

B.03 Road Crossings – Mid Link

Key Principle

Cycle tracks may be provided with priority crossings of roads where speeds are less than 30 mph, total traffic flows do not exceed 4,000 vehicles per day and the crossing is sited on a flat-topped road hump.

A number of mainland European countries allow the use of zebra-style pedestrian crossings by cyclists. At present cyclists may not lawfully cycle across zebra crossings within the UK and there are currently no layouts that can be delivered to achieve this. Where cycle tracks naturally bring cyclists to such facilities, wider than normal crossings should be provided and 'Cyclists dismount' signs used.

Design Guidance

Background

Cycle track crossings of roads can be broken down into two main categories. The first could be considered analogous to pedestrian crossings, both controlled and uncontrolled. The second category covers the type of crossing required when a cycle track running alongside a main road encounters a side road. Although the latter only relates to a specific type of crossing, it is covered by a section of its own (see also [B02 Road Crossings – Side Roads](#)) because of the number of issues it gives rise to, and the various ways in which the cyclist can be provided for at these locations. This section, therefore, covers the first category only. Tactile paving for both categories is covered in [B05 Footway Crossings and Tactile Paving](#).

The appropriate form of crossing should only be determined once an assessment has been carried out. Local Transport Note *The Assessment of Pedestrian Crossings* LTN 1/95 DoT 1995 describes the procedures which can be followed when deciding how pedestrians could be provided for. It is possible to adopt a similar approach for cycle crossings and it is suggested that the following site characteristics are recorded;-

- Location,
- Visibility,
- Complexity,
- Crossing traffic (e.g. cyclists only or cyclists and pedestrians),
- Vehicle flows and speeds,
- Road accidents.

When deciding upon which type of crossing would be most suitable, the following factors will also need to be considered;-

- Current difficulty of crossing,
- Potential delay to traffic using the road,
- Potential delay to cyclists crossing the road,
- Road capacity,
- Correspondence from interested parties,
- Installation costs,
- Operating costs.

The options, in order of complexity, are to;-

- Do nothing,
- Provide an uncontrolled crossing, possibly including a refuge island, with cyclists giving way to road traffic,
- Provide a "controlled crossing" where cyclists have priority over the road traffic - strictly speaking, this is a cycle-priority junction, not a crossing,
- Provide a controlled signalised crossing,
- Provide a grade separated crossing.

Determining the most suitable crossing type

In determining the suitability of different types of crossing, the importance of the cycle route in the context of the overall network should be taken into account. Opportunities to reduce traffic flows and speeds should be explored with a view to facilitating crossing by cyclists. Altering the impact of general traffic in this way will have a bearing on the type of crossing eventually decided upon.

The following table is a coarse guide to possible options for crossing 2-way roads. It should be only used to give a first indication of what may be suitable. In all instances, the features of individual locations should be assessed on a case by case basis.

Type of crossing for cyclists	85%ile speed on main road	Traffic flow on main road (2-way daily)
1. Cycle track has priority over road being crossed (See also B02 Road Crossings – Side Roads)	< 30mph	<4000
2. Cyclists give way to road traffic	< 50mph	<6000
3. Cyclists give way to road traffic plus central refuge - Urban	< 50mph	<8000
4. Cyclists give way to road traffic plus central refuge - Rural	< 60mph	<10,000
5. Signal control, including Toucans	< 50mph	>8000
6. Grade separated crossing - Urban	> 50mph	>8000
7. Grade separated crossing - Rural	> 60mph	>10,000

Cycle track has priority

Cycle priority junctions are key features for maintaining the continuity of cycle tracks, and their design needs careful consideration. They differ from conventional priority junctions in a number of practical ways and there are significant differences in the issues surrounding their operation. The designer must be aware of these differences and has to be satisfied that this type of junction will work safely where it is proposed to install it.



