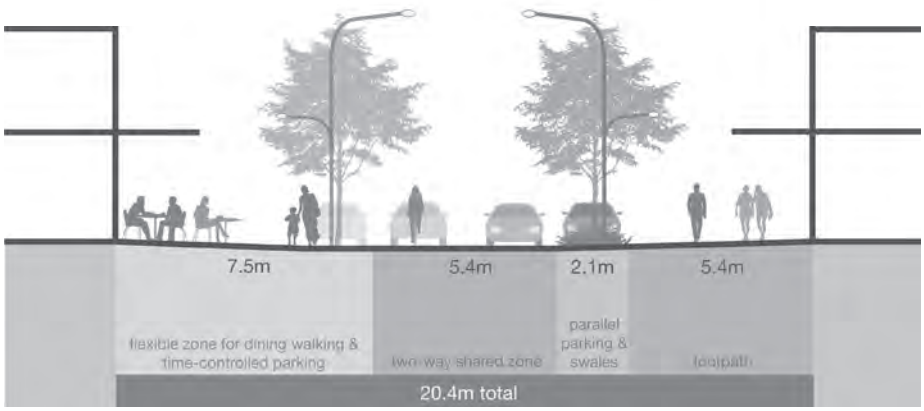


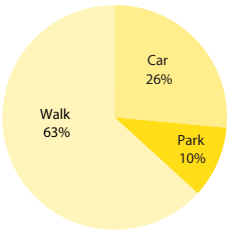
Current (DRAFT MAP)





Possible Change (DRAFT MAP)

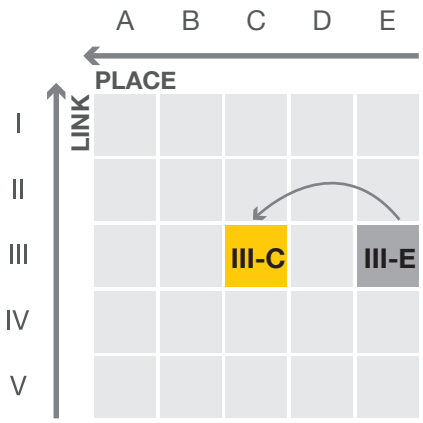




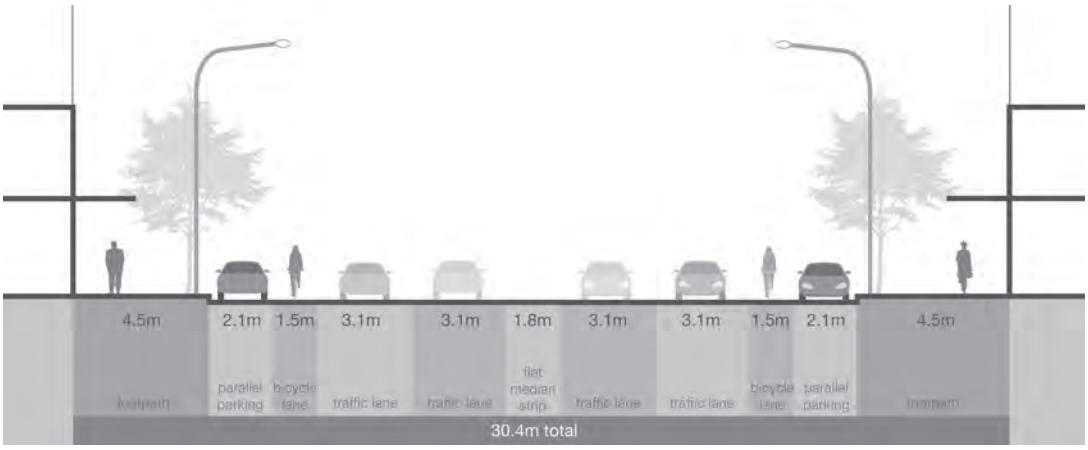
EXAMPLE street space reallocation for a 30m wide street

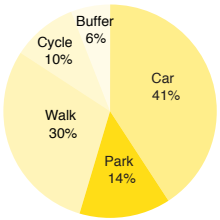
For this 30m wide street, opportunities were identified to:

- reduce traffic lane width to slow traffic and enable improved provisions for pedestrians and cyclists
- increase landscaping and trees
- provide separated bicycle lanes protected from vehicle flow
- position cyclists between footpath and parked cars
- widen the median refuge and introduce landscaping
- install pedestrian lighting
- encourage continuous eaves and canopies over foot-paths
- encourage greater intensity of land uses.

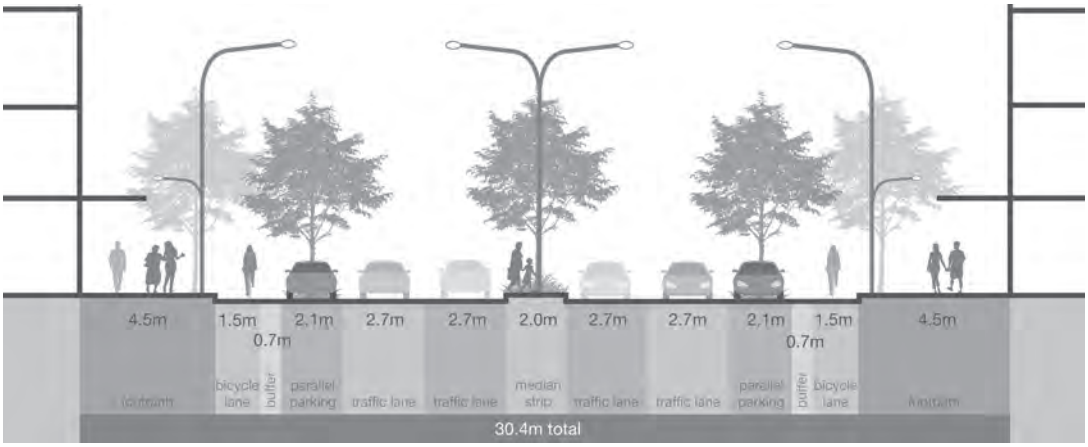


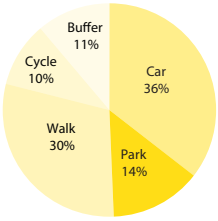
Current (DRAFT MAP)





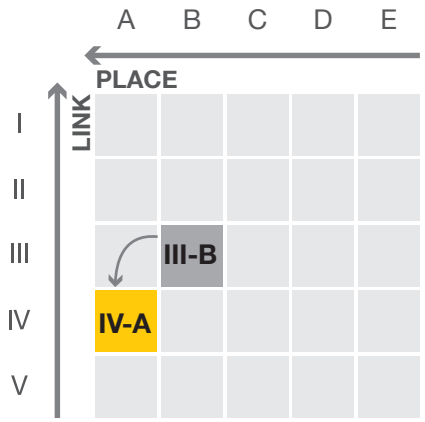
Possible Change (DRAFT MAP)





For streets identified as priority locations for redevelopment, opportunities for "complete" street design approach will allow creation of optimum environments. An artist's impression of possible large scale enhancements for Gouger Street illustrates some of the possibilities, which could include:

- new shared street surfacing with street space shared by all users
- enhanced opportunities for on-street cafe seating, public seating, public art, new tree plantings and widening of space for pedestrian activities
- reduction in car dominance in accordance with the street's Link role (including reduction of car lane width and time-restricted parking and loading).



Artist's impression for redesign possibilities for **Gouger Street**

D2 INTERSTATE CASE STUDIES

Childers Street, Canberra, ACT, Australia

Data source: GHD, Canberra

Childers Street is located in Canberra's City West. Its close proximity to the Australian National University reinforces its importance as a pedestrian route from the university to the city and as a town and growth interface. Before the redevelopment, the street was lined with off-street multistorey car parks and large numbers of on-street vehicles. The redevelopment in 2007 was timed around construction of new medium storey student accommodation along the street.

The Link and Place status of Childers Street changed from IV–E to V–C, reflecting the change of function and role of the street.

STREET FUNCTIONS:

- Little vehicular flow and no buses
- Multiple pedestrian desire line connecting city and the University
- Student accommodation along the street and Canberra School of Art situated at Childers Street's southern end
- Canberra Street Theatre located mid way along street

BEFORE IMPROVEMENT:

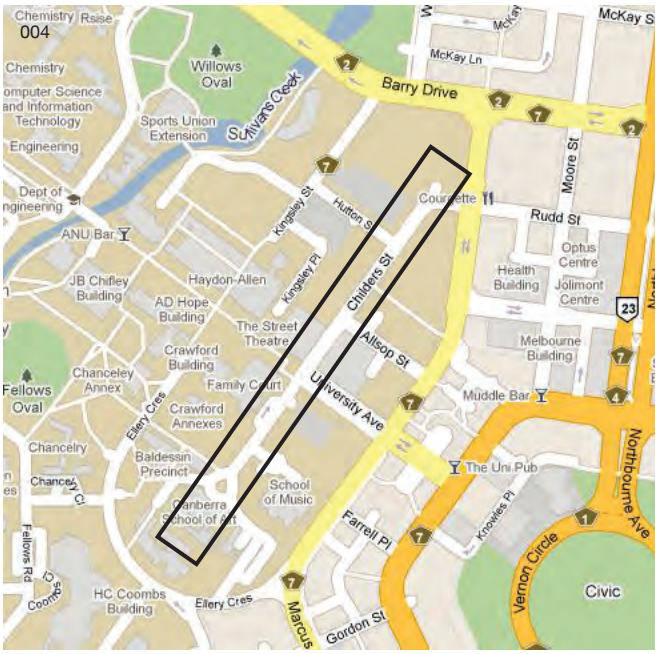
- Poor lighting and CPTED issues
- Poor neglected streetscape
- Traffic 'rat run' carrying c.490 vehicles in the morning peak
- Lack of infrastructure to support student housing
- Inactive street environment
- At grade and multi-storey car parks

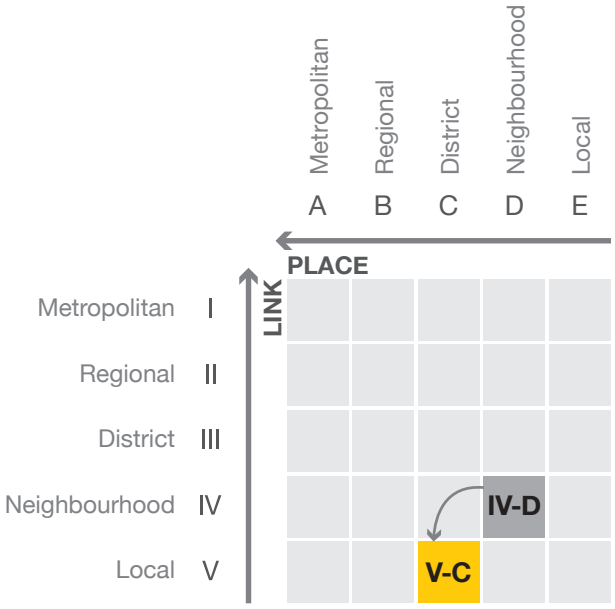
NATURE OF IMPROVEMENT:

- Shared level surface street and installation of a shared zone
- WSUD rain gardens filtering and detaining water runoff
- One-way slow points in a number of locations
- New street furniture and colourful glass street canopies, encouraging staying activities
- Relocation of services into a common service trench and upgrade of water and sewer lines
- Street lighting
- The cost of the works was $5.8 million

IMPACTS OF THE SCHEME:

- Traffic volume reduction in the pm peak to c.120 vehicles per hour
- Reduction in vehicular speeds
- Much increased pedestrian flow and activation
- Street level activation and attraction of new cafe ground floor development and tenancies
- Creation of a town and growth precinct





BEFORE

AFTER

Hargreaves Mall, Bendigo, NSW, Australia

Source: Local Area Access Program

Project ref no.91: Walk Bendigo[2]; Shared Spaces in Bendigo CBD: Principles, Best Practice and Proposals[3]

Hargreaves Mall is the focal point of the Bendigo's city centre. Its shopping areas are complemented by cafes, restaurants, and offices, business and the town hall. Prior to reconstruction, it carried moderate levels of vehicular traffic (under 5,000 vehicles per day), low cyclist flows and moderate to high pedestrian flow.

