WEST SUSSEX CYCLING DESIGN GUIDE

A guide for Developers, Planners and Engineers

August 2019

west sussex county council

FOREWORD

West Sussex County Council aims to make walking and cycling a central part of transport, planning, health and clean air strategies. We are doing this through the West Sussex Transport Plan 2011 – 2026, the West Sussex Walking and Cycling Strategy 2016 – 2026 and by working together with West Sussex's Local Planning Authorities to ensure walking and cycling considerations are designed into masterplans and development designs from the outset.

The Council recognises that good highway design, which prioritises and creates dedicated space for cycling and walking, will significantly contribute to:

- improving people's health and wellbeing,
- improving safety for pedestrians and cyclists,
- reducing congestion,
- improving air quality,
- boosting the local economy, and
- creating attractive environments where people wish to live

This document conveys our vision for better cycling infrastructure in West Sussex. It is intended to support decision makers and set out more clearly what is expected of developers.

Research commissioned by British Cycling (2014)[1], found that if the UK became a cycling nation like the Netherlands or Denmark it could:

- save the NHS £17 billion within 20 years
- reduce road deaths by 30%
- increase mobility of the nation's poorest families by 25%
- increase retail sales by a quarter
- shifting just 10% of journeys from car to bike would reduce air pollution and save 400 productive life years
- adopting Dutch safety standards could reduce cycling casualties by 2/3rds
- Cycling saves a third of road space compared to driving, to help cut congestion and bike parking takes up 8 times less space than cars

[1]Benefits of Investing in cycling, by Dr Rachel Aldred for British Cycling (2014)

This document provides technical solutions appropriate to specific scenarios that support all cycle users when planning for new development. Our aim is that these design standards become commonplace in all new schemes throughout the county and, as opportunities arise to renew and upgrade existing infrastructure through the normal maintenance routine, or as funding becomes available, they become the standard that is applied to the entire network if site-specific constraints allow.

The conversation around creating healthy environments that support greater levels of cycling is not just unique to West Sussex; it is receiving more attention and investment at a national level, in particular with the government's publication of the Cycling and Walking Investment Strategy (CWIS).

The Council would like to acknowledge the work done by Oxfordshire County Council, upon which these cycling design standards are based.

Roger Elkins
Cabinet Member for Highways & Infrastructure

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Introduction

A better environment for cycling

We would like to see a West Sussex where more people choose to cycle for more journeys. We believe this can be achieved through good highway design to create an attractive and safer environment for cycling. The better we can make the environment for cycling, the more people will choose to cycle. We believe there is a huge unmet demand for more people choosing to cycle, which we will unlock if we get it right.

A more attractive choice

What does this mean? For many journeys people have a choice of how they choose to travel. A large number of factors influence this decision including journey time, cost, convenience and safety. We need to make sure that we address these factors through good highway design so that cycling becomes the preferred choice more often. We need to ensure that people can cycle directly without unnecessary delays, that there is somewhere convenient to leave their cycle at their destination and that they can be and feel safer while cycling.

A choice for everyone

National census data indicates that in some areas of the county, such as along the coastal plain, the proportion of people cycling to work is higher than the national average. This is encouraging but more often than not those that choose to cycle are from specific demographics. We need to ensure we create the right conditions for everyone to choose to cycle, whether they are young or old, male or female, or disabled. We want to make cycling a preferred choice for everyone.

Benefits for everyone

The more people choose to cycle, the greater the benefits for everyone, regardless of whether or not they choose to cycle. An increase in cycle journeys contributes to reduced traffic congestion, better public health, a better environment, a stronger economy and a more pleasant place to live. These are things that everyone wants to see. We hope that the guidance in this document helps to bring these benefits to the people of West Sussex.

Part 1 - Our aims

1.1 Making cycling the natural choice for more journeys

1.1.1 The County Council adopted the West Sussex Walking & Cycling Strategy 2016-2026 as an integral part of the West Sussex Transport Plan 2011-2026. This guidance has been prepared to help deliver the aims and aspirations of the strategy.

1.1.2 The guidance aims to draw attention to key issues and to outline the application of contemporary cycle design thinking from across the country in the West Sussex context. Several similar documents from other parts of the country have been used to inform this guidance.

1.1.3 This document is intended to be a live document and updated when required. It is not intended to be exhaustive or to replicate detailed national or local guidance or regulations that already apply (examples include Design Manual for Roads and Bridges (DMRB) and Traffic Signs Regulations and General Directions 2016 (TSRGD)). Instead, it aims to 'signpost' to these documents.

1.1.4 Several guidance documents should be read in conjunction with this guidance. These documents include:

- Design Guidance Active Travel (Wales) Act 2013 (2014)
- London Cycling Design Standards (2014)
- Greater Manchester Cycling Design Guidance (2014)
- Making Space for Cycling (Cyclenation)
- Handbook for Cycle-friendly Design (Sustrans)
- Interim Advice Note 195/16 Cycle Traffic and the Strategic Road Network (2016)
- Roads in the South Downs (2015) (for developments located within the South Downs National Park)

The guidance contained within these documents is more comprehensive than that contained here and should be referred to for aspects not covered in detail in this guidance where relevant. Case studies that illustrate examples of good practice when developing new cycling infrastructure can be found on the gov.uk website and further related publications are listed in the References section of this document. **Note: as and when new best practice guidance is issued, particularly by the Department for Transport, this may replace guidance in these existing documents.**

1.1.5 In addition, Chapter 9 of the National Planning Policy Framework (Ministry of Housing, Communities and Local Government, Feb 2019) sets out the approach to promoting sustainable transport through new development. In particular, paragraph 110 states that applications for development should:

a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for the efficient delivery of goods, and access by service and emergency vehicles; and

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.

1.1.6 It is hoped that, by following the guidance contained here, the best value is obtained from future investment in transport facilities through ensuring these are well designed for existing and potential new cycle users from the outset. Well-designed facilities, with cycle users in mind, are essential to make cycling the mode of choice for as many journeys as possible and meet the aims and aspirations of both the West Sussex Walking & Cycling Strategy 2016-2026, Local Cycling and Walking Infrastructure Plans (LCWIPs), and the government's Cycling and Walking Investment Strategy (CWIS).

Part 2 - Cycling in new developments

New developments can offer both a blank canvas and the opportunity to create the ideal conditions that make cycling the first choice for many journeys. Manual for Streets and Streets for All provides the overall guidance for planning new developments. This section draws attention to some of the sections relevant for cycling design and expands upon them.

