

Walkable neighbourhoods

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Walkable neighbourhoods have implications for sustainability because developments that are walkable reduce incentives to drive, conserve scarce resources, and lower environmental impacts.

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Introduction

Walkable neighbourhoods make it easy and pleasant to use public or active forms of transport. This reduces dependency on private motor vehicles, and the amount of space required to accommodate them on streets and in apartment building basements.

Walkability also affects the social amenity and attractiveness of public spaces enjoyed by residents and visitors by increasing social street activity. Higher levels of street activity improves the safety of pedestrians and reduces opportunities for vandalism and street crime.

Walkable neighbourhoods are difficult to create if walkability is not considered from the beginning of project development.

What makes a neighbourhood “walkable”?

The characteristics that create walkable neighbourhoods are the *permeability*, *variety* and *legibility* of block structures.

Permeability refers to the block structure of developments, and the degree to which a block structure provides easy access to local destinations and public transport services in a development.

As these diagrams show, the permeability of different block structures make a significant difference to the way people are able to move through and around a development, reducing travel times. The first diagram allows movement through and around a number of small blocks. The second requires movement around the perimeter of a single large block.

Permeable block structures mean that it takes less time to move across blocks on foot.

Variety refers to the mixture of uses within a development and its immediate surroundings. A development that makes a feature of variety will have a number of different services within easy walking distance, and generates high levels of street activity along building edges and in public spaces.

As these diagrams show, the variety of services and land use that are available in a development will make a significant impact on how far residents will have to travel every day to access shops, open space.

Neighbourhoods with a wide variety of uses reduce the need to travel outside of the development for essential services.

Legibility refers to the ease with which someone who is walking through a development can understand its layout. A block structure that is regular, such as the grid layouts of cities like New York or which allows pedestrians clear lines of sight to landmarks at key destinations is more walkable than a block structure that is irregular and difficult to navigate. A development that has good legibility can be judged by the ease with which directions can be given.

As can be seen from the images above, it is much easier to use a grid system with clearly defined right or left turns (diagrams 1 and 2) to navigate than a more complex configuration (diagram 3).

Block legibility allows residents and visitors to navigate by landmarks or regularities in the way that streets and paths are layed out.

Together *permeability*, *variety* and *legibility* improve the sustainability of neighbourhoods by improving the ease, speed, and safety with which residents and visitors can walk to local destinations and services. These strategies create higher volumes of pedestrian traffic and public spaces more active, lively, safe and capable of sustaining local commercial activity.

Creating walkable neighbourhoods

There are a range of specific street treatments which support different levels of pedestrian activity by reducing the impact of private cars. The central issue is to use these elements in a way that reduces conflict between private car-use and other functions while at the same time making streetscapes attractive.

Pedestrian malls and **transit malls** allow extensive development of retail and community activity because there is no conflict with private cars.

Traffic calming, shared pedestrian access and **footpaths** can be used to slow private vehicle traffic or facilitate walking in areas that are used by private cars.

Public transport service levels

The frequency of public transport services and the hours they operate are the key components that need to be considered when discussing public transport service levels.

The former may be described as the number of buses, trains or trams/light rail vehicles per hour and can often vary between the peak and non-peak periods of operation during the mid-week (Monday to Friday), evenings and weekends.

The latter corresponds to when services start and finish. Again this may vary between weekend and non-weekend periods. Service coverage is an important issue, that is to say the degree of network coverage over a given area (the density and extent of the network).

If services are concentrated along main corridors then the network coverage is likely to be poor and result in lower levels of accessibility for passengers than when services have a greater spread.

The trade-off between both approaches is the level of service frequency each can offer. By concentrating services along key routes bus operators are able to maintain a much higher frequency of services compared with a network that offers greater levels of coverage.

Key Issues

Benefits

Walkable neighbourhoods reduce:

- Transport costs for end-users
- Space that must be devoted to unprofitable land uses such as car-parking and large road intersections
- Dependency on non-renewable resources like oil and gas
- Responsibility for generating greenhouse gas and local exhaust emissions.

