

OXFORDSHIRE CYCLING DESIGN STANDARDS



A guide for Developers, Planners and Engineers
Summer 2017

FOREWORD



Oxfordshire County Council aims to make cycling and walking a central part of transport, planning, health and clean air strategies. We are doing this through our Local Transport Plan: Connecting Oxfordshire, Active & Healthy Travel Strategy, Air Quality Strategy and working together with Oxfordshire'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

Working together with cycling, walking and physical activity associations and City and District Councils, as well as planning, transport and public health officers through the Active & Healthy Travel Steering Group, Oxfordshire County Council has produced Design Standards for both cycling and walking respectively. These two documents together convey our vision for better active travel infrastructure in Oxfordshire 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

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

The Cycling Design Standards provide 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 where possible to the entire network.

The conversation around creating healthy environments that supports greater levels of cycling is not just unique to Oxfordshire; 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.

Following approval at the Cabinet Member for Environment meeting in April 2017, the guide replaces previous guidance contained in Oxfordshire County Council's Residential Road Design Guide, which will be updated in due course.

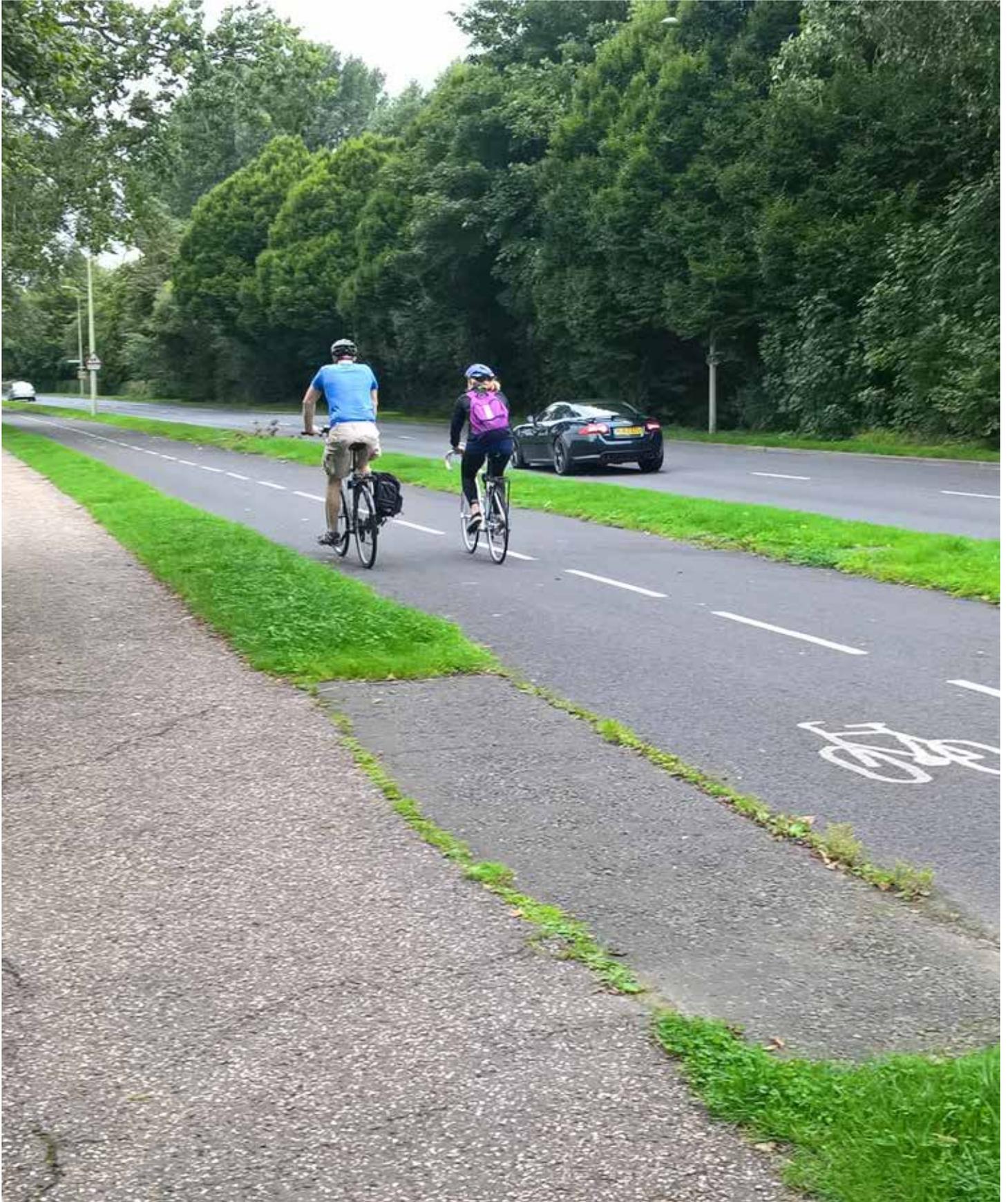


*Councillor Yvonne Constance OBE,
Cabinet Member for Environment*

Our thanks go to the Active & Healthy Travel Steering Group who have guided the production of both the Cycling and Walking Design Standards and to those stakeholders who kindly provided feedback.



Active & Healthy Travel Steering Group Member organisations



Marston Ferry Road, Oxford. Cycle users have a wide track (centre of photo), pedestrians have a separate track separated from the cycle path with a verge (left of photo), motor vehicles are separated from both (right of photo)

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INTRODUCTION

A better environment for cycling

We would like to see an Oxfordshire where more people choose to cycle for more journeys. We believe this can be achieved through good highway design to create an attractive safe 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 not only be safe while cycling but feel safe as well.

A choice for everyone

Many people already choose to cycle in Oxfordshire. This is very 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 Oxfordshire.



On quiet residential streets with 20mph speed limits, cycling provision on the carriageway and slow traffic can be a good solution

PART 1 - Our aims

1.1 Making cycling first choice for more journeys

- 1.1.1 The County Council adopted an Active and Healthy Travel Strategy in 2016, as an integral part of its Local Transport Plan 4. This guidance has been prepared to help deliver the aims and aspirations of the strategy.