Note: developers are encouraged to seek pre application advice from the County Council and the Local Planning Authority so that issues can be discussed at an early stage. Information about the Highways pre application advice service can be found on the West Sussex County Council website.

2.1 Connectivity and permeability

"Street networks should, in general, be connected. Connected, or 'permeable', networks encourage walking and cycling, and make places easier to navigate through. They also lead to a more even spread of motor traffic throughout the area..." - **Manual for Streets paragraph 4.2.3**

Diagram 1: Well-connected street layout (left). Poorly connected street layout (right). Credit: Manual for Streets

2.1.1 A well connected street network provides cycle users with the opportunity to make direct journeys with distance minimised whilst spreading motor traffic throughout a wider area, which reduces the level of traffic in any particular area. Both aspects help to make conditions for cycle users more attractive.

2.1.2 Any path connecting one street to another must be planned so that it can be used by both pedestrians and cycle users. Pedestrian only paths (footpaths) should not normally be provided (see 2.1.4). This maximises convenience for cycle users and prevents unsatisfactory situations where paths have been designed for pedestrians only but also become used by cycle users. Building placement needs to ensure acceptable forward visibility at resulting road/path junctions in order to meet this requirement.

Footways or footpaths?

Pedestrians are usually accommodated adjacent to the road carriageway on paths normally raised and edged with kerbs, often known as pavement. These are footways. Away from roads, pedestrians are accommodated on footpaths.

2.1.3 Footways (as opposed to footpaths) must be designed to be used by pedestrians only - cycle users must be accommodated on the road or a dedicated cycle facility.

2.1.4 There are a small number of circumstances where a footpath for pedestrians only might be appropriate, such as:

• Paths that lead off-site to footpaths which are Public Rights of Way (PRoW) and not suitable or without potential for cycling. The County Council's PRoW service should be consulted for advice
• Paths through enclosed or equipped play areas (alternative paths for cycle users should be provided if these are on desire lines)
• Paths that are short connections between parts of a property and in general not used by the public (for example, a path which only leads to a front door of a single property)

2.2 Provision of cycle infrastructure

"Pedestrians and cycle users should generally be accommodated on streets rather than routes segregated from motor traffic. Being seen by drivers, residents and other users affords a greater sense of security. However, short pedestrian and cycle-only links are generally acceptable if designed well…" - **Manual for Streets paragraph 4.2.4**

2.2.1 Creating a permeable street network as described in 2.1.1 will help to spread traffic evenly throughout a development. This should ensure motor traffic on most streets is minimised and, when combined with a low road design speed, will create conditions where no specific infrastructure for cycle users is needed. However, careful consideration of the needs of cycle users is still required and design aspects that can affect cycle users are detailed in section 3.1.

2.2.2 Short pedestrian and cycle links are essential to maximise permeability. General design considerations are to follow the principles contained in Manual for Streets chapter 4. Detailed design considerations are specified in section 3.4 of this document.

Green corridors

2.2.3 Although emphasis is on keeping pedestrian and cycle-only links short, there will be occasions where a longer form of traffic free path (or 'Green Corridor') may be desired through a development as either a design feature or incorporation of an existing public right of way. In these cases, it is essential that routes are wide (2.5m+ within a wider corridor), open, overlooked, not enclosed and barrier-free. Where a green corridor is proposed that uses an existing Public Right of Way it needs to follow the legal line and full width, while also ensuring provision for cycle users does not unnecessarily impact on other users, including walkers and equestrians as appropriate, as well as respecting habitats and protected species. Also, the provision of any form of green corridor is to be in addition to, not instead of, appropriate provision of cycle facilities elsewhere on the site, including on spine roads.

Spine and distributor roads

2.2.4 Accommodating cycle users on the carriageway applies equally for busier roads in new developments where the speed of the road is 30mph or less. While a well-connected street network helps to prevent roads becoming busy with motor traffic, only a small number of streets in a new development are usually connected to the existing highway network, resulting in greater levels of traffic on these roads.

2.2.5 While no specific cycle infrastructure is required along the majority of residential streets, busier streets do require specific infrastructure to create an acceptable environment for cycle users. Good design - including adequate space and priority for cycle users - is needed to ensure cycle users feel safe and cycle journeys are direct and convenient.

2.2.6 Along such roads, sometimes referred to as spine roads, the minimum provisions for cycle users are stepped cycle tracks (sometimes called hybrid cycle lanes, terraced or similar) on each side of the road. This also applies to smaller sites where these will ultimately form a larger overall development meeting these criteria. Table 2a sets out the minimum level of cycle infrastructure provision.

2.2.7 Design aspects for stepped cycle tracks can be found in section 3.2.

2.2.8 Other solutions for cycle user provision on busier roads can be considered but the principle of provision being an integral part of the carriageway rather than footway must remain. Shared-use footways alongside spine roads must not be provided, only pedestrian footways. Priority for cycle users at side road junctions is critical. Stepped cycle tracks as described in 3.2 or completely segregated cycle lanes are to be provided, not cycle lanes consisting only of painted lines as, in order to achieve adequate cycle lane width, simple painted lines create an unacceptably wide carriageway, making control of motor vehicle speed less self-enforcing.

Road type	Description of road type	Cycle provision
Primary distributor road	Sometimes required for larger developments. Normally connects to existing roads at either end. Development spine roads connect to this road. Development properties do not normally access this road directly.	Depends on the speed of road. Where greater than 30mph, off carriageway provision must be provided (cycle tracks), preferably segregated. Where 30mph or below, either the provision described above or that described for spine roads.
Spine Road	Road that connects to the existing highway network or primary distributor road. Residential streets connect to this road, and some development properties directly connect to this road. Local centres are likely to be served by this road.	Where spine road serves a development of greater than 500 dwellings and connects to existing highway or primary distributor road at both ends, stepped cycle tracks are to be provided throughout on both sides of the carriageway.
Residential Street	Streets serving dwellings which connect to a spine road and to each other.	Streets should be designed to minimise traffic speed. No specific cycle infrastructure required, but to be designed with cycle users in mind.

Table 1: Cycle provision and road type

Public Rights of Way

2.2.9 The West Sussex Rights of Way Management Plan 2018-2028 details how the public rights of way network will be managed and developed.

2.2.10 Sites will sometimes have existing Public Rights of Way (PROW) that cross them. Internally, within a site, and unless a public path order to divert or extinguish the path is confirmed, it is essential to recognise and incorporate existing public rights of way into the well-connected network of streets and paths. It may be possible to make footpaths available to cycle users where this will not impact detrimentally on other users of the path; if unsuitable, alternative parallel facilities for cycle users are to be provided. Discussion with the County Council's PRoW service will determine the approach to incorporating these paths into a new site.