Walkable neighbourhoods provide:

- Greater accessibility for all groups of people within the community, including children and people who do not drive
- Opportunities for personal activity and exercise that help reduce obesity rates in the community
- High levels of social amenity to local residents and visitors
- Environments that are active and therefore safer ? crime and anti-social behaviour is less likely to take place where there are comparatively higher numbers of people
- Building and streetscape treatments built at a human scale which makes them more attractive providing greater opportunities for landscaping
- Greater sense of community and belonging as there is more regular interaction with local people and businesses with shared experiences and interests.

Risks

To make walkable neighbourhoods viable, a development must have access to local services and high quality public transport (see Completion in Development Phase Actions).

This means that the success of the development is reliant on the existence of these services in the area, or upon successful negotiations with government and service providers to implement them as part of the project.

If government or private transport operators are not supportive of walkable developments, and are not prepared to assist with or provide high quality services (see glossary for definitions), the viability of the development could be put significantly at risk.

Savings

Walkable neighbourhoods require less space for motorised transport on streets, individual housing lots, or in the basements of apartment and office buildings. This has the potential to reduce the land-take required for transport infrastructure, and increase the portion of land that can be allocated to income generating activities.

The primary savings arising from walkable neighbourhoods are captured in the reduced cost of construction for apartment and office blocks, and in the reduced costs of transport for residents and other end-users. Such features can enhance the market value of developments as petrol and energy prices continue to increase.

Costs

Costs to consider ? a walkable neighbourhood shopping list

●Traffic calming and management

Traffic calming and management is achieved through the use of lighting, signals, signage and the strategic use of street furniture.

●Pedestrian-friendly lighting

provides adequate illumination of the walking surface, as opposed to conventional street lighting that provides illumination in the middle of the roadway for the use of cars.

●Standard crosswalk

striping and signage

●In-pavement lights

embedded in the pavement on both sides of pedestrian crossings and oriented to face oncoming traffic can be used to alert motorists to the presence of a pedestrian crossing or preparing to cross the street.

●Flashing overhead crosswalk signs

are flashing beacons that are activated when pedestrians are crossing.

●Pedestrian detectors

provide the means to automatically detect the presence of pedestrians in either the targeted curbside area and/or while moving in a designated crosswalk area. It may replace standard push buttons used to activate the pedestrian call feature.

●Count down signals

can be used in conjunction with conventional pedestrian signals to provide information to the pedestrian regarding the amount of time remaining to safely cross the street.

●Patterned concrete or pavers

can be used to warn motorists to expect pedestrians and create a more interesting and aesthetically appealing walkway.

●Planter boxes

can be used to create interest in streetscapes that act to slow road users and provide pleasant scenery for pedestrians.

●Benches

can also be used to create interest in streetscapes and provide places for pedestrians to rest and socialise. Strategic placement of benches create 'eyes on the street' that are useful in providing passive surveillance for homes, businesses or other public amenities such as bike racks and bubblers.

●Street trees

are useful in providing shade and shelter for pedestrians, and interest in streetscapes, but they also act as deterrents for speeding vehicles because they often reduce forward visibility.

●Traffic reduction

can be achieved by providing additional infrastructure that allows able pedestrians to become cyclists for longer trips. Cycling is facilitated by the provision of bike paths and bike storage areas. This is particularly useful if access to public transport is more than 100 metres away from homes or local businesses. Bike lockers at bus depots and train stations expand the catchment of these transport services by a further 500 metres.

Consult your suppliers for current costs and availability of these items.

Barriers

It is important that reasons why people don't walk are kept in mind at all stages of the development. Problems with the physical environment are the most obvious deterrent to walking, but it is also important to anticipate social

and institutional barriers in the feasibility, planning, design and construction phases. A holistic view is needed to ensure the maximum benefits.

Physical barriers to achieving a walkable neighbourhood

Lack of confidence in the walking infrastructure and confusion about which route to take, or how far it is to a destination, contribute to a resident or visitors perception that they lack time to make journeys on foot, and make private car travel seem more convenient.

