



# Footpath design

A guide to creating footpaths that are safe, comfortable, and easy to use

November 2013

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Institute for Transportation  
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# Introduction

Walking is fundamental to urban life. It is a healthy and pollution-free form of mobility and recreation. Pedestrian trips account for a quarter to a third of all trips in many Indian cities. However, the poor quality of pedestrian infrastructure sends a message that pedestrians are not welcome in the urban environment.

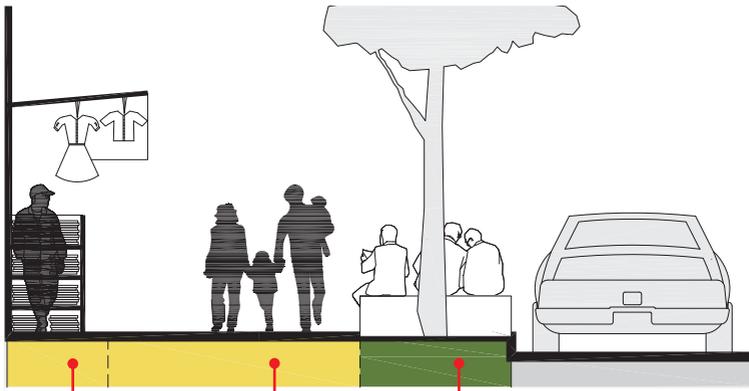
Fortunately, street design practice in India is beginning to recognise the integral role of walking in any sustainable transport system. Increasingly, engineers and planners are emphasising the need to design “complete streets” that make walking safe, comfortable, and convenient. Reflecting this changing outlook, the Indian Road Congress’ (IRC) First Revision of the *Guidelines for Pedestrian Facilities* represents a significant departure from traditional traffic engineering practice, which focused on maximising personal motor vehicle speeds at the expense of other street users. The *Guidelines* emphasise the need to design streets for all users and activities, including the social and economic activities that make Indian streets so vibrant. As explained in the guide:

“Developing a pedestrian environment means more than laying down a footpath or installing a signal. A truly viable pedestrian system takes into account both the big picture and small details—from how a city is formed and built to what materials are under our feet” (IRC:103-2012, 2.3).

The Institute for Transportation and Development Policy (ITDP) offers this quick reference guide to highlight key concepts from the IRC *Guidelines*, including footpath design standards that have been updated in the present Revision. The guide also draws from local and international best practice for some themes not covered in the IRC publication. Practitioners looking for more a more comprehensive resource on street design should refer to ITDP’s *Better Streets, Better Cities: A Guide to Street Design in Urban India*, available at [www.itdp.org/betterstreets](http://www.itdp.org/betterstreets).

# Zoning system

Comfort, continuity, and safety are the governing criteria for the design and construction of pedestrian facilities. For this reason, the footpaths are divided into three main zones: the frontage zone (also known as “dead width”), the pedestrian zone, and the furniture zone. Each of these zones plays an important role in a well-functioning footpath.



## Frontage zone.

The frontage zone can vary from a minimum width of 0.5 m along a compound wall to 1.0 m in commercial zones (IRC:103-2012, 6.1.5.3).

## Pedestrian zone.

The pedestrian zone provides continuous clear space for walking. The clear width must be at least 1.8 m in order to accommodate two wheelchair users at the same time (IRC:103-2012, 6.1.3) and must be entirely free of obstructions (IRC:103-2012, 6.1.10.2).

## Furniture zone.

Manholes, trees, benches, utility boxes and other potential obstructions should be placed outside the path of travel along a continuous line (IRC:103-2012, 6.1.10.2, 6.11.4).



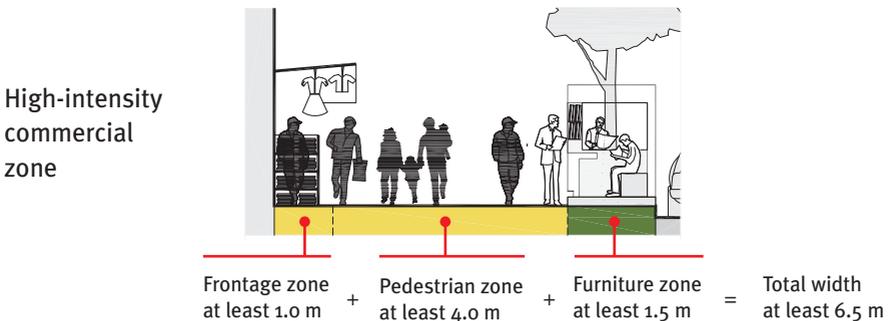
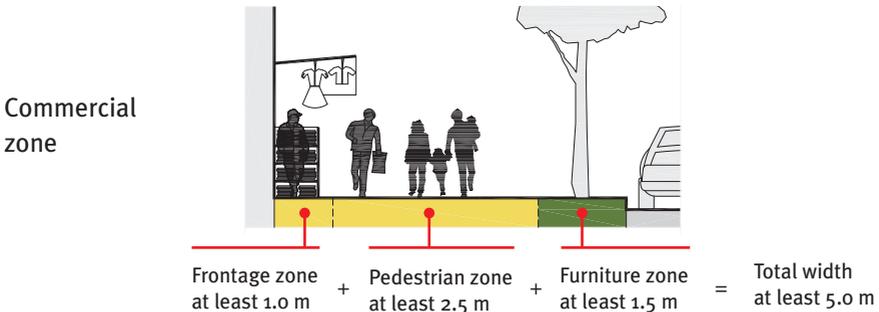
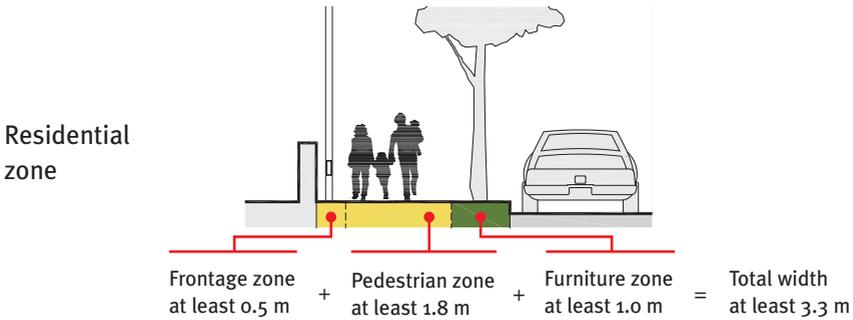
✗ The absence of a pedestrian zone forces pedestrians to walk in the carriageway. Utility boxes should be placed in the furniture zone, leaving clear space for pedestrians to walk.