Cyclist priority junction
on flat-topped road
hump, Thetford

Picture: Rob Marshall

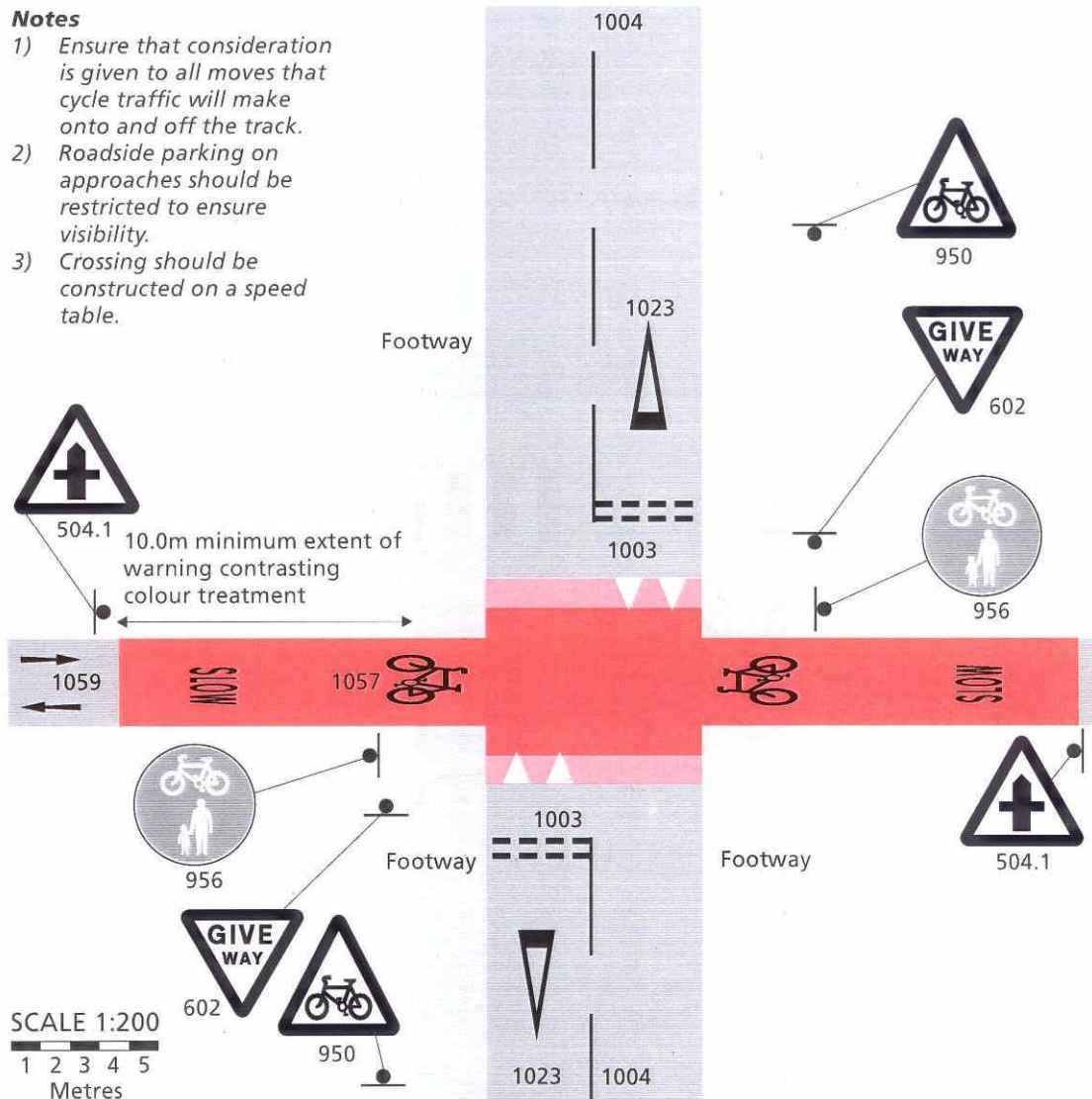
This type of junction gives a degree of control over motor traffic to users who may have little traffic sense and who could be lacking in judgement and maturity i.e. children. Their perception of control, and hence safety, may also be much greater than is justified and so design of such features must be undertaken with care. Whilst the same is true for zebra crossings, pedestrians wishing to use a zebra crossing generally have very little potential to approach it at speed and they usually turn through a right-angle to use it. Cyclists approaching a cycle priority junction, on the other hand, have considerable potential to do so at speed and they often join the crossing in line with it. The expected type of user can therefore influence the design and may determine whether such a layout is appropriate in the first place.

Another significant difference is the fact that a cycle priority junction gives a minor road priority over a major one. This only applies to cycle priority junctions and examples are relatively rare, so it needs to be made clear to motorists what is expected of them as they approach it. In addition, the visibility splay normally required at a conventional junction does not apply in the same way. The X-distance is normally measured from the give way line. In a cycle priority junction, the X-distance gets artificially extended because the give way line does not coincide with the edge of the cycle track (in the example shown in the picture below, it appears to have been pushed back about 6m). On the other hand, a motorist pulling away from the give-way line has to negotiate the ramp of the hump so it might be more appropriate to measure the X-distance from this point. It is not possible to advise on this issue here as no research has been carried out to establish good practice. The designer simply needs to be aware of these differences.

