

INFRASTRUCTURE/ **NETWORK LINKS**

**CYCLISTS and PEDESTRIANS**

Overview

Cyclists and pedestrians mix easily. Their speeds are not so different and cyclists adapt their behavior. Cycling should be allowed in car-free zones. Mostly, this can be fully mixed, but a soft physical separation is preferred when there are many pedestrians. The benefits for cyclists are shortcut routes and comfortable access to destinations in the area. On narrow streets, adjacent or shared-use paths for cyclists and pedestrians can provide a safe and comfortable solution.

Background and Objectives

*Function*

Allowing cyclists to share space with pedestrians in car-free zones avoids detours (network directness) and makes destinations more accessible to cyclists (network cohesion). Where space is limited along road sections, sharing space with pedestrians can improve safety and comfort for both.

*Scope*

Outside the built-up area, there are few pedestrians and most often no pavements. When there is a separated cycle track, pedestrians often like to use this. Because of the low numbers of pedestrians, this causes no real problems.

Inside **built-up areas**, pedestrian densities are much higher. Pedestrians typically walk on a network of pavements and crossings, separated from traffic, including bicycles. There are, however, two situations when sharing their space with cyclists needs to be considered.

- Allowing cyclists access to **car-free zones** (also called pedestrianised or vehicle-restriction areas) helps them to avoid detours and give them easy access to central urban destinations in the area.
- When **space is restricted**, fully separate provision for cyclists as well as pedestrians may not be possible if quality design dimensions are respected. Sharing space between cyclists and pedestrians may be the best available option. The safety risk of mixing cyclists and pedestrians is much lower than mixing either with motorized vehicles.

However, if pedestrian densities are too high, sharing becomes ineffective, also for cyclists. It is generally recommended to consider sharing at values **not above 200 pedestrians per hour per meter of available profile width**. Below that, several design solutions are possible (see below).



Carfree area at Ghent, with access for cyclists (image source: T. Asperges)

## Implementation

### Definition

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Provision for cyclists sharing space with pedestrians includes two cases.

- **Cyclist access to car-free zones.** This usually only requires additional signage exempting cyclists from the restriction for vehicles. At higher densities, some kind of visual or level separation is used.
- **Adjacent or shared-use paths for cyclists and pedestrians.** In many countries (though not all) these solutions have a legal status and corresponding signage (see below). With adjacent paths, cyclist and pedestrian paths are separated but next to each other. With shared-use paths, cyclists and pedestrians mix on the same path.

### Cycling in car-free zones

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Most cities now have one or several, small or extended **car-free zones**. These are mainly in shopping streets in the **historic city centre** or in **secondary centres**. Motorized traffic is banned to reduce risk, noise and pollution and to upgrade public space. The broad objective is to create a pleasant shopping atmosphere and to highlight the historic, esthetic and cultural values on display. Thus car-free zones also become symbolic urban landmark areas for residents as well as tourists.

Mostly, these areas are defined as pedestrian-only areas. Usually, there are time windows when some vehicles are allowed in for local access and deliveries. It is **generally recommended to give cyclists access to car-free zones at all times** for a number of reasons.

- **Cyclists are not the target of the traffic ban.** The objective of a car-free zone is to eliminate the negative effects of motorized traffic. It does not make sense to ban cyclists, who cause little or no nuisance.
- For **cycling through-traffic**, car-free zones are often **direct, safe and attractive shortcuts**. If cyclists are not allowed through, a car-free zone becomes in effect a cycling barrier. The cyclist is forced to follow routes around, often on busy and dangerous roads. Alternatively, the cyclist may dismount and walk through. In any case, journey distance and time increase and the network becomes less direct and attractive. In practice, many cyclists will cycle through even if not allowed, if this feels like the safest, most comfortable route.
- For **cycling destination traffic**, car-free zones offer **safe, direct and comfortable access to destination points**. City centres most often concentrate many commercial, cultural and social facilities, at easy cycling distances. Cyclists need to be able to get as close to them as possible: they gain time, they can park more safely nearby and they can comfortably transport objects. Forcing cyclists to dismount or even park at the edge of the car-free zone greatly reduces directness and comfort. If there is a car-park right below the shopping area, using the car may become a more attractive alternative.

The benefits for cyclists are clear, but we need to weigh them against the potential nuisance for pedestrians. When mixing with pedestrians, it is the cyclist who is faster and a potential source of danger, possibly surprising and stressing pedestrians. However, recent empirical studies<sup>1</sup> have shown that generally **cyclists and pedestrians mix well** and that fears of nuisances for pedestrians are unfounded and exaggerated.

- **Hardly any pedestrians are concerned** about cyclists in a car-free zone once they are used to their presence. Often there is initial aversion from pedestrians when the scheme is announced and first introduced, but this usually evaporates after about one year's experience.
- Empirical studies show that **cyclists tend to adapt their behavior**. Observations show that pedestrians are less hindered by cyclists than the other way round: it is cyclists who need to be flexible. Cyclists lower their speed, dismount and take other avoiding action when pedestrian densities are high. Surveys show that they are very much aware of

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<sup>1</sup> Fietsberaadpublicatie nr.8, 2005: *Fietsers in voetgangersgebieden: feiten en richtlijnen* (NL), quantitative empirical observation; TRL Report 583, 2003: *Cycling in Vehicle Restricted Areas* (UK), quantitative empirical observation and attitude survey of pedestrians and cyclists.

unpredictable movements, especially by unsupervised small children. Fears of large-scale reckless driving by cyclists are unfounded.

