Chapter 5 - Junctions and Crossings

Continuity is essential to the popularity of any cycle route, therefore the proper resolution of junction features is critical for its success. For the National Cycle Network, not only must junction details provide a safe solution, but they should also exhibit due regard for all types of road user. In particular, the quality of detail and the level of priority given to cyclists and pedestrians must reinforce the perception that they are welcome in the area - near urban centres possibly more so than motorists.

Use of Guidelines

In this section the layouts for typical junctions, which might be met along a cycle route, are shown including signing and marking requirements.

The junctions and crossings illustrated are arranged in a generalised sequence, starting with the simpler crossings of minor roads and accesses, progressing to major road crossings and more complex schemes.

The National Cycle Network, being a demonstration of high quality cycling provision, should have priority over private entrances and minor side roads wherever practicable. See Figure 5.4.

Crossing Priority

The assessment of the appropriate form of crossing facility at any one location will depend on a number of site specific factors. LTN 1/95 establishes a methodology for assessing crossing sites and includes a framework for the comparison of options. This procedure can be adapted for the evaluation of National Cycle Network crossings. An example of a site assessment record sheet for cycle/pedestrian crossings is included in Appendix 11 and Figure 5.1 gives a worked example of the assessment framework applied to a National Cycle Network crossing.

The delay assessment should include the projected increase in crossing movements as a result of the implementation of the National Cycle Network and local cycling facilities. The effect of delay on motor vehicles must be considered, but will not normally over-rule the provision of a crossing where there is a clear difficulty for cyclists and pedestrians.

Delay at junctions reduces the attractiveness of a route and therefore situations should be avoided where the cyclist would be required to stop or give way frequently. Toucan and pedestrian crossings should not unnecessarily delay cyclists and pedestrians once they have made a demand on it.

The highest level of provision for cyclists should be made, commensurate with the results of an assessment using the LTN 1/95 methodology.
The following table of speed/flow criteria for the carriageway to be crossed provides guidance in helping to determine the appropriate form of crossing. Whilst these criteria are important, other aspects of a crossing MUST be considered and this should only be done by using the LTN 1195 methodology. The need for measures to reduce vehicle speeds on the main road approaches should be addressed if necessary. The figures in the table are to be treated as guides only and not precise boundaries.

<table>
<thead>
<tr>
<th>Crossing Facility</th>
<th>85 percentile speed mph</th>
<th>Vehicle Flow 2 way vpd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle Track Priority</td>
<td>&lt;30</td>
<td>&lt;4000</td>
</tr>
<tr>
<td>Cycles Give Way to Cars</td>
<td>&lt;50</td>
<td>&lt;6000</td>
</tr>
<tr>
<td>Cycles Give Way to Cars with Central Refuge</td>
<td>*&lt;60 rural</td>
<td>&lt;10000 rural</td>
</tr>
<tr>
<td>Signal Control</td>
<td>&lt;50</td>
<td>&gt;8000</td>
</tr>
<tr>
<td>Grade Separated</td>
<td>&gt;50</td>
<td>&gt;8000</td>
</tr>
<tr>
<td></td>
<td>*&gt;60 rural</td>
<td>&gt;10000 rural</td>
</tr>
</tbody>
</table>

*The criteria have been extended for the rural area where the provision of signal control is likely to be unacceptable and where grade separated crossings may also be problematic e.g. in Areas of Outstanding Natural Beauty or National Parks.

**Visibility**

At junctions and crossings it is important that there is adequate visibility between cyclists and drivers, and between cyclists and pedestrians. The cycle route should be clearly marked both to guide cyclists and to inform drivers of the National Cycle Network route through the junction. It is recommended that, on the approaches to and within the junctions and crossings, the surface of the cycle track or lane be provided with a colour contrast treatment as a warning to cyclists of the potential hazard, and to discourage motorists from encroaching into the cycle facility.

**Signalled Controlled Junctions**

Signal control for cyclists can be used at junctions to reduce or eliminate conflict and at crossings to create a safe period for the manoeuvre. At signal controlled junctions advanced stop lines should be used wherever feasible. The need to allocate additional time as well as space to cyclists and pedestrians should also be considered. Once a demand has been registered, pedestrians and cyclists should not experience undue delay. Signal timings should recognise that many National Cycle Network users will travel more slowly than commuter cyclists.

**Roundabouts**

Conventional UK roundabouts can pose particular dangers for cyclists. Accident rates for cyclists on roundabouts are approximately 2-3 times higher than at traffic signal junctions. It is therefore important to consider carefully whether the cycle route can be designed to avoid existing dangerous roundabouts. At new junctions due weight should be given to the advantages for two-wheeled vehicles and pedestrians provided by a traffic signal junction (with appropriate cycle and pedestrian facilities) as opposed to a roundabout.
If the National Cycle Network route cannot avoid the roundabout it may be possible to modify it to an acceptable design as below.

a) "Continental style" roundabout - designed for use by mixed traffic. See Figure 5.16.

b) Roundabout with segregated cycle track. See Figure 5.16.

c) Full time signalisation of the roundabout.

The continental style roundabout complies with the recommendations of TD 16193 Geometric Design of Roundabouts but places greater emphasis on speed reduction of motor vehicles as opposed to capacity requirements which tend to be the predominant factors governing present UK roundabout design.

Full time signalisation of the roundabout is expensive and is only likely to be considered in heavily congested situations. However, it does have advantages for cyclists. It should eliminate the predominant type of accident, between motorists entering and cyclists circulating the roundabout.

Advanced stop lines should be considered in association with signalisation. The use of part time signals does not provide a significant benefit to cyclists in terms of reduced accident rates. Generally it will not be appropriate to route the National Cycle Network through such heavily trafficked junctions.

Peripheral cycle lanes on the circulating carriageway of the roundabout do not improve safety for cyclists.

**Mini Roundabouts**

Accident rates for cyclists at mini roundabouts are lower than those at other types of roundabout but slightly higher than the rates for priority junctions and traffic signal junctions.