STREET FUNCTIONS:

- Central city mall with shopping, cafe, bar and restaurant facilities and civic and office uses
- Traffic volumes of c.3,200 vehicles per day (after the scheme)
- Speed limit of 50 km/h (before and after the scheme)

BEFORE IMPROVEMENT:

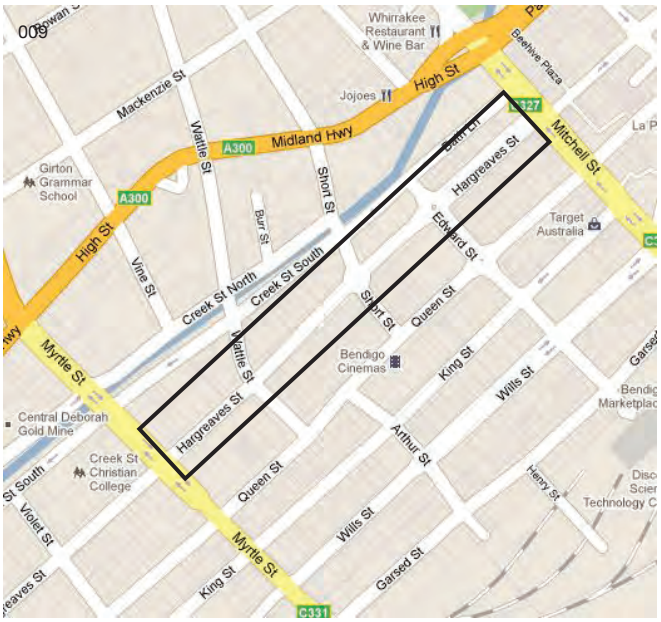
- Poor pedestrian safety
- High speeds and volume of traffic and high priority given to the movement of vehicles
- Poor streetscape amenities
- Low numbers of cyclists
- Street clutter – signs, traffic lights, barriers and other infrastructure

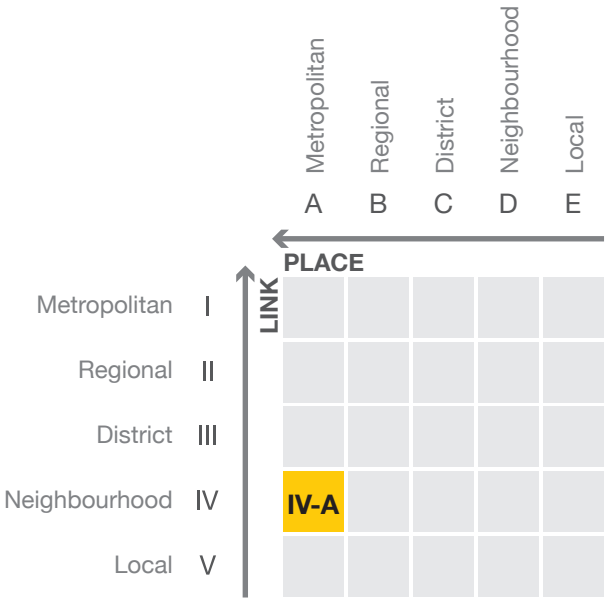
NATURE OF IMPROVEMENT:

- Shared level surface street
- Entry treatments into Mundy Street and Bull Street
- Removal of roundabout, pedestrian barriers and pedestrian crossings
- Removal of signage and non-essential infrastructure
- Widening of footpaths to 11.5 metres
- Installation of undercover secure bicycle storage
- Conversion of parking from 60 degree to 90 degree
- Installation of new street furniture and water feature
- The cost of the works was $2.1 million and the scheme was completed in 2009

IMPACTS OF THE SCHEME:

- Speeds along Hargreaves Street declined from an average of 41 km/h to 28 km/h
- Traffic volumes decreased by approximately 30%
- Changes in pedestrian movements, with more pedestrians crossing streets diagonally and moving freely around the space
- Fluctuations in pedestrian numbers: with increases and declines in some of the areas (which could be attributed to changes in land uses)
- Increased use of the space for formal and informal activities





AFTER

D3 INTERNATIONAL CASE STUDIES

Cowley Road, Oxford, UK

Source: Cowley Road [4]

Cowley Road is an important local shopping centre in Oxford, located on a secondary route into the centre that also incorporates high bus flows.

The Link and Place status for Cowley Road is III–C.

STREET FUNCTIONS:

- Daily traffic volumes of c.10,000 vehicles per day, 3,000 cyclists and 650 buses per day
- 20,000 daily two-way pedestrian flow (measured over 12 hours)
- District shopping centre (a mix of small and medium size retail businesses, restaurants, bars and clubs) and high density housing
- Relatively high accident rates

BEFORE IMPROVEMENT:

- Footpaths relatively narrow and in poor condition
- Limited number of formal pedestrian crossing points
- The carriageway varied between 11.0 metres down to 7.5 metres (mean 9.0 metres)
- Intense pressure on limited parking and loading spaces
- Corridor heavily congested during the day, but with high traffic speeds at night
- The 'place' condition in general was relatively poor

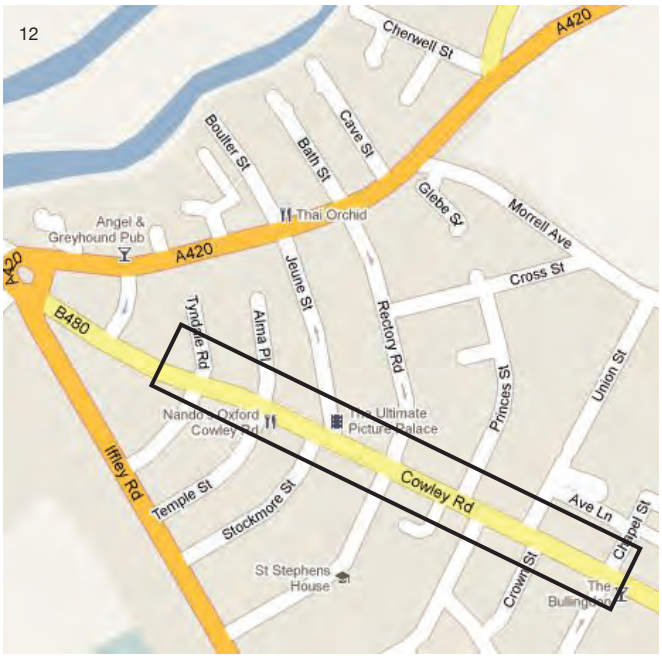
NATURE OF IMPROVEMENT:

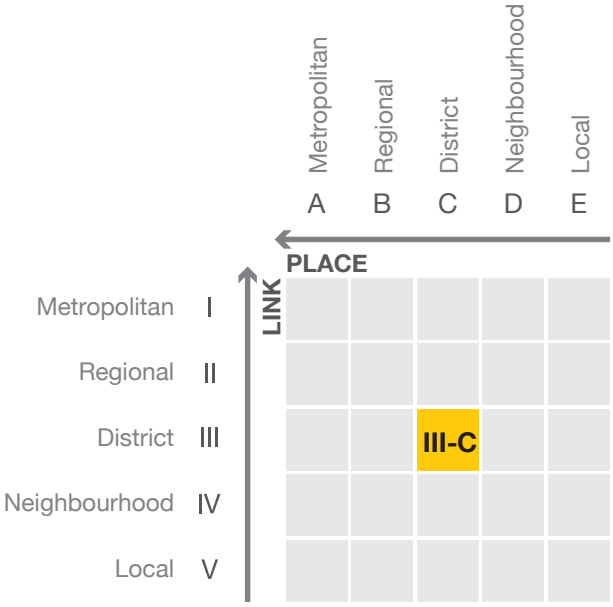
- 1000 metres of highway were modified
- Carriageway at 6.5 metres width with raised tables (no markings) in three places
- 20 mph (32km/h) limit in core 650 metre high street
- Footpaths widened and repaved; additional tree planting, seating and bicycle parking
- Raised kerb build-outs at side road junctions
- Three additional zebra crossings
- The cost of the works was £1.35 million (AUD $2.3m)
- Scheme was completed in 2005

IMPACTS OF THE SCHEME:

- 10% reductions in cars, 24% increase in bicycle flows
- Overall, a 36% fall in accidents (18% fall in pedestrian accidents and 55% fall in cyclists accidents)
- Average speed reduction of 2 mph (3 km/h)

12





AFTER

13

London Road, Southampton, UK

London Road is in the inner suburbs of Southampton; formerly the main road, it now serves a local traffic function due to road re-engineering and part of the area being regenerated.

The Link and Place status for London Road is IV–C.

STREET FUNCTIONS:

- Mainly a local neighbourhood road, but acted as a local distributor for 'rat running' traffic
- Of district-level significance as shopping centre.

BEFORE IMPROVEMENT:

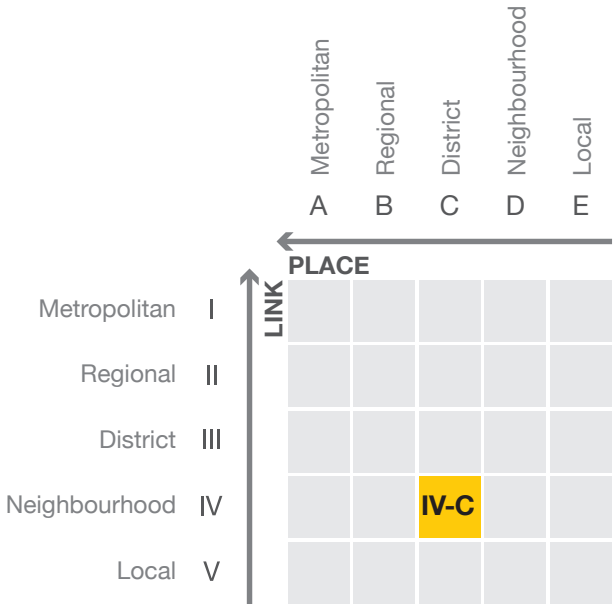
- 6,500 vehicles per day
- 5,500 pedestrians and 400 cyclists on weekdays
- Accident black spot, restricted pedestrian movement
- Transport-dominated environment, poor streetscape

NATURE OF IMPROVEMENT:

- Improvement of 450 metres of highway
- Widen footpaths, reduce kerb heights, narrow carriageway and remove guard railing
- Add a chicane half way along the street, by switching angle parking from one side of the street to the other
- Additional seating and removal of obstructions to walking: 'naked street' concept
- Addition of informal pedestrian crossings
- Improve street lighting, signposting and add quality tree planting
- The cost of the works was £1.3 million (AUD $2.2m)
- Scheme was completed in 2008

IMPACTS OF THE SCHEME:

- Traffic speeds and collisions have reduced
- Reductions in traffic volumes
- The streetscape and crossing improvements are helping to regenerate the area



BEFORE

AFTER

New Road, Brighton, UK

New Road Brighton is a minor street in the town's network but has important building frontages.