- 1.1.2 The guidance builds on previous guidance for cycling contained within the County Council's Residential Road Design Guide (RRDG) and on the themes contained within Manual for Streets (2007) and Manual for Streets 2 (2010). This guidance in this document supersedes the guidance within the cycling section of RRDG. RRDG will be fully updated at a future time. New guidance covering walking replacing that within RRDG has also been prepared alongside this cycling guidance.
- 1.1.3 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 Oxfordshire context. Several similar documents from other parts of the country have been used to inform this guidance.
- 1.1.4 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 'sign post' to these documents.
- 1.1.5 Several guidance documents should be read in conjunction with this guidance. These documents include:

- Interim Advice Note 195/16 Cycle Traffic and the Strategic Road Network (2016)
- 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)



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. For further related documents see the References section.

- 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 set out in the Active and Health Travel Strategy.

PART 2 - Cycling in new developments

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

2.1 Connectivity

"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



Traditional, inter-connected street layouts



Disconnected cul-de-sacs and winding roads



Diagram 1: Left image caption: "Well connected street layout". Right image caption "Poorly connected street layout". 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, in addition to spreading motor traffic throughout an area which reduces the level of traffic in any particular area, both aspects which 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 pavements. These are footways. Away from roads, pedestrians are accommodated on footpaths.



Example of a cycle cut-through that aids street permeability

- 2.1.3 Footways (as opposed to footpaths) should be designed to be used by pedestrians only - cycle users should 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 which include:
- Paths that lead off-site to footpaths which are public rights of way and not suitable or without potential for cycling
 - 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 described in 2.1.1 will help to spread traffic evenly throughout a development. This should ensure that motor traffic on most streets will be 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 which 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.

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 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 that provision for cycle users does not unnecessarily impact on other users, including walkers and equestrians, 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.