✓ Footpaths designed as per the zoning system provide uninterrupted walking space for pedestrians.

# Width

The width of the of the footpath can vary as per the adjacent land use. Footpaths in residential areas require a minimum clear width of 1.8 m, which is enough space for two wheelchairs to pass each other. For commercial areas, the clear width should be at least 2.5 m (IRC:103-2012, 6.1.5.2).



# Height

The height of the kerb above the carriageway should not exceed 150 mm (IRC:103-2012, 6.1.4).



✗ Excessive heights make footpaths hard to use, and many pedestrians prefer to walk in the carriageway.



✓ Footpaths with a height of no more than 150 mm are more likely to be used.

# Surface

Footpaths should have flat walking surfaces, allowing for proper drainage and preventing puddles from forming (IRC:SP:50 and IRC:103-2012, 6.1.6). Guide tiles should be laid along the length of the footpath to assist persons with vision impairments (IRC: 103-2012, 6.1.4).



✗ An uneven surface can make a footpath difficult to use.



✓ Footpaths with proper surfacing can be used by pedestrians.

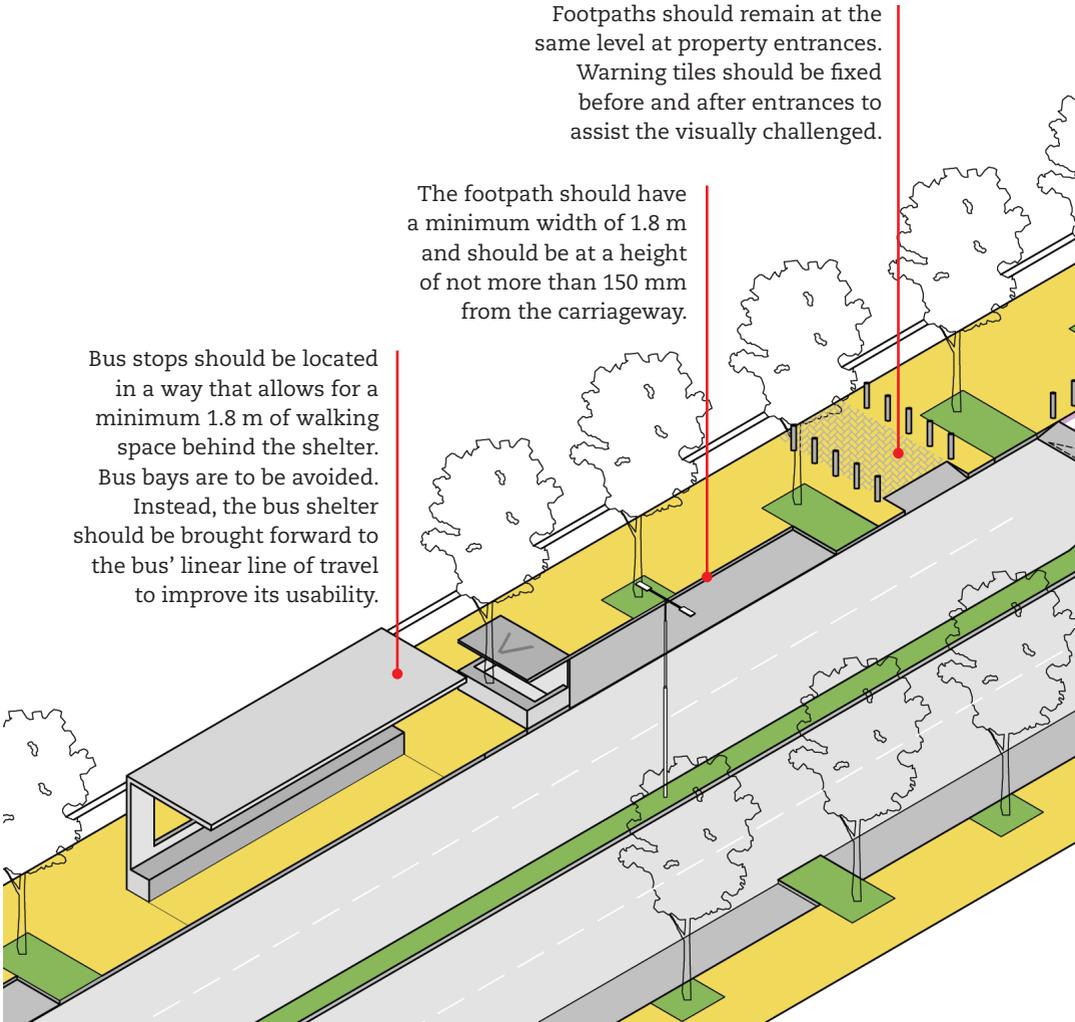
# Footpath elements

Well planned footpaths provide continuous space for walking. They also support other activities such as street vending and waiting at bus stops without compromising pedestrian mobility. The success of a footpath depends on the integration of multiple elements in a coherent design.