The Link and Place status for London Road before redesign was IV–D and as a result of the redesign it became V–B, giving higher significance to the Place function of the street.

STREET FUNCTIONS:

- Mainly an access road, but acted as a local distributor for 'rat running' traffic
- Of city-level significance as a place, due to presence of theatres, library, park area, etc.

BEFORE IMPROVEMENT:

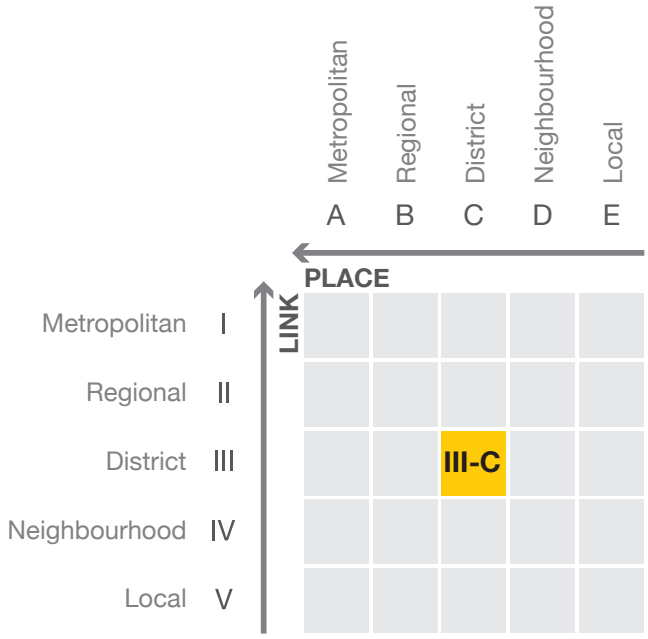
- Fast moving traffic
- Very little pedestrian street activity
- Poor environment that did not match quality of the buildings

NATURE OF IMPROVEMENT:

- Complete replacement of the 150 metres of carriageway, with very high quality flush granite blocks between the frontages, and new lighting
- Designation of 20 mph (32 km/h) zone
- No demarcation between footpath and carriageway
- High quality street furniture, particularly very long benches
- The cost of the works was £1.4 million (AUD $2.4m)
- Scheme was completed in 2008

IMPACTS OF THE SCHEME:

- Numbers of through vehicles have dropped sharply – by 90%
- Speeds are below 13 mph (20 km/h)
- Cycling has increased by 20%
- Pedestrian volumes have increased by 160%, with many people spending longer times and taking part in on street activities
- Now the fourth most popular attraction for tourists visiting the town



BEFORE

AFTER

Newland Avenue, Kingston–upon–Hull, UK

Source: Newland Avenue[5]

Newland Avenue is an important local shopping centre (140 shops), on a secondary radial route into the centre.

The Link and Place status for Newland Avenue is III–C.

STREET FUNCTIONS:

- Daily traffic volumes of c.12,000 vehicles per day and up to 36 buses per hour
- Relatively high accident rates

BEFORE IMPROVEMENT:

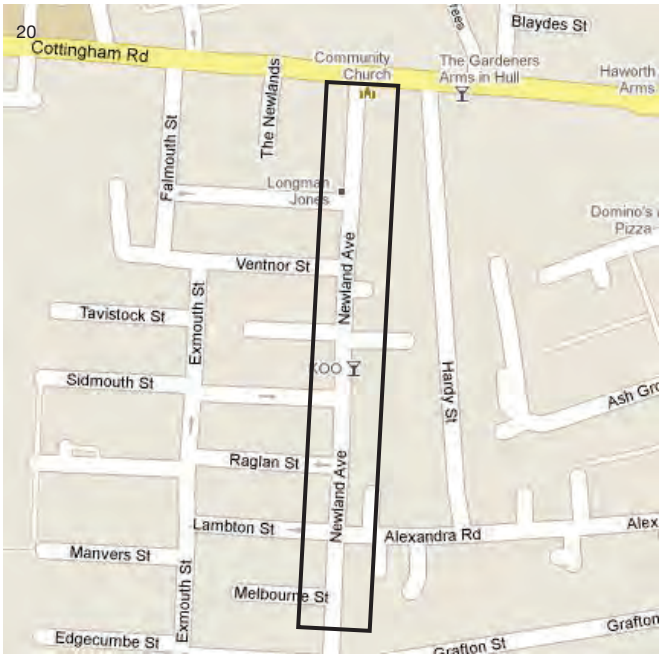
- Footpaths relatively narrow (2.5 metres), in poor condition
- Limited number of formal (signalised) pedestrian crossing points
- Carriageway varied between 12.2 and 6.6 metres (under railway bridge)
- Traffic speeds were relatively high, especially at night
- Street lighting was poor and there were personal security concerns
- The 'place' condition in general was very poor

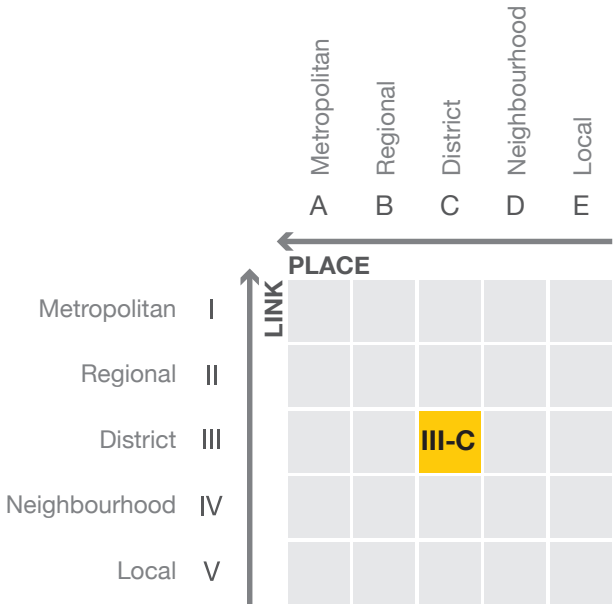
NATURE OF IMPROVEMENT:

- 900 metres of highway reconstructed
- Carriageway standardised at around 6.5 metres width
- Footpaths substantially widened, with tree planting and additional street furniture
- Shared (level) surface provided in core areas, speed tables at side road junctions
- Most signalised pedestrian crossings replaced with zebras, plus more informal
- The cost of the works was £1.75 million (AUD $3m)

IMPACTS OF THE SCHEME:

- 10% reductions in traffic flows; 15% reduction in nitrogen dioxide
- 20% increase in pedestrian footpath flows, and 25% increase at formal crossings
- 24% drop in all injury accidents
- Anecdotal evidence of increases in retail rental values and local house prices





BEFORE

AFTER

Walworth Road, London, UK

Source: Evaluating a streetscape improvement from a pedestrian perspective[6]

The Walworth Road forms part of a radial route into central London from the south, and runs through a major district shopping centre. The Link and Place status of Walworth Road is II–C.

STREET FUNCTIONS:

- Daily traffic volumes of c.20,000 vehicles per day and up to 80 buses per hour
- 12 hour pedestrian footpath flows of 70,000
- Relatively high accident rates

BEFORE IMPROVEMENT:

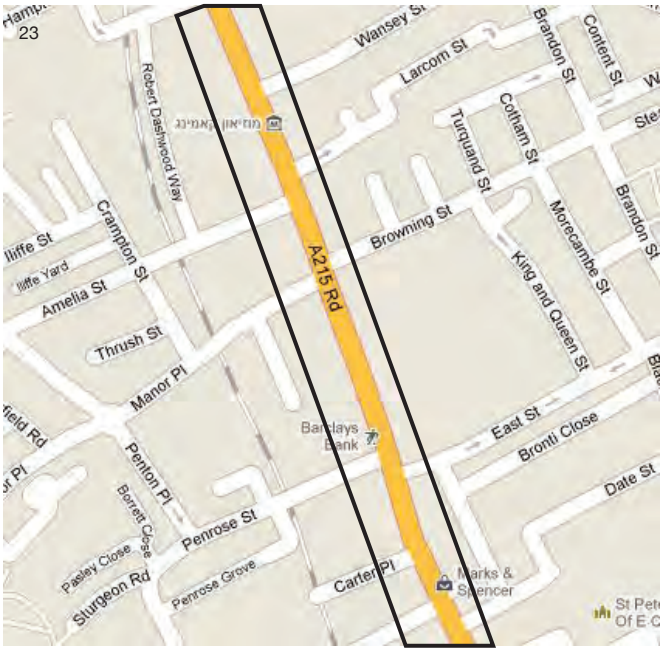
- Footpaths were narrow, uneven and heavily overcrowded
- Road crossing was restricted by guard railing and lack of crossings
- The carriageway was four lanes wide (with bus lanes in each direction)
- The 'place' condition in general was very poor

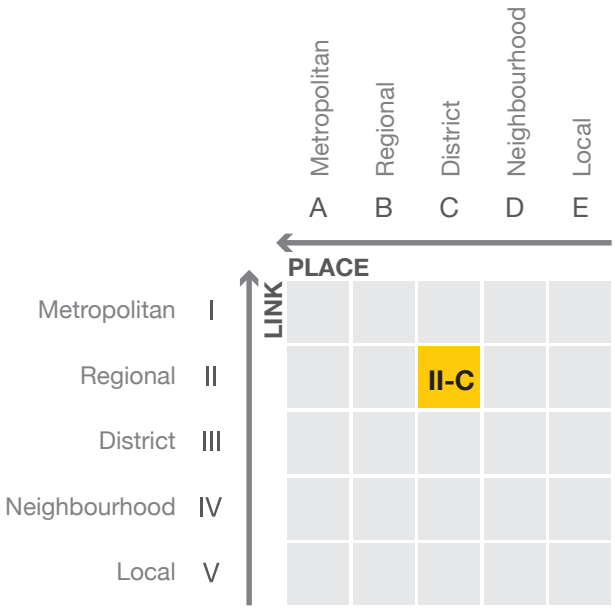
NATURE OF IMPROVEMENT:

- 710 metres of highway completely reconstructed
- Carriageway narrowed to two lanes in core shopping area
- Footpaths substantially widened, with tree planting and additional street furniture
- Speed tables provided at key crossing points, plus side road entry treatments
- Additional pedestrian crossing points provided
- The cost of the works was £4.5 million (AUD $7.65m)

IMPACTS OF THE SCHEME:

- Peak increases in pedestrian flows
- Increased use by unaccompanied children (+111%) and mobility impaired (+165%)
- Mixed impacts on traffic accidents (fewer vehicles, no reduction in pedestrians)
- Increased bus boardings and alightings
- Drop in on-street crime rates





BEFORE

AFTER

Northmoor, Manchester, UK

Northmoor inner city area was in need of regeneration with low value high-density terraced housing arranged on a grid pattern of relatively narrow streets. The aim of the scheme was to reduce traffic speeds, provide areas for street activity, raise the quality of the neighbourhood environment and reduce crime.

Local residential streets that have been redesigned have a status of V–C.