2.2.11 Footpaths are the most common type of Public Rights of Way and use by cyclists is not as of public right. However, cycle users have rights to use higher status routes alongside other users: bridleways, restricted byways and byways, but these are often unsurfaced and may not be suitable for some types of cycle. Where a Public Right of Way crosses a development site, it should be assessed for the potential to incorporate it into the local transport network and suitable provision made for cycle users. This is likely to take one of two forms:

- Provision of a parallel cycle path, offering shared use or segregated from the public right of way as necessary
- Enabling cycle users to use the route through the site by the landowner dedicating the route as bridleway or restricted byway

2.2.12 It should be noted that these provisions apply to Public Rights of Way through a new development area only. Off site, a new development usually impacts on PRoW in some way. Improvement of local off-road access may enhance the offer of the new development for future occupants whilst also being visible mitigation for the local disruption and any loss felt due to the development itself. Developers are, therefore, expected to play a positive role in improving the local PRoW network outside of the 'red line boundary' and the County Council's PRoW service welcomes early discussion with developers on this issue.

Contact the Public Rights of Way Team if you need more information:

prow@westsussex.gov.uk

01243 777620

2.3 Connectivity of sites to existing network

"Internal permeability is important, but the area also needs to be properly connected with adjacent street networks. A development with poor links to the surrounding area creates an enclave which encourages movement to and from it by car rather than other modes" **- Manual for Streets paragraph 4.2.5**

2.3.1 Connections for motor vehicles to the existing highway network from a new development are usually restricted to a small number of points. All opportunities therefore need to be explored to supplement these points with pedestrian and cycle user only links, particularly at points furthest from the site access road junction(s) and corners of the site. The aim is to ensure that the distance required to make a journey by bicycle is minimised. Indeed, cycling and walking should be the natural choice for shorter journeys (such as journeys to school) or as part of a longer journey.
2.3.2 The design and layout of the development must recognise that the site will form part of the wider network for cycle users and that cycle users will use the site roads and paths to make journeys passing through the site. Development layout needs to ensure cycle users passing through a site should not be subject to unnecessary diversions or delays and be able to maintain a direct route, so far as is possible. West Sussex County Council will assist with the identification of the wider network, particularly where it does not yet exist.

2.4 Cycle Parking

"Providing enough convenient and secure cycle parking at people's homes and other locations for both residents and visitors is critical to increasing the use of cycles. In residential developments, designers should aim to make access to cycle storage at least as convenient as access to car parking" **- Manual for Streets paragraph 8.2.1**

2.4.1 All cycle parking facilities should be secure, easy to use, and located in convenient, sheltered positions. Residential visitor cycle parking should be provided as communal parking at convenient and appropriate locations through the development ('Sheffield' stands preferred). Garages should be designed to allow space for car plus storage of cycles in line with 'Principle G' of the County Council's 'Guidance on Parking in New Developments 2019'.

2.4.2 There are several aspects to consider when planning cycle parking to ensure it is attractive to use and contributes positively to a journey by bike. Section 8.2 of Manual for Streets details many of the considerations.

2.4.3 Particular attention is drawn to the provision of enclosed cycle storage often provided for flats. Inside enclosed cycle storage areas, simple Sheffield type stands are often the most straightforward solution. However, they must be positioned with adequate spacing between them and to any walls. Entry doors or gates need to have clear access; for example, they must not open onto a parking space.

2.4.4 The standards contained in this section are very much minimum standards – new developments need to consider rising levels of cycle ownership (including accessories such as trailers and larger cycles such as cargo bikes and e-bikes) and ensure that provision is appropriate and sustainable. Provision of bolt-down cycle repair stations (stands featuring basic tools) and track pumps should be considered for workplaces and for communal cycle parking areas in residential developments. At workplaces consideration should be given to appropriate shower and changing facilities and secure locker storage.

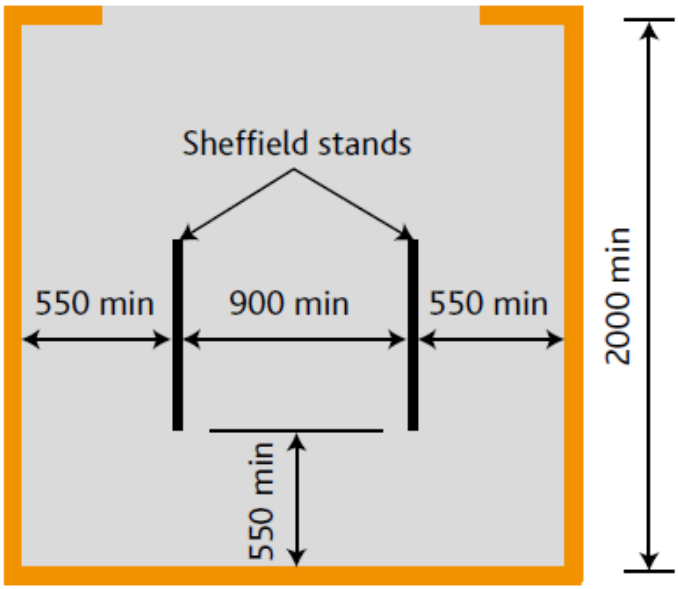

Diagram 2: Minimum dimensions of an enclosed cycle storage area. Credit: Manual for Streets

2.5 Checklist for developers

Cycle provision should be assessed using the LCWIP Route Selection Tool and score well against the assessment criteria:

Directness
Comfort
Gradient
Connectivity
Safety

The minimum standards for cycle parking must also be met.

2.6 Inclusive design

Infrastructure causes the most difficulty for disabled cyclists. Although most disabled cyclists (41%) use standard two-wheel bicycles around 1 in 3 have been unable to park and store a non-standard cycle. 'A Guide to Inclusive Cycling' (Wheels for Wellbeing, Nov 2017) contains advice about how inclusive cycling can be achieved through the provision of appropriate infrastructure and facilities.

Part 3 - Cycle facility specifications

This section gives guidance on the specification of infrastructure elements for cycle users. In addition to new developments, the guidance can apply to new schemes on the existing highway network. In retrofit locations it will not always be possible to achieve the minimum widths set out below and it may be necessary to compromise. Where existing constraints restrict the desired widths, or prevent types of infrastructure from being installed to the standards set in this chapter, designs will be considered on an individual basis.

