Design Manual for Roads and Bridges

Road Layout
Design

CD 195
Designing for cycle traffic

(formerly IAN 195/16)

Version 1.0.1

Summary
This document contains the requirements for cycle traffic on the trunk road and motorway network.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 195	1.0.**1**	March 2021	Core document, Scotland NAA	Incremental change to notes and editorial updates

New version of document published solely to resolve revision number issue.

This was caused when an amendment was made to the Scotland National Application Annex document in May 2020 to remove duplicate wording without a new revision number being issued. This meant there were incorrectly two revision 1 documents available on the website with different publication dates of March 2020 and May 2020.

No changes have been made to the core document and England National Application Annex since they were last updated in March 2020. No changes have been made to the Wales and Northern Ireland National Application Annexes since their original publication in September 2019. The Scotland National Application Annex is being re-published with a new revision number 0.0.1 to reflect the change made in May 2020 and no further changes have been made since this time.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 195	1	May 2020		
CD 195	1	March 2020		
CD 195	0	September 2019		

Foreword

Publishing information

This document is published by Highways England.

This document supersedes IAN 195/16 Cycle traffic and the strategic road network, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document provides requirements and advice relevant to the motorway and trunk road network for the design of infrastructure for cycle traffic. It is intended to be used by highway design professionals to facilitate the convenient and safe movement of cycle traffic, where cycling is legally permitted.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to the document.

1. Scope

Aspects covered

1.1 This document shall be used for the design of routes and assets used by cycle traffic.

NOTE *This document does not cover the design of shared use facilities for pedestrians, equestrians and cyclists.*

1.2 The national requirements for designing for cycle traffic set out in the National Application Annexes shall be followed.

Implementation

1.3 This document shall be implemented forthwith on all schemes involving cycle traffic on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 1.N].

1.4 Desirable minimum values presented in this document shall be used as default values.

1.5 Absolute minimum values shall only be used where there are existing physical constraints preventing the use of desirable minimum values on existing roads where a cycle route is proposed or an existing cycle route is to be improved.

Use of GG 101

1.6 The requirements contained in GG 101 [Ref 1.N] shall be followed in respect of activities covered by this document.

2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Road Layout
Design

CD 195
England National Application Annex to CD 195
Designing for cycle traffic

(formerly IAN 195/16)

Revision 1

Summary
This National Application Annex sets out the Highways England specific requirements for cycle traffic on the trunk road and motorway network.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
1	Mar 2020	Revision 1 (March 2020) Revision to update references only. Revision 0 (September 2019) Highways England National Application Annex to CD 195.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes IAN 195/16 Cycle traffic and the strategic road network which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex gives the Highways England-specific requirements for cycle traffic on the trunk road and motorway network.

A Highways England e-learning tool provides additional interactive information to help designers provide appropriate cycle routes.

The Highways England e-learning tool can be found here: https://cycletraffic-elearning.com CT-elearning [Ref 1.I]

This document refers to the provision for cycle traffic only which allows for a higher design speed when separated from pedestrian and equestrian traffic.

Requirements and advice for shared routes are provided in CD 143 [Ref 3.N].

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 7.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
AADT	Annual Average Daily Traffic
DfT	Department for Transport
SSD	Stopping Sight Distance

Terms and definitions

Terms

Term	Definition
Absolute minimum	The design parameter(s) that can be used where there is an existing physical constraint on existing roads where a cycle route is proposed or an existing cycle route is to be improved within the highway boundary.
Advisory cycle lane	A cycle lane bounded by a broken white line which enables motor traffic to enter the lane when legal to do so.
Cycle	As defined by the Road Traffic Act 1988 Road Traffic Act 1988 [Ref 8.N] (Section 192) [3]. NOTE: Types of cycle include: 1) standard cycles; 2) solo tricycles; 3) hand-cranked cycles; 4) tandem cycles; 5) recumbent cycles; 6) trailer cycles (tandems with a hinge, usually with the rear seat to carry a child); 7) cycles towing trailers; 8) cargo cycles; and 9) cargo tricycles.
Cycle design vehicle	A composite of the many types of cycle defined above, used to provide design criteria.
Cycle lane	A lane in the carriageway for use by cyclists.
Cycle network	A set of connected cycle routes that can be legally used by cycle traffic.
Cycle route	Any infrastructure that can be legally used by cycle traffic, including cycle tracks, stepped cycle tracks, cycle lanes, light segregated cycle lanes and carriageways.
Cycle route transition	A smooth and gradual feature where a cycle track joins, or a cycle lane leaves, the carriageway.
Cycle track	A track separate from the main carriageway for use by cyclists. NOTE: Cycle tracks can be newly constructed or created through conversion of a footway (using powers under the Highways Act 1980 Highways Act 1980 [Ref 6.N] [4]) or footpath (using the Cycles Traffic Act CTA [Ref 1.N] [5]).
Cycle traffic	A specific type of traffic on the network where the vehicles meet the definition of a cycle.
Desirable minimum	Design parameters that apply where the conditions for use of absolute minimum value criteria are not applicable.

Terms (continued)

Term	Definition
Green wave	Coordination of a series of traffic lights to allow continuous traffic flow over several junctions in one direction.
Light segregated cycle lane	A mandatory cycle lane that is separated from the carriageway by intermittent physical objects.
Mandatory cycle lane	A cycle lane bounded by a solid white line which excludes motor traffic.
Off-carriageway cycle route	A cycle route segregated from motor traffic and provided off the carriageway. NOTE: This includes cycle tracks.
On-carriageway cycle route	A cycle route provided on the carriageway. NOTE: This includes cycle lanes, light segregated cycle lanes and quiet streets.
Quiet street	A cycle route on low speed and low traffic volume roads where cycle traffic is combined with motor traffic. NOTE: A maximum motor traffic volume of 2500 vehicles per day and a speed limit of 20mph applies to quiet streets.
Shared use facility	A combined facility for use by pedestrians and cyclists.
Stepped cycle track	A one-way cycle track that is constructed at an intermediate height between the carriageway and the verge or footway.
Wheeling ramp	A feature which enables cyclists to go up or down steps without carrying their cycle.

E/1. Types of cycle route

E/1.1 Table E/1.1 shows the minimum cycle route provision which shall be used for different traffic speeds and volumes.

Table E/1.1 Minimum provision for cycle routes

Speed limit (mph)	Motor traffic flow (AADT-Average annual daily traffic)	Minimum provision for cycle routes
40 and over	All flows	Cycle tracks (excluding stepped cycle tracks)
30	>5,000	Cycle tracks
	0-5,000	Cycle lanes
20	>5000	Cycle tracks
	2,500-5,000	Cycle lanes
	<2500	Quiet streets

E/1.1.1 The design should achieve the best balance of the five design criteria set out in Table E/1.1.1.

Table E/1.1.1 Cycling design criteria

Coherence	Cycle networks link trip origins and destinations, including public transport access points and are continuous and easy to navigate.
Directness	Cycle networks serve all the main destinations and seek to offer an advantage in terms of distance and journey time.
Comfort	Infrastructure meets design standards for alignment and surface quality, and caters for all types of user, including children and disabled people.
Attractiveness	Aesthetics, noise reduction and integration with surrounding areas are important.
Safety	Cycle networks not only improve cyclists' and other road users' safety, but also their feeling of how safe the environment is (their personal security).

NOTE The following design characteristics can improve the personal security of users on cycle routes:

1) cycle routes within the view of passing people and passing traffic;

2) lighting;

3) underbridges that provide cross-sections wider than the specified values with flared wing-walls, good lighting and good sight lines;

4) vegetation that is a low growing variety (up to 0.8m) on underbridge approaches and adjacent to entries.

E/2. Cycle design vehicle

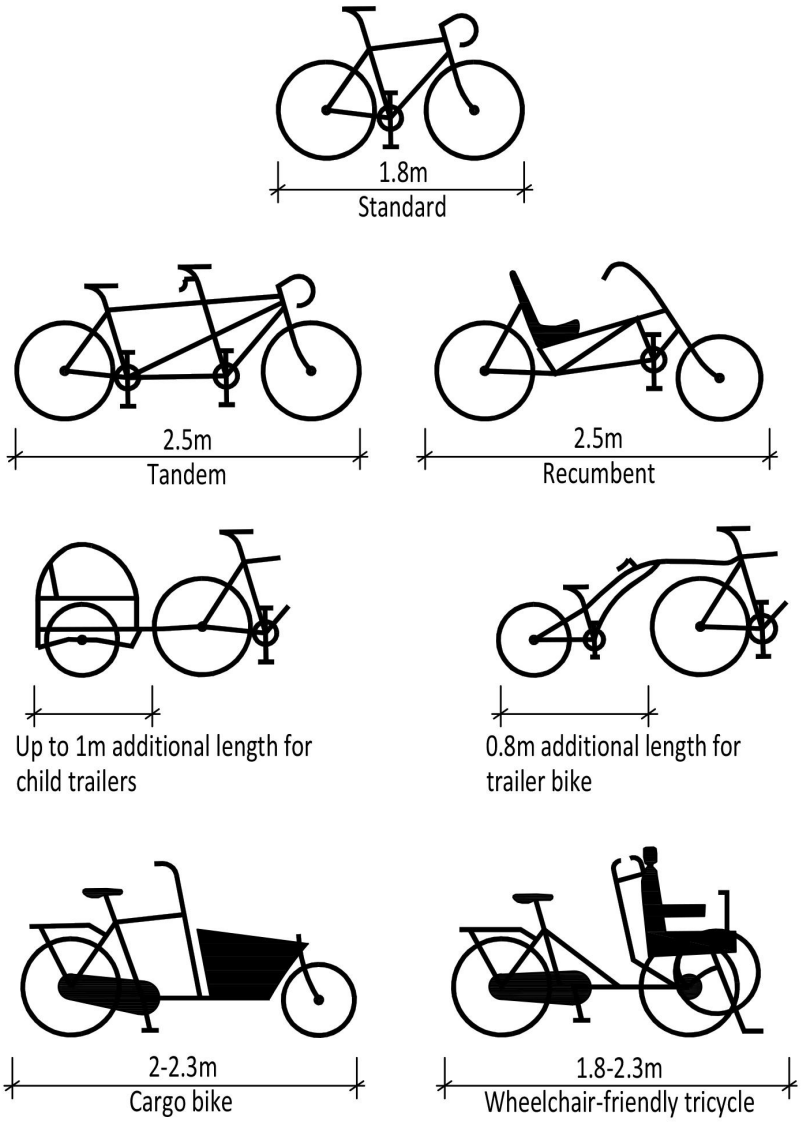
E/2.1 The dimensions of the cycle design vehicle shall be 2.8 metres long and 1.2 metres wide.

NOTE 1 The cycle design vehicle has been created to cater for a wide range of users.

NOTE 2 The length of 2.8 metres is made up of a bicycle at 1.8 metres plus a child trailer of up to 1.0 metres in length.

NOTE 3 Figure E/2.1N3 provides examples of different categories of cycle.

Figure E/2.1N3 Categories of cycle



E/3. Cycle route design

Common elements

Cycle lane and cycle track widths

E/3.1 Table E/3.1 shall be used to determine the desirable minimum and absolute minimum widths of different types of cycle routes.

Table E/3.1 Minimum widths of cycle routes

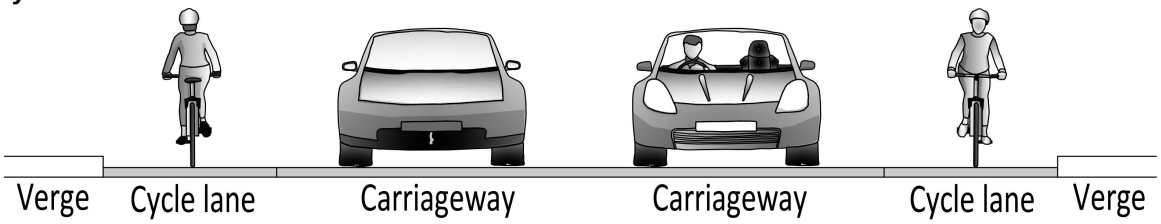
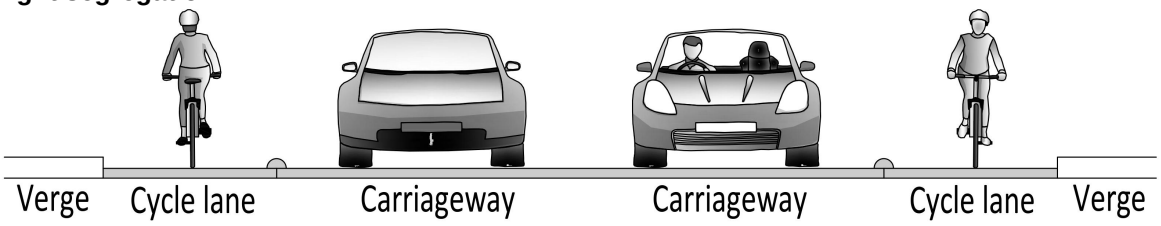
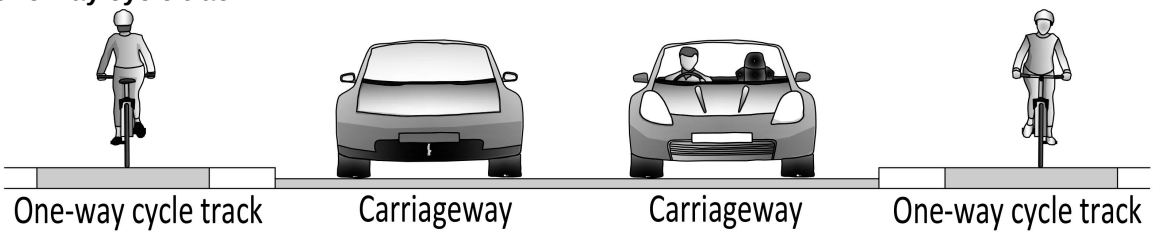
Cycle route type	Peak hour cycle flow (either one-way or two-way depending on cycle route type)	Desirable minimum width	Absolute minimum width (for sections up to 100 metres)
Cycle lane	<150	2.0 metres	1.5 metres
Cycle lane 			
Cycle route type	**Peak hour cycle flow (either one-way or two-way depending on cycle route type)**	**Desirable minimum width**	**Absolute minimum width (for sections up to 100m)**
Cycle lanes with light segregation	<150	2.5 metres	1.5 metres
Light segregation 			
Cycle route type	**Peak hour cycle flow (either one-way or two-way depending on cycle route type)**	**Desirable minimum width**	**Absolute minimum width (for sections up to 100m)**
One-way cycle track (including stepped cycle track)	<150	2.5 metres	1.5 metres
	150-750	3.0 metres	2.5 metres
	>750	4.0 metres	3.5 metres

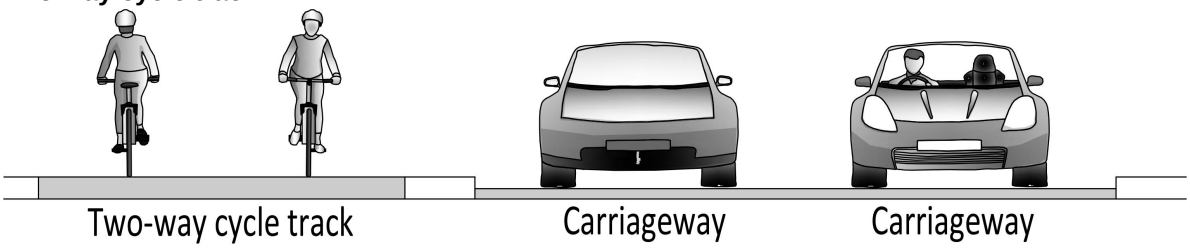
Table E/3.1 Minimum widths of cycle routes (continued)

One-way cycle track



Cycle route type	Peak hour cycle flow (either one-way or two-way depending on cycle route type)	Desirable minimum width	Absolute minimum width (for sections up to 100m)
Two-way cycle track	<150	3.0 metres	2.5 metres
	150 or greater	4.0 metres	3.5 metres

Two-way cycle track



NOTE *Cycle lanes with widths of more than 2.0 metres can benefit from a coloured surface, in addition to prescribed cycle markings to discourage general traffic from using the lane.*

E/3.1.1 Where cycling is intended to take place in a shared bus lane, the bus lane should be a minimum of 4.5 metres wide.

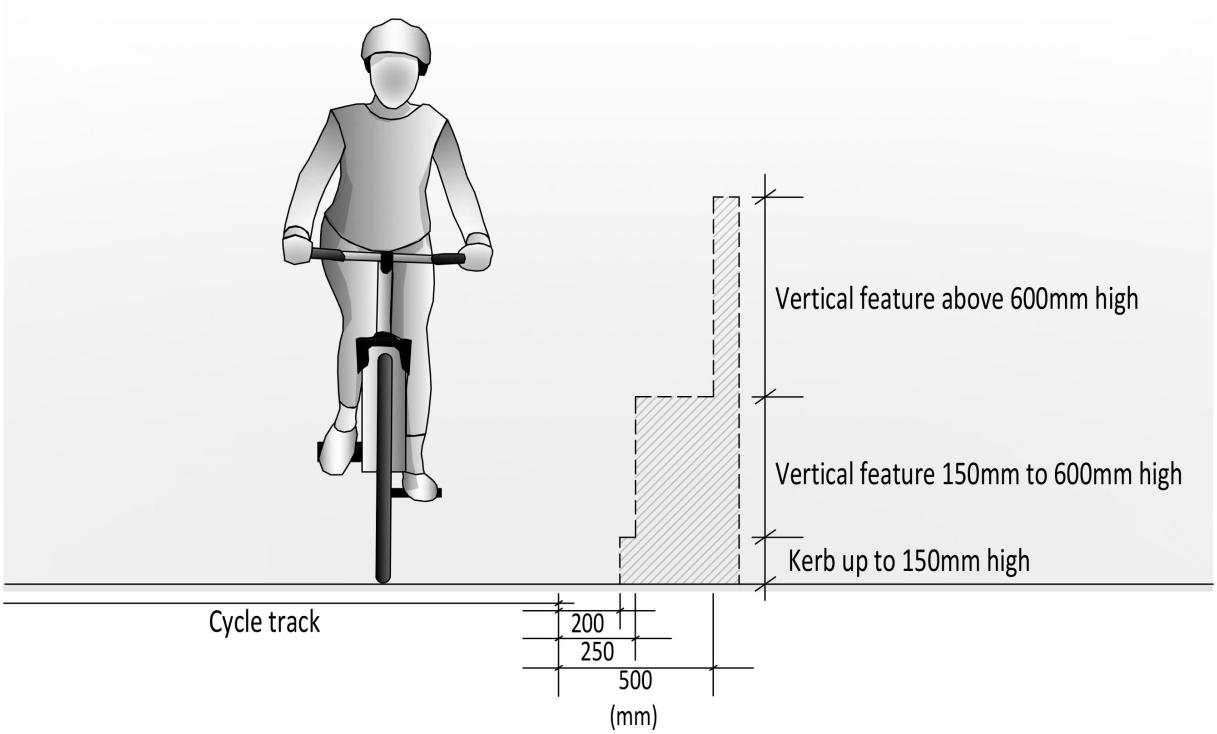
E/3.2 Additional width shall be added to cycle tracks to make allowance for fixed objects adjacent to or within the cycle track in accordance with Table E/3.2.

Table E/3.2 Additional width required to maintain effective width of cycle tracks

Type of edge constraint	Additional width required to maintain effective width of cycle track (mm)
Flush or near-flush surface (up to 6mm high)	No additional width needed
Kerb or other vertical feature from 6mm to 150mm high	Add 200mm
Vertical feature from 150 to 600 mm high	Add 250mm
Vertical feature above 600 mm high	Add 500mm
Drainage gullies	Add width of drainage gully

NOTE *Figure E/3.2N illustrates the additional width required to maintain effective widths for cyclists on cycle tracks.*

Figure E/3.2N Additional width required to maintain effective width of cycle tracks



E/3.3 Where edge constraints are adjacent to both sides of the cycle track, then allowance for each edge constraint shall be made in accordance with Table E/3.2.

NOTE *Using splayed kerbs along the edge of the cycle track increases the effective width and helps to prevent collisions by reducing the risk of pedals striking the kerb.*

Visibility splays

E/3.4 A visibility splay shall be provided for cycle traffic approaching crossings and junctions where the cyclists have to stop or give way.

E/3.5 Cycle traffic "x" distances shall be provided in accordance with Table E/3.5.

Table E/3.5 "x" distances for cycle traffic

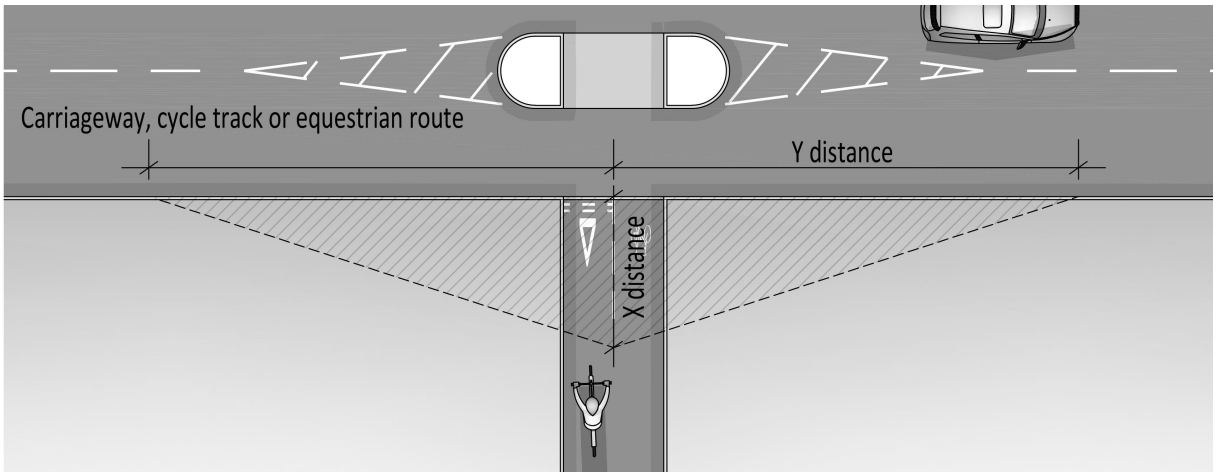
Desirable minimum (metres)	Absolute minimum (metres)
4.5	2.4

NOTE 1 *The "x" distance is measured from a give way or stop line, back along the centre line of the minor arm.*

NOTE 2 *The desirable minimum "x" distance allows two cyclists to observe the full "y" distance and both accept the gap in traffic.*

NOTE 3 *Figure E/3.5N3 indicates the "x" and "y" measurement for cycle traffic.*

Figure E/3.5N3 Visibility splay



NOTE 4 The '"y" distance is the stopping sight distance (SSD) required.

NOTE 5 The "y" distance is measured along the edge of the major arm from the centre of the minor arm.

E/3.6 "y" distances at junctions on cycle tracks shall be provided in accordance with the SSD references in Table E/3.6.

Table E/3.6 SSD references for cycle traffic

Major arm	Minor arm	SSD reference
Carriageway	Cycle track	Table 7/1 in CD 123 [Ref 4.N]
Cycle track	Cycle track	Table E/3.19
Equestrian route or footpath	Cycle track	Table 3.4 in CD 143 [Ref 3.N]

E/3.7 An eye height range of 0.8 metres to 2.2 metres for cyclists shall be used when measuring the "y" distance.

E/3.8 The object height shall be taken as 0.26 metres to 2.0 metres when measuring the "y" distance for cycle routes.

NOTE More detail on object heights is provided in CD 109 [Ref 2.I].

Longitudinal gradients

E/3.9 Cycle track gradients shall be provided in accordance with Table E/3.9.

Table E/3.9 Maximum length for gradients

Gradient	Maximum length of gradient (metres)
2.0%	150
2.5%	100
3.0%	80
3.5%	60
4.0%	50
4.5%	40
5.0%	30

NOTE 1 Steep gradients can lead to high speeds for descending cyclists or low speeds for climbing cyclists, which can create hazards for all users of the route.

NOTE 2 *Stopping distances increase significantly on downhill gradients in excess of 3%.*

E/3.9.1 Level sections of 5.0 metres minimum length should be used between gradients to achieve compliance with Table E/3.9.

E/3.9.2 Cycle lanes, stepped cycle tracks and lightly segregated cycle lanes on or adjacent to existing carriageways may follow the existing gradient.

E/3.10 Potential hazards adjacent to a cycle route shall be subject to a risk assessment to determine the need for protective measures.

Cycle route transitions

E/3.11 Cycle route transitions shall be provided where a cycle lane joins or diverges from the carriageway.

E/3.12 Cycle route transitions between the cycle track and the carriageway shall be a continuous surfacing course.

E/3.13 Where a cycle lane diverges away from the carriageway to become a cycle track, a cycle route transition shall be provided and include a mandatory cycle lane of a minimum of 5 metres length before diverging from the carriageway.

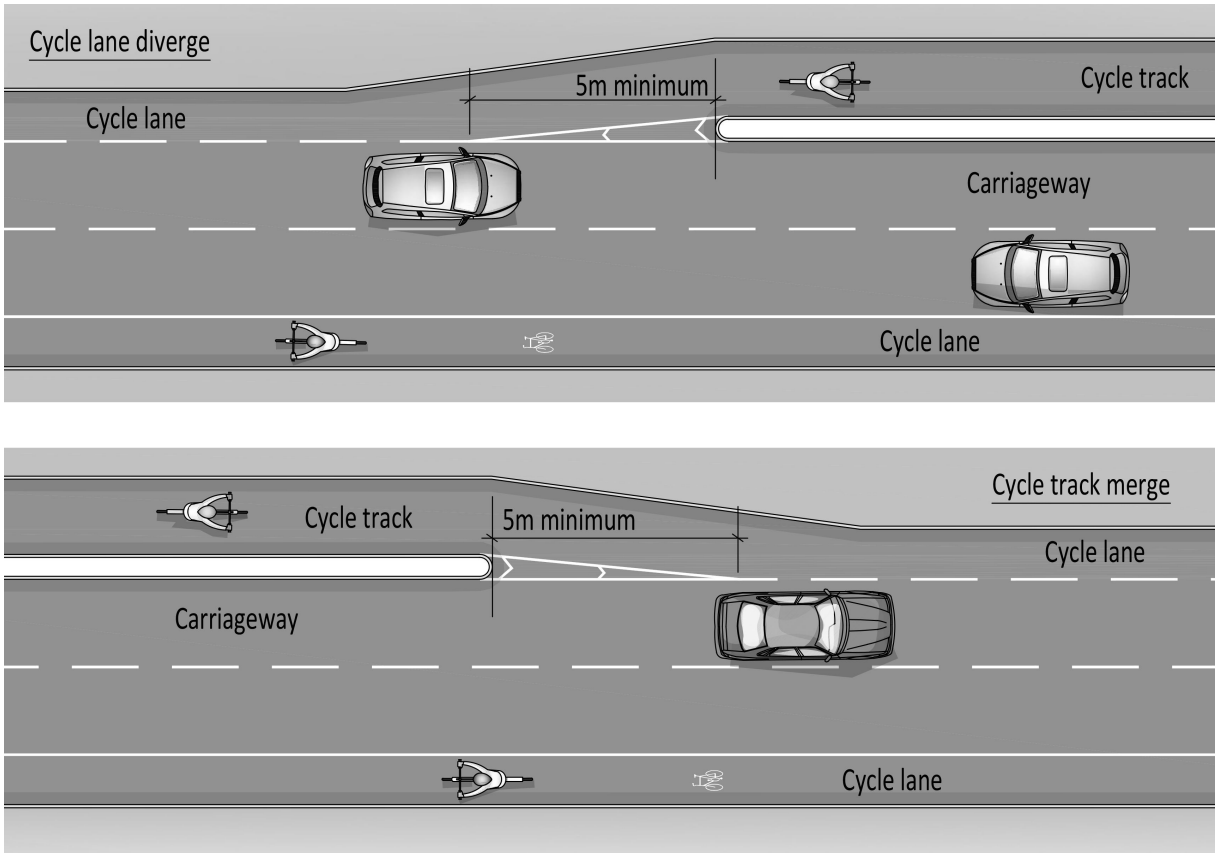
E/3.14 Where a cycle track re-joins the carriageway, a cycle route transition shall be provided and include a mandatory cycle lane of a minimum of 5 metres length before merging with a subsequent cycle lane.

NOTE *A cycle route transition can reduce the risk of cyclists colliding with vehicular traffic from behind whilst not inconveniencing on-carriageway cyclists.*

E/3.14.1 A cycle route transition between the carriageway and a cycle track should be smooth and gradual.

NOTE *Figure E/3.14.1N provides an indicative layout of a cycle route transition between a cycle track and carriageway.*

Figure E/3.14.1N Cycle route transition



Bus stops on cycle routes

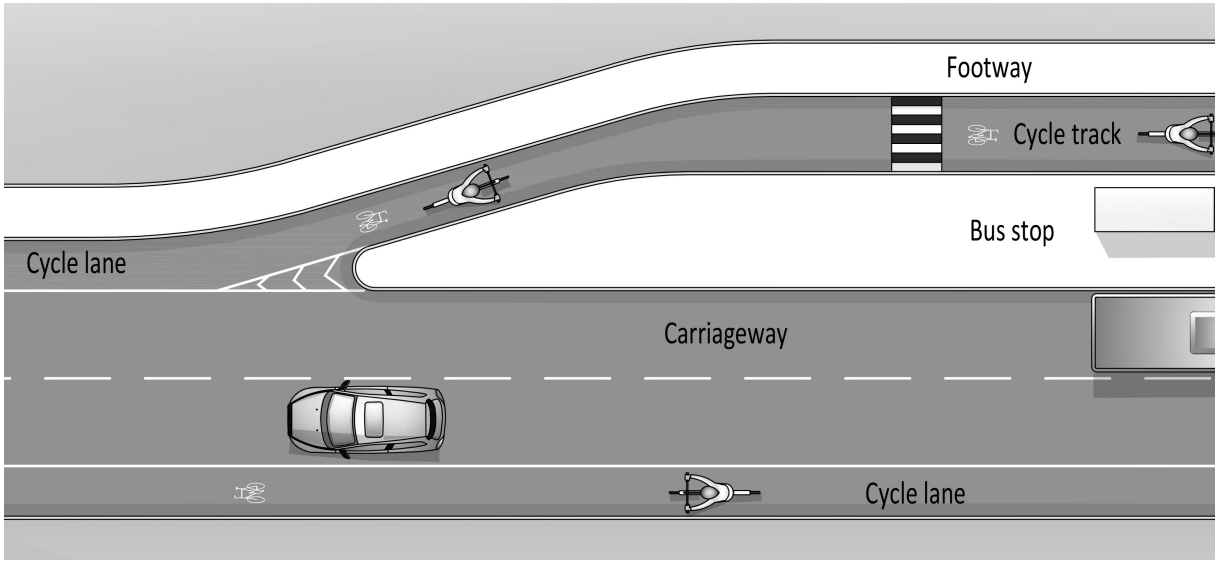
E/3.15 Cycle tracks shall be designed so that passengers disembarking from buses do not step down directly on to a cycle track.

NOTE 1 Bus stops can be a point of conflict between cyclists and buses and also between passengers and cyclists.

NOTE 2 Where there are high numbers of bus passengers boarding and alighting at the bus stop, a zebra crossing can be provided across the cycle track.

NOTE 3 Figure E/3.15N3 provides an indicative layout of a zebra crossing across a cycle track at a bus stop.

Figure E/3.15N3 Zebra crossing across a cycle track at a bus stop



NOTE 4 *Zebra crossings across cycle tracks do not necessarily include amber light beacons or zig-zag markings.*

E/3.15.1 Where a route with cycle lanes has bus stops with space available at the back, the cycle lane should be changed to a cycle track and routed behind the bus stop.

E/3.15.2 Where it is not feasible to route the cycle track to the back of the bus stop, cycle lane markings should be omitted for the length of the bus stop, except where the bus stop is in a bus lay-by which would allow the cycle lane markings to continue outside the bus lay-by.

NOTE *Requirements and advice for cycle tracks passing parking lay-bys are provided in CD 169 [Ref 11.N].*

Off-carriageway elements

Design speed

E/3.16 The design speeds in Table E/3.16 shall be used for cycle tracks.

Table E/3.16 Design speed for cycle tracks

Circumstance	Design speed (kph)	Absolute minimum design speed (kph)
On down gradients of 3% or greater	40	40
Gradients of less than 3%	30	20

E/3.17 Absolute minimum values for cycle track design speed shall only be used for distances up to 100 metres.

E/3.17.1 Where absolute minimum design speed values are used for cycle tracks, 'SLOW' markings should be included.

Stopping sight distance

E/3.18 Minimum SSDs provided in Table E/3.18 shall be used for cycle tracks.

Table E/3.18 Minimum SSD

Design speed (kph)	Minimum SSD (metres)
40	47
30	31
20	17

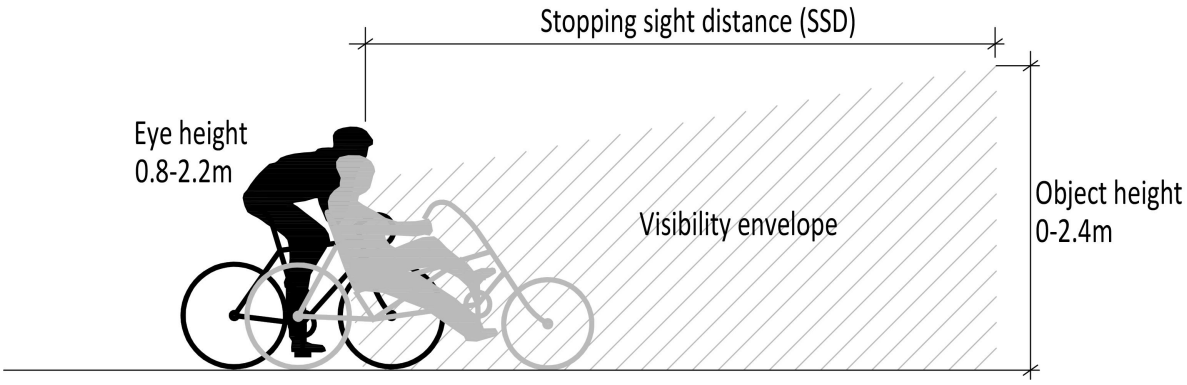
NOTE *SSDs are based on the same perception reaction times and deceleration rates for comfortable and emergency braking as assumed in CD 109 [Ref 2.I] Highway Link Design.*

Forward visibility envelope

E/3.19 For cycle tracks, the forward visibility envelope shall allow for objects between the cycle route surface and a height of 2.4 metres to be visible from an eye height in the range of 0.8 metres to 2.2 metres.

NOTE *The values quoted for the forward visibility envelope accommodate a range of cyclists including recumbent users, children and adults (reference Figure E/3.19N).*

Figure E/3.19N Forward visibility envelope



Horizontal alignment

E/3.20 Changes in horizontal alignment on cycle tracks shall be via simple curves with minimum horizontal radii values given in Table E/3.20.

Table E/3.20 Minimum horizontal radii for cycle tracks

Design speed (kph)	Minimum horizontal radius (metres)
40	57
30	32
20	14

NOTE *The minimum cycle track horizontal radii values are based on a V^2/R of 28.28 as per CD 109 [Ref 2.I] Highway Link Design.*

Vertical alignment

E/3.21 Sag and crest K values for cycle tracks shall be in accordance with Table E/3.21.

Table E/3.21 Minimum sag and crest K values for cycle tracks

Minimum sag K value	Minimum crest K value
5	6

Crossfall

E/3.22 Crossfall shall be provided on cycle tracks to prevent the collection of surface water.

E/3.23 Crossfall on cycle tracks shall not exceed 5%.

NOTE Higher crossfall values can create manoeuvring difficulties and contribute to loss of control in icy conditions.

E/3.24 Crossfall greater than 2.5% shall not be used on cycle tracks where cycle traffic is moving slower than the design speed or coming to a stop.

E/3.25 Crossfall on cycle tracks shall not be in an adverse direction where the horizontal radius is below 50 metres.

Horizontal separation

E/3.26 The minimum width of the horizontal separation between the carriageway and the closest edge of a cycle track shall be determined using the values in Table E/3.26.

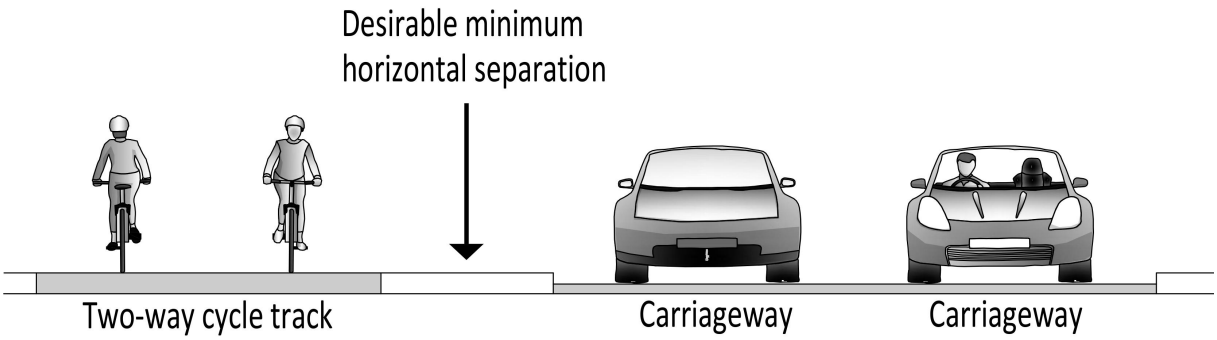
Table E/3.26 Minimum horizontal separation between carriageway and cycle tracks

Speed limit (mph)	Desirable minimum horizontal separation (metres)	Absolute minimum horizontal separation (metres)
30	0.5	N/A
40	1.0	0.5
50	2.0 (including any hard strip)	1.5 (including any hard strip)
60	2.5 (including any hard strip)	2.0 (including any hard strip)
70	3.5 (including any hard strip)	3.0 (including any hard strip)

NOTE 1 Horizontal separation between the carriageway and cycle tracks helps protect cyclists from the draught created by passing motor traffic and from debris thrown up by vehicles.