STREET FUNCTIONS:

– The roads are Local in Link status, serving the immediate housing area
– They also have a Local level Place function, with virtually no non-residential uses

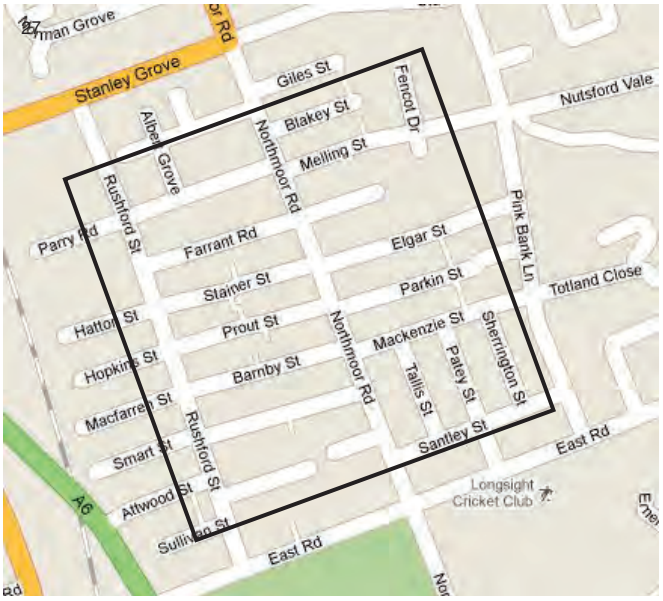
BEFORE IMPROVEMENT:

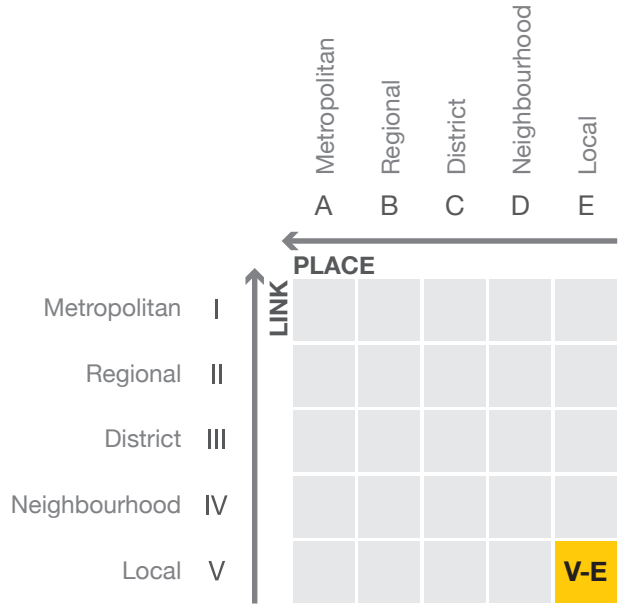
– High traffic speeds
– Unsafe environment for walking and cycling
– Unattractive street environment – a 'rundown' area
– High crime levels
– Nature of improvement:
– Shared level surfaces from one street frontage to the opposite one
– Parallel and angled parking creating a chicane effect
– Art works on pavement at many intersections
– Demolition of houses to create small green spaces
– Upgrade to street lighting
– Tree planting

IMPACTS OF THE SCHEME:

– Reduction of typical mean speeds from 22 to 30 km/h down to 15 km/h
– Sharp increase in community pride and in house prices
– Reduction in street crime and fear of crime
– Reductions in traffic collisions


26





AFTER

Morice Town Home Zone, Plymouth, UK

Morice Town (of around 330 households) is an inner suburb of Plymouth, with a grid layout of streets. The aim of the scheme was to help regenerate the area and reduce traffic volumes and speeds, through a 'shared space' design. The Link and Place status of redesigned streets is IV–D and V–E.

STREET FUNCTIONS:

- Mainly a set of Local roads, with limited Neighbourhood Link function
- Local, residential Place function, with a Neighbourhood primary school

BEFORE IMPROVEMENT:

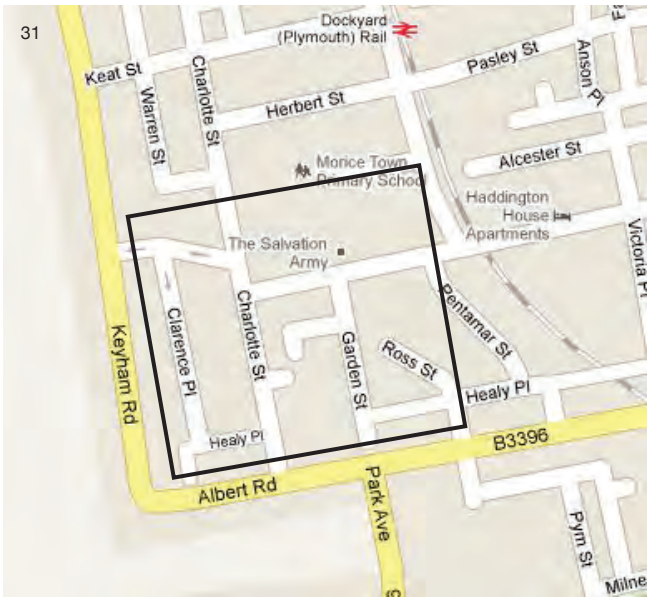
- High volumes of fast moving, rat running traffic
- High level of collisions
- Transport-dominated environment, poor streetscape
- High crime rates

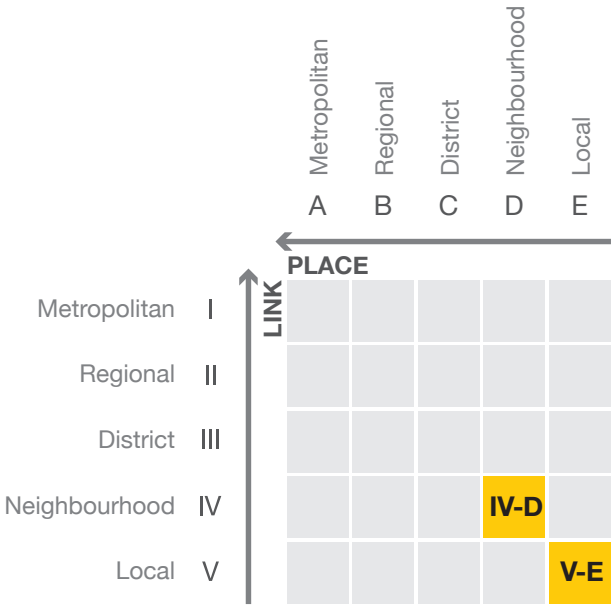
NATURE OF IMPROVEMENT:

- Extensive public engagement
- Reconstruction of street network of 2.3 km within a 9.97 hectare area
- Raising of carriageway to create a level surface over much of the area
- Vertical and horizontal traffic calming
- On–street play facilities
- Planting and other environmental improvements
- The cost of the works was £2.3 million (AUD $3.9m)

IMPACTS OF THE SCHEME:

- Through traffic cut by 40%; overall traffic down from 900 to 653 in 12-hour period
- Average traffic speeds 12.8 mph – a reduction of over 40% from 22.9 mph
- Reduction in crime (violence, theft and damage) reduced by nearly 90% (down from 92 to 9 reported incidents)
- Reductions in traffic collisions
- The streetscape and crossing improvements are helping to regenerate the area
- Property prices have increased by 10–15% above those in the surrounding area


31
Dockyard (Plymouth) Rail
Keat St
Warren St
Charlotte St
Herbert St
Pasley St
Anson Pl
Alcester St
Morice Town Primary School
Haddington House Apartments
The Salvation Army
Victoria Pl
Pentamar St
Keyham Rd
Clarence Pl
Charlotte St
Garden St
Ross St
Healy Pl
Healy Pl
B3396
Albert Rd
Park Ave
Pym St
Milne


Metropolitan
Regional
District
Neighbourhood
Local
A
B
C
D
E
PLACE
LINK
Metropolitan I
Regional II
District III
Neighbourhood IV
Local V
IV-D
V-E

AFTER


32


33


34


35

REFERENCES

1. GTA, URS, Intermethod and WAX. Draft Transport Study:City of Charles Sturt. 2011
2. Department of Transport. Local Area Access Program Project ref no.91: Walk Bendigo. 2010.
3. R Tolley. Shared Spaces in Bendigo CBD: Principles, Best Practice and Proposals. 2007.
4. WSP. Cowley Road. Oxfordshire County Council. 2008.www2.dft.gov.uk/pgr/roadsafety/dpp/mpr/schemereports/oxfordshire.pdf
5. WSP. Newland Avenue. Kingston–upon–Hull City Council. 2008. acocksgreenfocusgroup.org.uk/wp–content/uploads/2010/09/Newland–Avenue–Report.pdf
6. E Blennerhassett. Evaluating a streetscape improvement project from a pedestrian perspective. MSc Dissertation, Imperial College and University College, London. 2010

Image	Source
01, 22, 29, 32	Natalya Boujenko (Intermethod)
02–03	Adelaide City Council
04, 09, 12, 13, 14, 17, 20, 23, 26–35	www.googlemaps.com
05–08	GHD
10–11	Patricia Mendham (City of Marion)
15–16	Southhampton City Council
18–19	Jim Mayor, Brighton and Hove City Council
21–22	Tony Kirby (Local Transport Projects Ltd)
24–25	Erica Blennerhassett

01

CHAPTER E / FURTHER RESOURCES

E1 AUSTRALIAN STANDARDS & GUIDELINES

Guidelines and standards are produced to inform designers of streets of the requirements for consistent, safe and appropriate designs to cater for all road users.

Australian Standards provide information for the specific usage of traffic control devices on the road network. These are generally the first point of information when developing a street design.

Austroads is an association of Australian and New Zealand road transport and traffic authorities that aims to promote improved road transport outcomes. The *Austroads Guides* aim to guide contemporary practice of member organisations in developing safe, economical and efficient road designs.

Local conditions and circumstances may sometimes require unique or innovative approaches to design. However, the approach outlined in the *Guides to Road Design, Traffic Management and Road Safety* should be considered. State and local road authorities may develop and publish supplementary codes, guidelines and manuals to cover specific design situations.

The Department of Planning, Transport and Infrastructure has produced specific codes and technical standards to control the use of traffic control devices, shared zones and 40 km/h speed limits in South Australia.

The guidelines most relevant to street design that apply in South Australia are listed below with an overview of general content. This resource should help designers find relevant documents while working on a design.

Guide to Traffic Management

Austroads, 2008

The *Guide to Traffic Management* provides a comprehensive coverage of traffic management for practitioners in traffic engineering, road design and road safety.

Part 1: Introduction to Traffic Management

Introduces the discipline of traffic management and overviews the structure and content of the *Guide to Traffic Management.* It outlines the breadth of the subject, distribution of content among the various parts of the guide, and the relationship with other guides such as *Road Design, Road Safety and Road Transport Planning*.

Part 2: Traffic Theory

Introduces the characteristics of traffic flow and the theories, models and statistical distributions used to describe many traffic phenomena.

Part 3: Traffic Studies and Analysis

Discusses traffic performance of roads and intersections, including mid-block situations, signalised and unsignalised intersections, roundabouts, and road capacity.

Part 4: Network Management

Reviews broad strategies and objectives for managing road networks to provide effective traffic management, including network management and operational objectives, network performance measures, and network management plans.

Part 5: Road Management

Discusses traffic management issues that apply to a single length of a road, including road space allocation, access management, lane management and application of speed limits.

Part 6: Intersections, Interchanges and Crossings

Focuses on traffic management issues related to intersections, interchanges and crossings, and reviews factors that need to be considered in selection and design of intersections. It considers the needs of all road users including pedestrians, cyclists, motorcyclists, heavy vehicles and public transport.

Part 7: Traffic Management in Activity Centres

Discusses principles for the planning and traffic management of activity centres and associated transport nodes, including commercial and civic precincts, freight transfer centres, and intermodal transport interchanges.

Part 8: Local Area Traffic Management

Takes a systematic approach to traffic management in local areas, with guidance on the application and effectiveness of traffic control measures on an area-wide basis.