Speed Limit	Annual Average Daily Traffic (AADT)	Anticipated peak hour number of non-motorised users per hour (either 1-way or 2-way depending on the Cycle Route Type)	Cycle Route Type	Desirable Minimum Effective Width	Absolute Minimum Effective Width
20 or 30 mph	Below 2,500	Any	Cycle-friendly street design		
20 or 30 mph	2,500 - 5,000	<150	Cycle Lanes (Mandatory or Advisory)* **	2.0m	1.5m
20 or 30 mph	5,000+	<150	1-way cycle track (including stepped cycle track)* **	2.5m	1.5m
		150-750		3.0m	2.5m
		>750		4.0m	3.5m
30 mph	5,000+	<150	2-way cycle track or shared path **	3.0m	2.5m
		>150	2-way cycle track (segregated from pedestrians) **	4.0m	3.5m
40 mph and above	Any	<150	2-way cycle track or shared path ***	3.0m	2.5m
		>150	2-way cycle track (segregated from pedestrians) ***	4.0m	3.5m

* Where the minimum width cannot be attained over the majority of its length, cycle lanes should not normally be provided. In such circumstances, and where demarcation of a route is deemed appropriate, the use of signing and cycle symbol logo patches located 1.5m from the kerb may be an alternative option.
** Light forms of cycle lane segregation, such as wands or armadillos, can also be considered.
*** Tracks on high speed roads should be separated from the carriageway by verge space or hedge. See 3.2.7.

Table 2a: Summary of minimum provision of cycle infrastructure on highways

Where vertical features are present, additional clearance will be required to maintain effective widths as set out in Table 2b.

Type of edge constraint	Additional width required to maintain effective width of cycle track
Flush or near-flush surface	No additional width needed
Kerb up to 150 mm high	Add 200 mm
Vertical feature from 150 to 600 mm high	Add 250 mm
Vertical feature above 600 mm high	Add 500 mm

Table 2b: Additional clearances to maintain effective widths for cycle users

3.1 Quiet streets

3.1.1 No specific cycle infrastructure is required or necessarily desired on streets where traffic is light and speed is low. For the purposes of this document this is defined as where the 5-day average annual daily motor traffic flow is less than 2,500 and speed limit of either 20mph or 30mph. Most residential streets fall into this category.

3.1.2 Although no specific infrastructure is required, the needs of cycle users must still always be considered. This is particularly true when using features to help ensure slow moving motor vehicles - the impact of features designed to slow or calm motor traffic on cycle users must be considered.

3.1.3 The following table outlines features sometimes used and their potential impact on cycle users. It is not intended to be exhaustive.

Feature	Possible impact on cycle users
Surface changes/rumble strips/cobbles	Can cause cycle users to become unsteady. Where used, alternative smoother surface sections for cycle users should be provided. For example, if rough cobbles are to be used, smooth sections for cycle users should be provided, and these need to be in appropriate locations and not a narrow strip at the very edge of the road. Often a wider section one metre from the road edge will be more appropriate.
Build-outs	Can be an inconvenience and potential danger for cycle users and may be too narrow for cleaning vehicles to access leading to detritus build-up. If used, build-outs must have a method for cycle users to bypass them, although care should be taken to ensure this is in an appropriate location, particularly if parked cars are likely to be present on either side, in which case street furniture should prevent parking too close to the build-out. The bypass facility should have a smooth surface.

Table 3: Road features that negatively impact cyclists and should be avoided if site-specific constraints allow

3.2 Busier roads

3.2.1 Where the average annual daily motor traffic flow (AADT) exceeds 2,500, or where the road speed is higher than 40mph, provision for cyclists must be made.

3.2.2 Cycle users should be provided with space to cycle. This helps to improve safety for cycle users and allows cycle users not to be obstructed when vehicle congestion causes slow or stationary traffic. In addition, the provision of space dedicated for cycle users helps to improve perceived safety of cycling and creates a more pleasant cycling experience as a result.

3.2.3 Several types of cycle facility can provide dedicated space for cycle users including mandatory cycle lanes, stepped cycle tracks and parallel cycle tracks completely segregated from traffic.

3.2.4 The minimum infrastructure provision is stated in Table 2a.

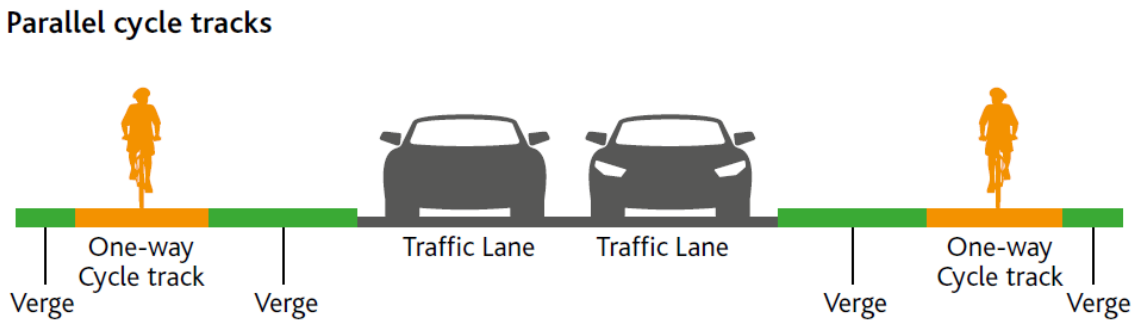

Diagram 3: Parallel cycle track

3.2.5 Along inter-urban higher speed roads, priority for cycle provision is to focus on fully segregating cycle users from traffic. This can be achieved with the provision of completely segregated cycle tracks or shared use paths alongside the road. In these circumstances some of the negative aspects of roadside shared use paths that occur where provided in urban areas can be less of an issue: pedestrian usage tends to be significantly lower reducing potential for conflict; and the number of side-roads is likely to be lower. Care must be taken to ensure good integration with the carriageway at appropriate points.

3.2.6 Such paths must generally cater for cyclists travelling in both directions. There should be an aim, where it is possible, for them to be provided on both sides of the carriageway to prevent the need for cycle users to have to cross the carriageway and back again. Paths should be set back away from the roadside as far as possible to reduce the possibility of cycle users being dazzled by car headlights at night.

3.2.7 Design aspects for shared use paths alongside roads are the same as for any off-carriageway path and detailed in section 3.4. Paths should be separated from the carriageway by verge space or hedge – the greater the buffer between the path and the carriageway the more pleasant the path environment can be. This separation is especially important for paths also used by equestrians.

