
**VOLUME 5 ASSESSMENT AND
PREPARATION OF ROAD
SCHEMES**

**SECTION 2 PREPARATION AND
IMFORMATION**

PART 4

TA 91/05

**PROVISION FOR NON-MOTORISED
USERS**

SUMMARY

This Advice Note provides guidance in relation to provision for non-motorised users, through the design and implementation of both on- and off- carriageway provision including crossings, junctions and general design considerations.

INSTRUCTIONS FOR USE

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1. Remove Contents pages from Volume 5.
2. Insert new Contents page for Volume 5 dated February 2005.
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**THE DEPARTMENT FOR REGIONAL DEVELOPMENT
NORTHERN IRELAND**

Provision for Non-Motorised Users

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1. INTRODUCTION

General

1.1 The purpose of this Advice Note is to highlight the needs of Non-Motorised Users (NMUs) on trunk roads, and provide guidance on provision of both Off-Carriageway Routes (OCRs) and on-carriageway facilities, including crossings and junctions. OCRs are NMU routes which may be either inside or outside the highway boundary, but do not form part of the carriageway.

1.2 NMUs are considered to be pedestrians, cyclists and equestrians. Particular consideration should be given to the needs of disabled people, who may use any of these modes or other equipment such as wheelchairs.

1.3 For the purpose of this Advice Note users of electrically assisted pedal cycles or powered wheelchairs and invalid carriages, that conform with current Department for Transport regulations and may legally be used on pedestrian or cycle facilities, are also considered as NMUs.

1.4 This Advice Note should be read in conjunction with *TA 90 (DMRB 6.3.5)*, *HD 42 (DMRB 5.2.5)* and *TA 68 (DMRB 8.5.1)*. Other documents within the Design Manual for Roads and Bridges (DMRB) also provide information in relation to NMUs; these are identified where relevant within this Advice Note.

1.5 This Advice Note and those identified in paragraph 1.4 wholly supersede *TA 67 (DMRB 5.2.4)* and replace Chapters 8 and 11 of *TA 57 (DMRB 6.3.3)*.

Advice Note Objectives

1.6 All NMUs have a legal right to use the public highway, unless specifically prohibited.

1.7 Encouraging modal shift, particularly to walking and cycling, has a very important role to play in creating a more integrated and sustainable transport system.

1.8 All purpose trunk roads typically carry high flows of fast moving traffic and are generally unattractive for NMUs to travel along or across. However, trunk roads often provide important links or routes for NMUs, representing the quickest, most direct route between key destinations, and are often used

because of the lack of more convenient alternatives. As such there is a need to ensure that scheme designs take full account of NMU requirements, and that opportunities are taken to encourage safer and more attractive provision wherever possible.

1.9 This Advice Note considers facilities for NMUs as part of trunk road schemes. Other national, regional and user group guidance is also available and may provide additional or more suitable advice in other situations.

1.10 This Advice Note contains information on legal issues in relation to NMUs within England and Wales (Annex 1). **However, legal advice should always be sought before proposals are finalised because of the possibility of changes to legislation and case law.**

Implementation

1.11 This Advice Note should be used forthwith for the planning and design of trunk roads and motorway improvement schemes, currently being prepared, provided that in the opinion of the Overseeing Organisation this would not result in unreasonable expense or delay to the progress of the scheme. Design Organisations should confirm its application to particular schemes with the Overseeing Organisation.

1.12 This Advice Note does not apply in Scotland.

Research and Consultation

1.13 This guidance draws from a range of documents from governmental and non-governmental organisations. A range of user groups and other organisations have also been consulted in the development of this Advice Note.

Definitions

1.14 **Overseeing Organisation:** The highway authority responsible for the scheme.

1.15 **Design Organisation:** The organisation(s) commissioned to undertake scheme preparation.

2. NMU REQUIREMENTS

General

2.1 This chapter identifies the characteristics of different NMUs and their general requirements.

Pedestrians



Figure 2/1 – Pedestrian Footbridge Over M1 Slip Road

2.2 Walking is a means of travel in its own right, but is an essential part of many other journeys, including those by car and public transport. However, there has been a decline in both the number and distance of journeys on foot since the mid-1980s. Nearly half of all journeys are less than 2 miles, a distance that could easily be walked by the majority of people.

2.3 Walking is used to access a wide variety of destinations including educational facilities, shops, and places of work, normally within a range of up to 2 miles. Walking and rambling can also be undertaken as a leisure activity, often over longer distances.

2.4 The term ‘disabled people’ covers a wide range of people with physical, sensory or mental impairment, with different needs and abilities. There are various forms of disability, as follows:

- **Mobility Impaired** – includes people who use wheelchairs and those who can walk but only with difficulty, often using some form of aid such as a stick or walking frame.
- **Visually Impaired** – can be sub-divided into blind and partially sighted people.
- **Hearing Impaired** – can be subdivided into those who are profoundly deaf and those with impaired hearing, ranging from severe to mild deafness.
- **People with reaching, stretching and dexterity problems** – these are frequently the result of arthritis, muscular dystrophy or complaints of the nervous system.
- **People with learning disability** – difficulty in understanding complicated information or using complex machines.

2.5 Approximately 14% of the population have physical, sensory or mental impairments that cause mobility difficulties. Many people, particularly older people, have more than one impairment. Able-bodied people also encounter temporary mobility impairment, for example when pushing a baby’s buggy, carrying shopping or luggage and escorting children.

2.6 Disabled people have a range of specific needs, in terms of manoeuvrability requirements, gradients, ramps and steps, barriers, colour contrast, surfaces, kerbs, crossings and access to public transport. Disabled and older people have particular difficulties crossing busy roads such as trunk roads. It is usually possible to accommodate the needs of most pedestrians by providing for disabled people. Therefore, meeting the needs of disabled people should be a fundamental part of the design process.

2.7 Under the Disability Discrimination Act 1995, Design Organisations should ensure that where possible, accessibility for disabled people is equal to that of other NMUs. Particular attention is drawn in the Act to disabled people’s access to bus stops, escape routes for disabled motorists and service and picnic areas, which are described further in Chapter 8.

2.8 For more detailed advice and best practice guidelines, Design Organisations should refer to

Inclusive Mobility: a Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (DfT, 2002) and Guidance on the Use of Tactile Paving Surfaces (DfT, 1999).



Figure 2/2 – Wheelchair Users Passing Under Elevated Highway

Cyclists

2.9 Cycling currently accounts for a low percentage of all trips in the UK, yet many people own bicycles. Nearly three quarters of all journeys are less than 5 miles in length, distances that could easily be cycled by the majority of people. However, the flow of traffic on major roads, together with the environment and design of these roads, often deters people from cycling.



Figure 2/3 – Cyclist Using OCR

2.10 Cycling is undertaken by a range of users, including disabled people, on bicycles of different sizes and configurations. Cyclists also have a wide range of abilities. Design standards for the National Cycle Network have been developed to be suitable for use by novice adult cyclists, families with young children or sensible unaccompanied 12 year olds.

2.11 Cycling is used for accessing a variety of different destinations, including educational facilities, shops and places of work, up to a range of around 5 miles. Cycling is also undertaken as a leisure activity, often over much longer distances. As well as being a mode of transport in its own right, cycling frequently forms part of a journey in combination with cars and public transport.

2.12 There is a range of requirements to be met in order to encourage cycling. These include the provision of good quality surfaces with appropriate geometry, minimal obstructions, good signing, appropriate crossing facilities and secure parking.

Equestrians



Figure 2/4 – Equestrian Using Minor Road Running Adjacent to Trunk Road

2.13 Horse riding and carriage driving are both popular and expanding forms of recreation, carried out by over 3 million people (1999) throughout the UK.

2.14 Horse riding is undertaken by a range of different users, including disabled people, mainly for recreational purposes. In particular, equestrian activity often takes place in the vicinity of pastures, stables, riding schools and racecourses. Horse riding routes normally consist of a local circuit of up to 8 miles, often using a combination of major roads, minor roads, bridleways and restricted byways as a result of the fragmented right

of way network. Equestrianism is both a rural and urban activity.

2.15 Horses are permitted to be ridden on verges, but not on footways adjacent to roads. They are not ideally suited to being ridden alongside high speed trunk roads, and where practicable, equestrians should be routed away from the immediate vicinity of roads. However, where improvements for equestrians within the highway boundary are identified as desirable or necessary, designers need to be aware of certain specific requirements that arise.

2.16 Horses can be unpredictable animals that require appropriately designed facilities and firm control from their rider, to ensure that both rider and horse remain safe. This is often beyond the ability of inexperienced riders. In particular, horses often cannot be held by their riders at the road edge without encroaching on the carriageway. When crossing the carriageway, a horse can be startled or become impatient if waiting for long periods. They may also suddenly stop.

2.17 Equestrians have a range of special requirements, which include minimal obstructions in the verge, a need for appropriate crossing facilities and, where horse riders frequently use the verge, suitable surfaces adjacent to the highway. Surface material is an important factor in determining the overall design speed of an equestrian route (see Chapter 8).

General NMU Requirements

2.18 Inevitably, the differing needs of NMUs will sometimes conflict. There is also likely to be a significant variation in abilities and experience within each NMU group; for example, novice cyclists may require OCRs, while experienced ones may prefer on-carriageway provision. Similarly, many NMUs will be unable to drive, and hence cannot be relied on to correctly comprehend highway signing. Design Organisations should aim to provide appropriate facilities that balance the needs of each group.

3. SCHEME DEVELOPMENT AND ASSESSMENT

General

3.1 This chapter describes how NMUs should be considered throughout the design process to ensure that an appropriate standard of NMu provision is made.

Design Brief and NMu Audit

3.2 In the Design Brief, reference should be made to the need to cater for the requirements for NMUs throughout the design process. Design Organisations are required to apply NMu Audit procedures as part of the design process; advice on carrying out NMu Audits is given in *HD 42 (DMRB 5.2.5)*. The NMu Audit process will assist in identifying existing conditions and the objectives of new or improved NMu provision. This is important in identifying appropriate solutions.

Existing and Future Usage Patterns

3.3 It is important to consider the range of potential users, key destinations and latent demand in determining the appropriate form of NMu provision.

3.4 Local issues and needs will also have an impact upon the level of provision required for a particular scheme. Such issues may include access to schools, leisure facilities, retail areas, rights of way, woodland and country parks.

3.5 To assist in establishing existing levels of usage, *TAL 6/00* identifies methods of monitoring walking. *TAL 8/95* and *TAL 1/99* identify methods of modelling and monitoring cycling levels respectively. User group representatives may also be able to advise on current use.

3.6 In common with road design, NMu provision should be designed on the basis of a 15-year design life and thus take into consideration potential increases in NMu usage. National usage projections for different NMu groups should be supplemented by an assessment of the potential for future changes in the local area

(such as new trip generators planned, land zoned for housing, new industrial estates) that may lead to increases in NMu activity significantly above the national average. Further information is provided in *HD 42 (DMRB 5.2.5)*.

Consultation

3.7 The opportunity should always be taken to co-operate with Local Authorities and other organisations, to achieve the best overall solutions to meet needs in the area affected by the scheme. Partnership will be essential in providing successful NMu facilities.

3.8 As part of the scheme design process, consultation should be used to help identify desire lines, current design problems and other local issues, as well as identifying the type of provision appropriate within a scheme.

3.9 Information on existing rights of way and other NMu routes is available from a range of sources:

- **Local Authority** – ‘County Road Map’, ‘Definitive Map’, Greenways¹, Quiet Lanes², National Trails, Recreational Paths and local cycle routes.
- **Ramblers Association** – National Trails, Long Distance Paths, European Paths, Easy Paths and Challenging Paths (www.ramblers.org.uk).
- **CTC** – local and long distance on-road and off-road cycle routes (www.ctc.org.uk).
- **Sustrans** - National Cycle Network (www.sustrans.org.uk).
- **British Horse Society** – National Bridle Route Network (www.uk-ride.org.uk).

3.10 Design Organisations should identify and agree with the Overseeing Organisation the appropriate level

¹ A Countryside Agency initiative to highlight car-free routes that link local facilities to open spaces via off-carriageway networks for NMUs.

² A Countryside Agency initiative to create networks on minor rural roads, with the aim of preserving the character of existing quiet country lanes and enhancing them so that walkers, cyclists and horse riders can share them with greater safety.

of consultation required. However, consultation should normally be carried out with the Local Authority, Regional Road User Committee and local user group representatives, during the feasibility and preliminary design stage.

3.11 Public meetings and exhibitions should be well publicised throughout a radius of around 5 miles and held in an accessible location where all local people can attend. It is essential that the building in which these events are held can be accessed by disabled people and that events cover a combination of periods, including times inside and outside normal working hours, to ensure as many local users as possible can attend.

3.12 Insufficient consultation and consideration of NMU needs is likely to result in a greater number of objections from local people and user groups, often leading to Public Inquiries. Good consultation can be expensive, but should allay local fears and help to ensure that appropriate NMU provision is made early on, without the need for additional mitigation at a later stage.

General Design Principles

3.13 There is no single correct solution for the provision of NMU facilities, and much will depend upon the overall objectives of the scheme in addition to specific local issues. It is recommended that options are considered in accordance with the 'Hierarchy of Provision' identified in draft LTN 1/04 and illustrated in Table 3/1 below. It should be noted that in some cases a combination of these solutions may be required to ensure an appropriate level of provision.

3.14 Traffic reduction is unlikely to be a viable option on trunk roads. However sometimes an approach combining one or all of the other options will be required.

3.15 Facilities for NMUs should offer positive provision that reduces delay, diversion and danger. Five core principles common to NMU routes have been identified in draft LTN 1/04, as follows:

- **Convenient:** NMU facilities should allow people to go where they want, and new facilities should usually offer an advantage in terms of directness and/or reduced delay compared with previous provision.
- **Accessible:** NMU routes should form a network linking trip origins and key destinations. The routes should be continuous and as direct as possible. There should be proper provision for crossing busy roads and other barriers.
- **Safe:** Not only must facilities be safe, but for the well being of users, they must be perceived to be safe.
- **Comfortable:** Facilities should meet appropriate design standards, and cater for all types of user.
- **Attractive:** Aesthetics, noise reduction and integration with surrounding areas are important. NMU facilities should be attractive and interesting to help encourage their use.