Footpaths should remain at the same level at property entrances. Warning tiles should be fixed before and after entrances to assist the visually challenged.

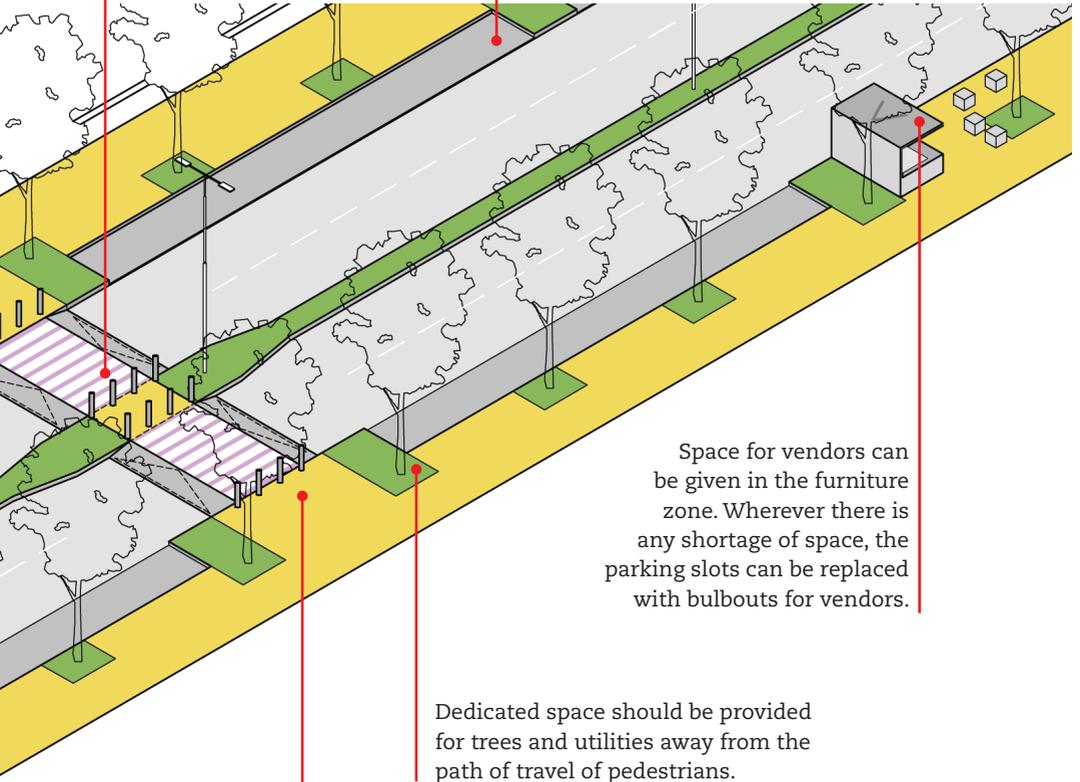
The footpath should have a minimum width of 1.8 m and should be at a height of not more than 150 mm from the carriageway.

Bus stops should be located in a way that allows for a minimum 1.8 m of walking space behind the shelter. Bus bays are to be avoided. Instead, the bus shelter should be brought forward to the bus' linear line of travel to improve its usability.



A tabletop pedestrian crossing should be provided at an interval of at least every 200 m. The crossing should be at the same level as the footpath.

Parallel parking for cars uses space efficiently and increases safety for vehicles exiting the parking bay. The same space can be used for perpendicular parking of two wheelers. Material for the parking bay should be different from that used for the carriageway.



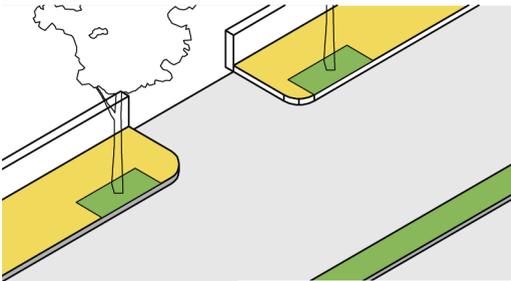
Space for vendors can be given in the furniture zone. Wherever there is any shortage of space, the parking slots can be replaced with bulbouts for vendors.

