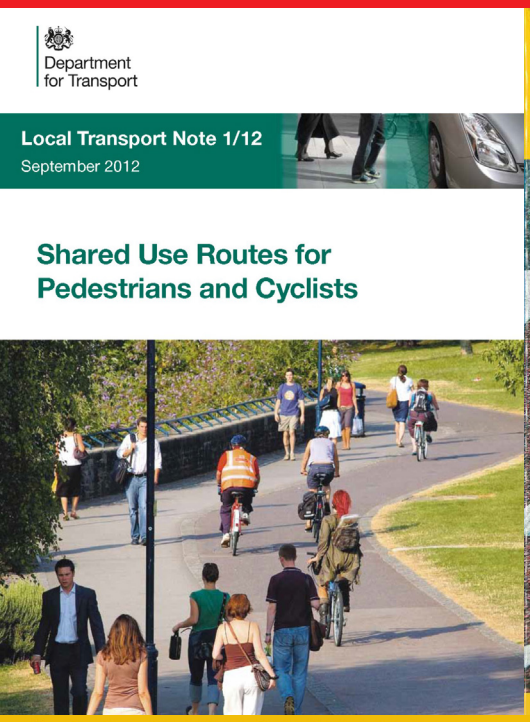
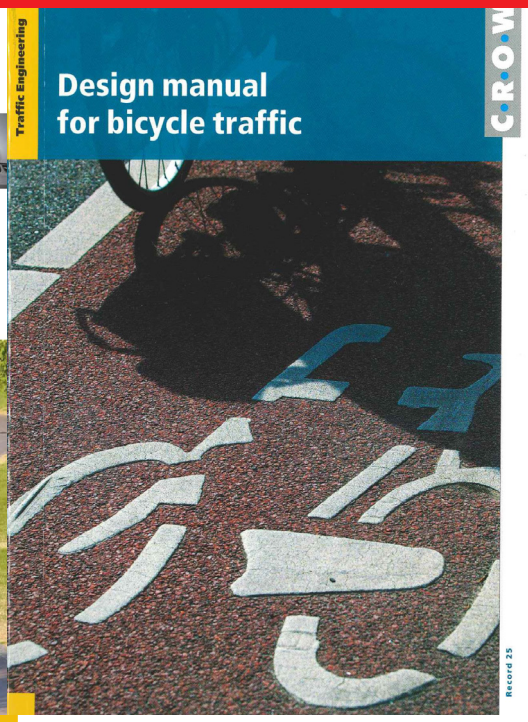
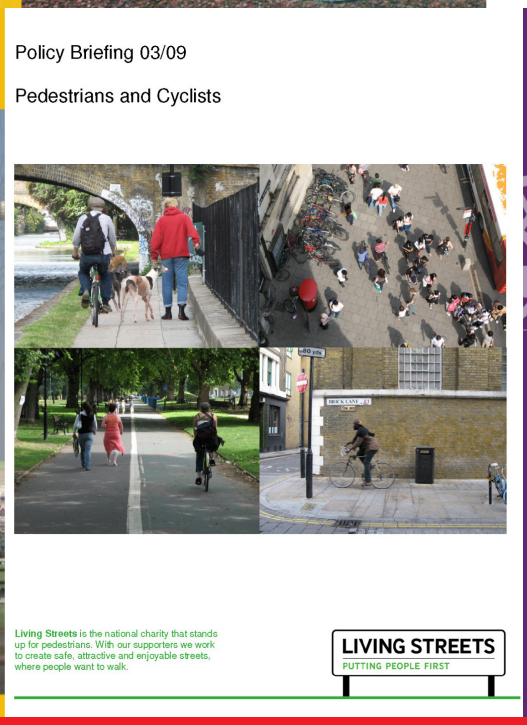
# Bristol City Council
# SHARED PEDESTRIAN/CYCLE SPACE REVIEW





urban movement
RESEARCH | PLANNING | STRATEGY | DESIGN

REFERENCE DOCUMENTS

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# INTRODUCTION

This paper presents a brief summary of a number of documents that have relevance to the design of streets and spaces where movement on foot and by bicycle is permitted, but where access by motor vehicles is largely restricted.

The types of document reviewed include national guidance, research reports, policy statements, other summaries and think pieces. An attempt is made to distil the chief conclusions or findings of these documents, as they relate to the review of how best to make provision for walking and cycling in different types of traffic-free spaces in central Bristol.