Part 9: Traffic Operations

Discusses traffic operational matters relating to traffic management on road networks, including traffic signal systems, congestion management, incident management, management of transport information and operational management of road space.

Part 10: Traffic Control and Communication Devices

Reviews design and use of traffic control and communication devices, including traffic signs, pavement markings and traffic signals.

Part 11: Parking

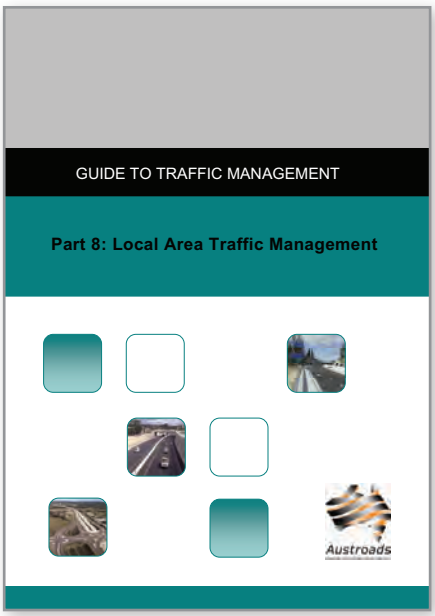
Discusses parking demand and supply and provides a parking policy framework, including implementation of on-street and off-street parking, parking controls in urban centres, parking on rural roads, park-and-ride facilities, and electronic parking guidance systems.

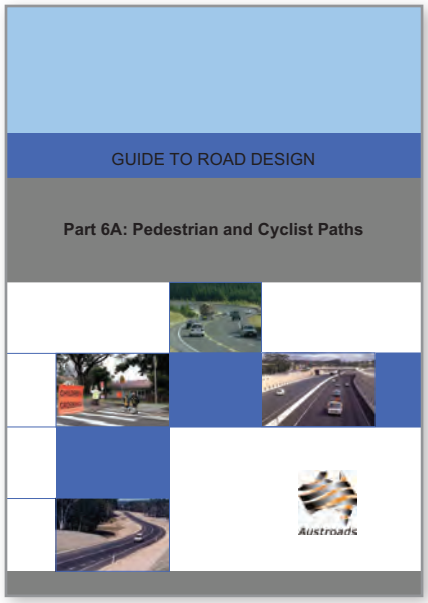
Part 12: Traffic Impacts of Developments

Discusses processes for assessing the traffic and transport impacts of land use developments, including policy and planning considerations, development profiles, traffic impact assessments, and access management.

Part 13: Road Environment Safety

Reviews approaches to ensuring a safe road environment in a traffic management context, including road user behaviour, and the role of road design and traffic management in providing road and roadside safety.





Guide to Road Design

Austroads, 2008

The *Guide to Road Design* provides guidance on safe, economical and efficient design across the range of road categories, from major roads to local roads.

Part 1: Introduction to Road Design

Introduces the *Guide to Road Design*, defines its status, purpose and areas of application and describes the functions and content of each of its parts. The context of the road design process in each method of delivery of road projects is discussed, as are road design philosophy and principles.

Part 2: Design Considerations

Discusses key aspects of design:

- objectives of a road design project including appropriate recognition of transport demands, safe and efficient traffic operations and provides for all road users
- context sensitive design, the associated concepts of design domain and functional classification of roads and the vehicular, human and road factors influencing design
- the broad range of considerations affecting road design.

Part 3: Geometric Design

Provides guidance on appropriate cross-section standards. It enables designers to develop safe and coordinated road alignments which cater for the traffic demand at the chosen speed.

Part 4: Intersections and Crossings – General

Covers intersection design topics such as road design considerations, design process, choice of design vehicle, provision for public transport and property access. It also provides guidance on design of pedestrian and cyclist crossing treatments.

Part 4A: Unsignalised and Signalised Intersections

Outlines design topics of at-grade intersections such as the layout design process, sight distance, the types and selection of intersections, auxiliary lanes, traffic islands and medians, right-turn and left-turn treatments and signalised intersections.

Part 4B: Roundabouts

Provides guidance on roundabout design, including pedestrian and cyclist treatments, pavement markings, signs and landscaping.

Part 4C: Interchanges

Covers geometric design of interchanges on freeways/motorways and arterial roads including alignment and cross-section of the freeway in the vicinity of the interchange, the intersecting road and the ramps, merge and diverge ramp terminals at the freeway, and ramp terminals at the intersecting road.

Part 5: Drainage Design

Provides guidance on good road drainage design process and practice and on the need to control pollution and erosion from road use, road construction and road maintenance activities. Treatments designed to prevent pollutants from entering natural watercourses and water flows from causing damage are described.

Part 6: Roadside Design, Safety and Barriers

Provides guidance on roadside safety (e.g. hazard identification, mitigation and treatment) and the use and design of safety barriers.

Part 6A: Pedestrian and Cyclist Paths

Covers geometric design of pedestrian and cycling paths and associated facilities such as types of path and their location within the road reservation, alignment, geometric requirements, and design of treatments such as path intersections and terminals.

Part 6B: Roadside Environment

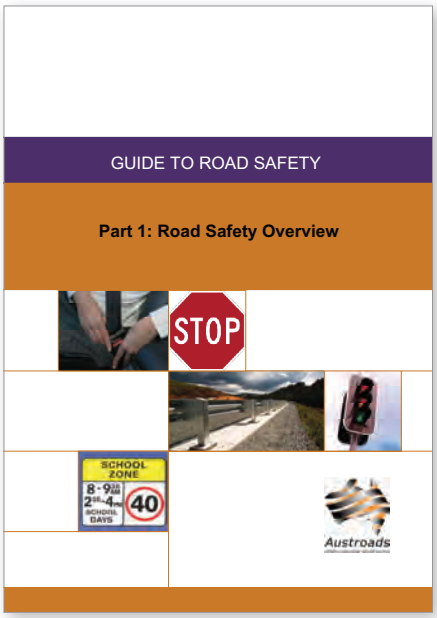
Focuses on the design of roadsides to preserve and/or enhance environmental values and roadside amenity. It discusses design of roadside facilities to manage water quality, control noise, manage fauna movement across roads and basic landscaping information.

Part 7: Geotechnical Investigation and Design

Describes the importance of geotechnical investigations and how road design outcomes and other design activities are influenced by site conditions, associated ground response, geological hazards and locally available materials.

Part 8: Process and Documentation

Describes requirements for quality of documentation and presentation. It describes key factors which might influence design choices for road projects and provides a checklist for design considerations, summarising the type and nature of information, why it is needed, likely sources and references for further guidance.



Guide to Road Safety

Austroads, 2008

The *Guide to Road Safety* provides comprehensive coverage of road safety issues for practitioners involved in traffic engineering, road design and road safety.

Part 1: Road Safety Overview

Discusses road crash costs and road authorities' duty of care to provide safe travel, different approaches to measuring road safety, the Safe System approach as a conceptual framework for road safety management and the merits of an evidence-based approach to countermeasures.

Part 2: Road Safety Strategy and Evaluation

Provides an overview of road safety planning and essential processes. It discusses an evidence-based approach to road safety, strategic partnerships, setting realistic goals, safer roads, vehicles and road users, monitoring and review, and outlines the process of strategy development.

Part 3: Speed Limits and Speed Management

Discusses appropriate speed limits to improve road safety, while maintaining the efficiency of the road network. Speed limits need to reflect the varying types of road users, the road environment, types of vehicles driven and the safety, amenity and economic needs of the community.

Part 4: Local Government and Community Road Safety

Covers strategic partnerships and capacity building, developing a road safety strategy, funding a plan and mobilising resources, implementation, recent case studies of road safety strategies and individual activities, and monitoring, evaluation and review.

Part 5: Road Safety for Rural and Remote Areas

Quantifies the road safety problem on rural and remote roads in Australia and New Zealand, identifies the people most at risk of being involved, factors that contribute to these crashes, possible countermeasures and monitoring and evaluation options.

Part 6: Road Safety Audit

Details the road safety audit process and discusses legal liability, costs and benefits, safety principles and technical issues which need to be considered in road safety engineering. Includes updated checklists for use in assessing road designs and inspecting sites at different stages of a project.

Part 7: Road Network Crash Risk Assessment and Management

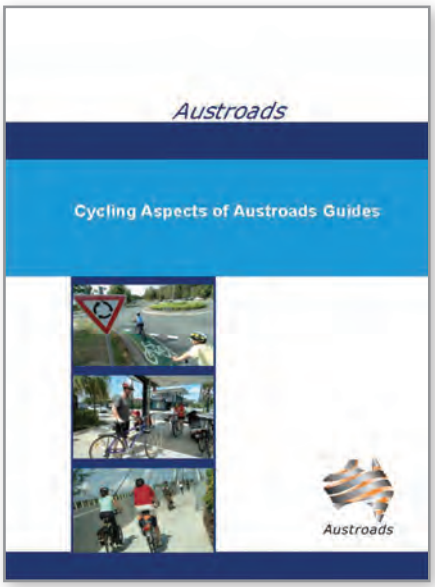
Covers communication and consultation, identifying risks, analysing, evaluating and treating risks, monitoring and review. Examples of risk include road trauma, legal risk, and risk from adverse public opinion. Case studies help in assessment and management of risks.

Part 8: Treatment of Crash Locations

Explains how to identify crash locations, diagnose the crash problem and its causes, select a countermeasure which targets the problem, design a safe remedial treatment and establish its cost effectiveness. It also provides information on sources of road crash data and how engineering improvements fit into a road safety strategy.

Part 9: Roadside Hazard Management

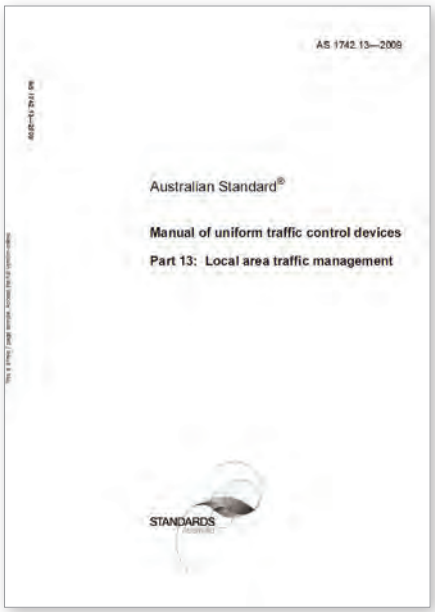
Provides guidance in reducing the incidence and severity of run-off-road crashes. Discusses the need to provide a road environment that minimises potential for loss of vehicle control. Also discusses safety barriers and the need to provide a roadside free of hazards or one which is forgiving, and to take a strategic approach to treating and managing roadside hazards.



Cycling Aspects of Austroads Guides

Austroads, 2011

This report contains information that relates to the planning, design and traffic management of cycling facilities and is sourced from Austroads Guides, primarily the Guide to Road Design, the Guide to Traffic Management and the Guide to Road Safety. The guide has been produced to ensure that information is readily available for practitioners who have a specific interest in cycling issues and facilities.



Australian Standards

Australian Standards are available from SAI Global. They are produced to ensure consistent and appropriate application of traffic control devices across Australia, although each state has local variations on requirements for some traffic control devices.

(infostore.saiglobal.com).

AS 1742 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES

Provides the standard requirements for traffic management on the road network, and is the base resource regarding the use of signs and traffic control devices.