Mini roundabouts may be appropriate on the National Cycle Network where cyclists need to turn right or where speeds need to be reduced. Mini roundabouts may also be appropriate to reduce delays to cyclists on the National Cycle Network where they join or cross the major road from a minor road, where priorities cannot be reversed. Such roundabouts should have adequate entry and exit deflections. They should have a raised central island which ensures sufficient deflection for cars and smaller vehicles whilst allowing large HGVs to overrun them on tight turns. Excessive visibility to the right on entry can lead to accidents. It is recommended that mini roundabouts on cycle routes be designed as speed reducing measures with single lane entries and that the approaches normally have other traffic calming features associated with them. (See also Chapter 6).
### SITE ASSESSMENT - Considerations

<table>
<thead>
<tr>
<th>Location</th>
<th>Grid reference, description of highway, usage by buses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway Facilities</td>
<td>Lighting, gradient, speed limit skid resistance</td>
</tr>
<tr>
<td>Visibility</td>
<td>Impact of parking and vehicle speeds on stopping sight distance and visibility of pedestrians and cyclists approaching crossing</td>
</tr>
<tr>
<td>Complexity</td>
<td>Adjacent junctions, entrances, schools, acting to divert drivers attention from crossing points</td>
</tr>
<tr>
<td>Pedestrian /Cycling Traffic</td>
<td>Existing and projected traffic by type or group</td>
</tr>
<tr>
<td>Motor Traffic</td>
<td>Existing and projected by type and speed</td>
</tr>
<tr>
<td>Accidents</td>
<td>Records, qualitative analysis for projected traffic</td>
</tr>
</tbody>
</table>

### CROSSING OPTION ASSESSMENT - Evaluation Matrix

Example of an evaluation matrix showing type of information required.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Do Nothing (Advisory Crossing)</th>
<th>Advisory Crossing With Island</th>
<th>Toucan Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger /Unpleasantness for pedestrians/cyclists</td>
<td>Very unpleasant/dangerous due to traffic speed and HGVs</td>
<td>Unpleasant due to traffic speed and HGVs</td>
<td>Reasonably pleasant and safe</td>
</tr>
<tr>
<td>Delay for Pedestrians/Cyclists. Average wait in seconds peak period</td>
<td>30 (able)/120 (elderly) in peak period</td>
<td>15 (able)/40 (elderly) in peak period</td>
<td>1 - 3 seconds after end of vehicle minimum green period</td>
</tr>
<tr>
<td>Vehicle delay in peak periods</td>
<td>None</td>
<td>None</td>
<td>2 stops per minute of 12 seconds</td>
</tr>
<tr>
<td>Effect on road capacity</td>
<td>Not reduced</td>
<td>Not reduced</td>
<td>40% Reduction</td>
</tr>
<tr>
<td>Installation costs</td>
<td>None at this stage</td>
<td>1500</td>
<td>20,000</td>
</tr>
<tr>
<td>Operating costs</td>
<td>None</td>
<td>100</td>
<td>2000</td>
</tr>
<tr>
<td>Representations</td>
<td>No support</td>
<td>Police also suggest speed reduction measures. Local council in favour, on cost grounds</td>
<td>Petition (140 signatures) 8 letters following accident to schoolgirl on bike</td>
</tr>
</tbody>
</table>

(Based on LTN 1/95)
**Cycle Track Priority Crossing - Figure 5.2**

**Notes**

1. Cycle track priority road crossing should only be used for crossing single carriageway roads where the vehicle flow is less than 4000 vehicles per day and vehicle speed is less than 30mph. Where speeds exceed this, speed reducing features may be appropriate.

2. The flat top road hump should be constructed in a contrasting colour or material to give prominence to the traffic calming feature (See Chapter 9). The road hump design and location must comply with the Road Hump Regulations, including signing requirements.

3. This facility will require reasonable visibility between the cycle track and the carriageway dependent upon the circumstances at a particular location. Reasonable visibility will therefore be provided between the cycle track and the footway and thus it is unlikely that sign Diag No. 963.1 will be necessary.

4. The designer should be aware that the maximum permitted height of a road hump is 100mm, and kerbs are generally 125mm. Providing a level crossing may necessitate dropping the kerb line slightly.

5. This detail shows an arrangement to give cyclists priority to cross a minor road. In choosing such an arrangement designers should be aware that this does not accord the same priority to pedestrians.

6. Diag No. 950 is shown on this drawing to illustrate the range of circumstances in which it can usefully be employed. In practice, it will normally be sited at a greater distance from the feature than it has been possible to show in the drawing. Advice is given in Chapter 4 of the Traffic Signs Manual. Note that the distance on plate Diag No. 572 should be in yards.

7. Diag No. 7014 "Changed Priorities Ahead" will be used on the approaches to the crossing when relevant. When priorities are changed then local publicity will be given to the change.

**References**

1. Local Transport Note 1/86 Cyclists at Road Crossings and Junctions (S)

2. Traffic Advisory Leaflet 4/90 Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians

3. Traffic Advisory Leaflet 7/96 The Highways (Road Humps) Regulations 1996 (S)

4. The Highways (Road-Humps) Regulations 1996 (SI 1996 No. 1483) (S)

5. The Highways (Traffic Calming) Regulations 1993 (SI 1993 No. 1849) (S)

**Examples**

1. OXFORD: Marston Road (Oxfordshire County Council)

2. OXFORD: Marston Ferry Road (Oxfordshire County Council)
Cycle Track Priority Crossing – Figure 5.2

- **Diag No. 950**: Note: Distance plate Diag No. 572 may usefully be applied.

- **Diag No. 602**: The cycle track crossing and approaches are to be coloured to alert cyclists and drivers. See Chapter 9.

- **Diag No. 956**: Note: Restrict roadside parking on approaches to ensure visibility.
Mandatory Cycle Lane: Continuation Across Minor Road - Figure 5.3

Notes References
1. It is recommended that the cycle lane be coloured when it crosses the junction and on the approach. This approach should be considered in line with the approach to colouring of cycle lanes adopted elsewhere in a local area.

2. Where a mandatory cycle lane is continued by an advisory cycle lane across a minor road, the advisory cycle lane should begin at least 10m in advance of the junction to avoid abrupt turns by motor vehicles.

3. Where mandatory and advisory cycle lanes have been shown, the prescribed upright signs to accompany the road marking have been omitted for clarity.