Dedicated space should be provided for trees and utilities away from the path of travel of pedestrians.

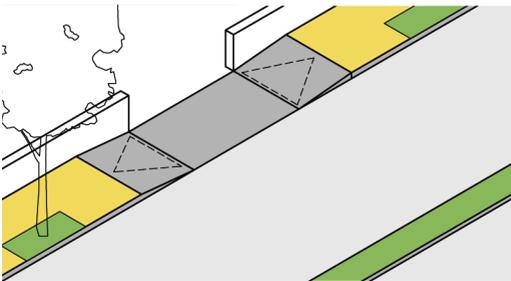
Bulbouts at pedestrian crossings reduce the walking distance across the carriageway.

# Property entrances

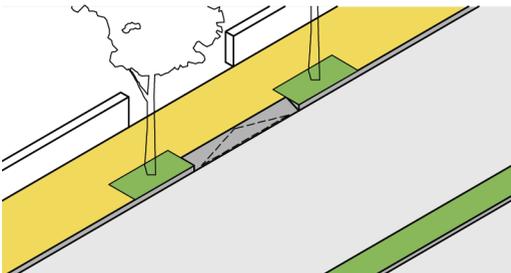
Footpaths must be continuous even at property entrances for uninterrupted pedestrian movement. The height of the footpath should remain the same. Warning tiles must be laid on either side of the property entrance in order to warn visually challenged persons about possible vehicle movement (IRC 103-2012, 6.4.3). Bollards should be installed to prevent vehicles from parking on the footpath, leaving a clear width of at least 1.2 m (IRC:103-2012, 6.12). At every property entrance, an appropriate material should be used to avoid damage due to vehicle movement.



✘ Ending the footpath with abrupt curbs renders the footpath inaccessible for many pedestrians.



✘ Lowering the entire footpath to the level of the carriageway is unacceptable as property entrances may become waterlogged.



✔ Where required to provide the access to private properties, vehicle ramps should be provided in the furniture zone.



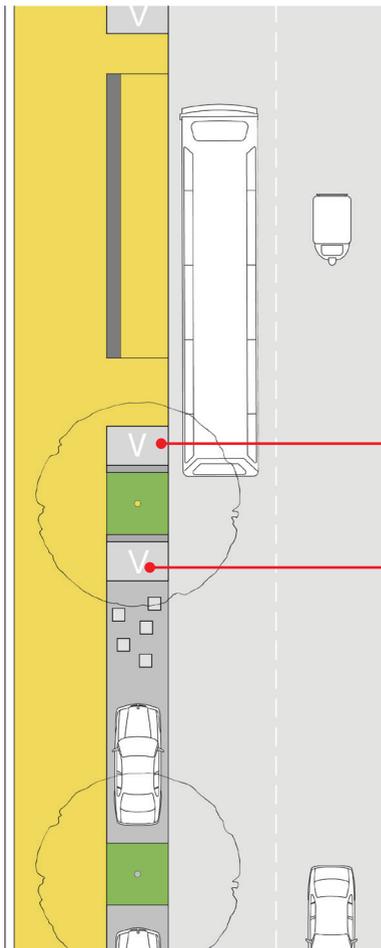
- ✗ A footpath that constantly changes levels discourages pedestrians from using it. Pedestrians prefer to walk on the carriageway instead.



- ✓ Footpaths that maintain a constant level through property entrances are convenient for pedestrians to use. Vehicles use a ramp, helping to reduce speeds.

# Vending

Street vending provides essential goods and services to a wide range of population groups. It also makes public space safer by contributing “eyes on the street,” particularly on streets lined with compound walls. If designed properly, vending can be accommodated in the streetscape without interfering with other uses. The furniture zone of the footpath or a bulbout in the parking lane are ideal locations for vending (IRC:103-2012, 6.11.2). The material used for the vending area should facilitate good drainage. (IRC:103-2012, 6.11.3).



Vending spaces should be placed in a bulbout in the parking lane (as pictured here) or in the furniture zone, leaving clear space for pedestrian movement.

Vendors tend to be attracted to spaces under trees or close to bus stops. Vendors also prefer spots that are visible to passersby.



✗ If streets do not provide designated zones for vending, these activities can become obstructions to the movement of pedestrians.

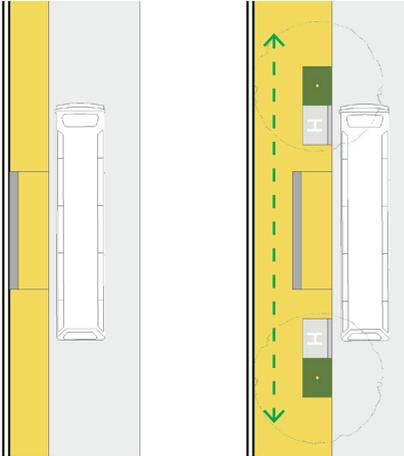


✓ Footpaths should be designed such that there is sufficient space for vending outside of the pedestrian zone (IRC:103-2012, 6.11.2).