NOTE 2 Figure E/3.26N2 provides an indicative cross section for horizontal separation between the carriageway and cycle track.

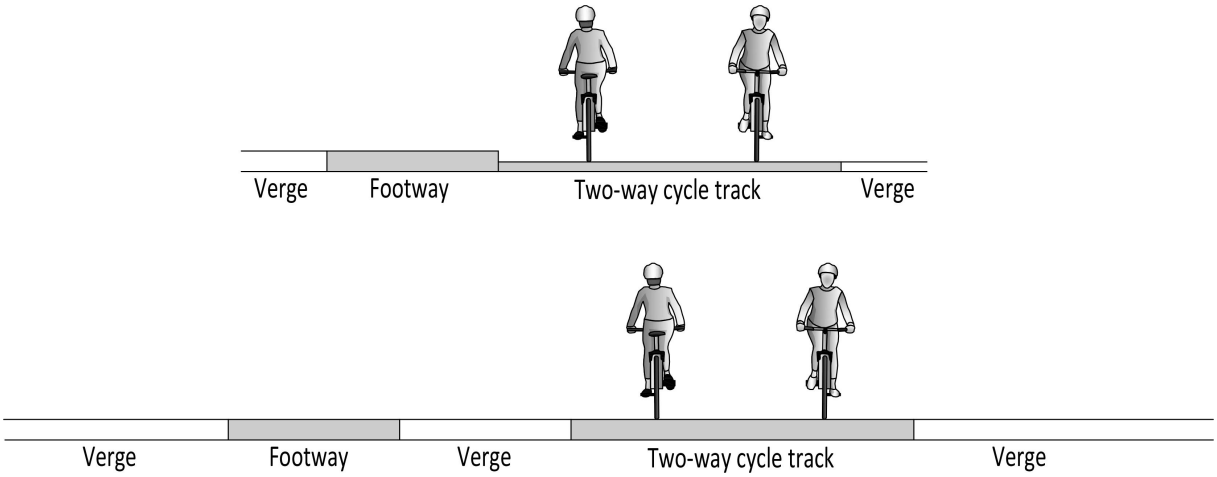
Figure E/3.26N2 Horizontal separation between the carriageway and cycle track



E/3.26.1 Where a footway is adjacent to a cycle track this should be separated by a kerb or a verge.

NOTE Figure E/3.26.1N provides indicative cross sections of the horizontal separation between a cycle track and a footway by a kerb and a verge.

Figure E/3.26.1N Two-way cycle track seperation by kerb or verge



E/3.26.2 Cycle tracks may be provided at the same or higher level as the adjacent carriageway.

E/3.27 Where a solid white line is used to mark the edge of a cycle track, this shall be used in conjunction with an edge of carriageway marking to avoid drivers from mistaking the cycle track marking for an edge of carriageway marking.

NOTE *In unlit areas a solid white line to the Traffic Signs Regulations and General Directions (TSRGD 2016 [Ref 12.N]) diagram 1049B can be used to mark the edge of a cycle track adjacent to a kerb.*

One and two-way cycle tracks

E/3.28 Centre line markings shall be provided on two-way cycle tracks.

NOTE 1 *The use of centre line markings helps to differentiate one-way cycle tracks from two-way cycle tracks.*

NOTE 2 *Figures E/3.28.N2a and E3.28.N2b illustrate typical cross sections of one-way and two-way cycle tracks adjacent to a carriageway.*

Figure E/3.28N2a One-way cycle track adjacent to a carriageway

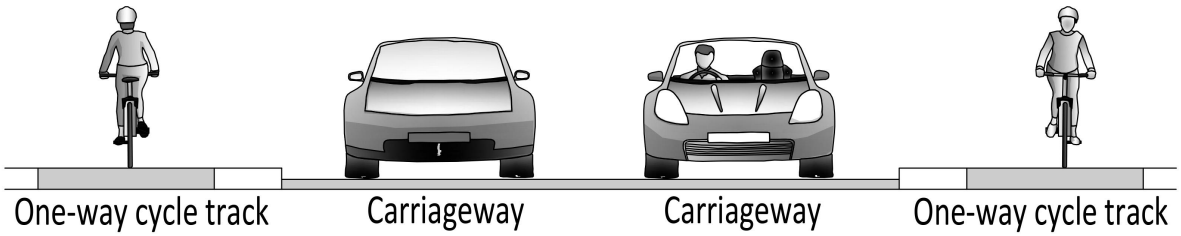
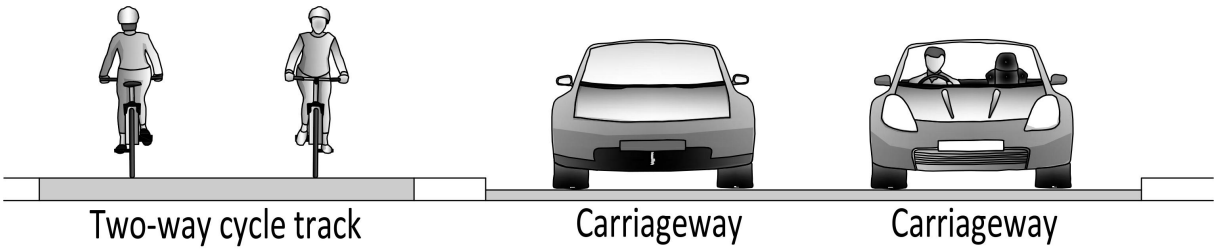


Figure E/3.28N2b Two-way cycle track adjacent to a carriageway



NOTE 3 *Further information on cycle track characteristics and potential hazards can be found in Appendix E/A.*

Stepped cycle tracks

E/3.29 Where a stepped cycle track is to be used, a cycle route shall also be provided on the opposite side of the road to deter cyclists from using a stepped track as a two-way facility.

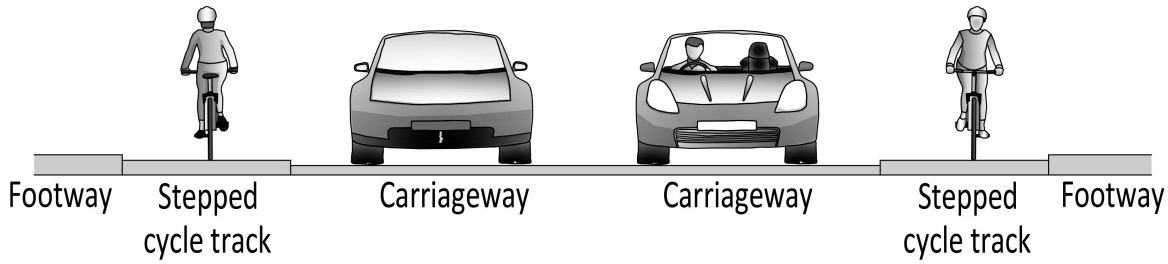
NOTE 1 Stepped cycle tracks are one-way in the same direction of flow as the adjacent traffic lane.

NOTE 2 The advantage of the stepped cycle track is that it provides physical separation in a space efficient way by taking a similar amount of space to a cycle lane, and it allows cyclists to retain priority at side road junctions which have give-way priority.

E/3.30 The height difference from a stepped cycle track to the carriageway shall be a minimum of 50mm with a further 25-50mm step up to an adjacent footway (if not separated by a verge).

NOTE Figure E/3.30N provides an indicative cross section of a stepped cycle track.

Figure E/3.30N Stepped cycle track



E/3.31 On the approach to junctions, stepped tracks shall transition to a mandatory cycle lane, a minimum of 5m before changing to TSRGD 2016 [Ref 12.N] markings (Diagram 1010) through the junction.

Measures to prevent motor traffic access to cycle tracks

E/3.32 Cycle tracks shall be clear of street furniture and obstructions with the exception of features to prevent motor traffic access.

E/3.33 The gap between posts and other physical constraints on cycle tracks shall be a minimum of 1.5 metres to restrict access by motor traffic while retaining access by cycle traffic.

E/3.34 Bollards on cycle tracks shall be aligned in such a way that enables a cycle design vehicle to approach and pass through the bollards in a straight alignment.

E/3.35 A frame and K frame type barriers, often used to prevent motorcycle access, shall not be used on cycle tracks.

NOTE A and K frame barriers cannot be negotiated by the cycle design vehicle.

E/3.36 Bollards on cycle tracks shall be designed to allow access for maintenance.

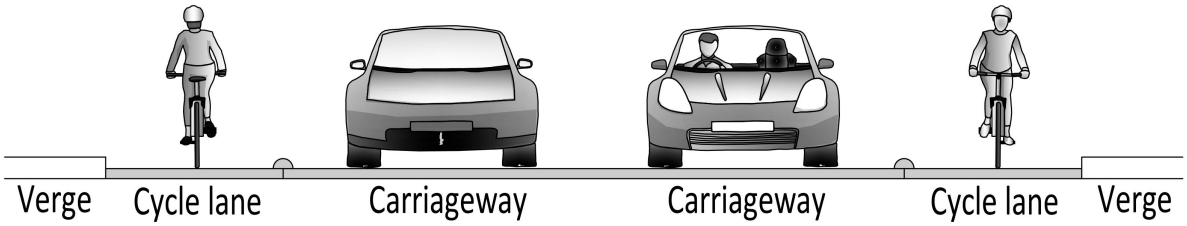
On-carriageway elements

Light segregation

E/3.37 Light segregation of cycle lanes shall only be used on mandatory cycle lanes.

NOTE 1 Light segregated cycle lanes (as illustrated in Figure E/3.37N1) are mandatory cycle lanes with the addition of intermittent physical objects between motor traffic and cycle traffic to reduce the risks of motor vehicle incursion.

Figure E/3.37N1 Light segregation



NOTE 2 The options for segregation features can include flexible bollards, low height separators (typically less than 0.3 metres vertical height) or an intermittent raised kerb.

E/3.38 A solid white line shall be marked on the motor vehicle side of a vertical feature used for the light segregation of a cycle lane.

E/3.39 The offset between the nearside of the solid edge line and vertical features of a light segregation cycle lane shall be in accordance with TSM Chapter 5 [Ref 13.N] for refuge islands.

E/4. Crossings

Cycle crossing design options

E/4.1 The type of cycle crossing to be provided on links and at junctions shall be in accordance with Table E/4.1.

Table E/4.1 Suitable types of cycle crossing

Speed limit	Location type	Two-way traffic flow on carriageway to be crossed, AADT	Maximum number of lanes to be crossed in one movement	Preferred cycle crossing type	Other possible cycle crossing type(s) in order of preference
≥60 mph	All	Any	Any	Grade separated	No alternative
40 mph and 50 mph	All	>10000	Any	Grade separated	Signal controlled cycle crossing
		6000-10000	2 or more	Grade separated	Signal controlled cycle crossing
		0-10000	1	Uncontrolled: cycle traffic gives way	Grade separated or signal controlled cycle crossing
		0-6000	2	Uncontrolled: cycle traffic gives way	Grade separated or signal controlled cycle crossing
≤30 mph	Links	>8000	Any	Grade separated	Signal controlled cycle crossing
		0-8000	2	Parallel pedestrian/cyclist crossing	Signal controlled cycle crossing or grade separated
		0-4000	1	Uncontrolled: cycle traffic has priority	Signal controlled cycle crossing or grade separated
	Roundabout entries	>8000	Any	Grade separated	Signal controlled cycle crossing
		0-8000	2	Parallel pedestrian/cyclist crossing	Signal controlled cycle crossing or grade separated
		0-4000	1	Uncontrolled: cycle traffic gives way	Signal controlled cycle crossing or grade separated
	Roundabout exits	>8000	Any	Grade separated	Signal controlled cycle crossing
		0-8000	1	Parallel pedestrian/cyclist crossing	Signal controlled cycle crossing or grade separated
		0-4000	1	Uncontrolled: cycle traffic gives way	Signal controlled cycle crossing or grade separated

Table E/4.1 Suitable types of cycle crossing (continued)

Speed limit	Location type	Two-way traffic flow on carriageway to be crossed, AADT	Maximum number of lanes to be crossed in one movement	Preferred cycle crossing type	Other possible cycle crossing type(s) in order of preference
≤30 mph	Side road entries	>8000	Any	Grade separated	Signal controlled cycle crossing
		0-8000	2	Parallel pedestrian/cyclist crossing	Signal controlled cycle crossing or grade separated
		0-2000	1	Uncontrolled: cycle traffic has priority	Signal controlled cycle crossing or grade separated
	Side road exits	>8000	Any	Grade separated	Signal controlled cycle crossing
		0-8000	1	Parallel pedestrian/cyclist crossing	Signal controlled cycle crossing or grade separated
		0-2000	1	Uncontrolled: cycle traffic has priority	Signal controlled cycle crossing or grade separated

NOTE 1 *'Speed limit' parameter refers to the highest speed limit on any arm at the junction.*

NOTE 2 *'Two-way traffic flow' refers to the traffic flow on the link to be crossed by cycle traffic.*

E/4.1.1 The default option should be to design crossings for cyclists separate from pedestrian crossings.

E/4.2 The same type of cycle traffic crossing shall be used across a junction arm entry and exit.

NOTE *At multiple arm junctions, each arm can have different types of cyclist crossing, provided that each junction arm entry and exit has a consistent cyclist crossing type.*

Uncontrolled cycle traffic crossings

Priority cycle traffic crossings

E/4.3 Where cycle traffic has priority, the cycle track shall be on a flat-topped speed hump.

E/4.3.1 The use of coloured surfacing across the carriageway at the crossing point should be provided to highlight an area of the road intended for cycle traffic in accordance with CD 236 [Ref 9.N].

E/4.4 All speed humps must be constructed in accordance with the Highways (Road Humps) Regulations SI 1999/1025 [Ref 10.N].

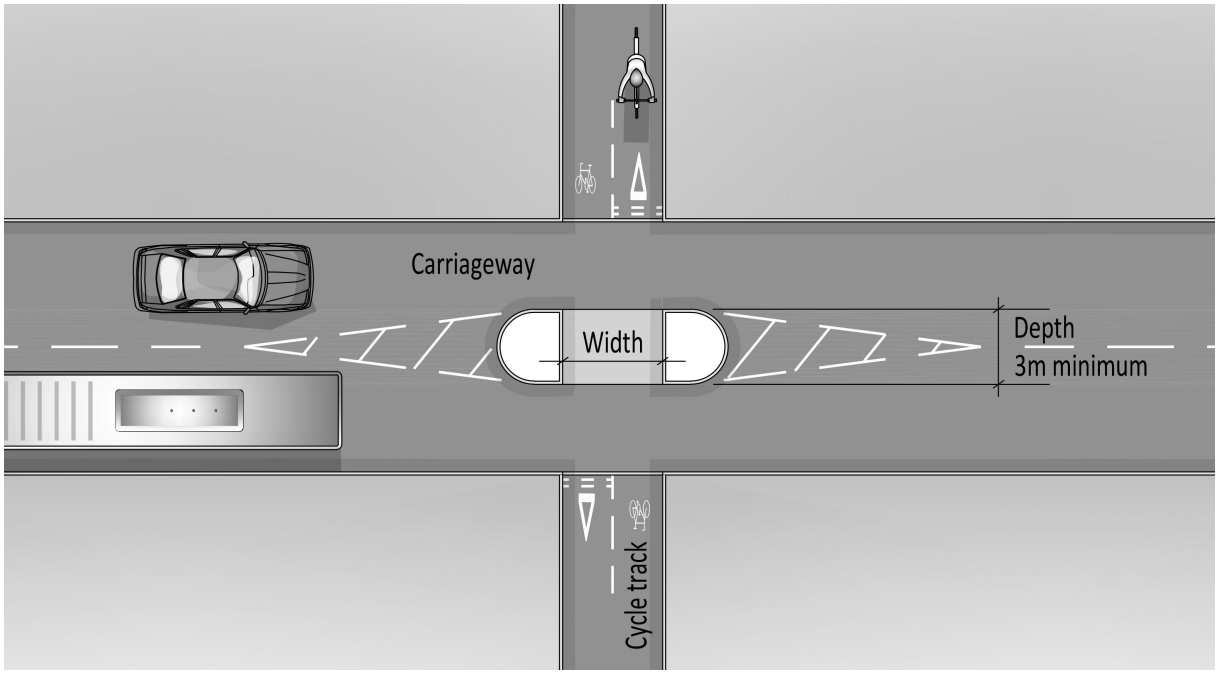
Refuges at cycle traffic crossings

E/4.5 Where a refuge is to be provided at a cycle traffic crossing, the width of the refuge shall provide space for cycle traffic at least equal to the width of the cycle track connecting to the crossing point either side of the carriageway (see Figure E/4.6).

NOTE *Refuges allow cycle traffic to cross carriageways in two or more separate movements. At uncontrolled crossings they improve safety and comfort and reduce delay where cycle traffic does not have priority.*

E/4.6 The depth of the refuge measured in the direction of cyclists' travel shall be a minimum of 3m (as shown in Figure E/4.6).

Figure E/4.6 Refuges at cycle traffic crossings



Cycle traffic crossings of priority junctions

Bent-out and bent-in crossings of minor roads

E/4.7 Cycle tracks which intersect the minor road at priority junctions shall cross the minor road in one of two ways - either bent-out or bent-in crossings.

NOTE 1 Bent-out crossings cross the minor road away from the give way line.

NOTE 2 Bent-in crossings cross the minor road at the mouth of the junction as a mandatory cycle lane.

E/4.8 Where a cycle route intersects the minor road of a priority junction, the order of preference for a crossing facility shall be the following:

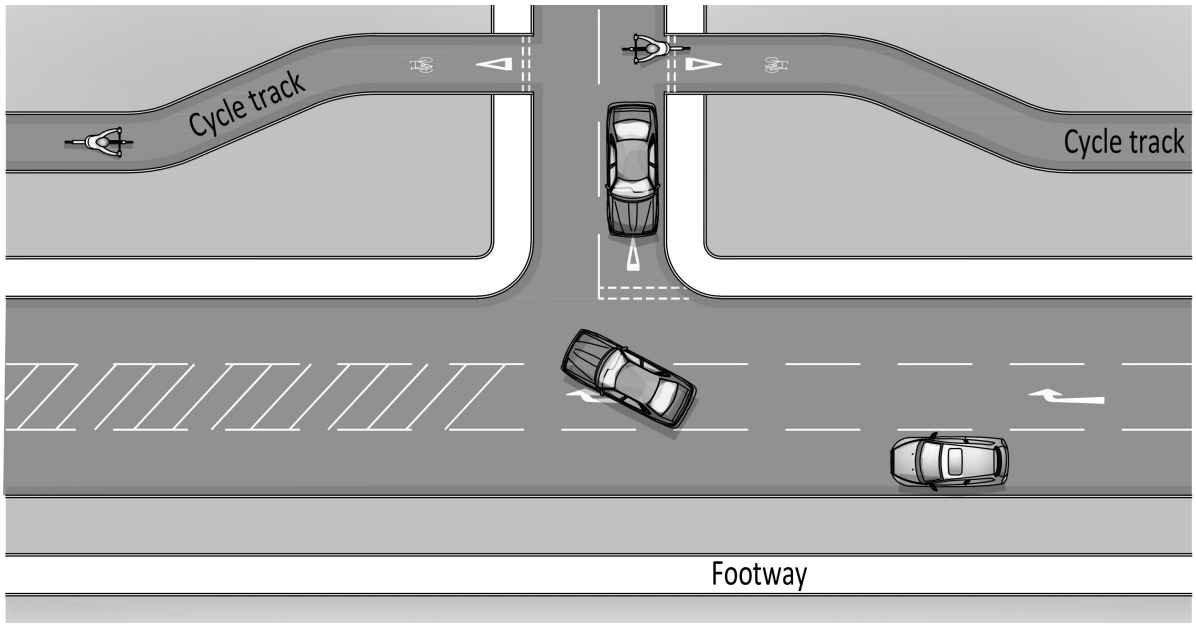
1) bent-out crossing where cycle traffic has priority;
2) bent-in crossing;
3) bent-out crossing where cycle traffic does not have priority.

NOTE The decision to adopt at-grade priority for the cycle track depends on the amount of traffic turning in and out of the side road (and the ability to safely accommodate the anticipated volume of traffic turning off the main road when cyclists are using the crossing).

E/4.9 Bent-out crossings shall not be used for stepped cycle tracks.

NOTE Bent-out crossings of minor roads, as shown in Figure E/4.9N, are suitable for roads with a speed limit up to 30mph on the minor road.

Figure E/4.9N Indicative layout of a bent-out crossing at a minor road



E/4.10 At bent-out crossings the set-back distance to the minor road crossing shall be measured from the kerbline of the major road, or from the kerbline of the nearside diverging taper if present, to the nearest edge of the cycle track.

E/4.11 Where cycle traffic does not have priority at bent-out crossings the set-back distance for the crossing of the minor road shall be a minimum of 10 metres from the junction.

E/4.12 Where signal controlled bent-out crossings are provided on minor roads, the crossing shall be located far enough away from the major road so that vehicles do not queue back into the major road.

E/4.13 Where the signal controlled bent-out crossing cannot be located far enough away from the major road to prevent queuing on to the major road, the whole junction shall be signal-controlled.

E/4.14 At bent-out crossings, where cycle tracks cross minor private access roads carrying less than 2000 AADT, there shall be no marked priority for either cycle traffic or traffic using the minor road.

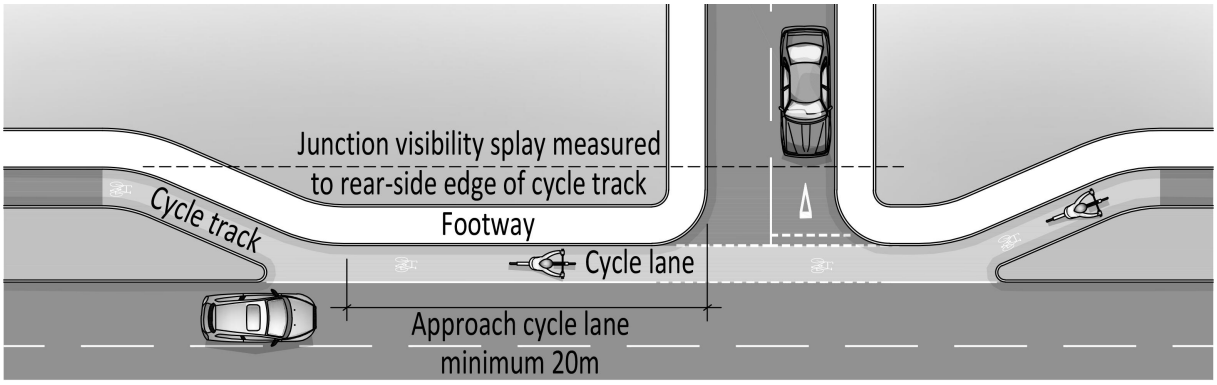
E/4.15 At bent-out crossings, where cycle tracks cross minor private access roads carrying less than 2000 AADT, there shall be a minimum set-back distance of 5 metres.

E/4.16 Cycle tracks at bent-in crossings shall be one-way.

NOTE 1 Bent-in crossings of minor roads are suitable where the speed limit on any arm of the junction does not exceed 30mph.

NOTE 2 Figure E/4.16N2 provides an indicative diagram of a bent-in crossing.

Figure E/4.16N2 Indicative layout of a bent-in crossing



E/4.17 At bent-in crossings the cycle track shall become a cycle lane in advance of the corner radius of the minor road junction.

E/4.18 At bent-in crossings the length of the approach cycle lane shall be at least 20 metres.

E/4.19 The cycle lane shall return to a cycle track immediately beyond the corner radius of the minor road junction at bent-in crossings.

Stepped cycle track crossings of minor roads

E/4.20 Where a stepped cycle track approaches a minor road, the stepped cycle track shall transition to a cycle lane.

E/4.21 At stepped cycle track crossings where the corner radius of the minor road is ≤6 metres, the length of the approach cycle lane shall be a minimum of 5 metres.

E/4.22 At stepped cycle track crossings where a radius larger than 6 metres is used in the design, the length of the approach cycle lane shall be a minimum of 20 metres.

E/4.23 Where the speed limit and traffic flows on the major road, downstream of the minor road, prevent the use of a cycle lane, the cycle lane shall return to a stepped cycle track immediately beyond the mouth of the minor road junction.

Controlled cycle traffic crossings

Signal controlled cycle traffic crossings

E/4.24 Detectors shall be provided on the cycle track approaches to signal controlled crossings so that the cycle traffic green phase is called in advance of a cyclist arriving at the cycle track stop line.

E/4.24.1 Cycle traffic may be controlled by primary low and high level cycle signals at the cycle traffic stop line.

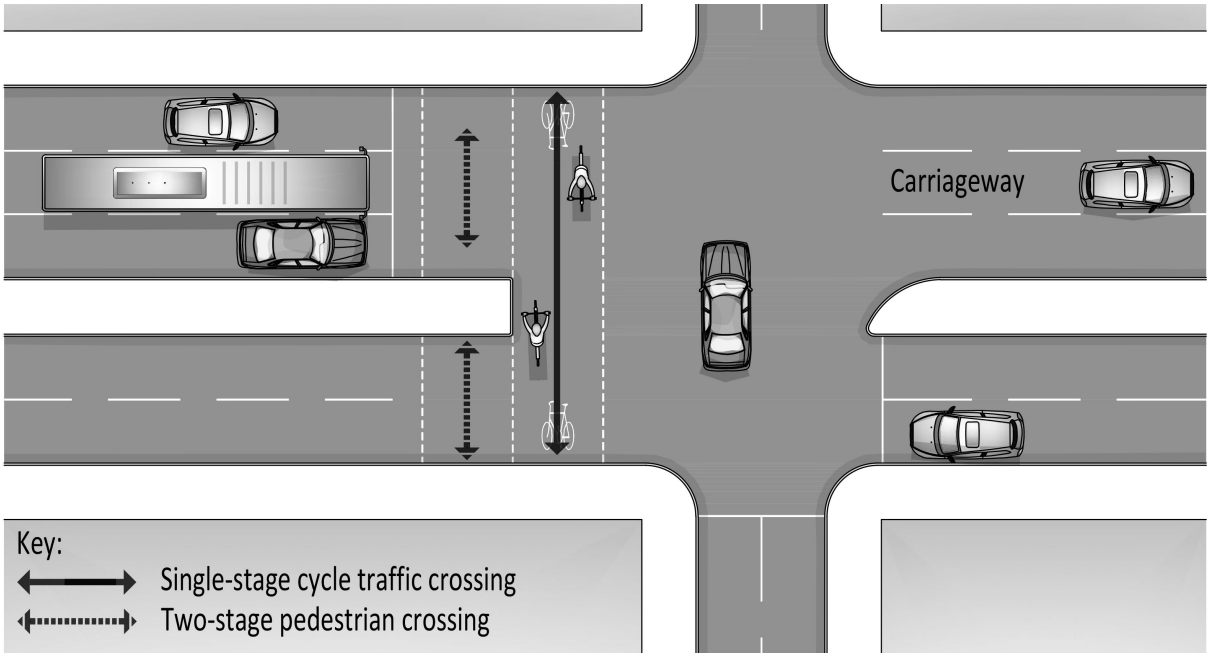
E/4.24.2 Secondary high level cycle traffic signals should be provided at signal controlled cycle traffic crossings where there is a risk of poor visibility to low level cycle traffic signals.

E/4.24.3 Where a cycle route passes through a series of signal controlled crossings, the signals should be coordinated to provide a green wave for cycle traffic, based on the cycle traffic design speed.

E/4.25 Signal controlled cycle traffic crossings shall be provided with road markings to diagram 1055.3 TSRGD 2016 [Ref 12.N] Schedule 14, Part 2, Item 57 (informally known as elephant's footprints) to indicate to all road users the presence of the crossing and the route to be taken by cycle traffic.

NOTE *Figure E/4.25N provides an indicative layout of a separate cycle traffic and pedestrian signal controlled crossing.*

Figure E/4.25N Separate cycle traffic and pedestrian signal controlled crossing



E/4.25.1 The footway and cycle track on the approach to signal controlled cycle traffic crossings should be surfaced in contrasting materials to each other.

E/4.25.2 A single stage should be provided to eliminate the need for cycle traffic to wait on islands in the middle of signal controlled junctions.

E/4.26 The design parameters in Table E/4.26 shall be used for calculating signal timings for signal controlled cycle traffic crossings.

Table E/4.26 Design parameters for calculating signal timings for signal controlled cycle traffic

Design parameter	Flat, downhill or uphill gradient of less than 3%	Uphill gradient of 3% or more
Reaction time	1 second	
Acceleration	0.5 m/s^2	0.4 m/s^2
Maximum design speed	20 kph	15 kph

NOTE *The cycle traffic crossing times at signal controlled cycle traffic crossings provided in Table E/4.26N are determined principally by the acceleration rate of cyclists.*

Table E/4.26N Cycle traffic crossing times for signal controlled cycle crossings

Crossing length (m)	Indicative situation	Cycle traffic crossing time from standing start	
		Flat, downhill or uphill gradient of less than 3% (seconds)	Uphill gradient of 3% or more (seconds)
8	Single carriageway	8	8
10		8	9
12		9	10
14		9	10
16	Dual 2 lane carriageway	10	11
18		10	11
20		11	12
22		11	12
24	Dual 3 lane carriageway	11	13
26		12	13
28		12	14
30		12	14
32		13	15
34		13	15
36		14	16

E/4.26.1 Designers may decide that there are circumstances where the maximum design speed of 15 kph, as suggested for uphill gradients of 3%, is appropriate as the design speed for flatter crossings.

NOTE *The assumed maximum design speed is based on the absolute minimum value given in Table E/3.17 to allow for slower-moving cyclists to clear the signals safely.*

E/4.27 The green aspect for cycle traffic at signal controlled cycle traffic crossings shall run for the minimum of 7 seconds (normal minimum green time for crossings).

E/4.27.1 On-crossing detectors at signal controlled cycle traffic crossings should be used to extend the green aspect to the maximum green for cycle traffic when demand necessitates.

E/4.28 The maximum green time at signal controlled cycle traffic crossings shall be no less than the cycle traffic crossing times given in Table E/4.24N derived using Table E/4.24.

E/4.29 Stages parallel with other traffic phases at signal controlled cycle traffic crossings shall be called if cycle traffic demand exists, even if no demand exists on parallel traffic phases.

Parallel pedestrian and cycle traffic crossings

E/4.30 Parallel pedestrian and cycle traffic crossings shall be used where it is necessary to provide crossings which cater for both cycle traffic and pedestrians.

E/4.30.1 Parallel pedestrian and cycle traffic crossings may be provided on raised tables subject to authorisation from the DfT.

NOTE *Statutory requirements for the layout of parallel pedestrian and cycle traffic crossings for pedestrians and cycle traffic are given in TSRGD 2016 [Ref 12.N] .*

E/4.31 When providing for cycle traffic at roundabouts, parallel pedestrian and cycle traffic crossings shall be introduced between 5 metres and 20 metres from the give-way line.

E/4.31.1 When providing for cycle traffic at roundabouts, signal controlled pedestrian and cycle traffic crossings should be introduced at 20 metres or more than 60 metres from the give-way line.

E/4.32 Parallel pedestrian and cycle traffic crossings shall be used in situations where zebra crossings are recommended in CD 116 [Ref 5.N].

Staggered crossings

E/4.33 Staggered crossings shall not be used unless the central refuge can accommodate the design parameters for the cycle design vehicle and a two-way cycle track (including pedestrian facilities where appropriate) in accordance with Tables E/3.1 and E/3.2.

Toucan crossings

E/4.34 Toucan crossings shall only be used where it is necessary for pedestrians and cyclists to share the same space at the crossing.

NOTE 1 An example of where it can be necessary to share the same space at a crossing would be where a shared use path leads to the crossing.

NOTE 2 Further guidance on the design of toucan crossings is given in Local Transport Note 02/08 LTN 2/08 [Ref 3.I] and Sustrans Technical Info Note No.18 [Ref 4.I].

Cycle traffic at grade separated cycle track crossings

Underbridges

E/4.35 Height dimensions for cycle tracks at underbridges shall be provided in accordance with Table E/4.35.

Table E/4.35 Height dimensions for cycle tracks at underbridges

Length (m)	Cycle track headroom (metres)	
	Desirable minimum	Absolute minimum
<23	2.4	2.2
≥23	2.7	2.2

E/4.36 Appropriate signs shall be used to warn cyclists of low headroom where underbridge heights do not meet the desirable minimum headroom height given in Table E/4.35.

E/4.37 Kerb separation shall be provided between cycle tracks at underbridges and any adjacent pedestrian facilities.

Overbridges

E/4.38 Where an overbridge is being introduced because a road severs an existing right of way, the overbridge shall be sited and aligned to minimise the diversion from the existing line of the cycle route.

NOTE Further requirements regarding overbridge design are provided in CD 353 [Ref 2.N] Design Criteria for Footbridges.

E/4.39 Where a footpath is required alongside a cycle track on an overbridge, the footpath shall be separated from the cycle track with a kerb and additional width provided on the cycle track (see Table E/3.2).

Wheeling ramps

E/4.40 Wheeling ramps at steps shall be a minimum of 100mm wide and be positioned 200mm from a vertical feature (for example a parapet or hand rail) to avoid handlebars and bags from becoming snagged.

E/4.40.1 Wheeling ramps at steps should only be installed as an interim solution until there is acceptable alternative provision that is accessible to users of all types of cycle.

E/4.40.2 Where wheeling ramps are used at steps, signing for a suitable alternative route should be provided.

NOTE The wheeling ramp can be provided as a channel or by infilling a section of the steps.

E/5. Junctions

On carriageway cycle traffic provision at priority junctions

E/5.1 At priority junctions, the continuation of nearside cycle lanes using road markings to diagram 1010 (TSRGD 2016 [Ref 12.N]) shall be provided across the minor road(s).

E/5.2 The width of a cycle lane shall be a minimum of 2 metres where the cycle lane is passing the mouth of a junction that does not have a minor road entry treatment road hump.

E/5.3 Any segregation feature of a cycle lane on the major road approach to a priority junction shall be terminated a minimum of 5 metres from the minor road where the corner radius is 6 metres or less.

E/5.4 Where a radius greater than 6 metres is used, the segregation feature of a cycle lane on a major road shall terminate a minimum of 20 metres from the minor road.

Cycle traffic at roundabouts

E/5.5 Cycle lanes shall not be provided on the perimeter of the circulatory carriageway of a roundabout.

NOTE *Cycle lanes on the perimeter of the circulatory carriageway of a roundabout encourage cyclists to take up a nearside position where they are vulnerable to being hit by vehicles exiting the roundabout.*

Compact roundabouts

E/5.6 At compact roundabouts, cycle tracks shall be provided when the total junction throughput is above 8,000 AADT.

E/5.7 When cycling is on-carriageway through a compact roundabout, any cycle lanes, light segregated cycle lanes or stepped cycle tracks shall end 20-30 metres in advance of the give way line so that cyclists integrate with motor traffic on the roundabout approach.

Normal roundabouts

E/5.8 At normal roundabouts, including where there are segregated left turn lanes, one of the following design options shall be used when providing for cycle traffic:

1) provide cycle tracks around the junction, with cycle track crossings of each arm;
2) remodel the junction as a compact roundabout, where permitted by CD 116 [Ref 5.N];
3) provide grade separated cycle tracks around and/or across the junction;
4) introduce signal control to the roundabout, with appropriate cycle track provision;
5) replace the roundabout with a signal controlled junction or another form of junction, with appropriate cycle track provision.

NOTE *Refer to CD 116 [Ref 5.N] for requirements and advice for cycle tracks and shared use at segregated left turn lanes.*

Cycle track priority around roundabouts

E/5.9 Where cycle tracks are provided at roundabouts they shall be two-way, except where cycle traffic has priority over any of the roundabout entries and exits.

E/5.9.1 Where cycle tracks are used on the roundabout approaches, they should link with cycle tracks around the roundabout.

Cycle traffic at signal controlled roundabouts

E/5.10 When providing for cycle traffic, one of the following four approaches shall be used at signal controlled roundabouts:

1) on-carriageway provision;

2) off-carriageway provision;
3) a cycle track across or around the central island;
4) grade separated provision.

On-carriageway provision at signal controlled roundabouts.

E/5.11 Advanced stop lines shall not be used at signal controlled roundabout approaches that:

1) carry more than 5000 AADT;
2) have more than two traffic lanes; and/ or
3) receive more than 30% of the traffic signal cycle time.

E/5.12 Facilities for on-carriageway cycle traffic at signal controlled roundabouts shall be provided in accordance with Table E/5.12, in order of preference.