4. Where a mandatory cycle lane continues across minor accesses then the Traffic Regulation Order will need to include an exemption to allow vehicles needing to use these accesses to enter the cycle lane at these points. Alternatively, these can be treated in the same way as more major accesses, incorporating a short section of advisory cycle lane marking.

5. Use of the triangular marking Diag No. 1023 is recommended on the minor road approach to emphasise the need to give way.

1. Local Transport Note 1/86 Cyclists at Road Crossings and Junctions (S)

Examples
1. OXFORD: Banbury Road (Oxfordshire County Council)
2. YORK: Melrose Gate, Bootham, The Mount (York City Council)
3. EDINBURGH: Queensferry Street (Edinburgh City Council)
Cycle symbol located across exit to give added prominence to the cycle lane

Mandatory cycle lane (Diag No. 1049)

Advisory cycle lane (Diag No. 1004)

The cycle lane is to be coloured to give prominence to the crossing

Mandatory cycle lane (Diag No. 1049) to be continued across minor accesses, private house drives etc. See note 3. Alternatively the advisory cycle lane marking can be provided across the access.
Notes

1. Private accesses with less than 100 vehicle movements per day can be treated in this manner where a cycle track/footway crosses the access.

2. Where the private access is formed by dropped kerbs in line with the carriageway kerb line then the crossing can be provided with no additional measures except the raised white line delineator Diag No. 1049.1 in the case of the segregated cycle track/footway.

3. Where the private access has a kerbed entrance, the purpose of the treatment is to change the perception of drivers turning into the access from that of continuing on the carriageway to that of crossing an area designated for pedestrians and cyclists. For this reason it is recommended that the access be re-engineered as shown in preference to introducing a flat top road hump, which is a carriageway feature.

4. Where the entrance is built up the designer must consider drainage requirements.

5. Warning features which may be considered useful are: colour contrast treatment for the cycle track approaches to the access crossing, cycle marking Diag No. 1057 placed in the entrance to the access, sign Diag No. 950 with arrow plate indicating that the presence of cyclists should be anticipated. These warning features should be considered as part of a general assessment of the crossing including the layout, cycle/vehicle flows and visibility.

6. Where intervisibility of the cycle track and private access is very poor, additional warning signs should be considered.
Private Access with Dropped Kerbs in Line with Carriageway Kerbline

Segregated Cycle Track/Footway

Unsegregated Cycle Track/Footway

Private Access with Kerbed Entrance Re-Engineered

Before access has been re-engineered

After access has been re-engineered
Cycle Track Priority Crossing "Bending Out" at Minor Road - Figure 5.5

Notes

1. Cycle track priority road crossings should only be used for crossing roads where the vehicle flow is less than 4000 vehicles per day and vehicle speed is less than 30mph.

2. The flat top road hump should be constructed in a contrasting colour or material to give prominence to the traffic calming feature (see Chapter 9). The road hump design and location must comply with the Road Hump Regulations, including signing requirements.

3. The designer should be aware that the maximum permitted height of a road hump is 100mm, and kerbs are generally 125mm. Providing a level crossing may necessitate dropping the kerb line slightly.

4. This facility will require reasonable visibility between the cycle track and the carriageway dependent upon the circumstances at a particular location. Reasonable visibility will therefore be provided between the cycle track and the footway and thus it is unlikely that sign Diag No. 963.1 will be necessary.

5. It is important for safety that the "bend out" is designed so as to provide the cyclist with a straight approach to the crossing. The cycle path should not be deflected through an angle greater than 450 and should not give the cyclist the feeling of a detour.

6. Diag No. 950 is shown on this drawing to illustrate the range of circumstances in which it can usefully be employed. In practice, it will normally be sited at a greater distance from the feature than it has been possible to show in the drawing. Advice is given in Chapter 4 of the Traffic Signs Manual.

7. Diag No. 7014 "Changed Priorities Ahead" will be used on the approaches to the crossing when relevant. When priorities are changed then local publicity will be given to the change.

8. Where build-outs or flat top road humps are constructed the designer must consider highway drainage requirements.

9. This detail shows an arrangement to give cyclists priority to cross a minor road. In choosing such an arrangement designers should be aware that this does not accord the same priority to pedestrians.

1. Local Transport Note 1/86 Cyclists at Road Crossings and Junctions (S)
2. Traffic Advisory Leaflet 4/90Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians
3. Advisory Leaflet 7/96 Highways (Road Humps) Regulations 1996 (S)
4. The Highways (Road Humps) Regulations 1996 (SI 1996 No. 1483) (S)
5. The Highways (Traffic Calming) Regulations 1993 (SI 1993 No. 1849) (S)
6. Sign Up for the Bike - CROW 1993

Examples

1. OXFORD: Marston Road
   (Oxfordshire County Council)
2. OXFORD: London Road
   (Oxfordshire County Council)
3. OXFORD: Marston Ferry Road
   (Oxfordshire County Council)
4. WESTON SUPER-MARE: Worle Parkway
   (Avon County Council)
Cycle Track Priority Crossing “Bending Out” at Minor Road – Figure 5.5

Deflection to take account of visibility requirements and speed of cyclists. See note 5

Area to be kept clear for visibility

The 4.0m minimum set back may be achieved by build-outs where highway limits are constrained

Alternative: In Line Cycle Track Crossing, Give Way
Where there is insufficient space to construct a "bend out" then a flat top road hump in line with the cycle track/footway may be suitable. This will require Give Way markings for the cyclist

Restrict roadside parking to ensure visibility

Build-outs can help ensure the crossing is in line with the cycle track/footway

Diag No. 950
Note: Distance plate Diag No. 572 may usefully be applied
Toucan Crossing - Figure 5.6

Notes

1. Where traffic signal control is thought appropriate, designers should refer to the assessment framework described in LTN 1195 and Figure 5.1.

2. In urban areas, where the 85 percentile speed exceeds 50mph, speed reduction measures should be taken before an at-grade crossing is introduced.

3. Crossing should be located where adequate visibility is available.

4. Special authorisation is required for both the cycle signal aspect and the modified push button plate.

5. The use of the 'U' pattern of tactile surfacing guides blind and partially sighted users to the appropriate position and is the design recommended for Toucan crossings.