# Bus stops

The inappropriate positioning of bus stops often results in commuters standing in the street while waiting for the bus. To avoid such a situation, bus stops should be placed adjacent to the bus' linear line of travel so that the bus does not need to pull over to the left (IRC:103-2012, 6.10). Bus bays should be avoided because they increase travel time for bus users. The position of the bus stop should always leave clear space for walking behind the shelter.

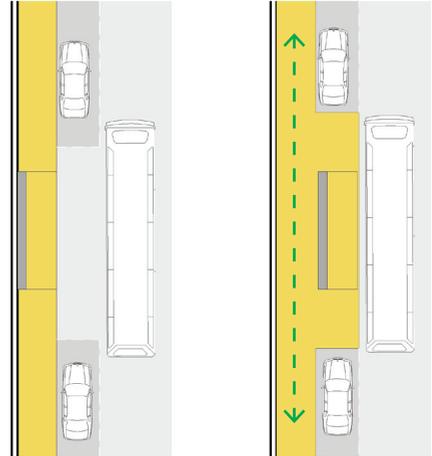
## Streets without on-street parking



**X** In places where the bus stop interferes with the movement of pedestrians, the footpath should be redesigned to avoid conflict.

Where a larger width is available, the bus stop should be placed in the furniture zone, leaving at least 1.8 m of clear width between the bus shelter and the edge of the right-of-way.

## Streets with on-street parking



**X** If there is a parking lane between the footpath and the carriageway, the bus stop must be placed on a bulbout in the parking lane, giving passengers direct access to the bus and pedestrians a clear width of at least 1.8 m behind the bus shelter.



✗ If bus stops are placed away from the bus' line of travel, passengers are forced to step into the street to board the bus. In addition, the bus stop blocks the entire width of the footpath, so pedestrians not using the bus stop need to walk in the street.

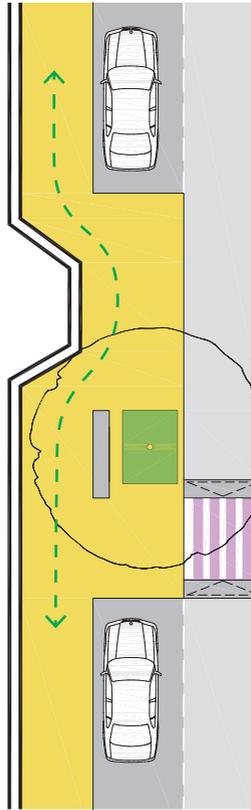
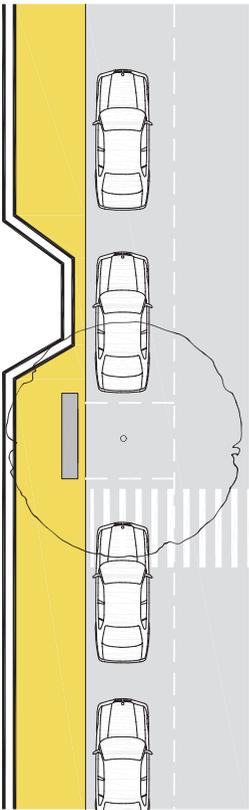


✓ This bus stop is located on a bulbout in the parking lane. Passengers can board directly from the curb rather than stepping into the street. Clear space for pedestrian movement is provided behind the bus stop.

# Parking bays

Parking is a flexible street element that should only be provided where there is sufficient space in the right-of-way after adequate provisions have been made for pedestrian facilities.

The material for the parking areas should be different from that of the carriage way to help define where parking is permitted and to prevent high-speed driving through parking bays.



Parking bays should be avoided at intersections, bus stops, mid-block crossings, or locations with unavoidable changes in the right-of-way that would compromise the width of the footpath.

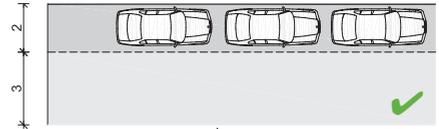
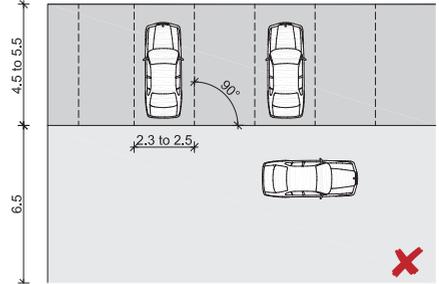
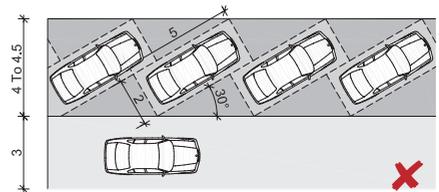
Where there is insufficient space for tree pits, utility boxes, street furniture, or vending on the footpath, the footpath should be extended through a bulbout in the parking lane.



✗ Angular and perpendicular parking occupy a large portion of the right-of-way. Exiting the parking bay can be dangerous because drivers have limited visibility.