As the give-way line is not fixed relative to the cycle track, its eventual location is another issue which needs to be decided upon. Note that while moving it further away from the track might at first seem to improve safety, if it is placed too far away it could end up being ignored by motorists.

At cycle priority junctions, TSRGD requires the cycle track to cross the road on a flat-topped road hump. This arrangement can only be used for roads with a speed limit of 30mph or less because the Road Hump regulations restrict the use of humps to these roads. A hump height of 75mm is recommended (100mm max). Although TSRGD allows diagram 1003 (twin broken line) markings to be used on their own, in these circumstances, they should always be accompanied by diagram 1023 (triangle) markings and 'Give way' signs to diagram 602 (see also [A03 Traffic calming](#)).

Figure 6.2.2 Cycle track crossing minor road



Source: Lancashire the Cyclists' County

Note: Tactile paving on footways has been omitted for clarity

See: [B05 Footway Crossings and Tactile Paving](#)

Ideally, the road hump should be preceded (in both directions) by other speed-reducing features on the carriageway. It is also worth considering some form of speed-reduction for cyclists approaching the junction (see [B08 Access and Speed Controls](#)). Note that give-way signs and markings only apply to vehicles. In practice, pedestrians will probably use the crossing.

Cyclists give way to road traffic

Where circumstances preclude cyclists being given priority, an uncontrolled cycle crossing may be the next best solution. There is no requirement to place these crossings on a flat-topped hump. If a hump is used, the issue of cyclists approaching at speed on the cycle track could again become significant, and it may be necessary to include a speed-reducing feature to mitigate this (see [B08 Access and Speed Controls](#)). Give way markings (and, possibly, signs) will be required on the cycle track approaches.



Cyclists give way at road crossing, Thurrock

Picture: Rob Marshall)

Cyclists give way to road traffic, central refuge present

Where cycle routes cross roads with speed limits above 30 mph and vehicle flows are high, it becomes more difficult for cyclists to judge vehicle speeds and find an adequate gap in the traffic. A central refuge makes this task a lot easier. With a refuge, there is no need to find a gap in the traffic flowing in both directions, so opportunities to cross each lane also become a lot more frequent.

Whenever possible, cyclists should be allowed to cross in a straight line even though it is a two-stage exercise. Central "sheep-pen" enclosures and other indirect crossing routes add to the cyclist's delay and involve extra effort, reducing the attractiveness of the route.

Care needs to be taken to ensure that refuges installed to benefit cyclists crossing the road do not create pinch points for cyclists using the road itself.



A1 South of Berwick

Picture: Sustrans

The width of the gap in the central refuge (i.e. measured parallel to road centreline), should be at least 2.5 m and preferably not less than 3.0m. Where rural routes carrying cycling family groups cross major roads, the width should be increased to allow for groups of pedestrians and cyclists to cross together - typically 4m or wider depending on levels of use.

The depth of the gap in the central refuge (i.e. measured perpendicular to road centreline), should be at least 2 m and preferably not less than 2.5m, to accommodate the full length of a typical bicycle. On roads with higher speeds or flows, extra depth should be provided if possible. Care should be taken to ensure that the surface of the gap is flush with the adjacent carriageway.



A1 South of Berwick

Picture: Sustrans

Where cyclists using a road carrying large flows of high speed traffic need to turn right to join a cycle track on the opposite side, it may be more appropriate to get them to the central refuge via a jug-handle turn on the nearside. This allows them to cross both carriageways at right angles to the flow.



Jug-handle at non-priority crossing, Hayling Island, Hampshire (confident cyclists may wish to stay on the carriageway in such circumstances but in the face of heavy traffic the opportunity to pull off and more readily take advantage of gaps can provide advantages)

Picture: Patrick Lingwood

Signal Control (see also [A08 Signal Controlled Junctions](#))

Cycle crossings can be controlled by signals in a number of ways. If a cycle track crosses a road at a signal controlled junction, it can be given a dedicated phase within the signalling sequence. If the track is intended to be used solely by cyclists, and pedestrians are catered for elsewhere, the signal aspect to Diagram 3000.2 should be used.