6. A 1200mm depth of tactile surfacing at the dropped kerb is recommended when the pedestrian approach is straight on to the crossing. In other circumstances an 800mm depth of tactile surfacing at the dropped kerb is recommended.

7. The provision of the straight through cycle facility should be used with care if there are significant numbers of pedestrians using the crossing.

8. Care should be taken in the positioning of poles, any guard railing and other street furniture, so as not to create conflict by constricting movements.

References

1. Traffic Advisory Leaflet 10/93 TOUCAN An Unsegregated Crossing for Pedestrians and Cyclists

2. Local Transport Note 1/95 The Assessment of Pedestrian Crossings

3. Local Transport Note 2/95 The Design of Pedestrian Crossings

4. Local Transport Note 1/86 Cyclists At Road Crossings and Junctions (S)

5. Traffic Advisory Leaflet 4/90 Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians

6. Disability Unit Circular 1/91 The Use of Dropped Kerbs and Tactile Surfaces at Pedestrian Crossing Points

7. Disability Unit Draft Guidance Note: Guidance on the Use of Tactile Paving Surfaces

Examples

1. BRISTOL: A420/Bristol Et Bath Railway Path (Avon County Council)

2. SOUTHAMPTON: The Avenue (Hampshire County Council)

3. EDINBURGH: Melville Drive/Levern Terrace (Edinburgh City Council)
Modified Diag No. 4003
10.0m Minimum Extent of warning contrasting colour treatment

Pedestrian Path

Tactile surfacing (blister paving) at Toucan crossing

Modified Diag No. 4002

Tactile surface defining segregation

Diag No. 956

Raised white line delineator Diag No. 1049.1

Diag No. 957

Footway

Note: The blister paving layouts have been taken from the Disability Unit Draft Guidance Note, Guidance on the Use of Tactile Paving Surfaces
Cycle Track Give Way Crossing - Figure 5.7

Notes

1. Where traffic flows are less than 4000 vehicles per day on a single carriageway the cycle track priority crossing should be considered.

2. This detail is not suitable for vehicle flows greater than 6000 vehicles per day or where speeds are greater than 50mph.

3. If visibility between the cycle track and the footway is inadequate and it is not possible to incorporate measures to improve visibility then traffic sign Diag No. 963.1 may be necessary to advise pedestrians of a cycle track crossing. Unnecessary use of this will cause sign clutter.

4. Where visibility is poor (see Figure 8.6) it is preferable to use all the signs and markings available for the Give Way (Diag No.s 602, 1003 and 1023) for the cyclist rather than a barrier/chicane with "Cyclists Dismount" signs which are not considered acceptable. The use of the "Stop" sign is not appropriate for cycles, given the slower speeds at which cyclists can be expected to be travelling compared with motor vehicles. The "Stop" sign also requires approval from the Secretary of State.

5. Increased prominence of crossings or additional route guidance for cyclists may be necessary. Discussion with Sustrans and DOT to determine an appropriate solution is encouraged.

6. Diag No. 950 is shown on this drawing to illustrate the range of circumstances in which it can usefully be employed. Its location is diagrammatic only. Advice is given in Chapter 4 of the Traffic Signs Manual. Note that the distance on plate Diag No. 572 should be in yards.

7. Where carriageway width permits, it may be advantageous to provide a central refuge. This will benefit both cyclist and pedestrian safety.

8. A build-out can usefully be employed as a traffic calming feature, where the road is heavily parked or where there is a high pedestrian flow on the footway. Narrowing the carriageway to a single lane with build-outs on both sides and assigning priority to one direction is a valuable feature for a cycle track crossing. However, care must be taken not to create problems for cyclists on the main carriageway. See Figure 6.1 note 1.

References

1. Local Transport Note 1/86
   Cyclists At Road Crossings and Junctions (S)

2. Traffic Advisory Leaflet 4/90
   Tactile Markings for Segregated Shared Use by Cyclist and Pedestrians

Examples

1. MILTON KEYNES: Redways, various minor road crossings
   (Buckinghamshire County Council).

2. NOTTINGHAM: A6005 Woodside Road, junction with B6464 Broadgate
   (Nottinghamshire County Council)

3. LONDON: Ambassador Cycle Route crossing Pimlico Road
   (Westminster City Council)

4. WESTON- SUPER-MARE: Ewart Road (Avon County Council) NOTTINGHAM: University Boulevard (Nottinghamshire County Council)
Cycle Track Give Way Crossing – Figure 5.7

Min 10.0m Extent of warning contrasting colour treatment

Drop kerb arrangement

Diag No. 956

Diag No. 950

Note: Distance plate Diag No. 572 may usefully be applied

Build-out see note 8

The cycle track/footpath approaches to the edge of carriageway are to be coloured to alert cyclists. See Chapter 9

Note: Drop kerb at crossing point to be flush with carriageway. See detail in Chapter 9

Look Left, Look Right road markings can be located in front of the dropped kerbs

See Figure 5.8, note 7 regarding location of the cycle Give Way lines
Cycle Track Crossing with Refuge Island - Figure 5.8

Notes

1. In urban areas, this detail is not suitable for vehicle speeds greater than 50mph and/or traffic flows greater than 8,000 vehicles per day.

2. If visibility between the cycle track and the footway is inadequate and it is not possible to incorporate measures to improve visibility then traffic sign Diag No. 963.1 may be necessary to advise pedestrians of a cycle track crossing. Unnecessary use of this will cause sign clutter.

3. Where visibility is poor (see Figure 8.6) it is preferable to use all the signs and markings available for the Give Way (Diag No.s 602, 1003 and 1023) for the cyclist rather than a barrier/chicane with "Cyclists Dismount" signs which are not considered acceptable. The use of the "Stop" sign is not appropriate for cycles, given the slower speeds at which cyclists can be expected to be travelling compared with motor vehicles. The "Stop" sign also requires approval from the Secretary of State.

4. Guidance details for minimum carriageway beside the refuge are given in Figure 6.2.

5. Generally the crossing area within the refuge should have a longitudinal width between 3.0m and 4.0m (absolute minimum 2.5m) to accommodate groups of cyclists/families, and should be flush with the adjacent carriageway.