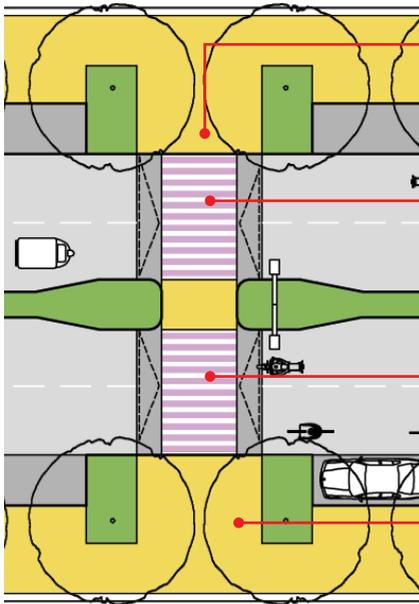
✓ Parallel parking for cars is preferred over angular or perpendicular parking because it saves space and is safer while exiting the parking bay. Parallel parking also doubles as perpendicular parking for cycles and two wheelers.



The standard width for a parking lane is 2 m. The maximum dimensions for a regular parallel car parking should not exceed 2.5 m x 6.0 m. For disabled parking, a bay of 3.6 m x 6.0 m should be provided (IRC 103-2012, 6.16.2).

# Pedestrian crossings: Mid-block

Formal mid-block pedestrian crossings should be provided at regular intervals (i.e., at least every 200 m) to ensure that pedestrians have a safe place to cross. To ensure safety, formal crossings should be signalised or should be constructed as tabletop crossings with ramps for vehicles. The purpose of a tabletop crossing is to reduce vehicle speeds and also emphasise the presence of the pedestrian crossing. Warning tiles should be laid wherever there is a pedestrian crossing (IRC: 103-2012, 6.7).



**Accessibility.** Warning tiles should be placed at the edge of the footpath to warn the visually challenged about the carriageway.

**Height.** Crosswalks should be elevated to a level of the adjacent footpath (150 mm above the road surface) with ramps for motor vehicles with a slope of 1:5 to 1:8 (IRC:103-2012, 6.7.4.1).

**Width.** Crossings should be as wide as the adjacent footpath and never narrower than 3 m (IRC:103-2012, 6.7.2)

**Crossing distance.** Pedestrians must be given the shortest possible direct route to cross the street (IRC:103-2012, 6.7.4.1). The bulbout into the parking lane helps reduce the crossing distance.



✘ The absence of raised a traffic-calmed crossing allows for vehicles to drive at high speeds, making it dangerous for pedestrians to cross the road.

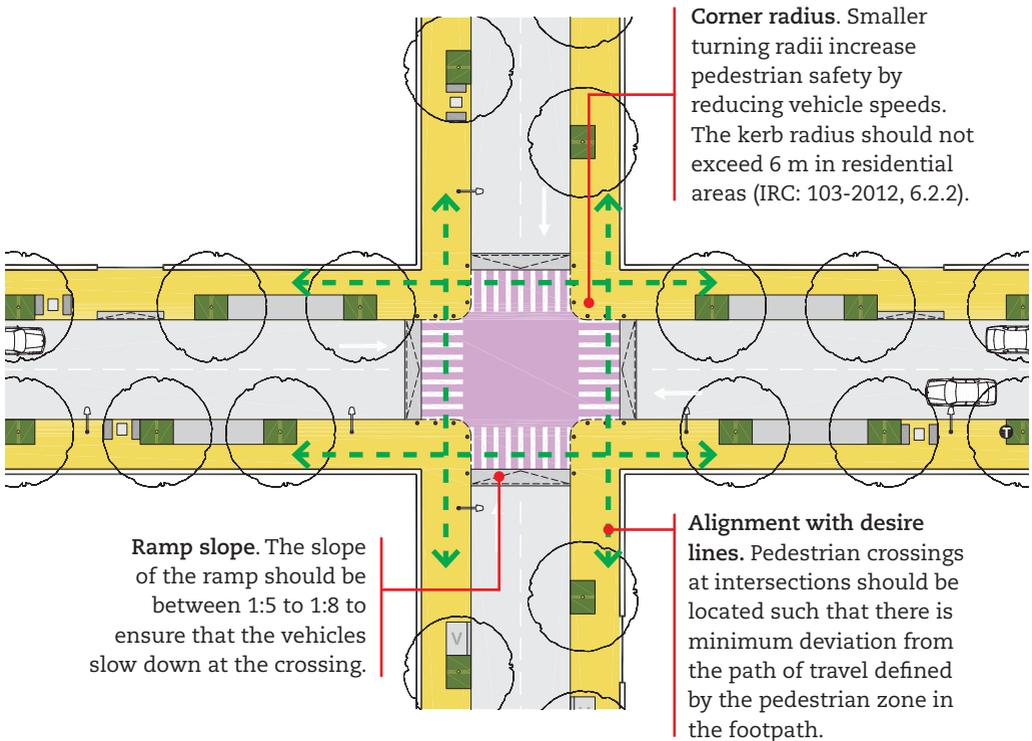


✔ Raised crossings compel vehicles to reduce their speed, thereby increasing pedestrian safety.