	Hierarchies of Provision for	
	Pedestrians/Equestrians	Cyclists
Consider First  Consider Last	Traffic reduction	Traffic reduction
	Speed reduction	Speed reduction
	Reallocation of road space to pedestrians/equestrians	Junction or hazard site treatment, traffic management
	Provision of at-grade crossings	Redistribution of the carriageway (bus lanes, widened nearside lanes etc)
	Improved pedestrian/equestrian routes on existing desire lines	Cycle lanes, segregated cycle tracks constructed by reallocation of carriageway space, cycle tracks away from roads
	New pedestrian/equestrian alignment or grade separation	Conversion of footways to unsegregated shared use cycle tracks alongside the carriageway

Table 3/1 – Hierarchies of Provision

3.16 A basic principle in scheme design is that the existing rights of way network should be preserved as far as possible, even where usage levels are low. A low level of usage may be as a result of severance and could disguise the fact that a particular path is an essential link for certain local journeys. Preserving the network should save considerable resources, as any diversion will require legal orders, which are normally opposed by user groups. In extreme cases, such a proposed diversion could threaten the delivery of the whole scheme.

3.17 Where rights of way diversions are necessary, it is recommended that they should not normally result in additional journey lengths for NMUs of more than 10%, unless agreed with the Overseeing Organisation. For situations where high numbers of work, school or other non-recreational NMu journeys are likely to be made, diversions should be kept to levels lower than this. It will often be more appropriate for diversions to follow a new route through land adjacent to the highway boundary, rather than run alongside the carriageway.

Choice of Facility

3.18 NMu facilities should always be designed and constructed to appropriate standards. Although it is accepted that lower standards will need to be used in

certain circumstances, clear justification for the use of these lower standards should always be made as part of the design process. Further information is given in draft *LTN 1/04* and *TA 90 (DMRB 6.3.5)*.

3.19 Provision of adequate pedestrian facilities should be considered within every scheme. This may include footpaths (pedestrian rights of way) or footways including appropriate surfaces, kerbs, signing and crossing facilities. The level of provision should also be appropriate to the expected number of users.

3.20 Footways should normally be provided within the highway boundary or in another location in the form of an OCR. In urban situations, footways should normally be provided on both sides of the carriageway, while in rural situations footways should normally be provided on at least one side of the carriageway, to connect to most key destinations.

3.21 Cycling facilities can be provided either on-carriageway or off-carriageway. In many situations both on- and off-carriageway provision may be necessary, particularly in areas with a high level of cycling. Figure 3/1 provides a guide to assist in determining the appropriate form of provision for cyclists. These criteria should not be applied rigidly, but using judgement based on the vehicle speed limit, volume and content of motorised traffic, volume of NMUs and other local issues.

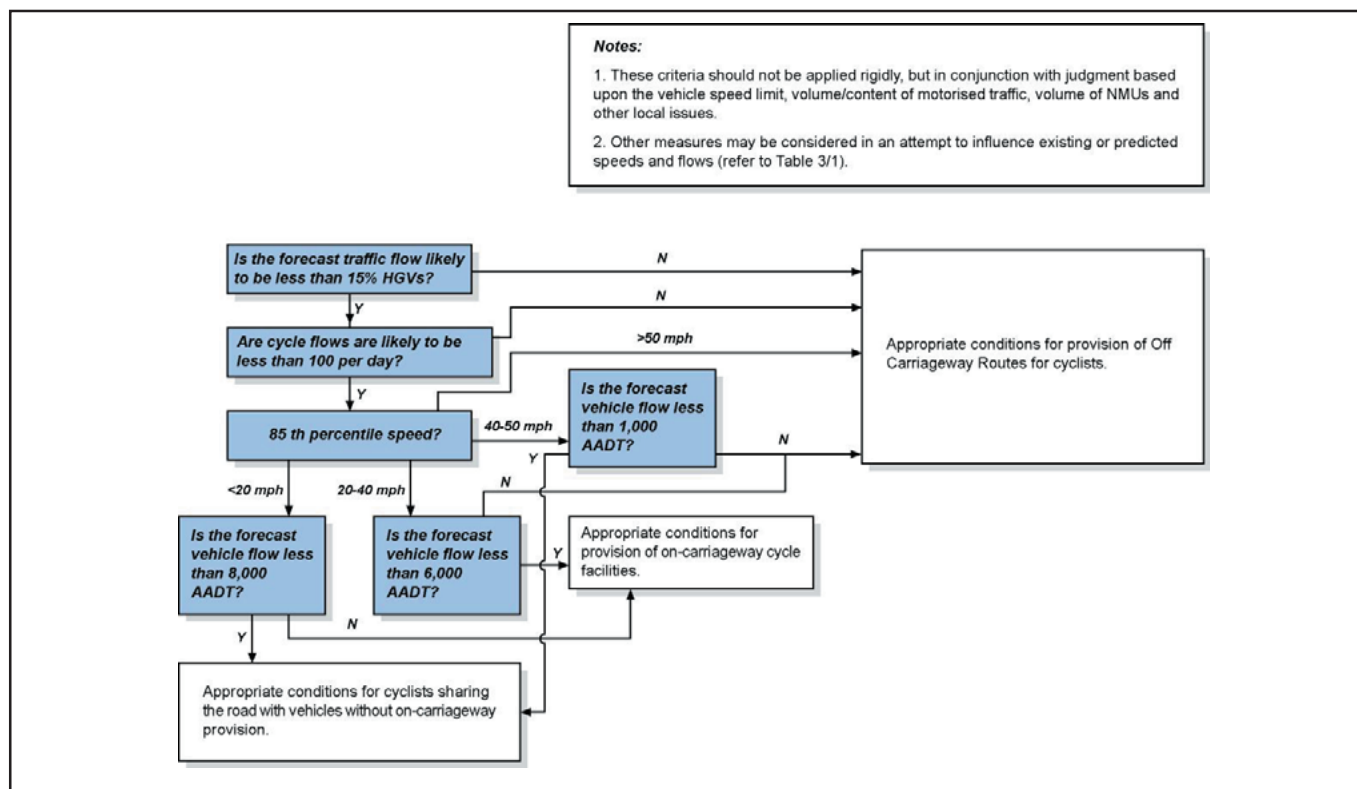


Figure 3/1: Provision of On- or Off-Carriageway Cycle Facilities

3.22 Where off-carriageway facilities are proposed, it is recommended that they are provided on both sides of the road. Where space is limited, it may be acceptable to provide a two way facility on one side of the road. However, in unlit areas, cyclists with headlights may cause confusion when heading directly towards motorists. It is therefore recommended that where routes are provided on one side of the road only, a high degree of separation between the carriageway and cycle route should be provided, or street lighting at an appropriate level as agreed with the Overseeing Organisation. Where lighting is required, consideration should be given to light intrusion.

3.23 Since horses can be better controlled when ridden rather than led, the design of equestrian routes should minimise or eliminate the need to lead horses. As such, there should be a 'whole route' strategy for equestrian routes to enable continuous ridden use as far as practicable. New facilities should help link together existing routes, including bridleways, byways and minor roads, wherever possible.

3.24 Schemes should normally include provision of off-carriageway equestrian facilities in the following circumstances:

- where highway verges accommodate frequent equestrian movements;
- in close proximity to riding schools, stables, racecourses or pastures;
- where the route acts as a link to bridleways, or feeds bridleways to crossings or other equestrian facilities.

3.25 Equestrian facilities can normally be used by other types of NMUs, even if the facility provides specific features for equestrian use. On this basis, consideration of requirements of other NMUs will be essential when designing equestrian facilities along the same route.

3.26 In exceptional circumstances, it may be acceptable not to provide NMU facilities, for example highways adjacent to tunnels or other route sections that have or will have an NMU prohibition. In such cases Design Organisations should provide explicit justification, with agreement from the Overseeing Organisation, for not providing NMU facilities.

3.27 Where no provision for NMUs is made as part of a scheme, it will be important to ensure that appropriate alternative NMU routes and suitable linkages are provided and signed.

Shared NMU Provision

3.28 Shared use is an important consideration in designing for NMUs. It will often be beneficial to accommodate equestrians separately from pedestrians and cyclists. There may also be some value in providing for pedestrians and cyclists separately, although in isolated areas adjacent or shared facilities can give users a greater sense of security due to the number of people using the facility.

3.29 However, it should be noted that disabled people in particular are often very cautious about the use of shared NMU facilities without adequate physical segregation between users.

3.30 The draft *LTN 2/04* provides further guidance and highlights the following issues that require particular consideration:

- **Consultation and publicity** – any proposal to allow cyclists to use pedestrian facilities must involve extensive consultation and publicity.
- **Segregated or unsegregated** – combined NMU flows in excess of 200 per hour require specific measures such as kerbs, railings, verge, line marking or different surface textures to denote segregation.
- **Signage and markings (and tactile surfaces where appropriate)** – These are important for the proper operation of shared use routes.
- **Geometric Dimensions** – Different geometric layouts and dimensions are appropriate in different situations. These are identified within draft *LTN 2/04* and *TA 90 (DMRB 6.3.5)*.

Scheme Assessment

3.31 As with all highway schemes, assessment and justification will be required for schemes including NMU facilities. The assessment will cover Environment, Safety, Economy, Accessibility and Integration.

3.32 The provision of NMU facilities, including new routes and crossings, should be regarded as an integral element of the overall cost of a scheme and not as an additional item that needs to be separately justified. As such, provision of measures for NMUs should be considered in the same way as other 'soft' features such as landscaping.

4. NMU OFF-CARRIAGEWAY ROUTES (OCRs)

General

4.1 In many circumstances, it may be decided that the most appropriate form of NMU provision is an OCR. This chapter identifies the range of issues that need to be addressed in developing OCRs for NMUs. For information on geometric design aspects, refer to *HD 39 (DMRB 7.2.5)* and *TA 90 (DMRB 6.3.5)*.

4.2 OCRs may be designed specifically for use by NMUs, or through the adoption or conversion of rights of way in partnership with Local Authorities or private landowners.

4.3 OCRs may be developed as an improvement scheme in their own right, or as an integral part of new all-purpose road improvements.

4.4 In order to provide NMUs with a more effective and attractive route than trunk roads, OCRs should aim to provide better connectivity. To achieve this, routes should normally aim to connect to the following locations:

- **Key destinations** – residential areas, health facilities, retail outlets, educational facilities, places of worship, recreational and social facilities and civic buildings.
- **Public transport** – railway and light rail stations, bus stations, bus stops and park & ride sites.
- **NMU routes** – National Cycle Network, Greenways, Quiet Lanes, National Bridle Route Network and other rights of way.

4.5 All OCR types can be financed, designed and implemented by the Overseeing Organisation as long as they are included as part of published statutory orders and receive the appropriate statutory approvals. However, wherever possible the Overseeing Organisation should aim to provide a scheme that links into local networks.

OCR Types

4.6 In the development of an OCR, various options will be available to the Design Organisation. Given the typical length of trunk roads, it is likely that a single

OCR will need to use a variety of route types along its length, in order to respond to different local constraints. For the purposes of this guidance, the following route types have been identified:

- **Route Type A** – Within trunk road verge;
- **Route Type B** – Land outside, but adjacent to the highway boundary;
- **Route Type C** – Distant from trunk road;
- **Route Type D** – Existing rights of way;
- **Route Type E** – Redundant or bypassed road;
- **Route Type F** – Minor highway;
- **Route Type G** – Other locations such as forestry tracks, canal towpaths, abandoned railway lines and farm tracks. These may be in public or private ownership.

4.7 The route types are described in turn below. Annex 2 provides detailed information on construction issues and the advantages and disadvantages of each type.

Route Type A Within Trunk Road Verge

4.8 An OCR may be created immediately adjacent to the trunk road within the existing highway on land owned by the Overseeing Organisation. This route type is often the most appropriate solution in operational, financial and legal terms. In many instances, a footway is already in existence, which should be re-used within the OCR. Many trunk roads have a reasonable verge between the carriageway and the highway boundary or other property boundary. In some instances, the verge will be wide enough to accommodate the minimum dimensions of an OCR; however, where the verge is too restricted, consideration could be given to purchasing land adjacent to the highway boundary to accommodate an OCR (see Route Type B).

4.9 Where verge width is restricted, the physical hazards of proximity to the trunk road are considerable and other route types may be more appropriate. Crossing facilities often require a considerable amount

of space and as a result may prove to be an overriding constraint.

Route Type B
Land Outside, But Adjacent To The Highway Boundary

4.10 An OCR may be created adjacent to the trunk road by extending the highway to encompass land directly adjacent to the highway boundary. This route type exploits most of the advantages of Route Type A, but will require purchase of additional land. For sections of trunk road where individual properties intrude into the verge, the OCR may comprise sections of both Route Types A and B, while still providing frontage access. With Route Type B there are likely to be fewer signposts, lighting columns and other obstructions than in Route Type A, where such features would require removal or cause a minor obstruction on route.

4.11 Route Type B provides similar advantages to Route Type A, but with less width restriction and a safe distance from high speed traffic. However, there are more complicated issues regarding the purchase and creation of the route.

Route Type C
Distant From Trunk Road

4.12 An OCR may be created distant from the trunk road, perhaps at a second or third plot boundary from the road, if necessary in partnership with the Local Authority. The desired outcome is a separate route running broadly parallel to the trunk road. There should be few existing services in this area.

4.13 This route type may involve disruption to existing habitats. Because the line of the route is flexible, it can be directed along appropriate gradients and connected to key destinations. Connections back to the trunk road (e.g. for access to bus stops) or to frontages may be required, and where these need to be frequent, this route type will be less appropriate.

4.14 Route Type C should provide a pleasant alternative route where trunk roads pass through both developed and undeveloped areas. The likely absence of width restrictions, and flexible alignment, offer potential for mixed use at a safe distance from high speed traffic. However, this route type involves the creation of a new right of way and there will therefore be associated legal and practical issues.

Route Type D
Existing Rights of Way

4.15 An OCR may be developed by adopting or modifying existing rights of way such as footpaths, bridleways or restricted byways. Route Type D seeks to take advantage of the existing legal status of rights of way and existing patterns of use. It is an attractive option where existing width permits.

4.16 However, existing rights of way are unlikely to connect fully to trunk roads, key destinations or transport links. To achieve OCR integration may therefore require development of new rights of way links. It may position the OCR at a considerable distance from the road, and to achieve full OCR standards may create issues of visual and environmental impact. A change of legal status, in partnership with the Local Authority or private landowners, may be necessary and negotiation of private rights may be required.