The documents in question are:

- Shared Use Routes for Pedestrians and Cyclists – Local Transport Note 1/12. (DfT, Sept 2012)
- Shared Space – Local Transport Note 1/11. (DfT, Oct 2011)
- Cycling in Pedestrian Areas – Traffic Advisory Leaflet 9/93. (DfT, Aug 1993)
- Adjacent and Shared Use Facilities for Pedestrians and Cyclists – Local Transport Note 2/04. (DfT, 2004)
- Design Manual for Bicycle Traffic (CROW, Netherlands; English Version, 2007)
- Pedestrian Comfort Guidance for London (Mayor of London/Transport for London, 2010)
- Cycling in Pedestrian Areas – TRL Report PR15. (P Trevelyan & JM Morgan, Jan 1993)
- Cycling in Vehicle Restricted Areas – TRL Report TRL 583 (DG Davies, L Chinn, GS Buckle & SJ Reid, 2003)
- Pedestrians and Cyclists – Policy Briefing 03/09. (Living Streets, Nov 2009)
- Cycling and Pedestrians –Campaigns Briefing 4R. (CTC, Jan 2014)
- Vehicle Restricted Areas – Design Portfolio A.07. (Cycling England, 2009?)
- Cycling in Pedestrian Areas – List of UK Locations. (Cycling England, 2009?)
- Cycling in Pedestrian Areas – Facts and Guidelines: summary of research published by Fietsberaad in 2005. (Ing. Hans Godefrooij)
- The Merits of Segregated and Non-Segregated Traffic-Free Paths – report to Sustrans (Phil Jones Associates, August 2011)
- London Cycling Design Standards (Mayor of London/Transport for London, December 2014)

## Shared Use Routes for Pedestrians and Cyclists – Local Transport Note 1/12. (DfT, Sept 2012)

This LTN is intended to be read in conjunction with LTN 2/08 Cycle Infrastructure Design, which brought together and updated all national guidance on the subject.

LTN 1/12 covers shared use routes that are designed to accommodate the movement of pedestrians and cyclists. Such routes may be created from new, or by converting existing footways or footpaths; they may also be segregated or unsegregated.

According to LTN 1/12, a segregated route is one where pedestrians and cyclists are separated by a feature such as a white line, a kerb or some other feature. By contrast on an unsegregated route, pedestrians and cyclists mix freely and share the full width of the route.

In practice, as is found in some locations in Bristol, and indeed several of the streets covered in the Case Studies companion to this paper, there is often a blurring of the distinction between segregated and shared routes. In other words, there are streets and spaces that are formally shared across their whole width, but where there is also a nominal cycle route by lines, kerbs or other material change.

LTN 1/12 makes a number of important points of relevance to this review:

- it is essential to understand that shared use is not an 'easy fix' to be used, for example, when it is difficult to make comfortable space for cycling in the main carriageway;
- the design of shared use routes requires careful consideration and is best carried out by someone experienced in planning and designing for pedestrians and cyclists;
- a poorly designed facility can make conditions worse for both user groups;
- a shared use route that serves pedestrians poorly is likely to be unattractive to cyclists too;
- if improvements for cyclists can only be realised through a significant reduction in route quality for pedestrians, the scheme is unlikely be acceptable.

## Shared Space – Local Transport Note 1/11. (DfT, Oct 2011)

LTN 1/11 was keenly awaited at the time of its publication, with practitioners and campaigners especially eager for there to be national guidance on an approach to design that was considered excitingly innovative by some and fraught with danger by others. LTN 1/11 concerns streets and spaces that may be 'shared' by pedestrians, cyclists and motor vehicles, not just the former pair of user groups.

The LTN defined 'shared space' as "a street or place designed to improve pedestrian movement and comfort by reducing the dominance of motor vehicles and enabling all users to share the space rather than follow the clearly defined rules implied by more conventional designs". It also emphasised the importance of local context: "each site is different and the way a street performs will depend on its individual characteristics, the features included and how these features work in combination". LTN 1/11 additionally stressed the need for stakeholder engagement and inclusive design.

Of particular relevance to this review, the LTN describes sharing as: "a measure of how well pedestrians are able to use the space as they wish without having to defer to vehicle users, including cyclists (cycles are vehicles)". The following statements also have relevance to sharing between pedestrians and cyclists.

- A 'tangible indicator' of sharing is that cyclists give way to pedestrians.
- Pedestrians should be able to choose whether they interact with vehicles in shared space.
- 'Shared space' describes an environment that encourages drivers, pedestrians and cyclists to behave in a more co-operative manner.
- Research suggests that cyclists have a high awareness of pedestrians in shared space and tend to ride around them or give way. Cyclists were found to be more likely to avoid or give way to pedestrians than vice versa.
- Cyclists prefer smooth, well maintained surfaces. Substantial surface texture (e.g. cobbled-effect setts) can be hazardous for cyclists.