Part 1: 2003 General Introduction And Index Of Signs

Part 2: 2009 Traffic Control Devices For General Use

Part 3: 2009 Traffic Control Devices For Works On Roads

Part 4: 2008 Speed Controls

Part 5: 1997 Street Name And Community Facility Name Signs

Part 6: 2004 Tourist And Service Signs

Part 7: 2007 Railways Crossings

Part 9: 2000 Bicycle Facilities

Part 10: 2009 Pedestrian Control Protection

Part 11: 1999 Parking Controls

Part 12: 2000 Bus, Transit, Tram And Truck Lanes

Part 13: 2009 Local Area Traffic Management

Part 14: 1996 Traffic Signals

Part 15 2007 Direction Signs, Information Signs And Route Numbering

AS/NZS 2890 PARKING FACILITIES

The Parking Facilities standard defines the requirements for parking in the street environment.

Part 3: 1993 Bicycle parking facilities

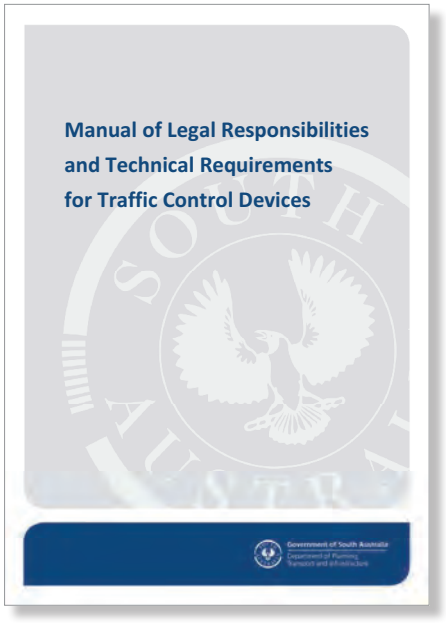
Part 5: 1993 On-street parking

Part 6: 2009 Off-street parking for people with disabilities

AS 1428 DESIGN FOR ACCESS AND MOBILITY

The AS 1428 provides design requirements for buildings encompassing the specific needs of people with disabilities.

Part 1: 2009 Design for access and mobility – Means to assist the orientation of people with vision impairment – Tactile ground surface indicators



Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices

DEPARTMENT OF PLANNING, TRANSPORT AND INFRASTRUCTURE, 2012

The Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices (The Manual) consists of:

Part 1: Legal Responsibilities (the Notices)

The Notices contains which grant approvals and delegate the Minister's powers to road authorities for the use of traffic control devices. These Notices specify the conditions of approval or authorisation, the devices excluded from general approval and devices with additional conditions of use.

Part 2: Code of Technical Requirements (the Code).

The Code, sets out the technical requirements for the use of traffic control devices in South Australia. It must be read together with, but takes precedence over all Australian Standards and other reference documents (including Austroads).

It details the exceptions and additions to the *Australian Standards* and *Austroads Guides*, including:

- Selected values when a range is specified in Australian Standards
- Signs and devices which cannot be used in South Australia
- Signs and devices not covered in Australian Standards

The Notices require Councils to conform to the Code as a condition of approval for the use of traffic control devices. The Code invokes the various traffic related standards and guides in South Australia. The reader must first refer to the standards and guides and shall comply with the variations stated in the Code.

Specific areas of the Code which reference bicycles and pedestrians include:

PEDESTRIAN RELATED HAZARDS

Specifies the need to ensure that the installation of a traffic control devices does not pose a hazard to pedestrians.

ACCESSIBLE FACILITIES

Incorporate the provision of accessible facilities for people with mobility or vision impairment in the installation of traffic control devices.

SIGN FLUORESCENCE

Specifies the use of fluorescent yellow green retro–reflective material for pedestrian warning signs and associated supplementary plates.

PAVEMENT MARKINGS NOT TO BE USED

The pedestrian crossing markings contained in AS/NZS 2890.1 Parking facilities Part 1: Off–street car parking (2004) shall not be used.

SCHOOL ZONES

Describes design requirements for school zones. Speed limit for school zones is 25km/h when children present, compared to Australian Standard of 40km/h.

PEDESTRIAN CROSSINGS

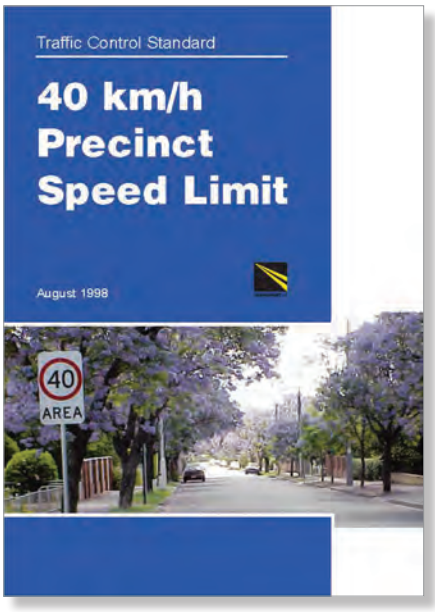
Specifies the requirements for pedestrian crossing facilities including mid-block pedestrian actuated traffic signals, pedestrian push-buttons, wombat crossings, children's crossings (emu and koala), and off-street zebra crossings. Guidelines are also included to assist in assessing the demand for pedestrian facilities.

PEDESTRIAN SURVEYS

Outlines the process for conducting pedestrian surveys to assist in determining the location and type of crossing facility.

LATM DEVICES

Requires LATM devices to accommodate the needs of pedestrians and cyclists, with cyclist bypasses provided where appropriate. Pedestrian and cyclist considerations are identified in addition to the requirements of AS 1742.13 MUTCD Part 13: Local area traffic management and Austroads Guide to Traffic Management Part 8: Local area traffic management. Minimum length requirements are specified for contrasting pavements or raised pavements to avoid pedestrians perceiving them as a type of pedestrian crossing. Also identifies pedestrian access considerations for raised pavements and road humps in off-street areas.



Traffic Control Standard: 40 km/h Precinct Speed Limit

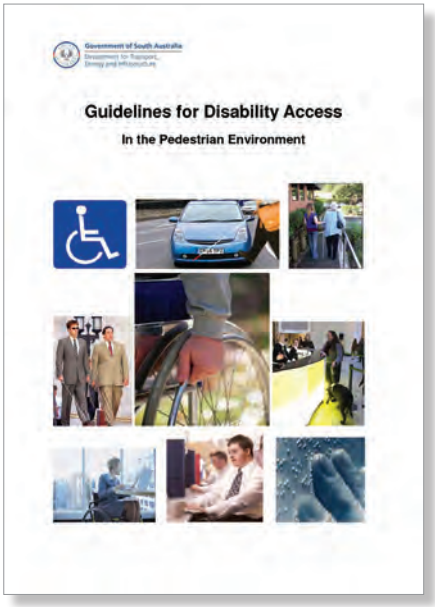
Department for Transport, Energy and Infrastructure, 1998
(now known as Department of Planning, Transport and Infrastructure, DPTI)

Implementation of a 40 km/h speed limit precinct requires approval by DPTI. Approval is based upon an area meeting the criteria for mean speeds of traffic on selected roads in an area, as well as demonstrating community support for the lower speed limit.

Design Guidelines for Shared Zones in South Australia

Department for Transport, Energy and Infrastructure, 2010
(now known as Department of Planning, Transport and Infrastructure, DPTI)

These guidelines specify the general design requirements for shared zones, particularly in residential areas. Copies of these guidelines are available from DPTI on request. Submissions for approval of shared zones in South Australia should follow these guidelines.



Guidelines for disability access in the pedestrian environment

Department for Transport, Energy and Infrastructure, 2009
(now known as Department of Planning, Transport and Infrastructure, DPTI)

These guidelines provide information on how to accommodate those with various disabilities, when constructing road and transport related infrastructure. The guidelines provide an overview of disability types and establish design principles to guide the planning, design and construction of infrastructure to enable those with disabilities to negotiate the pedestrian and public transport environment with ease and safety. The document is also a single resource to enable readers to understand the many aspects of the disability framework.

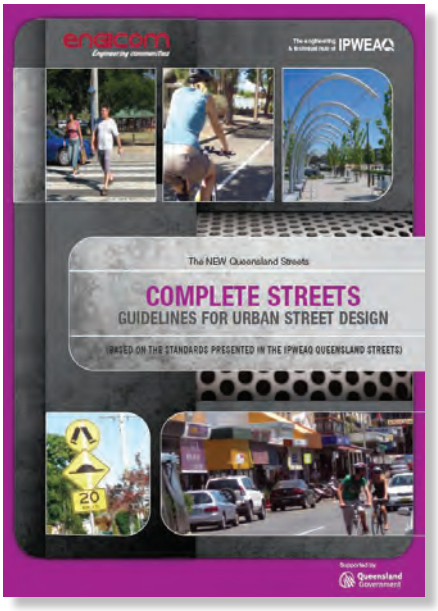
E2 FURTHER PUBLISHED RESOURCES

These documents, currently in use nationally and internationally, are useful for further street design information. Most do not apply specifically in South Australia but practitioners can always draw on useful insights and design experience from colleagues elsewhere. Some of the texts included in this section (e.g. *Cities for People, Link and Place: A Guide for Street Planning and Design, Public Place Urban Spaces and Great Streets*) have been written with international audience in mind.

National guidance

COMPLETE STREETS: GUIDELINES FOR URBAN STREET DESIGN

Author:	Parson Brinckerhoff
Year:	2010
Publisher	Institute of Public Works Engineering Australia Queensland Division Inc (IPWEAQ)
Location:	Brisbane, Queensland, Australia
Length:	155 pages
URL:	www.engicom.com.au/products/complete–streets/
Key focus:	Street design guide (for Queensland) for 'streets' with 'roads' that provide transport function excluded



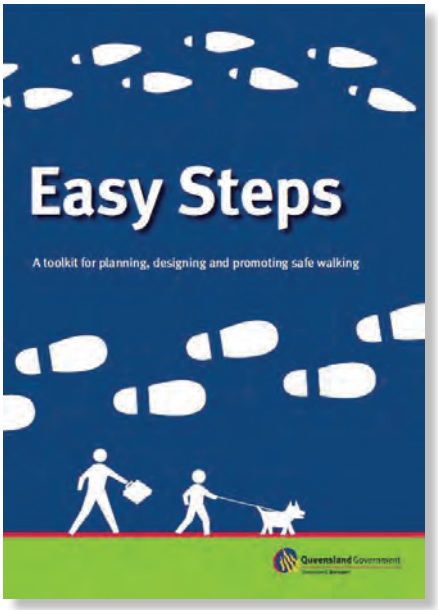
Complete Streets presents a street design approach for the state of Queensland and covers streets that are destinations (excluding roads that 'provide a transport function'). The advice is based on the following user hierarchy: pedestrians, cyclists, public transport users and motorists. The guide provides basic design dimensions for key street design features and design principles of facilities for all modes of transport.

SAFER DESIGN GUIDELINES FOR VICTORIA

Author:	Department of Sustainability and Environment and Crime Prevention Victoria
Year:	2005
Publisher	The State of Victoria Department of Sustainability and Environment
Location:	Melbourne, Victoria, Australia
Length:	65 pages
URL:	www.dpcd.vic.gov.au/_data/assets/pdf_file/0011/41231/Safer_Design_Guidelines.pdf
Key focus:	Safety considerations in planning schemes.

These Victorian guidelines consider safety for urban structure, activity centres, building design, parks and open spaces, walking and cycling paths, public transport, car park areas, public facilities, lighting and signage. The guidelines were developed to assist planners and designers in creating safer urban environments.