Table E/5.12 Methods of providing for on-carriageway cycling at signal controlled roundabouts

Order of preference	Method of provision	Description	References
1	**Separate stages**	Cycle traffic is provided with separate stages at the signal controlled node. Cycle traffic complete their manoeuvres without conflict. Cycle traffic approaches the signal controlled node via a cycle lane or track.	Appendix E/A
2	**Exiting traffic held**	Cycle traffic is provided with a track or lane (protected by light segregation) around the outside of the circulatory carriageway. Left turning motor traffic exiting the roundabout is held on red while circulating traffic are given a green aspect. Traffic turning left to leave the roundabout is given a green aspect at the same time as traffic entering the roundabout. This requires tighter exit geometry than is common where existing large roundabouts are signal controlled.	CD 116 [Ref 5.N] provides requirements for signal controlled roundabouts. Appendix E/A
3	**Cycle gate with early release**	A cycle gate controls how cycle traffic enters an area between two traffic stop lines (the reservoir area). Cycle signals show red to cycle traffic while traffic is receiving green at the two stop lines. Cycle traffic is released into the empty reservoir while traffic is held at the first stop line, and given an early release. This improves safety but introduces a time penalty for cycle traffic and is less suitable for cycle traffic movements that pass through a number of signal controlled nodes.	Appendix E/A

NOTE *Cycle gates can be used at signal controlled junctions at locations other than roundabouts.*

Cycle track provision at signal controlled roundabouts

E/5.13 Cycle tracks at signal controlled roundabouts shall be two-way, so that right turning cycle traffic takes the shortest route through the junction.

NOTE *Access to and from these two-way routes can be from one-way cycle tracks, cycle lanes or general traffic lanes on the roundabout entries and exits (see Section 4 for requirements for transitions between cycle tracks and carriageway).*

E/5.14 Cycle traffic crossings of the roundabout entries shall be integrated with the junction control so that cycle traffic can cross while circulatory traffic is receiving a green aspect.

E/5.15 Where the red period for motor traffic entering the roundabout is of insufficient duration to enable a minimum green to be provided for cycle traffic crossing movements, an alternative stage shall be provided on demand.

E/6. Signing

Cycle traffic direction signing strategies

E/6.1 Cycle traffic signing strategies shall be developed for all cycle routes.

E/6.1.1 Cycle traffic signing strategies should include the following attributes:

1) promotion of connectivity to local destinations and with local cycle networks in consultation with the local highway authority;
2) identification of primary, target, local place name and other local destinations in consultation with the local highway authority;
3) liaison with the local highway authority regarding all signed destinations so that they are coherently signed on the local cycle network until the destination is reached;
4) provision of additional cycle signs (blue face) to promote the cycle route and provide easier wayfinding for cyclists;
5) minimised sign clutter in accordance with Traffic Advisory Leaflet 01/13 Reducing Sign Clutter TAL 1/13 [Ref 5.I].

E/6.2 Cycle traffic direction signs shall be provided for all junction layouts for both on and off-carriageway cycle routes.

NOTE 1 *Existing road signs can be included as part of the overall cycle signing strategy if suitable to minimise sign proliferation and repeated information.*

NOTE 2 *Where route choice options are considered challenging to understand, wayfinding maps or TSRGD 2016 [Ref 12.N] "indication of a route for cyclists through a road junction ahead" signing can be beneficial where the path of cyclists through the junction is not intuitive.*

Design of direction signs for cycle traffic

E/6.3 There shall be a minimum clearance of 500mm between the edge of a cycle facility and any parts of a sign or lighting assembly that are less than 2.3 metres in height.

E/6.4 All sign faces shall be specified with retro-reflective material.

E/6.5 Either the distance or the cycle journey time to destinations shall be shown on cycle direction signs.

E/6.5.1 Where a destination is within a 15 minute cycle journey time, then the destination should be signed using the journey time and not the distance.

E/6.6 Where journey times are provided on signs, these shall be calculated assuming a typical cyclist speed on the route in question, taking account of factors (e.g. topography and crossing points) that can slow the cyclist.

E/6.6.1 The average speed of cyclists on a level surface should be assumed as 12mph (reference LTN2/08 LTN 2/08 [Ref 3.I]).

E/7. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	CTA, 'Cycle Tracks Act'
Ref 2.N	Highways England. CD 353, 'Design criteria for footbridges'
Ref 3.N	Highways England. CD 143, 'Designing for walking, cycling and horse riding (vulnerable users)'
Ref 4.N	Highways England. CD 123, 'Geometric design of at-grade priority and signal-controlled junctions'
Ref 5.N	Highways England. CD 116, 'Geometric design of roundabouts'
Ref 6.N	The National Archives. legislation.gov.uk. Highways Act 1980, 'Highways Act 1980'
Ref 7.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 8.N	The National Archives. legislation.gov.uk. Road Traffic Act 1988, 'Road Traffic Act 1988'
Ref 9.N	Highways England. CD 236, 'Surface course materials for construction'
Ref 10.N	The Stationery Office. SI 1999/1025, 'The Highways (Road Humps) Regulations 1999'
Ref 11.N	Highways England. CD 169, 'The location and layout of lay-bys and rest areas'
Ref 12.N	The Stationery Office. TSRGD 2016, 'The Traffic Signs Regulations and General Directions 2016'
Ref 13.N	The Stationery Office. TSM Chapter 5, 'Traffic Signs Manual Chapter 5 - Road Markings'

E/8. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	Highways England. CT-elearning, 'Cycle Traffic E-Learning'
Ref 2.I	Highways England. CD 109, 'Highway link design'
Ref 3.I	LTN 2/08, 'Local Transport Note - Cycle infrastructure design'
Ref 4.I	Sustrans. Sustrans. Technical Info Note No.18, 'Toucan Crossings'
Ref 5.I	Department for Transport. TAL 1/13, 'Traffic Advisory Leaflet 01/13'

Appendix E/A. One-way and two-way cycle tracks

Table E/A.1 Characteristics, hazards and uses of one-way and two-way cycle tracks

	One-way cycle track	Two-way cycle track on one side of carriageway
Characteristics		
Layout	Cycle tracks along both sides of carriageway.	One cycle track.
Directness and coherence	Crossings of carriageway to access and leave the cycle track and make all movements.	Crossings of carriageway to reach destinations on the opposite side of carriageway from the cycle track; and for cyclists on that side to access the cycle track.
Hazards		
Turning movements	Cycle traffic at risk from left turning traffic entering side roads.	Cycle traffic at risk from left turning traffic entering side roads.
	Cycle traffic at risk, but lower risk than with two way cycle tracks, from right turning traffic entering side road and from minor road traffic entering the junction.	Cycle traffic at risk from right turning traffic entering side roads.
Blocking issues	Cycle track may be blocked by traffic queuing on side road, affecting one direction of cycle traffic.	Cycle track may be blocked by traffic queuing on side road, affecting both directions of cycle traffic.
	Cyclists may use main carriageway if side road blocked. This use would be in the same direction of travel as the adjacent general traffic lane.	Cyclists may use main carriageway if side road blocked. This may encourage use of the carriageway by cycle traffic travelling in the opposite direction to traffic in the adjacent general traffic lane.
Sight lines and visibility	When crossing side roads, whatever form of priority or control is provided, cyclists need to look behind to check for left turning vehicles.	When crossing side roads, whatever form of priority or control is provided, cyclists need to look behind to check for left turning vehicles (or right turning vehicles if travelling in the opposite direction to the adjacent general traffic flow).
	n/a	Sufficient separation or barriers may be needed to reduce risk of drivers being dazzled by oncoming cycle lights and cyclists being dazzled by oncoming vehicle head lights particularly on unlit roads.
	Cyclists may incorrectly use one-way tracks in the wrong direction if it is easier than crossing a major road.If cycle users persist in using one-way tracks the wrong way, this suggests that the facility may need to be made two-way.	n/a
Implementation locations		
Locations	Urban areas due to high frequency of side roads.	Rural and urban areas with few side roads.
	n/a	Large junctions where network for cycle traffic needs to maintain coherence.

Road Layout
Design

CD 195
Northern Ireland National Application Annex to CD 195 Designing for cycle traffic

(formerly IAN 195/16)

Revision 0

Summary
This National Application Annex contains the Department for Infrastructure Northern Ireland specific requirements for cycle traffic on the trunk road and motorway network.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: dcu@infrastructure-ni.gov.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Sep 2019	Department for Infrastructure Northern Ireland National Application Annex to CD 195.

Foreword

Publishing information

This document is published by Highways England on behalf of Northern Ireland.

This document supersedes IAN 195/16 Cycle traffic and the strategic road network, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document provides requirements and advice relevant to the motorway and trunk road network for the design of infrastructure for cycle traffic. It is intended to be used by highway design professionals to facilitate the convenient and safe movement of cycle traffic, where cycling is legally permitted.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

NI/1. Requirements for cycle traffic

NI/1.1 Direction on the design of routes and facilities for cycle traffic in Northern Ireland shall be obtained from the Department of Infrastructure.

NI/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Road Layout
Design

CD 195
Scotland National Application Annex to CD 195 Designing for cycle traffic

(formerly IAN 195/16)

Version 0.0.1

Summary
This National Application Annex contains the Transport Scotland specific requirements for cycle traffic on the trunk road and motorway network.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 195	0.0.**1**	March 2021	Scotland NAA	Incremental change to notes and editorial updates

Document was amended in May 2020 to remove duplicate wording where the reference text stated 'roads for all'.

A new revision number was incorrectly not created at this time and no further changes have been made to this document since May 2020.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 195	0	September 2019		

Foreword

Publishing information

This document is published by Highways England on behalf of Transport Scotland.

This document supersedes IAN 195/16 Cycle traffic and the strategic road network, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document provides requirements and advice relevant to the motorway and trunk road network for the design of infrastructure for cycle traffic. It is intended to be used by highway design professionals to facilitate the convenient and safe movement of cycle traffic, where cycling is legally permitted.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

S/1. Requirements for cycle traffic

S/1.1 The design of routes and facilities for cycle traffic in Scotland shall be in accordance with Cycling by Design 2011 [Ref 1.N].

S/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Transport Scotland. Cycling by Design, 'Cycling by Design' , 2011
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Llywodraeth Cymru
Welsh Government

Road Layout
Design

CD 195
Wales National Application Annex to CD 195 Designing for cycle traffic

(formerly IAN 195/16)

Revision 0

Summary
This National Application Annex contains the Welsh Government specific requirements for cycle traffic on the trunk road and motorway network.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Welsh Government team. The email address for all enquiries and feedback is: Standards_Feedback_and_Enquiries@gov.wales

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Sep 2019	Welsh Government National Application Annex for CD 195.

Foreword

Publishing information

This document is published by Highways England on behalf of Welsh Government.

This document supersedes IAN 195/16 Cycle traffic and the strategic road network, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document provides requirements and advice relevant to the motorway and trunk road network for the design of infrastructure for cycle traffic. It is intended to be used by highway design professionals to facilitate the convenient and safe movement of cycle traffic, where cycling is legally permitted.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

W/1. Requirements for cycle traffic

W/1.1 The design of routes and facilities for cycle traffic in Wales shall be in accordance with Active Travel (Wales) Act 2013 Design Guidance ATDG (W) [Ref 1.N].

W/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Welsh Government. ATDG (W), 'Active Travel (Wales) Act Design Guidance'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Design Manual for Roads and Bridges

Road Layout
Design

CD 143
Designing for walking, cycling and horse-riding

(formerly TA 90/05, TA 91/05, TA 68/96, TD 36/93)

Version 2.0.1

Summary
This document provides requirements and advice for the design of walking, cycling and horse-riding facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 143	2.0.**1**	March 2021	Core document, Scotland NAA	Incremental change to notes and editorial updates

New version of document published solely to resolve revision number issue.

This was caused when an amendment was made to the Scotland National Application Annex document in May 2020 to remove duplicate wording without a new revision number being issued. This meant there were incorrectly two revision 2 documents available on the website with different publication dates of March 2020 and May 2020.

No changes have been made to the core document and England National Application Annex since they were last updated in March 2020. No changes have been made to the Wales and Northern Ireland National Application Annexes since their original publication in November 2019. The Scotland National Application Annex is being re-published with a new revision number 1.0.1 to reflect the change made in May 2020 and no further changes have been made since this time.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 143	2	May 2020		
CD 143	2	March 2020		
CD 143	1	January 2020		
CD 143	0	November 2019		

Foreword

Publishing information

This document is published by Highways England.

This document supersedes TA 90/05, TA 91/05, TA 68/96 and TD 36/93, which are withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document provides requirements and advice for the design of walking, cycling and horse-riding facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 4.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
km	Kilometre
kph	Kilometres per hour
mm	Millimetre
mph	Miles per hour
NAA	National Application Annex
SSD	Stopping sight distance

Terms and definitions

Terms and definitions

Term	Definition
Absolute minimum	The design parameter(s) that can be used where there is an existing physical constraint where a walking, cycling or horse-riding route is proposed, or an existing walking, cycling or horse-riding route is to be improved within the highway boundary.
Desirable minimum	Design parameters that apply where the conditions for use of absolute minimum value criteria are not applicable.
Headroom	The distance above the surface of a walking, cycling or horse-riding route that is generally free from obstructions to allow the safe passage of users. NOTE: Headroom for subways is separate from the general headroom space.
Separation	The distance between a walking, cycling or horse-riding route and the carriageway.
Shared use	A facility used by more than one type of user - for example pedestrians and cyclists or pedestrians, cyclists and equestrians. This includes segregated or unsegregated facilities.
Stopping sight distance	The distance for a cyclist or equestrian to perceive, react and stop safely in adverse conditions, such as on wet asphalt or where the surfacing is loose.

1. Scope

Aspects covered

1.1 This document shall be used for the design of walking, cycling and horse-riding routes on and/or adjacent to the motorway and all-purpose trunk road network.

NOTE 1 CD 195 [Ref 2.N] provides requirements and advice for the design of cycle traffic infrastructure.

NOTE 2 Information on Inclusive Mobility is available in Inclusive Mobility [Ref 3.N].

NOTE 3 Information on tactile surfaces is available in Guidance on the use of Tactile Paving Surfaces PPU 1622RB [Ref 1.I].

1.2 The National Application Annexes (NAAs) shall be used for designing for walking, cycling and shared use.

Implementation

1.3 This document shall be implemented forthwith on all schemes involving walking, cycling or horse-riding facilities on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 4.N].

Use of GG 101

1.4 The requirements contained in GG 101 [Ref 4.N] shall be followed in respect of activities covered by this document.

2. General design principles

2.1 Walking, cycling and horse-riding routes shall be free from unnecessary diversions, frequent obstacles and fragmented facilities.

2.1.1 Where absolute and desirable minimum values are provided within this document, the desirable minimum value should be used unless an existing physical constraint prevents the use of this.

2.1.2 Walking, cycling and horse-riding routes should be designed to achieve the best balance of the five core design principles in Table 2.1.2.

Table 2.1.2 Core design principles for walking, cycling and horse-riding

Coherence	Link trip origins and destinations, including public transport access points. Routes are continuous and easy to navigate.
Directness	Serve all the main destinations and seek to offer an advantage in terms of distance and journey time.
Comfort	Infrastructure meets design standards and caters for all types of user, including children and disabled persons.
Attractiveness	Aesthetics, noise reduction and integration with surrounding areas are important.
Safety	Dedicated networks and facilities not only improve pedestrian, cyclist and equestrian safety, but also their feeling of how safe the environment is. This includes access to adjacent areas, sightlines, fencing, lighting, landscaping and surveillance. It also includes avoiding opportunities for assailants to conceal themselves.

3. Walking routes

3.1 NAAs shall be used for the design of routes and facilities for walking.

4. Cycling routes

4.1 NAAs shall be used for the design of routes and facilities for cycling.

5. Horse-riding routes

General

5.1 Horse-riding routes shall be designed to minimise the need for equestrians to lead horses.

NOTE *Horses can be better controlled when ridden rather than led.*

Design speed

5.2 Design speeds for horse-riding routes shall be in accordance with Table 5.2.

Table 5.2 Design speeds for horse-riding routes

Horse-riding activity	Design speed	Example situations
Trot/canter	20 kph	Remote from carriageway (for ≥ 50.0 metres length)
Walk	10 kph	Adjacent to carriageway; On approach to crossing; Remote from carriageway (for < 50.0 metres length)

NOTE *Remote from the carriageway means the road is either:*

1) generally not visible due to screening or planting; or

2) visible, but more than 6.0 metres from the horse-riding route.

Visibility

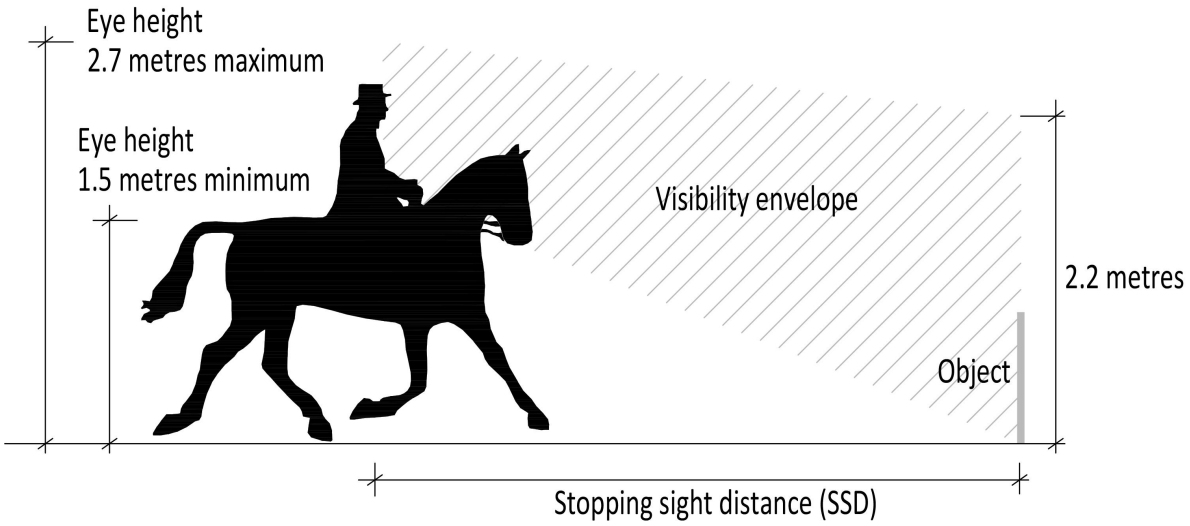
5.3 Stopping sight distance (SSD) for equestrians shall be in accordance with Table 5.3.

Table 5.3 SSD for equestrians

Design speed	SSD
20 kph	30.0 metres
10 kph	10.0 metres

5.4 For equestrians, the forward visibility envelope shall allow for objects between the ground and a height of 2.2 metres to be visible from a rider's eye height of 1.5 metres to 2.7 metres, in accordance with Figure 5.4.

Figure 5.4 Forward visibility envelope for equestrians



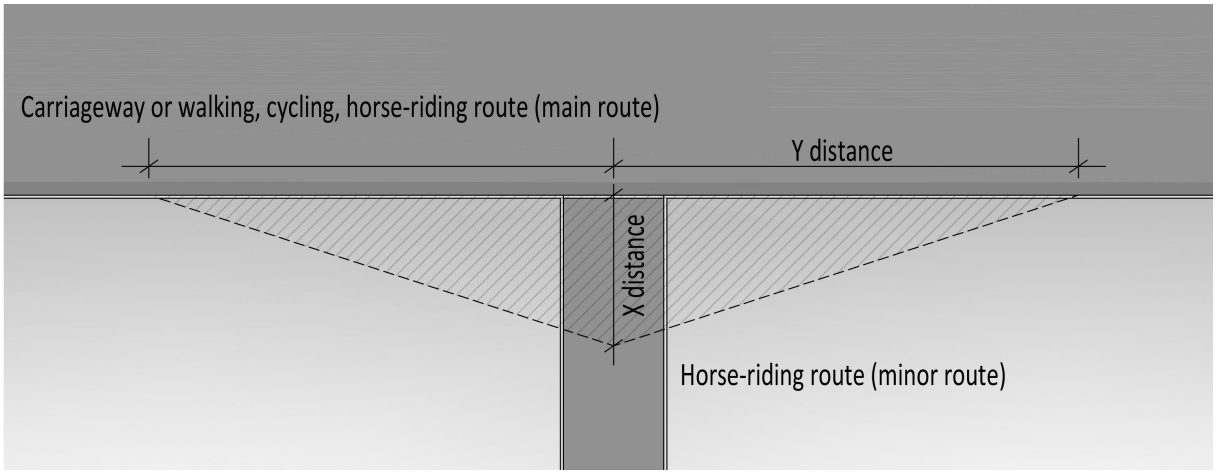
NOTE *The object height is taken as a range so that equestrians can observe deformations, holes and objects which could interfere with the horse's progress.*

Visibility at junctions and crossings

5.5 Visibility splays shall be provided for horse-riding routes at junctions and crossings where equestrians have to stop or give way.

NOTE *Figure 5.5N provides a diagram of visibility splay "x" and "y" distances for horse-riding routes.*

Figure 5.5N Visibility splay "x" and "y" distances for horse-riding routes



5.6 "Y" distances shall be measured from an eye height of 1.5 metres to 2.7 metres for equestrians.

5.7 When measuring "y" distances at junctions or crossings, the object height shall be taken as 0.26 metres to 2.0 metres.

5.8 Visibility splay "x" distances for equestrians at junctions and crossing points with mainline carriageways shall be provided in accordance with Table 5.8.

Table 5.8 Visibility "x" distance requirements for equestrians at junctions and crossings

Desirable minimum	Absolute minimum
5.0 metres	3.0 metres

5.9 Visibility splay "y" distance for equestrians at junctions and crossing points with mainline carriageways shall be provided in accordance with Table 5.9.

Table 5.9 Visibility splay "y" distance requirements for equestrians at junctions and crossings with mainline carriageways

85th percentile approach speed on mainline carriageway	"Y" distance
40 kph	135.0 metres
50 kph	168.0 metres
60 kph	211.0 metres
85 kph	270.0 metres
100 kph	345.0 metres

5.10 Visibility splay "y" distances for equestrians at junctions and crossing points with horse-riding routes shall be in accordance with the SSD values for equestrians as provided in Table 5.3.

5.11 For visibility splay "y" distances for equestrians at junctions and crossing points, CD 195 [Ref 2.N] shall be used.

Gradient

5.12 The maximum longitudinal gradient on a horse-riding route, where cycling is prohibited, shall be 20%.

NOTE *Where cycling is permitted on a horse-riding route the maximum gradient is defined by the cycling requirements.*

5.12.1 Longitudinal gradients on horse-riding routes should be kept to a minimum.

5.12.2 Steps may be used to reduce the overall longitudinal gradient on horse-riding routes.

5.13 Where steps are used on horse-riding routes, these shall be 0.15 metres in height and 2.8 metres in length.

5.14 Where steps are used on horse-riding routes, these shall consist of a maximum longitudinal gradient of 10% on each step.

Crossfall

5.15 On horse-riding routes, the crossfall values for footways in Inclusive Mobility [Ref 3.N] shall be used.

5.15.1 Adverse crossfall on bends should be avoided on horse-riding routes.

Cross-sections

5.16 Surfaced widths for horse-riding routes shall be in accordance with Table 5.16.

Table 5.16 Surfaced widths for horse-riding routes

Minimum 2-way width (where horses are expected to pass each other)	3.0 metres
Minimum single file width	2.0 metres

5.16.1 Horse-riding routes where single file use is unavoidable should be signed accordingly.

5.16.2 Sudden changes in widths on horse-riding routes should be avoided except at gates.

5.16.3 Where changes in widths are necessary on horse-riding routes, tapers of no sharper than 1:7 should be used.

5.16.4 Locations to turn a horse around on a horse-riding route should be available at intervals of no more than 1km.

5.16.5 The surfaced width of the horse-riding route at horse turning points should be a minimum of 3.0 metres.

5.16.6 On horse-riding routes or horse-riding routes shared with pedestrians and/or cyclists, the separation from the carriageway should be a minimum of 1.8 metres.

NOTE *Where a hard strip is provided on the carriageway, it can be considered as part of the separation distance for horse-riding routes.*

5.16.7 Where visual screening is provided between the horse-riding route and the carriageway, gaps should be avoided as the sight and sound of vehicles can unnerve horses.

Access controls

5.17 Where bridle gates are used on horse-riding routes, a minimum width of 1.525 metres between posts shall be provided.

5.17.1 There should be a surfaced width of 3.0 metres on either side of a bridle gate for a distance of 5.0 metres.

NOTE *A surfaced width of 3.0 metres either side of a bridle gate allows an equestrian to turn 90 degrees after passing through the gate to be able to close it from horseback.*

5.17.2 Fencing for 1.5 metres each side of a bridle gate should be free of barbed wire and overhanging trees.

Headroom on horse-riding routes

5.18 Except for momentary obstructions, headroom for horse-riding routes where horses are ridden shall be a minimum of 3.4 metres.

5.19 Where momentary obstructions are present on a horse-riding route, the minimum headroom shall be 2.8 metres at the momentary obstruction.

NOTE 1 *Momentary obstructions can include overhanging trees and signs.*

NOTE 2 *For headroom requirements at subways see equestrian crossings.*

5.19.1 If horses are led rather than ridden, 2.8 metres headroom on horse-riding routes may be used over longer distances than for momentary obstructions, such as below bridges.

5.19.2 Where horses are to be led on horse-riding routes, mounting blocks should be provided on either side of the area where horses are to be led together with signs advising equestrians to dismount.

Equestrian crossings

5.20 Where there is a parking demand, physical measures to prevent parking at equestrian crossings shall be included in the scheme design.

5.20.1 Protective posts may be provided to prevent parking at horse-riding routes that are crossed by vehicular accesses to the carriageway.

5.21 Where overbridges are proposed for equestrian use, CD 353 [Ref 1.N] shall be used on the approach to the bridge for cross-sections, fences and infill panels.

NOTE *Underpasses are preferred to overbridges by equestrians for grade-separated crossings.*

5.22 Stand-alone signal controlled crossings for equestrians shall not be provided where the 85th percentile speed exceeds 50mph.

NOTE *Information on calculating 85th percentile speeds is available in CA 185 [Ref 7.N].*

5.23 At-grade equestrian crossings shall not be provided on:

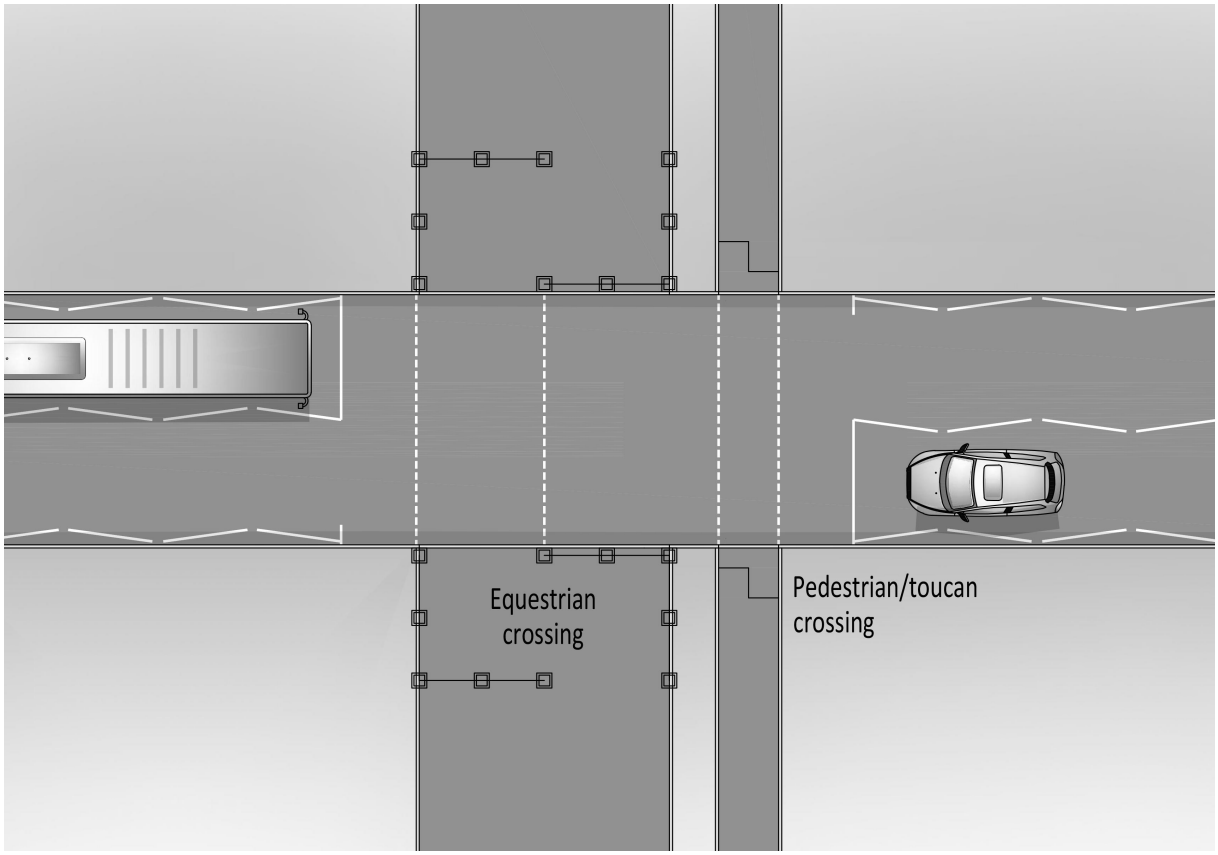
1) roads with a 120 kph design speed;
2) wide single carriageways;
3) wide single 2+1 roads; and
4) single carriageways with climbing lanes.

5.23.1 Signal controlled equestrian crossings should not be combined with a pedestrian and/or cyclist crossing in order to avoid potential conflict.

NOTE 1 *Signal controlled equestrian crossings can be installed parallel to pedestrian and/or cyclist crossings.*

NOTE 2 *A drawing of a typical signal controlled equestrian crossing parallel to a pedestrian and/or cyclist crossing is shown in Figure 5.23.1N2.*

Figure 5.23.1N2 Indicative signal controlled equestrian crossing parallel to a pedestrian and/or cyclist crossing



5.23.2 At equestrian crossing points, a 10.0 metres wide band of high friction surfacing should be provided across the carriageway to prevent horses from slipping.

5.23.3 Where high friction surfacing is used, this should be of the same colour as the carriageway.

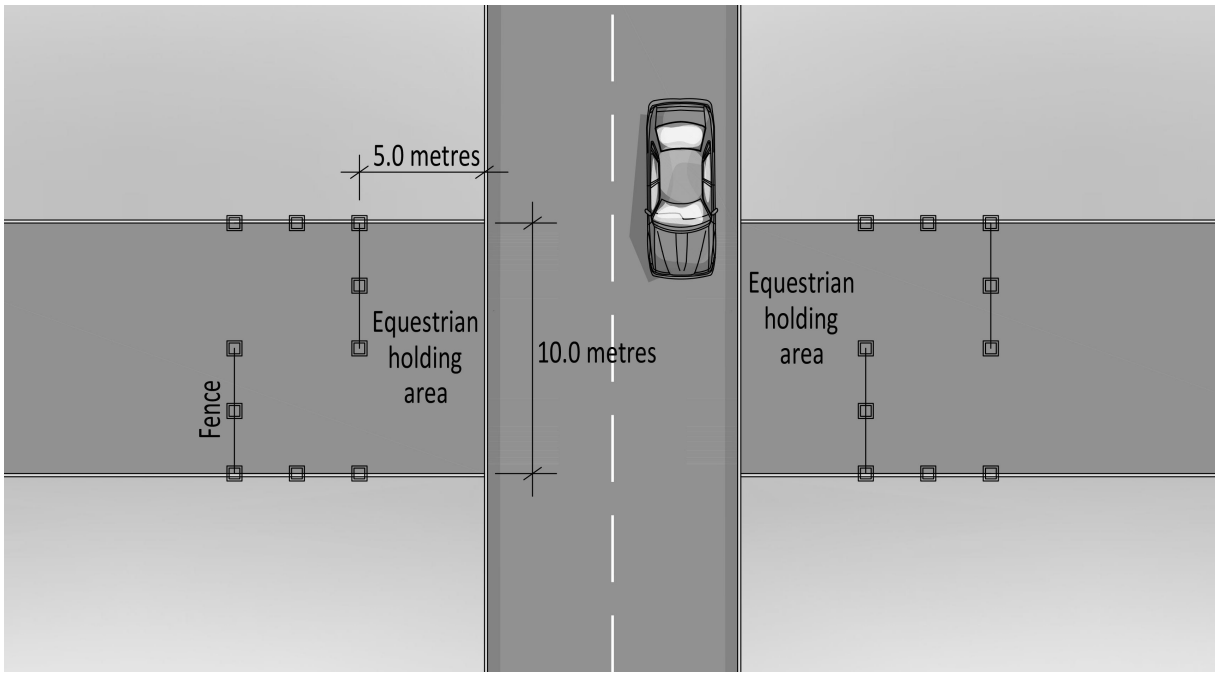
5.24 Where at-grade equestrian crossings are provided, a fenced, grassed holding area of 10.0 metres wide by 5.0 metres long shall be provided in the verge.

NOTE 1 When crossing the carriageway at-grade, a holding area can be beneficial as a horse can be startled or become impatient waiting for long periods.

NOTE 2 Staggered approaches to at-grade crossings can be beneficial to prevent equestrians from moving straight across the road without checking for oncoming traffic.

NOTE 3 A drawing of a typical equestrian at-grade crossing holding area is shown in Figure 5.24N3.

Figure 5.24N3 Equestrian at-grade crossing holding area



5.24.1 Facilities associated with horse-riding routes i.e. bridle gates and/or horse stiles should be a minimum of 4.0 metres from the edge of the carriageway.

5.25 Where an at-grade equestrian crossing is provided on a dual carriageway, a holding area of 5.0 metres wide by 3.0 metres long shall be provided in the central reserve.

5.25.1 At-grade equestrian crossings should only be provided on dual carriageways where alternative crossings are not possible.

Subways on horse-riding routes

5.26 Where horse-riding routes are to be incorporated into subways, provision shall be in accordance with Table 5.26.

Table 5.26 Minimum dimensions for subways incorporating horse-riding routes

Minimum headroom (ridden)	Minimum headroom (led)	Minimum width
3.7 metres	2.7 metres	3.0 metres

5.26.1 A dismount sign and mounting blocks should be provided for equestrians where the headroom is less than 3.7 metres.

Lighting

5.27 For lighting of horse-riding routes within the highway extents, TD 501 [Ref 5.N] shall be used.

5.27.1 Horse-riding routes should not be lit where they are adjacent to an unlit highway.

5.27.2 Horse-riding routes in urban areas should be lit.

5.27.3 Horse-riding routes away from the highway extents in rural areas should not be lit unless high user flows are expected.

5.27.4 Any lighting columns or lit bollards should be sited a minimum of 0.5 metres back from the edge of horse-riding routes.

Drainage

5.28 For drainage of horse-riding routes within the highway extents CG 502 [Ref 6.N] shall be used.

5.28.1 Filter drains and french drains within the verge should be avoided on horse-riding or shared use routes because of the difficulty they cause to horses.

NOTE Drainage grates and utility covers can cause slipping problems for horses.

Surfacing

5.29 Surfacing for horse-riding routes shall be in accordance with Table 5.29.

Table 5.29 Surface options for horse-riding routes

Surface material	Adequacy scale	Construction details
Hot rolled asphalt surface course	3	25mm hot rolled asphalt wearing course (6mm aggregate size) on 60mm bituminous macadam base course on 150mm thick type 1 sub-base
Bituminous macadam surface course	2	25mm dense bitumen macadam wearing course on 60mm bituminous macadam base course on 150mm thick type 1 sub-base
Surface dressing on stone base or bitumen	2	Single coat gravel 3-6mm size 50mm dense bituminous macadam of 20mm aggregate size on 100-150mm type 1 granular material
Clay pavers	3	65mm thick on sand on 150mm type 1 sub-base
Concrete block flags	3	65mm thick blocks on 30mm sharp sand bed and 150mm type 1 sub-base
In situ concrete	2	40mm granolithic concrete on 75mm concrete on 150mm type 1 sub-base, surface to be textured to provide satisfactory skid resistance
Naturally binding stones and gravels	2	20mm depth limestone/hoggin (3mm dust) or other such as 50mm depth Breedon gravel (6mm dust) or 75mm depth Coxwell Gravel (30mm fines)
Sand	1	75mm sand on 150mm free draining layer
Wood chips	1	Chips laid to a compacted thickness of 225mm on free draining surface layer
Grassed gravel	1	150mm surface course of aggregate mixed with 25% topsoil on 150mm aggregate on geotextile sub-base
Reinforced turf	1	Rubber bonded fibre/grit sand laid on turf
Scalping/ballast with quarry waste	2/3	Maximum 40mm size with a high content of quarry waste laid (well compacted) on 150mm type 1 sub-base
Industrial waste products	1/2	100mm wearing course/150mm base course graded fuel ash/pulverised fuel ash/colliery shale/red shale
Road planings	2	Screened recycled road planings

NOTE 1 The surfacing adequacy scale is as follows:

1) 1 - excellent;

2) 2 - good; and

3) 3 - reasonable.

NOTE 2 Short grass or wood chip surfaces used for horse-riding routes lend themselves to a fast trot/canter by horses whereas macadam surfaces are only suitable for walking or a slow trot.

NOTE 3 Scalpings vary in quality and some can not be suitable for use on horse-riding routes.