## Cycling in Pedestrian Areas – Traffic Advisory Leaflet 9/93. (DfT, Aug 1993)

Although over 20 years old, the two-page TAL 9/93 retains relevance as it relates to research undertaken for the DfT. This research is detailed in the Transport Research Laboratory report PR15 (see page 7 of this paper). The Department "wished to establish whether genuine conflicts resulted from the sharing of space by pedestrians and cyclists where motor vehicular movements in the highway had been reduced or extinguished".

The main conclusions of the research were that:

- observation revealed no real factors to justify excluding cyclists from pedestrianised areas, suggesting that cycling could be more widely permitted without detriment to pedestrians; and
- a wide variety of regulatory and design solutions existed to enable space to be used safely and effectively in pedestrianised areas. These varied considerably in response to local circumstances.

Other findings were as follows.

- Pedestrians change their behaviour in the presence of motor vehicles, but not in response to cyclists.
- Cyclists respond to pedestrian density, modifying their speed, dismounting and taking other avoiding action where necessary.
- Accidents between pedestrians and cyclists were very rarely generated in pedestrianised areas (only one pedestrian/cyclist accident in 15 site years) in the sites studied.
- Where there are appreciable flows of pedestrians or cyclists, encouragement to cyclists to follow a defined path aids orientation and assists effective movements in the area. At lower flows, both users mingle readily.

All four of these findings should continue to influence decisions concerning whether or not pedestrians and cyclists can/should share the same street/space. The fact that they arise from robust research is important in the context of the influence that anecdote typically has on such decisions. (See, for example, the entry on Peterborough's Bridge Street in the Case Studies companion paper.)

## Adjacent and Shared Use Facilities for Pedestrians and Cyclists – Local Transport Note 2/04. (DfT, 2004)

The status of LTN 2/04 is uncertain. Although it replaced LTN 2/86 Shared Use by Cyclists and Pedestrians, it is notable that LTN 1/12 (see page 4, opposite) refers back to LTN 2/86, but not LTN 2/04. It is possible that LTN 2/04 was only ever issued in draft. At any rate, any national advice it contained has now been superseded.

Some elements of Annex C to LTN 2/04 retain relevance, however. This annex is entitled 'Attitudes to Shared Use Facilities' and contains the following statements.

- Surveys carried out for the DfT and CTC in recent years have reinforced the view that shared use routes are generally accepted by pedestrians and cyclists, and that users would not wish to revert to pedestrian-only use if it means putting cyclists at risk. This research confirms the findings of earlier research undertaken for the preparation of LTN 2/86.
- Unsegregated sharing may be unacceptable if disabled, elderly, blind or partially sighted people make significant use of the facility. Tolerance of shared arrangements is likely to vary with such factors as the age profile of the local pedestrian population, and the proportion of people with a visual handicap or walking difficulties. The only way to determine such tolerance is through survey, consultation, and a readiness to suspend or modify new arrangements if they prove unacceptable in use.
- Footway or footpath sharing should not be regarded as a general or area-wide remedy to cycle safety problems, but should be confined to specific links and locations where there is no alternative solution to a cycle safety problem. Short links in continuous cycle routes and quiet footways along heavily trafficked rural roads used for cycling to schools are examples.

## Design Manual for Bicycle Traffic (CROW, Netherlands; English Version, 2007))

'The CROW Manual', as this document is usually called, is the standard Dutch text on designing for cycling and "describes the steps required to create a bicycle-friendly infrastructure".

Section 5.7 on 'Bicycles and Pedestrians' is of direct relevance to this review. Specifically, it asks "whether it is always necessary to prohibit bicycles (from pedestrian precincts) as well as motorised traffic", and goes on to pose these three linked questions:

- Should/can cyclists be permitted in the car-free zones?
- If so, should cycle and pedestrian traffic be combined or separated?
- If they are to be separated, should that separation be hard or soft?

In seeking to answer these questions, the manual advises that "the benefits for cyclists, if they are permitted in car-free zones, must be weighed against the nuisance they cause to pedestrians". It then suggests that the most appropriate design response should relate to the cross-section of the street in question and to the intensity of use. Arising from the latter, it presents a table (reproduced below) suggesting the best form of treatment for different categories of pedestrian flow density.

The headline from this is that the CROW manual considers pedestrian and cycle traffic can be combined, in some form, if there are fewer than 200 pedestrians per hour per metre of (usable) cross-section width. While this is plainly a guide figure, and does not relate to the intensity of cycle movement, it nevertheless provides a solid basis for rational decision-making, and the use of such an approach for in Bristol is likely to be very helpful.

