

C2 Walking and urban design

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Purpose

This module describes the role that urban planning and design can play in providing attractive environments for people to walk in.

Introduction

Urban design is the composition of architectural form and open space in a community context. The elements of a city's architecture are its buildings, urban landscape, and service infrastructure, just as form, structure, and internal space are elements of a building. Whether public or private in actual ownership, urban design comprises the architecture of an entire community that all citizens can enjoy and identify as their own. Like architecture, urban design reflects considerations of function, economics, and efficiency, as well as aesthetic and cultural qualities.

Urban design suggests serious collective concern for three-dimensional space and gives as much consideration to public areas between or beneath buildings as to the buildings themselves. This requires an understanding of microclimate, the durability of materials, practicality of maintenance and the wishes of likely future users.

The attractiveness of a place for walking and the experience of the walking activity are inextricably tied up with urban design. Three distinct types of pedestrian activities must be addressed (Gehl 2002), although their relative importance and the opportunities for addressing them will vary,

for example, between urban activity centres and suburban locations:

- ▶ *Necessary activities*: things that have to be done, such as going to school, waiting for the bus and going to work. In the short term, these activities take place regardless of the physical environment, but in the longer term a poor environment will drive people to other places or other modes of travel.
- ▶ *Optional activities*: activities that people are tempted to do when climatic conditions, surroundings and the place are inviting. These activities are especially sensitive to the quality of places; that is, these activities will be carried out in places where people like to be.
- ▶ *Social activities*: activities that occur wherever people move about in the same spaces, including watching, listening to, or otherwise experiencing other people.

C2.1 Liveable neighbourhoods, smart growth and walkable communities

Shaping Up (Queensland Transport n.d.), *Liveable Neighbourhoods* (WAPC 2000) and the US Smart Growth (Litman 2004) are policies that integrate decisions on transport and land use. This integration is achieved by discouraging dispersed, automobile-dependent development at the urban fringe and encouraging more compact, mixed-use development within existing developed areas.

Such policies can help achieve a number of community objectives, including creating patterns of more accessible land use, improving transport options, creating more liveable communities and reducing public service costs. Comparison of the characteristics of liveable neighbourhoods and conventional suburban development clearly shows the synergy between liveable neighbourhoods and walking (highlighted in Table C2-1).



Table C2-1
Comparing liveable neighbourhoods/smart growth and conventional suburban development

Characteristic	Liveable neighbourhoods, smart growth	Conventional suburban development
Density	Higher density, clustered activities	Lower density, dispersed activities
Growth pattern	Infill (brownfield) development	Urban periphery (greenfield) development
Land use mix	Mixed land use	Homogeneous (single-use, segregated) land uses
Scale	Human scale; smaller buildings, blocks and roads; careful detail, since people experience the landscape up close, as pedestrians	Large scale; larger buildings and blocks, wide roads; less detail, since people experience the landscape at a distance, as motorists
Public services (shops, schools, parks)	Local, distributed, smaller; accommodates walking access	Regional, consolidated, larger; requires automobile access
Transport	Multimodal transportation and land use patterns that support walking, cycling and public transit	Automobile-oriented transportation and land use patterns; poorly suited for walking, cycling and transit
Connectivity	Highly connected roads, sidewalks and paths, allowing relatively direct travel by motorised and non-motorised modes	Hierarchical road network with numerous loops and dead-end streets, and unconnected sidewalks and paths, with many barriers to non-motorised travel
Street design	Streets designed to accommodate a variety of activities; traffic calming	Streets designed to maximise motor vehicle traffic volume and speed
Planning process	Planned and coordinated between jurisdictions and stakeholders	Unplanned, with little coordination between jurisdictions and stakeholders
Public space	Emphasis on the public realm (streetscapes, pedestrian environment, public parks, public facilities)	Emphasis on the private realm (yards, shopping malls, gated communities, private clubs)

Source: Litman 2004



Figure C2-1
Traffic calming improves both perceived and actual safety for pedestrians



Walkable communities are not all the same. A wide range of features contribute to establishing a walking community (BFA 1998):

