

Transport Proof of Evidence

Application 21/01028/OUTMAJ

HMP Garth and HMP Wymott, Moss Lane, Ulnes Walton, Leyland

Ministry of Justice

August 2023

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Transport Proof of Evidence – Volume 2

TOWN AND COUNTRY PLANNING ACT 1990
APPEAL BY THE MINISTRY OF JUSTICE
PROOF OF EVIDENCE ON BEHALF OF THE MINISTRY OF JUSTICE

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Appendix A – Policy, Standards and Guidance

A.1 Manual for Streets 2

Manual for Streets 2



Wider Application of the Principles

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Ministerial Foreword



Streets and roads make up around three-quarters of all public space – their design, appearance, and the way they function have a huge impact on the quality of people's lives. The Department for Transport is committed to high quality design in the public realm and our technical advice is evidence of that commitment.

In 2007 the Department published the Manual for Streets, replacing guidance which had been in use for 30 years. It completely changed the approach to the design and provision of residential and other streets. It enjoys an excellent standing and its success has generated a desire among professionals for technical advice to cover other streets and roads along similar lines.

Manual for Streets 2 – Wider Application of the Principles is the result – a product of highly collaborative working between the Department for Transport and industry. It is an excellent demonstration of what can be achieved when Government works in partnership with others.

I congratulate the Chartered Institution of Highways and Transportation and the team which made publication of Manual for Streets 2 possible and I commend the document to all those involved in designing the public realm. The challenge now is for them to embrace the advice and extend the advantages of good design to streets and roads outside residential areas.

A handwritten signature in black ink that reads "Norman Baker". The signature is written in a cursive, slightly slanted style.

NORMAN BAKER
Parliamentary Under Secretary of State for Transport

Presidential Foreword



By Geoff Allister
CIHT President 2010-2011

In 2007 the Department for Transport published the Manual for Streets, a landmark document that is changing the face of our residential streets. The Manual for Streets (MfS1) did not set out new policy, it reinforced a philosophy that had been growing since the late 1990s to return our residential streets to the community by engineering them to create a greater sense of place, provide an environment that is accessible and safe for all, and one that improves the quality of life.

The Chartered Institution of Highways and Transportation's new guidelines builds on the advice contained in MfS1, exploring in greater detail how and where its key principles can be applied to busier streets and roads in both urban and rural locations up to, but not including, trunk roads. Manual for Streets 2 – Wider Application of the Principles will help to fill the perceived gap in design advice between MfS and the design standards for trunk roads set out in the Design Manual for Roads and Bridges.

Manual for Streets 2 is the result of a partnership between practitioners and policy makers from highway engineers and urban designers to transport planners. The quality of the advice it contains is a true testament to the knowledge and expertise of all those who have contributed to its preparation. I thank them all, particularly the members of the steering group and the editorial team for the considerable time and effort they have contributed to this project.

I would also like to thank the sponsors the Department for Transport, the Association of Directors of Environment, Economy, Planning and Transport, the Commission for Architecture and the Built Environment and the Homes and Communities Agency who have made these guidelines possible.

On behalf of the Institution, I am pleased to commend Manual for Streets 2 – Wider Application of the Principles to all those who are involved in the planning, construction and improvement of our streets and roads. I am sure it will make a significant contribution to professional practice and, over time, to our communities and the places where people live, work and play.

A handwritten signature in black ink that reads "G W Allister". The signature is written in a cursive, slightly stylized font.

Geoff Allister
President 2010-2011

Partnering Organisations Preface

Streets play a fundamental part in community life which is why CAGE has been a long term supporter of the development of Manual for Streets. Our experience tells us that creative design can deliver more vibrant and inclusive streets. Happily we're not alone in this view. Policy makers, practitioners, and community members also identify well designed, civilising streets as critical to issues such as community cohesion, economic vitality, well-being and health. The key challenge in delivering these wider benefits is the ability to strike a more effective balance between the movement, meeting and exchange functions of our street network. Manual for Streets 2 will play an important role in supporting this agenda.