# Pedestrian crossings: Intersection

Intersection design should manage conflict in a way that enhances safety for pedestrians. The preferred design is to raise the intersection to the level of the footpath. Vehicles slow down when crossing over the ramp, and a material difference emphasises that they are entering a shared space. Ramps should be provided at all intersections that are not signalised to ensure that pedestrians can cross safely.

Where raised crossings are not provided (i.e., at intersections that are signalised), the footpath should be ramped down to the level of the carriageway. The ramp should not be steeper than 1:10 (IRC: 103-2012, 6.5).





✓ Preferred design. The entire intersection is raised to the level of the footpath, compelling motor vehicles to slow down. The material difference alerts vehicle users that they are entering a shared space.



✓ Acceptable design for minor intersections. If the intersection is not signalised, it is acceptable to raise the crossings that are perpendicular to the minor arms while the crossing on the major arm is provided at grade.

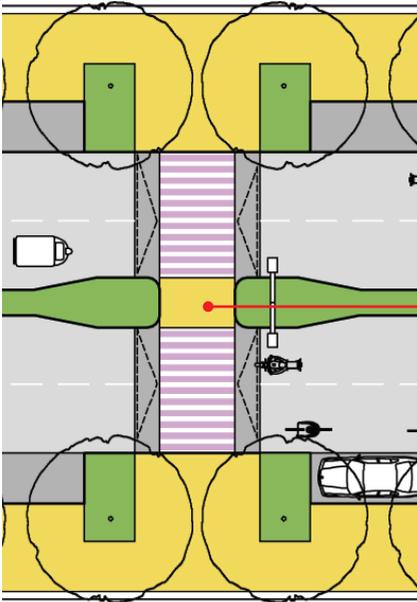


✓ Acceptable design for signalised intersections. If the crossing is at the level of the carriageway, each corner must be ramped. The width of the ramp should be at least 1.2 m, and the slope no steeper than 1:10 (IRC: 103-2012, 6.2.2, 6.5).

# Pedestrian refuges: Mid-block

Refuge islands in a mid-block crossing are essential when pedestrians need to cross more than two lanes. The islands gives pedestrians time to rest and reorient themselves before crossing the rest of the street.

Where median fences are installed, breaks should be provided at frequent intervals—i.e., wherever there is demand—to allow pedestrians to cross. Pedestrians benefit from safety in numbers when designated crossing points are provided.



**Refuge dimensions.** The refuge should be the same width as the pedestrian crossing and the depth should not be less than 2 m, enough to park a wheelchair (IRC:103-2012, 6.7.3.3).



✗ Railings should be avoided on footpaths and medians as they restrict pedestrian movements.

✓ Pedestrian refuges can also be at the carriageway level as long as they are delineated by bollards.



✓ A pedestrian refuge should be as wide as the crossing and should allow a high volume of pedestrians to wait before crossing.

# Pedestrian refuges: Intersections

Intersections must provide direct, intuitive pedestrian crossings. Designated crossings should reflect pedestrian desire lines, avoiding detours. Crossing distances should be minimised, and pedestrian refuges are required to give pedestrians a safe space to wait before crossing successive streams of traffic.

Wherever slip roads or turn pockets are present, raised table top crossings must be provided between the footpath and the triangular pedestrian refuge for safer crossing (IRC 103-2012, 6.7.3.3, 6.2.2). Slip roads or turn pockets should be avoided at intersections for streets with rights-of-way of 30 m or less. Pedestrian refuge islands must also be provided in medians. The refuges should be large enough to handle observed pedestrian volumes.



- ✗ Large turning radii and the absences of refuge islands can make crossing a street very dangerous for pedestrians. Here children are forced to walk amongst of fast moving vehicles while crossing.



✗ Islands that are blocked with fences or planted with vegetation are not accessible to pedestrians.

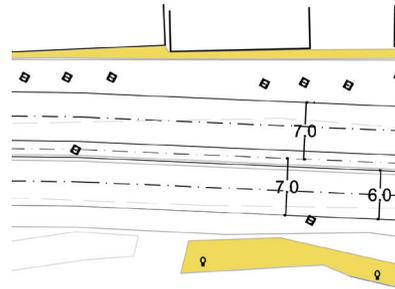


✓ Refuge islands can provide a safe place for pedestrians to wait for a green signal. They also reduce the crossing distance. The placement of refuge islands should reflect pedestrian desire lines.

# Design process

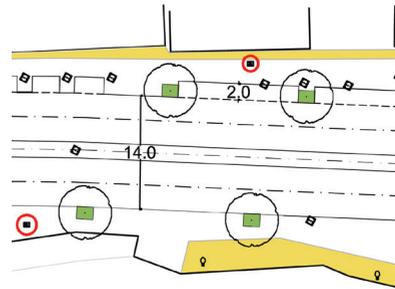
## Step 1

The designer begins by drawing the new centreline within the available right-of-way. Next, the number of traffic lanes is set and the centreline offset to create the kerb lines. The carriageway may not be larger than the width that ensures that the clear space available on the footpath never falls below the minimums specified in this guide (see pp 2-4). The carriageway width should remain constant to avoid creating bottlenecks.