**Table 20. Possibilities for combining bicycle and pedestrian traffic**

| Number of pedestrians per hour per metre of profile width[1)] | Recommended solution [33] |
|---|---|
| < 100 | Full combination |
| 100 - 160 | Separation; traffic path with continuous profile (no differences in height) |
| 160 - 200 | Separation; traffic path with sectional profile |
| > 200 | No combination possible |

1) the number of pedestrians that pass an imaginary line straight across a street in an hour, divided by the total profile width in metres

## Pedestrian Comfort Guidance for London (Mayor of London/Transport for London, 2010)

This may seem a strange document to cite in connection with design for cycling. However, TfL's approach to assessing Pedestrian Comfort Levels (PCLs) is one that may be of value in devising a rational guide to making decisions about sharing. Like the CROW Manual (see previous entry), it looks at the intensity of movement relative to the space available for it.

The primary objective of the guidance is given as being "to assist those responsible for planning London's streets to create excellent pedestrian environments through a clear, consistent process during the planning and implementation of transport improvement projects". Clarity and consistency are equally important to the matter of determining which environments are suitable for pedestrians and cyclists to share.

The guidance is tailored to the needs of London, just as Bristol could choose to devise an approach for shared pedestrian/cycle space that is tailored to its needs. The London guidance:

- takes account of different user behaviour within a variety of street/location types;
- includes the impact of street furniture and static pedestrians (e.g. window shoppers);
- goes further than existing measures of pedestrian density that simply assess crowding (e.g. Fruin Levels), being based on comfort and taking into account user perceptions as well as observed behaviours; and
- provides a standard approach for the assessment and review of comfort on footways and crossings.

Based on metrics that are simple to obtain (e.g. pedestrian flows and physical dimensions), the guidance enables the categorisation of conditions in any street on the following scale: Comfortable - Acceptable - At Risk - Unacceptable/Uncomfortable.

Similar thresholds of comfort/acceptability could be established for different magnitudes and combinations of pedestrian and cycle flows in any given street/space.

## Cycling in Pedestrian Areas – TRL Report PR15. (P Trevelyan & JM Morgan, Jan 1993)

This is the research behind TAL 9/93 (see page 5). It found that, where cycling is permitted in pedestrian areas, arrangements generally fall into one of these four categories:

1. shared use of the whole, or certain sections of, the pedestrian area;
2. combined use with selected motor vehicles (e.g. buses and service vehicles);
3. time-restricted areas; and
4. special path(s) for cyclists.

PR15 also noted that the practice of allowing cyclists in pedestrian areas is rather more widespread in Western Europe than the UK.

The study analysed one-hour video recordings at 12 sites in England and nine in mainland Europe; plus 12-hour video studies and questionnaires at four sites in England. The main findings were:

- pedestrians respond to the presence of permitted motor vehicles by altering their behaviour, whereas the preseence of cyclists has no appreciable effect;
- cyclists adapt their speed to suit pedestrian density and dismount if necessary, with potential conflicts generally being overcome by the cyclist taking avoiding action;
- pedestrians areas have good safety records; in data covering 15 site years, only one collision between a cyclist and a pedestrian (a child in this case) was recorded; and none were observed in any of the video surveys;
- at lower levels of pedestrian and cycle flows, both users mingle readily through the pedestrian area; and
- at higher levels of flow, surface treatment and the disposition of street furniture and shop displays can have a significant influence. An identified section for cyclists clearly aids orientation and assists smooth operation; and in such circumstances observations indicate that pedestrians tend to use the side ares, while cyclists tend to ride in the middle of the street.

The research concluded that it disclosed no real factors justifying exclusion of cyclists from pedestrian areas; and that it is important not to exclude cyclists and force them to use dangerous alternative routes.

## Cycling in Vehicle Restricted Areas – TRL Report TRL 583 (DG Davies, L Chinn, GS Buckle & SJ Reid, 2003)

TRL583 describes a study of Vehicle Restricted Areas where cycling is permitted but motor vehicles are not. It does not address the general issue of shared use by cyclists and pedestrians.

The research was undertaken in Cambridge, Hull and Salisbury, and comprised a mixture of observation surveys (video monitoring & manual speed surveys) and interviews with both pedestrians and cyclists. VRAs in a further nine towns were also investigated.

Observation data on 2,220 cyclists showed that the following factors influenced whether cyclists dismounted and how fast they cycled:

- pedestrian flow;
- regulations;
- type of cyclist; and
- site characteristics.

While the majority slowed or dismounted when pedestrian flows were high, a minority (mostly young males) continued to cycle quite fast.

Interviews with 300 pedestrians and 150 cyclists showed that the majority of pedestrians were 'not bothered' by cyclists in the VRA; although a number reported having seen collisions between cyclists and pedestrians in the VRA, and the majority of pedestrians in two of the three main sites said they would like to see cyclists excluded for at least part of the day. The site where pedestrians were least concerned was the one with the lowest flows of cyclists.