Dedicated light-controlled crossing, Bedford

Picture: Rob Marshall

Where pedestrians share the crossing with cyclists, a toucan crossing should be used. Toucans can also be used as a stand-alone crossing away from junctions. Another option is to use a parallel crossing, where pedestrian and cyclist crossing flows are segregated by a short gap. This type of crossing is usually only suited for stand-alone use due to its width.



Signalised cycle crossing leading from town centre to quiet street
High Street East, Slough

Picture: Patrick Lingwood

Cycle/pedestrian crossing with central refuge and near side aspects within signal controlled junction, Taunton

Picture: Alex Sully



Toucan crossings

Toucan crossings are primarily used to link cycle tracks away from junctions, although they can also be used at signal-controlled junctions and where cycle tracks cross the arms of large roundabouts. Detailed guidance on the provision of pedestrian crossings may be found in;-

- *The Assessment of Pedestrian Crossings* LTN 1/95 DoT 1996.
- *The design of Pedestrian Crossings* LTN 2/95 DoT 1995.
- Traffic Advisory Leaflet 10/93 "Toucan" – *An unsegregated crossing for pedestrians and cyclists.*
- Traffic Advisory Leaflet 4/98 *Toucan Crossing Development.*

When installed as a stand-alone crossing, a Toucan should ideally be quicker and safer for cyclists to use than alternative ways of getting across the road. The delay before the cyclist gets a green light should be set to the minimum.

Research into pedestrian and cyclist attitudes has shown that, for signalised crossings, the volume of traffic, safety, delay and convenience of siting have a significant influence on users deciding whether or not to use them. Toucan crossings should therefore be positioned on desire lines and configured to give a green signal for cyclists and pedestrians with the minimum of delay.

Toucans are primarily recommended for 2-way daily flows on the main road of over 8000 vehicles and peak hourly flows of more than 1000 vehicles in 30 mph speed limit areas or at lower flows with speed limits of 40 mph and above. The presence of pedestrian crossing movements and cycle routes to school should also be taken into account.

Cyclists should be allowed to cross the carriageway in one movement. The use of pens or split crossings, with separate signal control for each crossing movement, should be avoided wherever possible. Where pens are employed detectors should be used to match the call on the second stage to provide a continuous crossing movement. Pens should be wide enough for cyclists and pedestrians to mix without conflict. Cyclists should never be required to dismount at a Toucan crossing.

Some early Toucans served footpaths and cycle tracks which were segregated right up to the kerb line. The problem with this arrangement is that blind or partially sighted people could easily drift over to the cyclist's side by the time they had crossed the road. For this reason, waiting areas for toucans should be shared use, even in cases where the footpath and the cycle track revert to segregation away from the crossing.

Parallel crossings

When pedestrians and cyclists use a Toucan, they share the area of road they are crossing on. If the flows of either group are significant and there is some form of segregation present on the approach to the crossing, both user groups can benefit from a degree of separation on the crossing itself. Such a crossing is called a parallel crossing. Toucan and parallel crossing can be considered analogous to mixed use and adjacent use routes, respectively.

There should be sufficient separation between the footway and the cycle track at the kerb edge, to reduce the likelihood of blind or partially sighted people drifting onto the cyclist's side when they reach the other side of the road. Separate signal heads are required, and because of this and the space requirements, such crossings are comparatively expensive.



Cycle track leading to a parallel crossing, Kingston upon Thames

Picture: Rob Parsey

Grade separated crossings (see also [C01 Headroom](#))

Grade separated crossings remove the potential for conflict between cyclists and motor traffic. The crossing can be placed on a bridge or within a subway but both have disadvantages. Although they eliminate the danger from road traffic, the relative isolation of the crossing itself can give rise to personal security issues, whether real or perceived. Grade separation also increases the effort required for people wishing to use the crossing. A bridge generally requires more user effort than a subway because users have a greater height change to negotiate. However, although subways are easier to use, the personal security issues can be more significant and good visibility, lighting and flared approaches are important.

For cyclists and pedestrians, a safe and convenient surface crossing is much more user-friendly. Grade separated crossings should only be considered after surface crossings have been ruled out and this should not occur until the practicable options for making surface crossings work have been exhausted.



Subway avoiding major road, Taunton

Picture: Alex Sully

Zebra Crossings

The design and use of zebra crossings is covered under the *Zebra, Pelican and Puffin Pedestrian Crossing Regulations and General Directions 1997*. These require motorists to give way to pedestrians on a zebra crossing.