- ▶ People of all ages and abilities have easy access to their community 'on foot'; an automobile is not needed for every trip.
- ▶ People walk more, and the community and neighbourhoods are safer, healthier, and friendlier places.
- ▶ Parents feel comfortable about their children being outside in their neighbourhoods; they do not worry about the threat of motor vehicles.
- ▶ Children spend more time outside with other children and are more active, more physically fit and healthier.
- ▶ Streets and highways are designed or reconstructed to provide safe and comfortable facilities for pedestrians, and are safe and easy to cross for people of all ages and abilities.
- ▶ Pedestrians are given priority in neighbourhood, work, school and shopping areas; motor vehicle speeds are reduced (and, in some places, motor vehicles have been eliminated entirely) to ensure compatibility with pedestrian traffic.
- ▶ Motor vehicle speeds are carefully controlled to ensure compatibility with adjacent land uses and the routine presence of pedestrians (see Figure C2-1).
- ▶ Drivers of motor vehicles drive in a prudent, responsible fashion, knowing that they will be held strictly accountable for any threat, injury, or death caused by their lack of due care or violation of the *Australian Road Rules*.
- ▶ Air quality and water quality are good.

C2.2 Context analysis

Understanding the context of urban locations is essential to ensure that development is connected to and integrated with surrounding areas, including planned and committed developments (see the box 'Context analysis using walkable catchments'). Context analysis should identify key opportunities and constraints, including:

- ▶ opportunities for improving existing planning frameworks
- ▶ conflicts with existing plans.

The key tool for context analysis is the walkable catchment (or 'pedshed'), which is 'the actual area served within a 400 metre (5-minute) or 800 metre (10-minute) walking distance along the street system from a public transport stop, town or neighbourhood centre' (WAPC 2000).

Context analysis using walkable catchments

For context and site analysis mapping, describe and analyse (as appropriate) the following information:

- ▶ existing and planned neighbourhood, town and regional centres, and major employment areas
- ▶ neighbourhoods around existing and planned neighbourhood, town and regional centres, indicated by circles of 400–450 metre radius centred on the neighbourhood or town centre (see Figure C2-2)
- ▶ transport routes, including freeways, arterial route and neighbourhood connector alignments, public transport routes, bus stops and rail stations
- ▶ walkable catchments, or 'pedsheds', of existing and planned rail stations via circles of 800-metre radius centred on the rail stations (see Figure C2-2)
- ▶ surrounding subdivision (indicating fronts and backs of lots) for a reasonable and useful distance beyond the site boundary
- ▶ existing and proposed land use distribution
- ▶ site characteristics, such as landform, areas of environmental significance, environmental protection policy areas, bushland, wetlands, damplands and foreshore reserves.

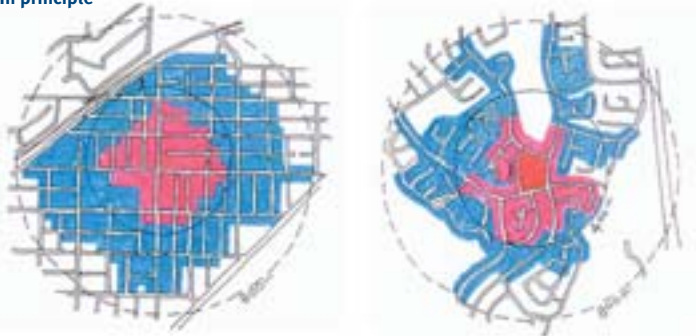
(WAPC 2000)



Source: WAPC 2000

Figure C2-2
An example of context and site analysis mapping

In principle



New urbanism design

- 60% of the area within 400 m radius of the neighbourhood centre is within 400 m actual walking distance
- 58% of the area within 800 m radius of the neighbourhood centre is within 800 m actual walking distance

Conventional suburban development

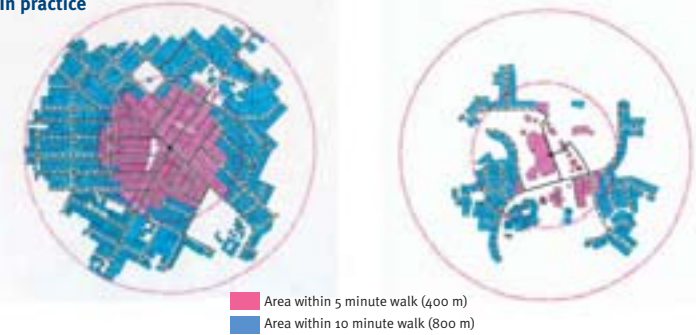
- 38% of the area within 400 m radius of the neighbourhood centre is within 400 m actual walking distance
- 41% of the area within 800 m radius of the neighbourhood centre is within 800 m actual walking distance