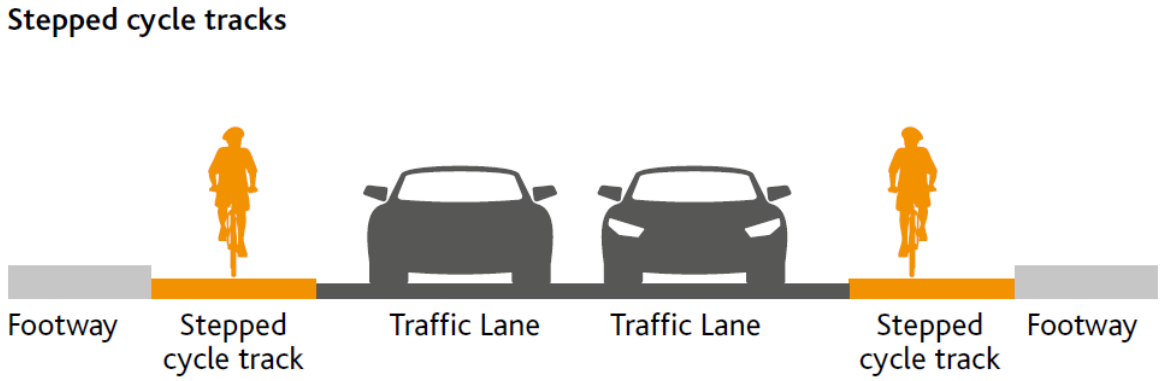

Diagram 4: Stepped cycle track

3.2.8 Stepped cycle tracks provide cycle users with some protection from traffic, dedicated space on the carriageway and priority across side-road junctions. Sometimes referred to as 'hybrid' or 'terraced' cycle lanes, the cycle lane is raised slightly above the rest of the carriageway and clearly separated from it with kerbing, with a further kerb between the cycle lane and the footway. This design addresses several of the negative aspects of roadside shared use paths while retaining the

benefits. They can usually be constructed without needing substantially more overall highway space than shared use paths require.

3.2.9 There are several different design styles of cycle lanes that provide some form of partial segregation from traffic.

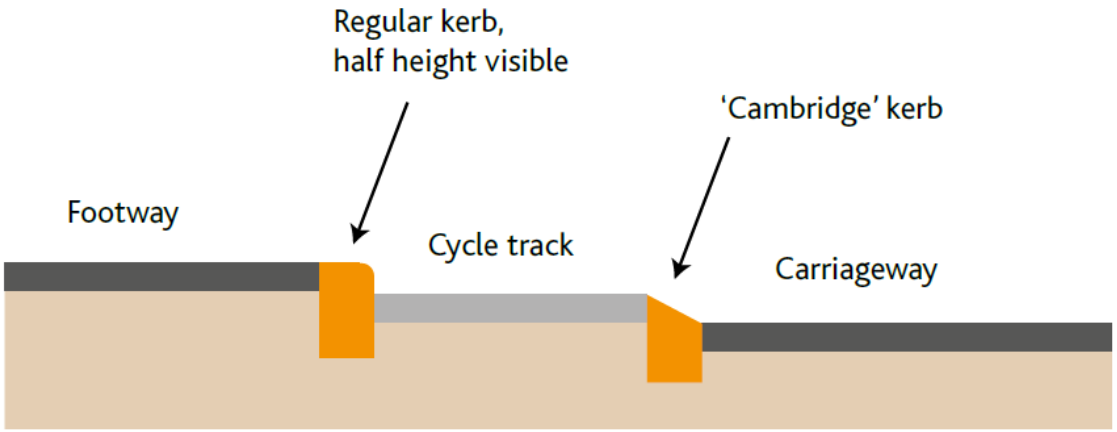

Diagram 5: Stepped cycle track cross-section

3.2.10 The preferred design of stepped cycle track is shown in Diagram 5. This has a kerb of mid height between the cycle lane and the rest of the carriageway, and another similar height kerb to the footway or verge. The kerbs provide barriers helping to prevent incursion from motor vehicles while allowing street cleaning vehicles to access the cycle lane when required, helping to ensure the facility doesn't become a 'gutter' for litter and foliage. At side roads, the cycle lane can remain raised across the junction mouth. At more complicated junctions it may be necessary for raised cycle lanes to drop down to carriageway height, becoming regular painted cycle lanes.

3.2.11 Stepped cycle tracks should be of a width between 1.5 metres (absolute minimum running width - excludes kerb/paint width) and 2 metres, with a recommended width of 1.8 metres. Where cycle traffic volumes demand a width of greater than 2 metres, or space is available, full segregation should be considered first.

3.2.12 Kerbs separating the stepped cycle track from the rest of the carriageway should be 'Cambridge' kerbs, which were developed specifically for raised cycle lanes to ensure cycle users can safely negotiate an obstruction in the cycle track by re-joining the carriageway.

3.2.13 Kerbs separating a stepped cycle track from the footway should be half-height bullnose kerbs to ensure appropriate physical footway edging relied upon by partially sighted people and to discourage cycle users from riding on the footway.

3.2.14 Parking in stepped cycle tracks must not be permitted. Where parking is to be accommodated, a stepped cycle track could pass either side of the parking bays, although passing on the nearside is preferable. An adequate buffer should be provided to prevent car doors being opened into the cycle track.