These barriers are created by:

- Longer distances imposed by poorly planned road layouts, barriers, footbridges and subways
- Lack of continuous pedestrian routes created either by missing sections or by unsuitable crossing treatments which also create gaps in the route
- Lack of signage to potential destinations
- Uncertainty about whether a route is fully accessible
- Poor-quality walking surfaces (cracked, uneven or slippery)
- Obstacles on the footpath, including poorly placed street furniture
- Lack of footpath maintenance, including litter and overhanging vegetation.

Safety related barriers to achieving a walkable neighbourhood

Fear of adverse health effects, being attacked in isolated or potentially risky areas, or being injured by other forms of traffic (ie bikes, skaters and private cars) also contribute to a reluctance to make use of available walking routes.

These barriers are created by:

- Lack of rest areas and seating
- Lack of shade
- Lack of shelter from inclement weather
- Poor-quality lighting
- Speeding traffic
- Traffic fumes and noise.

Social barriers to achieving a walkable neighbourhood

Poorly planned block and road layouts, which give priority to motorized traffic, contribute to the perception that pedestrians have a low social status in relation to car drivers.

This perception can be reinforced by:

- Failures to plan for street frontages that enhance the aesthetics and amenity of this public space for pedestrians.
- Tolerance of obstructions placed on footpaths by third parties
- Failure to enforce restrictions about parking on footpaths.

Institutional barriers to achieving a walkable neighbourhood

In deciding to develop with walkability in mind, you are likely to encounter a number of institutional barriers that relate to the fact that it has not been a priority for many decades.

You should anticipate and prepare for difficulties in:

- Justifying walking schemes through 'traditional' economic criteria
- Finding research into pedestrians and walking journeys
- Quantifying changes in pedestrian numbers as a result of potential interventions
- Countering the effects of businesses paying mileage travel allowances to car drivers for very short trips
- Finding or accessing resources allocated to walking schemes.

Sustainable developments that provide the best outcomes for pedestrians and cyclists are not necessarily part of the established thinking on road and pedestrian safety. You may need to allocate time and money for dealing with barriers that have become established in state and national safety standards.

You are likely to encounter a lack of knowledge and expertise, among infrastructure providers and professions, on ways to provide for walking or practices that restrict walking - concern for pedestrian safety can result in walking being made less convenient. You will also encounter arguments that it is inevitable that the volumes and speeds of motorized traffic will increase, and that this must be accommodated.

These issues can provide extra expense in terms of getting expert advice in addressing the stated goals of standards in a non-standard way.

Benchmarks

Leed Rating System - U.S. Green Building Council

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, has been designed to encourage and accelerate global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.

Green Building Case Studies

Development phase actions

Feasibility

Achieving the goal of walkability in a new development requires attention at every phase of the project, to ensure that appropriate decisions are made in assessing the feasibility of the project, planning of block structures, design of street treatments, choice of materials and construction techniques.

The decision to pursue a walkable development needs to be made when assessing the potential feasibility of the project.

First, proximity to existing facilities and access to high quality public transport services needs to be assessed. If these are not present, they will need to be provided as part of the development, affecting costs and timing.

Second, the general nature of block structures and access routes throughout the development are critical to walkability, which in turn affects the portion of land that can be sold for residential or commercial development.

A key question is: what market price can be achieved for walkable developments in a particular location, as distinct from those that are highly car dependent?

Planning

Land-use and transport zones are the foundations for a walkable neighbourhood. A walkable development will generally give equal priority to pedestrian and bicycle access as it does to private cars and primary access routes throughout the development must allow quick and easy access to a variety of non-residential land-uses and facilities are located within easy walking distance throughout the development.

Design

Once land-use and transport zones have been determined, the details of streetscapes need to be designed to accommodate walking.

This is not as simple as it might seem. Pedestrians come in all shapes, sizes, ages and abilities. Many of them come in pairs or groups. Some use wheelchairs or prams, and others may use some form of walking assistance.