EASY STEPS: A TOOLKIT FOR PLANNING, DESIGNING AND PROMOTING SAFE WALKING

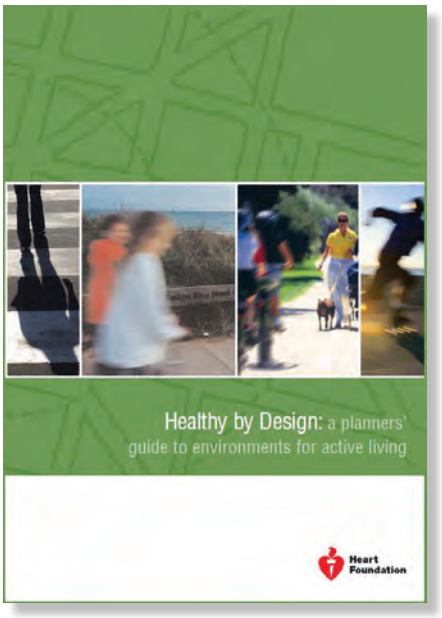


Author:	Queensland Government, Queensland Transport
Year:	2005
Publisher	The State of Queensland (Queensland Transport)
Location:	Brisbane, Queensland, Australia
Length:	160 pages
URL:	www.tmr.qld.gov.au/Travel–and–transport/Pedestrians–and–walking/Easy–Steps.aspx
Key focus:	A resource toolkit for developing walking schemes and improving walking environments.

Easy Steps is a detailed resource of walking strategies, approaches for developing and implementing walking priority schemes, design principles for walking environment and wider consideration of walking benefits. This Queensland document is designed to assist practitioners in increasing walking levels in their local areas.

HEALTHY BY DESIGN: A PLANNERS GUIDE TO ENVIRONMENTS FOR ACTIVE LIVING

Author:	National Heart Foundation of Australia
Year:	2004
Publisher	National Heart Foundation of Australia
Location:	Victoria, Australia
Length:	38 pages
URL:	www.heartfoundation.org.au/SiteCollectionDocuments/Healthy–by–Design.pdf
Key focus:	Planning principles and considerations for design of healthy communities.



This resource guide provides design considerations for national Australian audience for walking and cycling routes, streets, local destinations, open space, public transport, seating, signage, lighting, fencing and walls. It also advocates a design process that fosters a community spirit.

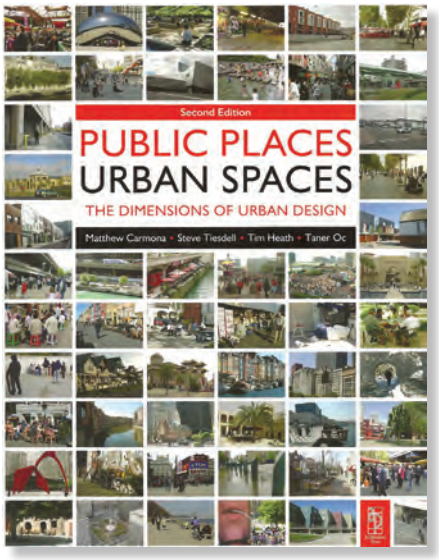
International guidance

SHARED SPACE: LOCAL TRANSPORT NOTE 1/11

Author:	Department for Transport
Year:	2011
Publisher	The Stationery Office
Location:	Norwich, UK
Length:	55 pages
ISBN:	978–0–11553–209–2
Key focus:	A design guidance for shared streets

This UK Local Transport Note provides an overview of the shared space street environments, user needs and behaviour. It advises on traffic volumes and speeds under which shared street designs are appropriate and summarises some of the background evidence and rationale. The publication puts forward advice related to the design process and design treatments associated with shared streets.

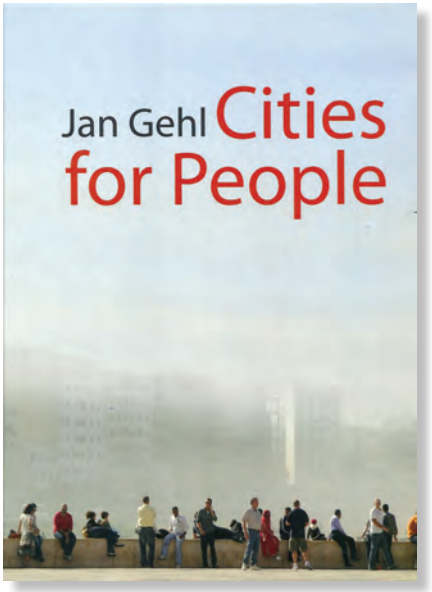
PUBLIC PLACES URBAN SPACES: THE DIMENSIONS OF URBAN DESIGN



Author:	Matthew Carmona, Steve Tiesdell, Tim Heath and Taner Oc
Year:	2010 (Second edition)
Publisher	Elsevier
Location:	Oxford, UK
Length:	393 pages
ISBN:	978–1–85617–827–3
Key focus:	A comprehensive resource of urban design considerations with many references to streets.

Public Places Urban Spaces addresses a breadth of urban design considerations, drawing on many known worldwide techniques and urban design processes. It deals with many scales of application, from small elements through to streets, blocks and neighbourhoods. The information is grouped around three main parts: the context of urban design (theoretical and historical), dimensions of urban design (morphological, perceptual, social, visual, functional and temporal) and implementation processes.

CITIES FOR PEOPLE

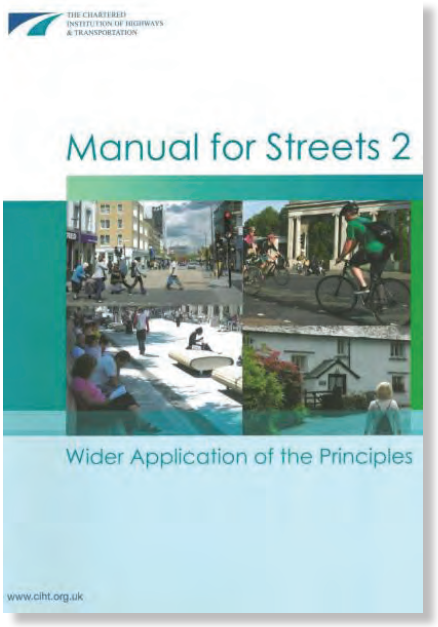


Author:	Jan Gehl
Year:	2010
Publisher	Island Press
Location:	Copenhagen, Denmark
Length:	269 pages
ISBN:	978–1–59726–573–7
Key focus:	A collection of design insights in how to create betters cities (and streets) for people, based on appreciation of a human dimension.

Cities for People is based on extensive practice of Gehl Architects in transforming and regenerating cities around the world. Design principles presented are based on consideration of human senses and scale and pedestrian and cycling needs for climate protection, accessibility, activation, communication and social interaction. The book also has a toolbox for evaluating quality of public spaces.

MANUAL FOR STREETS 2

Author:	Department for Transport and Chartered Institution of Highways and Transportation
Year:	2010
Publisher	The Chartered Institution of Highways and Transportation
Location:	London, UK
Length:	137 pages
URL:	www.dft.gov.uk/pgr/sustainable/manforstreets/
Key focus:	Street design principles based on dual function of streets as places and movement conduits; and case studies for a number of completed mixed priority routes in the UK.



Manual for Streets 2 has supplementary guidance documents to Manual for Streets (2007). It explains how the principles put forward in the initial document can be applied wider, not just to low-trafficked streets. This guide incorporates further findings and case studies from research and pilot projects by the Department for Transport and Commission for Architecture and the Built Environment.

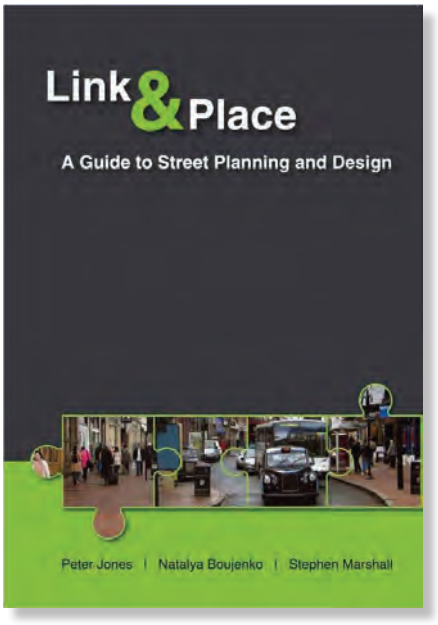
MANUAL FOR STREETS

Author:	Department for Transport , Communities and Local Government and Welsh Assembly Government
Year:	2007
Publisher	Thomas Telford Publishing
Location:	London, UK
Length:	144 pages
ISBN:	978–0–7277–3501–0
URL:	www.dft.gov.uk/pgr/sustainable/manforstreets/
Key focus:	Street design guide for lightly trafficked residential streets

Manual for Streets puts forward street guidance for lightly trafficked residential streets for use in the UK. Drawing on principles of integrated street design, streets as places and the need to balance competing street demands, this repositions the focus of designers to more holistic considerations.

LINK AND PLACE: A GUIDE TO STREET PLANNING AND DESIGN

Author:	Peter Jones, Natalya Boujenko and Stephen Marshall
Year:	2007
Publisher	Local Transport Today
Location:	London, UK
Length:	250 pages
ISBN:	978–1–899650–41
URL:	www.transportxtra.com/shop/books/?id=19
Key focus:	A street design toolkit that recognises dual functionality of streets as places and links/movement conduits; examples to illustrate suggested principles and processes.



The Link and Place Guide puts forward a balanced street network hierarchy that recognises strategic important of movement and placemaking. The guide is a comprehensive resource of processes, tools and techniques that take into account movement and placemaking, supported by numerous European examples.

DESIGN MANUAL FOR BICYCLE TRAFFIC

Author:	CROW
Year:	2007
Publisher	CROW
Location:	Ede, The Netherlands
Length:	388 pages
ISBN:	
URL:	www.crow.nl/nl/Publicaties/publicatiedetail?code=REC25
Key focus:	Cycling design guidance for Dutch practice.

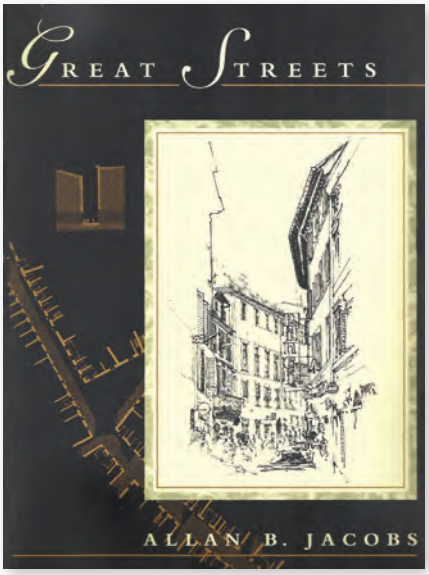
CROW's Design Manual for Bicycle Traffic guides the provision of bicycle friendly infrastructure for Dutch practice. It has extensive information on all aspects of bicycle infrastructure with detailed analysis for various types of facilities.

URBAN DESIGN AND TRAFFIC: A SELECTION FROM BACHS TOOLBOX

Author:	CROW
Year:	2006
Publisher	CROW
Location:	Ede, The Netherlands
Length:	416 pages
ISBN:	978–90–6628–473–9
URL:	www.crow.nl/nl/Publicaties/publicatiedetail?code=221
Key focus:	Design advice and design principles for all movement modes and wider considerations based on Dutch practice.