Example of a Green Corridor

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 cycle user 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 applies to any new road serving a new development where it connects together two existing roads and serves a development of greater than 500 houses. This also applies to smaller sites where these will ultimately form a larger overall development meeting these criteria.
- 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 should 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.



Example of side road priority for cyclists

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 design speed of road. Where greater than 30mph, off carriageway provision should 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 Oxfordshire Rights of Way Management Plan 2015-2025 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 which cross them. Negotiations with the County Council’s Countryside Access Team will determine the approach to incorporating these into a new site. Internally, within a site, it is essential to recognise and incorporate existing public rights of way into the well-connected network of streets and paths and to make these available to cycle users where they are suitable or can be made suitable without impacting the other users of the path. If unsuitable, alternative parallel facilities for cycle users are to be provided.
- 2.2.11 Footpaths are the most common type of public right of way, and cycle users do not have rights to use them. 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 cycling. 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 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 a 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 public rights of way in some way – the adopted Rights of Way Management Plan 2015-2025 sets out how this is dealt with. The County Council’s Countryside Access Team welcomes early discussion with developers on this issue.

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 it should be more convenient to walk or cycle than to drive.
- 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 possible. Oxfordshire County Council will assist with the identification of the wider network – particularly where it doesn't exist yet.

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 For new residential developments, the County Council's minimum approved standards are:

Resident cycle parking:

- 1 space for 1 bed unit, 2 spaces for larger units

Visitor cycle parking:

- In addition to the above, 1 stand per 2 units where more than 4 units

As a guide:

- Garages should be designed to allow space for car plus storage of cycles in line with District Council design guides where appropriate
- 1 stand = 2 spaces. The number of stands to be provided from calculations to be rounded upwards
- Preferred stand is of 'Sheffield' type.
- All cycle parking facilities to be secure and located in convenient positions
- Oxford City Council has a separate standard to reflect high cycle usage in the city
- Residential visitor cycle parking should be provided as communal parking at convenient and appropriate locations through the development

2.4.2 There are several aspects to consider when planning cycle parking to ensure that 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.



Parking space for 12 cycles (To promote and facilitate active travel, locations for cycle parking should be incorporated at destinations)

2.4.3 Particular attention is drawn to the provision of enclosed cycle storage often provided for flats. Inside an enclosed cycle storage area 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 ensure that provision is appropriate and sustainable.

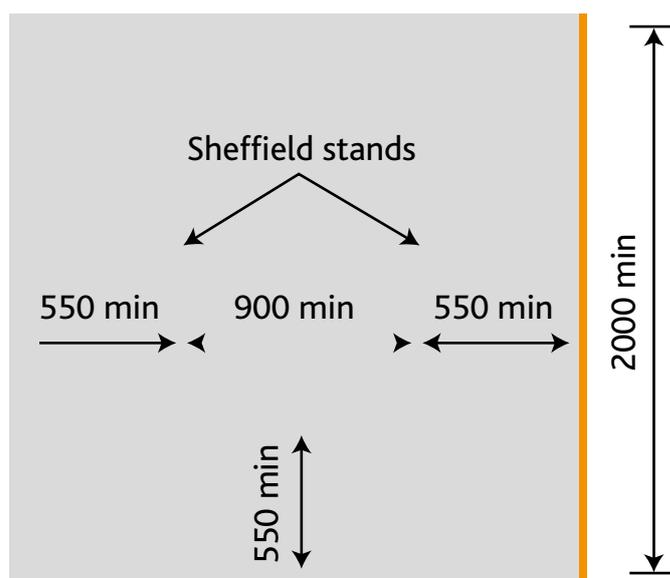


Diagram 2: Minimum dimensions of an enclosed cycle storage area. Credit: Manual for Streets

2.5 Checklist for developers

Is there permeability for cycle users throughout the development?	
Is appropriate cycle infrastructure provided?	
Does the development layout ensure good connectivity to the wider network and destinations for cycle users?	
Are the minimum standards for cycle parking met?	