The report recommends that street furniture should be arranged to channel cyclists away from doorways and that any areas intended for exclusive use by pedestrians should be indicated by kerbs or other means. It also suggests that there is scope for improving the public's understanding of the signs used in VRAs. The authors' overall conclusion is that sharing is not an ideal solution for either user group, but may be an appropriate compromise in some situations. It is stressed that the relative risks and benefits to both user groups should be assessed in the context of local circumstances.

## Pedestrians and Cyclists – Policy Briefing 03/09. (Living Streets, Nov 2009)

Living Streets is 'the national charity that stands up for pedestrians', and so its take on the issue of sharing between pedestrians and cyclists is an important one for policy-makers and designers to understand.

While stressing that Living Streets wants to see more people cycling, the briefing makes the general point that the built environment should prioritise the needs of pedestrians over all other modes, including cyclists – a clear principle from the Manual for Streets (2007).

The briefing makes plain that its focus is on 'shared use' routes for movement where there is no segregation between cyclists and pedestrians and where motor vehicles are not involved. The key concerns expressed relate essentially to what might be termed 'abuse of the footway': both anti-social cycling on pavements and the use of 'shared use' signs (TSRGD Diagram 956) to permit legal cycling on footways where this is inappropriate in terms of available space and pedestrian flow density.

The briefing notes that the conversion of footways to shared use is bottom of the DfT's 'Hierarchy of Provision' (see the Manual for Streets) and should, accordingly, be understood as a tool of last resort. The following statement is of particular relevance: "Poorly designed shared or adjacent use on footways, often implemented in a token effort to increase the local lengths of 'cycling provision', are welcomed by neither cyclist organisations nor pedestrians and must become a thing of the past."

Other points made by the briefing are:

- pedestrians and cyclists share many common objectives when it comes to urban planning;
- footway cycling laws must be better enforced;
- off-road provision for cyclists must never come at the expense of pedestrian safety or amenity.
- when designing off-road routes for cyclists, segregation is generally preferable to shared use, so long as sufficient width is available; and
- shared use signage (TSRGD 'Diagram 956') should be amended to emphasise pedestrian priority (e.g. pedestrian symbol above cycle).

## Cycling and Pedestrians – Campaigns Briefing 4R. (CTC, Jan 2014)

This briefing expresses CTC's view on the topic and presents some key facts and arguments in relation to cycling and the risk to pedestrians, red light jumping, cycling on the footway, and sharing space.

The headline messages are:

- Cyclists are perfectly able to mix harmoniously with pedestrians and, contrary to popular belief, are not a major danger to them; and
- Pedestrians are more likely to be injured or killed in collision with a motor vehicle than in collision with a cycle, even if they are walking on the verge or footway. This is all the more surprising because, unlike driving, most cycling takes place where there are high levels of pedestrian activity.

The views of the CTC on this topic include:

- cyclists should behave responsibly and within the law;
- cyclists do very little harm to other road users, including pedestrians.
- unlike driving, most cycling takes place in areas of high pedestrian activity, but it poses far less risk to pedestrians than motor vehicles; this is the case even for pavement cycling and red light jumping, neither of which CTC condones;
- cyclists and pedestrians are able to interact far more harmoniously, even in crowded conditions, than is often thought; and
- trials usually prove that cyclists very rarely put any pedestrian in a hazardous situation; codes of practice (backed up by policing, if required) are preferable to undermining the promotion of safe cycling for fear of the actions of a minority.

Other statements of relevance include:

- converting paths to shared use is never an ideal solution, especially in urban streets;
- local circumstances should dictate whether sharing is an acceptable option, or not;
- separating cycles and pedestrians on shared routes is not necessarily helpful;
- such separation should only be considered the preferred solution where there is sufficient width and where movement patterns are mostly (if not wholly) linear.

## Vehicle Restricted Areas – Design Portfolio A.07. (Cycling England, 2009?)

This paper sets out the following 'key principle':

"Allowing cycling through restricted areas should be the rule rather than the exception. Where this is not appropriate, consideration should be given to allowing access to cyclists outside of the busiest pedestrian hours."

In the context of any new proposal to introduce VRAs or pedestrianised areas, it is noted that, where there are concerns about cycle use, the preferred approach should be to allow cycling from the outset using an experimental traffic regulation order and only restrict access when and if the need for such action has been proved.

Noting the guidance and research contained in TAL 9/93, PR15 and TRL583 (see previous entries), the guidance also notes that: "If cyclists want to use cycle-restricted streets, they are likely to use them despite the existence of a ban. Where cyclists are currently using a shopping street and pedestrianisation is proposed, it is generally be preferable to accommodate them with good design than attempt to deter them with bans and enforcement."

Where there is no attractive alternative route for cycling, banning cyclists from VRAs is likely to result in regular infringements of the ban and, more generally, to discourage cycling.