Source: Jones 2000

Figure C2-3

New urbanism compared to conventional suburban development: in principle

In practice



- Area within 5 minute walk (400 m)
- Area within 10 minute walk (800 m)

Mt Lawley (WA): Good walkability/accessibility

- ▶ Complex and diverse land use
- ▶ Wide range of lot sizes and housing types
- ▶ Connected grid road network

Willeton (WA): Poor walkability/accessibility

- ▶ Simple land use follows area zoning
- ▶ Little lot and housing diversity
- ▶ Hierarchical road network

Source: Jones 2000

Figure C2-4

Traditional (connected grid) compared to conventional suburban development: in practice

In both principle and practice, the details of urban form have a profound influence on the walkability of an area (see Figures C2-3 and C2-4 for comparisons of network designs that provide differing levels of walking accessibility).

The concept of walkable catchments is integral to land use and transport integration planning in Queensland, and is described in *Shaping up* (Queensland Transport n.d., particularly for commercial and activity centres (see Figure C2-5).

The primary focus in walkable catchment analysis is on access through the road and street network. Short cuts through parks and pedestrian paths between locations (e.g. between cul-de-sacs) should be included only where the lighting is good and there is a high level of surveillance from adjoining development, especially during evenings and weekends. Similarly, the walkable catchment may need to be reduced where there is poor surveillance of routes or where routes are perceived to be unsafe or unattractive places to walk (see C2.4 *Walkability*).

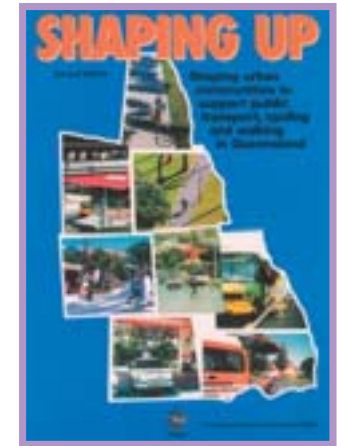
The objectives for a walkable catchment should be (WAPC 2000):

- ▶ at least 60% of dwellings within a 400-metre radius around an existing or potential neighbourhood or town centre, or an existing or potential bus stop, have relatively direct walking access to the centre or bus stop (i.e. are within a 400-metre safe walking distance)
- ▶ at least 60% of dwellings within an 800-metre radius of an existing or potential train station, have relatively direct walking access to the station (i.e. are within an 800-metre safe walking distance).

C2.3 Convenience and amenity

Convenience begins with a connected network of streets that provides alternative routes with reasonable walking distances between destinations. A well-designed movement network also promotes neighbourhood safety by routing the heaviest traffic around neighbourhoods without sacrificing street connectivity for pedestrians, cyclists and buses (see Module C3 *Developing walking networks*).

The level of aesthetic and activity interest is critical in determining how far people are willing to walk. People are often unwilling to walk more than 100 metres across a car park to reach a desired destination, but will walk at least three times that distance along a street of shopfronts (Transportation and Growth Management Program 1999).



Source: Queensland Transport

Figure C2-5
Shaping up

Similarly, in activity centres, train passengers are willing to walk 1200 to 1300 metres to and from the station, much further than the conventionally assumed 800 metres (Ker & Ginn 2003).

Newly developing areas

For newly developing areas, both land use and movement systems can be planned in accordance with walkability objectives. These, in turn, are an integral part of the principles of liveable neighbourhoods (WAPC 2000) and smart growth (Litman 2004). These principles (Transportation and Growth Management Program 1999) include:

- ▶ *Efficient use of land and energy resources:* Compact development shortens trips, lessens dependence on the private car, and consequently reduces transport energy consumption and air pollution.
- ▶ *Full use of urban services:* Compact development creates neighbourhoods where more people will use existing services, including roads and transport infrastructure.
- ▶ *Mix of uses:* Locating shops, houses, schools and recreation areas within walking distance of each other in compact neighbourhoods with pedestrian-friendly streets promotes:
 - independence of movement, especially for seniors and the young who can walk, cycle or use public transport



- safety, through round-the-clock presence of people
- reduction in car use, especially for short trips
- support for those who work at home, through the proximity of services and facilities.

To gain the full benefit of a mix of uses, buildings must be conveniently connected by streets and paths. Otherwise, people will still be inclined to use cars, even for short trips.