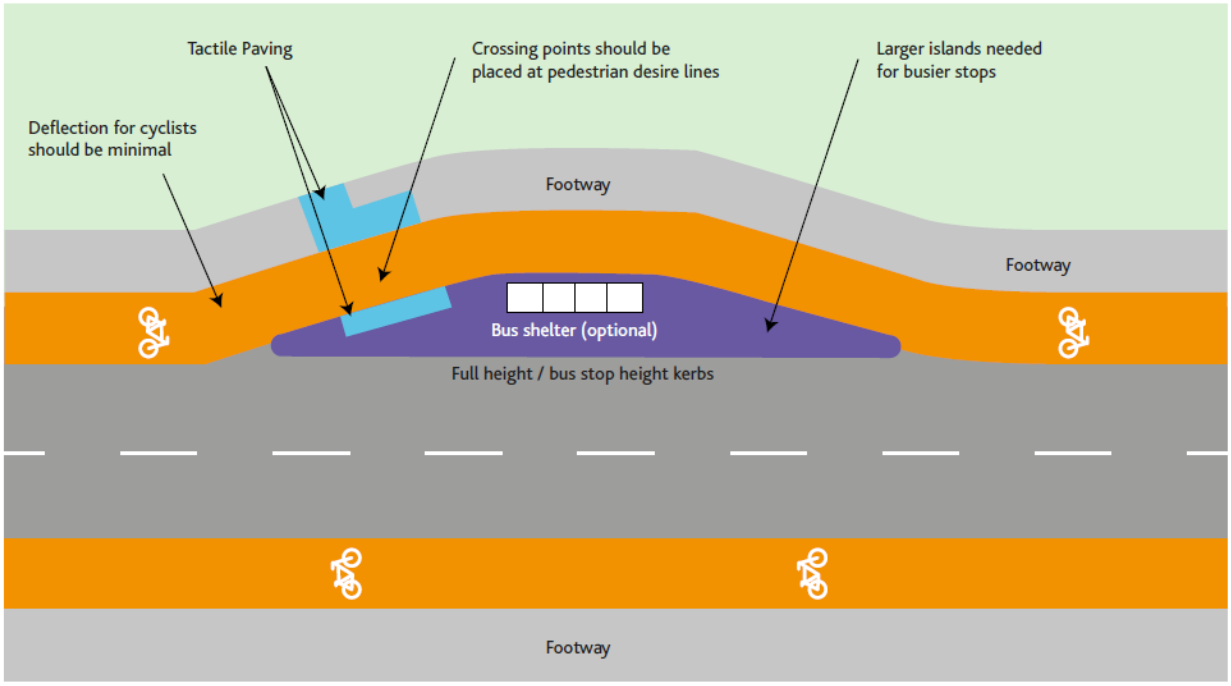

Diagram 6: Bus Stop by-pass (indicative layout – not to scale)

3.2.15 Bus stop bypasses may be appropriate for stepped cycle tracks; however, care needs to be taken to ensure their design is not unnecessarily inconvenient for cycle users or pedestrians. The angle of deflection for the cycle track to pass behind a bus stop should be minimised while ensuring appropriate width and space for bus passengers.

3.2.16 Locations of crossing points for pedestrians should be based on desire lines and be raised across the cycle track. Where a bus lane is present, designs should take into account that some cycle users may wish to use the bus lane rather than the bypass when a bus is not present. As a general principle, bus passengers should not be able to step off a bus directly into any form of cycle infrastructure.

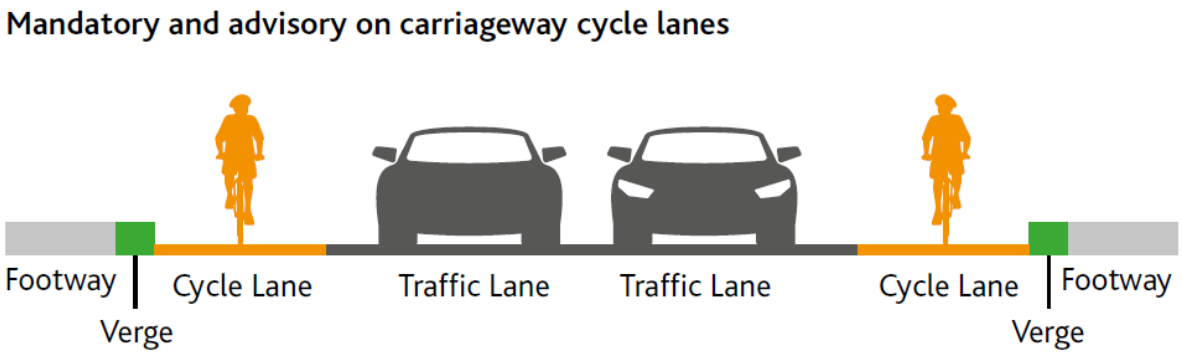

Diagram 7: On-carriageway cycle lanes

3.2.17 The widths of both mandatory and advisory cycle lanes are the same as for stepped cycle tracks: 1.5m to 2m with 1.8m being the recommended width.

3.2.18 Where the minimum width cannot be attained over the majority of its length, cycle lanes should not normally be provided. Research by Parkin J & Meyers C, 2009 suggests cycle lanes can cause motorists to leave a smaller and, in the case of narrow lanes, inadequate space when

overtaking a cycle user. In such circumstances, and where demarcation of a route is deemed appropriate, the use of signing and cycle symbol logo patches located 1.5m from the kerb may be an alternative option. There may be limited occasions where short sections of substandard width cycle lane do have clear benefit, such as to allow access to an advance stop line at traffic lights or to maintain continuity.

3.2.19 Both mandatory and advisory lanes should in general not make use of specially coloured surfaces. This is primarily to reduce maintenance costs. Short sections of coloured surface may be used in some circumstances, such as across side road mouths. When roads are resurfaced, this must include the full width of the carriageway including cycle lanes.

3.2.20 The use of LED road studs to delineate cycle lanes is encouraged, particularly along busier roads.

3.2.21 Light forms of cycle lane segregation, such as wands, orcas, or armadillos, can be considered.

3.2.22 If site-specific constraints allow, ironworks - such as drains and drain covers – should not be sited within 1.2m of the kerb. Drain/manhole covers should not be sited where cyclists could lose front wheel grip (e.g. on corners). Skid resistant covers should be used at locations where this cannot be practically achieved.

3.3 Junctions

3.3.1 The needs of cycle users should be incorporated into the designs of all junctions. The needs of cycle users should be considered for all possible movements.

3.3.2 Junctions present many complex issues for good cycle facility design and a great deal of recent work has been done elsewhere to try to address this. This guidance document does not aim to cover detailed design aspects of junctions. For this reason, it is essential to refer to the more detailed guidance on junctions contained within the following reference documents (see also References section at the end of this guide):

- Design Guidance - Active Travel (Wales) Act 2013 (2014)
- London Cycling Design Guidance (2014)
- Greater Manchester Cycling Design Guidance (2014)
- Handbook for Cycle-friendly Design (Sustrans, 2014)
- Interim Advice Note 195/16 – Cycle Traffic and the Strategic Road Network (2016) (sections 2.4, 2.6 and 2.7)

3.3.3 The toolkit for junction designers has recently been enhanced with low level signals for cycle users, early release for cycle users, and two stage turns now available. These are covered in some of the documents listed above and should be incorporated into designs where appropriate.

3.3.4 At traffic light-controlled junctions on classified roads or where cycle lanes or stepped cycle tracks are present, advance stop lines should be provided on all arms of the junction together with appropriate means to access them. Advance stop lines should be a minimum of 4m deep.

3.3.5 Roundabouts can be particularly daunting for some cycle users, especially large multi-lane roundabouts. Approaches, exits and the geometry of roundabouts should aim to cause traffic to slow down to use the roundabout and therefore reduce the risk to cycle users. For low speed roads

with low traffic volumes roundabout entry should be radial, not tangential. For higher speed roads with higher traffic volumes where tangential roundabouts are to be provided, the design should give consideration to cycle users and the type of cycle routes the roundabout is connecting to (see Table 2a). These aspects are covered in some of the documents listed in 3.3.2. Dialogue with the County Council is encouraged – especially in relation to complex scenarios or where capacity is material consideration.