Design Issue 1 – There is more than one kind of pedestrian

Type of pedestrian	Sub groups
Unassisted	Able pedestrian Runner/jogger Adult pedestrian Young pedestrian
On small wheels	Pedestrian with a pram In-line skates Roller skates Skateboards Kick scooters

Mobility impaired	Impaired pedestrian Aged pedestrian Pedestrian with a walking frame Pedestrian with a cane Pedestrian with a guide dog Sensory impaired pedestrian Mobility scooters Manual wheelchairs Electric wheelchairs
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Design Issue 2 – Different Pedestrians have different needs

All pedestrian types require a particular amount of space to walk in, and a successful walking route will need to accommodate passing and overtaking.

Source: *Pedestrian planning and design guide: The principles of pedestrian network planning., Land Transport New Zealand*

As seen in the diagram above, a clear width of 1000 mm is adequate for people with ambulant disabilities. It just allows passage for 80 percent of people who use wheelchairs. People who use wheelchairs require a clear width of 1.2 metres.

A clear width of 1500 mm allows a wheelchair and a pram to pass, but to allow two wheelchairs to pass comfortably, a clear width of 1.8 metres is required.

Issues to consider based upon different pedestrian types

Pedestrians vary widely in their physical abilities and judgement. For example, children’s heights and varying abilities at different ages need to be considered. Older pedestrians are experiencing declines in speed of reflexes, hearing and sight. Abilities can vary during the course of the same walking journey as the pedestrian becomes tired or acquires an encumbrance such as a parcel or a child. Clusters of pedestrians with similar characteristics may be found at some types of land use, such as children in the vicinity of schools.

Design Issue 3 – Speed Kills and Pedestrians Know It

A walkable development will generally give equal priority to pedestrian and bicycle access as it does to private cars. Reducing car travel speeds is important as high speed traffic makes pedestrians feel unsafe and deters people from engaging in other uses along streets – such as outdoor eating, walking with young children and pets and stopping to have conversations.

This is done by reducing the design speed of roads and where possible giving priority to public transport. Ensuring that car travel speeds remain relatively slow throughout the development can be achieved in several ways and each has advantages and disadvantages.

These include:

- **Traffic calming features.** These can include roundabouts, chicanes and speed humps – features that slow traffic through either the horizontal or vertical displacement of vehicles. These can be problematic if there are not enough of these features as drivers respond by slowing and speeding up rapidly, which can create problems with

noise.

•**Reducing lane widths.** Drivers instinctively travel slowly when lanes are narrow. While widening lanes may be viewed as a way of making roads safer, it can actually increase accident rates and conflicts between pedestrians and cars due to higher travel speeds.

•**Shared pedestrian access features.** Drivers and pedestrians must communicate with each other in designated shared access areas. This affects driver behaviour, in that travel speeds are reduced and awareness of pedestrians and other road users is higher. In other words, drivers do not take for granted that they have priority. Programs like Naked Streets initiated by Hans Mondermann and Kensington High Street in London provide good examples of this approach to street design.

Design Issue 4 – Pedestrians need landmarks

The design of the development is also an opportunity to introduce a public art program and increase the legibility of the development. Public art assists walkability by creating landmark features that distinguish street corners and streetscapes throughout the access and transport routes for the development. These help pedestrians to navigate their way through a neighbourhood while at the same time help to create interest and a sense of place. These could, for example, be sculpture and decorative pavement features that celebrate local indigenous and non-indigenous history or landscape and natural features of the area.

Case Study: Crown Street Glasgow – street art, mixed use, human scale

Design Issue 5 – Avoiding conflicts between pedestrians and cyclists

Where people walk, they are also likely to cycle. Pedestrian routes should be seen as potential cycle routes if the road spaces are not designed for the full range of road users. This means that it is worthwhile anticipating potential conflicts by creating routes that can accommodate both pedestrians and cyclists.