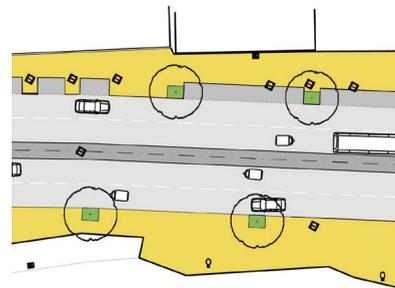
## Step 2

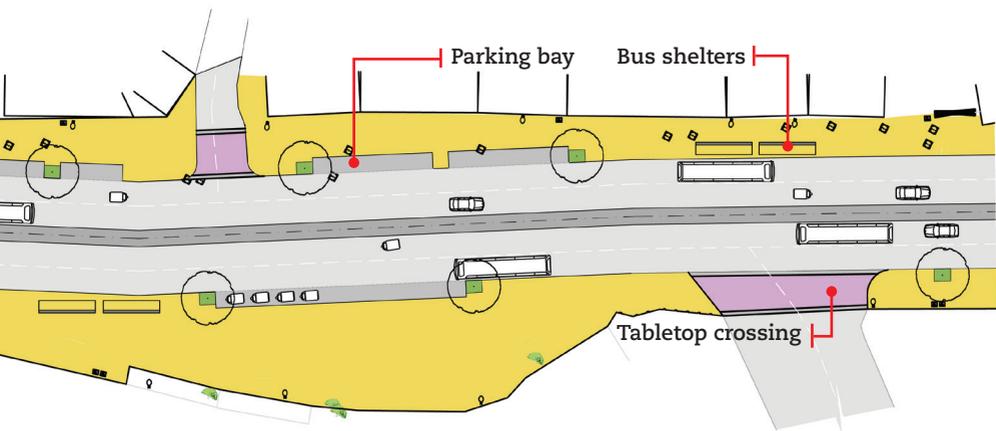
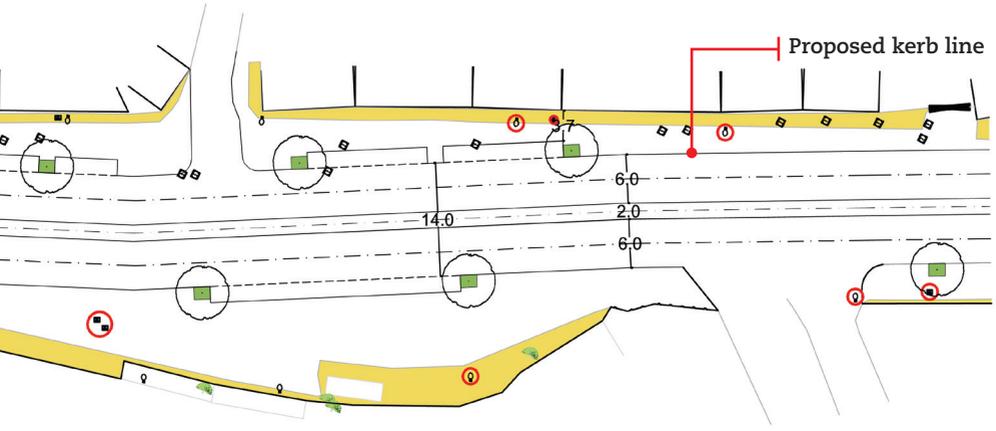
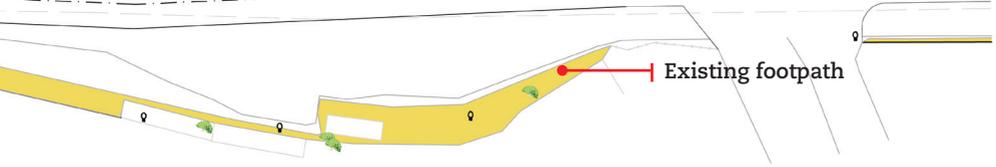
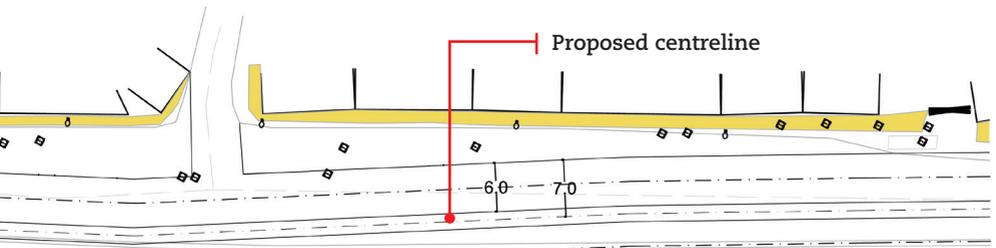
Once the centreline and curb alignment are fixed, the position of major elements such as parking bays, trees, and bus stops can be determined. The designer must ensure that none of these elements reduce the clear width of the footpath below the minimum requirement.



## Step 3

Finally, the detailed design is completed, including the placement of street furniture, utility boxes, and other elements. These elements should reflect the needs of pedestrians in the surrounding area. The position of the elements should follow the zoning system (see pp 2-3), leaving adequate clear space for pedestrian movement.





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