5.30 Where unbound horse-riding route surfaces are provided, these shall include an edge restraint.

6. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. CD 353, 'Design criteria for footbridges'
Ref 2.N	Highways England. CD 195, 'Designing for cycle traffic'
Ref 3.N	Department for Transport (UK Gov). Inclusive Mobility, 'Inclusive Mobility'
Ref 4.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 5.N	Highways England. TD 501, 'Road lighting'
Ref 6.N	Highways England. CG 502, 'The certification of drainage design'
Ref 7.N	Highways England. CA 185, 'Vehicle speed measurement'

7. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	DETR - Dept of the Environment, Transport & Regions. PPU 1622RB, 'Guidance on the use of Tactile Paving Surfaces'

Road Layout
Design

CD 143
England National Application Annex to CD 143 Designing for walking, cycling and horse-riding

(formerly TA 90/05, TA 91/05, TA 68/96, TD 36/93)

Revision 1

Summary
This National Application Annex contains the Highways England specific requirements for designing for walking, cycling and horse-riding.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
1	Mar 2020	Revision 1 (March 2020) Update to references only. Revision 0 (November 2019) Highways England National Application Annex to CD 143.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes TA 90/05, TA 91/05, TA 68/96 and TD 36/93, which are withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex gives the Highways England specific requirements and advice for the design of walking, cycling and shared use facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 6.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
N/A	Not applicable

Terms and definitions

Terms and definitions

Term	Definition
Segregated facility	A shared use facility where the sections of the paved area allocated to different user groups are segregated from one another by a white line or physical feature.
Unsegregated facility	A shared use facility without segregation features.

E/1. Walking routes

Geometry

E/1.1 For crossfall and gradients on walking routes Inclusive Mobility [Ref 5.N] shall be used.

E/1.1.1 Adverse crossfall on bends should be avoided on walking routes.

Cross-sections

E/1.2 Widths for walking routes shall be in accordance with Table E/1.2.

Table E/1.2 Widths for walking routes

	No vertical features present either side	Vertical feature on one side and < 1.2 metres height	Vertical feature on one side and ≥ 1.2 metres height	Vertical features on both sides (distance per side)
Desirable minimum width	2.6 metres	+ 0.25 metres	+ 0.5 metres	0.25 metres for < 1.2 metres height 0.5 metres for ≥ 1.2 metres height
Absolute minimum width	2.0 metres			

NOTE *Walking routes include footways and footpaths.*

E/1.2.1 On walking routes, the separation from the carriageway should be at least 1.5 metres or 0.5 metres on roads with speed limits of 40 mph or less.

NOTE *Where a hard strip is provided on the carriageway, it can be considered as part of the separation distance for walking routes.*

Headroom on walking routes

E/1.3 Headroom for walking routes where obstructions are present shall be in accordance with Table E/1.3.

Table E/1.3 Headroom on walking routes

Length of obstruction	Headroom
Longer than 23.0 metres in length	2.6 metres
Up to and including 23.0 metres in length	2.3 metres

NOTE 1 *Table E/1.3 applies to general headroom such as clearance from overgrowth and other obstructions along a walking route.*

NOTE 2 *For headroom requirements at subways, see crossings.*

E/2. Cycling routes

E/2.1 CD 195 [Ref 2.N] shall be used for the design of cycle traffic only routes.

E/3. Shared use routes

Design speed

E/3.1 The design speed for routes shared by pedestrians, cyclists and equestrians shall be in accordance with Table E/3.1.

Table E/3.1 Design speeds for routes shared by pedestrians, cyclists and equestrians

User type	Primary user type	Design speed
Pedestrians/cyclists	Cyclists	30kph
Pedestrians/equestrians	Equestrians	Table 5.3 of CD 143 [Ref 3.N]
Cyclists/equestrians	Cyclists	30kph
Pedestrians/cyclists/equestrians	Cyclists	30kph

Alignment

E/3.2 The alignment of shared use routes shall allow for all potential users of the route.

E/3.2.1 Changes in horizontal alignment on shared use routes should be designed with simple horizontal curves rather than straight sections with occasional sharp curves.

NOTE *Sharp curves can reduce the available intervisibility between users; potentially leading to collisions.*

Crossfall

E/3.3 For crossfall on shared use routes, the crossfall values for footways in Inclusive Mobility [Ref 5.N] shall be used.

E/3.3.1 Adverse crossfall on bends should be avoided on shared use routes.

Cross-sections

E/3.4 Widths of segregated shared use routes shall be in accordance with Table E/3.4.

Table E/3.4 Widths of segregated shared use routes

	Routes segregated by a line or physical feature
Desirable minimum width	5.0 metres (3.0 metres cycling route and 2.0 metres walking route)
Absolute minimum width	3.0 metres (1.5 metres either side)

E/3.5 Widths of unsegregated shared use routes shall be a minimum of:

1) 3.0 metres where there are 200 users an hour or more; or
2) 2.0 metres where there are less than 200 users per hour.

E/3.5.1 On segregated and unsegregated shared use routes for pedestrians and cyclists, the separation from the carriageway should be a minimum of:

1) 1.5 metres on roads with a speed limit greater than 40mph; or
2) 0.5 metres on roads with speed limits of 40mph or less.

NOTE *Where a hard strip is provided on the carriageway, it can be considered as part of the separation distance for shared use routes.*

E/3.5.2 Where segregated and unsegregated shared use routes includes a horse-riding route, the separation from the carriageway should be at least 1.8 metres.

NOTE *Where a hard strip is provided on the carriageway, it can be considered as part of the separation distance for shared use routes.*

E/3.6 For cross-sections of walking, cycling and horse-riding routes on bridges, CD 353 [Ref 1.N] shall be used.

Headroom

E/3.7 The determining user type for headroom on shared use routes shall be in accordance with Table E/3.7.

Table E/3.7 Headroom by user type on shared use routes

Route type	Determining user type
Walking/cycling	Cyclists
Walking/horse-riding	Equestrians
Cycling/horse-riding	Equestrians
Walking, cycling and horse-riding	Equestrians

NOTE 1 *Headroom requirements for cyclists can be found in CD 195 [Ref 2.N].*

NOTE 2 *Headroom requirements for equestrians can be found in Section 5 of CD 143 [Ref 3.N].*

E/3.8 For headroom of walking, cycling and horse-riding enclosed overbridges, CD 353 [Ref 1.N] shall be used.

E/4. Crossings

Common elements

E/4.1 Uncontrolled crossings shall not be provided where slip road traffic joins or leaves the network in free flow conditions.

E/4.2 Where there is a parking demand, physical measures to prevent parking at pedestrian and cyclist crossings shall be included in the scheme design.

E/4.2.1 Protective posts may be provided to prevent parking at walking and cycling routes that are crossed by vehicular accesses to the carriageway.

E/4.2.2 Reflective material should be provided near the top of protective posts to help cyclists identify physical parking prevention measures during night time.

E/4.2.3 A yellow or white non-reflectorised band may be provided near the top of protective posts to help partially sighted pedestrians to see the posts.

Pedestrian crossings

E/4.3 For the assessment and design of pedestrian crossings LTN 1/95 [Ref 7.N] and LTN 2/95 [Ref 8.N] shall be used.

E/4.4 Stand-alone signal controlled crossings for pedestrians and cyclists shall not be provided where the 85th percentile speed exceeds 50mph.

E/4.5 Dropped kerbs shall be provided at pedestrian crossings.

Refuge islands

E/4.6 Refuge islands shall not be provided where the speed limit is greater than 40 mph except where the refuge island is incorporated into a single lane dualling design.

E/4.7 Table E/4.7 shall be used to determine the depth of pedestrian and shared use refuge islands, measured in the direction of travel of the pedestrian or cyclist.

Table E/4.7 Depth of pedestrian and shared use refuge islands

User type	Desirable minimum depth	Absolute minimum depth
Pedestrians	2.0 metres	1.5 metres
Shared use	3.0 metres	2.5 metres

E/4.7.1 The width of the pedestrian or shared use refuge island should not be less than the width of the connecting facility or less than 2.0 metres.

E/4.8 Dropped kerbs shall be provided at refuge islands.

E/4.8.1 Tactile surfaces should be provided at the dropped kerb approaches to pedestrian and shared use refuge islands and within the refuge island.

NOTE *Further information on tactile surfaces is available in Guidance on the use of Tactile Paving Surfaces PPU 1622RB [Ref 1.I].*

Subways

E/4.9 Cross-sections and headroom of pedestrian subways shall be provided in accordance with Table E/4.9.

Table E/4.9 Minimum pedestrian subway dimensions

Type of subway	Length of subway	Height	Width
Wide	N/A	2.6 metres	5.0 metres
Normal	< 23.0 metres	2.3 metres	3.0 metres
	≥ 23.0 metres	2.6 metres	3.3 metres
Narrow	N/A	2.3 metres	2.3 metres

NOTE 1 *Wide subways are where a subway forms an extension to a footway system carrying a large number of pedestrians.*

NOTE 2 *Normal subways are suitable for the majority of situations.*

NOTE 3 *Narrow subways are for small numbers of pedestrians where normal subways cannot be justified on cost grounds.*

E/4.9.1 The longitudinal gradient of the subway should be no less than 0.7% to allow for drainage.

E/4.9.2 In subways forward visibility of 4.0 metres or more should be provided at corners and changes of direction for pedestrians.

NOTE *For the purposes of determining visibility provision at corners and changes of direction in subways, pedestrians can be assumed to be 0.4 metres away from an adjacent vertical wall.*

E/4.9.3 In subways the forward visibility envelope should extend from a height of 1.5 metres (representative of an adult) to 0.6 metres (for a child).

NOTE *Inside corners rounded off to a radius of 4.6 metres meet the forward visibility criteria in subways.*

E/4.9.4 Access ramps or stairs should be the same width as the subway.

E/4.9.5 On stairs and ramps at subways, handrails should be provided:

1) on both sides of the stairs and ramps, at a distance of 45 mm from the wall;
2) with a central handrail where the width of stairs or ramps exceeds 3.0 metres;
3) at a height of 1.0 metre above the level surface;
4) at a height of 0.9 metres above a ramp;
5) at a height of 0.85 metres above the nose of a step;
6) with a handrail cross section of between 45 mm and 55 mm in diameter.

E/4.9.6 On stairs and ramps at subways, landings should be provided:

1) at changes in direction and changes in gradient;
2) at intervals where the total rise is no greater than 3.5 metres (even on straight ramps);
3) which are the same width as the ramp or stairs;
4) a minimum of 2.0 metres long, measured along the centre line of the landing;
5) that are horizontal;
6) that are adequately drained.

E/4.9.7 Pedestrian ramps and stairs should both be provided for access to pedestrian subways.

E/4.9.8 Ramps should have a maximum gradient of 5%, or a maximum gradient of 10% for short distances only where significant constraints exist.

E/4.10 Table E/4.10a and Table E/4.10b shall be used for dimensions for straight and helical stairs.

Table E/4.10a Dimensions for straight stairs

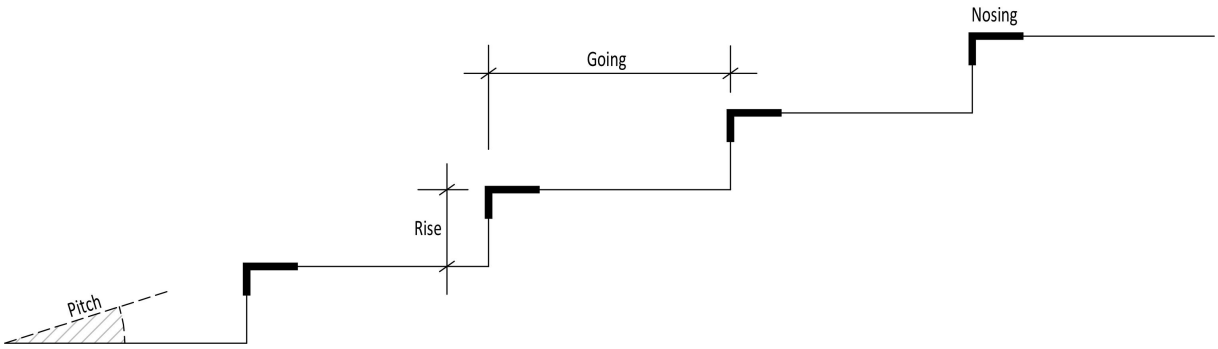
Rise			Going			Pitch	
Minimum	Maximum	Optimum	Minimum	Maximum	Optimum	Maximum	Optimum
100 mm	150 mm	130 mm	280 mm	350 mm	300 mm	33 degrees	27 degrees

Table E/4.10b Dimensions for helical stairs

Rise (r)	Going (g)			2r + g	
	Minimum inner going	Centre going	Maximum outer going	Minimum	Maximum
150-190 mm	150 mm	250 mm	450 mm	480 mm	800 mm

NOTE *Figure E/4.10N provides a diagram of stair elements.*

Figure E/4.10N Stair elements



E/4.10.1 The following criteria should be applied to straight and helical stairs:

1) headroom between any ceiling and stair measured vertically to be no less than the height of the subway;
2) stair flights to comprise no more than 20 steps between landings, or 9 steps where dedicated facilities other than steps are not provided;
3) landings to be the same width as the stair;
4) landing depth to be 1.8 metres deep;
5) not be more than 3 successive flights of stairs without a change of direction of 30 degrees or more at a landing;
6) all landings to be horizontal;
7) all landings to be adequately drained;
8) stair pitch to be uniform with steps of equal rise;
9) nosings on the stairs to be rounded to a 6 mm radius without overhang;
10) nosings on the stairs to be colour contrasted from the rest of the step.

E/4.10.2 For helical stairs central structural columns should be slender to avoid places of concealment.

Shared use pedestrian and cyclist facilities in subways

E/4.11 In subways, unsegregated pedestrian and cyclist provision shall be provided in accordance with Table E/4.11.

Table E/4.11 Minimum dimensions for unsegregated subways for pedestrians and cyclists

Subway length	Height	Width	
		Desirable minimum	Absolute minimum
< 23.0 metres	2.4 metres	4.0 metres	3.0 metres
≥ 23.0 metres	2.7 metres	4.0 metres	3.0 metres

E/4.12 In subways, segregated pedestrian and cyclist provision shall be provided in accordance with Table E/4.12.

Table E/4.12 Minimum dimensions for segregated subways for pedestrians and cyclists

Subway length	Height		Width		Additional width
	Cycling route	Walking route	Cycling route	Walking route	Between subway wall and cycling side of route
< 23.0 metres	2.4 metres	2.3 metres	2.5 metres	2.0 metres	0.5 metres
≥ 23.0 metres	2.7 metres	2.6 metres	2.5 metres	2.0 metres	0.5 metres

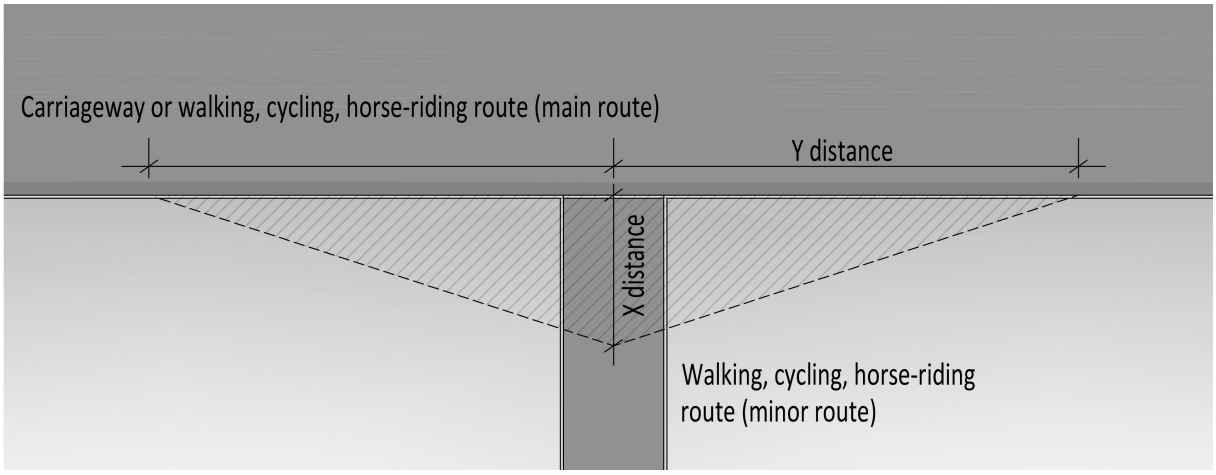
E/4.13 For gradients on bridges of shared use routes, CD 353 [Ref 1.N] shall be used.

E/5. Visibility at junctions and crossings

E/5.1 Visibility splays shall be provided for routes at junctions and crossings used by pedestrians, cyclists (on shared use facilities only) and equestrians where these users have to stop or give way.

NOTE *Figure E/5.1N provides a diagram of visibility splay "x" and "y" distances for walking, cycling and horse-riding routes.*

Figure E/5.1N Visibility splay 'x' and 'y' distances for walking, cycling and horse-riding routes



E/5.2 Visibility splay "x" distances for pedestrians, cyclists (on shared use facilities only) and equestrians at junctions and crossing points shall be provided in accordance with Table E/5.2.

Table E/5.2 Visibility "x" distance requirements at junctions

	Desirable minimum	**Absolute minimum**
Pedestrian	2.0 metres	1.5 metres
Shared use (pedestrians and cyclists)	4.0 metres	2.5 metres
Equestrians	5.0 metres	3.0 metres

NOTE *For cyclists at shared use crossings and junctions, the desirable minimum "x" distance equates approximately to the length of two cycles.*

E/5.3 Visibility splay "y" distance for pedestrians and cyclists (on shared use facilities only) at junctions and crossing points shall be provided in accordance with Table E/5.3.

Table E/5.3 Visibility "y" distance requirements at junctions

Minor route	**Design speed on mainline**	**Main route**			
		Mainline carriageway	**Cycle track**	**Shared use route**	**Horse-riding route**
Pedestrian-/cyclist	All	CD 123 [Ref 4.N]	CD 195 [Ref 2.N]	Table E/3.1	Table 5.3 of CD 143

NOTE *Requirements for "y" distances on shared use routes with equestrians can be found in Table 5.9 of CD 143.*

E/5.4 "Y" distances shall be measured from an eye height of 0.9 metres to 2.0 metres for pedestrians and 1.0 metre to 2.2 metres for cyclists.

E/5.5 When measuring "y" distances at junctions or crossings, the object height shall be taken as 0.26 metres to 2.0 metres.

E/6. Other design features

Lighting

E/6.1 TD 501 [Ref 9.N] shall be used for the lighting of walking, cycling and horse-riding routes within the highway extents.

E/6.1.1 Walking, cycling and horse-riding routes should not be lit where they are adjacent to an unlit highway.

E/6.1.2 Walking, cycling and horse-riding routes in urban areas should be lit.

E/6.1.3 Walking, cycling and horse-riding routes away from the highway extents in rural areas should not be lit unless:

1) high user flows are expected;
2) routes are expected to be used as school or commuter routes.

E/6.1.4 Any lighting columns or bollards should be sited a minimum of 0.5 metres back from the edge of the walking, cycling and horse-riding routes.

E/6.1.5 Underpasses should be lit where there is a perceived risk to personal security.

Drainage

E/6.2 For drainage of walking cycling and horse-riding routes within the highway extents CG 502 [Ref 10.N] shall be used.

E/6.2.1 Filter drains and french drains within the verge should be avoided on shared use routes because of the difficulty they cause to horses.

Surfacing

E/6.3 Surfacing for walking and cycling routes shall be in accordance with Table E/6.3.

Table E/6.3 Surface options for walking and cycling routes

Surface material	Adequacy scale		Construction details
	Walking route	Cycling route	
Hot rolled asphalt surface course	1	1	25mm hot rolled asphalt wearing course (6mm aggregate size) on 60mm bituminous macadam base course on 150mm thick type 1 sub-base
Bituminous macadam surface course	1	1	25mm dense bitumen macadam wearing course on 60mm bituminous macadam base course on 150mm thick type 1 sub-base
Surface dressing on stone base or bitumen	1	1	Single coat gravel 3-6mm size 50mm dense bituminous macadam of 20mm aggregate size on 100-150mm type 1 granular material
Clay pavers	4	3	65mm thick on sand on 150mm type 1 sub-base
Concrete block flags	1	1	65mm thick blocks on 30mm sharp sand bed and 150mm type 1 sub-base
In situ concrete	1	2	40mm granolithic concrete on 75mm concrete on 150mm type 1 sub-base, surface to be textured to provide satisfactory skid resistance
Naturally binding stones and gravels	2	2	20mm depth limestone/hoggin (3mm dust) or other such as 50mm depth Breedon gravel (6m m dust) or 75mm depth Coxwell Gravel (30mm fines)
Sand	3	4	75mm sand on 150mm free draining layer
Wood chips	2	4	Chips laid to a compacted thickness of 225mm on free draining surface layer
Grassed gravel	1	3	150mm surface course of aggregate mixed with 25% topsoil on 150mm aggregate on geotextile sub-base
Reinforced turf	2	3	Rubber bonded fibre/grit sand laid on turf
Scalping/ballast with quarry waste	2	2	Maximum 40mm size with a high content of quarry waste laid (well compacted) on 150mm type 1 sub-base
Industrial waste products	2	3	100mm wearing course/150mm base course graded fuel ash/pulverised fuel ash/colliery shale/red shale
Road planings	1	1	Screened recycled road plannings

NOTE 1 The surfacing adequacy scale is as follows:

1) 1 - excellent;

2) 2 - good;

3) 3 - reasonable; and

4) 4 - inadequate.

NOTE 2 *Longitudinal and transverse surface defects on walking and cycling routes can result in trip hazards for pedestrians and loss of control for cyclists.*

NOTE 3 *Surfacing requirements for horse-riding routes can be found in Section 5 of CD 143.*

E/6.4 Where unbound walking or shared use route surfaces are provided, these shall include an edge restraint.

E/7. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. CD 353, 'Design criteria for footbridges'
Ref 2.N	Highways England. CD 195, 'Designing for cycle traffic'
Ref 3.N	Highways England. CD 143, 'Designing for walking, cycling and horse riding (vulnerable users)'
Ref 4.N	Highways England. CD 123, 'Geometric design of at-grade priority and signal-controlled junctions'
Ref 5.N	Department for Transport (UK Gov). Inclusive Mobility, 'Inclusive Mobility'
Ref 6.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 7.N	The Stationery Office. LTN 1/95, 'Local Transport Note 1/95 - The assessment of pedestrian crossings'
Ref 8.N	The Stationery Office. LTN 2/95, 'Local Transport Note 2/95 - The assessment of pedestrian crossings'
Ref 9.N	Highways England. TD 501, 'Road lighting'
Ref 10.N	Highways England. CG 502, 'The certification of drainage design'

E/8. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	DETR - Dept of the Environment, Transport & Regions. PPU 1622RB, 'Guidance on the use of Tactile Paving Surfaces'

Department for Infrastructure
An Roinn Bonneagair

Road Layout
Design

CD 143
Northern Ireland National Application Annex to CD 143 Designing for walking, cycling and horse-riding

(formerly TA 90/05, TA 91/05, TA 68/96, TD 36/93)

Revision 0

Summary
This National Application Annex contains the Department for Infrastructure Northern Ireland requirements for designing for walking, cycling and horse-riding.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: dcu@infrastructure-ni.gov.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Nov 2019	Department for Infrastructure Northern Ireland National Application Annex to CD 143.

Foreword

Publishing information

This document is published by Highways England on behalf of the Department for Infrastructure, Northern Ireland.

This document supersedes TA 90/05, TA 91/05, TA 68/96 and TD 36/93, which are withdrawn

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex gives the Department for Infrastructure Northern Ireland specific requirements and advice for the design of walking, cycling and shared use facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

NI/1. Design of walking, cycling and shared use routes and associated facilities

NI/1.1 The Department for Infrastructure Northern Ireland shall be contacted regarding the design of routes and facilities for walking, cycling and shared use.

NI/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Design Manual for Roads and Bridges

Road Layout
Design

CD 143
Scotland National Application Annex to CD 143 Designing for walking, cycling and horse-riding

(formerly TA 90/05, TA 91/05, TA 68/96, TD 36/93)

Version 1.0.1

Summary
This National Application Annex contains the Transport Scotland specific requirements for designing for walking, cycling and horse-riding.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

This is a controlled document.

Contents

Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 143	1.0.**1**	March 2021	Scotland NAA	Incremental change to notes and editorial updates

Document was amended in May 2020 to remove duplicate wording where the reference text stated 'roads for all'.

A new revision number was incorrectly not created at this time and no further changes have been made to this document since May 2020.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 143	1	January 2020		
CD 143	0	November 2019		

Foreword

Publishing information

This document is published by Highways England on behalf of Transport Scotland.

This document supersedes TA 90/05, TA 91/05, TA 68/96 and TD 36/93, which are withdrawn

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex gives the Transport Scotland specific requirements and advice for the design of walking, cycling and shared use facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

S/1. Design of walking, cycling and shared use routes and associated facilities

S/1.1 Transport Scotland's Roads for All [Ref 3.N] and Cycling by Design [Ref 1.N] shall be used for the design of routes and facilities for walking, cycling and shared use.

NOTE *Requirements for the assessment of walking, cycling and horse riding routes are addressed in GG 142 [Ref 4.N].*

S/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Transport Scotland. Cycling by Design, 'Cycling by Design'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	Transport Scotland. Roads for All, 'Roads for All - Good Practice Guide for Roads'
Ref 4.N	Highways England. GG 142, 'Walking, cycling and horse-riding assessment and review'

Llywodraeth Cymru
Welsh Government

Road Layout
Design

CD 143
Wales National Application Annex to CD 143 Designing for walking, cycling and horse-riding

(formerly TA 90/05, TA 91/05, TA 68/96, TD 36/93)

Revision 0

Summary
This National Application Annex contains the Welsh Government specific requirements for designing for walking, cycling and horse-riding.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Welsh Government team. The email address for all enquiries and feedback is: Standards_Feedback_and_Enquiries@gov.wales

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Nov 2019	Welsh Government National Application Annex to CD 143.

Foreword

Publishing information

This document is published by Highways England on behalf of Welsh Government.

This document supersedes TA 90/05, TA 91/05, TA 68/96 and TD 36/93, which are withdrawn

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex gives the Welsh Government specific requirements and advice for the design of walking, cycling and shared use facilities on and/or adjacent to the motorway and all-purpose trunk road network.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

W/1. Design of walking, cycling and shared use routes and associated facilities

W/1.1 Active Travel (Wales) Act Design Guidance ATDG (W) [Ref 1.N] shall be used for the design of routes and facilities for walking, cycling and shared use.

W/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Welsh Government. ATDG (W), 'Active Travel (Wales) Act Design Guidance'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Design Manual for Roads and Bridges

General Principles and Scheme Governance
General information

GG 142
Walking, cycling and horse-riding assessment and review

(formerly HD 42/17)

Revision 0

Summary
This document sets out the walking, cycling and horse-riding assessment and review (WCHAR) process for highway schemes on motorways and all-purpose trunk roads.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Nov 2019	GG 142 replaces HD 42/17. This full document has been re-written to make it compliant with the new Highways England drafting rules.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes HD 42/17, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This document sets out the walking, cycling and horse-riding assessment and review (WCHAR) process for highway schemes on motorways and all-purpose trunk roads.

It defines the applicable highway schemes and stages in the highway scheme development process at which walking, cycling and horse-riding assessments and reviews are needed, together with the process requirements.

The purpose of this document is to facilitate the inclusion of all walking, cycling and horse-riding modes in the highway scheme development process from the earliest stage, enabling opportunities for new or improved facilities and their integration with the local and national network(s). This could include the creation and/or improvement of facilities for pedestrians, cyclists and equestrians that are separate from the highway.

WCHAR is intended to provide increased collaboration, interaction and engagement with key stakeholders.

The WCHAR process is not an independent audit of walking, cycling and horse-riding matters related to the highway scheme.

The competencies expected of the Lead Assessor responsible for leading this work are set out in Section 3 of this document.

The process is made up of two distinct parts - the assessment and review.

The aims of carrying out a walking, cycling and horse-riding assessment are:

1) to gain an appropriate understanding of all relevant existing facilities for pedestrians, cyclists and equestrians (users) in the local area;
2) to provide background user information that can be referred to throughout the development of the highway scheme;
3) to identify opportunities for improvement for users.

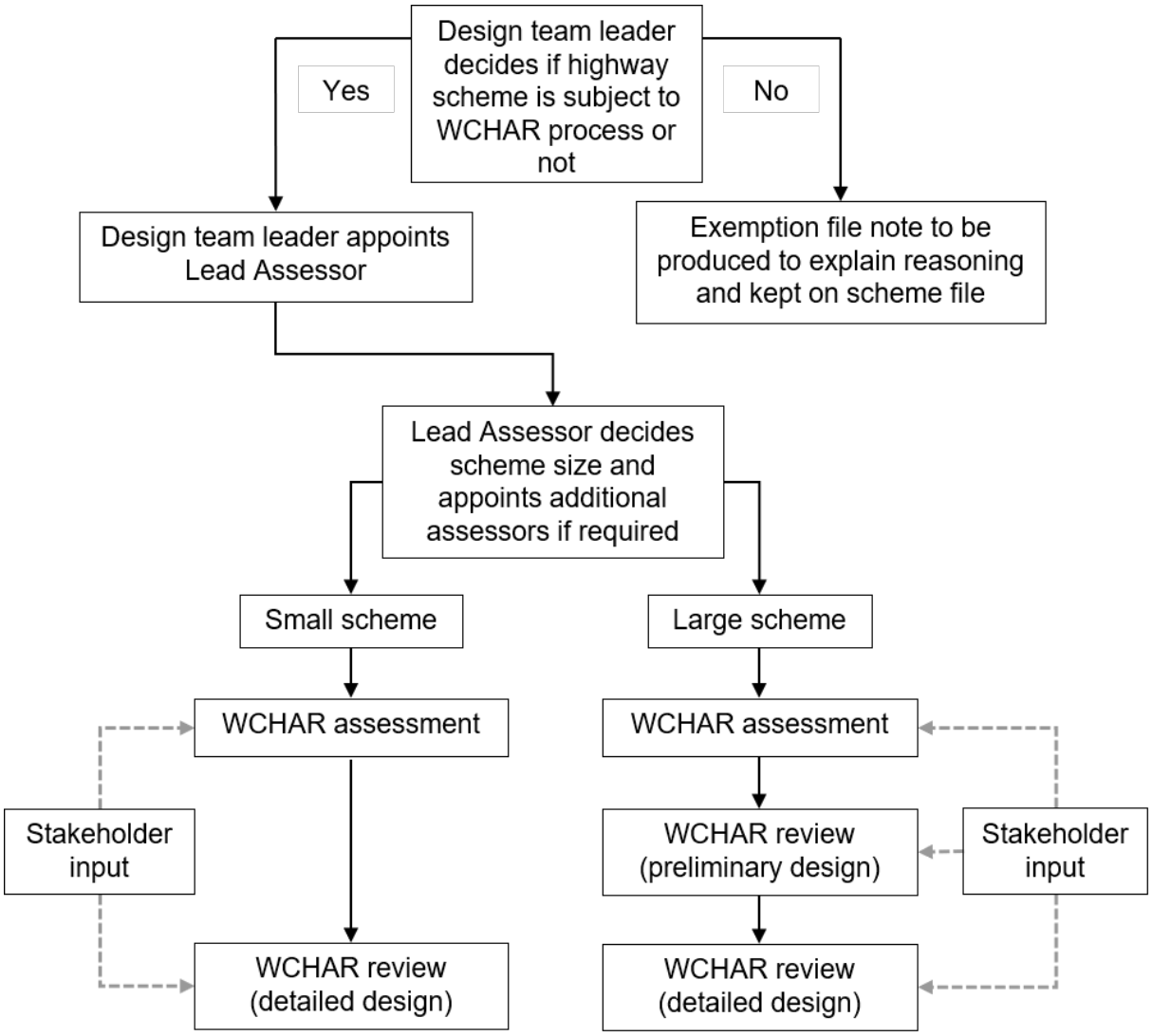
The aims of carrying out a walking, cycling and horse-riding review are:

1) to continually review proposals for pedestrians, cyclists and equestrians throughout the development of the highway scheme design;
2) to review the potential impact of the proposed highway scheme on users in the area and on existing facilities;
3) to identify new opportunities for improvement (or removal of constraints) for users that may arise from the development of the highway scheme that were not evident during the assessment phase.

The process concludes prior to the commencement of construction of a highway scheme.

The WCHAR process is summarised in the WCHAR process summary:

WCHAR process summary



Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 1.N] apply to this document.

Abbreviations

Abbreviations

Abbreviation	Definition
RSA	Road safety audit
WCHAR	Walking, cycling and horse-riding assessment and review

Terms and definitions

Terms and defintions

Term	Definition
Assessment and review team	The team of Lead Assessor and any additional appointed assessors who are responsible for undertaking the assessment and/or review. NOTE: Also referred to as 'assessment team' and 'review team' for appropriate stages of the WCHAR process.
Assessor	A practitioner who is appointed to assist the Lead Assessor. NOTE: More than one assessor can be appointed by the Lead Assessor.
Design team leader	A person within the design organisation responsible for the development of the highway scheme and who performs a role other than Lead Assessor for the same highway scheme. NOTE: The design team leader can be known by other titles in some cases, therefore design team leader is a collective term.
Lead Assessor	An appointed and competent practitioner who is responsible for the completion of the WCHAR process in accordance with this document. The Lead Assessor provides specific advice on the provision for pedestrians, cyclists and equestrians within a highway scheme.
Third party organisation-led highway scheme	A highway scheme that is promoted by a developer or third party organisation that has an impact on the motorway or all-purpose trunk road network.
Walking, cycling and horse-riding assessment	The first part of the WCHAR process. NOTE: Also referred to as 'the assessment' within this document.
Walking, cycling and horse-riding assessment and review	The overall process for the assessment and review of walking, cycling and horse-riding facilities within the highway scheme development process.
Walking, cycling and horse-riding assessment report	The document output of the assessment.
Walking, cycling and horse-riding review	The second and final part of the WCHAR process. NOTE: Also referred to as 'the review(s)' within this document.
Walking, cycling and horse-riding review report	The document output of the review(s).

Terms and defintions (continued)

Term	Definition
Walking, cycling and horse-riding users	Users that include: 1) pedestrians - including mobility impaired and vulnerable pedestrians; 2) cyclists - including mobility impaired and vulnerable cyclists; and 3) equestrians - including mobility impaired and vulnerable equestrians. Other users to be considered as part of this process include (but not limited to): 4) scooter riders (non-motorised); 5) cyclists with electrically assisted pedal cycles (where these conform to Department for Transport or other relevant regional regulations and where they can legally be used); and 6) users of powered wheelchairs (where these conform to Department for Transport regulations and where they can legally be used).
WCHAR study area	An area surrounding a highway scheme that the Lead Assessor has determined as being relevant to the WCHAR process.

1. Scope

Aspects covered

1.1 This document shall be used for all highway schemes on the motorway and all-purpose trunk road network.

1.2 Highway schemes shall be exempt from the requirements of the assessment and the review phases of the WCHAR process where:

1) they are located entirely within the extents of existing roads for which motorway regulations apply;
2) they are located entirely within the extents of existing roads where pedestrians, cyclists and equestrians are not permitted;
3) they have no impact on pedestrians, cyclists and equestrians, and where this can be clearly demonstrated prior to commencing the WCHAR process.

1.3 Where the assessment and review phases are not applied to a highway scheme, as a result of a valid exemption, the design team leader shall record this decision on an exemption file note to be kept on record in the project file.

NOTE 1 *The design team leader determines the applicability of the WCHAR process on a scheme-by-scheme basis.*

NOTE 2 *Appendix A provides an exemption file note template.*

1.4 Ex-vehicle pedestrians, such as those using a lay-by or emergency refuge area, shall be exempt from the WCHAR process as their primary mode of travel to a particular location on the motorway and all-purpose trunk road network is vehicular.

1.5 The assessment and review phases of the WCHAR process shall apply to the pre-construction activities associated with a highway scheme.

NOTE *The WCHAR process concludes before the construction phase of a highway scheme and no further assessment or review applies post-construction.*

Developer-led and third party organisation-led highway schemes

1.6 Where developer-led and third party organisation-led highway schemes impact on the motorway and all-purpose trunk road network, this document shall be applied.

Implementation

1.7 This document shall be implemented forthwith on all highway schemes involving walking, cycling and horse-riding on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 1.N].

Use of GG 101

1.8 The requirements contained in GG 101 [Ref 1.N] shall be followed in respect of activities covered by this document.

2. WCHAR process

Appointment

2.1 A Lead Assessor shall be appointed by the design team leader to undertake the WCHAR process.

NOTE The competencies expected of a Lead Assessor can be found in Section 3.

WCHAR highway scheme size

2.2 The Lead Assessor shall determine the highway scheme size for the WCHAR process.

2.2.1 Table 2.2.1 should be used to determine whether a large or small highway scheme process is applied.

Table 2.2.1 Large and small highway scheme process criteria

Large highway scheme	Highway schemes comprising new road construction (including new motorways), significant changes to an existing all-purpose trunk road or significant changes to an urban environment consisting of both the trunk road network and local highway network. In addition, any scheme aimed principally at providing for pedestrians, cyclists or equestrians.
Small highway scheme	Highway schemes comprising minor changes to an existing all-purpose trunk road, or changes to existing motorway or trunk road junctions that affect the local highway network in a rural area.

NOTE Table 2.2.1N provides example highway schemes for large or small highway scheme classification.

