

C3 Developing walking networks

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Purpose

This module describes the importance and features of well-planned walking networks and how people can be encouraged to use them.

Introduction

A comprehensive walking network enhances mobility in local areas. Many factors contribute to the effectiveness and attractiveness of a walking network, such as:

- ▶ convenient connections between people's homes and logical destinations within walking distance
- ▶ safe and convenient links to public transport
- ▶ attractive recreational paths
- ▶ effective wayfinding through the network
- ▶ an aesthetically pleasing walking environment.

C3.1 Connectivity

A well-planned walking network emphasises connectivity between places that are within convenient walking distance. The distance that people are willing to walk will vary between individuals and places, and also depends on the purpose and duration of the trip and activity. In general, acceptable walking distance is considered to be 400 to 800 metres (or 5 to 10 minutes), but train passengers, for example, frequently walk further than a kilometre to the station (Ker & Ginn 2003).



Source: ARRB

Figure C3-1

Lack of footpaths makes walking difficult and dangerous

Connectivity can be both physical and visual. Places can have a physical connection through a pathway network, as well as a visual connection through the design of views to local landmarks. Connectivity means maximising both these types of connections (see the box 'Neighbourhoods with high connectivity' and Figure C3-2).

Connectivity requires provision of facilities. Lack of footpaths makes walking difficult and dangerous (see Figure C3-1) and will quickly lead to heavily car-based patterns of travel and activity. Installing footpaths later is more costly and will only overcome car-based travel habits to a limited extent.

Improving connectivity, especially where key barriers can be overcome (e.g. through a linking pathway where there is no road connection) can result in substantial improvements to the 'walkability' of an area and enlargement of the walkable catchment for activities and activity centres (see Module C2 *Walking and urban design*).

C3.2 Linking pedestrian routes to public transport

Pedestrian routes need to be linked to the public transport network. This should be done at the strategic-planning stage of a new subdivision, or as part of a comprehensive plan when trying to improve linkages in established residential areas.



Neighbourhoods with high connectivity

Neighbourhoods with high connectivity have the following traits:

- ▶ a clear street and pathway structure that is easy to read (see C3.4 Wayfinding)
- ▶ key destinations that are integrated into the pathway network
- ▶ opportunities for a variety of connections, which make an area 'permeable'
- ▶ pathways that allow connections between streets to key destinations in as short a distance as possible (such as at the end of cul-de-sacs or at intervals along street blocks)
- ▶ important community facilities clustered together, creating easy connections between different facilities (e.g. schools and shops)
- ▶ pathways on all streets
- ▶ open-space areas and parks with pathways that cross between streets and across areas such as watercourses and vegetation
- ▶ major pathways with reasonably flat grades
- ▶ generally, no footbridges and underpasses.

Roads and underpasses may be justified where major road crossings occur. Underpasses work best if they are well lit, have active adjoining areas and are supervised. Footbridges are more attractive to walkers if they are on the same level as surrounding land uses, such as shops, and can be accessed by both stairs and other means.

Source: Westerman 1998

Permeability

- ▶ Permeability is the basis for sustainable and democratic urban form: if you can't get to a place, then you can't use it.
- ▶ A gridded town affords the potential for choice and change.
- ▶ The grid should be connected consistently through a variety of scales — larger boulevards down to more narrow pedestrian paths to allow perimeter blocks of development to exist with clearly distinguishable public and private sides.
- ▶ The connectivity provides for integration of uses and activities.

Source: Jones 2000

For effective links to be made, the following three topics must be addressed, both broadly and in detail:

- ▶ land use planning
- ▶ public transport networks
- ▶ pedestrian facilities.

Land use planning

Sound land use planning is a major factor in creating good links between pedestrian routes and public transport. In greenfield sites, or new subdivisions, a strong framework is created through:

- ▶ selecting new sites for residential development that have an existing or planned railway close by, or that are near an existing or planned highway that would allow good bus connections to nearby centres
- ▶ planning a focused community centre that includes shops, schools and other key community facilities in a central location
- ▶ concentrating denser housing around such a community centre to maximise the number of people within walking distance.

Greenfield planning should, wherever possible, provide permeability for bus public transport, so that bus stops can be close to where people live. Where public transport is on the periphery of a proposed development, the layout of the development should provide convenient walking access to bus stops to increase the walkable catchments. This can be done through developing a suitable internal road and path layout with multiple access points. If a subdivision is walled in, efforts should be made to provide walking links to bus stops on surrounding streets (see Figure C3-2).