Minimum dimensions of shared paths (Source: Table 6.3 of Austroads Part 14)

	Local access path	Commuter path	Recreational path
Desirable	2.5m	3.0m	3.5m
Acceptable	2.0 - 2.5m	2.0 - 3.5m	3.0 - 4.0m

Speeds also contribute to conflicts between pedestrians and cyclists

Bikes travel much faster than all pedestrians. A fit, healthy adult will generally travel at a mean speed of 1.5 m/s (15th percentile (15%ile): 1.3 m/s), and the aged and those with mobility impairments travel more slowly, at around 1.2 m/s (15%ile: 1.0 m/s). The vast majority of people walk at speeds between 0.8 metres per second (m/s) and 1.8 m/s (2.9 kilometres per hour and 6.5 km/h)

Mobility scooters can travel faster than most pedestrians, but may take time to manoeuvre between different road and footpath levels.

Construction

If it wasn't planned for in the design phase, it won't happen in the construction phase, but the best laid plans can be ruined by a lack of attention to detail during the construction phase.

It is important to ensure that construction teams understand the walkability objectives of the development. In this way, construction details and choice of materials for pavement and street treatments can be selected so as to be most compatible with walking.

Things to keep in mind when choosing materials or when construction phase revisions of plans are undertaken:

•Maximum friction between the foot and the pavement

Because of the complex nature of friction measurement and performance, international requirements are not uniform. However, this will be affected by the presence of lubricants such as water, any surface treatments such as sealers, and the deterioration of the chosen surface over time. Polished hard surfaces can become slippery due to the presence of fine dust or grit as well as by water.

Official guidance for applying these standards is provided in *An introductory guide to the slip resistance of pedestrian surface materials* HB197:1999 and *Slip resistance of pedestrian surfaces?guide to the reduction of slip hazards*. It is advisable to provide a safety factor by exceeding the requirements of the standards, thereby catering for activities such as running that require more friction.

•Minimum changes to the height of the walking surface

A pedestrian trips when the surface being walked upon has an abrupt increase in height that is large enough to snag the toe of a shoe and cause the pedestrian to lose balance.

Testing used as a guide for pedestrian road treatments in New Zealand indicates that a change in the surface of a path, by even half a centimeter, can be problematic for older pedestrians (Murray). Based on this analysis, 6 mm is commonly used as the intervention standard for sudden changes in footpath level, but a stricter standard would appear to be justified.

Lot Creation

It is important that during the lot creation and selling process prospective residents understand that the development is a walking-based community. It is important not to set up expectations that you have no intention of meeting, and clear communication will assist in minimizing this risk and maximizing the appeal of the development for those who are genuinely interested in sustainable living.

Completion

Once a development nears completion and residents and businesses begin to move into a new neighbourhood, it is critical that services needed to make basic features of the development functional are in operation.

If local public transport services are not available, for example, people may be compelled to drive more which will raise local traffic volumes and impact on the amenity of local areas. If local schools and retail services are not available, the need to drive cars will over-ride opportunities for walking. This has the potential to undermine the design and amenity goals of the development as interim measures may be introduced to facilitate car-use such as larger intersections and car-parking facilities. Such measures could become permanent fixtures.

The introduction and phasing in of services is a critical aspect of development completion. How well this is

carried out will determine the extent to which the benefits derived from making developments walkable can be realised.

Links

- [Walk 21 Charter](#)
- [Mobility management: design for active transport factsheet](#)

References

Bentley, I., Alcock, A., Murrain, P., McGlynn, S. and Smith, G 1985, *Responsive Environments: a manual for designers*, Architectural Press, London.

Gehl, J 2001, *Life between buildings: using public space*, The Danish Architectural Press, Copenhagen.

Institute for Transport Studies, 2008 (originally published in January 2003), *Transport strategy: a Decision-Maker's Guidebook*, University of Leeds, Leeds.

NZ Transport Agency (NZTA), 2008, *Pedestrian planning and design guide: The principles of pedestrian network planning*, New Zealand Government.

NSW Department of Planning, 2004, *Planning guidelines for walking and cycling*. NSW Government, Sydney.

Queensland Transport, 2006, *Cycle Note 2: Reducing conflict between bicycle riders and pedestrians*, Queensland Government, Brisbane.

Tolley, R 2007, *Sustainable transport: planning for walking and cycling in urban environments*, Taylor and Francis, London.

Link to Content

- <http://yourdevelopment.org/factsheet/view/id/70>