Table 2.2.1N Example large and small highway schemes

Example large highway schemes	Example small highway schemes
New motorway or all-purpose trunk road construction or major modification of an existing trunk road or motorway junction.	Minor rural all-purpose trunk road or motorway junction improvements.
All-purpose trunk road or motorway junction upgrade in existing urban area.	Changes to lane markings, priorities or widths on existing all-purpose trunk roads.
New town or village bypass.	Urban all-purpose trunk road schemes that do not involve changes to the road layout.
Creation of footway, shared use path or cycle track alongside or crossing an existing all-purpose trunk road.	Highway schemes that solely involve changes to speed limits on all-purpose trunk roads.
Motorway schemes that could affect pedestrians, cyclists and equestrians where the scheme extends as far as the non-motorway network at the end of the slip roads or overbridges, for example.	Emergency motorway diversion signing schemes that involve diverting traffic onto roads where pedestrians, cyclists or equestrians can be present and/or affected.
Route-based improvements on a rural all-purpose trunk road.	Changes to signs aimed at pedestrians, cyclists and equestrians.
Urban all-purpose trunk road schemes involving changes to the road layout.	Highway schemes affecting lay-bys, including the creation of new lay-bys on the all-purpose trunk road network.
Major rural all-purpose trunk road junction improvements.	Structures schemes affecting a route that could be used by pedestrians, cyclists and equestrians (e.g. motorway bridge parapet replacement).
	All-purpose trunk road speed control schemes (such as horizontal/vertical physical measures, signs).
	Stand-alone crossings.

3. Assessment and review team competency

Lead Assessor role

3.1 The Lead Assessor shall co-ordinate the WCHAR process and the resources required to deliver this.

NOTE *The Lead Assessor is an integral part of the team appointed by the design team leader to deliver the highway scheme.*

3.1.1 The Lead Assessor should have the expected competencies as set out in Table 3.1.1.

Table 3.1.1 Lead Assessor expected competencies

Background
Knowledge of walking, cycling and horse-riding policies within the UK.
Knowledge of the needs of each user group: pedestrians; cyclists; equestrians; and the various sub-groups of these.
Knowledge of current best practice in infrastructure design for all user groups.
Knowledge of the planning and operation of walking, cycling and horse-riding networks.
Knowledge of potential issues created by facilities that provide for a combination of users.
Experience of managing stakeholder consultation events.
Experience of managing conflicting stakeholder views and expectations.
Experience of working on the all-purpose trunk road and motorway network.
Experience of designing facilities for pedestrians, cyclists and equestrians.
Experience of completing feasibility studies and assessment of walking, cycling and horse-riding infrastructure design.
Assessment competencies
Experience of identifying key trip generators and subsequent desire lines for pedestrians, cyclists and equestrians.
Experience of the analysis and subsequent interpretation of survey data such as pedestrian count data and automatic cycle count data.
Experience of assessing existing routes and facilities used by pedestrians, cyclists and equestrians including condition surveys performed during site visits.
Experience of collision data analysis in the context of providing facilities for pedestrians, cyclists and equestrians.
Experience of identifying viable and proportionate opportunities for the improvement of facilities for pedestrians, cyclists and equestrians.
Knowledge of transport networks and their operation, including the opportunities and issues arising from potential multi-modal transport options for pedestrians, cyclists and equestrians.
Review competencies
Experience of presenting options to key stakeholders and promoting the various benefits and dis-benefits of options.
Experience of working as part of a wider design team(s) in order to present and discuss options for enhancing the design for all user groups.

Assessment and review team

3.2 The WCHAR assessment and review team shall include a Lead Assessor.

3.2.1 The Lead Assessor may appoint additional assessors.

NOTE *Appointing additional assessors can be beneficial where there is anticipated high workload, such as on large highway schemes.*

3.3 The Lead Assessor and any additional appointed assessors shall record their involvement and specified role in the WCHAR process through the assessment and review report documentation.

3.3.1 An assessor(s) appointed by the Lead Assessor should have, in the Lead Assessor's professional opinion, relevant knowledge and experience for the task they are being asked to undertake.

3.4 Members of the WCHAR assessment and review team shall not be permitted to be members of the road safety audit (RSA) team for the same highway scheme.

NOTE *Members of the WCHAR assessment and review team are not permitted to be members of the RSA team in order to maintain the independence of the RSA team.*

4. Walking, cycling and horse-riding assessment

General

4.1 The assessment shall be applied to large and small highway schemes.

4.2 The assessment shall be completed during the options or concept stage of a highway scheme where this exists.

4.3 Where an options or concept stage does not exist, the assessment shall be completed before the end of the preliminary design stage.

4.4 The output of the assessment shall comprise an assessment report.

NOTE *An assessment report template can be found in Appendix B.*

4.5 Opportunities for new or improved facilities for walking, cycling and horse-riding users shall be identified at the assessment phase and recorded within the assessment report.

NOTE 1 *Identified opportunities for improvement of walking, cycling and horse-riding facilities do not always need to be restricted to the highway scheme extents.*

NOTE 2 *In some cases, improvements to facilities outside the limits of the highway scheme can result in greater improvements for users than an attempt to incorporate dedicated facilities within the highway scheme extents.*

Walking, cycling and horse-riding assessment report - information

WCHAR study area

4.6 The Lead Assessor shall define a WCHAR study area on a scheme-by-scheme basis.

4.6.1 The WCHAR study area should typically extend 1km surrounding a small highway scheme and 5km surrounding a large highway scheme.

Report information summary

4.7 The minimum information to be included in assessment reports shall be in accordance with Table 4.7.

Table 4.7 Information requirements for large and small highway schemes

Assessment and summary of	Large highway scheme	Small highway scheme
Walking, cycling & horse-riding policies and strategies within or related to the WCHAR study area.	Yes	Yes
Personal injury collision data.	Yes	Yes
Multi-modal transport service and interchange information within the WCHAR study area.	Yes	Yes
Key trip generators and local amenities within the WCHAR study area.	Yes	Yes
Information gathered during site visit.	Yes	Yes
Information gathered during liaison with key stakeholders.	Yes	Yes
Existing walking, cycling and horse-riding network facilities within the WCHAR study area.	Yes	Yes
Walking, cycling and horse-riding user survey data.	Yes	**No**
Information gathered during liaison with local user groups and wider public.	Yes	**No**

4.7.1 The Lead Assessor should determine the appropriate quantity of the information to be captured, such that only information which can be used to help inform the highway scheme design is collated.

Assessment of walking, cycling and horse-riding policies and strategies

4.8 The assessment report shall contain an analysis of walking, cycling and horse-riding policies and strategies relevant to the WCHAR study area.

4.8.1 Walking, cycling and horse-riding policies and strategies should be used to help inform the identification of opportunities for improvement of walking, cycling and horse-riding facilities.

Collision data

4.9 Personal injury collision data shall be obtained for the latest available period and include a minimum period of three years of data.

4.9.1 Personal injury collision data should not be limited to pedestrian, cyclist and equestrian collisions.

4.10 Personal injury collision data shall be analysed to identify any collision cluster sites and trends that can influence or impact the highway scheme.

NOTE *Analysis of personal injury collision data allows the identification of existing problems which can discourage use of a particular site by pedestrians, cyclists and equestrians.*

4.10.1 Where damage-only collision data is available it should be analysed to identify trends that could currently discourage walking, cycling and horse-riding.

NOTE *Damage-only collision data can allow the identification of issues and thus improvements that can otherwise go undetected when analysing only personal injury collision data.*

Multi-modal transport service and interchange information

4.11 Multi-modal transport services, associated infrastructure and interchanges within the WCHAR study area shall be identified and recorded.

NOTE *Multiple modes of transport can be used by pedestrians, cyclists and equestrians as part of a longer trip.*

4.11.1 Access to and from multi-modal transport services, interchanges and facilities should be assessed in the context of the proposed highway scheme.

4.11.2 Destinations for multi-modal transport services, together with their frequencies and interchange facilities, should be identified and assessed as part of the assessment.

Key trip generators and local amenities

4.12 The assessment shall include an analysis of local trip generators and amenities in the WCHAR study area to identify likely desire lines for pedestrians, cyclists and equestrians.

4.12.1 The assessment should include an assessment of committed future development in the WCHAR study area, including any improvements to multi-modal transport services, interchanges and facilities.

Site visits

4.13 The Lead Assessor shall conduct a site visit to the WCHAR study area during the assessment.

4.13.1 The scope of a site visit should be determined by the Lead Assessor.

NOTE *It is not necessary to include a site visit to all routes within the WCHAR study area where there is no relevance to the highway scheme or crossing points.*

4.13.2 The Lead Assessor should be accompanied by any additional assessor(s) that have been appointed.

NOTE *A site visit allows the Lead Assessor and assessor(s) to identify opportunities that can be missed from online mapping or other sources of desktop data collection and are therefore an important part of the assessment.*

4.13.3 The specific timing of a site visit should be determined by the Lead Assessor.

4.13.4 The specific timing of a site visit should be influenced by the proximity of certain trip generators such as schools where the morning and afternoon peak periods are more relevant (due to higher anticipated user flows).

NOTE *A site visit during hours of darkness can be beneficial in identifying additional hazards and issues, particularly on urban commuter routes which are likely to be in darkness in the winter months at peak commuting times.*

Liaison with key stakeholders

4.14 The assessment report shall contain a record of liaison with key stakeholders to understand their specific needs and concerns.

4.14.1 Liaison with key stakeholders should include representatives for walking, cycling and horse-riding from all local authorities for which the highway scheme is within or extends across their boundaries.

4.14.2 Liaison with key stakeholders other than local authorities should be determined by the Lead Assessor in the context of the highway scheme.

NOTE *Key stakeholders other than local authorities can include walking, cycling and horse-riding organisations as well as disability groups, local businesses and transport operators.*

Existing walking, cycling and horse-riding facilities

4.15 An assessment of the existing walking, cycling and horse-riding facilities within the WCHAR study area shall be undertaken.

4.15.1 The assessment of the existing walking, cycling and horse-riding facilities should include the current condition and effectiveness where these are deemed relevant to the highway scheme in the Lead Assessor's professional opinion.

NOTE *It is not necessary to report on the condition of all facilities within the WCHAR study area where these are not relevant to the highway scheme.*

4.15.2 The existing walking, cycling and horse-riding facilities deemed relevant to the highway scheme, in the Lead Assessor's professional opinion, should be assessed in isolation for each mode of travel.

NOTE *The interaction of each mode can be studied at the review phase of the process.*

4.16 The assessment of existing walking, cycling and horse-riding facilities shall include information on all of the main walking, cycling and horse-riding strategic networks within or connecting to the WCHAR study area for large highway schemes.

NOTE *Assessment of strategic walking, cycling and horse-riding networks can include a county-wide or a town/city-wide area for large highway schemes.*

4.17 Where gaps in existing walking, cycling and horse-riding strategic networks are identified within the WCHAR study area for large highway schemes, these shall be recorded so that opportunities for improvement and/or betterment can be identified.

NOTE 1 *Walking, cycling and horse-riding strategic networks can include National Cycle Network (NCN) routes, public rights of way, bridleways and byways open to all traffic.*

NOTE 2 *A crucial element of the strategic network assessment is to establish the longer term plans for county-wide and town/city-wide strategic networks.*

Walking, cycling and horse-riding survey data for a large highway scheme

4.18 The assessment report for a large highway scheme shall contain an analysis of any existing walking, cycling and horse-riding survey data where this is available within the WCHAR study area (and if collected within the previous 12-month period).

NOTE *The survey data can provide information such as likely desire lines and usage figures that can assist in the completion of the assessment.*

4.19 Where walking, cycling and horse-riding survey data collected within the previous 12 month period does not already exist, it shall be obtained for a large highway scheme.

4.19.1 Walking, cycling and horse-riding survey data should include usage figures for pedestrians, cyclists and equestrians.

4.19.2 The Lead Assessor should determine the type of survey data to be collected.

4.19.3 The Lead Assessor should assess the latent demand potential by examining existing usage patterns and likely trip generators in the WCHAR study area and through local key stakeholder liaison.

Liaison with local user groups and wider public for a large highway scheme

4.20 The assessment report for a large highway scheme shall include records of local group liaison relevant to the WCHAR study area except where wider public or local user group involvement is not, in the Lead Assessor's professional opinion, deemed appropriate.

4.20.1 Where the Lead Assessor deems it relevant to liaise with the wider public, this should be undertaken during the assessment.

Reporting of different user groups

4.21 The assessment report shall demonstrate that the needs of all user groups have been identified and evaluated.

Report approval

4.22 The assessment report shall be signed by both the Lead Assessor and the design team leader.

NOTE 1 *The Lead Assessor signs the assessment report to confirm that it contains appropriate walking, cycling and horse-riding information for the development of the highway scheme design, and has been completed in accordance with this document.*

NOTE 2 *The design team leader signs the assessment report to confirm that the process has been completed at the appropriate time and that the competency of the Lead Assessor has been reviewed in accordance with Section 3 of this document.*

4.23 The signed assessment report shall be kept on the highway scheme file.

NOTE *The assessment report is not forwarded for approval to the Overseeing Organisation.*

5. Walking, cycling and horse-riding review

General

5.1 The review shall be undertaken as an ongoing process during the design stages of the highway scheme (but after the completion of the assessment report).

5.2 The assessment and review team shall record the design decisions relating to the provision of walking, cycling and horse-riding facilities.

5.3 The minimum output of the review shall be in accordance with Table 5.3.

Table 5.3 Minimum WCHAR review outputs

Large highway schemes	Two review reports: 1) a review report at the end of the preliminary design stage and before commencement of detailed design; followed by 2) a review report at the end of the detailed design phase (before construction commences).
Small highway schemes	A single review report at the end of the detailed design phase (before construction commences) that contains a record of all decisions from the preliminary and detailed design stages.

NOTE *A review report template can be found in Appendix C.*

5.3.1 Where the Lead Assessor deems it necessary, in their professional opinion, an additional review report may be produced at the preliminary design stage of small highway schemes.

NOTE *Identification of opportunities for improvement of walking, cycling and horse-riding facilities at the review phase do not always need to be restricted to those that can be delivered within the context of the highway scheme.*

5.4 Where a highway scheme is delayed by more than 12 months between the assessment and review phases, the assessment report shall be revisited and re-issued to take account of any changes prior to the review being undertaken.

5.4.1 As the assessment and review team can change between the assessment and review phases of the process, the following items should be confirmed by the Lead Assessor in order for the review to be able to take place:

1) completion of an assessment report within the last 12 months since the commencement of the review phase;
2) the stated highway scheme size is still relevant; and
3) the assessment report has been signed by the Lead Assessor and the design team leader.

Walking, cycling and horse-riding review report - information

Review of assessment report

5.5 Opportunities for improvement identified in the assessment report shall be reviewed during the review phase(s) and included within the review report.

Review of previous review report

5.6 For large highway schemes, opportunities for improvement identified in the preliminary design stage review report shall be reviewed during the detailed design stage and included within the detailed design stage review report.

Review of highway scheme proposal

5.7 Highway scheme design drawings and associated information shall be reviewed at the preliminary and/or detailed design stages to:

1) ensure that previously identified opportunities at the assessment phase have been taken into account and implemented where achievable; and
2) identify opportunities for improvement for pedestrians, cyclists and equestrians as a result of the developing highway scheme design.

5.7.1 Each mode of travel (walking, cycling and horse-riding) should be reviewed in isolation and then in the context of other users.

Liaison with key stakeholders

5.8 The Lead Assessor shall determine the need for further liaison with key stakeholders during the review phase and record the outcomes in the review report.

5.8.1 Liaison with key stakeholders at the review phase should be targeted in order to prevent unnecessary delay to a highway scheme or a repetition of liaison at the assessment phase.

NOTE *Liaison with key stakeholders at the review phase can be useful in identifying new opportunities and reviewing any opportunities resulting from the progression of the highway scheme design.*

Site visits

5.9 A further site visit to the study area shall be undertaken if this is deemed necessary by the Lead Assessor.

Actions taken to implement opportunities

5.10 Where opportunities to improve or introduce new facilities for pedestrians, cyclists or equestrians have resulted in changes to the highway scheme design, the actions taken to implement the opportunities shall be recorded in the review report.

5.11 Where opportunities to improve or introduce new facilities for pedestrians, cyclists or equestrians have been identified but not implemented, the reasoning for this shall be recorded in the review report.

Reporting of different user groups

5.12 The review report shall include a section for each user group (pedestrians, cyclists and equestrians as well as sub-groups within each group) to demonstrate that the needs of those groups identified in the assessment report have been addressed.

Report approval

5.13 The review report shall be signed by both the Lead Assessor and the design team leader.

NOTE 1 *The Lead Assessor signs the review report to confirm that opportunities for users and improvements to applicable facilities have been reviewed throughout the design process, and that it has been produced in accordance with this document.*

NOTE 2 *The design team leader signs the review report to confirm that the process has been completed at the appropriate time and that the competency of the Lead Assessor has been reviewed in accordance with Section 3 of this document.*

5.14 The signed review report(s) shall be kept on the highway scheme file.

NOTE *The review report(s) is not forwarded for approval to the Overseeing Organisation.*

6. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'

Appendix A. Exemption file note

A1 Exemption file note

Highway scheme name:

Table A.1 Highway scheme description

A1.1 Exemption statement

In accordance with GG 142 walking, cycling and horse-riding assessment and review I have examined the potential presence of pedestrians, cyclists and equestrians within the extents of the highway scheme and any potential user impact outside the scheme extents (as a result of the highway scheme).

For the reasons set out below, this highway scheme is considered exempted from the assessment and review phases of the WCHAR process:

Table A.2 Reasons for exemption from the assessment and review

Table A.3 Design team leader approval

Name of design team leader	
Job title of design team leader	
Organisation	
Signed	
Date	

Appendix B. Assessment report template

B1 Background and highway scheme description

B1.1 Background

Provide a statement of the Lead Assessor's justification for the highway scheme size (large or small). In addition, provide an explanation of the design stages at which a walking, cycling and horse-riding review will be undertaken and when the associated report(s) will be delivered.

Provide a brief statement about the existing highway layout (if applicable).

B1.2 Proposed highway scheme

Provide a brief explanation of the proposed highway scheme and include any specific elements that are intended to improve the existing situation for walking, cycling and horse-riding.

B1.3 WCHAR study area

Provide a statement confirming the Lead Assessor's decision about the extent of the WCHAR study area.

Provide a plan to clearly define the WCHAR study area.

B2 WCHAR assessment

This section summarises the findings of the assessment as set out in Section 4 of GG 142. The findings under each topic area are summarised in an individual table below and any potential opportunities for improvements are noted in each table and then summarised later in sub-section B3. This information does not have to be presented in a tabular format.

Table B.1 Assessment of walking, cycling & horse-riding policies and strategies

Assessment of walking, cycling & horse-riding policies and strategies
Provide a list of the walking, cycling and horse-riding policies and strategies analysed as part of the assessment. Provide a summary of key or relevant points of each policy and strategy.

Table B.2 Collision data

Collision data
Provide details of collision data within the study area that is judged to be relevant to the highway scheme. Provide a summary of the pedestrian, cyclist and equestrian collisions within the study area.

Table B.3 Multi-modal transport services and interchange information

Multi-modal transport services and interchange information
Provide a list of transport services, locations of associated interchanges and service frequencies within the study area. Provide details of access to, and facilities at, interchanges that are related to walking, cycling and horse-riding - e.g. cycle parking facilities.

Table B.4 Trip generators

Trip generators
Provide a list of trip generators within the study area that may influence levels of walking, cycling and horse-riding and the associated desire lines. Provide a plan of the key trip generators (this does not have to be all trip generators within the study area).

Table B.5 Site visit

Site visit
Provide details of the site visit carried out as part of the assessment - attendees, times, dates and facilities visited. Provide a summary of the site visit findings including the standard and condition of existing facilities where appropriate/relevant.

Table B.6 Liaison with key stakeholders

Liaison with key stakeholders
Provide details of liaison with key stakeholders - including organisation details of those contacted. Provide a summary of stakeholder discussions. e.g. agreed meeting minutes or opportunities of interest identified by each stakeholder.

Table B.7 Existing pedestrian, cyclist and equestrian facilities

Existing pedestrian, cyclist and equestrian facilities
Provide a plan of the existing facilities within the WCHAR study area. Provide a summary assessment of the condition of the key existing facilities for walking, cycling and horse-riding (this does not have to be exhaustive and will mostly be informed by the site visit). For large highway schemes - provide a summary assessment of the strategic networks.

Table B.8 Liaison with local user groups and wider public

Liaison with local user groups and wider public
Provide details of liaison with local user groups and the wider public - including organisation details of those contacted. Provide a summary of discussions. e.g. agreed meeting minutes, or opportunities of interest identified by each stakeholder, details of exhibitions held and feedback received.

B3 User opportunities

The opportunities highlighted below are deemed to be relevant to the highway scheme and should be considered by the design team leader throughout the progression of the highway scheme design in addition to any further opportunities that may arise through the ongoing development of the design phase(s).

Table B.9 Identified user opportunities

General
Provide details of identified opportunities that are general to the highway scheme and user type - this could include opportunities for matched funding projects with key stakeholders.
Strategic opportunities
Provide details of identified opportunities that are strategic in nature - such as completion of missing links that would benefit the wider strategic user networks such as the National Cycle Network and the public rights of way network.
Pedestrian specific opportunities
Provide details of identified opportunities that would benefit pedestrians within the study area. Examples: This could include new facilities or improvements to footways, footpaths and upgraded pedestrian crossings.
Cyclist specific opportunities
Provide details of identified opportunities that would benefit cyclists within the study area. Examples: This could include improvements to on and off-carriageway cycle routes, upgrading of footways to shared use paths and upgrading existing crossings to provide for cyclists. This could also include associated infrastructure such as cycle parking.
Equestrian specific opportunities
Provide details of identified opportunities that would benefit equestrians within the study area. Examples: This could include improvements to bridleways, upgraded crossings to better provide for equestrians and improvements to existing shared use facilities to accommodate equestrian use.

B4 Walking, cycling and horse-riding assessment team statement

As Lead Assessor, I confirm that this walking, cycling and horse-riding assessment report has been compiled in accordance with DMRB GG 142. The walking, cycling and horse-riding assessment was undertaken by the following assessment and review team:

Table B.10 Walking, cycling and horse-riding Lead Assessor

Name	Name of Lead Assessor
Position	Job title of Lead Assessor
Organisation	Organisation of Lead Assessor
Signed	
Date	

Table B.11 Walking, cycling and horse-riding assessor (where appointed)

Name	Name of assessor
Position	Job title of assessor
Organisation	Organisation of assessor

As the design team leader, I confirm that the assessment has been undertaken at the appropriate stage of the highway scheme development.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the expected competencies contained in GG 142.

Table B.12 Design team leader

Name	Name of design team leader
Position	Job title of design team leader
Organisation	Organisation of design team leader
Signed	
Date	

Appendix C. Review report template

C1 Background and highway scheme description

C1.1 Background

Provide a statement to confirm that the size of the highway scheme (large or small) judged at the assessment stage is still correct or note any change in scheme size. Provide details of any completed or planned future walking, cycling and horse-riding review(s).

Provide a brief statement about the existing highway layout (where applicable).

C1.2 Proposed highway scheme

Provide a brief explanation of the proposed highway scheme and include any specific elements that are intended to improve the situation for walking, cycling and horse-riding.

C1.3 Review team

Provide details of the walking, cycling and horse-riding review team and note any changes that may have occurred since the preceding assessment or review.

C1.4 WCHAR study area

Provide a statement confirming the Lead Assessor's decision about the extent of the WCHAR study area.

Provide a plan to clearly show the WCHAR study area.

C2 Review of walking, cycling and horse-riding assessment opportunities

This section provides a summary of the opportunities identified as part of the assessment report and the actions taken or outcomes related to these during the preliminary design phase of the highway scheme. They are provided verbatim from the review report issued at the end of the preliminary design phase of the highway scheme.

Table C.1 Opportunities identified during the assessment

General opportunities
Provide details of each opportunity from the assessment report. Provide the actions taken to address each opportunity.
Strategic opportunities
Provide details of each opportunity from the assessment report. Provide the actions taken to address each opportunity.
Pedestrian specific opportunities
Provide details of each opportunity from the assessment report. Provide the actions taken to address each opportunity.
Cyclist specific opportunities
Provide details of each opportunity from the assessment report. Provide the actions taken to address each opportunity.
Equestrian specific opportunities
Provide details of each opportunity from the assessment report. Provide the actions taken to address each opportunity.

C3 Preliminary design stage walking, cycling and horse-riding review opportunities (for large highway schemes)

This section documents any user related opportunities identified during the preliminary design phase (after the assessment report has been issued). They have been developed through discussions between the Lead Assessor and the wider design team and recorded here (along with actions taken / outcomes).

Table C.2 Opportunities identified during the preliminary design phase

General opportunities
Provide details of each opportunity identified in the preliminary design phase. Provide the actions taken to address each opportunity.
Strategic opportunities
Provide details of each opportunity identified in the preliminary design phase. Provide the actions taken to address each opportunity.
Pedestrian specific opportunities
Provide details of each opportunity identified in the preliminary design phase. Provide the actions taken to address each opportunity.
Cyclist specific opportunities
Provide details of each opportunity identified in the preliminary design phase. Provide the actions taken to address each opportunity.
Equestrian specific opportunities
Provide details of each opportunity identified in the preliminary design phase. Provide the actions taken to address each opportunity.

C4 Detailed design stage walking, cycling and horse-riding review

This section records any user-related opportunities identified during the detailed design phase (after the assessment report and preliminary design phase review report, where applicable, has been issued). They have been developed through discussions between the Lead Assessor and the wider design team and recorded here (along with actions taken / outcomes).

For small highway schemes, record decisions made during the entire design phase here without reference to a previous review report unless one has been produced.

It also includes new opportunities for improvement identified as a result of the developing design.

Table C.3 Opportunities identified during the detailed design phase

General opportunities
Provide details of each opportunity identified in the detailed design phase. Provide the actions taken to address each opportunity.
Strategic opportunities
Provide details of each opportunity identified in the detailed design phase. Provide the actions taken to address each opportunity.
Pedestrian specific opportunities
Provide details of each opportunity identified in the detailed design phase. Provide the actions taken to address each opportunity.
Cyclist specific opportunities
Provide details of each opportunity identified in the detailed design phase. Provide the actions taken to address each opportunity.
Equestrian specific opportunities
Provide details of each opportunity identified in the detailed design phase. Provide the actions taken to address each opportunity.

C5 Walking, cycling and horse-riding review team statement

As Lead Assessor, I confirm that this walking, cycling and horse-riding review report has been compiled in accordance with DMRB GG 142 and thus records all design team deliberations and decisions relating to walking, cycling and horse-riding issues and opportunities.

The walking, cycling and horse-riding review was undertaken by the following team:

Table C.4 Walking, cycling and horse-riding Lead Assessor

Name	Name of Lead Assessor
Position	Job title of Lead Assessor
Organisation	Organisation of Lead assessor
Signed	
Date	

Table C.5 Walking, cycling and horse-riding assessor (where appointed)

Name	Name of assessor
Position	Job title of assessor
Organisation	Organisation of assessor

As design team leader, I confirm that the assessment has been undertaken at the appropriate stage of the highway scheme development.

I confirm that in my professional opinion the appointed Lead Assessor has the appropriate experience for the role making reference to the expected competencies contained in DMRB GG 142.

Table C.6 Design team leader

Name	Name of design team leader
Position	Job title of design team leader
Organisation	Organisation of design team leader
Signed	
Date	

Design Manual for Roads and Bridges

Highway Structures & Bridges
Design

CD 353
Design criteria for footbridges

(formerly BD 29/17)

Revision 0

Summary
This document contains the requirements for the design criteria for footbridges.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	CD 353 replaces BD 29/17. This full document has been re-written to make it compliant with the new Highways England drafting rules.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes BD 29/17 which is withdrawn.

Contractual and legal considerations

This document forms part of the design specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

BD 29/17 has been reviewed as part of the general revision and update of the DMRB. There are few material changes, and most of the amendments have been made to improve consistency and clarity of the requirements and advice.

Assumptions made in the preparation of the document

The assumptions made in GG 101 [Ref 11.N] apply to this document.

Terms and definitions

Terms

Term	Definition
Bridleway	Public right of way open to pedestrians, equestrians and cyclists
Cycle path	Part of a road or footbridge designated and marked as intended for use by cyclists
Cyclist	A pedal cyclist
Desire line	Line likely to be taken by pedestrians, cyclists or equestrians finding the shortest or most desirable route between two points
Footbridge	A pedestrian bridge
General highway terms	For the definition of the general highway terms used in this document such as trunk road, motorway, carriageway, verge etc., refer to BS 6100 [Ref 1.I]
Goal orientated users	Users making a journey to reach a specific destination
Pedestrian bridge	For the purpose of this document, a pedestrian bridge is a bridge, or any part of a bridge, specifically intended to be used by pedestrians, cyclists and/or equestrians
Recreational users	Users making a journey for leisure purposes

1. Scope

Aspects covered

1.1 This document shall apply to the design of pedestrian bridges.

NOTE *This document deals mainly with geometric and user requirements, other design aspects such as strength and properties of materials being covered by other documents within the DMRB Series.*

1.2 This document shall be used where appropriate in conjunction with the relevant parts of the Eurocodes, except where otherwise specified herein.

1.3 This document specifies criteria which shall be used for the design of urban or rural footbridges, which are intended for use by pedestrians, cyclists and equestrians and includes those parts of highway bridges specifically intended for such use.

NOTE *Guidelines for the selection and design of other suitable forms of pedestrian crossings are outside the scope of this document. However, "Provision for Non Motorised Users" CD 143 [Ref 5.N] contains advice on the selection of appropriate crossings.*

Implementation

1.4 This document shall be implemented forthwith on all schemes involving pedestrian bridges on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 11.N].

Use of GG 101

1.5 The requirements contained in GG 101 [Ref 11.N] shall be followed in respect of activities covered by this document.

2. General principles

2.1 The design of the bridge shall primarily ensure the safety of its users and those in its environs.

2.1.1 The footbridge and the approach footpaths should facilitate and encourage its use by all the intended user groups as a means of crossing the obstacle crossed by the structure.

2.2 The selection of alignment, layout, structural form, details and finishes shall be assessed against the full range of relevant design criteria, including:

1) the type of use;
2) accessibility;
3) safety;
4) aesthetics;
5) environment;
6) environmental impact;
7) cost;
8) robustness;
9) durability;
10) sustainability;
11) buildability; and
12) the ease of operation, inspection and maintenance.

2.3 The design shall take account of all likely users and observers of the bridge, and of the obstacle to be crossed, before deciding on its location, alignment and form.

2.3.1 The obstacle spanned by the bridge may include a road, railway, and watercourse.

NOTE *For goal-orientated users, an alignment which addresses the main desire line(s) and avoids obstacles and sharp bends is likely to be a high priority. For recreational users, the design can include features which add value to the bridge user, such as an alignment or form which reduces exposure to traffic, enhances new views, creates a new cycle route, or provides occasional resting places. Such features are part of the overall aesthetic and experience of the bridge.*

2.4 The potential risks arising from wilful misuse, vandalism, graffiti, and other types of anti-social behaviour shall be taken into account in the design.

NOTE *Some bridges attract attempts at vandalism, anti-social behaviour, suicide or self-harm, perhaps due to their location, seclusion, height or other local characteristics. Where this is perceived to be a potential problem, consultation with relevant local bodies such as the police, neighbourhood watch, community groups, local health boards, Samaritans etc. can assist in arriving at appropriate solutions. Non-engineering solutions are preferred, such as clearing vegetation or removing visual barriers which reduce visibility. Avoid the use of enclosures, wherever possible, unless they are required for other reasons.*

2.5 Where footbridge materials or components have a potentially high second-hand or scrap value and can therefore be at risk of theft, the design shall incorporate suitable measures to minimise the risk of their unauthorised removal.

2.6 Measures that minimise the risk of theft and require the use of special tools or procedures, shall be designed such that they remain effective throughout their required design life.

2.6.1 Any special maintenance requirements of the measures incorporated for minimising the risk of theft should be described within the maintenance manual for the structure.

3. Layout and appearance

General

3.1 Where a footbridge crosses a dual carriageway carrying traffic with permitted speeds in excess of 30 mph, the bridge shall have a single span crossing both carriageways where possible to avoid the need for a support in the central reserve.

3.2 Where intermediate piers cannot be avoided, the structural layout, including any vehicle impact protection around the piers, shall be justified at the concept stage.

3.3 Where any part of a footbridge and its supports is located close to a highway such that an errant vehicle could cause damage, the design of the footbridge shall include appropriate vehicle impact protection in accordance with BS EN 1991-1-7 [Ref 6.N] and PD 6688-1-7 [Ref 12.N].

3.4 The design shall follow the advice given in "The Appearance of Bridges and Other Highway Structures" CD 351 [Ref 16.N] and comply with the requirements of CD 351 [Ref 16.N] in relation to all aspects of the appearance of the bridge and the experience of its users and observers.

NOTE *Elegant proportions, a logical structural form, visual clarity and attractive details are among the essential visual characteristics of any good footbridge design, as well as sensitivity to its context and its environmental and social impact.*

3.5 The design shall carefully evaluate the following factors:

1) appearance of the bridge from all angles;
2) views of and from the bridge; and,
3) the experience of the user on the bridge and approaching it.

NOTE *Such factors are particularly important for footbridges because a pedestrian interacts slowly and directly with the bridge in a way that does not happen for those using a highway bridge in a vehicle for example.*

3.6 The design shall minimise the visual and environmental impact of the bridge, access ramps and stairs.

3.6.1 In certain topographies, this requirement may be achieved by visual screening using existing or new planted hedgerows or tree lines as illustrated in Figure 3.6.1.

Figure 3.6.1 Use of visual screening to minimise visual and environmental impact of the bridge

3.6.2 The advice of a landscape architect may be sought in relation to any proposed planting.

3.6.3 Planting schemes which create enclosed areas causing potential anxiety or security risk to users, or which can eventually cause trip or slip hazards from root and branch growth or leaf-fall, should be avoided.

3.7 The design shall take into account any effects on future maintenance liabilities for the structure.

3.8 The location and arrangement of the footbridge shall be selected to make maximum use of the local topography, placing the abutments at or close to adjacent ground level, where possible, so as to minimise the need for stairs and ramps as illustrated in Figure 3.8.

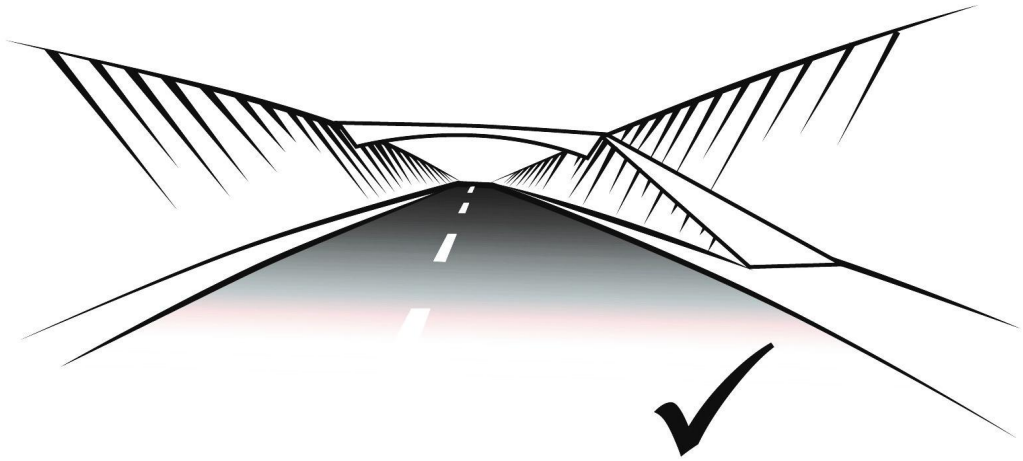
Figure 3.8 Illustration of maximum use of local topography to minimise the need for stairs and ramps

3.9 Wherever possible, the design shall make use of natural and man made slopes and topography, such as cuttings and embankments, to accommodate the access ramps and stairs in order to minimise the need for them to be supported by additional structural elements.

NOTE *Good and bad footbridge access provisions are illustrated in Figure 3.9N1a and Figure 3.9N1b.*

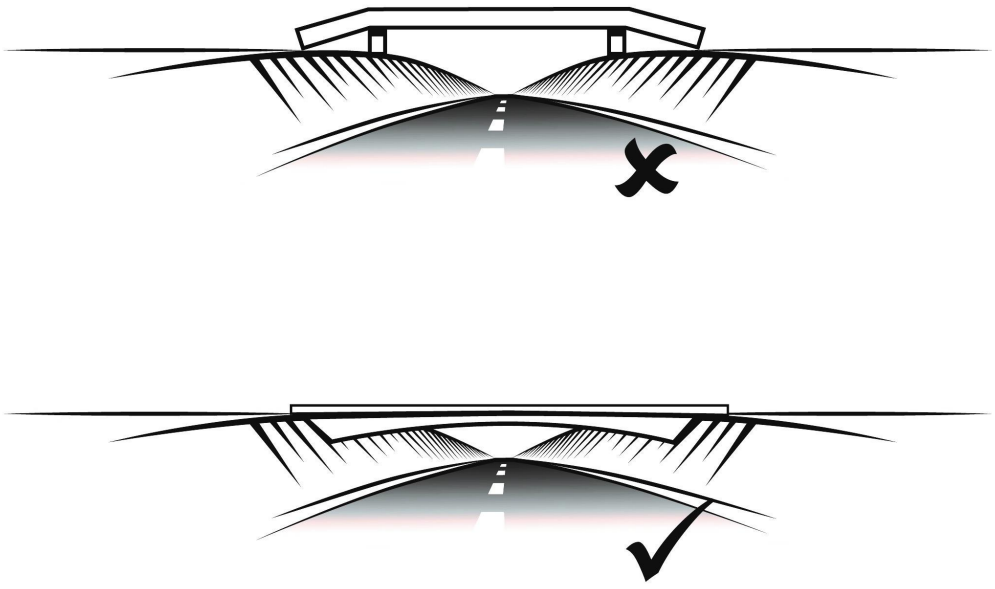
Figure 3.9Na Illustration of bad footbridge access

Figure 3.9Nb Illustration of good footbridge access



3.10 Where the footbridge crosses a road which is in a cutting, particularly when the bridge is visible from a distance on the skyline, the cutting slope shall extend up to deck level where possible in accordance with Figure 3.10.