- This explains why, as studies have shown, **accidents** between cyclists and pedestrians in car-free zones **are extremely rare**, and almost never serious.
- In practice, **cycling traffic is highly self-regulating**. When the pedestrian density makes cycling too difficult, cyclists will use an alternative route. The fear that pedestrians may be overwhelmed by masses of cyclists is again unfounded.

**Legally**, cyclists can be given access simply by adding **a sign exempting cyclists** from the restriction, in the same way that residents or delivery vehicles can be exempted. In most countries, **cyclists must give way to pedestrians in car-free zones**. The status of the area is therefore quite clear to all users. Still, additional signage may be considered to incite cyclists to behave as guests. In some countries, such as France, cycle access to car-free zones is the legal default option, unless there are duly justified counterarguments. Cyclists must drive at walking speed.

In addition to signage, it is recommended to provide **proper design solutions in proportion to pedestrian densities**. Pedestrian density is easy to determine: it is the combination of pedestrian intensities and profile width, expressed as the number of pedestrians per available meter. This proves to be the best indicator of the degree to which cyclists can share pedestrian space.

- At low pedestrian densities, **full sharing** is perfectly possible. Pedestrians and cyclists mix freely and both have full freedom of movement in all directions.
- At higher pedestrian densities, a form of **separation** is recommended. This is **not a legal separation**: cyclists are legally allowed across the entire width of the area. The objective is more psychological. A recognizable cycle path in the middle encourages both pedestrians and cyclists to remain in the space set aside for them. This way, they hinder each other less and the risk of collision is reduced. Cyclists are also channelled away from doorways from which pedestrians may emerge. At the same time, it aids orientation and makes flows of movement more effective all round. The disadvantage is that it segregates space and restricts movements for both types of user.

Dutch guidance, based on empirical research, suggests the following threshold indicators.

<b>Pedestrians per hour per meter of available profile width</b>	<b>Recommended design solution</b>
<b>&lt; 100</b>	Full sharing
<b>100 – 160</b>	Visual separation only
<b>160 - 200</b>	Visual and level separation
<b>&gt; 200</b>	Sharing not possible

The following design recommendations should be kept in mind.

- When **visual separation** is provided, make sure the cycling traffic path is **continuous and easy to recognize**. Usually a simple marking will suffice, possibly including cycle symbols and advisory cycle lane arrows<sup>2</sup>. The path may be underlined by street furniture.
- When **level separation** is provided, the cycling traffic path should be a **'soft' separation integrated into the physical street design**. The boundaries of both zones should gently slope and flow into each other, using different materials and colors. Cycle symbols may be added. If the separation is too 'hard' (too high, a vertical partition, plantation) leaving and entering will be uncomfortable for cyclists and pedestrians may trip over it.

<sup>2</sup> For advisory lanes, see fact sheet CYCLE LANE

In making the choice, also keep in mind the following points.

- When defining pedestrian densities, take into account the **actually available space**: pavement cafés, bicycle racks or other urban street furniture all reduce available width.
- Take into account **fluctuation of pedestrian densities**. On busy shopping days, such as Saturdays and late night shopping evenings, cycling may be impossible. This is no reason to ban cyclists for the rest of the week. If necessary, cycling may be banned within those limited time windows.
- **Consider a cycling ban only exceptionally**. A cycling ban in general is difficult to enforce, especially when it goes against spontaneous behavior. It should only be considered when and where cycling is clearly hazardous and when a high-quality alternative route is available. Some regulators may want to ban cycling as a safety precaution, even when cycling is still possible and there is no reasonable alternative. Cyclists will find such a prohibition illogical and will not respect it. This way, pedestrians will be even more surprised and legitimately angered.
- **The mobility impaired have contradictory needs**. For wheelchair users, a difference in level is an obstacle, but for the visually impaired it is an aid in orientating and keeping clear of cyclists.
- **Avoid a legally separated space**. Marking a formal cycle lane or creating a separated cycle track may seem attractive to cyclists: they can claim their own reserved space and can drive faster. However, for the same reasons, the risk of collisions with straying pedestrians increases. Also, this will provoke mutual intolerance between users, both claiming the right to their territories. Finally, the pleasant quality of the car-free zone may suffer.
- Also **provide cycle parking facilities** in car-free zones when cyclists have access.



*Cycling in car-free zones, without and with visual separation (image source: P.Kroeze)  
Adjacent or shared cycling and pedestrian paths*

In many city streets, **space is constrained** and optimum solutions for all **competing space claims** are not possible. The first approach should be to try and free up space by reducing the claims of motorized traffic: reroute car traffic and take out a traffic lane; take out a parking lane; calm traffic to make mixing possible. Another approach for cyclists is to provide an attractive alternative cycling route, but if this imposes important detours, cyclists will keep using the narrow street.