Richard Simmons
Chief Executive, CAGE

ADEPT enthusiastically supports this important piece of work which will be an essential reference in the future. Local authorities are increasingly aware of the fundamental nature of well designed and maintained streets to the economic, social, educational and environmental well-being of local citizens and communities; and the harmful consequences of neglecting the places where we live and work.



George Batten
President of ADEPT

Status and Application

Manual for Streets 2: Wider Application of the Principles (MfS2) forms a companion guide to Manual for Streets (MfS1). Whilst MfS1 focuses on lightly-trafficked residential streets it also states that, *'a street is defined as a highway that has important public realm functions beyond the movement of traffic.... Most highways in built up areas can therefore be considered as streets.'* MfS1 also stated that, *'many of its key principles may be applicable to other types of streets, for example high streets and lightly trafficked lanes in rural areas'.*

The following definitions apply throughout this document:

MfS1 refers to Manual for Streets (2007).

MfS2 refers to this document.

MfS refers to both documents.

MfS2 builds on the guidance contained in MfS1, exploring in greater detail how and where its key principles can be applied to busier streets and non-trunk roads, thus helping to fill the perceived gap in design guidance between MfS1 and the Design Manual for Roads and Bridges (DMRB).

DMRB is the design standard for Trunk Roads and Motorways in England, Scotland, Wales and Northern Ireland. The strict application of DMRB to non-trunk routes is rarely appropriate for highway design in built up areas, regardless of traffic volume.

MfS2 provides advice and does not set out any new policy or legal requirements.

Section A

Context and Process



1_ Principles

1.1_ Introduction

1.1.1 MfS2 has been prepared for the Chartered Institution of Highways and Transportation (CIHT) by a multidisciplinary team of consultants. The document is endorsed by the Department for Transport (DfT), the Homes and Community Agency (HCA), the Welsh Assembly Government (WAG), Commission for Architecture and the Built Environment (CABE), the Association of Directors of Environment, Economy, Planning and Transport (ADEPT) and English Heritage. All of these organisations contributed to its development.

1.1.2 This new document does not supersede MfS1; rather it explains how the principles of MfS1 can be applied more widely. It draws on a number of sources including:

- The Department for Transport's 'Mixed Priority Route' research study¹;
- Interim findings from the ongoing Department for Transport research into Shared Space²;
- Case Studies, including detailed research by CABE; and
- Further research into the relationship between junction visibility and collisions.

1.2_ MfS Principles

1.2.1 MfS1 changed the way we approach the design, construction, adoption and maintenance of urban streets. The principal changes to practice, as set out below, also form the basis of this document which considers the wider highway network.

- **Applying a user hierarchy** to the design process with pedestrians at the top. This means considering the needs of pedestrians first when designing, building, retrofitting, maintaining and improving streets.
- **Emphasising a collaborative approach** to the delivery of streets. Many busy streets and rural highways require a 'non-standard' approach to respond to context and this can be achieved by working as a multidisciplinary team and by looking at and researching other similar places that work well. It is important to include all skill sets required to meet scheme objectives. Many of these are included in MfS1, paragraph 1.2.1.
- **Recognising the importance of the community function** of streets as spaces for social interaction. Streets should integrate not segregate communities and neighbourhoods.
- **Promoting an inclusive environment** that recognises the needs of people of all ages and abilities. Designs must recognise the importance of way-finding and legibility, especially with regards to the sensory and cognitive perceptions of children, older people and disabled people.
- **Reflecting and supporting pedestrian and cyclist desire lines** in networks and detailed designs.
- **Developing masterplans and preparing design codes** for larger scale developments, and using design and access statements for all scales of development.
- **Establishing a clear vision and setting objectives for schemes**, which respond to the more complex and competing requirements in mixed use contexts.
- **A locally appropriate balance should be struck between the needs of different user groups.** Traffic capacity will not always be the primary consideration in designing streets and networks.
- **Creating networks of streets that provide permeability and connectivity** to main destinations and choice of routes.
- **Moving away from hierarchies of standard road types** based on traffic flows and/or the number of buildings served.
- **Developing street character types** on a location-specific basis requiring a balance to be struck between place and movement in many of the busier streets.
- **Encouraging innovation** with a flexible approach to street layouts and the use of locally distinctive, durable and maintainable materials.
- **Using quality audit processes** that demonstrate how designs will meet objectives for the locality.