6. Diag No. 950 is shown on this drawing to illustrate the range of circumstances in which it can usefully be employed. Its location is diagrammatic only. Advice is given in Chapter 4 of the Traffic Signs Manual. Note that the distance on plate Diag No. 572 should be in yards.

7. Where pedestrian flows on the footway are high it may be advantageous to bend out the footway (as shown), or provide a build-out (see Figure 5.7). This will allow cyclists to wait at the Give Way line without impeding pedestrians. If this is not feasible then the Give Way lines can be placed at the back of the footway.

8. Segregation on the immediate approaches to the crossing may not be appropriate in all circumstances, as research has shown that cyclists and pedestrians will wait and cross in the most convenient positions for the movement they are making, which will not necessarily coincide with the space allocated to them. Consideration may be given to the inclusion of Give Way lines within the refuge.

References

1. Local Transport Note 1/86: Cyclists at Road Crossings and Juncions (S)

2. Traffic Advisory Leaflet 4/90 Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians

Examples

1. NOTTINGHAM: University Boulevard, Beeston/Middle Street (Nottinghamshire County Council)

2. OXFORD: Headington Roundabout (Oxfordshire County Council)
Cycle Track Crossing with Refuge Island – Figure 5.8

Min 10.0m Extent of warning contrasting colour treatment

Note: Drop kerb at crossing point to be flush with carriageway. See detail in Chapter 9

Raised white line delineator Diag No. 1049.1

Diag No. 957

Diag No. 950

Footway bendout See note 7

Diag No. 956

Drop kerb arrangement

The cycle track/footpath approaches to the edge of carriageway are to be coloured to alert cyclists

2.0m preferred (1.8m minimum)

Diag No. 950

Note: Distance plate Diag No. 572 may usefully be applied
Staggered Cycle Track Crossing of Major Road - Figure 5.9 (Two-Way Segregated Cycle Lane Within Parking Bay Area)

Notes

1. The 0.5m wide segregation island shown beside the cycle lane is not wide enough to allow the erection of street furniture.

2. Where build-outs or segregation islands are constructed the designer should consider highway drainage requirements.

3. It is recommended that the surface of the approaches to the crossing be coloured. This approach should be considered in line with the approach to colouring of cycle facilities adopted elsewhere in the local area.

4. Where carriageway width permits, it is advantageous to provide a central refuge. This will benefit both cyclists and pedestrians.

5. Generally the crossing area within the refuge should have a longitudinal width between 3.0m and 4.0m (absolute minimum 2.5m) and should be flush with adjacent carriageway. This detail can be provided more easily by constructing two islands in the carriageway rather than a complete refuge with dropped kerbs.

6. Guidance details for minimum carriageway width beside the refuge are given in Figure 6.2.

7. The preferred width of a one-way cycle lane is 2.0m, minimum width 1.5m. Two-way cycle lanes should preferably be 3.0m wide and should be physically segregated from motor vehicles.

8. A width of 1.2m is sufficient to allow access for the largest types of cycle currently used by people with disabilities.

References

1. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

2. Traffic Advisory Leaflet 4/90: Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians

3. The Highways (Traffic Calming) Regulations 1993 (SI 1993 No. 1849) (S)

1. LONDON: King Street, Hammersmith
   (London Borough of Hammersmith and Fulham)

2. BRISTOL: Coronation Road
   (Avon County Council)

3. DERBY: Exeter Bridge
   (Derbyshire County Council)
Staggered Cycle Track Crossing of Major Road – Figure 5.9
(Two-Way Segregated Cycle Lane Within Parking Bay Area)

The access slip and protective build-out detail can be provided for all cycle movements along the main road.

Central refuge where appropriate.

Drop kerb arrangement

Gaps to be left in segregation to maintain existing drainage

Separation of pedestrians and cyclists at the crossing can be provided. See Figure 5.8, this is however generally not necessary.

Drop kerb arrangement

2.0m preferred (1.8m minimum)
**Offset Crossing at Unsignalised Junction - Figure 5.10**

**Notes**

1. This detail has been drawn in an urban setting, the same detail may be used on rural roads.

2. Traffic Signal Control may be appropriate. Designers should refer to the Assessment Framework described in LTN 1/95 and Figure 5.1.

3. In urban areas, where the 85 percentile speed exceeds 50mph, speed reduction measures should be taken before an at-grade crossing is introduced.

4. Crossings should be located where adequate visibility is available.

5. The refuges should be located as close to the junction as possible or cyclists may ignore them. Deviations from the cyclist's desire line should be minimised. The alignment of the cycle tracks either side of the crossing will be crucial.

6. Refuge set back distance should not be greater than 40m otherwise the detour becomes onerous. If one or both of the right turns off the major road are prohibited, then the central refuge island can be located closer to the minor road junction.

**References**

1. TD 42/95  Geometric Design of Major/Minor Priority Junctions

2. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

**Examples**

1. **HUCKNALL**: A611 Hucknall Bypass/Nottingham Road  
   (Nottinghamshire County Council)

2. **HULL**: Sutton Road/Holwell Road  
   (Humberside County Council)

3. **SOUTHAMPTON**: Millbrook Roundabout  
   (Hampshire County Council)
Offset Crossing at Unsignalised Junction – Figure 5.10

Preferred Layout

See Figure 5.8 for details of cycle track crossing a refuge island

Alternative Layout

NCN route in opposite direction will be a mirror image of the facilities shown here

<table>
<thead>
<tr>
<th>Refuge Set Back Dimension (W)</th>
<th>Design Speed (kph)</th>
<th>Distance (m)</th>
</tr>
</thead>
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<tr>
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</table>

Note: Refer to TD42/95 Geometric Design of Major/Minor Priority Junction See note 3
Staggered Cycle Track Crossing of Dual Carriageway - Figure 5.11

Notes

1. Generally provide see-through guard rails on the central refuges at all staggered road crossings.

2. The entrance into the staggered refuge should be such that cyclists turn left, facing oncoming traffic when approaching the exit.

3. The minimum entry width into the refuge should be 2.5m.

4. Traffic signal control may be appropriate. Designers should refer to the assessment framework described in LTN 119 5 and Figure 5.1.

5. In urban areas, where the 85 percentile speed exceeds 50mph speed reduction measures should be taken before an at-grade crossing is introduced.