Urban Design and Traffic is a comprehensive resource for Dutch practice that covers a wide range of considerations relating to traffic, transportation and urban design. The book explores the gradual shift in approaches to traffic engineering over the last 70 years and offers many techniques and examples for designing streets that 'will result in a sustainable, liveable, safe city in which people play a central role'.

GREAT STREETS



Author:	Allan Jacobs
Year:	1993
Publisher	Massachusetts Institute of Technology Press
Location:	USA
Length:	331 pages
ISBN:	978–0–262–600023–1
Key focus:	Comparison of world›s best streets and their characteristics and recommendations of what makes great streets

Jacobs' timeless book Great Streets describes some of the world's most loved streets and their characteristics and compares grid pattern settings of one square mile areas in 100 cities. The book draws out characteristics of some of the best streets to establish factors contributing to their great qualities.

STREET DESIGN MANUAL

Author:	New York City Department of Transportation
Year:	2009
Publisher	New York City Department of Transportation
Location:	USA
Length:	232 pages
ISBN:	978–0–615–29096–6
Key focus:	Policy and design guidelines for streets in New York City

The New York City Street Design Manual provides policies and design guidelines to city agencies, design professionals, private developers and community groups for the improvement of streets and sidewalks throughout the five boroughs. It is intended to serve as a comprehensive resource for promoting higher quality street designs and more efficient project implementation.

E3 FURTHER INTERNET RESOURCES

This section provides a list of useful websites that collate and/or publish information useful in street design.

RUDI

www.rudi.net/

Rudi.net is a UK based not-for-profit membership resource for professionals involved in making better places. It contains over 20,000 pages of material related to urban development needed for research, proposal preparation, commissioning projects, fact-checking and general reference. The website contains:

- links and information on design guidance, publications and books
- articles (arranged by categories)
- news.

SUSTRANS

www.sustrans.org.uk/

Sustrans is a not-for-profit organisation in the UK that promotes journeys by foot, bike or public transport. Sustrans campaign for sustainable travel practices, develop guidance documents, monitor and evaluate walking and cycling projects and initiatives and campaign to make improvements in travel behaviour and physical street environment.

Site contains:

- extensive Sustran publications on design, active living and travel behaviour
- research and monitoring publications
- media releases, photo library and links to other related websites.

PPS

www.pps.org/

Project for Public Spaces (PPS) is an USA based nonprofit planning, design and educational organisation (founded in 1975), dedicated to helping people create and sustain public spaces that build stronger communities. The website contains information on successful public space projects, an image collection, articles and blogs.

TDM ENCYCLOPEDIA

www.vtpi.org/tdm/

Transportation Demand Management (TDM) Encyclopedia is a comprehensice resource of information about innovative management solutions to transportation problems, produced by the Victoria Transport Policy Istitute in Canada.

The website provides a series of concise articles on a variety of transportation and mobility topics, providing a wealth of further references that the reader may also find useful.

HAMILTON–BAILLIE ASSOCIATES

www.hamilton–baillie.co.uk/

Hamilton-Baillie Associates Ltd is a small company in the UK providing specialist knowledge on solutions for reconciling traffic movement with quality public spaces with international reputation in implementing shared space projects. The website contains publications relating to shared streets and also provides project information for some of the completed and evaluates schemes.

HEALTHY SPACES AND PLACES

www.healthyplaces.org.au

Funded by the Australian Government Department of Health and Ageing, Healthy Spaces and Places is a national guide setting out the importance of planning, designing and creating sustainable, people-friendly places. It has two parts, a summary printed booklet and the website.

As a national guide, Healthy Spaces and Places supports and complements planning and design initiatives of state, territory and local governments. It provides practical tools, case studies, guidelines and research evidence.

CABE

www.cabe.org.uk/

The Commission for Architecture and the Built Environment (CABE) was formed in 1999 in the UK to provide an independent review and design advice of the built environment projects in the UK and to provide enabling and educational service. CABE's work included a significant publishing program, focussing on research into evidence, best practice and development of guidelines for built environment projects and processes. In April 2011, CABE merged with the Design Council.

CABE website contains:

- hundreds of examples of good practice case studies
- over 300 CABE publications covering various aspects of architecture and built environment
- guides for masterplans, buildings and places
- client guides
- case studies.

E4 USEFUL TERMS & DEFINITIONS

BICYCLE BOULEVARDS

Bicycle boulevards (widespread throughout USA, Canada, Germany (Fahrradstraße) and the Netherlands (Fietstraten) are low-volume and low–speed streets optimised for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. These treatments allow through movements for cyclists while discouraging similar through trips by non–local motorised traffic.[1]

CIVILISED STREETS

'Civilised streets' is a term often used for streets where people of all ages can walk, cycle, play, talk and shop more easily.

HOME ZONE

'Home Zone' is the UK term for a street where people and vehicles share the whole of the road space safely, and on equal terms; and where quality of life takes precedence over ease of traffic movement. Homes Zones are typically applied to residential streets and their design features are the same as for shared streets.

INCLUSIVE DESIGN

Based on the social model of disability – that people are disabled or disadvantaged by society's failure to recognise and meet their needs, not an inherent lack of capability – inclusive design aims to remove the barriers that create undue effort and separation.

ROAD

A 'road' is mostly defined as a 'way by which people, vehicles and animals pass between places'. It is therefore primarily a carriageway space.

SHARED SPACE

'Shared space' is synonymous with a 'shared street'.

SHARED STREET

A 'shared street' is a street, where all or parts of its length have no vertical level difference. For sections with no vertical level difference, a shared street can be legally shared by all street users.

Synonymous terms: 'Encounter zones' in Switzerland, 'woonerf' relating primarily for residential neighbourhoods in the Netherlands and 'home zones' relating primarily to residential neighbourhoods in the UK.

SHARED SURFACE

A shared street typically features shared surfaces, i.e. surfaces with little or no demarcation to designate different users and no kerbs. It may be uniform or differentiated by texture, colour or the placement of street furniture. In a street with a shared surface, demarcation is absent and pedestrians and vehicles share the same surface.

SHARED ZONE

A 'shared zone' is a legal traffic control device (usually a sign) that provides pedestrians with equal rights with motor vehicles in a specified area. Motor vehicles can use the shared zone but at a greatly reduced speed of 10 km/h which does not present a safety hazard to pedestrians.

SIMPLIFIED STREET

A street where signing, road markings for motor traffic and street furniture is consciously simplified through design. Simplified streets encourage a users to interpret the environment, decide on the appropriate behaviour and negotiate priority.

STREET

A 'street' is a space between buildings, including a carriageway, footpaths and access to frontages.

TRANSIT ORIENTED DEVELOPMENT

Also known as Transit Oriented Design, or TOD, it is the creation of compact, walkable communities centred around high quality transit routes (typically train systems), often rejuvenating old existing areas adjacent railway corridors. TODs seek to reduce dependence on a car for mobility and everyday living for people in urban areas.

WALKABLE COMMUNITIES

Walkable communities are communities designed to a pedestrian scale, where goods and services are located within a walking distance. Traditional old towns and communities, designed before an automobile became a commodity, were typically walkable. Concerns with car reliability ignited recent interest in creating walkable communities.

WATER SENSITIVE URBAN DESIGN

The National Water Commission defines as: Water-sensitive urban design ensures that urban water management is sensitive to natural hydrological and ecological cycles. It integrates urban planning with the management, protection and conservation of the urban water cycle.[2]

WOONERF

Woonerf (plural 'woonerven'; in English, 'home zones') is a slow speed (30 km/h) neighbourhood of shared streets in the Netherlands. Emerging as a successful design trend since the 1960s, it was applied in more recent years in other countries, known as 'home zones' or 'shared streets'.

E5 HOW THIS COMPENDIUM WAS DEVELOPED

The initiative for developing this Compendium lies with the South Australian Active Living Coalition. Members of the Coalition, frequently confronted with the challenge of reviewing new or retrofit street design proposals, recognised the lack of an agreed approach or guidance in South Australia to the design of residential streets. This often resulted in uncertainty in appropriateness of bringing in new and innovative approaches based on international experiences, making design processes and approvals challenging.

In compiling guidance and case studies for this Compendium, the project team invited industry practitioners to express their views and recommendations. This inclusive approach steered the structure of the Compendium, its content and case studies.

Compendium development started in November 2010 with two working sessions attended by over 60 street design practitioners and policy makers from state and local governments, from a number of associations and from consultancies. The issues of current regulatory barriers and typical challenges facing street design were discussed in detail and recommendations for the focus of the Compendium were put forward. Key recommendations made at these sessions included:

- the Compendium should include a series best practice examples
- an aspirational document was preferred to rigid guidance
- trialling any guidance given on a local case study
- wide support for the 'Link and Place' approach as a strategic principle for determining street functions
- the Compendium should provide references to national guidance applicable to street design
- the Compendium should be a voice for integrated street design and 'streets for people' agenda.


02

03


04


05


06


07

The scope of the Compendium took in, as much as possible, recommendations made by the professional community. In the five months following, work took place in developing draft guiding principles, collating best practice case studies from around the world, trialling Compendium principles on Bowden Urban Village site and gathering further inputs from many South Australian practitioners.

In April 2011, two working sessions with over 65 attendees reviewed the draft principles and concepts that formed the backbone of the Compendium. During these sessions, attendees applied the Compendium principles to a number of streets in various council areas of SA. This gave the project team invaluable and specific feedback on the usefulness of the concepts and practical considerations in their application. This advice enabled further refinement and completion of the document.

The project team wishes to express their heartfelt gratitude for the gift of time, passion, experience and feedback of all colleagues that took part in the journey of developing the Compendium.

REFERENCES

1. Portland State University. Fundamentals of Bicycle Boulevard Planning and Design. Portland, Oregon. 2009.
2. Australian Government National Water Commission, Water sensitive urban design. nwc.gov.au/urban/more/water–sensitive–urban–design

Image	Source
01	Adelaide City Council
02–05	Josephine Alvaro
06, 07	Natalya Boujenko

About the Consulting Authors

NATALYA BOUJENKO

Natalya Boujenko, a founder of Intermethod, is a strategic consultant specialising in integrated street design and city development. Her portfolio spans a vast range of local and international projects and policy work in London, Birmingham, Belfast and Adelaide. She has authored a number of published design guidance and manual documents, technical papers and publications, including joint authorship of '*Link and Place: A Guide to Street Planning and Design*'.

PAUL MORRIS

Paul Morris is the manager of the Adelaide office for GTA Consultants. He has over 25 years involvement with transport planning and traffic engineering with experience in local and state government and consulting roles. Paul has extensive experience in developing transport and traffic standards and guidance, practical traffic management, parking and road safety, road safety auditing, traffic impact assessments and integration with urban planning and design.

PROFESSOR PETER JONES

Peter Jones is Professor of Transport and Sustainable Development in the Centre for Transport Studies at University College London. He is a member of the UK Independent Transport Commission, the CIHT Urban Design Group and Chair of the UK Sharing the Streets Network. He co–authored the publication *'Link and Place: A guide to Street Planning and Design'*, and has been involved in applications of the principles in several towns and cities. He is co-editing a major new resource for the CIHT on '*Streets and Planning in the Urban Environment*'.

THE STREETS FOR PEOPLE COMPENDIUM WORKING GROUP:

Jenni Carr
(Heart Foundation, SA Division)

Alison Collins
(Department of Planning, Transport and Infrastructure)

Brian Delaney
(Department of Planning, Transport and Infrastructure)

Kirsten Potoczky
(Urban Renewal Authority)

Peter Watts
(Department of Planning, Transport and Infrastructure)

Government of South Australia

Heart Foundation

http://saactivelivingcoalition.com.au