Route Type E
Redundant or Bypassed Road

4.17 Following the re-alignment of a trunk road, redundant stretches of road sometimes remain. These are often used as lay-bys, bus-stops or short sections of access road running broadly parallel to the trunk road. An OCR may be created by adopting and modifying these stretches of road. In cases where the ownership has passed to private hands, it would be necessary to re-establish a right of way as well as negotiate purchase or adoption, in partnership with the Local Authority. It is likely that these roads will be wider than necessary for an OCR, and may already possess appropriate foundations and wearing course.

4.18 Route Type E can often provide a practical short stretch of OCR at relatively low cost which will link conveniently to both Route Type A and B.

Route Type F
Minor Highway

4.19 An existing minor highway may be adopted as an OCR and modified as required to meet OCR standards, by agreement with the Local Authority.

4.20 This route type takes advantage of the existing legal status, patterns of use and connections to trunk roads. However, NMUs may encounter motorised users, and there may be a lack of protection for NMUs unless appropriate facilities (such as footways or cycle lanes)

are provided. This route type will not normally involve the purchase of land, thus reducing the legal and practical problems involved. Traffic Regulation Orders may be required to slow or restrict certain types of motorised traffic. Badging will be important to ensure that the new OCR status is acknowledged by both motor vehicles and NMUs (see paragraph 4.33).

4.21 Route Type F is a useful option, if the problems of combined use by motorised and non-motorised users can be overcome.

Route Type G Other Locations

4.22 Included in this category are farm access roads, private roads, farm access tracks, disused airfields, former MOD tracks, private footpaths with space for widening, footpaths within urban or country parks, forestry tracks, canal towpaths, and abandoned railway lines. OCRs can also be purpose built in new developments to provide greater accessibility.

4.23 This route type allows for a considerable range of possibilities for OCRs, particularly in response to local circumstances. It will normally require either a partnership with the Local Authority to re-designate access, an agreement to permissive access, or land purchase from the private landowners in order to permit NMU use.

4.24 Technical features of this route type will vary, but gradients and widths may already conform to OCR standards, and some access for construction is likely to exist.

4.25 This range of possible route types should add interesting variety to the route experience and provide economies through the use of existing infrastructure.

Choice of Route Type

4.26 In order to assess which of the route types is most appropriate in any one location, the following should be considered:

- general design principles, as identified in Chapter 3;
- likely levels and type of demand (existing and latent) for the route;
- the need to achieve links with key destinations;

- landscape and ecological impacts;
- construction and technical issues.

Local Distinctiveness

4.27 Achieving local distinctiveness is important in providing high quality design for OCRs. Recognising the elements within the landscape that make each place special and 'distinctive' allows for the more sympathetic introduction of a new OCR. Designs should aim to retain and extend the local distinctiveness of an area and respond in a way that is both sensitive and skilful. These issues may be addressed as part of the design process, by considering the following:

- identify the context – consider the wider landscape pattern and type;
- identify local features – consider the specific local elements that form the landscape pattern and type;
- identify the history and culture of the landscape;
- use elements and features in the design of an OCR that reflect local distinctiveness.

4.28 Identifying the context of the OCR is crucial in ensuring it will sit appropriately within the landscape. The OCR may extend for some distance and therefore cross through areas of landscape with distinctly different character, such as upland to lowland or scarp to vale. The patterns of the landscape, influenced by land use (such as different agricultural type and practices, forestry, etc) will strongly affect the route alignment and identity. This should be borne in mind throughout the design of the route. It may be decided to give an OCR a strong identity throughout the whole route, or to vary the character of the route as it passes through different contexts. What is important is consistency of approach.

4.29 Identifying local features provides the next level of detail required to ensure the OCR reflects the local character. The local features to consider may include the following:

- **Topography, vegetation and structures** – The shape and size of fields, land uses at a more local level, landform and natural landscape features, construction materials, types of structures and the density and type of planting all have a significant effect on the landscape character.

- **Traditional routes** – It is important to be aware of the traditional way that routes were constructed and why. The main features are the level of the route in relation to the surrounding land and the elements that enclose the route, such as hedgerow, wall or bank.
- **Geology** – This has a major influence on the range of materials and architectural detail in a given locality. It generates materials of different colours, shapes and patterns (e.g. clay, granite, and limestone).
- **Local crafts and building traditions** – These will set a precedent for the type of fencing and railings, types of brickwork, building stone, types of walls and access points used along the OCR, responding fully to the local distinctiveness of the area.
- **Design guidance** – There is also a need to consider any local design guidance from parish councils, Local Authorities or other bodies.

4.30 Understanding the historic and cultural associations of a place is an important element in identifying local distinctiveness. For example, the OCR may run along a traditional route from one place to the next. This may only be recognised locally, but have cultural significance to the local community. Understanding these cultural links and making reference to them in the design will enhance the identity of the OCR.

4.31 Interpreting the local distinctiveness for an OCR will help decide how best to reflect the local characteristics. The following principles guide this process:

- **Creating new field patterns** – This is probably the most important element in influencing the character and alignment of the OCR. The route alignment is fundamental in minimising visual impact. It will normally be better to adopt an alignment of existing enclosing elements (such as hedges and walls). Alignments that cross open countryside should be avoided, unless specifically considered appropriate or necessary.
- **Designing new enclosing elements** – In some instances, enclosing elements may not be required. However, where they are new, they should not be visually intrusive. This is because the view from a distance is considered to be more important than conformity in the detail of

material or construction. To limit impacts, new enclosing elements should match existing elements, using local materials and construction where possible. Where this is not possible, a contemporary style boundary feature should be provided rather than a poor replica.

- **Responding to local topography** – In most rural situations, an OCR should generally follow contour lines. This makes for easier travel, and in most cases will conform to local character.
- **Creating new surfaces** – Surfaces will have to be well compacted and level in situations where intensive use by small-wheeled vehicles is anticipated. To reflect the local geology and to respond to local traditions, local stone may be appropriate (see Chapter 8). Where conflict cannot be resolved, functional performance should take priority over local distinctiveness.

4.32 While designs should aim to retain and extend the local distinctiveness of an area, it is essential to ensure that adequate provision for disabled people is made.

Badging

4.33 In the development of OCRs, it is important that the route is well identified to NMUs. The term ‘badging’ has been used to describe the range of visual devices that could be used in order to denote the status of the OCR both to its users and to others.

4.34 Badging is useful for the following purposes:

- to help provide an identifiable route through its character;
- to provide general information to current and potential users of the OCR;
- to confirm the legal status of the path with regard to its use, particularly in terms of the welfare, safety and convenience of other users;
- to inform users of the extent of the route and its principal destinations;
- to provide information about features of interest such as wildlife, landscape or archaeology.

4.35 Design Organisations should work with Local Authorities to try to ensure that badging reflects issues of local distinctiveness. In addition to the standard signs

in the Traffic Signs Regulations and General Directions (TSRGD), the following devices can also be used to provide character and badge the OCR:

- maps, information leaflets (see Figure 4/1) and promotional material;
- logos and graphics;
- typography;
- colours of horizontal surfaces;
- consistency in the design and use of materials in elements such as barriers, road surfaces and edgings.

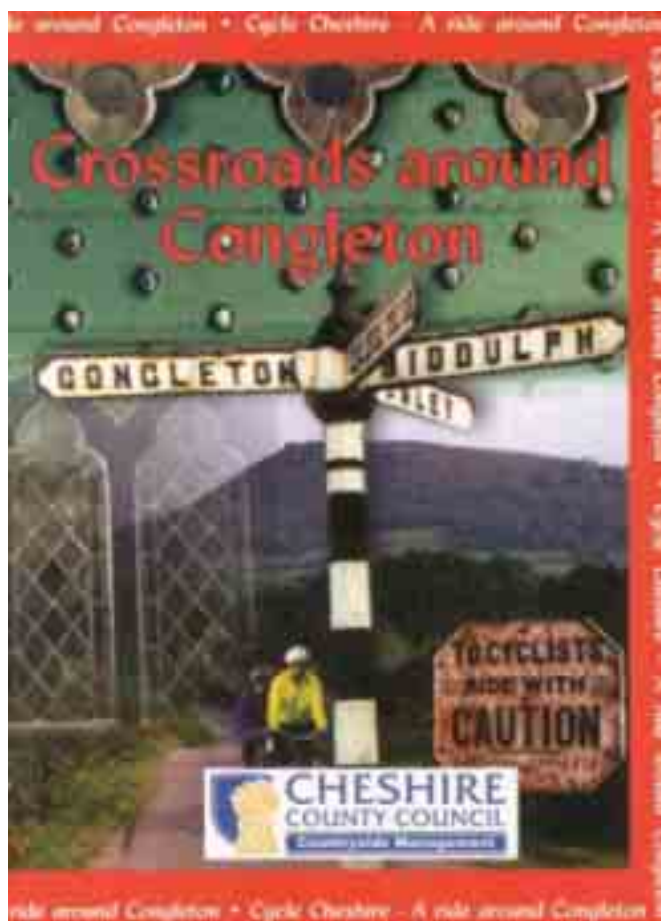


Figure 4/1 – Promotional Leaflet Produced by Cheshire Council for a Rural Cycle Route

5. ON-CARRIAGEWAY CYCLING FACILITIES

General

5.1 In some cases, as identified in Chapter 3, on-carriageway provision for cyclists may be the most appropriate solution. This chapter identifies the range of options available. Further advice is available in other documents, including

- *Traffic Signs Manual, Chapter 5 (DfT, 2003)*;
- *Cycle-Friendly Infrastructure – Guidelines for Planning and Design (IHT/DfT, 1996)*;
- *Cycling by Design – A Consultation Paper (Scottish Executive, 1999)*;
- *The National Cycle Network – Guidelines and Practical Details (Sustrans, 1997)*.

5.2 TD 27 (DMRB 6.1.2) provides details of the design standards for cross-section and headroom for all purpose trunk roads. Any variation in cross-section will require 'Departure from Standard' approval from the Overseeing Organisation.

5.3 Approaches that may be used in the provision of on-carriageway routes include:

- wide nearside lanes;
- with-flow cycle lanes (advisory/mandatory);
- contra-flow cycle lanes;
- with-flow and contra-flow bus/cycle lanes.

5.4 Annex 3 provides information on the construction issues, advantages and disadvantages of each measure. Detailed guidance on layout and implementation is provided in the *Traffic Signs Manual, Chapter 5 (DfT, 2003)*.

Wide Nearside Lanes

5.5 The provision of a wide nearside lane can be a relatively simple and cost effective way of improving safety for cyclists on the carriageway, while also reducing vehicle delay and frustration. They may be provided by adjusting the road markings to establish narrower offside lanes (on dual carriageways).

'Departure from Standard' approval is required from TD 27 (DMRB 6.1.2).

With-flow Cycle Lanes (Advisory/Mandatory)

5.6 Cycle lanes are provided to allocate and demarcate space for cyclists within the carriageway and can help to ensure a safe separation between motor vehicles and cyclists. Cycle lanes are a low cost measure in comparison with the development of OCRs, and are most useful on urban/suburban roads. It should be noted that cyclists are permitted to travel outside cycle lanes and their use is not compulsory.

5.7 Cycle lanes may be mandatory or advisory, although mandatory cycle lanes are often preferable. Mandatory cycle lanes may only be used by cyclists, with all other vehicles prohibited from entry. Advisory cycle lanes may be entered by motor vehicles when encroachment is unavoidable. Both types require effective parking and loading restrictions to prevent abuse by motor vehicles and help ensure successful operation.

Contra-Flow Cycle Lanes

5.8 One-way traffic systems can be inconvenient for cyclists. To prevent long diversions for cyclists a contra-flow cycle lane may be provided. These allow cyclists to travel against the flow of motorised traffic. Signing and markings highlight the need for motorists to anticipate cyclists in the contra-flow direction. It is clearly essential that the 'one-way' Traffic Regulation Order (TRO) excludes cyclists from the restrictions.

5.9 Further information can be found in *TAL 6/98* and the *Traffic Signs Manual, Chapter 5 (DfT, 2003)*.

With-Flow and Contra-Flow Bus/Cycle Lanes

5.10 The use of with-flow and contra-flow bus lanes to form shared use bus/cycle lanes can improve both safety and convenience for cyclists, particularly in urban areas. Further information can be found in *LTN 1/97 Keeping Buses Moving*.

Other Considerations for On-Carriageway Cycle Provision

5.11 Road narrowings are sometimes used on major roads as traffic calming measures and/or environmental features. Cyclists require special consideration at road narrowings to ensure their safety and protection. Further information can be found in *TAL 1/97*.

5.12 Cyclists also require special consideration at road works to ensure their safety and protection. Further information can be found in *TAL 15/99*.

6. CROSSINGS

General

6.1 Careful design at crossings is a key aspect of providing safe and attractive NMU routes. This chapter provides information on NMU crossing selection and assessment criteria, and a summary of crossing types.

6.2 Reference should also be made to *TA 90 (DMRB 6.3.5)* for geometric parameters associated with crossing provision, *TA 68 (DMRB 8.5.1)* for advice on assessment of at-grade pedestrian crossings and the *Traffic Signs Manual, Chapter 4 (DfT, 2004)* for advice on warning signs.

Crossing and Junction Assessment and Selection

6.3 Selecting the most appropriate form of crossing for a particular location requires careful assessment. Where possible the needs of NMUs should be incorporated into the design without a detrimental impact upon other road users.

6.4 From an NMU perspective, crossing facilities should aim to have the following characteristics (based on principles developed in *Providing for Journeys on Foot (IHT, 2000)*):

- **Safety and Comfort** – users should feel safe and should not feel intimidated by motorised traffic. The speed of approaching vehicles should be taken into account.
- **Location** – where safety considerations permit, crossing points should also coincide with desire lines. This is particularly important on identifiable local routes such as school routes or access to country parks.
- **Convenience** – there should be appropriate opportunity to cross quickly and efficiently at designated crossing points without NMUs being required to wait for long periods. In addition, long stretches of enclosing guardrails at crossings should be avoided.

- **Capacity** – crossings should be wide enough to accommodate peak demand and, in particular, signalled crossings should respond quickly and safely to demand.
- **Opportunity** – crossings should respond quickly and safely to demand from NMUs.