6. Where the road is more than 15.0m wide a staggered crossing is recommended. If the road width is greater than 11.0m a stagger should also be considered. Occasionally, the cycle track may have to be bent out locally to create an alignment through a stagger.

7. A minimum dimension of 3.0m is recommended between crossing limits on the central refuge.

8. The minimum width between guard rails is 2.0m. A sufficient width should be allowed to accommodate all users.

9. Diag No. 950 is shown on this drawing to illustrate the range of circumstances in which it can usefully be employed. In practice, it will normally be sited at a greater distance from the feature than it has been possible to show in the drawing. Advice is given in Chapter 4 of the Traffic Signs Manual.

10. If visibility between the cycle track and the footway is inadequate see Figure 5.8 notes 2 and 3.

11. Where pedestrian flows on the footway are high see Figure 5.8 note 7.

References

1. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

2. Traffic Advisory Leaflet 4/90: Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians

3. Local Transport Note 1/95 The Assessment of Pedestrian Crossings

4. Local Transport Note 2/95 The Design of Pedestrian Crossings

Examples

1. PRESTON: Hutton Roundabout, A59 Crossing, (Lancashire County Council)

2. NOTTINGHAM: West Bridgford, A60/Loughborough Road, (Nottinghamshire County Council)

3. DARLINGTON: A1157, Parkgate Crossing, (Durham County Council)

4. NOTTINGHAM: Hucknall Bypass, A611 (Nottinghamshire County Council)

5. PRESTON: A6 Ringway/Ormskirk Road (Lancashire County Council)
Gaps in guard rails with dropped kerbs can be provided at these locations for right turn movements where the stagger is >10m long.

Min 10.0m
Extent of warning contrasting colour treatment

See Figure 5.8 note 7

Diag No. 950

Diag No. 956

Diag No. 950

Diag No. 956

Diag No. 950

Diag No. 963.1

Diag No. 956

Diag No. 956

Guard rails

Drop kerb at crossing point, to be flush with carriageway. See Figure 8.6
Notes

1. Advanced Stop Lines improve safety for cyclists and give them priority in an important situation. There is no evidence that they reduce saturation traffic flows.

2. Advanced Stop Lines have proved successful for vehicle flows up to 1000 per hour in one direction and with up to three lane approaches. However, on the National Cycle Network, they will normally be appropriate for right-turning cyclists on approaches with one or two lanes.

3. In order to give additional guidance to highlight a route to cyclists it may be appropriate to show route numbers. Details of appropriate signs are shown in Figure 9.1.

4. It is recommended that Advanced Stop Line reservoirs and cycle lane approaches to the junction be coloured. This approach should be considered in line with the approach to colouring of cycle facilities adopted elsewhere in a local area. See Chapter 9.

5. Where mandatory and advisory cycle lanes have been shown, the prescribed upright signs to accompany the road marking have been omitted for clarity.

6. Where a cycle lane is only provided on the approach to the Advanced Stop Line it should extend for the distance that traffic queues on that approach to the junction.

7. Mandatory cycle lanes are preferable on the approach to the Advanced Stop Line, however there may be circumstances where occasional encroachment by motor vehicles is unavoidable in which case an advisory cycle lane can be provided. It is desirable that waiting and loading restrictions are provided in conjunction with the advisory cycle lane where parked vehicles would otherwise be anticipated to block the lane.

8. See Figure 5.13, note 6, for Central Advisory Lane approach to Advanced Stop Lines and Figure 5.15 for Staggered Stop Lines.

References

1. Traffic Advisory Leaflet 8/93: Advanced Stop Lines for Cyclists


3. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

Examples

1. NEWCASTLE UPON TYNE: Hunters Road/Brighton Grove crossings, Portland Road/Barrack Road (Newcastle Upon Tyne City Council)

2. BRISTOL: Whiteladies Road/Tyndall’s Park Road (Avon County Council)

3. LONDON: Albion Gate entrance to Hyde Park crossing Bayswater Road (Westminster City Council)

4. BRADFORD: Manningham Lane/Queens Road (Bradford City Council)

5. YORK: Queens Street/Blossom Street (York City Council)

6. CAMBRIDGE: Devonshire Road/Tenison Road (Cambridgeshire County Council)
Advanced Stop Line reservoir extends the half width of carriageway and facilitates right-hand turn into the local cycle network.

National Cycle Network direction sign.

Mandatory cycle lane.

Advisory cycle lane.

Diag 967.
Staggered Minor Road Crossing Major Road at Signalised Junction - Figure 5.13

Notes

1. Increased prominence of crossings or additional route guidance for cyclists may be necessary. Discussion with Sustrans and the DOT to determine an appropriate solution is encouraged. The application of "Elephant Footprints" (Ref WBM 294) may be suitable in some circumstances, in which case, special authorisation from the DOT will be required.

2. "Elephant Footprints" are unlikely to be authorised where speeds are expected to exceed 30mph, except where cyclists are under signal protection.

3. Where carriageway width permits, it is advantageous to provide a central refuge. This will benefit both cyclist and pedestrian safety.

4. It is recommended that Advanced Stop Line reservoirs and cycle lane approaches to the junction be coloured. This approach should be considered in line with the approach to colouring of cycle lanes adopted elsewhere in a local area.

5. The most common method of tactile segregation is by using a raised white line delineator (Diag No. 1049. 1) combined with tactile paving. The use of a 50mm upstand may be appropriate in certain locations on the National Cycle Network to suit local conditions or where it is considered that this omission will be particularly detrimental to the partially sighted.

6. A central advisory lane has been found to be an advantage to right turning cyclists as against a nearside approach lane where vehicle flows are greater than 200-300 vehicles per lane per hour, particularly where there is a heavy cycle right turn and a heavy straight ahead motor vehicle flow with two lanes. A central advisory lane is also an advantage for straight ahead cycle movements when there is a nearside left turn lane.