In older residential areas, planning for infill development should focus around existing centres, particularly those along railways.

Bus networks

For a new community, local bus networks need to be designed at the master-planning phase, preferably in consultation with local bus operators. Efficient bus networks maximise the number of passengers that use them. This can increase the frequency of buses and patronage rates, which in turn improve the network's economic viability.



Source: ARRB

Figure C3-2
Walled subdivisions need to provide convenient access to bus stops



Source: Danish Road Directorate 2000

Figure C3-3
This bus gate provides connectivity for pedestrians and cyclists, but not cars

To achieve an efficient bus network, the road system should be designed around permeable road networks that enable bus stops to be within walking distance of most residents and that pass through a number of main interchange sites.

In some communities, through-traffic of motor vehicles other than buses, emergency and, possibly, service vehicles is not desirable. Here, 'bus-only' access points (sometimes called 'bus gates') may be appropriate. In extreme cases, a retractable bollard activated by a bus-mounted transponder may be used to prevent access by other vehicles. Bus gates should allow access by pedestrians and cyclists, enhancing the walkability of the development (see Figure C3-3).

Pedestrian facilities

Pedestrian facilities related to public transport need to be well designed to encourage greater patronage. Specific measures to achieve this include:

- ▶ ensuring good lighting near bus shelters, railways and the paths leading to them to improve public safety
- ▶ designing to allow access by all users
- ▶ installing and maintaining high-quality bus shelters and rail facilities
- ▶ locating bus shelters at key locations to allow as much public surveillance as possible (such as near parks, shops, schools, major roads) and with convenient access to and from surrounding development.



Attributes of attractive pathways

Attributes of attractive pathways for recreational users (see Figure C3-4) include:

- ▶ safety: paths should be clearly visible from nearby residences or roads, or within well-used parks
- ▶ generally high-quality construction and maintenance
- ▶ good night-time lighting that can increase usage for a longer time near dusk and improve safety at night
- ▶ good facilities that improve users' comfort, such as seats and bubblers
- ▶ clearly marked paths and destinations, with signs at suitable intervals and at main junctions
- ▶ convenient connections that allow easy selection of different routes linking key places.



Figure C3-4
Example of an attractive pathway

C3.3 Recreational walking routes

Why do people walk for recreation? There are two main reasons: for fitness and/or for pleasure.

'Fitness walkers' probably do not mind less-than-pleasant views as much as the 'pleasure walkers', and are perhaps fonder of more physically demanding grades. Pleasure walkers are more likely to enjoy a walk to a destination (e.g. shops, school and parks) that may also be part of a larger loop; they may also seek a gentler grade. Yet there are many characteristics that all recreational walkers want their pathways to have (see the box 'Attributes of attractive pathways').

Measures to improve wayfinding

Measures to improve wayfinding include:

- ▶ curving the street pattern to reflect the site's topography
- ▶ planning an open-space network that protects existing watercourses and includes pathways that accentuate watercourse crossings
- ▶ highlighting natural and cultural landmarks by locating roads and pathway junctions near them, creating opportunities for vistas that terminate with views of landmarks
- ▶ maintaining evidence of past heritage, such as large trees, farm dams and buildings
- ▶ designing a hierarchy of streets, using varying widths, medians and street trees
- ▶ locating important landmarks on local high points where this is suitable, so they can be seen from a distance (e.g. church steeples can be used as a visual cue for a town centre or school).

C3.4 Wayfinding

'Wayfinding' refers to how walkers find their way around an area. Clear visual and physical cues make an area easy to 'read' (i.e. increase an area's 'legibility').

Pedestrians use cues like landform, watercourses, views, surrounding land uses and street layouts to orientate themselves as they walk around an area. Their use of these markers can be almost intuitive. Other more obvious cues are well-placed signs that include directions or maps. See the box 'Measures to improve wayfinding'.

The site-planning stage is the best time to plan for wayfinding. Emphasis should be given to:

- ▶ highlighting the natural attributes of a site's landscape
- ▶ designing a connected and easily understood street and pathway system
- ▶ maintaining items related to the heritage of a site
- ▶ consciously creating the opportunity for visual cues.

In existing developed areas, it is particularly important to provide open vistas wherever possible (Gehl 2002), so that pedestrians can see where their walking route is heading. Streets and laneways are all part of the pedestrian network in activity centres, but often do not provide clear vistas and are often unattractive (see Figure C3-5). Such locations could be improved by lighting, signage, public artwork or, where possible, creating interactive ground-level frontages.