Figure 3.10 Footbridge crossing a road in a cutting



3.11 Where the bridge is to carry an existing rural footpath, bridleway or byway, any diversion of that route shall be such as to minimise the total route length and maintain the existing desire line so as to make the path more pleasant, provide better accessibility and help exploit the topography.

3.11.1 Where it is necessary to divert an existing route, the diversion may need to start a long way from the bridge to achieve the desired outcomes.

3.11.2 Rural footpaths frequently follow field boundaries and historic rights of way and the layout should avoid diversions that cut directly across fields.

NOTE *Further guidance on the diversion of existing rights of way can be found in Section 3 of CD 143 [Ref 5.N] "Provision for Non-Motorised Users".*

3.11.3 Rural footpaths, bridleways and byways should not be diverted to run beside unscreened, busy roads.

3.11.4 The design should avoid any inaccessible or confined spaces where rubbish and detritus can accumulate or inspection and maintenance are made difficult.

Access

3.12 Access to the deck of a footbridge shall take account of the provisions of the Equality Act 2010 Acts 2010 c.15 [Ref 5.I].

3.12.1 The provisions of the Equality Act 2010 Acts 2010 c.15 [Ref 5.I] may require access to be provided by both ramps and stairs.

3.12.2 Where ramps alone provide the most direct route to the deck, the stairs may be omitted.

3.12.3 Access by stairs alone should only be evaluated in exceptional circumstances and with the agreement of local access and disability groups.

3.13 Access ramps and stairs shall be simple, short and direct wherever possible, following the main desire line and avoiding long detours or unnecessary climbing.

3.14 The choice of gradients and landings (rest areas), and the radii of turns and manoeuvring spaces, shall suit the needs of all potential users, including mobility-impaired users, cyclists and equestrians and particular requirements are given in section 5.

3.15 Where a footbridge crosses a road, the design shall be such as to encourage pedestrians to use the footbridge rather than to cross the road at grade.

NOTE *Pedestrians can be encouraged to use the footbridge rather than to cross a road at grade by providing suitable guardrails, fencing or appropriate planting to act as a physical barrier alongside the road.*

3.16 Where a footbridge or footway passes close to an adjacent structure or footpath, the design shall assess the hazard to persons attempting to jump or climb across the gap between the structures.

3.16.1 The design should be such as to prevent or deter attempts to climb between adjacent structures where such action presents a risk.

3.16.2 Where possible, a gap should be provided between the bridge and the adjacent structure of at least 2 metres.

3.17 Unauthorised access onto the footbridge by motor vehicles shall be prevented, without hindering access by the intended users of the footbridge, by the use of suitable measures such as bollards or staggered railings at the ends of the bridge.

3.17.1 Unauthorised access measures should be appropriate to the particular context and environmental setting.

3.18 Restrictions on footbridges shall be adequately marked in a contrasting colour to assist visually impaired users.

NOTE *Further information can be obtained from Inclusive Mobility [Ref 4.I].*

4. Design standards

General

4.1 Steel, concrete, timber and aluminium footbridges shall be designed in accordance with the relevant parts of the Eurocodes.

4.2 Where other materials are employed, the design shall be in accordance with:

1) an equivalent codified guidance; or,
2) current best practice.

4.3 Where footbridge sub-structures are sited on railway or waterway property, the design shall satisfy the appropriate authority's requirements.

Vibration and dynamic response

4.4 The design shall meet the vibration serviceability requirements set out in BS EN 1990 [Ref 9.N], NA to BS EN 1990 [Ref 8.N], BS EN 1991-2 [Ref 7.N], NA to BS EN 1991-2 [Ref 18.N], and PD 6688-2 [Ref 13.N], as implemented by DMRB CD 350 [Ref 17.N].

NOTE Modern lightweight footbridges can be susceptible to vibrations caused by bridge users, whether deliberately or unintentionally. Footbridges with vertical modes of vibration less than 5 Hz and/or lateral modes of vibration less than 2.5 Hz can be particularly susceptible, and the resulting motions can cause discomfort to bridge users and even lead to structural damage in extreme cases.

4.5 Accelerations shall be calculated for lateral and torsional modes of vibration with natural frequencies of less than 2.5Hz in response to single pedestrian (and small pedestrian groups) when walking and jogging and to crowded conditions.

NOTE 1 A methodology for the determination of dynamic lateral responses arising from pedestrians is given in Appendix A.

NOTE 2 The methods in Appendix A are additional to the provisions of BS EN 1991-2 [Ref 7.N], its National Annex NA to BS EN 1991-2 [Ref 18.N], and PD 6688-2 [Ref 13.N], as implemented by DMRB CD 350 [Ref 17.N].

NOTE 3 The dynamic response of footbridge structures is a relatively specialist area of work. Obtain specialist advice where necessary to derive an appropriate prediction of the structural response and pedestrian comfort.

4.6 Where dampers are required to control vibration amplitudes, they shall be robust, durable, accessible for routine inspection but not to anyone other than authorised inspectors, and designed for easy maintenance.

NOTE Obtain specialist advice where necessary to determine the most appropriate damper to suit the application.

Minimum thickness of metal sections

4.7 The minimum thickness of metal structural elements shall be as defined in table 4.7.

Table 4.7 Minimum thickness of metal sections

Steel plates and sections other than hollow sections effectively sealed by welding	6 mm
Steel hollow sections effectively sealed by welding	5 mm
Aluminium alloy plates and sections	4 mm

5. Dimensional standards

Clearances to highway beneath the bridge

5.1 The vertical clearances to a highway beneath the bridge shall be in accordance with CD 127 [Ref 2.N].

5.1.1 The vertical and horizontal clearances to railways, canals and watercourses should be agreed with the Technical Approval Authority.

5.2 The horizontal clearance from the edge of the carriageway to the footbridge supports shall be a minimum of 4.5 metres over the full height of the carriageway clearance envelope.

5.3 Where there is a possibility that the hard shoulder can be used as a running lane in the future, the design shall account for any specific allowances which have to be made for this.

Minimum width

5.4 The minimum clear width of the footway, ramps and stairs shall be the greater of 2.0 metres or the dimension determined from the following in relation to predicted peak pedestrian traffic:

1) on the level or where the gradient is 1:20 or shallower: 300 mm of width per 20 persons per minute;
2) on steps, or where the gradient is 1:15 or steeper: 300 mm of width per 14 persons per minute; or,
3) for gradients between 1:15 and 1:20, a dimension derived by linear interpolation between 1 and 2.

5.5 Where the footbridge is for shared use by cyclists or equestrians, the design shall also comply with the requirements of section 11.

Headroom clearance on the bridge

5.6 The minimum headroom to the underside of overhead obstacles such as stay cables, roof enclosures or other overhead features, measured vertically from the footway surface across the full width between handrails, shall be in accordance with Table 5.6.

Table 5.6 Minimum headroom clearance on the bridge

For use by pedestrians only	2.3 m
For use by pedestrians and cyclists	2.4 m
For use by dismounted equestrians (dismounting provisions in accordance with section 11)	2.7 m
For use by mounted equestrians	3.7 m

5.7 Where the overhead obstacle is a potentially vulnerable or critical structural component, such as a slender stay cable, or where an important or sensitive feature such as a sign gantry is close to the bridge, the clearance shall be such that it is not easy to reach when standing anywhere on the footbridge, including on raised benches or other raised features where these are provided.

Maximum gradients

5.8 The maximum gradient on the bridge and approach ramps shall not be steeper than 1 in 20 unless special circumstances apply.

5.8.1 Where special circumstances apply, a relaxation in ramp gradient to 1 in 15 may be permitted, or even to 1 in 12 in cases of extreme difficulty.

NOTE *Such special circumstance include locations where a maximum slope of 1 in 20 cannot be achieved for the desired bridge and ramp alignment without either creating a long diversion, causing unacceptable environmental impact, or requiring excessive use of space.*

5.9 Where a relaxation in gradient is applied, landings and changes in direction shall be provided in accordance with section 5.

5.10 Gradients steeper than 1 in 12 shall not permitted.

Landings and horizontal alignment on ramps

5.11 Intermediate horizontal landings shall be provided as follows:

1) for gradients shallower than 1 in 22: intermediate landings are not required;
2) for a gradient between 1 in 20 and 1 in 22: at equal vertical rise intervals of not more than 2.5 metres; and,
3) for gradients steeper than 1 in 20: at vertical rise intervals of not more than 0.65 metres.

5.12 The length of a landing shall not be less than 2.0 metres, measured along the centreline for straight ramps or at 900 mm from the handrail on the inside edge for curved ramps.

5.12.1 Where the gradient is steeper than 1 in 20, there should be a significant change in plan alignment at intervals corresponding to a vertical rise of 3.5 metres.

5.12.2 A change in plan alignment may be achieved by either a change in direction of at least 30 degrees or an offset in the horizontal alignment of at least the width of the footway.

5.12.3 Where ramps have a gradient steeper than 1 in 20, successive sloping ramps in one line may be used where no other arrangement of ramps is possible on the site or where such an arrangement provides more encouragement to pedestrians to use the footbridge by shortening the walking distance or improving the desire line.

Spiral and curved ramps

5.13 The effective gradient and governing dimensions for spiral and curved ramps shall be measured 900 mm from the edge of the footway on the inside of the curve.

5.14 The requirements of the subsection 'Maximum gradients' for plain ramps shall apply to the effective gradient on spiral and curved ramps.

5.15 The minimum inside radius of the footway for curved and spiral ramps shall be 5.5 metres.

5.15.1 Where bridges are designed for use by cyclists and/or equestrians, a larger curve radius may be required.

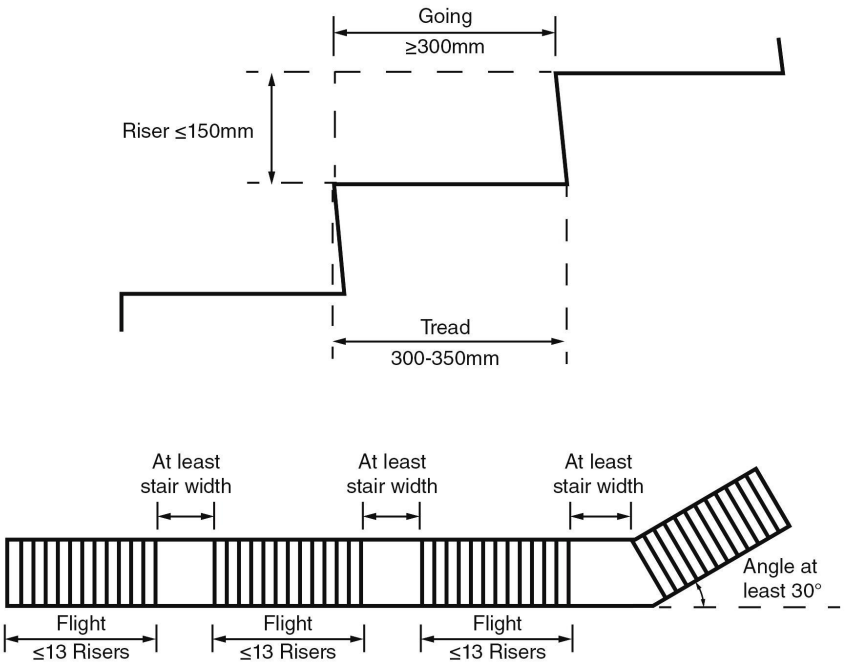
Stairs

5.16 Dimensions and safety requirements for access stairs to footbridges shall comply BS 5395 [Ref 1.N] for 'public' stairs, except as amended in accordance with figure 5.17.

5.17 Public stairs complying with figure 5.17 shall have the following characteristics:

1) number of risers in a single flight: $\leq$ 13;
2) riser dimension: $\leq$ 150 mm be constant over the width of the stair;
3) going dimension: $\geq$ 300 mm;
4) risers and goings of each step in a flight of stairs to be uniform;
5) have a maximum of three successive flights provided any adjacent flights create a change in direction of at least 30 degrees; and,
6) landing lengths to be not less than the width of the stairs or 2 metres, whichever is the greater, measured along the centre line of the stairs.

Figure 5.17 Plan and section of public stair with amended characteristics



5.17.1 Further guidance for dimensional and safety characteristics of public stairs further may be obtained from Dept. for Transport publication Inclusive Mobility [Ref 4.I].

5.18 Stairs shall not have completely open risers.

5.18.1 Risers may be solid or perforated.

5.19 Where perforated risers are provided, the openings shall meet the following requirements:

1) maximum principal dimension of the perforation = 50 mm;
2) maximum ratio of the open area to the total area of the riser = 0.4.

6. Parapets

General

6.1 All bridge spans, ramps and stairs shall be provided with parapets.

6.2 Parapets are an integral part of the bridge and shall be in accordance with CD 351 [Ref 16.N].

NOTE *In addition to providing an essential, robust and durable safety fence, the parapets are a conspicuous visual feature and one that significantly affects the appearance of the bridge and the experience of the user. Their design requires careful assessment and attention to detail.*

6.3 Parapets shall conform to the requirements of CD 377 [Ref 14.N] and the further provisions in this document.

6.4 The height of the edge upstand under the parapet for plain or spiral ramps shall be not less than 25mm and no more than 50mm.

NOTE *An upstand is not required under the parapet on stairs.*

6.5 Where a stair parapet is provided with a bottom rail, the clearance from the rail to the nose of the stairs shall be at least 50mm but not greater than 100mm.

NOTE *The height of a stair parapet is measured vertically above the line joining the noses of the stairs.*

6.6 Glass parapets shall be made of laminated and toughened glass.

6.7 Where a glazed system is proposed, it shall be made from laminated and toughened glass.

6.7.1 Laminated and toughened glass panels should retain sufficient post fracture strength to remain in place within its fixings when they are damaged such that shards created during shattering are retained by the laminated materials.

6.8 A risk assessment shall be undertaken during the selection of the glazing system.

6.8.1 Where a footbridge is exposed to particularly strong winds (such as where it is unusually high above the surrounding ground level), the height of the parapet may be increased to 1.30m with a solid or partially solid infill panel to provide extra protection to users.

6.8.2 As an alternative to raising the height of the parapet an enclosed form of superstructure may be evaluated in order to provide enhance user protection against strong winds.

NOTE *Advice on enclosed footbridges is provided in Section 7 of this document.*

6.8.3 Where parts of the footbridge, ramps or stairs pass close to buildings, the design should incorporate solid parapet infill panels or suitable screening to protect the privacy of bridge users, adjacent residents and others where necessary.

6.9 Where structural members of a footbridge serve as a parapet, the height of the parapet, the infilling of open areas, the upstand at the edge of the walkway surface and the climbability of any part shall be in accordance with the requirements for parapets.

NOTE *The climbability aspect requires particular attention where diagonal members occur at intermediate heights.*

Handrails

6.10 Handrails designed in accordance with BS 8300-1 [Ref 3.N] shall be provided on both sides of:

1) stairs; and,
2) the footway on bridge decks and ramps wherever the gradient exceeds 1 in 20.

6.10.1 Additional central handrails should be provided where the width of the footway exceeds 3 metres.

6.11 The top of the handrail shall be between 900 and 1000 mm above the footway surface, measured vertically.

NOTE *On stairs this height is measured vertically above the line joining the noses of the stair treads.*

6.12 All handrail surfaces shall be smooth and free from sharp edges, and have a clear distance behind the handrail of at least 60 mm to any part of an enclosure or solid obstacle in between the handrail attachments, to allow hands to slide freely along its surface without risk of injury.

6.13 Handrails of circular section shall have a diameter of between 40 and 50 mm.

6.14 Handrails of non-circular section shall have a depth and shape which enables them to be grasped easily by hand.

6.14.1 Non-circular handrails should not be less than 50mm wide by 38mm deep with rounded edges.

6.15 Handrails shall be of contrasting colour or texture from the parapet to which it is attached to assist those with visual impairment.

NOTE *Further guidance on provision of handrails can be obtained in Inclusive Mobility [Ref 4.I].*

6.16 The handrail and its fixings shall be designed to resist a uniformly distributed load of 0.7 kN/m applied separately in the horizontal and vertical directions in such a way that the system is designed for the most severe effects.

NOTE *The loadings applied to the handrail are not to be assessed in addition to the loadings defined for the parapet as a whole.*

7. Enclosed footbridges

7.1 Footbridges shall be designed with full or partial enclosure where it is assessed that there is a particularly high risk of the following:

1) objects being dropped or thrown from the footbridge; or
2) persons jumping onto the carriageway from the footbridge.

7.1.1 Depending on the issues relevant at a particular site, a high parapet with an inward canted top may suffice in place of full enclosure.

7.1.2 Where a footbridge is exposed to very adverse weather or strong winds, such as where it is unusually high above the surrounding ground level, or where it is so high above the road that pedestrians can feel insecure, then full or partial enclosure may be required.

7.2 Where full or partial bridge enclosure is proposed, the aerodynamic and other effects of wind both on the structure and on the comfort of its users shall be investigated and analysed.

7.2.1 Specialist advice may be necessary to assess the aerodynamic and other effects of wind on the structure and comfort of its users.

7.3 Wind tunnel testing shall be considered where reliable design guidance is not available for the form of bridge design.

NOTE Guidance for wind tunnel testing is given in CD 363 [Ref 4.N].

7.4 Cladding and infill panels shall be suitable for their use and location, with a robustness and durability appropriate for the intended lifespan of the footbridge.

7.4.1 Panels (perforated or otherwise) can be of any suitable material, but solid panels which are above the handrail should be transparent, unless otherwise required such as in the case of some equestrian bridges.

7.5 Where cleaning of the outside surfaces of the enclosure is required, the design shall enable this to be carried out in a safe manner.

7.6 The design shall prevent unauthorised public access to the outside of the enclosure.

NOTE 1 Particular care is needed to prevent access to the outside at the ends of the bridge where it is over a cutting.

NOTE 2 Flush glazing on the outside face of the structure is an acceptable form for enclosure of the walls, and arched mesh roofs are an acceptable form for preventing roof access. Other solutions are also possible.

7.7 The minimum clearance inside the enclosure shall comply with Section 5.

8. Drainage

8.1 Provision shall be made for the drainage of water from the footbridge, and from its roof in the case of enclosed footbridges.

8.2 All walkway surfaces, steps, ramps and roof shall have sufficient falls and suitable detailing to allow water to run off in the manner intended by the design.

8.3 With the exception of stair treads and structures with perforated decks, water from the footbridge shall be carried away to a:

1) drainage system; or,
2) soakaway.

8.4 Drainage outlets shall project a suitable distance beyond the adjacent structure to prevent water splashing onto the structure.

NOTE *These requirements are to prevent discharge or spill onto the carriageway or footpaths below the bridge, or staining of adjacent exposed surfaces.*

8.5 Positive drainage shall be provided beneath all deck movement joints, with water being directed away from bearings and bearing shelves.

8.6 Steel decks shall be carefully detailed to ensure the fabrication process does not induce distortions caused by weld shrinkage which could lead to water ponding on the deck.

NOTE *Measures that can be considered to avoid deck distortions include the use of 8mm deck plate spanning no more than 800mm. The deck plate can be cambered to provide a transverse cross fall to the edges of the deck to ensure surface water is shed to the sides and directed to a positive drainage system.*

8.7 The longitudinal profile of the bridge shall be designed with precamber to overcome self-weight and live action deflections whilst maintaining a positive fall to drainage outlets.

8.7.1 The precamber should be sufficient to ensure positive fall to the drains under SLS load conditions including snow loading.

8.8 The design shall ensure that drainage paths and deck camber profiles at landings prevent the possibility of ponding (particularly at corners where the landing is used to allow a change in direction).

8.9 Where a flight of stairs is included within the structure the drainage paths shall be detailed to prevent water ponding at the top and bottom of stair landings and prevent the possibility of water discharging down the steps from adjacent ramps.

8.10 Steps and nosings shall be detailed to prevent water getting trapped on the step (for example due to a nonslip nosing upstand or back fall on the step occurring due to inadequate construction tolerance).

8.11 Where there is a risk of leaf debris falling onto the deck, and also at the base of long ramps, the use of proprietary channel drains with gratings covers shall be avoided.

NOTE 1 *The slots can be become blocked with debris resulting in the drainage becoming ineffective.*

NOTE 2 *On long ramps or steep gradients a large percentage of water can run over the top of any grating.*

8.12 The possibility of water running over the top of any grating system shall be assessed in any drainage design.

8.12.1 A drainage system should, where possible, be provided off the structure upstream of the deck or expansion joint to capture and prevent surplus surface water from reaching the structure from adjacent paved surfaces.

8.13 Erosion protection at drainage discharge points shall be provided to prevent damage to structure foundations and adjacent soft surfaced areas.

8.14 When designing a drainage system, the provision of access shall be evaluated to allow safe periodic/routine maintenance operations to be undertaken.

9. Walkway surface

9.1 The fitness for purpose and choice of the combined substrate/surfacing system for the respective user type shall be:

1) assessed in accordance with the requirements in this section; and,
2) agreed with the Overseeing Organisation.

9.2 The nature of the walkway surfacing system represents a vital part of the overall appearance, character, performance and durability of the bridge, and shall be assessed as an integral part of the design to suit the particular application.

9.3 The suitability of the surfacing system shall be assessed in line with all performance requirements such as corrosion resistance, slip resistance, environmental deterioration, noise transmission, free drainage and durability.

9.3.1 Noise attenuation may be required in some cases, such as on equestrian bridges close to sensitive noise receivers.

NOTE *Proper adhesion of surfacing materials with all parts of the structure is necessary, including with painted elements, ducts, etc.*

9.4 The upper substrate surface of bridge decks, ramps and stairs shall be waterproofed or otherwise protected against deterioration due to water or surface contaminants.

9.5 All traversed surfaces shall be designed to have minimum slip resistance for the life of the walkway surfacing equivalent to a mean corrected pendulum test value of 45 units using a standard skid resistance pendulum test in accordance with BS EN 13036-4 [Ref 15.N].

9.6 Cover plates to expansion joints at deck level shall be flush with the walkway surface and provided with a suitable slip resistant coating or be profiled to provide a non-slip finish.

9.7 The width of any exposed gap in the walkway surface, such as at movement joints, shall not exceed 12mm, taking into account movements due to temperature.

9.8 Where the bridge is designated for use by cyclists, any gap, joint or discontinuity in the bridge deck surface that is aligned within a plan angle of less than 30^{o} to the normal line of travel shall be flush with the surface and such that a bicycle wheel cannot be caught or deflected when it passes over.

NOTE *Gaps, joints and discontinuities include the edges of manhole covers, for example.*

9.9 The installation date and minimum expected life of the surfacing and waterproofing system shall be given in the maintenance manual for the structure.

10. Lighting

10.1 Footbridges shall be illuminated where they are located in areas where public lighting is provided.

10.2 Lighting shall conform to the requirements of BS 5489-1 [Ref 2.I].

10.3 The design shall take into account not only the level and nature of illumination necessary for safety reasons, but also the visual impact and aesthetic character of the lighting scheme when viewed both by users of the bridge and those passing or living nearby.

NOTE 1 Footbridge lighting, where required, is an important aspect of the design and can be a highly significant visual feature during hours of darkness. Refer to the recommendations of CD 351 [Ref 16.N] in respect of the appearance of the bridge at night.

NOTE 2 Lighting design is a specialist field, and in certain cases the input of a specialist lighting designer is needed to achieve the quality of lighting demanded by the bridge and its environment.

10.4 The design shall avoid unnecessarily excessive illumination, and in particularly any direct glare in the eyes of bridge users, drivers passing beneath or other observers.

10.5 Where illumination is provided on the bridge, it shall be consistent to ensure that all walkway surfaces, stairs and handrails are visible.

10.6 Footbridge lighting shall be on a circuit that can be isolated.

10.6.1 Footbridges may be illuminated by means of existing adjacent road or footway lighting, augmented where necessary by additional ground level mounted lighting columns and lanterns.

10.6.2 Where it is not possible or appropriate to illuminate a footbridge by means of existing lighting from the adjacent road or footway, the footbridge may be illuminated by:

1) light fittings incorporated into the parapet or handrail; or,
2) other light fittings mounted on the bridge.

NOTE A covered walkway cannot be lit from existing lighting from the adjacent road or footway.

10.7 All components of the lighting system, including all fittings, connections, wiring and switchgear, shall be robust and tamper proof.

10.7.1 Parapet members should not be used as cable ducts.

10.8 Wherever possible, luminaires shall be accessible by authorised personnel for maintenance without the need to provide special access facilities.

11. Combined use footbridges

General

11.1 The layout and surfacing of the footbridge approaches beyond the ramp and stair ends shall be in accordance with the guidance in CD 143 [Ref 5.N].

NOTE *Further guidance on the layout and surfacing of the footbridge approaches beyond the ramp and stair ends can be obtained in CD 143 [Ref 5.N] .*

11.2 The design for cycle traffic shall be in accordance with CD 195 [Ref 3.I].

11.3 Tactile surfacing for combined use situations shall be in accordance with the requirements of Guidance on the use of tactile paving surfaces PPU 1622RB [Ref 10.N].

Combined use by pedestrians and cyclists

11.4 Footbridges designed for combined pedestrians and cyclists use shall be either segregated or unsegregated.

11.5 The form of segregation shall be consistent over the full length of the footbridge and its approaches.

11.5.1 The form of segregation may not involve a physical dividing barrier.

11.5.2 Differing surface textures and colours may also be used, subject to the requirements of section 9, to differentiate the footway from the cycle path and aid visually impaired users.

11.6 Where the bridge is part of a pedestrian and cycle route, specific provision shall be made in accordance with any guidance on shared use by cyclists and pedestrians provided by the Overseeing Organisation.

11.7 The minimum clear usable widths for the footway and cycle path on shared use bridges and ramps shall be in accordance with Table 11.7.

Table 11.7 Minimum bridge widths for shared use

	Footway	Cycle path	Total
When segregated by a kerb not less than 50mm high	2.0 m	2.7 m	4.7 m
When segregated by a physical barrier not less than 900mm high	2.0 m	3.0 m	5.0 m
When segregated by a white line and/or contrasting surface colours or textures	1.5 m	2.5 m	4.0 m
Unsegregated	-	-	3.5 m

11.8 On bridges designed for use by cyclists, the minimum height of the parapet shall be 1.40 metres.

11.9 Where cyclists are segregated from pedestrians by a physical barrier, the increased parapet height shall only be provided on the cycle track side of the bridge, unless an assessment justifies otherwise.

NOTE *Section 6 contains other requirements for the parapet.*

11.10 Where there is a risk that fast moving cyclists can present a safety hazard to other bridge users, the design shall include suitable features to slow the speed of cyclists to reduce this risk, without hindering the passage of:

1) prams;
2) wheelchairs or mobility and visually impaired users; and,
3) other bridge users such as tandems and cyclists with trailers.

11.10.1 Features for slowing the speed of cyclists may include bollards, chicanes or other devices.

11.10.2 Features for slowing down speed should be located on level landings especially where ramp gradients are steeper than 1 in 20.

11.10.3 Features for slowing should encourage cyclists to slow down without forcing them to dismount.

11.10.4 Unless there is an immediate justification for using barriers or chicanes, they should be omitted.

11.11 The geometry of the bridge approaches shall be such that installation of barriers and chicanes at a later date is possible.

NOTE *Further requirements and advice regarding designing for cycle traffic can be obtained in accordance with CD 195 [Ref 3.I].*

Combined use by pedestrians and equestrians

11.12 Where a bridge is designated for equestrian use, it shall be designed in accordance with the relevant parts of the Eurocodes as implemented by DMRB CD 350 [Ref 17.N].

11.12.1 All bridges catering for equestrians should be designed for combined pedestrian/equestrian use, and can very often be required to accommodate cyclists too.

11.13 The minimum width of a footbridge for combined pedestrian/equestrian use shall be 3.5 metres.

11.13.1 Where a large number of horses are expected to cross the bridge at the same time (such as where the bridge is adjacent to a riding school or stables, for example) a larger width may be required.

11.13.2 In some cases of very frequent use by equestrians as well as pedestrians and/or cyclists it may be necessary to provide suitable physical segregation.

11.14 Where the headroom on the bridge does not conform to the requirements of section 5, suitable signs shall be provided requiring equestrians to dismount.

11.15 The design shall incorporate mounting/dismounting blocks in the approaches to the bridge to assist those who prefer to lead their horse across the bridge.

11.16 Mounting blocks shall not reduce the clear width required for combined pedestrian/equestrian use.

11.16.1 Where mounting blocks are intended they should be located such that the passage of users, including prams and wheelchairs or mobility and visually impaired users is not restricted.

11.16.2 Mounting/dismounting blocks are intended for the convenience of equestrians and may also be provided where the crossing is not part of a designated bridleway.

11.17 Where solid infill panels higher than the minimum height required by section 6 are used in order to reduce the risk of horses being startled by traffic on the carriageway below, the design shall assess the effects on bridge appearance and the potential loss of utility to other users.

11.18 Wherever possible, the design shall provide suitable equestrian waiting areas off the bridge, and permit all users approaching the bridge to see the entire length of the structure, so as to allow mounted users the option of crossing when the deck is clear.

11.19 Suitable signs shall be erected on the approaches to the footbridge to warn other users of the likely presence of horses, and requesting cyclists to take particular care or give way to equestrians.

11.20 On designated bridleways, where the deck is constructed of steel, timber or any other material which can resonate with the sound of horses' hooves and potentially alarm them, a noise attenuating surfacing system shall be used.

11.20.1 On non-designated bridleway bridges, warning signs may be installed to alert equestrian users of sound resonance from the impact of the horses' hooves with the surfacing of the deck.

11.20.2 Such surfacing systems may include dense rubber paving blocks for example.

NOTE *Additional information on tactile surfacing for combined use situations can be obtained in accordance with DETR publication 'Guidance on the use of tactile paving surfaces' PPU 1622RB [Ref 10.N].*

12. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	BSI. BS 5395, 'Code of practice for the design of stairs for limited access'
Ref 2.N	Highways England. CD 127, 'Cross-sections and headrooms'
Ref 3.N	BSI. BS 8300-1, 'Design of an accessible and inclusive built environment, Part 1: External environment - Code of practice'
Ref 4.N	Highways England. CD 363, 'Design rules for aerodynamic effects on bridges'
Ref 5.N	Highways England. CD 143, 'Designing for walking, cycling and horse riding (vulnerable users)'
Ref 6.N	BSI. BS EN 1991-1-7, 'Eurocode 1 - Actions on structures - Part 1-7 General actions - Accidental actions'
Ref 7.N	BSI. BS EN 1991-2, 'Eurocode 1. Actions on structures. Traffic loads on bridges'
Ref 8.N	BSI. NA to BS EN 1990, 'Eurocode: Basis of structural design'
Ref 9.N	BSI. BS EN 1990, 'Eurocode: Basis of structural design'
Ref 10.N	DETR - Dept of the Environment, Transport & Regions. PPU 1622RB, 'Guidance on the use of Tactile Paving Surfaces'
Ref 11.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 12.N	BSI. PD 6688-1-7, 'Recommendations for the design of structures to BS EN 1991-1-7'
Ref 13.N	BSI. PD 6688-2, 'Recommendations for the design of structures to BS EN 1991-2'
Ref 14.N	Highways England. CD 377, 'Requirements for road restraint systems'
Ref 15.N	BSI. BS EN 13036-4, 'Road and airfield surface characteristics. Test methods. Part 4- Method for measurement of slip/skid resistance of a surface: The pendulum test'
Ref 16.N	Highways England. CD 351, 'The design and appearance of highway structures'
Ref 17.N	Highways England. CD 350, 'The design of highway structures'
Ref 18.N	BSI. NA to BS EN 1991-2, 'UK National Annex to Eurocode 1: Actions on structures – Part 2: Traffic loads on bridges'

13. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	BSI. BS 6100, 'Building and civil engineering vocabulary'
Ref 2.I	BSI. BS 5489-1, 'Code of practice for the design of road lighting, Part 1: Lighting of roads and public amenity areas'
Ref 3.I	Highways England. CD 195, 'Designing for cycle traffic'
Ref 4.I	Department for Transport (UK Gov). Inclusive Mobility, 'Inclusive Mobility'
Ref 5.I	The National Archives. legislation.gov.uk. Acts 2010 c.15, 'The Equality Act 2010'

Appendix A. Pedestrian induced dynamic response

A1 Lateral response calculations

Peak lateral deck accelerations induced by pedestrians should be calculated by following the approach described in NA to BS EN 1991-2 [Ref 18.N] and PD 6688-2 [Ref 13.N], but with certain parameters modified to relate to lateral response, rather than vertical.

A1.1 Direction of loading

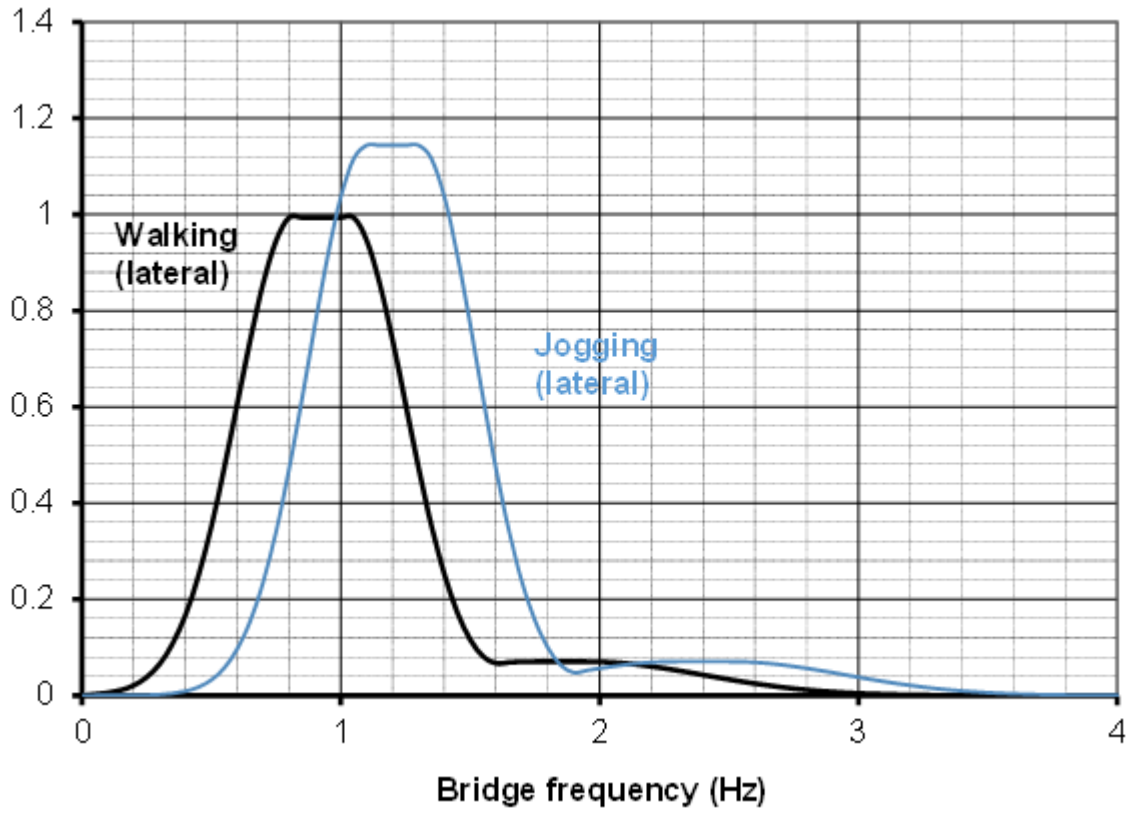
Lateral dynamic loads due to pedestrians should be taken to be in the horizontal plane, orthogonal to the longitudinal axis of the bridge deck.

A1.2 Reference load

The reference load for use in lateral response calculations is F_0 = 70N, for both the walking and jogging cases.

A1.3 Combined population and harmonic factor

Figure A.1 Combined population and harmonic factor for use in lateral response calculations



The combined population and harmonic factor $k(f_v)$, as obtained from figure NA.8 in NA to BS EN 1991-2 [Ref 18.N] for vertical response calculations, should be substituted for a similar parameter $k'(f_{v,lat})$, where $f_{v,lat}$ is the natural frequency of the lateral deck mode being considered. $k'(f_{v,lat})$ to be obtained from figure A.1.

A1.4 Lateral deck acceleration limits

Peak lateral deck accelerations, calculated according to the method described in this appendix, should be compared against the limit recommended in BS EN 1990 [Ref 9.N].

Measures to provide damping should be introduced if the accelerations are above the recommended limits.

Highway Structures & Bridges
Design

CD 353
England National Application Annex to CD 353 Design criteria for footbridges

(formerly BD 29/17)

Revision 0

Summary
There are no specific requirements for Highways England supplementary or alternative to those given in CD 353.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Highways England National Application Annex to CD 353.