References

1. Traffic Advisory Leaflet 8/93
   Advanced Stop Lines for Cyclists
2. Local Transport Note 1/86
   Cyclists at Road Crossings and Junctions (S)
3. Traffic Advisory Leaflet 4/90
   Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians
4. Traffic Advisory Leaflet 5/96
   Further Development of Advanced Stop Lines

Examples

1. NOTTINGHAM: Robin Hood Way/Queens Drive
   (Nottinghamshire County Council)
2. HILLINGDON: Central Ave to Shakespeare Ave crossing Uxbridge Road
   (London Borough of Hillingdon)
3. CAMBRIDGE: Hills Road
   (Cambridgeshire County Council)
4. OXFORD: High Street/Longwall Street, central advisory lane
   (Oxfordshire County Council)
The above detail shows two options. The choice of option will be dependent on available space, land and traffic flows.
Notes

1. This drawing shows provision for cyclists on the National Cycle Network; cyclists approaching from the north can be catered for by providing Advanced Stop Lines if considered necessary. See Figure 5.12.

2. Detail implies a minimum road width of 10.2m to incorporate two-way vehicle flow, cycle lane and island, if standard lane widths of 3.65m are used.

3. The needs of pedestrians will need to be considered and taken into account in any design and a pedestrian stage may be required. Where pedestrian studs are provided across the cycle route, measures should be included to advise pedestrians that the cycle route is two directional.

4. Appropriate staging for the cycle movements from the south and cast will need to be determined with reference to the expected cycle volumes and turning movements. These phases will need to run separately from the all vehicle phases to provide safe passage for cyclists.

5. Increased prominence of crossings and additional route guidance for cyclists may be necessary. Discussion with Sustrans and the DfT to determine an appropriate solution is encouraged. The application of "Elephant Footprints" (Ref WBM 294) may be suitable in some circumstances, in which case, special authorisation from the DfT will be required.

6. "Elephant Footprints" are unlikely to be authorised where speeds are expected to exceed 30mph, except where cyclists are under signal protection.

7. It is recommended that the cycle track approaches to the junction be coloured. This approach should be considered in line with the approach to colouring of cycle lanes adopted elsewhere in a local area. See Chapter 9.

8. Where separate signalisation is provided for cyclists it is important to site all signal heads carefully to avoid confusion to either cyclists or motorists.

9. A width of 1.2m is sufficient to allow access for the largest types of cycle currently used by people with disabilities.

References

1. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

2. Traffic Advisory Leaflet 6/87 Innovatory Cycle Scheme, London, Albert Gate/Albion Gate

3. Traffic Advisory Leaflet 6/86: Innovatory Cycle Scheme, Cambridge,

Examples

1. CAMBRIDGE: Hills Road (Cambridgeshire County Council)

2. BEDFORD: Brickhill Drive/Larkway Signals (Bedfordshire County Council)

3. NOTTINGHAM: Canal Street/Carrington Street (Nottingham County Council)
Two-Way 90° Turn at Signalised Junction – Figure 5.14

"Elephant Footprints" 400 mm sq white marks Ref. WBM 294 (requires special authorisation)

Advanced stop line and approach lane will assist in aligning motor vehicles with correct exit lane

Typical signal arrangement
Diag No. 3000.2

Cycle-triggered induction loops (directional)

Lateral connection onto Major Road

Cycle track/footpath

Build-out/refuge to be provided at lateral link

1.0m minimum
1.5m preferred

2.0m minimum

STAGING

1. C

2. C

3. C

C = Cycle movements
Notes

1. Advanced stop lines have proved successful for flows one way up to 1000 vehicles per hour and with three lane approaches. However, on the National Cycle Network they will normally be appropriate for right-turning cyclists on approaches with one or two lanes.

2. The left bypass cycle lane can also be used at an unsignalised junction and at a junction where the left turn is prohibited. In the latter case it may be necessary for the TRO to exempt cyclists.

3. It is recommended that the surface of the cycle lane approaches to the junction be coloured. This approach should be considered in line with the approach to colouring of cycle lanes adopted elsewhere in a local area. See Chapter 9.

4. The needs of pedestrians will need to be considered and addressed in any design. In particular, the bypass arrangement providing the straight ahead movement should be used with care, and should take account of the level of pedestrian crossing demand and the number and speed of cyclists.

References

1. Traffic Advisory Leaflet 8/93: Advanced Stop Lines for Cyclists

2. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)


Examples

1. OXFORD: High Street/Longwall Street
   (Oxfordshire County Council)

2. OXFORD: Headington Road/Gipsy Lane
   (Oxfordshire County Council)

3. CAMBRIDGE: Hills Road
   (Cambridgeshire County Council)
Bypass Arrangement
Cycles to be segregated from pedestrians

Drop kerb arrangement flush with carriageway
See Figure 8.6

Bypass Arrangement
Cycles to be segregated from pedestrians

Advanced Stop Line

Staggered Stop Line
Staggered stop lines can be used as an alternative to advanced stop lines where a right turn is not possible or not permitted

Note: An alternative to the advanced stop line shown above is the segregated signalised cycle lane.
See Figure 5.14
Roundabout - Figure 5.16

Notes

1. The "continental style" roundabout with single lane approaches and narrow circulating carriageway has a vehicle capacity of up to 3,000 vehicles per hour. This type of roundabout complies with the recommendations of TD 16/93.

2. At roundabouts that cannot be adapted to the "continental style" or, with traffic flows greater than 3,000 vehicles per hour and no signals, a segregated cycle track is recommended on the National Cycle Network. Signalisation of a heavily trafficked or fast roundabout can assist cyclists crossing the entries/exits.

3. The dimensions for the "continental style" roundabout are: inscribed circle diameter 28-36m; circulatory carriageway width 4-6m; entry/exit widths 4-5m with radial (perpendicular) approach arms. The low profile over-run area should be formed in setts or other textured surface material. It should be clearly visible. The size of the over-run area will be dependent upon the size of the design vehicle for the roundabout.

4. The aspects of roundabout design which make the "continental style" roundabout safer for cyclists than the typical UK roundabout are: reduced entry width (preferably single lane) reduced circulating width (preferably single lane) and increased angle of entry. Greater emphasis in design is placed on speed reduction.

5. It is recommended that the segregated cycle track facility at a roundabout be two way where there is a significant right turn element to the cycle flows.

6. The crossing area within the deflection island should conform to the requirements of Figure 5.8.

7. At Give Way cycle crossing points, it is recommended that the entry be no more than two lanes wide, whilst the exit be kept to a single lane.