If no alternatives are possible, road managers will try to accommodate all space claims one way or another. They may compromise on quality and provide **substandard provision for cyclists and pedestrians**: cycle tracks, cycle lanes and pedestrian pavements that are simply too narrow for safety and comfort. When cyclists feel endangered or are stuck in traffic, some of them mount on the pavement: this is generally illegal, and also uncomfortable due to the height of the pavement border. An alternative for cyclists is a advisory lane, but this may not be the most attractive solution, especially to inexperienced users.

Faced with these constraints, **adjacent or shared-use pedestrian and cycling facilities** may be considered.

- Moving pedestrians' and cyclists' paths together requires **less space**. The width for both can be safely reduced, because the speed difference is less important. Both cyclists and pedestrians are safely separated from motorized traffic. In case of need, they can encroach momentarily onto the other's space at little risk. They will have a better perception of space and safety than on separated lanes and pavements of the same width.
- An additional advantage is that cyclists and pedestrians can be **separated from the carriageway by a parking lane**. This way, there is less risk of collision with opening doors. As with all cycle tracks, the parking lane should be truncated and the path bent in to the carriageway before the intersection.<sup>3</sup>
- A disadvantage is that **pedestrians may resist**. They may feel that space is taken away from them, that cyclists should be on the carriageway and that space should be taken away from motorists.

If space is available, **physically segregated adjacent paths are preferred**. This is more comfortable and safer for all, especially in the presence of the mobility impaired.<sup>4</sup> Here are some recommendations.

- Apply the legally required **signage**. Regulation may impose the type of physical separation, such as a white line marking or a difference in level.
- Create a **physical separation** between the cycling path and the pedestrian path. There are various possibilities: a narrow verge, a slight difference in level (one or two centimeters), a sunken kerb or line markings or any combination of the above. The distinction may even be limited to a simple difference in material.
- Consider **low and short stretches of walls and railings**. This may be useful at locations with higher conflict potential, for instance at school entrances or other places where great numbers of people enter or leave at the same time. Walls and railings should be limited to short stretches, otherwise people will be trapped on one side and forced to make detours. They must also be kept as low as possible (below 1.2m) to reduce the risk of collisions with cycle handlebars. Hedges are not recommended, since they require more space and maintenance.
- Aim for a **recommended combined width of 4 m** or more, with a minimum of 3 m. Additional width (0.25 m) must be provided in case of vertical edges (distance from walls, parked cars).

If space for adjacent paths is lacking, consider **shared-use** facilities.

- Apply the necessary **signage** and regulations for shared-use zones.
- Aim for a recommended **width of 3 m**, with a minimum of 2 m.

Both solutions are also suited to **routes across parks**. Without through routes for cyclists, parks also become barriers in the cycle network. Cycling links through parks are highly attractive as short-cuts, safe routes away from traffic and generally pleasant experiences. These can be designed into new park designs, or created on existing park paths.

- The most attractive and least restrictive option is to **share existing paths**. Since pedestrian flows are generally low, this can be done simply by using vertical signage and some additional ground markings. If space allows, a physical separation may be created, but this may not fit in well with the park design.
- On highly-used main cycle links, **solitary cycle tracks**, uniquely reserved for cyclists, are recommended. Parallel pedestrian routes should exist or be created; otherwise pedestrians will feel restricted or walk on the cycle track anyway. In existing parks, pedestrians will not easily accept that a space up to now reserved to them is taken away for cyclists.

<sup>3</sup> See fact sheet INTERSECTIONS

<sup>4</sup> Design recommendations for adjacent and shared-use facilities are mainly derived from UK guidance.



Signage for adjacent and shared-use cycling and pedestrian paths (top UK, bottom BE)



Shared cycling and pedestrian route through Kensington Gardens (image source: St Albans Cycle Campaign)



Cycling lanes adjacent to pedestrians (image source: T.Asperges and F. Boschetti)

## Considerations

### Strengths

- Cycling access to car-free zones highly improves the quality of the cycling network: improved directness shortcuts (directness), away from motorized traffic (safety), easier access to destinations (cohesion), pleasant environment (attractiveness).
- Mixing cyclists and pedestrians on adjacent and shared-us facilities is safer and more attractive for cyclists in streets too narrow for full lanes or tracks.
- Implementation of cyclist access to car-free zones is mostly simply a matter of signage and some markings.

### Weaknesses

- Pedestrians may initially resent sharing with cyclists. Awareness raising and a testing period may be needed to convince them.
- Mixing cyclists and pedestrians may be felt as a nuisance by the visually impaired (full sharing) and the mobility impaired (physically separated paths).
- Implementation of cycling access to busy car-free zones needs physical separation integrated in the street design.

### Alternative options

- Cycling through car-free zones can only be avoided when a high-quality alternative route exists.
- Mixing cyclists and pedestrians along narrow roads can be avoided by reducing the space claims of motorized traffic.