Both of these streets have about the same amount of carriageway space and carry around the same volume of vehicular traffic. The cross section and arrangement of buildings mean that the one in the upper photo segregates two communities whilst the one in the lower photo is at the centre of the community and offers retail and commercial opportunities.

- **Designing to keep vehicle speed at or below 20mph** in streets and places with significant pedestrian movement unless there are overriding reasons for accepting higher speeds.
- **Using the minimum of highway design features** necessary to make the streets work properly. The starting point for any well designed street is to begin with nothing and then add only what is necessary in practice.

1.3_Scope of MfS

1.3.1 The following key areas of advice, derived from principles contained in MfS, can be applied based on speed limits, subject to a more detailed assessment of local context, as shown below in **Table 1.1**.

Speed Limit	20mph	30mph	40mph	50+mph
User Hierarchy	●	●	●	●
Team Working	●	●	●	●
Community Function	●	●	●	●
Inclusive Design	●	●	●	●
Ped/Cycle Support	●	●	●	●
Master Plans/Design Codes	●	●	●	●
Stopping Sight Distance	●	●	●	●
Frontage Access	●	●	●	●
Minimise Signs and Street Furniture	●	●	●	●
Quality Audits	●	●	●	●
Connectivity/Permeability	●	●	●	●

Table 1.1 Application of key areas of MfS advice

Note: ● yes ● subject to local context

1.3.2 It is clear from **Table 1.1** that most MfS advice can be applied to a highway regardless of speed limit. **It is therefore recommended that as a starting point for any scheme affecting non-trunk roads, designers should start with MfS.**

1.3.3 Where designers do refer to DMRB for detailed technical guidance on specific aspects, for example on strategic inter-urban non-trunk roads, it is recommended that they bear in mind the key principles of MfS, and apply DMRB in a way that respects local context. It is further recommended that DMRB or other standards and guidance is only used where the guidance contained in MfS is not sufficient or where particular evidence leads a designer to conclude that MfS is not applicable.

1.3.4 The application of MfS advice to all 30mph speed limits as a starting point is in keeping with MfS1.

1.3.5 Much of the research behind MfS1 for stopping sight distance (SSD) is limited to locations with traffic speeds of less than 40mph and there is some concern that driver behaviour may change above this level as the character of

the highway changes. However, 40mph speed limits in built-up areas cover a wide range of contexts, from simple urban streets with on-street parking and direct frontage access to 2/3 lane dual carriageways. Furthermore, local context varies not only from street to street but also along the length of a street.

(See Figure 1.1.)

1.3.6 Where a single carriageway street with on-street parking and direct frontage access is subject to a 40mph speed limit, its place characteristics are more of a residential street or high street, with higher traffic flows, and may result in actual speeds below the limit. It is only where actual speeds are above 40mph for significant periods of the day that DMRB parameters for SSD are recommended. Where speeds are lower, MfS parameters are recommended.

Where there may be some doubt as to which guidance to adopt, actual speed measurements should be undertaken to determine which is most appropriate. (See **Chapter 10** for SSD guidance.)

1.3.7 Similarly, in rural areas many parts of the highway network are subject to the national speed limit but have traffic speeds significantly below 60mph. (See **Figure 1.2**) Again in these situations where speeds are lower than 40mph, MfS SSD parameters are recommended.