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 schemes on the existing highway network as well.

Speed limit	Average Annual Daily Motor Traffic Flow (AADT)	Minimum Cycle Infrastructure Provision
40mph +	Any	Cycle tracks (segregated or shared with pedestrians). Reference should also be made to Oxfordshire Walking Design Standards paragraph 2.6 - Shared Use: Pedestrians and Cyclists if segregation is to be considered
20mph - 30mph	2,500 – 5000	Cycle lanes
	> 5000	Stepped cycle tracks

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

3.1 Quiet streets

- 3.1.1 No specific cycle infrastructure is required or desired on streets where traffic is light and speed is low. For the purposes of this document this is defined as where the average annual daily motor traffic flow is less than 2,500. 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 - not a narrow strip at the very edge of the road - often a wider section around one metre from the road edge will be more appropriate
Build-outs	Unnecessary inconvenience and potential danger for cycle users. If used, build-outs should 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

Table 3: Road features that negatively impact cyclists and should be avoided where possible

3.2 Busier roads

- 3.2.1 Where the average annual daily motor traffic flow exceeds 2,500, or where the road speed is higher than 40mph, infrastructure for cycle users should be provided.
- 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 2.

Parallel cycle tracks

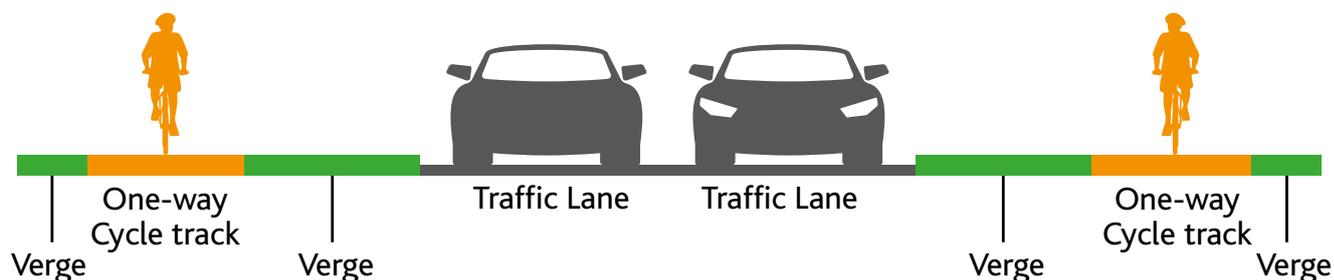


Diagram 3: Parallel cycle track

- 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 however.
- 3.2.6 Such paths should 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.

Stepped cycle tracks

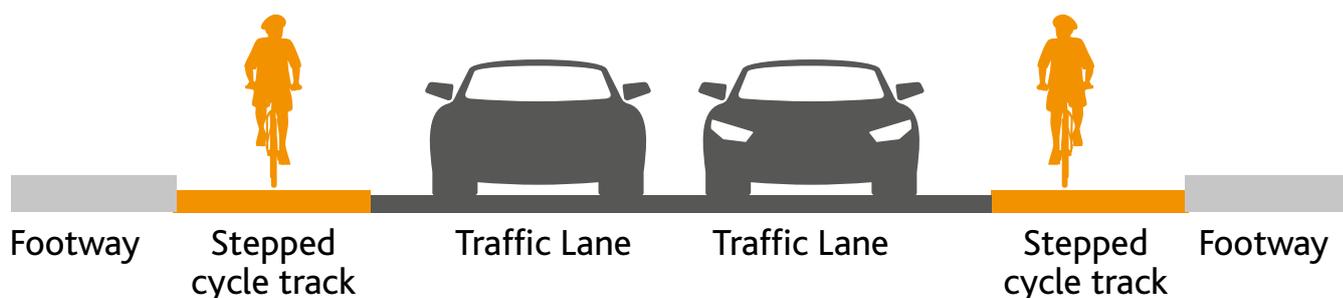


Diagram 4: Stepped cycle track

- 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, indeed Oxford has had some for several decades - for example along Donnington Bridge Road.