The paper states that marking a cycle route within VRAs should be approached with caution as it can lead to higher cycle speeds and possibly more serious conflicts. Cyclists are also more likely to be obstructed by straying pedestrians if constrained to a defined route and will need to use the rest of the area (illegally) to pass them.

The final design should be established by appropriate consultation. One way of identifying the path cyclists may be expected to follow is to use cycle symbols (TSRGD 'Diagram 1057') which have the advantage of reinforcing the fact that cyclists are permitted, but also allow cyclists to use of the full width of the area. Such symbols may easily be combined with streetscape enhancement and created, where appropriate, within the pattern of paving or from historic surfacing materials.

## Cycling in Pedestrian Areas – List of UK Locations. (Cycling England, 2009?)

This document, which accompanies Design Portfolio A.07 (see previous entry), comprises two tables that list a large number of streets in English towns and cities where cycling is permitted in pedestrian areas either 24/7 (Table 1) or during commuter hours only (Table 2).

It is interesting to note that both Design Portfolio A.07 and the CTC briefing (see page 8, opposite) consider time restrictions on cycle access to be acceptable "if there are valid concerns about inconvenience to pedestrians at peak times". While neither is explicit about the need for an acceptable alternative cycling route outside the permitted hours, this should be a key consideration in the consideration and implementation of any part-time cycling regulations.

(While not otherwise referred to in this review, research report TRL371 'Alternative routes for cyclists around pedestrian areas' (1998) may be of interest in this regard.)

The level of scheme information provided in the tables is basic, and in some instances now out-dated. Nevertheless, it provides a concise guide to streets that may be relevant case studies, and more generally helps to show that cycling in pedestrian areas is relatively commonplace in urban settlements and streets of a very wide variety of characters.

## Cycling in Pedestrian Areas – Facts and Guidelines: summary of research published by Fietsberaad in 2005. (Ing. Hans Godefrooij)

This paper presents the findings of research commissioned by the Fietsberaad (the Dutch centre of expertise on cycling policy) to investigate the point at which the use of shared space by both cyclists and pedestrians starts causing problems. This helped inform the relevant content of the CROW Manual (see entry on page 6).

While the research covered 182 locations in 15 cities, the paper notes that the number of cyclists and pedestrians at most locations was relatively low, and that locations with both a high number of pedestrians and a high number of cyclists do not appear in the dataset.

It is emphasised that it is pointless to ban cyclists from pedestrian areas unless they have a good alternative and unless cycling is impossible because of the large number of pedestrians. Where bans are appropriate, thoughtful cycling policy (such as creating bicycle parking spaces near the edges of the pedestrian area) can help to support compliance.

The point is made that the aim of pedestrianising streets is primarily to keep out cars, not cyclists. The paper also underlines the importance of taking a context-specific approach, noting that while general guidance on pedestrian density thresholds for different types of treatment is helpful (see Table 20 of the CROW Manual), "empirical analysis makes it impossible to draw firm conclusions about when cyclists and pedestrians can be mixed in pedestrian areas".

The research found that, in almost 50% of the cases where mixing cyclists and pedestrians is possible, cycling is actually banned (full- or part-time). This is likely to be the main reason why "cyclists apparently do not take prohibitions seriously. If the combination is possible, and cyclists find the route attractive, there will be cyclists. If the combination cyclists/pedestrians is not possible, there are hardly any cyclists, especially if there is a good alternative route".

In other words, effective decision-making in this field needs to be rational, informed by common sense on the basis of local data and conditions.

## The Merits of Segregated and Non-Segregated Traffic-Free Paths – report to Sustrans (Phil Jones Associates, August 2011)

This document is an update of a literature-based review first undertaken in 2008. This was to provide Sustrans with an evidence base in connection with its proposal to the Welsh Assembly that a duty should be placed on Highway Authorities to develop and maintain a nationwide network of traffic-free paths for walkers, cyclists and disabled people.

The context was the suggestion by the Guide Dogs for the Blind Association and the Joint Committee on Mobility for Blind and Partially-Sighted People that funding should be made available to create wholly separate networks of pedestrian and cycle routes.

The study concluded that "both segregated and non-segregated paths have their advantages and disadvantages. There is no ideal form of segregation, for example; all have their pros and cons". While the review did identify "a number of indicators that point towards segregation or non-segregation being the most appropriate response in a particular situation, the choice will depend on the balance between these factors, and local circumstances will therefore inevitably influence the best design for a particular section of path". The indicators identified include:

- whether or not the main features of interest to users are on one side;
- absolute and relative flows of pedestrians and cyclists;
- variability of pedestrian/cyclist modal split;
- presence of pairs of groups of pedestrians or cyclists (i.e. not singletons)
- cycling speeds;
- flows across the main direction of travel;
- land/space availability;
- inter-visibility of users; and
- gradient.