1.3.8 Direct frontage access is common in all urban areas, including where 40mph speed limits apply, without evidence to suggest that this practice is unsafe. This is confirmed in TD41/95³ (Annex 2 paragraph A2.10) which states that *'in the urban situation there is no direct relationship between access provision and collision occurrence'*. However, this is not true of rural roads (A2.5) where the research identified a *'statistically significant relationship for collisions on rural single carriageways with traffic flow, link length and farm accesses. On rural dual carriageways, the significant relationship extended to laybys, residential accesses and*

other types of access including petrol filling stations' (See Chapter 9 for further advice on direct frontage access.)

1.3.9 This approach demonstrates that the key MfS principles can be applied widely to improve the quality of highways and their application is not limited to low speed or lightly trafficked routes.

1.3.10 Any new design has to take account of local context, however adopting speed limits as a proxy to identify which elements of MfS apply provides a reasonable way forward. It is clear from Table 1.1 that for a particular context, even though some aspects of MfS may not apply, there are still many principles which affect design quality that do.

Single Lane, Frontage Access, On-Street Parking



Wide Single Lane, Frontage Access, On-Street Parking



2/3 Lane Dual Carriageway. No frontage access. No stopping.



Figure 1.1 Typical Range of Urban 40mph Speed Limits



Figure 1.2 National speed limits apply in rural lanes but actual speeds can be much lower

1.4_ The Benefits of Better Streets

1.4.1 It is important to take into account multiple objectives when developing transport strategies and schemes, and not simply congestion reduction. These other priorities include economic regeneration, climate change, casualty reduction, reducing air and noise pollution, minimising the impact of transport on the natural environment, heritage and landscaping, and encouraging more sustainable and healthy patterns of travel behaviour.

1.4.2 Making appropriate provision for road-based public transport, cycling and walking can help to encourage modal shift from the private car, and so contribute to the sustainability and health agendas. Enhancing street environments through a high quality public realm incorporating local materials and historic street features, removal of clutter and pedestrian barriers, use of shared space where appropriate and enhanced street lighting can help to stimulate local economic activity, reduce street crime and encourage a sense of local community; this in turn encourages more local, shorter distance travel on foot or by cycle. This will be particularly important in conservation areas, national parks, World Heritage sites and other environmentally sensitive areas.

1.4.3 Local Transport Note 3/08, 'Mixed Priority Routes: Practitioners' Guide'¹, refers to ten schemes which were among the least safe of urban roads which were transformed into safer, friendlier, more attractive and inclusive streets as discussed in the box out below.

The ten MPR schemes:

- 1 Walworth Road, London
- 2 Wandsworth Road, London
- 3 Prince of Wales Road, Norwich
- 4 Newland Avenue, Hull
- 5 Nantwich Road, Crewe
- 6 Renshaw Street/ Berry Street, Liverpool
- 7 Wilmslow Road, Rusholme, Manchester
- 8 St Peter's Street/ Chequer Street, St Albans
- 9 The Parade/ Victoria Terrace, Leamington Spa
- 10 Cowley Road, Oxford

Mixed Priority Routes (MPR) demonstration project

Mixed Priority Routes are streets that carry high levels of traffic and also have:

- A mix of residential use and commercial frontages;
- A mix of road users, i.e. shoppers, cyclists, bus passengers, schoolchildren;
- A mix of parking and deliveries.

They are not just transport routes. Although dealing with transport and safety is a key element, other concerns associated with the local economy and local communities may also generate an interest in improving the area with economic regeneration and environmental improvements.

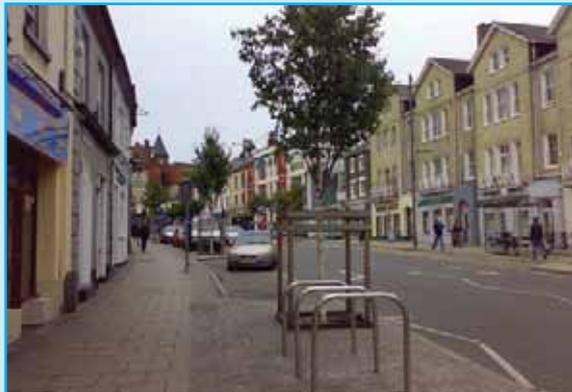
There are many benefits to be gained from enhancing the high street environment with an integrated approach. The investment is likely to contribute towards assisting the delivery of a range of local authority corporate objectives and targets including:

- Accessibility planning;
- Casualty reduction;
- Economic regeneration;
- Public service agreement;
- Quality of life; and
- Sustainability.