Department for Infrastructure
An Roinn Bonneagair

Highway Structures & Bridges
Design

CD 353
Northern Ireland National Application Annex to CD 353 Design criteria for footbridges

(formerly BD 29/17)

Revision 0

Summary
There are no specific requirements for the Department for Infrastructure, Northern Ireland supplementary or alternative to those given in CD 353.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated team in the Department for Infrastructure, Northern Ireland. The email address for all enquiries and feedback is: dcu@infrastructure-ni.gov.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Department for Infrastructure Northern Ireland National Application Annex to CD 353

Highway Structures & Bridges
Design

CD 353
Scotland National Application Annex to CD 353 Design criteria for footbridges

(formerly BD 29/17)

Revision 0

Summary
There are no specific requirements for Transport Scotland supplementary or alternative to those given in CD 353.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Transport Scotland team. The email address for all enquiries and feedback is: TSStandardsBranch@transport.gov.scot

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Transport Scotland National Application Annex to CD 353.

Llywodraeth Cymru
Welsh Government

Highway Structures & Bridges
Design

CD 353
Wales National Application Annex to CD 353 Design criteria for footbridges

(formerly BD 29/17)

Revision 0

Summary
This National Application Annex contains the Welsh Government specific requirements related to design criteria for footbridges.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Welsh Government team. The email address for all enquiries and feedback is: Standards_Feedback_and_Enquiries@gov.wales

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
0	Mar 2020	Welsh Government National Application Annex to CD 353.

Foreword

Publishing information

This document is published by Highways England on behalf of the Welsh Government.

This document supersedes BD 29/17, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

This National Application Annex outlines the implementation requirements for CD 353 Design of footbridges for Wales and should be read in conjunction with the main document

Assumptions made in the preparation of the document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

W/1. Special requirements for Wales

Requirement (CD 353, 2.4)

W/1.1 The following text shall be inserted after Clause 2.4 in CD 353 [Ref 1.N].

W/1.2 In Wales, during the project development and design, a risk assessment shall be undertaken by the designers.

W/1.3 In Wales, when the risk assessment has identified a particular risk associated with unauthorised access then designers shall consider what reasonable measures could be taken to restrict access to the means of suicide.

W/1.3.1 Subject to the agreement of the Technical Approval Authority, consultation may be required with the Local Health Board and health stakeholders to identify reasonable measures to restrict access to the means of suicide.

W/1.3.2 Reference should be made to the current Suicide and Self Harm Prevention Strategy for Wales. Suicide Prevention 2015-2020 [Ref 3.N].

W/2. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	Highways England. CD 353, 'Design criteria for footbridges'
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	Welsh Government. Suicide Prevention 2015-2020, 'Talk to me 2: Suicide and Self Harm Prevention Strategy for Wales 2015-2020'

Design Manual for Roads and Bridges

General Principles and Scheme Governance
General information

GG 119
Road safety audit

(formerly HD 19/15)

Revision 2

Summary
This document provides the requirements for road safety audit for highway schemes on the trunk road and motorway network.

Application by Overseeing Organisations
Any specific requirements for Overseeing Organisations alternative or supplementary to those given in this document are given in National Application Annexes to this document.

Feedback and Enquiries
Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated Highways England team. The email address for all enquiries and feedback is: Standards_Enquiries@highwaysengland.co.uk

This is a controlled document.

Contents

Release notes

Version	Date	Details of amendments
2	Jan 2020	Revision 2 (January 2020) is for an update to superseded references. Revision 1 (January 2019) was for the removal of the health and safety plus equality, diversity and inclusion clauses that are now covered in GG 101. Revision 0 (October 2018) GG 119 replaces HD 19/15. This full document has been re-written to make it compliant with the new Highways England drafting rules. Technical content changes have also been incorporated throughout where relevant.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes HD 19/15, which is withdrawn.

Contractual and legal considerations

This document forms part of the works specification. It does not purport to include all the necessary provisions of a contract. Users are responsible for applying all appropriate documents applicable to their contract.

Introduction

Background

The objective of the road safety audit process is to provide an effective, independent review of the road safety implications of engineering interventions for all road users.

The Overseeing Organisations attach great importance to the improvement of road safety on the motorway and trunk road network. The application of DMRB requirements, that are based on road safety considerations, help achieve this objective.

However, even with the careful application of design standards by competent professionals, the design process will not remove all hazards for road users.

The road safety audit process, as set out in this document, helps manage the interaction of different design requirements for highway schemes.

The objective of road safety audit is to identify aspects of engineering interventions that could give rise to road safety problems and to suggest modifications that could improve road safety. It is important to note that road safety audit is not intended to be a technical check of compliance with design requirements.

Although road safety has always been considered during design, road safety audit has existed for a number of years to provide an independent check that the design characteristics do not contribute to collisions and/or incidents on highway schemes.

Road safety audit is undertaken by staff with experience of collision data analysis, road safety engineering experience and a reasonable understanding of highway design principles such as design requirements and best practice. 2008/96/EC [Ref 1.N] has mandated the road safety audit process and associated qualification requirements across the European Community. It is undertaken at key stages in the design, construction and early operation of a highway scheme.

Although Overseeing Organisations and design teams do not necessarily contain staff with collision data analysis and road safety engineering experience, these organisations play an equally important role alongside road safety audit teams in achieving the objectives of the process. The road safety audit process does not change the Overseeing Organisation's duty to manage safety for all populations and undertake an appropriate level of risk assessment.

This document is sub-divided into sections aimed at the different parties in the road safety audit process. It is expected that all parties will work in partnership (where appropriate) to identify, manage and mitigate the hazards in the most appropriate way.

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 2.N] apply to this document.

It is assumed that the Overseeing Organisation involved in the road safety audit process will provide the appropriate staff resources and technical support to undertake the process. This may include seeking advice from other appropriate individuals.

It is assumed that staff with the appropriate competency and authority within the Overseeing Organisation will be involved in the decision-making process when responding to RSA and deciding upon subsequent actions.

It is assumed that RSA teams have an awareness of the principles of road design.

It is assumed that RSA teams have an awareness of the principles of road safety risk assessments, and that identified RSA actions will be subject to formal design organisation risk assessments prior to implementation.

It is assumed that the design organisation may not be present to assist in stage 4 road safety audits.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the mutual recognition clause in GG 101 [Ref 2.N].

Abbreviations

Abbreviations

Abbreviation	Definition
TERN	Trans-European Road Network
RSA	Road Safety Audit

Terms and definitions

Terms

Term	Definition
Collision data analysis	The collection and examination of historical road traffic collision data over a period of time in order to identify common trends and factors which can justify corrective action.
Design organisation	The organisation(s) commissioned to undertake various phases of scheme preparation. NOTE 1: At some stages of road safety audit, this can be the contractor.
Exemption file note	A note held on file, produced by the Overseeing Organisation, which includes the reasons why road safety audit is not applicable to a highway scheme. NOTE 1: An exemption file note is not a substitute for the production of a departure from standard where road safety audit is applicable but the process is not applied. NOTE 2: An exemption file note template can be found in Appendix A.
Highway scheme	All works that involve construction of new highway or permanent change to the existing highway layout or features. This is also considered to include the EC Directive 2008/96/EC 2008/96/EC [Ref 1.N] term "Infrastructure Project". NOTE 1: Road safety audit is not applicable to all highway schemes and applicability is determined by the Overseeing Organisation. NOTE 2: The applicability requirements for road safety audit can be found in section 2. NOTE 3: The term highway scheme includes road schemes in Scotland.
Interim road safety audit	The application of the road safety audit process to the whole or part of a highway scheme at any time during its design and construction. Interim road safety audit is neither mandatory nor a substitute for the stage 1, 2, 3 and 4 road safety audits.
Like for like maintenance highway schemes	A highway scheme proposed as maintenance works, that solely involves the replacement or refurbishment of a highway feature with a corresponding feature, which as a minimum, will appear the same, be located in the same position, perform the same and be constructed of comparable materials as the feature it replaces.
Maintaining agent	The organisation responsible for the ongoing maintenance of the motorway and all-purpose trunk road network at the highway scheme location.

Terms (continued)

Term	Definition
Overseeing Organisation specialist	A person from the Overseeing Organisation that has the appropriate training, skills and experience in the road safety discipline. NOTE 1: For Highways England, this will be an appropriate person from the Safer Roads-Design team. NOTE 2: For Transport Scotland this will be the Head of Standards. NOTE 3: For Welsh Government this would be a specialist within the Network Management Division of the Transport Department. NOTE 4: For the Department for Infrastructure Northern Ireland this will be a specialist within the Engineering Directorate.
Road safety audit	The review of highway schemes at the completion of preliminary design, completion of detailed design, the completion of construction and as a post opening monitoring exercise. NOTE 1: At stages 1, 2 and 3 the aim is to identify relevant road safety matters and communicate these in the form of road safety audit problems and recommendations. NOTE 2: At stage 4 the aim is to communicate road safety audit problems and recommendations based on collision data analysis.
Road safety audit action	An agreed action recorded in the road safety audit decision log in response to each road safety audit problem raised.
Road safety audit brief	The instructions to the road safety audit team defining the scope and details of the highway scheme to be subject to road safety audit, including sufficient information for the stage of road safety audit to be undertaken.
Road safety audit decision log	A table within the road safety audit response report to record the road safety audit problems and recommendations, the design organisation and Overseeing Organisation responses and agreed road safety audit actions to road safety audit problems.
Road safety audit problem	An identified road safety matter together with a resultant potential road traffic collision type, identified highway scheme location and summary. NOTE 1: This can include road user injuries where there is no identifiable road traffic collision type. NOTE 2: This includes existing road safety matters where the proposed highway scheme impacts the existing road safety matter or vice versa.
Road safety audit recommendation	A proportionate and viable suggestion for improvement to eliminate or mitigate an identified road safety audit problem. NOTE 1: In some circumstances, the recommendation can include further work to be undertaken by the design organisation to establish an appropriate mitigation measure or improvement.

Terms (continued)

Term	Definition
Road safety audit report	The report produced by the road safety audit team describing any road safety problems identified by the road safety audit team and the associated road safety recommendations.
Road safety audit response report	A report produced by the design organisation following road safety audit stages 1, 2 and 3. The report includes both a design organisation and Overseeing Organisation response to each problem and recommendation raised in the road safety audit report. NOTE 1: The road safety audit decision log is part of the road safety audit response report. NOTE 2: The road safety audit response report is produced collaboratively by the design organisation and Overseeing Organisation. NOTE 3: A road safety audit response report is not produced for stage 4 road safety audits.
Road safety audit site visit	A visit to the location of a proposed or completed highway scheme by the road safety audit team and other invitees.
Road safety audit team	A team that works together on all aspects of the road safety audit, independent of the highway scheme conception, design, construction and operation. NOTE 1: The road safety audit team comprises a road safety audit team leader and at least one road safety audit team member. NOTE 2: The road safety audit team observer is not part of the road safety audit team. NOTE 3: The individuals within the road safety audit team can be drawn from different organisations including the Overseeing Organisation and the design organisation.
Road safety audit team leader	A person with the appropriate training, skills and experience who is approved for a particular highway scheme and road safety audit stage by the Overseeing Organisation. NOTE 1: The road safety audit team leader is responsible for leading the road safety audit team through the process and managing the production of the road safety audit report.
Road safety audit team member	A member of the road safety audit team with the appropriate training, skills and experience necessary for a particular highway scheme and road safety audit stage, working with the road safety audit team leader.
Road safety audit team observer	A person with the appropriate training, skills and experience accompanying the road safety audit team to gain experience of the road safety audit process and/or highway scheme type. NOTE 1: The road safety audit team observer is encouraged to contribute to the road safety audit team discussions.

Terms (continued)

Term	Definition
Road safety engineering	The design and implementation of highway schemes intended to reduce the number and severity of collisions involving road users, drawing on the results of collision data analysis.
Road safety matters	An element of the existing road environment or proposed road environment that could potentially contribute to a road traffic collision or features that could present a risk of injuries to road users.
Road traffic collision	As defined as personal-injury road traffic accident in Reported Road Casualties in Great Britain STATS19 [Ref 3.I].
Specialist advisor	A person approved by the Overseeing Organisation to provide specialist independent advice to the road safety audit team where the scheme includes features outside the experience of the road safety audit team. NOTE 1: Features can include complex traffic signal controlled junctions or smart motorway technology.
Strategic decision	A decision agreed by the Overseeing Organisation on an element that already reflects an appropriate balance of a number of factors including road safety. NOTE 1: This can include items such as route choice, junction type and standard of provision.
Third party organisation	Organisations that are not working on behalf of the Overseeing Organisation and are promoting a highway scheme on the Overseeing Organisation's highway network. NOTE 1: A third party organisation can be a government department, government owned company, developer, local authority, statutory undertaker, private individual, private organisation or consultant working for any of these parties.

1. Scope

Aspects covered

1.1 This document shall be used to implement road safety audit on highway schemes on motorways and all-purpose trunk roads.

NOTE 1 Highway schemes include:

1) work carried out under agreement with the Overseeing Organisation resulting from developments that affect the trunk road and motorway network; or

2) a highway scheme being promoted by third party organisations.

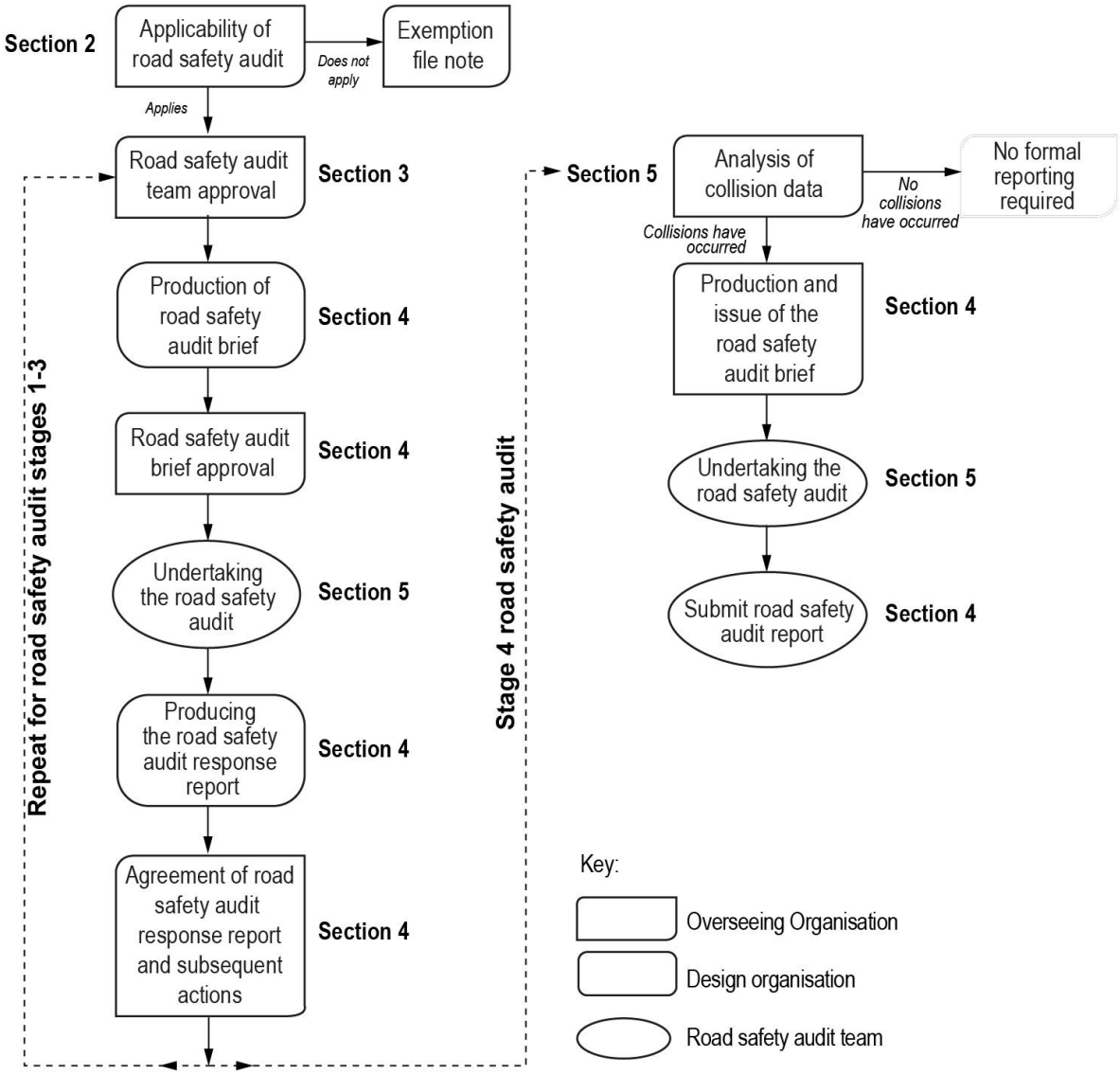
NOTE 2 The operational safety of temporary traffic management for the construction of highway schemes is covered by chapter 8 of the Traffic Signs Manual TSM Chapter 8 [Ref 3.N].

1.2 The Overseeing Organisation shall determine the applicability of road safety audit to highway schemes using section 2 of this document.

1.3 Where road safety audit is applied to a highway scheme, it shall be undertaken at each of the following stages:

1) Stage 1 - Completion of preliminary design.
2) Stage 2 - Completion of detailed design.
3) Stage 3 - Completion of construction.
4) Stage 4 - Post opening monitoring.

Figure 1.3 Road safety audit process overview



NOTE *Figure 1.3 provides an overview of the road safety audit process and the relevant sections of this document.*

Implementation

1.4 This document shall be implemented forthwith on all highway schemes on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 2.N].

NOTE 1 *Like for like maintenance highway schemes are excluded from road safety audit.*

NOTE 2 *An exemption file note is not required for like for like maintenance highway schemes.*

Use of GG 101

1.5 The requirements contained in GG 101 [Ref 2.N] shall be followed in respect of activities covered by this document.

2. Applicability of road safety audit

Trunk road and motorway network

2.1 Where there are physical changes to the highway impacting on road user behaviour or resulting in a change to the outcome of a collision on the trunk road and motorway network, road safety audit (RSA) shall apply, regardless of the procurement method.

NOTE *Temporary traffic management and temporary changes to the highway not associated with the construction of a highway scheme, and that last longer than 6 months in duration, are considered to be physical changes to the highway.*

2.2 RSA shall not apply where a physical change to the highway will not impact on road user behaviour, or change the outcome of a collision on the trunk road and motorway network.

2.3 The Overseeing Organisation shall produce an exemption file note to be kept on the scheme file (or equivalent) where there is no need to apply RSA on the trunk road and motorway network.

NOTE *An exemption file note template is provided in appendix A.*

Trans-European Road Network (TERN)

2.4 In accordance with the European Directive on Road Infrastructure Safety Management 2008/96/EC [Ref 1.N], RSA must be applied to highway schemes on the TERN.

3. Road safety audit team requirements

RSA team structure

3.1 At all RSA stages the RSA team shall be comprised of the RSA team leader and at least one RSA team member.

3.1.1 RSA team observers may observe the RSA team to gain experience in carrying out RSA.

3.2 The number of RSA team observers shall be limited to a maximum of two.

3.3 The RSA team shall be independent from the highway scheme conception, design, construction and operation.

Specialist advisors

3.4 Where required by the RSA team, specialist advisors shall be approved by the Overseeing Organisation.

3.5 A specialist advisor shall be independent of the RSA team and highway scheme conception, design, construction and operation.

Audit team approval

3.6 The Overseeing Organisation shall approve the proposed RSA team before the RSA is undertaken.

3.6.1 The Overseeing Organisation may ask the design organisation to propose a RSA team on their behalf for approval by the Overseeing Organisation.

3.7 RSA team approval shall be recorded within the highway scheme file and communicated to the RSA team.

3.7.1 Approvals of the RSA team are scheme and RSA stage-specific and the use of personnel or organisations on previous RSAs should not guarantee their suitability to undertake a RSA on other schemes.

3.8 Proposed members of the RSA team shall demonstrate their competency by means of a road safety specific curriculum vitae (CV) detailing training, continuing professional development (CPD) and experience.

3.8.1 Experience should be relevant to the type of scheme being subject to RSA and identified in the proposed RSA team members' CV.

NOTE 1 The CPD record in the CV used to demonstrate competence for a proposed member of the RSA team can include other areas such as highway design, traffic management and highway maintenance.

NOTE 2 Relevant CPD does not have to take the form of formal training courses.

NOTE 3 Outcome-based structured reading, the preparation and presenting of relevant material and work based learning can all form part of a CPD record.

3.8.2 Table 3.8.2 should be used for reference when reviewing the training, CPD and experience of the RSA team:

Table 3.8.2 RSA team competency

	RSA team observer	RSA team member	RSA team leader
Training	10 days of formal collision data analysis or road safety engineering/road design training	10 days of formal collision data analysis or road safety engineering/road design training	10 days of formal collision data analysis or road safety engineering/road design training
CPD	N/A	A minimum of 2 days CPD in the field of RSA, collision data analysis or road safety engineering in the last 12 months	A minimum of 2 days CPD in the field of RSA, collision data analysis or road safety engineering in the last 12 months
Experience	1 year of collision data analysis or road safety engineering/road design experience	2 years of collision data analysis or road safety engineering/road design experience	4 years of collision data analysis or road safety engineering/road design experience
	N/A	5 RSAs completed within the last 24 months as team leader, member or observer	5 RSAs completed within the last 12 months as team leader or member

NOTE 1 *Whilst it is not intended that the RSA team have extensive detailed design knowledge, it is important to include RSA team members with experience or training in road design.*

NOTE 2 *Experienced road safety professionals who are proposed for the RSA team can have developed their careers from a range of backgrounds.*

NOTE 3 *RSA team observers are not part of the RSA team.*

3.8.3 Proposed members of the RSA team with the recommended experience of collision data analysis and road safety engineering should not be accepted where this is not evident within the previous 24 months.

3.9 At least one individual within the RSA team undertaking RSA on the motorway and/or trunk road network must hold a certificate of competency in RSA in accordance with the requirements of the European Directive on Road Infrastructure Safety Management 2008/96/EC [Ref 1.N], acquired according to appendix G of this document.

4. RSA process requirements

4.1 The Overseeing Organisation shall initiate the RSA process at all stages, allowing time for all parties to complete the full RSA process.

Producing the RSA brief

4.2 The design organisation shall prepare the RSA brief for submission to the Overseeing Organisation for stage 1, 2 and 3 RSAs.

4.3 The Overseeing Organisation shall have responsibility for approving and issuing the RSA brief to the RSA team.

4.4 For stage 4 RSAs, and where there is no design organisation available, the Overseeing Organisation shall prepare and approve the RSA brief for submission to the RSA team.

NOTE A RSA brief template is provided in appendix C.

4.5 Where the RSA team has identified that the RSA brief is insufficient for their purpose, a request for further information shall be made to the Overseeing Organisation.

4.5.1 Any information requested but not supplied to the RSA team should be identified in the introduction to the RSA report.

Producing the RSA report

4.6 The RSA team leader shall be responsible for leading the RSA team through the process and managing the production of the RSA report.

4.7 The RSA team shall produce and issue a RSA report directly to the Overseeing Organisation for all stages.

4.8 Any misinterpretations of the highway scheme proposals shall be identified by the Overseeing Organisation and discussed with the RSA team.

4.9 Anything agreed to be outside of, or not covered by the RSA process or RSA brief shall be identified by the Overseeing Organisation and discussed with the RSA team.

4.10 Where changes are agreed to a RSA report between the RSA team and Overseeing Organisation, a revised version of the RSA report shall be produced by the RSA team and issued to the Overseeing Organisation.

NOTE A RSA report template for RSA stages 1, 2 and 3 is provided in appendix D.

Producing the RSA response report

4.11 A RSA response report shall be produced for stage 1, 2 and 3 RSAs.

NOTE A RSA response report is not be required for stage 4 RSAs.

4.12 The design organisation shall manage the production of the RSA response report in collaboration with the Overseeing Organisation.

4.13 The RSA response report shall include a summary of the scheme, the stage of RSA, the RSA report document reference and date of the RSA report it relates to.

4.14 The RSA response report shall contain details of the representatives from the design organisation who prepared the RSA response report.

4.15 The RSA response report shall contain a RSA decision log to include a reiteration of each road safety problem and recommendation made in the RSA report.

4.16 The design organisation shall, for each RSA problem and recommendation, do one of the following:

1) accept the RSA problem and recommendation made by the RSA team;

2) accept the RSA problem raised, but suggest an alternative solution, giving appropriate reasoning; or
3) disagree with the RSA problem and recommendation raised, giving appropriate reasoning for rejecting both.

4.17 The RSA response report shall contain a response from the Overseeing Organisation and a RSA action for each problem agreed between the design organisation and Overseeing Organisation.

4.18 The RSA response report shall be signed by the Overseeing Organisation and design organisation to indicate their agreement on the RSA actions.

4.18.1 The RSA response report should be produced and finalised within one month of the issue of the RSA report.

NOTE *Appendix F shows a RSA response report and RSA decision log template.*

4.19 For each RSA action, either the design organisation or Overseeing Organisation shall be responsible for its implementation.

Subsequent actions

4.20 The Overseeing Organisation shall keep a record of all RSA reports and RSA response reports on the highway scheme file.

4.20.1 The Overseeing Organisation should provide electronic copies of the RSA reports and RSA response reports to the Overseeing Organisation specialist.

4.20.2 The Overseeing Organisation should provide an electronic copy of the RSA response report to the RSA team for information.

Repeating a RSA stage

4.21 Where the Overseeing Organisation deems a repeat RSA to be necessary, the repeated RSA shall only be concerned with the elements of the scheme that have been changed.

NOTE *The design organisation or Overseeing Organisation can request a RSA stage to be repeated where multiple changes or significant changes to the highway scheme are likely to have an impact on road user behaviour or the outcome of a collision.*

4.22 Stage 1 and stage 2 RSAs shall be repeated if the previous RSA for the relevant stage is more than 5 years old.

Communication

4.23 The design organisation and Overseeing Organisation shall agree an appropriate method of communication with the RSA team to maintain the RSA team independence.

4.23.1 All communication should be recorded, including minutes of meetings if these are held.

5. Undertaking the road safety audit

Scope of road safety audit

5.1 RSA shall only be concerned with road safety matters.

NOTE 1 RSA is not a technical check that the design conforms to standards and/or best practice guidance.

NOTE 2 RSA is not a check that the scheme has been constructed in accordance with the design.

NOTE 3 RSA does not consider structural safety.

NOTE 4 RSA does not cover health and safety issues concerning road workers during the construction, maintenance and operation of the road.

5.2 Road safety matters resulting from the operation of facilities for highway maintenance that affect road users shall be included in the scope of RSA.

5.3 The needs of all road users shall be assessed when undertaking the RSA.

Road safety audit brief

5.4 The RSA brief shall define the scope of the RSA to be undertaken.

5.5 Where the design of the highway scheme includes strategic decisions, this shall be clearly identified within the RSA brief.

5.5.1 The Overseeing Organisation should give sufficient notice to the RSA team of when the scheme will be ready for RSA and the date by which the RSA report will be required.

5.6 A RSA brief shall be stage-specific.

5.6.1 The RSA brief should contain the relevant information for each stage as identified within appendix C.

Road safety audit report

5.7 At all stages, the RSA team shall prepare a written RSA report.

5.8 The RSA report shall contain a separate statement for each identified RSA problem describing the location and nature of the problem and the type of collisions or road user injuries likely to occur as a result of the problem.

5.9 Each RSA problem shall be followed by an associated RSA recommendation.

5.10 The RSA team shall provide proportionate and viable RSA recommendations to eliminate or mitigate the identified RSA problems.

5.11 RSA recommendations including the words "consider" and "must" shall not be used.

NOTE The use of the word 'must' in RSA recommendations has the potential to be misinterpreted as an instruction from the RSA team.

5.12 Recommendations to 'monitor' shall only be made where a need to supplement the stage 4 RSA is specifically identified in terms of frequency and incidence of particular vehicle manoeuvres or collision contributory factors and the monitoring task can be specifically allocated.

5.13 RSA reports shall include:

1) identification of the RSA stage including a unique document reference number and any details of revisions;
2) a brief description of the highway scheme including details of its location and its objectives;
3) details of who supplied the RSA brief, who approved the RSA brief and who approved the RSA team;
4) identification of the RSA team membership as well as the names of others contributing such as the police, maintaining agent and specialist advisors;

5) details of who was present at the site visit, the date and time period(s) when it was undertaken and what the site conditions were on the day of the visit (weather, traffic congestion, etc.);
6) a location plan based on the scheme plan(s), marked up and referenced to problems and if available, photographs of the problems identified;
7) a statement, signed by both the RSA team leader and the RSA team member(s) in the format given in appendix D;
8) a list of information provided to the RSA team.

5.14 The RSA team shall not include any issues in the RSA report that have no implications on road user safety or any other items not covered by the RSA brief.

NOTE *Examples of inappropriate issues include maintenance defects observed during site visits and health and safety issues.*

5.15 The RSA team leader shall report any comments on issues that are not covered by the RSA brief directly to the Overseeing Organisation.

5.15.1 Maintenance defects noted during site visits should be immediately reported directly to the maintaining agent and the Overseeing Organisation.

Stages of road safety audit

5.16 Highway schemes shall be subject to RSA at stages 1, 2, 3 and 4.

NOTE 1 *General aspects to be addressed at RSA stages 1, 2 and 3 are provided in the lists in appendix B of this document.*

NOTE 2 *The lists provided in appendix B are not intended to be exhaustive and provide a prompt for optional supplementary checks.*

NOTE 3 *A RSA report template is shown in appendix D for stages 1, 2 and 3 and a stage 4 RSA report template is contained in appendix E.*

5.16.1 Interim RSA may be applied at stages 1, 2 and 3.

Stage 1 road safety audit - Completion of preliminary design

5.17 Stage 1 RSA shall be undertaken at the completion of preliminary design, (for example at the order publication report stage) before publication of draft orders.

NOTE *The end of the preliminary design stage is often the last occasion at which land requirements can have the potential to be changed.*

5.17.1 Stage 1 RSA should include road safety matters which have a bearing upon land take, licence or easement before the draft orders are published or planning consent is applied for.

5.17.2 Where preliminary design is not undertaken, a stage 1 RSA may be combined with a stage 2 RSA at the detailed design stage.

5.18 The RSA team shall review the preliminary design information provided with the RSA brief.

NOTE *Aspects that typically form the focus of the stage 1 RSA are included as appendix B.*

5.19 Site visits shall be carried out in accordance with the requirements under section 5 road safety audit site visits.

Stage 2 road safety audit - Completion of detailed design

5.20 Stage 2 RSA shall be undertaken at the completion of the detailed design stage.

NOTE *At stage 2, the RSA team focuses on the more detailed aspects of the highway scheme.*

5.21 The RSA team shall review the detailed design information provided with the RSA brief.

NOTE *Aspects that typically form the focus of the stage 2 RSA are included as appendix B.*

5.22 The stage 2 RSA shall include a review of the RSA actions in the stage 1 RSA response report.

5.23 RSA problems and recommendations relating to incomplete RSA actions in the stage 1 RSA shall be reiterated at the stage 2 RSA.

5.24 Site visits shall be carried out in accordance with the requirements under section 5 road safety audit site visits.

Stage 3 road safety audit - Completion of construction

5.25 The stage 3 RSA shall be undertaken when the highway scheme construction is complete.

5.25.1 The stage 3 RSA should be undertaken before the scheme has opened to avoid the need for the RSA team to traverse the site when fully open to traffic.

5.25.2 Where the stage 3 RSA cannot be undertaken before opening, alternative arrangements should be agreed with the Overseeing Organisation.

NOTE *Alternative arrangements include the RSA being carried out a short time after opening or in phases where a scheme is subject to phased completion and opening.*

5.25.3 The RSA team leader should discuss any alterations recommended at the stage 3 RSA with the Overseeing Organisation to give the opportunity for modifications to be undertaken before opening.

NOTE *Early implementation of alterations recommended at the stage 3 RSA has the potential to provide a safer working environment for the workforce and minimise delays to road users.*

5.26 Stage 3 RSAs shall be carried out within 1 month of opening unless otherwise agreed with the Overseeing Organisation.

5.27 RSA problems and recommendations raised in the stage 1 and stage 2 RSA shall be reviewed at the stage 3 RSA and reiterated if the associated RSA actions are not complete.

5.28 The RSA team shall review the information provided with the RSA brief.

NOTE *Aspects that typically form the focus of the stage 3 RSA are included as appendix B.*

5.29 Site visits shall be carried out in accordance with the requirements under section 5 Road safety audit site visits.

5.29.1 Where there is an accessibility issue that restricts the RSA team from accessing areas of the site, reference to this should be included in the introduction of the RSA report.

NOTE *An example of an accessibility issue is an area of live motorway that cannot be accessed on foot.*

5.30 The RSA team shall examine the highway scheme from the viewpoints of all road users.

5.30.1 The RSA team may decide to drive, walk, cycle and/or ride a horse through the scheme to assist their evaluation.

5.31 The RSA team shall visit the site together in daylight and during the hours of darkness.

NOTE *The purpose of a site visit during darkness is to identify hazards specific to night time operation.*

Stage 4 road safety audit - Post-opening monitoring

5.32 The Overseeing Organisation shall arrange for stage 4 RSA to be undertaken.

NOTE *The stage 4 RSA is an evidence-led review of road traffic collisions that have occurred in the vicinity of the highway scheme.*

5.33 Stage 4 RSA shall be carried out using 12 months of validated post highway scheme-opening road traffic collision data.

NOTE 1 *Stage 4 RSAs are carried out so that any post highway scheme-opening road safety matters can be identified and remedial action taken.*

NOTE 2 *The lag in availability of validated road traffic collision data means the RSA can occur later than 12 months from the opening of the highway scheme.*

NOTE 3 *The availability of validated road traffic collision data varies depending on the individual Overseeing Organisation.*

5.34 A stage 4 RSA report shall be produced where road traffic collisions have been recorded in the vicinity of the highway scheme over the 12 month period of validated road traffic collision data.

NOTE *A stage 4 RSA report is not needed where no road traffic collisions have been recorded in the vicinity of the highway scheme over the 12 month period of post-opening validated road traffic collision data.*

5.35 If the Overseeing Organisation decides not to proceed further with the stage 4 RSA reporting, this decision shall be recorded, and kept on the highway scheme file (or equivalent).

5.36 Where a stage 4 RSA report is required, a RSA brief shall be prepared and issued to the RSA team by the Overseeing Organisation.

5.36.1 The production of the RSA brief may be delegated to the design organisation where they are retained post highway scheme completion.

5.36.2 Where there have been highway layout changes following the period the scheme first became operational, the stage 4 RSA brief should make reference to these changes.

5.36.3 Where operational data exists, this should be provided with the RSA brief to enable the RSA team to understand the implications of any road safety matters that have not resulted in reported collisions.

5.37 The stage 4 RSA report shall include any RSA problems indicated by the road traffic collision data analysis and operational data, and where necessary, include RSA recommendations for remedial action.

NOTE *A stage 4 RSA report template is provided in appendix E.*

5.38 During the stage 4 RSA, road traffic collision data shall be analysed in detail by the RSA team to identify:

1) higher than expected numbers of road traffic collisions that have occurred since the scheme became operational (when compared to control data);
2) locations at which road traffic collisions have occurred; and
3) road traffic collisions that appear to arise from similar causes or show common factors or trends.

5.38.1 The analysis of road traffic collision data should include identification of changes in the collision trends in terms of number, rate (taking account of any traffic flow changes), types and other collision variables, and comparisons with control data.

5.39 The RSA team shall visit the sites of highway schemes if characteristics within the road traffic collision data show:

1) higher than expected numbers of road traffic collisions have occurred since the scheme became operational (when compared to control data); or
2) the road traffic collision rate or severity has increased since the scheme became operational; or
3) common trends (e.g. a high frequency of road traffic collisions during the hours of darkness or on a wet road surface); or
4) road safety matters related to vulnerable road users.

5.39.1 Where a site visit is needed, the RSA team should decide if the road traffic collision data analysis justifies an inspection during a particular time period and record their decision making within the RSA report.

NOTE *A particular time period could be during the hours of darkness or a peak period.*

Road safety audit site visits

5.40 Site visits shall be carried out by all members of the RSA team together.

5.41 Site visits shall be limited to a maximum of 6 people.

NOTE Site visit numbers include the RSA team and any additional specialist advisors, police and maintaining agent representatives.

5.42 Table 5.42 shall be used for determining site visit requirements for each RSA stage:

Table 5.42 RSA site visit requirements

RSA stage	Visits	Attendees	Invitees
Stage 1	Daytime	RSA team	As determined by RSA team
Stage 2	Daytime		
Stage 3	Daytime and darkness		Police representative Maintaining agent representative
Stage 4	As required by clause 5.39 (section 5, stage 4 road safety audit - post-opening monitoring)	RSA team	As determined by RSA team

NOTE Police and maintaining agent representation can be included at all stages of RSA if deemed beneficial and approved by the Overseeing Organisation.

5.43 The RSA team shall determine the need to vary the time of the site visit to observe specific traffic conditions at all stages of RSA.

NOTE Specific traffic conditions can include peak periods, the beginning or end of the school day or during frequent events.

Interim RSA

5.44 The Overseeing Organisation shall decide whether to undertake an interim RSA.

NOTE 1 Interim RSA can provide the benefit of early identification of potential road safety problems leading to savings in both programme and design costs.

NOTE 2 Interim RSA is particularly beneficial to larger projects with accelerated programmes, such as highway schemes involving early contractor involvement.

NOTE 3 Interim RSA supplements the RSA at stages 1, 2 and 3.

NOTE 4 Interim RSA does not replace a particular stage of RSA.

5.45 The RSA process for an interim RSA shall be completed in accordance with the requirements of the relevant RSA stage.

5.45.1 Interim RSA may be undertaken during the construction process with the agreement of the Overseeing Organisation.

5.45.2 Elements of the constructed scheme may be subjected to interim RSA, when works are partially complete or when individual elements or sections of the scheme are complete and opened to road users in stages.