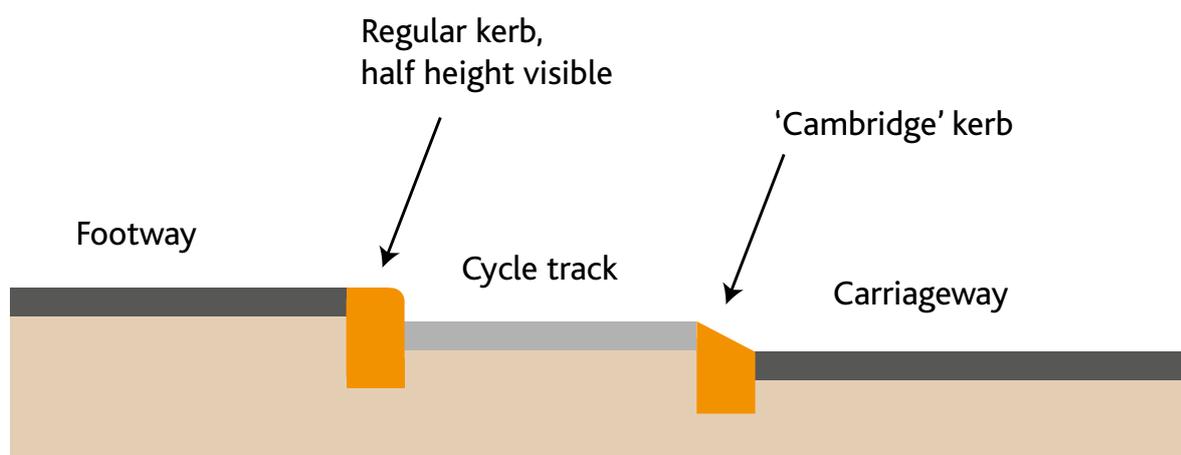


Diagram 5: Stepped cycle track cross-section

- 3.2.10 Our preferred design of stepped cycle track is shown above. 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 will usually be necessary for raised cycle lanes 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 move between in and out of them when required. This ensures that 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 should not be permitted. Where parking is to be accommodated, a stepped cycle track could pass either side of the parking bays. Adequate buffer should be provided to prevent car doors being opened into the cycle track.