Rights of Way Crossings

6.5 For many trunk road schemes, a key issue will be whether to provide an at-grade or grade separated facility at existing rights of way crossings. At informal at-grade crossings, where NMUs are expected to cross without special provision, the difficulty of crossing depends primarily on the width of road to be crossed and the availability of gaps in traffic. As traffic flows increase, the availability of adequate gaps decreases sharply. If delays between gaps become too high, users are likely to either take risks or be discouraged from using the crossing at all.

6.6 Informal at-grade NMU crossings should not be provided on dual carriageways of 3 or more lanes per carriageway. In addition, informal at-grade equestrian crossings are not recommended on roads with 120kph design speed, or on wide single carriageways.

6.7 Table 6/1 provides additional criteria to assist in determining whether informal at-grade crossing facilities are appropriate, based upon Average Annual Daily Traffic flows (AADT). However, these criteria should be seen as a general guide and local factors will also influence the decision.

Road type	AADT flow (two-way)		
	Normally Appropriate	Potentially Appropriate (see paragraph 6.8)	Not Normally Appropriate
Single carriageway	Below 8,000	8,000 to 12,000	Above 12,000
Dual carriageway	Below 16,000	16,000 to 25,000	Above 25,000
Wide single c'way	-	Below 10,000	Above 10,000

Table 6/1 - Criteria for Suitability of Informal At-Grade Rights of Way Crossings

6.8 In situations where the range is identified in Table 6/1 as ‘potentially appropriate’, designers should consider in more detail whether an informal at-grade crossing is suitable. This would include:

- site specific factors that may make it easier to cross, e.g. signals upstream of the crossing point, speed limits below national levels;
- potential demand to cross, types of user and types of journey being undertaken;
- overall diversion and delay caused to NMUs on routes that would use the crossing point;
- implications of providing a grade separated crossing (considering design options, environmental impact and possible ways of minimising this);
- any mitigation measures that may be possible in association with an informal at-grade crossing (e.g. speed activated signs).

6.9 For any informal at-grade crossing, consideration should be given to warning drivers of possible NMU activity using signs to diagram 562 plated with ‘Pedestrians crossing’ or ‘Cycles crossing’. Detailed guidance can be found in the *Traffic Signs Manual, Chapter 4 (DfT, 2004)*.

Selection of NMU Crossing Facilities

6.10 Potential locations for new or improved crossings should be considered in accordance with *TA 68 (DMRB 8.5.1)*. This sets out a framework approach, which is used to encourage informed decisions as to whether a crossing facility is required, and if so, what type. The Assessment Framework should be presented in two parts:

- Site Assessment; and
- Option Assessment.

6.11 Annex 4 provides a Site Assessment checklist based on *LTN 1/95*, but including reference to equestrian needs.

6.12 Where NMUs are expected to cross at junctions, the type of crossing and its location should be chosen so as to provide the shortest safe route. Tactile surfaces and dropped kerbs should be provided at all crossings, appropriate for the types of users. Further details are available in *Guidance on the Use of Tactile Paving Surfaces (DfT, 1998)* and *TA 57 (DMRB 6.3.3)*.

6.13 Crossings for different combinations of NMUs can be used where NMU routes meet the carriageway. Footways, cycle tracks, OCRs and rights of way can sometimes be combined and diverted over short distances to a single crossing point (see Chapter 3).

6.14 The marking known as elephant’s footprints, formerly shown on working drawing WBM 294 and in *LTN 1/86*, cannot be used without approval from the Overseeing Organisation. Authorisation will only be given where cyclists cross under the protection of traffic signals and the special marking is necessary because cyclists’ route through the junction would not otherwise be obvious.

6.15 Dropped kerbs should be provided at NMU crossing points. These should be laid flush with the adjacent carriageway surface where possible. Further details on the design of dropped and flush kerbs are available in *TA 57 (DMRB 6.3.3)* and *TA 90 (DMRB 6.3.5)*.

6.16 For any at-grade crossing, provision of adequate visibility is very important for safety reasons. Further

details on visibility may be found in TA 90 (DMRB 6.3.5).

6.17 Table 6/2 illustrates the range of NMU crossing facilities available. The following sections provide a brief summary of each type of crossing and provide reference to other guidance for further information. While some of the suggested crossing facilities are unlikely to be appropriate in most trunk road situations, Design Organisations should consider all options available.

Informal Pedestrian and Cycle Crossings

6.18 Refuge islands may be provided within the carriageway to improve crossing facilities for pedestrians and cyclists (see Figure 6/1). However, it should be noted that physical islands on high speed roads may constitute a hazard, and consideration should be given to speed reduction measures in these situations. Any island on a road with a speed limit greater than 40mph, that is not part of a single lane dualling design, requires ‘Departure from Standards’ approval.



Figure 6/1 – Pedestrian Refuge Island on A49 in Hereford

6.19 The preferred crossing width for pedestrian refuge islands is 2.0m (minimum 1.5m at constrained locations). The preferred crossing width for cyclist refuge islands is 3.0m to 4.0m (2.5m minimum at constrained locations). The length of the refuge should be determined by the frequency and type of use, but should not be less than the width of the connecting cycle facility or less than 2.0m. Tactile surfaces should be provided both at the dropped kerb approach to the crossing and within the refuge itself.

Grade	Control	Crossing Type
At-Grade	Informal	Pedestrian and Cycle Crossings (with/without refuge)
		Cycle Priority Crossings
		Equestrian Crossing with Holding Area
	Formal Uncontrolled	Zebra Crossing
	Formal Signalised	Pelican Crossing
		Puffin Crossing
		Toucan Crossing
		Equestrian Crossing
		NMU Stages At Traffic Signals
	Grade Separated	
Underpasses		
		Bridges

Table 6/2 – NMU Crossing Facilities

6.20 Traffic calming features such as pinch points, build outs and refuge islands reduce the carriageway width for vehicles and cyclists alike. Often this leads to ‘squeezing’ of the cyclist which makes them more vulnerable. These features should therefore be accompanied by a cycle by-pass wherever possible.

6.21 A staggered crossing may be considered on lit roads only and the length of stagger between crossing movements should be kept to a minimum. Staggered crossings should, where possible, be aligned as left/right manoeuvres rather than right/left so that NMUs turn to face oncoming traffic.

6.22 Possible layouts for cycle crossings include a simple cycle track with refuge island, offset crossing at unsignalised junction and staggered cycle track crossing of dual carriageway.

6.23 Further details on pedestrian refuge islands are available in *TA 68 (DMRB 8.5.1)*. Further details on Give Way Cycle Crossings are available in *LTN 1/86*.

Cycle Priority Crossings



Figure 6/2 – Cycle Priority Crossing on Cycle Route at Access to Supermarket in Hereford

6.24 Cycle route crossings of roads are normally configured so that the road has priority over the cycle route. Where appropriate, the priority may be reversed by placing the cycle track on a flat-topped speed hump and providing give-way markings on the side road (see Figure 6/2). All speed humps should be constructed in accordance with the *Highways (Road Humps) Regulations 1999 (SI 1999 1025)*.

6.25 Where a cycle track runs alongside a carriageway, with poor sight-lines into the side road, the

track and its side road crossing will need to be ‘bent out’ (deflected away from the carriageway). This is so that motorists turning into the side road being crossed by cyclists can complete their turn and still have time to stop. It also helps prevent stationary vehicles obstructing the main carriageway when waiting at the crossing.

6.26 Alternatively cycle tracks may be ‘bent in’, moving the cycle track onto the carriageway across the mouth of the junction. However, this may require some junction treatment to narrow the road to provide protection to the cyclist.

Unsignalised Equestrian Crossing with Holding Area

6.27 There should be a general presumption against the provision of informal at-grade crossings for equestrians on dual carriageways. However, crossings may be considered under certain circumstances. Where considered acceptable, an equestrian refuge in the central reservation of the carriageway should be provided (5m wide x 3m long). Equestrian refuges are likely to require a ‘U-turn’ prohibition.

6.28 On single carriageways (except wide single carriageways) which have a direct route across and which meet the visibility advice of *TA 90 (DMRB 6.3.5)*, an at-grade equestrian crossing is preferred.

6.29 Equestrians need to stand well back from the side of the road while waiting to cross. For all equestrian crossings, the grass verge should therefore be extended back on each side of the road at the point of crossing to provide a holding area for horses within the verge (10m wide x 5m long). In some situations the physical area required to create a holding area may trigger the rejection of an at-grade solution. *TA 90 (DMRB 6.3.5)* provides further details.

6.30 To prevent horse riders from moving straight across the road without checking for oncoming traffic, it can be beneficial to stagger the bridleway approach to the crossing from a suitable distance or provide a chicane at the entrance/exit to the highway boundary (considering the needs of other users).

6.31 It will be necessary to ensure that any informal equestrian crossings with holding areas are clearly visible to motor vehicles from the carriageway. Warning signs may be used to assist in alerting drivers to the hazard. However, additional visual highlighters may be used such as white rails or skid resistant surfacing on

the approach to the crossing as identified in *HD 28 (DMRB 7.3.1)* and *HD 36 (DMRB 7.5.1)*.

'Zebra' Crossings

6.32 Zebra crossings are relatively low cost facilities which offer immediate response to pedestrian demand and provide priority to the pedestrian across the whole crossing (see Figure 6/3). However they should not be introduced on roads with an 85th percentile speed of 35mph or above.

6.33 Further details on the design of zebra crossings are available in the *Zebra, Pelican and Puffin Pedestrian Crossings Regulations 1997 (SI 2400)* and *TA68 (DMRB 8.5.1)*.



Figure 6/3 – Zebra Crossing, Dalton in Furness

Signalised Crossings

6.34 The 85th percentile speed must not exceed 50mph for stand-alone signal controlled crossings.

6.35 The addition of audible and tactile signals with dropped kerbs at signal controlled crossings is recommended for the benefit of blind and partially sighted people. Further details are available in *TAL 4/91*.

'Pelican' Crossings

6.36 Pelican crossings are used away from junctions and are signal controlled. The crossing uses far side pedestrian signal heads with a fixed duration green man period and a flashing amber traffic signal/flashing green man pedestrian signal, demanded solely by push button.

'Puffin' Crossings

6.37 Puffin crossings (see Figure 6/4) vary from Pelican crossings as follows:

- They have near-side pedestrian signals, showing a steady red or green figure.
- They use the standard signal sequence.
- Kerbside detectors can sense when a pedestrian has crossed or moved away after pushing the demand button, in which case the demand is cancelled.
- Detectors sense pedestrians on the crossing and hold vehicles at a red light until they have crossed.



Figure 6/4 – 'Puffin' Crossing in Urban Area

6.38 For Puffin crossings, the all red clearance period can be extended by pedestrian on-crossing detection. It is intended that the Puffin operational cycle will become the standard form of pedestrian crossing at stand-alone crossings and junctions. Further details on Puffin crossings are available in *TAL 1/01* and *TAL 1/02*.

‘Toucan’ Crossings



Figure 6/5 – ‘Toucan’ Crossing in Use by Pedestrian and Cyclist

6.39 Toucan crossings (see Figure 6/5) permit cyclists and pedestrians to use the same crossing. They are normally linked to cycle routes. Paths for cyclists and pedestrians at crossing points should be well defined to avoid potential conflicts. Detectors may be used on the crossing to hold traffic until cyclists and pedestrians have crossed.

6.40 Toucan crossings are sometimes incorporated into signal controlled junctions in place of pedestrian-only phases.

6.41 The crossing has a similar form of vehicle detection as the Pelican or Puffin crossings and normally the same form of pedestrian on-crossing detector as the Puffin crossing.

Equestrian Crossing (Signal Controlled)



Figure 6/6 – Equestrian Crossing

6.42 This is a signal controlled crossing for use by ridden horses (see Figure 6/6). Signal controlled equestrian crossings are not combined with pedestrian and/or cycle crossings in order to avoid potential conflicts. If there is a requirement to provide facilities for other NMUs, these should be installed in parallel. Microwave detectors can also be used on the crossing to extend traffic times.

6.43 Holding areas should be provided within the verge as described in paragraphs 6.27 to 6.31. Further details on equestrian crossings are available in *TAL 3/03*.

NMU Stages at Traffic Signals

6.44 Designers should consider incorporating NMU traffic stages into signal controlled junctions, where there is shown to be a demand to cross. Puffin, Toucan and other control equipment can be adapted and used in signal controlled junctions to include pedestrian, cycle and equestrian stages.

6.45 The use of audible or tactile signals at NMU crossings is recommended for the benefit of blind and partially sighted people. However, audible signals can be confusing at signalised junctions unless there is an all red stage. Further details are available in *TAL 5/91*.

6.46 Further details on the design of pedestrian stages at traffic signals are available in *TA 15 (DMRB 8.1.1)* (being revised at the time of publication) and *TD 50 (DMRB 6.2.3)*.

Grade Separated Crossings

6.47 Grade separated crossings can be particularly beneficial where high volumes of NMUs need to cross high flows of fast moving traffic. The design of bridges and underpasses is highly dependent upon the local topography, the profile of the proposed crossing location, environmental impact and overall cost. For subways the height of the water table may also be a significant issue.

6.48 Schemes may include new purpose built bridges and underpasses or the adoption/conversion of existing grade separated facilities (e.g. agricultural access). Adoption or conversion will normally need to be developed in partnership with Local Authorities and/or in agreement with private landowners.

6.49 The early consideration of NMU issues is required as this can fundamentally affect the

environmental impact and Orders for the proposed scheme.

Bridges

6.50 Bridges with steps or steep ramps represent the least suitable form of crossing for disabled people and should therefore only be provided when other forms of crossings (at-grade or underpass) are not deemed appropriate. Footbridges cannot generally be used by disabled people unless they are designed on the basis of enhanced criteria for disabled use, as outlined in *BD 29 (DMRB 2.2.8)*. These criteria should always be adopted as far as practicable, as they are of benefit to many other users. Provision should be discussed with local disability groups, the Technical Approval Authority and any other authorities concerned.