A number of mainland European countries allow the use of zebra-style pedestrian crossings by cyclists. At present it is not unlawful for cyclists to cycle across zebra crossings within the UK but, unlike pedestrians, they do not have priority over traffic using the carriageway. In addition, there are currently no layouts that can be delivered to achieve this.

It is, nevertheless worth noting that an unpublished draft report prepared by TfL covering research into six sites where cyclists are known to cycle across zebra crossings (up to 1000 cyclists crossing per day) found the following:

- 🚲 87% of cyclists arriving at the crossings remained on their bicycles and cycled across.
- 🚲 Cycle vs. pedestrian conflict at the 'shared Zebra' sites was of the same order but slightly higher than that at Toucan crossings.
- 🚲 Vehicle vs. cycle conflict at 'shared Zebra' sites is somewhat higher than that at Toucans, Pelicans and puffins, but much safer than comparable uncontrolled crossings.

Where cycle tracks naturally bring cyclists to such facilities, wider than normal crossings should be provided and 'Cyclists dismount' signs used. The TfL draft report referred to above suggests that a minimum width of 4m be adopted where cyclists share zebra crossings with pedestrians.

If cycle crossing flows are high and the flow of traffic on the road is not too high or too fast, it may be worth considering converting the Zebra crossing to a flat-topped priority cycle track crossing. However, this type of crossing requires a considerable amount of careful consideration before it can be implemented (see above) and removes the legal priority afforded to pedestrians on zebra crossings.



Pedestrians and cyclists share wide Zebra crossing. Note 'Cyclists dismount' sign top right of picture, Hull

Picture: Tim Pheby

References

[TAL 04/98 Toucan crossing development](#) DfT 1998

[TAL 10/93 "Toucan" – An unsegregated crossing for pedestrians and cyclists](#) DfT 1993

[Cycle Track Crossings of Minor Roads](#), TRL Report 462

[Policy, Planning and Design for Walking and Cycling](#) – Local Transport Note 1/04, Public consultation Draft, DfT 2004

[Adjacent and Shared Use Facilities for Pedestrians and Cyclists](#) – Local Transport Note 2/04, Public consultation Draft, DfT 2004

[TAL 10/00 Road Humps: discomfort, noise and ground-borne vibration](#) DfT 2000

[TAL 9/98, Sinusoidal, H & S road humps](#), DETR

[TAL 7/96, Highway \(road Humps\) Regulations](#) 1996, DoT

[TAL 7/93 Traffic Calming Regulations](#)

[TAL 3/90, Urban Safety Management - Guidelines from IHT](#) (pdf – 6Mb) DfT 1990

[TA 90/05 The Geometric Design of Pedestrian, Cycle and Equestrian Routes](#) (pdf - 261kb) Design Manual for Roads and Bridges, Highways Agency 2002

[TD 36/93 Subways for Pedestrians and Pedal Cyclists Layout and Dimensions](#) (pdf – 95kb) Design Manual for Roads and Bridges, Highways Agency 1993

[Cycling England Gallery](#) pictorial examples

[Rural Road Traffic Calming – Information Sheet ff38](#) Sustrans

[London Cycling Design Standards – A guide to the design of a better cycling environment](#) (Sections 3.4, 3.5, and 3.6) TfL 2005

[Lancashire - The Cyclists' County](#) (pdf - 5.45Mb) (Section 3) – creating pleasant road conditions Lancashire County Council, 2005

[CTC Benchmarking – Best practice case studies](#)

[Collection of Cycle Concepts](#) (pdf - 7.12Mb) Danish Road Directorate 2000

[National Cycle Network – Guidelines and Practical details, Issue 2](#) Sustrans 1997

Other references

[LTN 1/95 The Assessment of Pedestrian Crossings](#) (pdf – 320kb) DfT 1995

[LTN 2/95 The Design of Pedestrian Crossings](#) (pdf – 1Mb) DfT 1995
Traffic Calming Techniques, IHT/CSS 2005

Pedestrian Perceptions of Road Crossing Facilities Sharples JM and Fletcher JP
Transport Research Laboratory 2001 (published by the Scottish Executive)

[Cycle Friendly Infrastructure - Guidelines for Planning and Design](#), Bicycle Association et al 1996

Shared-use Zebra Crossing Study TfL (unpublished draft) January 2007