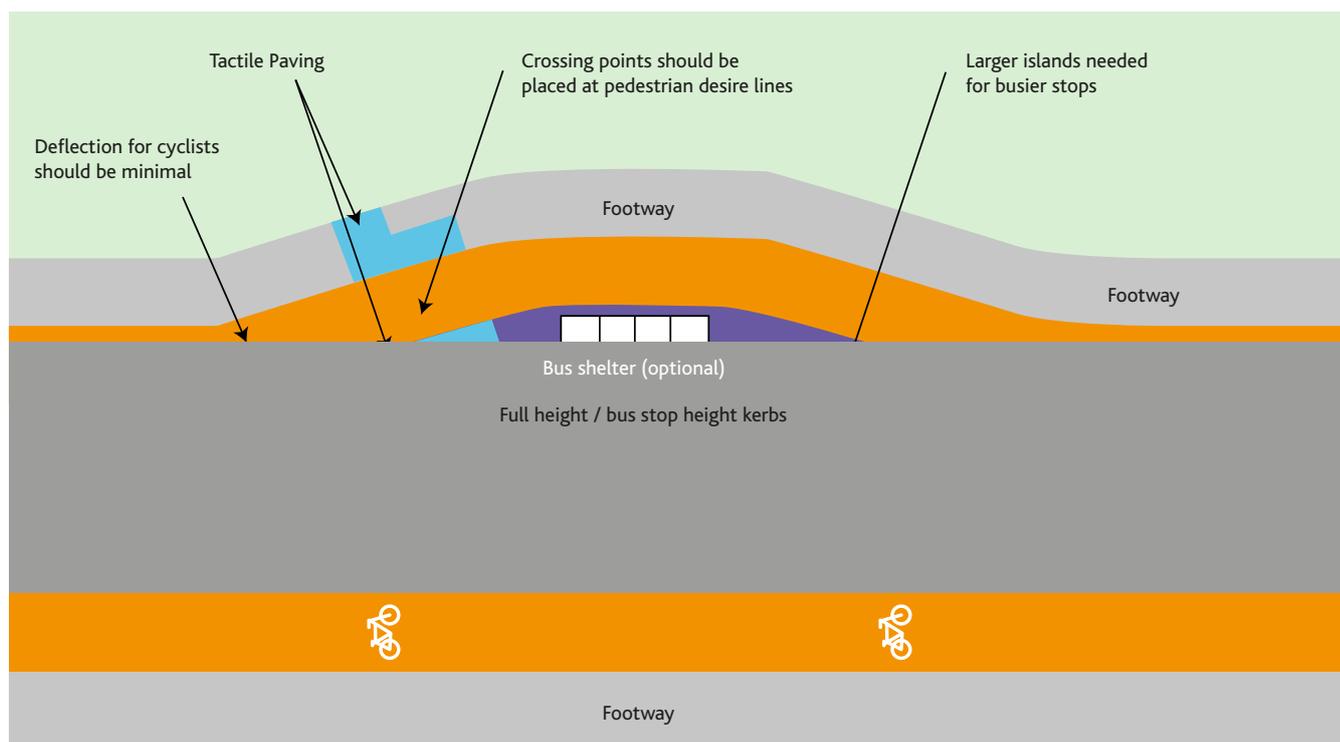


Diagram 6: Bus Stop by-pass (indicative layout – not to scale)

- 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.

Mandatory and advisory on carriageway cycle lanes

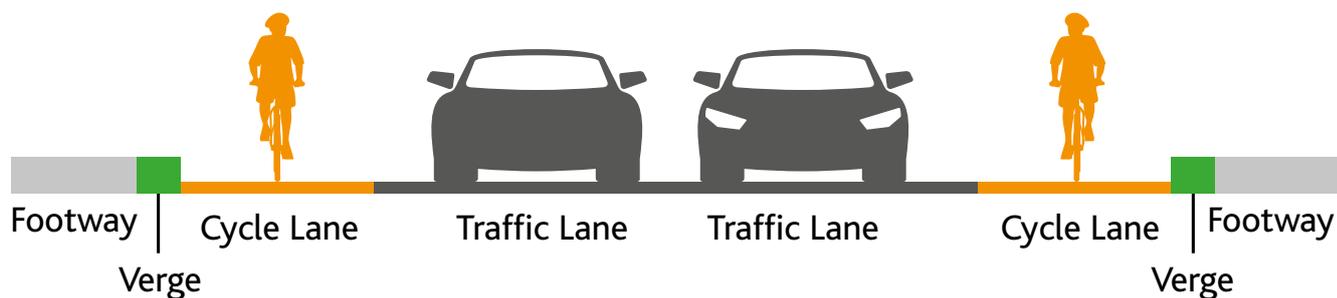


Diagram 7: On-carriageway cycle lanes

- 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. 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 should 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 or armadillos can be considered on an experimental basis.



The use of LED road studs to delineate cycle lanes is encouraged

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 at present aim to cover detailed design aspect of junctions. For this reason it is essential to refer to the more detailed guidance on junctions contained within these reference documents:
- Interim Advice Note 195/16 – Cycle Traffic and the Strategic Road Network (2016) (sections 2.4, 2.6 and 2.7)
 - Design Guidance - Active Travel (Wales) Act 2013 (2014)
 - London Cycling Design Guidance (2014)
 - Greater Manchester Cycling Design Guidance (2014)
- 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 - roundabout entry should be radial, not tangential, in order to slow traffic. These aspects are covered in some of the documents listed in 3.3.2.