6.51 Underpasses are preferred to bridges by equestrians. However, where bridges for equestrian use are necessary, the design should ensure that the width of the bridge on its approach is in line with standards identified in *BD 29 (DMRB 2.2.8)*. For bridleway bridges parapets should be of an appropriate height, with an infill panel at the bottom of the parapet to prevent horses from seeing the road below. Where possible, an appropriate fence at a similar height to the parapet should be used on the approach to the bridge (with infill panel). The bridge deck surface should be a non-echoing material such as concrete or pre-formed rubber (recycled tyres). Steel plate decks are unsuitable for equestrians because of the lack of friction and noise they produce. Wooden decks become slippery when wet. Some bituminous surfaces can be slippery for horses, and should be avoided on steep slopes (see Chapter 8).

6.52 If a bridleway also has a private means of access, the Overseeing Organisation should seek to agree the surface materials between the Local Authority (responsible for the bridleway) and the user of the private means of access.

6.53 Further details on the design of pedestrian, cyclist and bridleway bridges are available in *BD 29 (DMRB 2.2.8)*, *TA 90 (DMRB 6.3.5)*, *BD 52 (DMRB 2.3.3)*, draft *LTN 1/04* and draft *LTN 2/04*.

Underpasses

6.54 Underpasses are most acceptable for disabled people if the road is elevated so that users do not climb or descend to use the underpasses. Underpasses can be difficult for disabled people unless they are designed on

the basis of enhanced criteria for disabled use, as outlined in *TD 36 (DMRB 6.3.1)*. These design details are also of benefit to many other users and should therefore be adopted as far as practicable.



Figure 6/7 – Underpass Suitable for all NMUs

6.55 Agricultural underpasses provide more useful links than cattle underpasses, because they can provide combined agricultural/NMU access (see Figure 6/7).

6.56 Personal safety can be a significant issue in underpasses, and it is recommended that they are lit to an acceptable level to reduce the perceived risk (subject to environmental impact). Where power is unavailable consideration should be given to the use of solar panels. The use of graffiti resistant finishes can also help ensure that the external finish of the underpass is retained in good order.

6.57 Further details on the design of underpasses for NMUs are available in *TD 36 (DMRB 6.3.1)*.

7. JUNCTIONS

General

7.1 Volume 6 of DMRB provides advice on issues of junction design of relevance to NMUs. This chapter deals with issues not covered elsewhere in DMRB and provides information on advanced stop lines, NMUs at roundabouts, and cyclists at grade separated crossings. Further advice is available in other documents, including

- *Traffic Signs Manual, Chapter 5 (DfT, 2003);*
- *Cycle-Friendly Infrastructure – Guidelines for Planning and Design (IHT/DfT, 1996);*
- *Cycling by Design – A Consultation Paper (Scottish Executive, 1999);*
- *The National Cycle Network – Guidelines and Practical Details (Sustrans, 1997).*

Advanced Stop Lines (ASLs)



Figure 7/1 – Advanced Stop Line

7.2 Cyclists wishing to turn right or travel straight ahead at signalised junctions can often find themselves in conflict with motorised traffic, particularly at junctions with left turn only lanes.

7.3 ASLs can be used in these situations to hold motor vehicles back while allowing cyclists to take up a position nearer the signals (see Figure 7/1). This puts the cyclists where drivers can clearly see them,

allowing them additional time to either execute their manoeuvre or to get in a better position to do so.

7.4 The space between the two stop lines forms a reservoir for cyclists to wait in. The reservoir must be fed by a cycle lane, which can be either on the nearside (in which case it may be advisory or mandatory) or between traffic lanes (in which case it may only be advisory). Approach cycle lanes should normally begin at a minimum of 10m prior to the ASL or at the maximum queue length.

7.5 With a reservoir of 4m to 5m between stop lines, ASLs have proved successful for vehicle flows up to 1,000vph in one direction with up to two approach lanes. Central cycle lanes have been proved successful at 3-lane approaches. The cycle symbol (TSRGD diagram 1057) must be sited in the waiting area to remind drivers of their purpose and limit encroachment.

7.6 Full details on the design of ASLs are available in the *Traffic Signs Manual Chapter 5 (DfT, 2003)*, *TD 50 (DMRB 6.2.3)* and *TAL 5/96*.

NMUs at Roundabouts

7.7 Separate routes for pedestrians, with dropped kerb crossings away from the flared entries to the roundabout are preferred where this fits with desire lines, carriageway widths are limited, and vehicular traffic movements are straightforward. However, where this is not practical other NMu crossing facilities should be considered, such as pedestrian refuge islands, zebra crossings, signalised crossings and grade separated options. The need to provide separate routes away from flared entries should be taken into account by designers when determining the land-take requirements of their schemes.

7.8 Cyclists require special consideration at roundabouts to ensure safe passage through the entry, exit and the circulatory carriageway. 10% of all reported accidents involving cyclists occur at roundabouts; of these 11% are serious or fatal, and more than 50% involve the motorist entering the roundabout and colliding with cyclists using the circulatory carriageway.

7.9 If an off-carriageway cycle track around the perimeter of the roundabout is provided, the potential

for use of these routes by pedestrians and equestrians should also be considered, particularly when intersecting with routes such as bridleways and in close proximity to riding schools, stables and racecourses.

7.10 Different levels of treatment for cyclists are required at different forms of roundabout. These are considered in the following sections.

Mini Roundabouts

7.11 Well designed mini roundabouts generally reduce traffic speeds, and with the short distances involved it is recommended that cyclists use the carriageway without any special cycle facilities.

Normal Roundabouts

7.12 Traffic speeds generally increase with the size of roundabouts and larger entry flares:

- Roundabouts with an inscribed circle diameter of 28m to 36m are unlikely to present major safety problems to cyclists, unless they have wide flares on entry. In these situations consideration should be given to providing an off-carriageway cycle track around the perimeter of the roundabout.
- Roundabouts with an inscribed circle diameter of 36m to 50m are likely to have higher speeds and the risk to cyclists is greater. Cyclists should normally use the circulatory carriageway for total flows up to 8,000vpd. Where traffic flows are in excess of this, consideration should be given to providing an off-carriageway cycle track around the perimeter of the roundabout, or provision of traffic signals to control the flow of traffic in conjunction with ASLs.
- Roundabouts with an inscribed circle diameter of over 50m and/or dual carriageway entries generally have significantly higher speeds on entry, exit and on the circulatory carriageway, and are of greatest risk to cyclists. In these cases it is recommended that cyclists are provided with an alternative route such as an off-carriageway cycle track around the perimeter of the roundabout, with signal controlled crossing of entry and exit arms, or the provision of a grade separated facility.

Continental Roundabouts

7.13 'Continental' roundabouts are often designed for single lane entry with restricted capacity and geometry that is more suited to the needs of cyclists. This has an impact upon the capacity of the roundabout. It should be noted that continental roundabouts require 'Departure from Standard' approval from the Overseeing Organisation.

7.14 Further details on NMUs at roundabouts are available in *TD 16 (DMRB 6.2.3)*, *LTN 1/86* and *TAL 9/97*.

Cyclists at Grade Separated Junctions and Other Slip Road Junctions

7.15 Cyclists require special facilities at grade separated junctions and other slip road junctions to ensure safe integration with merging traffic. Speeds of motor vehicles joining or leaving the carriageway are likely to be in excess of 50mph, and conflicts can occur between relatively slow moving cyclists continuing across the main carriageway and motor vehicles wishing to leave or join the main carriageway.

7.16 Further details on cyclists at grade separated junctions are available in *TD 22 (DMRB 6.2.1)* and *TAL 1/88*.

7.17 Cycling provision suitable for grade separated junctions should also be considered acceptable at Type A and Type A modified lay-bys as described in *TA 69 (DMRB 6.3.3)*.

8. GENERAL CONSIDERATIONS

General

8.1 This chapter identifies a range of general considerations that need to be taken into account when planning and designing NMU routes.

Surfaces

8.2 The choice of materials and construction specifications are critical to the long-term integrity and aesthetic appeal of NMU facilities. NMUs require a good quality surface with an even profile and a smooth macro texture to provide a comfortable surface to travel on, but a harsh micro texture to provide sufficient skid resistance when wet.

8.3 The following issues should be considered when selecting an appropriate surface:

- type of use (volume and combination of NMUs and vehicles);
- skid resistance;
- strength and durability, from the anticipated loading;
- construction: rigid or flexible, pre-formed or in situ – often dependent upon the above and ease of construction;
- visual appearance – often dependent upon the local context and character;
- capital and routine maintenance costs.

8.4 Longitudinal and transverse defects on surfaces can cause serious trip hazards for pedestrians and loss of control for cyclists. In particular, cyclists are less likely to use the OCR surface if it is inferior to that of the carriageway. Surfaces should be machine laid where practical.

8.5 A range of appropriate surfaces for footways or cycle routes are identified in *HD 39 (DMRB 7.2.5)*. However, the development of an OCR will require the consideration of the potential combinations of NMUs that may use the OCR. Although *HD 39 (DMRB 7.2.5)* does not identify the use of unbound surfaces, in rural areas with lower NMU flows, unbound surfacing materials can be used to good effect. They are,

however, not suitable for use by wheelchairs and pushchairs. Table 8/1 outlines a range of bound and unbound surfaces, which includes an adequacy score relating to their appropriateness for use by different NMUs. Surface selection should be made on a case-by-case basis and agreed with the appropriate user groups and the Overseeing Organisation.

8.6 It should be noted that equestrian routes have traditionally been 'beaten earth' (dirt tracks) or redundant/little used macadam or bituminous carriageways. Bituminous surfaces can polish under normal wear and tear, which may provide an unsatisfactory surface for horses. Where routes have a high frequency of use, a formal sub-base and wearing course may be required.

8.7 The selection of equestrian surfacing also has a direct impact upon the speed at which the equestrian can ride. Short grass or woodchip surfaces lend themselves to a fast trot/canter by horses, whereas macadam surfaces are only suitable for walking or a slow trot.

Signing and Markings

8.8 Consistent and good quality signing will assist NMUs with identifying routes and advertise the presence of NMUs to other highway users. This is particularly important when identifying alternatives to on-carriageway facilities.

8.9 NMU destination signs should normally include both the next destination and the nearest major destination. Where possible, links with NMU routes such as National Cycle Network, 'Greenways', 'Quiet Lanes' and National Bridle Route Network should also be identified, including destination and route number where appropriate. OCRs may also be identified on plans in display cabinets.

8.10 Signing should be sited so as not to cause an obstruction to NMUs. Where possible, signs should not be placed within an OCR. However, where this is unavoidable, signs should be placed so that all the expected users can easily pass under or around them. Adjacent to OCRs, it is desirable that signs are sited back from the edge of the route to maintain an effective width. For more information refer to *TA 90 (DMRB 6.3.5)*.

Surface Material	Adequacy (see note a)			Construction Details
	Pedestrians	Cyclists	Equestrians	
Hot rolled asphalt surface course	1	1	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	1	1	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	1	1	2	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	3	65mm thick on sand on 150mm Type 1 subbase*
Concrete blocks/flags	1	1	3	65mm thick blocks on 30mm sharp sand bed and 150mm Type 1 sub-base*
In situ concrete	1	2	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	2	20mm depth limestone/hoggin (3mm dust) or other such as 50mm depth Breedon Gravel (6mm dust) or 75mm depth Coxell Gravel (30mm fines)
Sand	3	4	1	75mm sand on 150mm free draining layer
Wood chips	2	4	1	Chips laid to a compacted thickness of 225mm on free draining surface layer
Grassed gravel	1	3	1	150mm surface course of aggregate mixed with 25% topsoil on 150mm aggregate on geotextile sub-base
Reinforced turf	2	3	1	Rubber bonded fibre/grit sand laid on turf
Scalping/ballast with quarry waste	2	2	2/3	Max. 40mm size with a high content of quarry waste laid (well compacted) on 150mm Type 1 sub-base**
Industrial waste products	2	3	1/2	100mm wearing course/150mm base course Graded Fuel Ash/Pulverised Fuel Ash/Colliery Shale/Red Shale (approved by English Nature)
Road planings	1	1	2	Screened recycled road planings***

Notes

- a) Adequacy Scale: 1 – Excellent, 2 – Good, 3 – Reasonable and 4 –Inadequate.
- b) All gradients should be in line with other DMRB guidance and unbound surfaces should be well compacted.
- c) All wearing course depths are typical and require an adequate basecourse and/or sub-base based upon local CBR values. Local gravel should be used where possible.
- d) Unbound surfaces also require an edge restraint in the form of a pre-cast concrete pin-kerb or CCA treated softwood timber peg and edgeboard.
- * Only for equestrians for walk or trot. Not to be used on steep slopes.
- ** By their nature, scalpings will be of variable quality and some varieties will not be suitable for use on riding tracks. Local knowledge is important in the selections of scalpings as a surface material. The surface can also become polished and may become unsuitable for horse riding. Ballast is not always a satisfactory surface for horses as the surface can be kicked up by hooves and can damage the horse's foot.
- *** This material can be inconsistent. Specification should require small and uniform sized particles.

Table 8/1 – Surfaces for NMU Routes

8.11 Good road markings tend to assist cyclists as they channel traffic in clearly defined paths; however, road markings can be hazardous to NMUs if they:

- stand excessively proud of the surface;
- become slippery when wet;
- are used to excess, which adds to visual impact and future maintenance requirements, and can distract horses.

Lighting

8.12 NMU routes within or adjacent to the highway verge will often benefit from lighting spillage from carriageway lighting. However, other OCRs may be some distance from the carriageway and may require their own lighting provision. Lighting of OCRs adjacent to an otherwise unlit highway can cause problems for highway users, and is not recommended.

8.13 The provision of lighting for NMUs should largely be based upon local circumstances. In urban areas, it is recommended that where appropriate and feasible, routes should be lit, particularly at crossing points. Consultation may be required to assess appropriateness. It should be noted that commuter journeys during winter months are likely to take place in dusk or dark conditions in both directions.

8.14 NMU routes in rural areas should not normally include lighting unless there are specific requirements, which include:

- high flows of NMUs, particularly on adjacent and shared use NMU facilities;
- routes with intersections with rights of way and both minor and major roads falling below geometry standards (lighting used at a specific point to highlight danger);
- routes which form part of an identified school route, commuter route or other route;
- through any underpass (subject to environmental impact).

8.15 Where rural OCRs require lighting it should be continuous along the NMU route. It is also desirable that the lighting has a low environmental impact, and care should be taken at transition points from lit to unlit areas.

8.16 At surface level crossings on lit roads after dark, NMUs should always be seen in silhouette, i.e. the lighting source should be close to, but downstream of, the crossing.