The review also covers a number of Level of Service models that may provide the basis for a useful and objective tool to inform design. Such a tool would be similar to that discussed earlier (on page 6) in connection with the CROW Manual and TfL's Pedestrian Comfort Guidance.

## London Cycling Design Standards (Mayor of London/Transport for London, December 2014)

The new London Cycling Design Standards (LCDS) is arguably now the most comprehensive, detailed and helpful UK cycling design guide. It has several sections relevant to the consideration of if, when and how space might be shared by pedestrians and cyclists. These include 3.2.6 on 'Understanding pedestrian needs' and 4.5.4 and 4.6.2 which, respectively, cover 'Degrees of separation' between pedestrians and cyclists in off-road locations (incl. motor traffic-free streets and spaces) and alongside the carriageway.

Section 4.5.5 provides guidance on how to categorise flows of both pedestrians and cyclists (from 'very low' to 'very high') and how pedestrian and cycle flows relate to the degree of separation most likely to appropriate (see Figures 4.1.5 and 4.1.6 reproduced below).

Figure 4.1 5 Flow categories for partially separated and shared routes

| Peak flow categories | Pedestrians per hour | Cyclists per hour |
|---|---|---|
| Very low | 0-120 | 0-60 |
| Low | 120-200 | 60-150 |
| Medium | 200-450 | 150-300 |
| High | 450-900 | 300-450 |
| Very high | 900+ | 450+ |

Section 4.5.6 on 'Choosing the degree of separation' notes, however, that "flows may not be the principal determinant of appropriate infrastructure type. If the desire lines of pedestrians and cyclists cross within a given space, and the density and complexity of movements is high, then sharing is likely to make more sense than seeking to separate."

Section 4.5.7 considers width requirements, with Figure 4.18 (reproduced overleaf) demonstrating how different recommended widths have been derived for different cycle flow levels.

Section 4.5.12 highlights the problems that arise if cyclists are excluded from certain streets or spaces without an adequate alternative route being available, while 4.5.13 covers detailed design considerations in designing for shared use. It advises that "it can be beneficial to provide subtle ways of legitimising cycling through, for example, the application of bespoke studs or cycle symbols, or varying surface materials that suggest that the space has some different characteristics. This can help to raise awareness of the shared status and even to suggest a route through the space for cyclists."

The LCDS goes on to point out that such subtle markings may be especially useful in streets and spaces that are fully shared because it is problematic to divide formally between pedestrians and cyclists, and yet through which cyclists tend in any case to take a certain, consistent line.

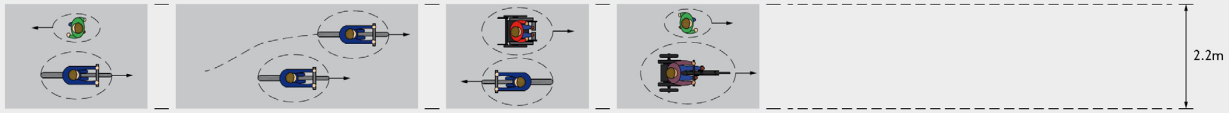
Figure 4.16 How pedestrian and cycle flows relate to degree of separation

| | Higher cycle flows | Lower cycle flows |
|---|---|---|
| **Higher pedestrian flows** | Partial separation unlikely to be complied with, so sharing preferred.<br>Forms of sharing may work for most of the time but be uncomfortable during peaks.<br>Longer term, cycle routes may need to be reassessed at the network scale. | Sharing is advisable, provided cycle flows likely to remain relatively low. |
| **Lower pedestrian flows** | Consider both options. Partial separation could be workable, depending on site-specific conditions, to keep some space free for walking during peak cycling times. | |

Figure 4.18 User interaction for different path widths

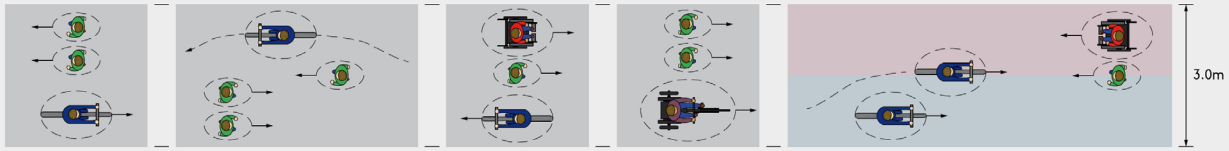
**2.2m-wide path** | **Shared use** | **Separated**

If flows are low, users can pass with minimal clearance in some cases, so cyclists will need to slow. There are few opportunities for overtaking.