8. See Figure 5.6 for details of Toucan crossing.

References

1. TD 16/93 Geometric Design of Roundabouts.
2. Cyclists and Roundabouts 1991 Et 1993 update CTC
3. Sign Up for the Bike - CROW 1993
4. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)
5. Traffic Advisory Leaflet 12/93 Over-Run Areas

Examples

1. SOUTHAMPTON: Millbrook roundabout unsegregated pedestrianl cycle path
   (Hampshire County Council)
2. BRISTOL: Emersons Green, reduced entry and exit widths at cycle track crossing
   (Avon County Council)
"Continental style" roundabout for use by mixed traffic

- Single lane entry and exit
- Narrow circulating lane
- Low profile over-run area
- Segregated cycle/pedestrian facility two way
- Unsegregated cycle/pedestrian facility two way
- Give Way cycle/pedestrian crossing two way
- Cycle lanes
- Toucan crossing two way

Roundabout with segregated cycle track
Bridge - Figure 5.17

Notes

1. Every proposal to convert an existing footbridge to shared use must be assessed on its local merits. The physical design and current usage must be considered alongside the quality of alternative routes available.

2. New and existing grade separated crossings should make use of natural topography to minimise the amount of level change along the route.

3. High quality lighting and measures to enhance the feeling of security for cyclists and pedestrians should be considered.

4. Approach gradients should not exceed 1:20 unless this results in significant out of line travel. Steep gradients may require separation of pedestrians and cyclists and barriers at the lower end of gradients.

5. Design should ensure that pedestrians and people with disabilities can use the facility.

6. Conversion of bridges to shared use may require raising the height of the handrail by extension or replacement.

7. Existing road bridges could be adapted by incorporating a cycle track within the footway. The minimum widths given for an unsegregated cycle track/footway are only acceptable where there is a low pedestrian flow.

Wheeling Ramps

8. The gradient of the steps should preferably not be greater than 26.50, this being the maximum specified for footbridges. This is important for two reasons. Firstly, because of the difficulty of pushing or holding back a bicycle steep gradients. Secondly, the need for the front chainring to clear the top step.

9. A handrail without an associated wheeling ramp should be available to pedestrians. Where a staircase makes a significant turn the wheeling ramp should be provided on the outside of the turn. The wheeling ramp can be formed in concrete, steel channel or hardwood.

10. Wheeling ramps can usefully be provided at locations where alternative provision in the form of ramps is not viable e.g., railway stations for access to platforms.

References

1. BD52/93: The Design of Highway Bridge Parapets
2. BD29/87: Design Criteria for Footbridges
3. Sign Up for the Bike - CROW 1993

Examples

1. BRISTOL: Great Stoke Way, Stoke Gifford
   (Avon County Council)

2. BRISTOL: Cumberland Road
   (Avon County Council)
Plan of Typical Cycle/Pedestrian Bridge

- Appropriate lead-in barriers to the bridge parapet should be considered particularly if the approach is on an incline.
- Gradient ≤ 5%
  Preferred Gradient 3%
- Guard rail may be appropriate
- Ramp to be provided in direction of travel of cyclists whenever possible
- Additional step access
- Barrier may be required at top of steps.

New Bridge Section

- Segregated path, 2.7m min width.
- Unsegregated path 2.0m min width
- Segregated white line delineator Diag No. 1049.1

Existing Highway Bridge Section

Typical Wheeling Ramp Elevation

- Handrail to be set close to wall
- Steps
- Margin 0.5m (where practical)
- Unsegregated cycle track/footway

Where there is insufficient width for the cycle track/footway consideration should be given to reducing carriageway lane widths in order to widen the cycle track/footway

March 1997
Notes

1. Every proposal to convert an existing subway to shared use must be assessed on its local merits. The physical design and current usage must be considered alongside the quality of alternative routes available.

2. The perceived security of pedestrians and cyclists using the subway can be improved by good visibility, lighting and flared approaches.

3. New and existing grade separated crossings should make use of natural topography to limit the amount of level change along the route and to maximise natural lighting. The approach and alignment through a subway should be open to give as much visibility and natural light as possible. Where space is available, opportunities should be taken to improve visibility, such as realigning approaches to give a straight through route or to remove zig-zag ramps.

4. The need to slow cyclists down on steep ramps and encourage them to keep to their own part of the subway is important. Cyclists should be able to negotiate any barriers without having to dismount.

5. The gradient of access ramps should be shallower than 3% and should not normally exceed 5%. If space is very restricted a gradient of up to 7% may be used if provided with staggered barriers to encourage cyclists to exercise greater care.

6. Any proposal for shared use of a subway will involve extensive consultation and a change in legal status to a cycle track.

7. Conversion of an existing subway must ensure that pedestrians, particularly disabled, blind and partially sighted people are not put at risk. Tactile paving to assist visually impaired people may be required.

References

1. Design Manual for Roads and Bridges (DOT) Volume 6, Section 3, Part 1. TD36/93 Subways for Pedestrians and Pedal Cyclists Layout and Dimensions

2. Local Transport Note 1/86: Cyclists at Road Crossings and Junctions (S)

3. Traffic Advisory Leaflet 4/90: Tactile Markings for Segregated Shared Use by Cyclists and Pedestrians


5. Traffic Advisory Leaflet 11/86: Innovatory Cycle Scheme, Chelmsford Central Park Subway Conversion to Shared Use

Examples

1. SOUTHAMPTON: Western Approach Cycle Route under Redbridge Road (Hampshire County Council)

2. BURY: Middleton Road/M66 (Greater Manchester Council)

3. STEVENAGE: Integral part of Newtown design (Hertfordshire County Council)
New Subway

Typical Section (Segregated)

Typical Section (Unsegregated)

Dimensions shown are minimum recommended for new subways
Dimensions in brackets apply to subway lengths > 23m
Broken lines illustrate additional space provided using elliptical culverts

Existing Subway Conversion

Typical Section

Raised white line delineator
Diag No. 1049.1

Dimensions shown on section
are typical for urban subways

Form of Segregation Appropriate to Various Widths of Existing Subways

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<thead>
<tr>
<th>Form of Segregation</th>
<th>Suggested Widths (metres)</th>
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