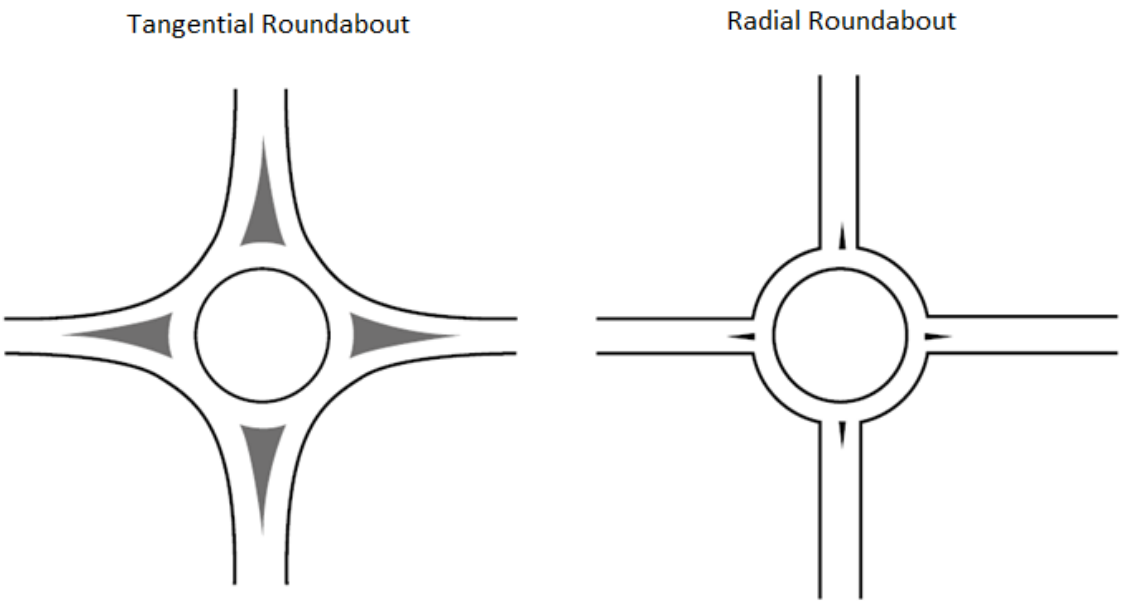

Diagram 8: Roundabouts on low speed roads with low traffic flows should be designed with radial entry

3.3.6 Adverse cambers at junctions are potential hazard for cyclists and should be mitigated.

3.4 Off-carriageway cycle facilities

3.4.1 Good facilities for cycle users on carriageways are complemented by good off-carriageway facilities.

3.4.2 It is imperative that on and off carriageway facilities are integrated to form a single network for cycle users and not considered as two separate networks. This includes where off-carriageway facilities meet a road that itself has no specific infrastructure for cycle users.

3.4.3 Path surfaces should be appropriate to the environment and users; for example, in urban areas paths should usually be sealed with 'black top' unless Conservation Area status precludes this. Town centre Public Realm schemes may require a higher standard of finish. In rural areas other surfaces may be more appropriate, such as compacted stone, or grit rolled into a stone surface, especially if the routes are shared with equestrian users (obtain advice from local riders and British Horse Society), or if the route is located in a sensitive location such in the South Downs National Park, an Area of Outstanding Natural Beauty, or open countryside. In certain rural locations the use of 'black top' may be acceptable if the surface is suitable for all path users (e.g. equestrians). The County Council's PRoW service can advise on this matter.

3.4.4 Paths should be lit wherever appropriate – and particularly where they connect one lit area to another. In rural areas, solar studs can provide an appropriate form of light. Consideration must be given to the South Downs National Park's International Dark Sky Reserve status.

3.4.5 Paths should be direct, open (not enclosed with high sided fences) and, if site-specific constraints allow, overlooked to aid personal security.

3.4.6 Off-carriageway facilities that are well used by cycle users and other users should be fully segregated by kerbing, verge or hedge, and not by painted lines. This benefits all users by reducing the potential for conflict, increasing perceived safety and helping to ensure all users can make their journey in an efficient and enjoyable manner.

3.4.7 On the highway network a section of a segregated path for cycle users should be 3 metres or wider, with 2.5m as a minimum acceptable for short sections (no greater than 100m). For walkers a minimum of 1.5m (2m+ recommended) is to be provided and for equestrians a minimum of 3m.

3.4.8 On the Public Rights of Way network footpaths should be a minimum of 3 metres wide and bridleways should be a minimum of 4m wide (see 2.2.9 to 2.2.12 above).

Shared paths

3.4.9 It is not always appropriate, possible or necessary to provide fully segregated off-carriageway paths. For lightly used paths a shared path will suffice (see Table 2a above). Extra care will be required to integrate shared paths with the carriageway for cycle users while suitably catering for the needs of pedestrians and other users, including equestrians where appropriate.

3.4.10 Usage should dictate the width of such paths, with 3 metres the recommended width - 2.5 metres may be acceptable but should be discussed with the County Council. Paths wider than 3 metres should normally be segregated rather than shared.

3.4.11 In general, shared paths should not be divided with painted lines. Where these have been provided in the past, they are often ignored by both pedestrians and cycle users and provide little benefit. In locations where usage is high segregation with painted lines may begin to become self-enforcing and have benefit.

3.5 Interface between on and off-carriageway facilities

3.5.1 Where a cycle facility transitions from off- to on-carriageway, or where an off-carriageway facility ends and cycle users continue their journey on carriageway, flush kerbs must be used rather than drop kerbs.

✓ flush kerb

✗ drop kerb

3.5.2 Barriers must not be provided at the beginning or end of off-carriageway facilities, except in circumstances where there is a demonstrable need. Where incursion by motor vehicles is an issue, a single centrally placed bollard should be sufficient. Bollard placement must ensure adequate space either side and include reflectors to ensure it can be seen at night. It may be necessary to apply for formal consent to site a bollard or barrier within an existing public right of way; the County Council's PRoW service can provide advice on request. A 1.5m gap either side of the bollard is required on bridleways.

3.5.3 The use of 'protected exits' is encouraged where an off-carriageway facility joins the carriageway. With this facility the off-carriageway (or roadside) cycle path continues directly onto the carriageway into a cycle lane. This interface allows cycle users to continue their journey seamlessly onto the carriageway without a need to stop and give way to traffic. Where no cycle lane on the carriageway is provided, a short section of advisory lane should be provided to allow the cycle user to merge into the traffic flow, again without needing to give way.