- ▶ **Transportation options:** For people who have a choice about how they travel, alternatives to the car must be safe, convenient and interesting. For walking, in particular, these performance factors are influenced by:
 - footpath and street design, including ensuring that people are protected from motor vehicles
 - placement of parking
 - location and design of building fronts, doors and windows (orientating windows and doors to the footpath increases awareness and the safety of the street environment)

- ▶ **Detailed, human-scale design:** The quality of pedestrian spaces is a strong determinant of whether people will use these spaces. The scale of desirable, attractive public spaces is appropriate to pedestrians (Queensland Transport n.d.).

Human-scale design is critical to the success of streets and paths as preferred routes for pedestrians. Streets that are balanced for pedestrians, cyclists and motorists promote the development of communities through the informal meeting of neighbours.

In relation to street design, the Western Australian *Liveable Neighbourhoods* policy (WAPC 2000) suggests that we should:

- contemplate the adjacent land uses and access needs, consider human scale and use appropriate features to enhance streetscape
- control traffic speed through appropriate street design, manage conflicts at driveways using access management techniques, and specify appropriate paved width, verge, walkways, street trees, medians, parking embayments etc.

A good source of information on human-scale urban design is the *New Urban News* (<<http://www.newurbannews.com>>).

- ▶ **Crime prevention through environmental design:** Proper design and effective use of the physical environment, including walking facilities, can produce behavioural effects that will reduce both the incidence of crime and the fear of crime,

thereby improving the quality of life. More information on this topic can be found in C6.2.5 *Crime prevention through environmental design* and at the following websites <http://www.cpu.sa.gov.au/sa_ckpted.htm> and <<http://www.aic.gov.au/publications/crimprev/ckpted/>>.

Existing developed areas

In existing developed areas, the scope for redesign of the physical form is often limited, and redevelopment opportunities scattered and constrained by the existing land subdivision and movement patterns. Examination of walkable catchments can, however, identify locations with poor walking access that could be improved, for example, by creating a pedestrian link where none currently exists. Improvements in convenience and amenity (e.g. improved lighting) will also enhance an area's attractiveness to pedestrians.

Traffic, both on main streets and local roads, can reduce walkability. Local area traffic management (for example, see Austroads 2004) is a useful tool in reducing traffic volumes and speeds on local roads, and there are many examples of traffic management being used to improve pedestrian safety and amenity on main streets (Westerman 1998). Traffic management initiatives have been shown to increase the level of pedestrian activity (Morrison et al. 2004).

Rail lines can be major barriers to pedestrian movement (see Module D2 *Design for accessibility*) and can also compromise the urban form by cutting off part of the catchment of an activity centre. Where this occurs, consideration should be given to improving access across the rail line (e.g. by building more crossings). In some cases, the potential enhancement of urban functioning (and related land values) may justify sinking the railway to allow seamless connection of the urban form, including pedestrian accessibility (see the case study 'Subiaco redevelopment').

C2.4 Walkability

Ultimately, levels of walking in an area will depend as much on perceptions as on reality, and on detail as much as on the big picture. The best way of establishing how people actually see an area and of picking up on the detail is to involve the community in assessing the walking environment.

A walkability checklist (walkinginfo.org 2004) will help gather consistent and useful information, allowing evaluation of a neighbourhood's walkability. It is important to apply the checklist through

Case study: Subiaco redevelopment

The fundamental driver of the Subiaco redevelopment in Western Australia was the sinking of the railway line, which allowed the reconnection of Subiaco and Wembley, and redevelopment of the former Jolimont industrial area. The resulting new land area could then be transformed into a desirable living space and create a focal point for residents, businesses and leisure seekers. The vibrant urban community of Subi Centro is the result (see Figure C2-6).

It was an important objective that the car did not dominate the area, and some roads were re-routed to give pedestrians priority. Such careful design strategies have created a friendly, welcoming environment for pedestrians.



Source: Subiaco Redevelopment Authority

Figure C2-6
Subiaco redevelopment in WA

individuals in the community, rather than through a planner's or engineer's perspective.

It is also desirable to develop a localised version of the checklist, adding issues of particular concern to the local community, or leaving out those that might not be relevant.

The checklist provides questions to consider, and suggests both immediate answers and long-term solutions to potential problems in the neighbourhood. The checklist can be completed on a regular route (e.g. to a school) to describe problems, identify improvements and arrive at an overall walkability rating.

In a main street, a simple way of assessing pedestrian exposure to risk is to observe the incidence of 'jay-running', which happens when people want to cross a road but cannot do so unless they run: 'When more than 6% of jay-crossers are jay-runners, alarm bells should start to ring' (Westerman 1998, p. 128).

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