Outcomes

Early results across a number of different indicators show that all of the MPR demonstration schemes have been successful in meeting their stated objectives:

- Safety: all schemes have achieved a substantial casualty reduction of between 24% and 60%;
- Environment: noise and air quality measurements have shown improvements;
- Accessibility: pedestrian and cycling activity has increased, and children and mobility impaired users generally feel more confident; and
- Economy: improvements in the quality of streetscape have led to a reduction in vacant premises and a more vibrant local economy.



Prince of Wales Road, Norwich



Newland Avenue, Hull

1.4.4 These schemes have clearly demonstrated a range of benefits beyond just road safety. These include increased economic vitality due to additional visitors to local shops and services and increased investment in regeneration, through improvements in facilities and the environment.

1.4.5 Research into mixed-use high streets carried out by University of Westminster⁴ has shown that they are well used and well liked by local people and encourage sustainable and inclusive patterns of living. Resolving the challenges of balancing the movement and place functions will result in these streets becoming the cornerstone of sustainable communities.

1.4.6 Both sets of research complement the studies carried out by CABI which found a clear link between street quality and property values - see Example below.

1.4.7 Green infrastructure, which provides a network of living green spaces, is important to the design of urban communities. Trees are one of the most visible components of green infrastructure and highway engineers and transport planners are well placed to help deliver this element of the natural environment. In the last few years a growing body of research has made it clear that trees bring a wide range of benefits both to the urban environment, individual people and to society as a whole. Further guidance on how to plan and design for street trees is given in **Chapter 12**.

1.4.8 A number of case studies that demonstrate the value of improving the public realm can be found in Section C.

CABI: Paved with Gold: the Real Value of Good Street Design (2007)⁵

Streets are public assets and, in common with other public realm features, assessing their value is a difficult undertaking. Broadly speaking streets are too often viewed in purely technical terms by the people designing and managing them on the one hand and their more aesthetic qualities by people funding economic redevelopment work on the other.

The truth lies somewhere in between - that streets which resolve competing demands and create places that people enjoy using can deliver in transport economic and social terms. CABI's research, 'Paved with Gold: the Real Value of Good Street Design' (2007), was designed as a demonstration project to show how to measure the impact of street design improvements on market prices as revealed through retail rents and residential prices.

London High Street case studies, outside the centre to avoid tourist effects, were identified in order to make them as comparable as possible. Streets with large shopping centres were excluded as their presence would skew results. A range of types of area and quality of streets was identified.

This work identified for the first time a direct causal link between street quality and market prices, which discounted all other factors. It established that prices are not totally explained by factors such as prosperity of the neighbourhood or public transport accessibility alone; a significant proportion of these prices are explained solely by the quality of the street.



9_ Junctions, Crossings and Accesses

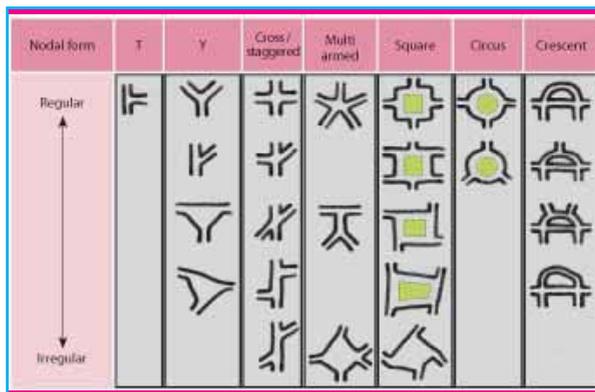
9.1_ Introduction

9.1.1 Junctions are critical places in a number of ways. In traffic terms, they are a potential source of delay and where most collisions tend to occur. They are often seen as a problem in these terms, and highway designers tend to minimise the number of junctions in a network. When junctions are provided or modified, particularly on busier highways, they tend to be designed with the principal aim of accommodating peak hour traffic flows.