3.5.4 Protected exits should not be used in all scenarios, for example where a cycle facility continues on the opposite side of the carriageway. In these scenarios a give way marking may be the most suitable option. Careful consideration is needed to ensure all possible movements of cycle users are adequately catered for.

Crossings

3.5.5 When designing crossing facilities for cycle users, designs should take into consideration that a crossing point is an interface between the off-carriageway cycle facility and the carriageway - not all cycle users will be crossing; some will be leaving the highway at that point to continue along the off-carriageway facility and vice-versa. It may be helpful to think of a crossing as a road junction with one or more arms available for cycle users only.

3.5.6 Crossing designs should not expect or require cycle users to dismount to cross the road.

3.5.7 As with junctions, this guidance does not currently cover detailed design aspects of crossings. Instead designers are to refer to the documents as listed in 3.3.2 and in the reference section together with the Design Manual for Roads and Bridges and Manual for Streets.

3.5.8 A new type of crossing for cycle users is now available. A parallel crossing provides a crossing for cycle users alongside a traditional zebra crossing and is sometimes referred to as a Tiger crossing.

3.6 Signing

3.6.1 Signing has three main functions: regulatory (traffic management signing that is enforceable); warning and information (traffic management signing that provides hazard warnings and guides vehicle positioning); and wayfinding (location and direction signing).

3.6.2 All cycle signs and road markings located within the public highway must be in accordance with the Traffic Signs Regulations & General Directions 2016 (TSRGD) and any subsequent amendments to this Statutory Instrument. Supplementary advice on correct signing application is found within the Traffic Signs Manual.

3.6.3 Off-highway signing shall indicate where cycling is permitted and support cycle wayfinding. This signing must conform to WSCC guidance and standards, although recognisable elements from on-highway signing should be incorporated to support continuity and legibility.

3.6.4 Cycle signing must be minimised to that actually required or with a clear benefit to users (refer to Traffic Advisory Leaflet 01/13 Reducing Sign Clutter). Consideration should be given to mounting repeater signs at smaller sizes on bollards, where practicable, rather than posts. Signing should be sensitive to the location.

3.6.5 The CYCLISTS DISMOUNT sign to TSRGD Schedule 11 Part 2 Item 46 should not be used; a CYCLISTS REJOIN CARRIAGEWAY sign to the same diagram may be more appropriate in some circumstances. The appropriateness of cycle infrastructure should be reconsidered at locations where a designer has to consider using a CYCLISTS DISMOUNT sign.

3.6.6 Use of the END OF CYCLE ROUTE signs to TSRGD Schedule 11 Part 2 Item 45 and the associated END road marking to TSRGD Schedule 11 Part 4 Item 30 should be avoided or minimised as they indicate provision for cyclists has ended. Signed provision must be made where an off-road track ends; in most cases this will be on the adjacent carriageway, for which a CYCLISTS REJOIN CARRIAGEWAY sign should be used. This must be made clear to cyclists to prevent inadvertent riding on footways.

3.6.7 Signs shall be mounted at a minimum height of 2.4 metres where cyclists can cycle beneath them. Wall or bollard mounting heights between 0.8 and 1.5 metres are preferred.

3.6.8 Signs should not be located more than 1.0 metre from the relevant surface to prevent possible user confusion. A minimum 500mm lateral clearance is required between edge of cycle facility and traffic sign installation (post or signplate depending on the latter's mounting height).

3.6.9 The use of directional signing is encouraged where it helps wayfinding, even for shorter sections of path. Directional signing should be provided at all junctions with other cycle routes and where a cycle route meets a carriageway. Distances will usually be indicated except where the journey time to a stated destination is less than 15 minutes for a cycle user travelling at 12mph, in which case the journey time should be displayed instead in mins.

3.6.10 Directional signs for cyclists should use 25mm x-height text (the smallest permitted size – x-height is the height of the lowercase letter ‘x’) to minimise signplate sizes. It will seldom be necessary to use larger text heights except where the viewing distance is greater than 30 metres, in which case 30mm x-height should suffice.

References

- Manual for Streets 1 (Department for Transport, 2007)
- Manual for Streets 2 (Department for Transport, 2010)
- Cycle & Pedestrian Routes within Car Parks (Sustrans Technical Information Note No. 16, 2011)
- The National Planning Policy Framework (Ministry of Housing, Communities & Local Government, Feb 2019)
- Local Transport Note 1/12 – Shared Use Routes for Pedestrians and Cyclists (Department for Transport, 2012)
- Door to Door: A strategy for improving sustainable transport integration (Department for Transport, 2013)
- Better Streets Delivered (Transport for London, 2013)
- Better Streets Delivered 2 (Transport for London, 2017)
- Design Guidance Active Travel (Wales) Act 2013 (Welsh Government, 2014)
- London Cycling Design Standards (Transport for London, 2014)
- Greater Manchester Cycling Design Guidance (Transport for Greater Manchester, 2014)
- Handbook for Cycle-friendly Design (Sustrans, 2014)
- Making Space for Cycling (Cyclenation, 2014)
- Street Design for All (Civic Voice, 2014)
- Benefits of Investing in Cycling (British Cycling/ Dr Rachel Aldred, 2014)
- Station Public Realm Design Guidance (Transport for London 2015)
- Waltham Forest Mini Holland Design Guide (Waltham Forest Council, 2015)
- Roads in the South Downs (South Downs National Park Authority, 2015)
- Interim Advice Note 195/16 Cycle Traffic and the Strategic Road Network (2016)
- Design Manual for Roads and Bridges (Highways England, 2019)
- Working Together to Promote Active Travel (Public Health England, 2016)
- Start Active, Stay Active (Department of Health, 2016)
- Traffic Signs Regulations and General Directions (Department for Transport, 2016)
- Case studies: developing new cycling infrastructure (Department for Transport, 2016)
- A Guide to Inclusive Cycling (Wheels for Wellbeing, 2017)
- Oxfordshire Cycling Design Standards (Oxfordshire County Council, 2017)
- North Tyneside Cycling Design Guide (North Tyneside Council, 2018)
- Parking in New Developments (West Sussex County Council, 2019)

Developers, planners and engineers are guided to read the Cycling Design Guide in conjunction with the relevant Local Planning Authority Local Plan as well as the following West Sussex County Council published documents:

- The West Sussex Transport Plan 2011-2026
- The West Sussex Walking & Cycling Strategy 2016-2026
- The West Sussex Rights of Way Management Plan 2018-2028

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