Third party organisation-led RSA

5.46 Where third party organisation-led schemes have the potential to result in highway schemes on the trunk road and motorway network, the process set out in this document shall be followed for all stages of RSA including appointment and approval of the RSA team.

NOTE *The highway scheme can be designed by an organisation working for the third-party organisation rather than an organisation working for the Overseeing Organisation.*

5.46.1 A stage 1 RSA report should be undertaken before planning consent is applied for as this demonstrates that the potential for road user safety issues has been addressed.

NOTE *The third party organisation-led scheme is submitted for planning approval to the local planning authority and, where there are highway implications, the highway or Overseeing Organisation is consulted.*

6. Certificate of competency curriculum

Training and assessment

6.1 The curriculum core modules provided in appendix G shall be used to provide appropriate RSA certificate of competency training and assessment.

NOTE 1 There are two routes through which a certificate of competency can be obtained – a portfolio of evidence route or a training route.

NOTE 2 Details of the two routes are also provided in appendix G.

Authorisation of certificate of competency

6.2 Organisations wishing to offer a certificate of competency shall have their assessment and certification processes reviewed and accepted in writing by the Highways England Safer Roads-Design team.

NOTE Highways England's Safer Roads-Design team fulfils this role on behalf of the other Overseeing Organisations.

6.3 Organisations offering a certificate of competency training course shall be independent of the candidate's employer.

6.4 Prior to the issue of a certificate of competency, organisations offering a training course shall assess the candidate's suitability as RSA team member and RSA team leader against the training, skills and experience guidance in section 3.

Certificate of competency validity

6.5 The certificate of competency shall not have a finite validity period.

NOTE It is not intended that holding a certificate of competency will require a mandatory membership of an organisation.

Certificates of competency awarded before implementation of EC Directive

6.6 Certificates of competency awarded before the implementation of the 2008/96/EC [Ref 1.N] shall be recognised.

6.6.1 Certificates of competency in RSA awarded in other European Union countries outside the UK may be acceptable.

7. Normative references

The following documents, in whole or in part, are normative references for this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ref 1.N	2008/96/EC, 'Directive 2008/96/EC of the European Parliament and of the Council of 19 November 2008 on road infrastructure safety management '
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	The Stationery Office. TSM Chapter 8, 'Traffic Signs Manual Chapter 8 - Road works and temporary situations'

8. Informative references

The following documents are informative references for this document and provide supporting information.

Ref 1.I	The Stationery Office. Legislation.gov.uk. CM&CHA 2007, 'Corporate Manslaughter and Corporate Homicide Act (2007)'
Ref 2.I	The National Archives. legislation.gov.uk. Highways Act 1980, 'Highways Act 1980'
Ref 3.I	gov.uk. STATS19, 'Reported road casualties in Great Britain'
Ref 4.I	National Policing Improvement Agency. Association of Chief Police Officers. RDIM, 'Road Death Investigation Manual'
Ref 5.I	The National Archives. legislation.gov.uk. Road Traffic Act 1988, 'Road Traffic Act 1988'
Ref 6.I	The Stationery Office. Roads(S) 1984, 'Roads (Scotland) Act 1984'
Ref 7.I	Highways England. GG 142, 'Walking, cycling and horse-riding assessment and review'

Appendix A. Exemption file note template

A1 Highway scheme details

Details of the highway scheme proposed for exemption from the road safety audit process are provided below.

Table A.1 Highway scheme name, location and description

A2 Exemption statement

In accordance with GG 119 road safety audit I have examined the details of the above highway scheme.

For the reason/s set out below, the highway scheme is considered exempt from road safety audit as there is no impact on road user behaviour for all potential road users in this location and there will be no adverse changes to the outcome of a collision.

Table A.2 Reasons for exemption

A3 Overseeing Organisation approval

The Overseeing Organisation approval for the exemption from the road safety audit process is provided below.

Table A.3 Overseeing Organisation approval

Name:	
Role:	
Organisation:	
Signature:	
Date:	

Appendix B. Road safety audit checklists

Road safety audit checklists are outlined on the next page.

Table B.1 LOCAL ALIGNMENT

Stage 1	Stage 2	Stage 3
Visibility		
Are horizontal and vertical alignments consistent with required visibility? Will sight lines be obstructed by permanent or temporary features e.g. bridge abutments and parked vehicles?	Are sight lines obstructed by: 1. safety fences; 2. boundary fences; 3. street furniture; 4. parking facilities; 5. signs; 6.landscaping; 7.structures; 8.environmental barriers; 9.crests; 10.features such as buildings, plant or materials outside the highway boundary? Is the forward visibility of at-grade crossings sufficient to ensure they are conspicuous?	Are the sight lines clear of obstruction?
New/existing road interface		
Will the proposed scheme be consistent with the standard of provision on adjacent lengths of road and if not, is this made obvious to the road user? Does interface occur near any potential hazard, i.e. crest, bend after steep gradient?	Where a new road scheme joins an existing road, or where an on-line improvement is to be constructed, will the transition give rise to potential hazards? Where the road environment changes (e.g. urban to rural, restricted to unrestricted) is the transition made obvious by appropriate signing and carriageway markings?	Is there a need for additional signs and/or road markings?
Vertical alignment		
Are climbing lanes to be provided? Will the vertical alignment cause any "hidden dips"?		

Table B.2 GENERAL

Stage 1	Stage 2	Stage 3
Departures from standards		
What are the road safety implications of any approved departures from standards or relaxations? (Are these strategic decisions within the scope of the RSA?)	Consider road safety aspects of any departures granted since the stage 1 RSA.	Are there any adverse road safety implications of any departures from standard granted since the stage 2 RSA?
Cross sections and cross-sectional variation		
How safely do the cross-sections accommodate drainage, ducting, signing, fencing, lighting and pedestrian, cyclist and equestrian routes? Could the scheme result in the provision of adverse camber? What are the road safety implications if the standard of the proposed scheme differs from adjacent lengths of highway?		
Landscaping		
Could areas of landscaping conflict with sight lines (including during windy conditions)?	Could planting (new or when mature) encroach onto the carriageway or obscure signs or sight lines (including during windy conditions)? Could earth bunds obscure signs or visibility? Could trees (new or when mature) be a hazard to an errant vehicle? Could planting affect lighting or shed leaves on to the carriageway?	Could planting obscure signs or sight lines (including during periods of windy weather)? Do earth bunds obscure signs or visibility? Could trees (new or when mature) be a potential hazard to an errant vehicle? Could planting affect lighting or shed leaves onto the carriageway?
Climatic conditions		
	Is there a need for specific provision to mitigate effects of fog, wind, sun glare, snow, and ice?	Are any extraordinary measures required?

Table B.2 GENERAL (continued)

Stage 1	Stage 2	Stage 3
Drainage		
Will the new road drain adequately, or could areas of excess surface water result? Could excess surface water turn to ice during freezing conditions? Could excessive water drain across the highway from adjacent land?	Do drainage facilities (e.g. gully spacing, gully locations, flat spots, crossfall, ditches) appear to be adequate? Are features such as utility covers or gullies located within footpaths, cycle routes or equestrian routes? Are features such as utility covers or gullies located in the likely wheel tracks for motorcyclists or cyclists? Do they give concern for motorcyclist/cyclist stability? Is surface water likely to drain across a carriageway and increase the risk of aquaplaning under storm conditions?	Does drainage of roads, cycle routes and footpaths appear adequate? Are drainage features such as utility covers or gullies located within footpaths, cycle routes or equestrian routes? Are features such as utility covers or gullies located in the likely wheel tracks for motorcyclists or cyclists? Do they give concern for motorcyclist/cyclist stability?
Lay-bys		
Has adequate provision been made for vehicles to stop off the carriageway including picnic areas? How will parked vehicles affect sight lines? Could lay-bys be confused with junctions? Is the lay-by located in a safe location (e.g. away from vertical crests or tight horizontal alignments with limited visibility)?	Have lay-bys been positioned safely? Could parked vehicles obscure sight lines? Are lay-bys adequately signed? Are picnic areas properly segregated from vehicular traffic?	

Table B.2 GENERAL (continued)

Stage 1	Stage 2	Stage 3
Public utilities/services apparatus		
Could utility apparatus be struck by an errant vehicle? Could utility apparatus obscure sight lines?	Can maintenance vehicles stop clear of traffic lanes? If so, could they obscure signs or sight lines? Are boxes, pillars, posts and cabinets located in safe positions away from locations that may have a high potential of errant vehicle strikes? Do they interfere with visibility? Has sufficient clearance to overhead cables been provided? Have any special accesses/parking areas been provided and are they safe? Are there any utility inspection chambers in live traffic lanes and/or wheel tracks including those of motorcyclists or cyclists? Do they give concern for motorcyclist/ cyclist stability?	Can maintenance vehicles stop clear of traffic lanes? If so, could they obscure signs or sight lines? Are boxes, pillars, posts and cabinets located in safe positions away from locations that may have a high potential for errant vehicle strikes? Do they interfere with visibility? Are any special accesses/parking areas provided safe? Are there any utility inspection chambers in live traffic lanes and/or wheel tracks? Has any loose material around utility covers or gullies located in the verge been compacted down and made level with the surrounding ground?
Access		
Can all accesses be used safely? Can multiple accesses be linked into one service road? Are there any conflicts between turning and parked vehicles?	Is the visibility to/from accesses adequate? Are the accesses of adequate length to ensure all vehicles clear the main carriageway? Do all accesses appear safe for their intended use?	Is the visibility to/from accesses adequate? Are the accesses of adequate length to ensure all vehicles clear the main carriageway?
Skid resistance		
	Are there locations where high skid resistance surfacing (such as on approaches to junctions and crossings) would be beneficial? Do surface changes occur at locations where they could adversely affect motorcycle stability? Is the colour of any high friction surfacing appropriate?	Do any joints in the surfacing appear to have excessive bleeding or low skid resistance? Do surface changes occur at locations where they could adversely affect motorcycle stability?
Emergency vehicles		
Has provision been made for safe access and egress by emergency vehicles?		

Table B.2 GENERAL (continued)

Stage 1	Stage 2	Stage 3
Future widening		
Where a single carriageway scheme is to form part of a future dual carriageway, is it clear to road users that the road is for two-way traffic?		
Agriculture		
	Have the needs of agricultural vehicles and plant been taken into consideration (e.g. room to stop between carriageway and gate, facilities for turning on dual carriageways)? Are such facilities safe to use and are they adequately signed?	
Fences and road restraint systems		
	Is there a need for road restraint systems to protect road users from signs, gantries, parapets, abutments, steep embankments or water hazards? Do the road restraint systems provided give adequate protection? Are the road restraint systems long enough? Are specific restraint facilities required for motorcyclists? In the case of wooden post and rail boundary fences, are the rails placed on the non-traffic side of the posts? If there are roads on both sides of the fence is an interlocking-design necessary to prevent impalement on impact?	Is the restraint system adequate? In the case of wooden post and rail boundary fences, are the rails placed on the non-traffic side of the posts? Have specific restraint facilities been provided for motorcyclists?

Table B.2 GENERAL (continued)

Stage 1	Stage 2	Stage 3
Adjacent development		
Does adjacent development cause interference/ confusion? (e.g. lighting or traffic signals on adjacent roads may affect a road user's perception of the road ahead) Is screening required to avoid headlamp glare between opposing carriageways, or any distraction to road users?	Has screening been provided to avoid headlamp glare between opposing carriageways, or any distraction to road users? Are there any safety issues relating to the provision of environmental barriers or screens?	Have environmental barriers been provided and do they create a potential hazard?
Basic design principles		
Are the overall design principles appropriate for the predicted level of use for all road users?		
Bridge parapets		
	Are parapet heights appropriate for the adjacent road user groups?	Is the projection of any attachment to the parapet likely to be struck by road users?
Network management		
		Have appropriate signs and/or markings been installed in respect of Traffic Regulation Orders?
Specific road users		
Is specific provision required for vulnerable groups? (i.e. the young, older users, mobility and visually impaired, motorcyclists.)	Are gradients appropriate for mobility scooters? Are timings at controlled crossings sufficient for all users? Do surface changes or excessive use of carriageway markings occur at locations where they could adversely affect motorcycle stability? Are specific restraint facilities required for motorcyclists? Are features such as traffic calming, utility covers or gullies located in the likely wheel tracks for motorcyclists or cyclists? Do they give concern for motorcyclist/cyclist stability?	Are the following adequate for specific and vulnerable groups? 1. visibility; 2. signs; 3. surfacing; 4. other guardrails; 5. drop kerbing/flush surfaces; 6. tactile paving; 7. gradients; 8. lighting levels; 9. restraint systems; 10. positioning of utility covers/gullies.

Table B.3 JUNCTIONS

Stage 1	Stage 2	Stage 3
Layout		
Is provision for right turning vehicles required? Are acceleration/deceleration lanes required? Are splitter islands required on minor arms to assist pedestrians or formalise road users' movements to/from the junction? Are there any unusual features that affect road safety? Are widths and swept paths adequate for all road users? Will large vehicles overrun pedestrian or cycle facilities? Are there any conflicts between turning and parked vehicles? Are any junctions sited on a crest? Is the junction type appropriate for the traffic flows and likely vehicle speeds?	Are the junctions and accesses adequate for all vehicular movements? Are there any unusual features, which may have an adverse effect on road safety? Have guardrails/safety fences been provided where appropriate? Do any roadside features (e.g. guard rails, safety fences, traffic bollards signs and traffic signals) intrude into drivers' line of sight? Are splitter islands and bollards required on minor arms to assist pedestrians or formalise road users' movements to/from the junction? Are parking or stopping zones for buses, taxis and public utilities vehicles situated within the junction area? Are they located outside visibility splays? Are any utility covers or gullies located in the likely wheel tracks of motorcyclists or cyclists?	Have guard rails/safety fences been provided where appropriate? Do any roadside features (e.g. guard rails, safety fences, traffic bollards signs and traffic signals) intrude into drivers' line of sight? Have bollards been provided to assist pedestrians or formalise road user movements?
Visibility		
Are sight lines adequate on and through junction approaches and from the minor arm? Are visibility splays adequate and clear of obstructions such as street furniture and landscaping? Will the use of deceleration or acceleration lanes obscure junction visibility?	Are the sight lines adequate at and through the junctions and from minor roads? Are visibility splays clear of obstruction?	Are all visibility splays clear of obstructions?
T, X, Y - junctions		
	Have ghost island right turn lanes and refuges been provided where required? Do junctions have adequate stacking space for turning movements? Can staggered crossroads accommodate all vehicle types and movements?	Are priorities clearly defined? Is signing adequate?

Table B.3 JUNCTIONS (continued)

Stage 1	Stage 2	Stage 3
All roundabouts		
	Are the deflection angles of approach roads adequate for the likely approach speed? Are splitter islands necessary? Is visibility on approach adequate to ensure drivers can perceive the correct path through the junction? Where chevron signs are required, have they been correctly sited? Are dedicated approach lanes required? If provided, will the road markings and signs be clear to all users? Are any utility covers or gullies located in the likely wheel tracks of motorcyclists or cyclists?	Can the junction be seen from appropriate distances and is the signing adequate? Where chevron signs are required, have they been correctly sited?
Mini roundabouts		
	Are the approach speeds for each arm likely to be appropriate for a mini roundabout? Is the centre island visible from all approaches?	

Table B.3 JUNCTIONS (continued)

Stage 1	Stage 2	Stage 3
Traffic signals		
	Will speed discrimination equipment be required? Is the advance signing adequate? Are signals clearly visible in relation to the likely approach speeds? Is "see through" likely to be a problem? Would lantern filters assist? Is the visibility of signals likely to be affected by sunrise/sunset? Would high intensity signals and/or backing boards improve visibility? Would high-level signal units be of value? Is the stopline in the correct location? Are any pedestrian crossings excessively long? Are the proposed tactile paving layouts correct? Are the markings for right turning vehicles adequate? Is there a need for box junction markings? Is the phasing appropriate? Will pedestrian/ cyclist phases be needed? Does the number of exit lanes equal the number of approach lanes? If not is the taper length adequate?Is the required junction intervisibility provided?	Can the traffic signals be seen from appropriate distances? Can drivers see traffic signal heads for opposing traffic? For the operation of signals: Are the signal phases working correctly, are unnecessary delays being created? Do pedestrian and cycle phases give adequate crossing time? Can pedestrians or cyclists mistakenly view the "green man" signal for other pedestrian or cycle phases?

Table B.4 WALKING, CYCLING AND HORSE RIDING

Stage 1	Stage 2	Stage 3
Adjacent land		
Will the scheme have an adverse effect on safe use of adjacent land?	Are accesses to and from adjacent land/properties safe to use? Has adjacent land been suitably fenced?	Has suitable fencing been provided?
Pedestrians		
Have pedestrian routes been provided where required? Do shared facilities take account of the needs of all user groups? Can verge strips dividing footways/cycleways and carriageways be provided? Where footpaths have been diverted, will the new alignment permit the same users free access? Are footbridges/subways sited to attract maximum use? Is specific provision required for special and vulnerable groups? (i.e. the young, older users, mobility and visually impaired?) Are tactile paving, flush kerbs and guard railing proposed? Is it specified correctly and in the best location? Have all walking needs been considered, especially at junctions? Are these routes clear of obstructions such as signposts, lamp columns etc.?	Have the needs of pedestrians been considered especially at junctions and roundabouts? Are any proposed drop kerbs flush with the adjacent highway? Is tactile paving proposed? Is it specified correctly and in the best location?	Are the following adequate?: 1. visibility; 2. signs; 3. surfacing; 4. other guardrails; 5. drop kerbing or flush surfaces; 6. tactile paving

Table B.4 WALKING, CYCLING AND HORSE RIDING (continued)

Stage 1	Stage 2	Stage 3
Cyclists		
Have cycle routes been provided where required? Do shared facilities take account of the needs of all user groups? Can verge strips dividing footways/cycleways and carriageways be provided? Is specific provision required for special and vulnerable groups? (i.e. the young, older users, mobility impaired?) Have all cycling needs been considered, especially at junctions? Are these routes clear of obstructions such as signposts, lamp columns etc.?	Have the needs of cyclists been considered especially at junctions and roundabouts? Are cycle lanes or segregated cycle tracks required? Does the signing make clear the intended use of such facilities? Are cycle crossings adequately signed? Has lighting been provided on cycle routes? Are any proposed drop kerbs flush with the adjacent highway? Are any parapet heights sufficient? Is tactile paving proposed? Is it specified correctly and in the best location?	Do the following provide sufficient levels of road safety for cyclists on, or crossing the road? 1. visibility; 2. signs; 3. guardrails; 4. drop kerbing or flush surfaces; 5. surfacing; 6. tactile paving.
Equestrians		
Have equestrian needs been considered? Does the scheme involve the diversion of bridleways?	Should bridleways or shared facilities be provided? Does the signing make clear the intended use of such paths and is sufficient local signing provided to attract users? Have suitable parapets/rails been provided where necessary?	Do the following provide sufficient levels of road safety for equestrians? 1) visibility; 2) signs; 3) guardrails.

Table B.5 TRAFFIC SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING

Stage 1	Stage 2	Stage 3
Signs		
Is there likely to be sufficient highway land to provide the traffic signs required? Are sign gantries needed? Have traffic signs been located away from locations where there is a high strike risk?	Do destinations shown align with signing policy? Are signs easy to understand? Are the signs located behind safety fencing and out of the way of pedestrians and cyclists? Is there a need for overhead signs? Where overhead signs are necessary is there sufficient headroom to enable designated walking, cycling and horse riding usage? Has sign clutter been considered? Is junction signing adequate, consistent with adjacent signing and easily understood? Have the appropriate warning signs been provided? Are signs appropriately located and of the appropriate size for approach speeds? Are sign posts and sign structures passively safe or protected by safety barriers where appropriate? Are traffic signs illuminated where required and the correct reflectivity provided? Are traffic signs located in positions that minimise potential strike risk? Is the mounting height of sign faces appropriate? Are traffic signs orientated correctly to ensure correct visibility and reflectivity?	Are the visibility, locations and legibility of all signs (during daylight and darkness) adequate? Are signposts protected from vehicle impact or passively safe? Will signposts impede the safe and convenient passage of pedestrians and cyclists? Have additional warning signs been provided where necessary?
Variable message signs (VMS)		
	Are the legends relevant and easily understood? Are signs passively safe or located behind safety fencing?	Can VMS be read and easily understood at distances appropriate for vehicle speeds? Are they adequately protected from vehicle impact or passively safe?

Table B.5 TRAFFIC SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING (continued)

Stage 1	Stage 2	Stage 3
Lighting		
Is the scheme to be street lit? Has lighting been considered at new junctions and where adjoining existing roads? Are lighting columns located in the best positions? (e.g. behind safety fences)	Has lighting been considered at new junctions and where adjoining existing roads? Is there a need for lighting, including lighting of signs and bollards? Are lighting columns passively safe? Are lighting columns located in the best positions e.g. behind safety fences and not obstructing walking, cycling and horse riding routes?	Does the street lighting provide adequate illumination of roadside features, road markings and non-vehicular users to drivers? Is the level of illumination adequate for the road safety of walkers, cyclists and horse riders? Is lighting obscured by vegetation or other street furniture?
Poles/columns		
Will poles/columns be appropriately located and protected?	Are poles and columns passively safe? Are poles and columns protected by safety fencing where appropriate?	
Carriageway markings		
Are any road markings proposed at this stage appropriate?	Do the carriageway markings clearly define routes/priorities? Are the dimensions of the road markings appropriate for the speed limit/design speed of the road? Have old road markings and road studs been adequately removed? Are road markings appropriate to the location? 1. centre and edge lines; 2. hatching; 3. road studs; 4. text/destinations; 5. approved and/or conform to the Regulations.	Are all road markings/studs clear and appropriate for their location? Have all superseded road markings and studs been removed adequately? Do the carriageway markings clearly define routes and priorities? Have all superseded road markings and studs been removed adequately?

Appendix C. Road safety audit brief template

Table C.1 Project Summary

Date:	Insert date
Document reference:	Insert unique document reference
Prepared by:	Insert design organisation
On behalf of:	Insert Overseeing Organisation
AUTHORISATION SHEET	
Project:	Insert highway scheme name
Report title:	Include RSA stage
PREPARED BY:	
Name:	Insert author of brief
Signed:	
Organisation:	Insert design organisation
Date:	Insert date
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	
Signed:	
Organisation:	Insert Overseeing Organisation
Date:	

Table C.2 General Details

<table>
<tr><td colspan="5">General details</td></tr>
<tr><td colspan="2">Highway scheme name and road number:</td><td colspan="3">Insert scheme title and road number/name</td></tr>
<tr><td>Type of scheme:</td><td colspan="4">e.g. new road scheme, smart motorway, junction improvement, traffic signs and road markings improvement, traffic calming scheme, etc.</td></tr>
<tr><td rowspan="2">RSA stage tick as appropriate.</td><td>1</td><td>2</td><td>3</td><td rowspan="2">4</td></tr>
<tr><td colspan="3">Interim</td></tr>
<tr><td colspan="3">Overseeing Organisation details</td><td colspan="2">Design organisation details</td></tr>
<tr><td colspan="3">Insert details</td><td colspan="2">Insert details</td></tr>
<tr><td colspan="3">Police contact details</td><td colspan="2">Maintaining agent contact details</td></tr>
<tr><td colspan="3">(Required for stage 3 RSAs)</td><td colspan="2">Insert details</td></tr>
<tr><td colspan="5">RSA team membership</td></tr>
<tr><td colspan="5">Insert details of the approved RSA team and any specialist advisors and observers where appropriate.</td></tr>
<tr><td colspan="5">Terms of reference</td></tr>
<tr><td colspan="5">Make reference to relevant DMRB documents and other guidance where appropriate.</td></tr>
</table>

Table C.3 Scheme Details

Scheme description/objective
General
Define the extents of the RSA, include a brief scheme description, the scheme objectives, a start date for construction if known and a completion date. In addition, for stage 4 RSAs, confirm when all related traffic management has been removed.
Design standards applied to the scheme design
For example, DMRB.
Design speeds
Provide details of applied and/or existing design speeds.
Speed limits
State whether mandatory or advisory, available speed data.
Existing traffic flows/queues
To include current automatic traffic counter (ATC) data, up-to-date turning count and queue information etc.
Forecast traffic flows
Where available and relevant, provide future traffic flow data including vehicle proportions.
Pedestrian, cyclist and equestrian desire lines
Include details of pedestrian, cyclist and equestrian movements in the vicinity of the scheme and, when applicable the relevant walking, cycling and horse riding assessment and review reports GG 142 [Ref 7.I]
Environmental constraints
Include all environmental constraints within the scheme extents, for example sites of special scientific interest (SSSI), conservation areas, listed properties etc.

Table C.4 Locality

Description of locality
Include all environmental constraints within the scheme extents, for example sites of special scientific interest (SSSI), conservation areas, listed properties etc.
General description
Include road network, road type, relevant land uses etc.
Relevant factors which may affect road safety
Factors known to the design organisation and considered as part of the design. This should also include anything that would not be immediately obvious to the RSA team – such as school crossing patrols and large events, for example.

Table C.5 Analysis

Collision data analysis
At stages 1, 2, and 3 provide a summary of road traffic collision data covering both the extent of the scheme and the adjoining sections of highway. As a minimum the most recent 36 months of data. At stage 4, provide 12 months of post-opening validated road traffic collision data. Raw data should be provided as an appendix.
Departures from standards
Include status details, i.e. approved/pending/rejected, and any design strategy records produced for improvements to existing trunk roads and motorways.
Previous road safety audit stage reports, road safety audit response reports and evidence of agreed actions
Attach previous reports to the RSA brief, or provide an explanation where these are not available.
Strategic decisions
Includes items outside the scope of this RSA which will not change irrespective of the RSA, for example route choice, junction type, approved departures from standard.
List of included documents and drawings
Documents
Reference and revision..... Title..... Date.....
For example: previous RSA reports; design responses; departures; road traffic collision data; walking, cycling and horse riding assessment and reviews. This could include any relevant operational data such as damage-only collision data or incident logs. This list could be included as an attachment to the RSA brief or a hyperlink to a shared electronic location where the RSA brief information has been collated.
Drawings
Drawing no. and revision..... Title.....
This list could be included as an attachment to the RSA brief or a hyperlink to a shared electronic location where the RSA brief information has been collated.

Table C.6 Checklist

Tick all that are included and provide reasons for those that are not included			
Site location plan		Scale layout plans	
Departures and relaxations from standards		Construction/ typical details	
Previous RSA reports		Previous RSA response reports and evidence of agreed actions	
Collision data and collision data analysis		Road traffic collision plot	
Traffic signal staging		Traffic counts	
Speed surveys		Pedestrian, cyclist and horse riding desire lines and volumes	
Walking, cycling and horse riding assessment and reviews		Items outside the scope of the RSA/ strategic decisions	
Other factors that may impact on road safety		Design speeds/ speed limits	
Design standards used		Adjacent land uses	

Appendix D. Stages 1, 2 and 3 Road safety audit report template

D1 Project details

Provide:

Table D.1 Project details

Report title:	Include stage of RSA
Date:	Insert date
Document reference and revision:	Insert unique document reference
Prepared by:	Insert RSA team organisation
On behalf of	Insert Overseeing Organisation

D2 Introduction

Provide:

1) a description of the proposed highway scheme including details of its location and its objectives. Make reference to any strategic decisions and confirm that any recommendations to make significant changes in relation to these elements are unlikely to be acceptable.
2) details of who supplied the RSA brief, who approved the RSA brief and who approved the RSA team.
3) identification of the RSA team membership as well as the names of other contributors such as the police, maintaining agent and specialist advisors.
4) details of who attended the site visit, the date, time periods when the audit was undertaken and the weather/traffic conditions on the day of the visit. Include the state of completion of the works at the stage 3 RSA.
5) the terms of reference of the RSA confirmation and that the RSA team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the designs to any other criteria.

D3 Items raised at previous road safety audits

Report any of the RSA actions in the RSA response report for the previous stage that have been agreed for action but not completed. Where the RSA action is not completed, or an RSA response report is not provided, outstanding problems and recommendations will be repeated here.

Where the circumstances have changed it may be necessary to revise the earlier problem and recommendation and this will be included only in section 4.

D4 Items raised at this road safety audit

Complete the information below. This does not have to be in the form of a table.

Table D.2 Items raised at this road safety audit

PROBLEM	
Location:	Insert the location of the problem and reference to a scheme drawing.
Summary:	Provide a short summary of the problem.
Describe the nature of the problem supported by background reasoning and include the type of collisions and/or road user injuries likely to occur.	
RECOMMENDATION	
Provide a proportionate and viable recommendation, based on the RSA stage, to eliminate or mitigate the identified RSA problem.	

D5 Audit team statement

Include the following statement to be signed by the RSA team leader and RSA team member(s):

Table D.3 Audit team statement

We certify that this road safety audit has been carried out in accordance with GG 119.	
ROAD SAFETY AUDIT TEAM LEADER	
Name:	
Signed:	
Position:	
Organisation:	
Date:	
ROAD SAFETY AUDIT TEAM MEMBER(S)	
Name:	
Signed:	
Position:	
Organisation:	
Date:	

D6 Problem location plan

Insert as an appendix to the RSA report.

Appendix E. Stage 4 Road safety audit report template

E1 Project details

Provide:

Table E.1 Project details

Report title	Stage 4 RSA report
Date	Insert date
Document reference and revision:	Insert unique document reference
Prepared by:	On behalf of: Insert RSA team organisation
On behalf of:	On behalf of: Insert Overseeing Organisation

E2 Introduction

Provide a brief description of the highway scheme including details of its location and its objectives.

Include details of who supplied the RSA brief, who approved the RSA brief and who approved the RSA team.

Identification of the RSA team membership as well as the names of other contributors.

Details of who attended the site visit, the date, time periods when the audit was undertaken and the weather/traffic conditions on the day of the visit.

E3 Scheme details

Provide details of the highway scheme, its location and when it was completed.

Clarify the dates of previous RSAs.

E4 Collision data analysis

Analyse the road traffic collisions recorded since the scheme became operational using 12 months of validated post-scheme opening data.

Compare the road traffic collision data with relevant control data.

Identify any post-opening road traffic collision problems.

E5 Items raised at stage 3 road safety audit

Report any of the RSA actions in the RSA response report for the previous stage that have not been completed. Where the RSA action is not completed, or an RSA response report is not provided, outstanding problems and recommendations will be repeated here.

Where collisions have occurred related to previous problems, regardless of the RSA response report, a revised problem and recommendation will be included in section 6.

E6 Items raised at this stage 4 road safety audit

In this section identify any road safety audit problems indicated by the collision data analysis and provide road safety audit recommendations for remedial action where appropriate. This does not have to be in the form of a table.

Table E.2 Items raised at this stage 4 road safety audit

PROBLEM	
Location:	Insert the location of the problem and reference to a scheme drawing
Summary:	Provide a short summary of the problem
Describe the nature of the problem supported by background reasoning and include the type of collisions or road user injuries that have occurred	
RECOMMENDATION	
Provide a proportionate and viable recommendation to eliminate or mitigate the identified RSA problem. This could include recommendations to provide further monitoring where insufficient information can be gathered from the available data.	

E7 Audit team statement

Include the following statement to be signed by the RSA team leader and RSA team member(s):

Table E.3 Audit team statement

We certify that this road safety audit has been carried out in accordance with GG 119.	
ROAD SAFETY AUDIT TEAM LEADER	
Name:	
Signed:	
Position:	
Organisation:	
Date:	
ROAD SAFETY AUDIT TEAM MEMBER(S)	
Name:	
Signed:	
Position:	
Organisation:	
Date:	

E8 Problem location plan

Insert as an appendix to the report.

Appendix F. Road safety audit response report template for stages 1, 2 and 3 only

F1 Project details

Provide:

Table F.1 Project details

Report title:	Include stage of RSA
Date:	Insert date
Document reference and revision:	Insert unique document reference
Prepared by:	Insert design organisation
On behalf of:	Insert Overseeing Organisation

Table F.2 Authorisation sheet

Project:	
Report title:	
Prepared by:	
Name:	
Position:	
Signed:	
Organisation:	
Date:	
Approved by:	
Name:	
Position:	
Signed:	
Organisation:	
Date:	

F2 Introduction

Include a summary of the scheme, the stage of the RSA and the date or reference of the RSA report it relates to.

Provide details of the representatives from the design organisation who prepared the RSA response report.

F3 Key personnel

Provide:

Table F.3 Key personnel

Overseeing Organisation:	Insert details of the personnel from the Overseeing Organisation
RSA team:	Insert details of the personnel from the RSA team
Design organisation:	Insert details of the design organisation

F4 Road safety audit decision log

Insert RSA decision log. This can be a spreadsheet appended to the RSA response report.

Table F.4 Road safety audit decision log

RSA problem	RSA recommendation	Design organisation response	Overseeing Organisation response	Agreed RSA action
Insert the original problem from the RSA report.	Insert the original recommendation from the RSA report.	Insert the design organisation's response.	Insert the Overseeing Organisation's response.	Insert the design organisation's and the Overseeing Organisation's agreed action to the problem.

F5 Design organisation and Overseeing Organisation statements

Include the following statements to be signed by the design organisation and the Overseeing Organisation.

Table F.5 Design organisation statement

On behalf of the design organisation I certify that: **1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the Overseeing Organisation.**	
Name:	
Signed	
Position:	
Organisation:	
Date:	

Table F.6 Overseeing Organisation statement

On behalf of the Overseeing Organisation I certify that: **1) the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and** **2) the agreed RSA actions will be progressed.**	
Name:	
Signed:	
Position:	
Organisation:	
Date:	

Appendix G. Routes to obtaining a certificate of competency and outline training curriculum

G1 Training routes

Table 1 summarises the two routes by which a certificate of competency in road safety audit is obtained; the portfolio of evidence route and the training route. It is envisaged that a training course covering the core modules in the training curriculum in table 2 will be of the order of two days duration.

Table G.1 Routes to obtaining a Certificate of Competency

Portfolio of evidence route	Training course route
Evidence to be included in the portfolio: Details of how the candidate meets the RSA team training, skills and experience guidance contained in section 3 of this document. Example RSA reports with details of the candidate's contribution to the road safety audit process and production of the road safety audit reports. A witness statement from an appropriate person vouching for the content of the candidate's portfolio submission and that the candidate has an acceptable level of understanding of the core modules identified in this appendix. The witness to hold a recognised qualification in the field of road safety, civil engineering or transportation planning or hold a senior professional position within a relevant company or organisation. The portfolio of evidence is signed by the candidate and submitted to an independent professional organisation or company who have had their certification process accepted by Highways England on behalf of all the Overseeing Organisations. This professional organisation or company is responsible for reviewing candidate's submissions and, where appropriate, issuing the Certificate of Competency in road safety audit.	Prior to completion of the training course and issue of a certificate of competency, the candidate submits the following to the training provider: Details of how the candidate meets the RSA team training, skills and experience guidance contained in section 3 of this document. Example RSA reports with details of the candidate's contribution to the road safety audit process and production of the road safety audit reports. A witness statement, from an appropriate person which vouches for the content of the above submissions. This witness to hold a recognised qualification in the field of road safety, civil engineering or transportation planning or hold a senior professional position within a relevant company or organisation. The course provider assesses the candidates regarding their understanding of the content of the training course and verifies the evidence submitted. Where a candidate has demonstrated to the training provider that they meet the training, skills and experience guidance and understood the content of the training course, the training provider is responsible for issuing the certificate of competency in RSA.

G2 Core modules

Table 2 summarises the core modules to be included in the training curriculum.

Table G.2 Core modules of training curriculum

Core module		Example module content
1	Road safety legal issues, legislation and policy	Review of the reasons why RSA is undertaken, in terms of the 1980 Highways Act Highways Act 1980 [Ref 2.I]; 1988 Road Traffic Act Road Traffic Act 1988 [Ref 5.I]; and Roads (Scotland) Act 1984 Roads(S) 1984 [Ref 6.I] where appropriate. Introduction to the 2007 Road Death Investigation Manual RDIM [Ref 4.I] The Corporate Manslaughter and Corporate Homicide Act 2007 CM&CHA 2007 [Ref 1.I] The 2008/96/EC [Ref 1.N] The Manslaughter by Gross Negligence Common Law Road safety policies, targets and strategies
2	Collision investigation focused on the strategic road network or comparable roads	Understanding and applying collision investigation techniques. Update on any developments in collision trends.
3	Road safety audit	Improvement and clarification of known potential issues, focused on the strategic road network or comparable roads, to cover: Roles and responsibilities RSA administration and practice RSA reporting

Table G.2 Core modules of training curriculum (continued)

Core module		Example module content
4	Road safety engineering/ road design	This module includes development in road safety engineering and its influence on road design, with focus on the trunk road and motorway network. The 2008/96/EC [Ref 1.N] specifically requires training or experience in road design. Road safety auditors should have an understanding of the Design Manual for Roads and Bridges (DMRB) design standards, and how good design principles reduce collision risk. The module could include the following: Road/junction geometry and design: 1) Design speed; 2) Horizontal and vertical alignment, including cross sections, drainage, stopping sight distances and adverse camber; 3) Appropriateness of junction type; 4) Visibility; 5) Road surfaces, including the use of high friction surfacing. Roadside features: 1) Passive infrastructure; 2) Road restraint systems and guard railing; 3) Landscaping; 4) Highway lighting. Facilities for vulnerable road users: 1) Pedestrian/cycling/equestrian facilities; 2) Mobility and visually impaired; 3) Motorcyclists.