8.17 Any lighting columns or bollard lights should be sited a minimum of 0.5m back from the edge of the OCR, so as not to cause an obstruction to NMUs.

8.18 Where locations have no existing power supply, the use of solar powered lighting may be considered.

8.19 Further information is provided in *Technical Report Number 23: Lighting of Cycle Tracks* produced by the Institution of Lighting Engineers and BS 5489.

Drainage and Manholes

8.20 On-carriageway drainage should be outside the effective carriageway area (including the hardstrip). Positive drainage in the form of gullies can cause problems for NMUs. For cyclists, the front wheel of a bicycle can be trapped by drainage grate slots, and hence where grates are unavoidably within the cycle route they should normally be outside the usable width of the cycle route. They should also be modern cycle-safe and hydraulically efficient models, such as “vane” or “honeycomb” grates. Drainage slots should be oriented perpendicular to the direction of travel. Manholes should be installed fully flush with the surrounding surface and outside any equestrian route.

8.21 Filter drains and french drains within the verge should generally be avoided on verges used as NMU routes, because of the difficulty they cause to horses.

8.22 On NMU routes, rainwater will normally disperse to the verges. However at dips and on kerbed sections, positive drainage should be provided to prevent ponding. Ditches and gullies hidden in overgrown verges are a hazard, and should generally be avoided. However, where these are necessary, they should be a minimum of 0.5m back from the edge of the NMU route to avoid hazards if NMUs accidentally leave the route. Regular maintenance is essential.

8.23 Drainage grates and utility covers can also cause slipping problems for equestrians. The drainage of equestrian routes may rely on run-off to adjacent land provided this is within the boundary of the facility or road; otherwise, gullies and pipe systems may be required.

8.24 Where an extruded kerb segregates a cycle or equestrian route, drainage should take place through

300mm wide gaps in the extruded kerb. The frequency of the gaps will be influenced by the drainage design for the route.

Street Furniture

8.25 Cycle theft can be a major problem. The provision of carefully planned, secure and convenient parking facilities can reduce this problem and help to promote cycling. In addition, it is recommended that parking is located in well used public areas and is appropriately lit.

8.26 *TAL 5/02* identifies suitable types of and locations for cycle parking. This includes use of Sheffield stands (for short/medium stay parking) and cycle lockers (long stay parking).

8.27 Access barriers may be used to prevent unauthorised access by motorised vehicles onto rights of way and OCRs. However, these should be avoided wherever possible and only installed if there is either high likelihood of, or existing evidence of, misuse. Metal or timber bollards can be used successfully as access barriers as long as they are designed to allow wheelchair access (refer to *Inclusive Mobility* (DfT, 2002) for further details). Alternatively, motorcycle barriers may be used; Sustrans have developed a design which is suitable for cycle routes. However, these are unsuitable for routes with equestrian use, for which barriers developed by the British Horse Society would be acceptable.

8.28 Cycle chicanes can be used both as access barriers and traffic calming measures for cyclists on OCRs. However, these should again be designed to ensure that wheelchair users and equestrians retain full access. Further details of cycle chicanes can be found in *Cycle-Friendly Infrastructure - Guidelines for Planning and Design* (IHT/DfT, 1996).

8.29 Street furniture, such as seating and bins, should be included at intervals along OCRs to provide resting and amenity facilities for NMUs, particularly for those with mobility impairments. In commonly used pedestrian areas, seats should be provided at intervals of no more than 50m. This is particularly important in close proximity to hospitals, residential areas and nursing homes. Design Organisations should liaise with Local Authorities about the provision and management of these facilities.

8.30 The use of pedestrian guardrails in both on-carriageway and off-carriageway design is outlined

in *TA 57 (DMRB 6.3.3)* and the Overseeing Organisation standard for road restraint systems. However, the use of guardrails should be kept to the minimum necessary, and where used, designs should avoid obstructing inter-visibility between drivers and pedestrians.

Personal Safety and Security

8.31 Designers need to take account of personal security issues when designing an NMU route. OCRs within or adjacent to the highway verge will bring about a degree of perceived and actual personal safety if a sufficient visual and physical connection with the carriageway can be maintained.

8.32 Where this is not possible, the design of the OCR should take into account the perceived and actual personal security of NMUs by providing good access into adjacent areas, sightlines, lighting (where appropriate) and the provision of a spacious and inviting environment where the NMU can feel at ease. Popular and well used routes will generate their own informal surveillance that will help to provide personal security. Opportunities for assailants to conceal themselves may be avoided by good design, such as avoiding use of sudden changes in fence lines.

8.33 Consideration needs to be given to the need for, and level of, landscaping in the vicinity of NMU routes. Such landscaping should be sympathetic to the required security of the route. Additionally, routes that are not maintained can cause security problems if the vegetation is not regularly cut back. Vegetation adjacent to the OCR should be maintained to an appropriate height to minimise the number of hiding places; this is likely to be of particular concern in urban/suburban areas. The maintenance requirements of schemes should therefore be carefully considered in design, including the health and safety aspects for operatives involved in future maintenance.

Maintenance and Monitoring

8.34 NMU routes, both on- and off-carriageway, should be maintained to an appropriate standard. In particular, debris should be removed regularly and a high standard of surface provided.

8.35 Where OCRs are developed in partnership with Local Authorities, the standard and funding of future maintenance will need to be agreed to the satisfaction of the Overseeing Organisation.

8.36 Scheme designs should ensure that access will be available for plant and machinery to undertake maintenance on OCRs.

8.37 It should be noted that legal action can be brought in respect of loss, injury or damage resulting from neglect or failure to maintain a highway (or cycle track).

8.38 All on-carriageway facilities and OCRs should be monitored to identify whether additional maintenance provision is required.

Other Issues

8.39 **Bus stops:** Because of the volume of traffic on trunk roads, it is common practice to provide a lay-by for a bus stop. The progressive introduction of low-floor buses and the desire to raise kerbs at bus stops to reduce the step into the bus, require a stop that the bus can approach parallel to the kerb. In lay-bys, standard kerb heights for bus stops range from 125mm to 140mm. Above this it is recommended that specialised bus stop kerbs should be used which give heights up to 220mm. Where bus stops are provided at the immediate side of high speed roads without lay-bys, the limits for kerb heights within *TA 57 (DMRB 6.3.3)* should be adhered to. The stop should be connected to the local pedestrian network of footways and footpaths, with dropped kerbs and tactile surfaces where roads are crossed. This network should be as direct as possible between the stop and local principal destinations.

8.40 **Escape routes for disabled motorists:** A number of sections of road, including tunnels and bridges, are provided with emergency escape routes. These should be designed so that they can be used by disabled people. Further details are given in *BD 78 (DMRB 2.2.9)*, *TD 27 (DMRB 6.1.2)*, and *Inclusive Mobility (DfT, 2002)*.

8.41 **Service and Picnic Areas:** Toilets and other facilities at service and picnic areas should be accessible to disabled people. Parking for disabled travellers should be provided close to the toilets. The geometry of car parking spaces for disabled people is specified in *TAL 5/95. The Building Regulations 2000 – Part M: Access and Facilities for Disabled People* includes regulations for access of disabled people to buildings, including ramps, steps and locations of tactile paving.

9. REFERENCES AND BIBLIOGRAPHY

Design Manual for Roads and Bridges (DMRB):

1. TA 90 (DMRB 6.3.5) The Geometric Design of Pedestrian, Cycle and Equestrian Routes
2. HD 42 (DMRB 5.2.5) Non-Motorised User Audits
3. TA 57 (DMRB 6.3.3) Roadside Features
4. TA 68 (DMRB 8.5.1) The Assessment and Design of Pedestrian Crossings
5. HD 39 (DMRB 7.2.5) Footway Design
6. TD 27 (DMRB 6.1.2) Cross-Sections and Headrooms
7. HD 28 (DMRB 7.3.1) Skidding Resistance
8. HD 36 (DMRB 7.5.1) Surfacing Materials for New and Maintenance Construction
9. TA 15 (DMRB 8.1.1) Pedestrian Facilities at Traffic Signal Installations
10. TD 50 (DMRB 6.2.3) The Geometric Layout of Signal-Controlled Junctions and Signalised Roundabouts
11. BD 29 (DMRB 2.2.8) Design Criteria for Footbridges
12. BD 52 (DMRB 2.3.3) The Design of Highway Bridge Parapets
13. TD 36 (DMRB 6.3.1) Subways for Pedestrians and Pedal Cyclists. Layout and Dimensions
14. TD 16 (DMRB 6.2.3) The Geometric Design of Roundabouts
15. TD 22 (DMRB 6.2.1) Layout of Grade Separated Junctions
16. TA 69 (DMRB 6.3.3) The Location and Layout of Lay-bys
17. BD 78 (DMRB 2.2.9) Design of Road Tunnels

DfT Traffic Advisory Leaflets (TALs):

18. TAL 6/00 Monitoring Walking
19. TAL 8/95 Traffic Models for Cycling
20. TAL 1/99 Monitoring Local Cycle Use
21. TAL 6/98 Contraflow Cycling
22. TAL 1/97 Cyclists at Road Narrowings
23. TAL 15/99 Cyclists at Road Works
24. TAL 4/91 Audible and Tactile Signals at Pelican Crossings
25. TAL 1/01 Puffin Pedestrian Crossing
26. TAL 1/02 The Installation of Puffin Pedestrian Crossings
27. TAL 3/03 Equestrian Crossings
28. TAL 5/91 Audible and Tactile Signals at Signal Controlled Junctions
29. TAL 5/96 Further Development of Advanced Stop Lines
30. TAL 9/97 Cycling at Roundabouts, Continental Design Geometry
31. TAL 1/88 Provision for Cyclists at Grade Separated Junctions
32. TAL 5/02 Key Elements of Cycle Parking Provision
33. TAL 5/95 Parking for disabled people

DfT Local Transport Notes (LTNs):

34. LTN 1/04 Policy, Planning and Design for Walking and Cycling (Consultation Draft, 2004)
35. LTN 2/04 Adjacent And Shared Use Facilities For Pedestrians And Cyclists (Consultation Draft, 2004)

- 36. LTN 1/97 Keeping Buses Moving
- 37. LTN 1/86 Cyclists at Road Crossings and Junctions

Other Documents:

- 38. Inclusive Mobility – A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure (DfT, 2002)
- 39. Guidance on the Use of Tactile Paving Surfaces (DfT, 1998)
- 40. The Traffic Signs Manual, Chapter 5: Road Markings (DfT, 2003)
- 41. Cycle-Friendly Infrastructure: Guidelines for Planning and Design (IHT/Bicycle Association/CTC/DfT, 1996)
- 42. The National Cycle Network: Guidelines & Practical Details (Sustrans, 1997)
- 43. Cycling By Design – A Consultation Paper (Scottish Executive, 1999), in use in Scotland
- 44. Guidelines for Providing for Journeys on Foot (IHT, 2000)
- 45. The Traffic Signs Manual, Chapter 4: Warning Signs (DfT, 2004)
- 46. The Highways (Road Humps) Regulations 1999: SI 1999 1025
- 47. The Zebra, Pelican and Puffin Pedestrian Crossings Regulations 1997: SI 1997 2400
- 48. Technical Report 23: Lighting of Cycle Tracks (Institution of Lighting Engineers, 1998)
- 49. BS 5489: Code of Practice for the Design of Road Lighting (BSi, 2003)
- 50. The Building Regulations 2000, Part M: Access and Facilities for Disabled People

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ANNEX 1 LEGAL FRAMEWORK (ENGLAND AND WALES ONLY)

General

A1.1 This annex is included for information and provides a summary of existing definitions, usage rights and responsibilities of different bodies, followed by issues relating to improving NMU facilities. **Legal advice should always be sought during the development of proposals to ensure that changes in legislation and case law have been taken into account.**

A1.2 Changes to public rights of way can be financed, designed and implemented by the Overseeing Organisation as long as they are included as part of published statutory orders and receive the appropriate statutory approvals.

Public Rights of Way

A1.3 Public Rights of Way comprise Footpaths, Bridleways, Restricted Byways and Byways Open to All Traffic. All Public Rights of Way are highways, and are shown on 'Definitive Maps' held by highway authorities.

- **Footpaths** – are highways over which the public have a right of way on foot only, not being a footway [Section 329(1) Highways Act 1980].
- **Bridleways** – provide a right of way on horseback, foot and bicycle. The Countryside Act 1968 gave cyclists the right to use bridleways but they must give way to other users. The right for cyclists to use a bridleway can be subject to an order or bylaw prohibiting cycling on particular parts of it.
- **Restricted Byways** – were created by the Countryside and Rights of Way Act 2000. They are generally open only to pedestrians, cyclists, horse-riders and horse-drawn vehicles and replace the former category of 'Roads Used as Public Paths' (RUPPs).
- **Byways Open to All Traffic** – (BOATs) have full public rights, including for vehicles, but rarely have a sealed surface and are generally used in a similar way to bridleways. The definition was created under the Wildlife and Countryside Act 1981.

A1.4 A **Footway** means a way comprised in a highway, which also comprises a carriageway, being a way over which the public has a right of way on foot only [Section 329(1) Highways Act 1980]. Footways are the pedestrian paths alongside a carriageway, and are often referred to as a pavement.

A1.5 **Cycle Tracks** are created under the Cycle Tracks Act 1984 through the upgrade of footpaths and footways to provide a right of way by bicycle and foot. Because cycle tracks are not a category of right of way, they are not shown on any Definitive Maps, and the conversion of a footpath to a cycle track requires its removal from the Definitive Map.

A1.6 **Permissive rights** routes exist where landowners have agreed with the highway authority for access to be available to particular categories of user under certain conditions. There are examples of permissive routes for pedestrians and cyclists on land owned by British Waterways, the Forestry Commission and the National Trust, as well as private landowners. They are for agreed periods. Some highway authorities have granted themselves permissive rights for paths on their own land instead of using the Cycle Tracks Act. This is not recommended. If there is no alternative to converting a route in this way, consultation is strongly recommended even though it is not a legal requirement.

A1.7 No right of way is established under permissive rights, and the landowner can still use the land for its primary purpose. The permission may be withdrawn at any time, either temporarily or permanently. This can have implications for highway authorities if they wish to invest money to improve or maintain permissive routes that cross land that they do not own.