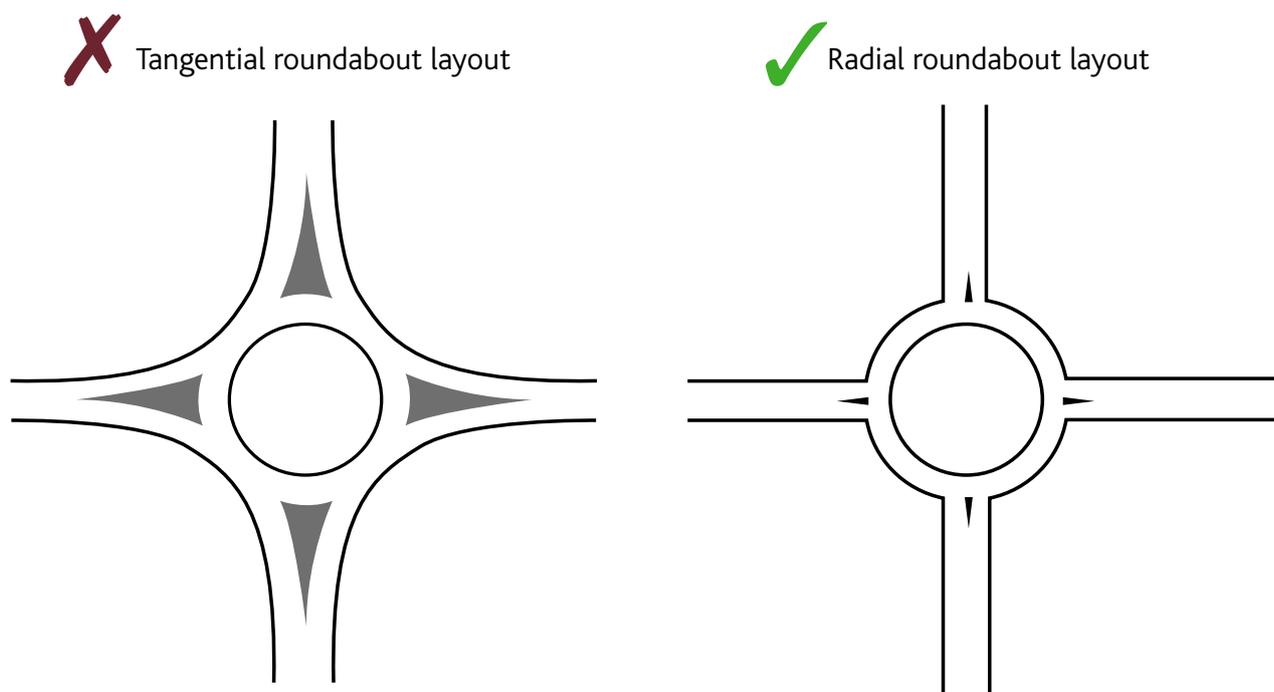


Diagram 8: Roundabouts should be designed with radial entry

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 together to form a single network for cycle users, and not considered as two separate networks. This includes where off-carriageway facilities meet a road which itself has no specific infrastructure for cycle users.
- 3.4.3 Path surfaces should be appropriate to the environment and users - in urban areas should be sealed with 'black top'. 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 as Area of Outstanding Natural Beauty or open countryside.



Cycle paths in urban areas should be sealed with 'black top' (left image), in more rural areas rolling grit into the surface may be more suitable (right photo)

- 3.4.4 Paths should be lit where they connect one lit area to another. In rural areas, solar studs can provide an appropriate form of light.
- 3.4.5 Paths should be direct, open (not enclosed with high sided fences) and, where possible, overlooked to aid personal security.

Segregated paths



Full segregation. Pedestrian path (right) and the two-way cycle track (centre) are separated from the main carriageway (left)

- 3.4.6 Off-carriageway facilities that are well used by either cycle users or other users should be fully segregated by either kerbing, verge or hedge and not painted lines. This benefits both cycle users and other 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 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.