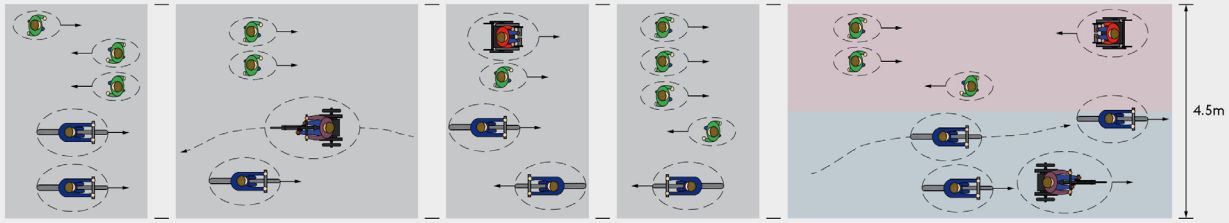

**3.0-wide path**

There are more opportunities to pass, and to do so with greater clearance, but this becomes uncomfortable with more users. Cyclists start to have to weave and to slow considerably. Separation can be acceptable if flows are very low, but capacity is quickly reached and compliance with the separation cannot be achieved.




**4.5m-wide path**

Shared use option permits users to arrange themselves and pass with reasonable comfort – cyclists less likely to have to weave. Separation may be effective with low to moderate flows with cyclists able to overtake each other entirely within the cycling side of the path but, again, compliance breaks down with larger numbers of users.

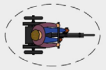



**Key to dynamic envelopes of different users**

0.6m Pedestrian

1.0m Wheelchair user

1.0m 'Standard' cyclist


1.3m Largest types of cycle

1.3m Two pedestrians walking side-by-side

1.5m Wheelchair user and pedestrian side-by-side

# SUMMARY + CONCLUSIONS

Although the reference documents are varied, in terms of such factors as their type, source, age and focus, they are - viewed as a whole - surprisingly consistent concerning a number of important messages that arise directly or can very reasonably be inferred. These are as follows.

- Decisions on whether pedestrians and cyclists should reasonably be expected to share the same street or space must take into account local conditions; as well as consideration of how these conditions may change in the future.
- There is no simple formula or calculation by which the decision to share or not share can readily be determined.
- That said, decisions should be based on a rational assessment of the density of flow of both pedestrian and cyclists in the context of the physical space constraints in the location in question (e.g. the width available for longitudinal movement).
- Research shows that cyclists can very largely be trusted to adapt their behaviour appropriately to the presence of pedestrians.
- Research also shows that incidence of cyclists causing physical harm to pedestrians, especially in vehicle restricted areas, is very low.
- Subjective concerns on the part of pedestrians about the danger posed by cyclists are important considerations, but should be addressed in the context of the objective evidence.
- If the decision is taken to (continue to) permit cycling in a vehicular restricted area, the choice of whether or not to mark a path for cyclists should be based on local considerations such as: relative pedestrian and cycle flows; whether the area is a street, a destination space, or a combination; the effective width available for longitudinal movement; and the flow of pedestrians across the main cycle flow.
- Where it is decided to mark the cycle path in some way, the choice of design should likewise be context-specific; and should recognise both that pedestrians will occasionally wander into the cycle path and that cyclists will not always stick rigidly to it.
- The principal value of marking a cycle path is to clarify the part of the space where the great majority of cyclists are likely to be encountered, and also to legitimise cycling in the eyes of pedestrians who might otherwise think 'their' space is being invaded.
- To assist harmonious interaction between the two user groups, signs should clearly indicate that the space is shared and, where necessary, that pedestrians have priority.
- No disproportionate attempts (e.g. excessively low speed limits or warning/threatening signs) should be made to cyclists keep to 'their' bit and pedestrians to 'their' bit. Where such measures are genuinely considered desirable or necessary (as opposed to being a reaction to anecdotal concerns), this will typically be a sign that sharing is inappropriate in that location.
- If the rational decision is taken to exclude cycling from any given area, whether full- or part-time, a suitable alternative cycling route should be provided. If it is not, either or both of two eventualities can be expected: some cyclists will infringe the ban; and/or the potential for cycling will be suppressed (with negative transport policy implications).
- Where an alternative route for cycling is needed, it must be adequately direct, comfortable and convenient, and part of a clear city cycling network that responds to the existing and future demand for cycling between different origins and destinations.
- Where no adequate alternative route can easily be provided in the short term, a policy that seeks to promote more cycling as a form of everyday transport for all must embrace significant investment in order to create an attractive alternative as quickly as possible.

In the UK to date, decisions to let pedestrians and cyclists share the same street, space or footway have too often arisen from the inability or unwillingness to invest in a better solution; and an unhappy compromise has been the typical outcome. Together, the reference documents make plain that any policy to seriously promote cycling must ensure that sharing only takes place where the conditions are suitable; not because the alternative is 'too hard' to deliver.

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