A1.8 **Unclassified Roads** may or may not have a sealed surface. Where unclassified roads without a sealed surface are depicted on Ordnance Survey 1:25 000 and 1:50 000 scale maps they appear as either "Other road, drive or track" or "Path", but their public highway status should be confirmed by reference to the Unclassified Road map held by all highway authorities. Reference can also be made to the highway authority's 'List of Streets', which identifies all adopted roads. It should be noted that the majority of 'other roads' shown on Ordnance Survey maps are private means of access (PMAs). The most recent Ordnance Survey maps show

most unsealed unclassified roads as “Other Routes with public access”.

Use of Footways and Cycle Tracks

A1.9 A footway is a right of way on foot, on a part of a highway that also comprises a carriageway. Section 66 of the Highways Act 1980 places a duty on the highway authority to construct a footway alongside the carriageway if considered necessary or desirable.

A1.10 Driving a vehicle (including cycles) or a horse on a footway is an offence under the Highways Act 1835. Therefore, footways cannot be used as linking sections on routes for cyclists or horse-riders. It should be noted that powered scooters and electric pavement vehicles can be legally used on the footway, up to a speed of 4mph.

A1.11 A cycle track alongside a carriageway cannot be used by horses. However, Section 71 of the Highways Act 1980 places a duty on the highway authority to provide an adequate grass verge for the safety and accommodation of ridden horses and driven livestock, where this is considered necessary or desirable. There is also a duty not to obstruct verges with signs or constructions which would prevent the safe passage of users.

Creation of New Off-Carriageway Routes

A1.12 The Overseeing Organisation has powers to create new footpaths, bridleways or all-purpose highways within an existing trunk road boundary or by extending the highway boundary into land alongside an existing trunk road owned by the Overseeing Organisation. Powers do not exist to create a route separated from the rest of the trunk road by intervening land. In these cases the Overseeing Organisation should work in partnership with the highway authority.

A1.13 Highway authorities have powers to create new highways (including cycle tracks) as well as footpaths and bridleways under the Highways Act 1980.

A1.14 New footpaths or bridleways can be created under Section 25 or 26 of the Highways Act 1980 by the Local Authority through agreement (public path creation agreement) or compulsory powers (public path creation order). Creation of a footpath or bridleway will require consultation with other highway authorities. Although there is no statutory requirement to consult with user groups, or parish or community councils, it is recommended.

A1.15 Both an agreement under Section 25 of the Highways Act 1980 and compulsory powers under Section 26 of the Highways Act 1980 would normally lead to compensation for loss caused by the creation of a public path.

A1.16 The creation of a new off-carriageway route may be classed as ‘development’, and therefore may require planning approval from the highway authority. However in some cases (e.g. where a new route is constructed as an extension to an existing highway, or an unadopted road is adopted and resurfaced) the route may be considered ‘permitted development’, and as such would not require planning approval.

A1.17 In general, a highway authority is entitled to grant itself ‘deemed planning permission’ for statutory works undertaken by the authority. However, it may judge that the processes of partnership and public involvement achieved through the conventional planning process achieve other worthwhile benefits.

Footpath Conversion to Cycle Track

A1.18 To convert all or part of a footpath to a cycle track, a footpath conversion order must be made applying to the appropriate width of the footpath. Footpath conversion orders are made under Section 3 of the Cycle Tracks Act 1984 and the Cycle Tracks Regulations 1984 (SI 1984/1431).

A1.19 Having obtained the necessary consents where the footpath crosses agricultural land, and having undertaken the required consultation process, a footpath conversion order is made by the highway authority. If there are unwithdrawn objections, the order has to be confirmed by the Secretary of State, if necessary after a public inquiry.

A1.20 If there are no objections, or all objections are withdrawn, the order can be confirmed by the highway authority. Section 2 of the Cycle Tracks Act 1984 applies and the adjacent or shared track should be clearly signed.

Footway Conversion to Cycle Track

A1.21 To convert all, or part, of a footway to a cycle track, all, or the appropriate part of the footway must be ‘removed’ under the powers in Section 66(4) of the Highways Act 1980, and a cycle track ‘constructed’ under Section 65(1). The process need not necessarily involve physical construction work, but there needs to be clear evidence that the highway authority has

exercised its powers. This can be provided by a resolution of the appropriate committee. By virtue of Section 21 of the Road Traffic Act 1988, it is an offence to use a motor vehicle on a cycle track, and the making of a Traffic Regulation Order is therefore no longer required to control such use. The adjacent cycle track or shared surface should be clearly signed.

Cycle Track Conversion to Bridleway

A1.22 Under subsection 65(2) of the Highways Act 1980, it is possible to 'alter' the use of the cycle track and extend it to equestrian use.

Maintenance

A1.23 All rights of way are public highways and their surface is owned and maintained by the highway authority. Stiles and gates, including those on or forming the highway boundary, are owned and maintained by the adjoining landowner; they must be maintained in good condition or the highway authority can serve notice to repair, or repair and counter-charge. Stiles and gates should be designed for use by disabled people.

A1.24 Links and accesses to rights of way within the trunk road boundary are the responsibility of the Overseeing Organisation, not the highways authority, for maintenance.

Rights of Way Improvement Plans

A1.25 The Countryside and Rights of Way Act 2000 (England and Wales) requires all highway authorities to prepare a Rights of Way Improvement Plan by January 2006. The Plans need to illustrate the extent to which the rights of way meet the present and future needs of the public, offer opportunities for exercise and recreation, and are accessible to blind and partially sighted people and people with mobility problems.

Disability Discrimination Act

A1.26 The Disability Discrimination Act 1995 (DDA) brought in a range of requirements upon service providers to prevent discrimination against disabled people. Although highway authorities (including Overseeing Organisations) are not recognised as service providers at present, they should aim to comply with Part III of the DDA until such time as a legal precedent has been set to confirm their status. Part III of the DDA

is based on the principle that disabled people should not be discriminated against (through non-provision of services or a different level of provision) by service providers when accessing everyday services that others take for granted.

A1.27 Design Organisations should refer to the Disability Rights Commission (DRC) '**Code of Practice – Rights of Access, Goods, Facilities, Services and Premises**' (available on-line at www.drc-gb.org/drc/InformationAndLegislation/Page331a.asp).

A2.1 – Route Type A – Within Trunk Road Verge



Above: Typical verge situation showing wide area which could comfortably accommodate a new pedestrian and cycling route. It is also sufficient to accommodate pedestrians & horses in an OCR.



Above: An existing path of 1.0m is already separate from the road, but at a distance less than the recommended 1.8m for equestrian use (see TA 90). The verge on the left would comfortably accommodate a wider path and allow the existing grass verge to be widened to 1.8m.

Construction Issues:-

- Given that the OCR will be associated with the character of the road, construction details of the OCR should follow traditional highway design standards highlighted within the DMRB
- The number of side roads and private accesses should be carefully considered
- All vehicular access points crossing the OCR should be clearly visible to NMUs
- The verge is likely to include a range of obstacles such as signposts, lighting columns, telegraph poles, service installations and manhole covers. Design solutions for repositioning or integrating within the OCR will be required
- Surface water drainage can sometimes be discharged onto the highway via the existing highway drainage system. Use of soakaways or discharge of water onto the surrounding soft landscape areas may be possible
- Gradients are likely to be satisfactory; however, minor re-grading may be required. A slight separation in grade may also be advantageous, to give a psychological feeling of protection
- A verge between the carriageway & OCR should be retained, whenever possible

Advantages:

- Land currently owned by Overseeing Organisation
- No legal delays or cost implications of land purchase
- Gradient likely to be suitable
- Connects to existing frontages, bus stops and other facilities
- Sometimes illumination from existing carriageway lighting
- Strong sense of route and fulfils the NMU’s expectation of a route along a road
- Minimum disturbance to neighbours
- Trunk road access for maintenance
- Often has good sightlines
- Often has low impact on surrounding land use and boundary
- Passing traffic provides feeling of personal security for pedestrians and cyclists

Disadvantages:

- Negotiations may be required to relocate services outside the verge or move to a more appropriate location within the verge
- Width may be restricted
- Less suitable for horses
- Lower quality experience due to proximity of road and less attractive as a leisure route
- Possible disruption to trunk road during construction
- Physical danger from passing vehicles at high speed
- Danger of slipping/falling into road
- Few opportunities for escape
- Potential loss of verge habitat
- Potential dangers from vehicles emerging from frontages and headlight glare
- Potential loss of environmental features
- Debris thrown up from passing vehicles and draft from passing vehicles may cause discomfort
- Not preferred route type for equestrians

A2.2 – Route Type B – Land Outside, but Adjacent to the Highway Boundary



Above: A new OCR could be located inside the existing estate boundaries. A new boundary may be needed above the new OCR. Care should be taken when breaking through field boundaries running perpendicular to the road.



Above: This busy trunk road and minimal verge width would make the location of an OCR just inside the existing dry stone field boundary an obvious opportunity.

Construction Issues:

- Dimensions flexible, dependent upon the predicted use of the route
- Construction details, including surfacing, boundaries, margins and vegetation, should follow the distinctive local character
- The continuity of agricultural activities should be retained
- Existing boundaries should be kept where possible, and new ones should conform to the local character
- All access points crossing the OCR should be clearly visible to NMUs
- Drainage provision may be required
- Connections to roadside services may already be in place, and therefore it may be easy to install new lighting using existing provisions

Advantages:

- Few negotiations with statutory undertakers required as services often need not be relocated
- Gradients will often be suitable
- Easy connections to road and frontages
- Direct route and close relationship with the road
- Retains existing field boundary
- Width likely to be suitable for horses
- Minimal disturbance to neighbours
- Good access to existing service infrastructure
- Easy access for construction and maintenance

Disadvantages:

- Creation of a new right of way or compulsory purchase of land required
- New boundaries required
- Stock control and field access need to be assured
- If retained, the existing boundary (eg. hedge or wall) could pose a risk to personal safety
- Potential loss of environmental features

A2.3 – Route Type C – Distant from Trunk Road



Above: The field boundary at the far right of the picture provides a possible location for a new OCR. Visibility from the road is good.



Above: An ideal location for Route Type C. A wide strip at the edge of the field, currently used for farm access, flat land, clear visibility and an attractive location combine to create good conditions for locating and constructing an OCR.

Construction Issues:

- Construction details including surfacing, boundaries, margins, and vegetation should suit the local environment
- The continuity of agricultural activities should not be disrupted
- Consideration should be given to crossing field boundaries
- Drainage provision may be required
- Crossing ditches or streams may add significantly to the cost
- Lighting may be required along the whole route or at conflict points (rural areas)
- The surface gradient should be appropriate for use
- Hazardous objects and topography should be fenced
- Partnership normally required between the Overseeing Organisation, Local Authority and landowners
- Design and construction should consider requirement for ongoing maintenance access

Advantages:

- Services often need not be relocated
- Width of OCR likely to be physically unrestricted
- Excellent for horses
- Can connect areas of interest
- Potential for new habitat creation
- Pleasant and healthy experience
- Enhanced recreational value
- Route can be selected to make use of favourable topography
- Safe from traffic
- May provide a significant short cut

Disadvantages:

- May divide existing field patterns and could sterilise severed land
- May not connect easily to public transport, frontages and road
- Additional distance may deter use
- Construction may disturb existing plant and animal habitats
- Personal security issues
- Possible problems of misuse
- No existing services
- Difficult construction access
- Need to construct new field boundaries
- Connecting links to road required
- Stock control needed
- Lighting can conflict with the character of a rural area
- Potential maintenance problems with access

A2.4 – Route Type D – Existing Right of Way



Above: This Public Bridleway has sufficient width to be adopted. With some modification including vegetation clearance and surface/drainage enhancements, it could become an OCR. Protection of existing private rights such as driving animals and private means of access must be ensured.



Above: This Public Bridleway runs for one mile connecting a trunk road with local villages with facilities. It is sufficiently wide and with some modifications could become an OCR.

Construction Issues:

- Dimensions will depend upon the existing provision and the extent to which modification is possible
- Construction details, including surfacing, boundaries, margins, and vegetation, should follow the local distinctiveness
- Drainage may be required
- Boundary treatment is critical to the success of this route type. Existing boundaries should be retained where possible or suitable boundaries installed, particularly in agricultural areas where stock control is needed
- Crossings should be secure from surrounding stock
- Obstructing vegetation should be cleared to reduce accidents and for safety
- The gradients should be taken into account, and where they are too steep the route should be realigned, taking into account surrounding ecology
- Design and construction should consider requirements for ongoing maintenance access
- The use of Restricted Byways and Bridleways would provide access for all NMUs and these are often wider than footpaths
- Partnership normally required between the Overseeing Organisation, Local Authority and landowners

Advantages:

- Good opportunity to establish a route because of existing legal status
- Likely to link key destinations and connect to existing network of footpaths, bridleways and leisure routes
- If designed sensitively, can retain existing plant and animal communities
- Pleasant, peaceful and healthy experience
- Safe from passing traffic
- Existing landholdings have already adapted to presence of right of way

Disadvantages:

- May not connect easily to public transport and frontages
- May add travelling time for users
- Construction may disturb existing plant and animal habitats
- Existing widths and gradients may not be suitable
- No existing service provision
- Difficult construction access
- No physical or visual connection to the trunk road
- Possible issue of personal safety/security
- Increased use may create nuisance for adjacent properties
- Connection to trunk road required
- Modification/enhancement can be contentious with user groups
- Can disrupt the existing use of the route
- Maintenance access may be difficult

A2.5 – Route Type E – Redundant or Bypassed Road



Above: This redundant road had been blocked to prevent fly-tipping, while allowing continued pedestrian and cycle access. Careful treatment of the surface could create an attractive OCR. Entrance barriers should be designed to allow free access for all NMUs. Where gating is required for stock purposes, but equestrian access is also required, gates should be operable without dismounting.



Above: This de-trunked road bypass has been turned into a local access road, and with minor modification would be suitable as an OCR.