Shared paths

- 3.4.8 It is not always appropriate, possible or necessary to provide fully segregated off-carriageway paths. For lightly used paths or where space is constrained a shared path will suffice. Extra care will be required to integrate shared paths with the carriageway for cycle users while appropriately catering for the needs of pedestrians and other users, including equestrians where appropriate.
- 3.4.9 Usage should dictate the width of such paths, with 3 metres the recommended width, 2.5 metres the minimum. Paths wider than 3 metres should normally be segregated rather than shared.
- 3.4.10 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. However, segregation with painted lines can begin to become self-enforcing and have benefit where usage is high.

3.5 Interface between off- and on-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 should be used not drop kerbs.



✓ flush kerb



✗ drop kerb

- 3.5.2 Barriers should 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 (reference design cycle vehicle being 1.2m wide) and include reflectors to ensure it can be seen at night.

- 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.



Placement of a single bollard to prevent vehicles from entering the cycle path



Example of protected exit – roadside cycle track merging onto carriageway

- 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 listed in 3.3.2 together with the Design Manual for Roads and Bridges.
- 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 Signage

- 3.6.1 Cycle traffic signs provide direction information, identification of infrastructure as being available for cycle users, and instructions or warnings. Cycle traffic signs must be in accordance with TSRDG.
- 3.6.2 The use of signage on cycle routes should be minimised and only signs actually required (specified in TSRDG) or that have a clear benefit should be provided (refer to Traffic Advisory Leaflet 01/13 Reducing Sign Clutter).
- 3.6.3 “Cycle users Dismount” signs should not be used. “Cycle users Re-join Carriageway” signs can be appropriate in some circumstances. Where a designer thinks a “Cycle users Dismount” sign is required, the appropriateness of the infrastructure for cycle users should be questioned.
- 3.6.4 Attention should be paid to the end of off road cycle tracks – it should be clear to cycle users that they need to continue on road, by either appropriate signage or markings. This is to avoid cycle users inadvertently carrying on riding on footway, and also to avoid the impression that provision for cycle users has simply ended.
- 3.6.5 The use of directional signage is encouraged where it helps wayfinding, even for shorter sections of path. Directional signage should be provided at all junctions with other cycle routes and where a cycle route meets a carriageway. Distances should normally be signed except where the journey time is less than 15 minutes (for a cycle user travelling at 12mph), in which case the journey time should be displayed instead.



Good practice - Signage in Bicester showing estimated journey times for cyclists and pedestrians

References

- **Manual for Streets** (2007)
- **Manual for Streets 2** (2010)
- **Cycle & Pedestrian Routes within Car Parks** (Sustrans Technical Information Note No. 16, 2011)
- **The National Planning Policy Framework** (Communities & Local Government, 2012)
- **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** (TfL, 2013)
- **Design Guidance Active Travel** (Wales) Act 2013 (2014)
- **London Cycling Design Standards** (2014)
- **Greater Manchester Cycling Design Guidance** (2014)
- **Handbook for Cycle-friendly Design** (Sustrans, 2014)
- **Making Space for Cycling** (Cyclenation, 2014)
- **Street Design for All** (2014)
- **Benefits of Investing in Cycling** (British Cycling/ Dr Rachel Aldred, 2014)
- **Station Public Realm Design Guidance** (Transport for London 2015)
- **Interim Advice Note 195/16 Cycle Traffic and the Strategic Road Network** (2016)
- **Working together to promote active travel** (Public Health England, 2016)
- **Start Active, Stay Active** (Department of Health 2016)
- **Traffic Signs Regulations and General Directions** (2016)
- **Better Streets Delivered 2** (TfL, 2017)

A copy of this document and those in the Oxfordshire County Council Design Standards series can be found at www.oxfordshire.gov.uk.

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

- The Active & Healthy Travel Strategy
- The Walking Design Standards
- Residential Road Design Guide

Produced by Oxfordshire County Council with guidance from members of the Active & Healthy Travel Steering Group:



Our thanks also go to our stakeholders who kindly provided feedback who included: Planners, engineers, public health professionals, walking, cycling, disability and urban design groups, public transport representatives and landowners.