Source: ARRB

Figure C3-5

Accessways are often not readily identifiable, attractive, well lit, secure or generally inviting

C3.5 Amenity of walking routes

'Walking amenity' refers to how pleasant a place is for walking. It covers such aspects as noise, shade, street furniture, personal safety and visual attractiveness. A place that is attractive for walking will often be one that attracts people to stay as well. Gehl (2002) identifies a range of features that contribute to making a city good to walk in and to stay in for a while:

- ▶ room to walk with dignity, integrity and without overcrowding
- ▶ comfortable climatic conditions (including protection from sun and wind)
- ▶ pleasant facades at street level to stroll alongside
- ▶ good conditions for people with disabilities and people with prams

- ▶ a clear structure to the pedestrian system (it should be easy to find your way around)
- ▶ a pedestrian system that connects important destinations
- ▶ the ability to promenade through the city
- ▶ the ability to develop a good walking rhythm with few interruptions
- ▶ few and short waiting times at intersections
- ▶ many well-placed benches
- ▶ widespread secondary seating, such as steps and edges of planter boxes
- ▶ well-situated cafes and outdoor restaurants
- ▶ effective lighting.

Noise

Some people may be quite happy to stroll along beside a noisy roadway, while others prefer quieter pathways. Thus noise is a difficult issue to design for. The best approach is to provide for a variety of pathways that allow walkers to choose the types they prefer. A good pathway network should include pathways near main centres and roads, and less busy pathways through parks and connecting to local streets.

High ambient noise levels pose a particular problem for people with vision impairments and others who rely on auditory cues, such as auditory indicators at pedestrian crossings.

Weather protection: shade and shelter

Opportunities for shade are important in hotter weather. Walkers will prefer a pleasant walk along a shady avenue to one without trees. In particular, shade needs to be provided around seating areas to allow walkers to rest in the shade at intervals during their walk. Formal seating should not take up the whole of the shaded area, to ensure that shaded space is available for people in wheelchairs or children in strollers.

Shelter, as well as shade, can be provided by awnings attached to buildings. In many places, awnings and verandas have been removed over the years, but opportunities may arise for these to be reinstated when properties are remodelled or redeveloped.

Seating and street furniture

Street furniture includes bus and picnic shelters, seating, cycle racks and drinking fountains. These need to be provided at key sites to make a walk more pleasant.





Figure C3-6
Recreational walkers will avoid paths that do not appear safe

Resting is an integral part of walking, especially for those with a disability, but seating is often inadequate or poorly located. It should be used to create opportunities for walkers to rest, enjoy a landscape or view, and interact with others (Gehl 2002). Public seating can be made more usable by providing clear signage and by showing locations on maps of the area (see, for example, <http://www.dpi.wa.gov.au/planning/access/main_map.pdf>). In general, seating will encourage people to stay longer in an area, which will encourage spending and boost local businesses.

Consider providing seating of varying heights to cater for the needs of people of different heights, ages and fitness (e.g. some people find low seats difficult to use).

Pathways likely to be used by people walking dogs may also need facilities for disposal of dog waste.

Personal safety

Women and children are far less likely to use a pathway if it feels unsafe, has poor sightlines or is partly concealed from active or passive surveillance; men are usually less affected by safety considerations. Improving safety requires provision of adequate lighting, informal surveillance and removing potential places for people to hide. Design of such measures is particularly important along major thoroughfares.

Walkers will 'vote with their feet' if they feel unsafe or insecure and will either not use the area or will take an alternative, more visible, route (see Figure C3-6). Evidence of the latter is often easy to spot, as walkers will tread an informal path where they do feel safe. Such evidence should give rise to a reassessment of path location and standards.

Underpasses are especially unattractive to most users due to a perceived lack of safety, odours and poor aesthetics. However, there is still a place for underpasses in some locations, as long as alternative routes are provided for those who do not wish to use the underpasses.

A clear separation between pedestrians and vehicles also enhances both the perceived and actual safety for walkers.

Visual attractiveness

Pleasant parks, extensive shade trees, good-quality pathways, wilder bushland areas, landmarks, special designs (such as bridges), the presence of water, and long-distance views all contribute to visual attractiveness for walkers. However, such locations can be relatively inaccessible and not subject to passive surveillance, so attention should be paid to the detail of path geometry, sightlines, visual interaction with the surrounding area, and options for users to leave the path safely and conveniently in an emergency.

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