Construction Issues:

- The width of the existing carriageway should be able to accommodate a wide range of route designs
- Existing surfaces may be appropriate, but also offer the potential to be resurfaced to provide separation for different users
- Drainage provision is likely to exist
- Lighting may be installed in these areas and services are likely to be available
- Where boundaries need to be added they should integrate with the surrounding landscape character, and allow access to adjacent property
- Redundant road signs should be removed and the surface should be repaired where necessary
- Partnership normally required between the Overseeing Organisation, Local Authority and landowners

Advantages:

- Good opportunity to establish a route because of existing legal status
- Likely to connect to places of interest
- Likely to connect to existing network of footpaths, bridleways and leisure routes
- Can retain existing plant and animal communities
- Pleasant, peaceful and healthy experience
- Safe from passing traffic
- Existing landholdings have already adapted to presence of right of way
- Gradients are likely to be suitable
- Enhancement works may restrict vehicle access. This may also reduce the potential for fly-tipping

Disadvantages:

- May not connect easily to public transport and frontages
- May add travelling time for users
- Construction may disturb existing plant and animal habitats
- No existing service provision
- No physical or visual connection to the trunk road
- Possible issue of personal safety and security
- Increased use may create nuisance for adjacent properties
- Connection to trunk road required
- Possible misuse
- New field boundaries and stock control may be required

A2.6 – Route Type F – Minor Highway



Above and Below: These lanes provide an attractive and quiet route. It would be beneficial to retain the boundary walls/hedges and mature vegetation, but at the expense of accommodating a range of users. Means of escape and refuge are limited when vehicular traffic is encountered and passing bays may be required if this route is to be successful. If vehicles cannot pass, users may be expected to reverse or seek refuge in passing places such as modified field entrances.



Construction Issues:

- Existing surfaces may be appropriate, but also offer the potential to be resurfaced to provide separation for different users
- Drainage provision is likely to exist
- Lighting may be installed in these areas and services are likely to be available
- Where boundaries need to be added they should integrate with the surrounding landscape character, and allow access to adjacent property
- Redundant road signs should be removed and the surface should be repaired where necessary
- Partnership normally required between the Overseeing Organisation, Local Authority and landowners

Advantages:

- Good opportunity to establish a route because of existing legal status
- Likely to connect to places of interest
- Likely to connect to existing network of footpaths, bridleways and leisure routes
- Can retain existing plant and animal communities
- Pleasant, peaceful and healthy experience
- Safe from passing traffic
- Existing landholdings have already adapted to presence of right of way
- Gradients are likely to be suitable
- Enhancement works may restrict vehicle access. This may also reduce the potential for fly-tipping

Disadvantages:

- May not connect easily to public transport and frontages
- May add travelling time for users
- Construction may disturb existing plant and animal habitats
- No existing service provision
- No physical or visual connection to the trunk road
- Possible issue of personal safety and security
- Increased use may create nuisance for adjacent properties
- Connection to trunk road required
- Possible misuse
- New field boundaries and stock control may be required

A2.7 – Route Type G – Other Locations



Farm access road



Private road



Farm access track: Access to residences



Former MOD track



Canal Towpath



Track through Forest Enterprise land



Public footpath within urban or country park



Disused airfield

ANNEX 3 ON-CARRIAGEWAY CYCLING FACILITIES

Construction issues, advantages and disadvantages of particular measures are set out in this Annex. Reference should also be made to the Traffic Signs Manual for layout and implementation details.

A3.1 – Wide Nearside Lane

<p>Construction Issues:</p> <ul style="list-style-type: none"> The standard carriageway lane width is 3.65m; however a wide nearside lane for cyclists should be 4.5m wide for sufficient clearance from HGVs. Wider nearside lanes than this are discouraged, due to the risk of use as two unmarked non-standard lanes Narrower outside lanes should be of a minimum width of 3.25m, subject to ‘Departure from Standard’ approval from TD 27 	
<p>Advantages:</p> <ul style="list-style-type: none"> Low cost/high benefit option (if simply adjusting road markings) Improves safety for cyclists, particularly on routes with high HGV/bus usage Can be used in rural and urban situations Particularly beneficial when a carriageway has a high number of side road junctions Avoids common problems that can arise with cycle lanes – obstruction by parked vehicles, poor road positioning by cyclists on approach to junctions Helps to reduce vehicle delay and driver frustration 	<p>Disadvantages:</p> <ul style="list-style-type: none"> Can encourage higher motor vehicle speeds Additional width may be used as parking Dependent upon existing width of lanes. May not be appropriate for older carriageways with sub-standard widths

A3.2 – With-Flow Cycle Lanes (Advisory/Mandatory)

<p>Construction Issues:</p> <ul style="list-style-type: none"> Cycle lanes can be developed by adjusting road markings, or expanding the width of the carriageway into the verge or footway. The desirable width of a one-way cycle lane (mandatory or advisory) is 2.0m, with a minimum being 1.5m Where adjacent on-street parking exists, the cycle lane should be located between the carriageway and the parking (rather than the footway) with a desirable 1m wide dividing strip (0.5m minimum) between the cycle lane and the parked vehicles to allow cyclists to avoid open car doors. The dividing strip should be clearly visible. This can be achieved by defining both sides of the cycle lane and colouring its surface, by using a marked hatched pattern or by using contrasting materials Cycle lanes should have a good quality surface, and good drainage (gullies should be outside the lane). The level of maintenance of the cycle lane should be equivalent to that of the main carriageway 	
<p>Advantages:</p> <ul style="list-style-type: none"> Low cost/high benefit option (if simply adjusting road markings) Helps coherence within the cycling network Cyclists are better protected and feel safer than with no facility Motorists can safely pass cyclists without delay or frustration Can make cycling more comfortable and attractive to new users Can help cyclists to avoid traffic congestion 	<p>Disadvantages:</p> <ul style="list-style-type: none"> Expansion of the carriageway may require land acquisition Motorists may become less aware of cyclists and cyclists who deviate from the lane may be at a greater risk If parking is permitted, vehicles will need to cross the lane Cycle lanes (particularly advisory ones) are often obstructed by parked vehicles Cycle lanes are often used by vehicles where manoeuvres require extra width, which can give a false sense of security to cyclists

A3.3 – Contra-Flow Cycle Lanes

<p>Construction Issues:</p> <ul style="list-style-type: none"> • Where possible the approaches to a contra-flow cycle lane entry and exit should be made using a with-flow cycle lane, to avoid cyclists performing different manoeuvres to general traffic • The provision of a cyclist right turning lane into the contra-flow lane can be considered where the speed is less than 30mph and vehicle volume is below 6000vpd. This requires authorisation from the Overseeing Organisation. Above these levels a 'jug handle' with central island can be considered • The preferred width of a one-way lane is 2.0m and 1.5m is a desirable minimum. • Where the width available for a cycle lane is below 1.5m, an advisory lane may be more appropriate • Where adjacent on street parking exists, the cycle lane should be located between the carriageway and the parking (rather than the footway) with a desirable 1m wide dividing strip (0.5m minimum) between the cycle lane and the parked vehicles to allow cyclists to avoid open car doors. The dividing strip should be clearly visible; this can be achieved by defining both sides of the cycle lane and colouring its surface, by using a marked hatched pattern or by using contrasting materials 	
<p>Advantages:</p> <ul style="list-style-type: none"> • Helps prevent long diversions for cyclists as a result of one-way systems • Low cost/high benefit option (if simply adjusting road markings) • Cyclists better protected and feel safer than with no facility 	<p>Disadvantages:</p> <ul style="list-style-type: none"> • Expansion of the carriageway may require land acquisition • If parking is permitted, vehicles will need to cross the lane • Cycle lanes (particularly advisory cycle ones) are often obstructed by parked vehicles • HGVs and buses may use the lane where manoeuvres require extra width • May cause confusion for on-coming motorists, especially at night

A3.4 – With-Flow & Contra-Flow Bus/Cycle lanes

<p>Construction Issues:</p> <ul style="list-style-type: none"> • Bus/Cycle lanes can be developed by adjusting road markings, or expanding the width of the carriageway into the verge or footway. A bus/cycle lane width of 4.5m is preferred, with a desirable minimum of 4.25m to allow buses to pass cyclists. However, where bus stops are not in the bus lane or where bus flows are low, a width of 3m is acceptable over short distances, although the bus will need to straddle the bus lane to pass a cyclist • Contra-flow bus/cycle lanes require greater widths to allow buses to overtake cyclists safely. Careful design of the beginning and end points is also required to reduce risk from motorists, who may not expect to encounter cyclists • Bus/cycle lanes must be supported by a Traffic Regulation Order to prohibit general motor vehicles from entering the lane (except buses, cyclists, emergency vehicles and for statutory purposes) and to regulate waiting and loading. A time plate for restricted operation of the bus/cycle lane (TSRGD 961) may be required • Any proposal to combine bus and cycle lanes should include consultation with the transport authority, operators and police. Additional safety training for drivers of scheduled services is recommended • Level of maintenance should be equivalent to that of the main carriageway 	
<p>Advantages:</p> <ul style="list-style-type: none"> • Low cost/high benefit option (if simply adjusting road markings) • Cyclists are better protected and feel safer than with no facility • Motorists can safely pass cyclists without delay or frustration • Can make cycling more comfortable • Can help cyclists to avoid traffic congestion • Sometimes easier to justify a bus/cycle lane than just a bus or cycle lane 	<p>Disadvantages:</p> <ul style="list-style-type: none"> • Expansion of the carriageway may require land acquisition • Motorists may become less aware of cyclists, and cyclists who deviate from the lane may be in greater risk • Not ideal for young or novice cyclists

ANNEX 4 NMU CROSSING SITE ASSESSMENT RECORD SHEET

NMU CROSSING - SITE ASSESSMENT RECORD SHEET			
Local Site Characteristics			
1.1	Site Location	Description (Attach annotated sketch)	
		Ordnance Survey Grid Reference	
1.2	Carriageway Type	Single	Double
		One-way	Two-way
		Number of lanes	
		Cycle lanes/tracks	
		Gradients	
1.3	Carriageway Width		Metres
1.4	Cycle Lane/Track Width	Side 1	Metres
		Side 2	Metres
1.5	Footway Width	Side 1	Metres
		Side 2	Metres
1.6	Useable Verge Width (after carriageway/margin/ footway)	Side 1	Metres
		Side 2	Metres
1.7	Refuge Island		Yes/No
	Width		Metres
1.8	Road Lighting Standard		
	BS 5489 classification		Category
	Is the existing lighting in accordance with BS 5489?		Yes/No
	Any rearrangement necessary?		Yes/No
	Better lighting standard needed?		Yes/No
	Supplementary lighting needed?		Yes/No
1.9	Minimum Visibility		
	Pedestrian/cyclist/equestrian to approaching vehicles	Direction 1	Metres
	<i>(note visibility through barriers for young pedestrians)</i>	Direction 2	Metres
	Vehicle to proposed site crossing	Direction 1	Metres
		Direction 2	Metres
1.10	Waiting/Loading/Stopping Restrictions		
	At prospective site		Yes/No
	Within 50m of the site		Yes/No
1.11	Public Transport Stopping Points		
	At prospective site		Yes/No
	Within 50m of the site		Yes/No
	Relationship to crossing		
	[in direction of travel]	Direction 1	Approach/exit
		Direction 2	Approach/exit

CROSSING SITE ASSESSMENT RECORD SHEET (CONTINUED)			
Local Site Characteristics (Continued)			
1.12	Nearby Junctions		
	Distance to nearest significant traffic junction	Direction 1	Metres
		Direction 2	Metres
1.13	Other Cyclist/Pedestrian Crossings		
	Distance to next crossing	Direction 1	Metres
		Direction 2	Metres
	Type of crossing	Zebra/Pelican/Puffin/Toucan/Other	
1.14	School Crossing Patrol		
	Distance if less than 100m		Metres
1.15	Skid Risk		
	Does surface meet skid resistance requirements?		Yes/No
1.16	Surroundings		
	(within 100m)		
	Hospital/sheltered housing/workshop for disabled people		Yes/No
	Older persons and/or disabled persons residential home		Yes/No
	(within 1km)		
	Local Shop		Yes/No
	Primary School		Yes/No
	Secondary School		Yes/No
	Post Office		Yes/No
	(up to 8km)		
	Railway/Bus Station		Yes/No
	Pedestrian leisure/shopping area		Yes/No
	Sports stadium (including race course)/entertainment venue		Yes/No
	Equestrian centre		Yes/No
	Junction with cycle route		Yes/No
	Junction bridle path or other Equestrian route		Yes/No
	Others (for example a Fire Station)		
Crossing Traffic Information			
2.1	Flow and Composition		
	Crossing cyclists		Number per hours
	Unaccompanied young cyclists		%
	Pedestrian count		Number per hours
	Prams/pushchairs		%
	Disabled People/Older People		%
	Unaccompanied young children		%
	Severe mobility difficulties		Number per day
	Visually impaired		Number per day
	Equestrians		Number per day
	Others		Number per day
	General Purpose of Crossing		

CROSSING SITE ASSESSMENT RECORD SHEET (CONTINUED)		
Crossing Traffic Information (Continued)		
2.2	Time to Cross The Road (Measured Sample)	
	Able pedestrians/dismounted cyclists	Seconds
	Mounted cyclists	Seconds
	Older people or disabled people	Seconds
	Equestrian	Seconds
2.3	Difficulty Crossing	
	Able pedestrians/dismounted cyclists	Yes/No
	Mounted cyclists	Yes/No
	Older people or disabled persons	Yes/No
	Equestrian	Yes/No
2.4	Latent Crossing Demand	
	Estimate for pedestrians	Number per hours
	Estimate for older people or disabled persons	Number per hours
	Estimate for cyclists	Number per hours
	Estimate for equestrians (up to 8km)	Number per hours
Traffic Information on Highway		
3.1	Flow and Composition on Carriageway to be crossed (note if one way)	
	Motor vehicle count	Number per hours
	Cyclists	Number per hours
	Heavy goods vehicles	%
	Public services vehicles	Number per hours
3.2	Vehicle Speeds	
	85 th percentile	kph
	Cyclists	kph
3.3	Level of Use of Footways/Cycle Track/Bridleway	
	Pedestrians	Number per hours
	Cyclists	Number per hours
	Equestrians	Number per hours
3.4	Traffic Delays (Measured)	
	Existing delay to traffic if any	Seconds
	Purpose of Road	
Road Accidents		
4.1	Mean Personal Injury (PI) Accident Frequency	
	Number per year at site (over 5 years if available)	PI accidents/year
	Number per year at an average local site (over 5 years if available)	PI accidents/year
	Number per year specifically involving NMUs	PI accidents/year