9.1.2 In place terms, conversely, junctions can be seen as an opportunity. By definition they are accessible places from several directions, and so tend to be a good location for buildings that attract significant numbers of people, such as shops and public buildings. Junctions are also the most natural way for people to find their way around an area, whether on foot or in a vehicle, and so are a good place for landmark buildings and other distinctive features, such as public art.

9.1.3 It is critical therefore to achieve a good balance of place and movement functions at junctions, particularly in urban areas.

9.1.4 As noted in MfS1 section 7.3, there is considerable flexibility over the form of junctions, which can add to their distinctiveness, so that they function as significant places in their own right.



A wide range of junction layouts is possible

9.1.5 In the past, concerns over capacity and safety have tended to overshadow any concerns about placemaking, and as a result many urban junctions are unattractive and difficult to negotiate, particularly on foot and cycle. Excessive use of guardrailling is a particular problem and further guidance on how to minimise it is given in **Chapter 12**.

9.1.6 Because junctions are a natural focus for all modes of travel, wherever possible they should include convenient and direct crossing facilities for pedestrians, desirably across all arms.

9.1.7 Well-designed crossings are of vital importance to the ability of pedestrians and/or cyclists to move around easily and safely.

9.1.8 Crossings that involve grade separation - subways and bridges - are undesirable and should only be used where essential due to traffic speeds and volumes. Grade separated crossings are much less convenient and therefore less likely to be used, particularly subways which create significant personal security concerns. These types of crossing are much more costly and elevated structures, with their lengthy approach ramps, cause a high degree of visual intrusion.

9.1.9 Where underpasses and bridges are used, they should be as short, wide and direct as possible to improve users' perception of security and make the routes more legible.

9.1.10 The former subway at Maid Marian Way, Nottingham, was unwelcoming and felt dangerous. When the subway was replaced by an at-grade crossing, the number of pedestrians increased significantly (see Case Study **Chapter 14**).

9.1.11 More generally, grade separated junctions and links, particularly in urban areas, are rarely successful in placemaking terms. The carriageways have no connection with their surroundings and are highly inflexible and costly to change. Elevated structures create unwelcoming environments at ground level, both beneath and adjacent to the route.



Nechells Parkway, Birmingham - Despite this pedestrian subway being close by, and the absence of a formal surface crossing, many people choose to walk across the central reservation to reach the bus stops.

9.1.12 The choice of junction and crossing type at a particular location should be made after considering all of its functional requirements - including both movement and place functions - and not just capacity and road safety. Every type of junction has its advantages and disadvantages, and the effect of alternative options should be considered.

9.1.13 A Quality Audit approach (see **Chapter 4**) can be used to assess alternative junction types and layouts, so that the best balance of outcomes is achieved, taking into account the objectives of the scheme.

9.2_ Spacing of Junctions

9.2.1 In the past, guidance on minimum junction spacing has often been based on recommended stopping sight distances (SSD) for 85th percentile speeds. The reductions in SSD compared to previous practice means that junction spacing criteria determined on this basis should be reduced. However, in any event there appears to be little evidence that spacing criteria based on SSD are justified on safety or other grounds.



9.2.2 The need for and provision of junctions on new highways, and additional junctions on existing routes, should be assessed in the round, considering a wide range of factors such as the need for access at particular locations, the impact on the size of development blocks, the potential for interaction between adjacent junctions and the consequent effect on user delay and road safety.

9.3_ Crossings

9.3.1 General advice on the choice of crossing type and their design is given in Local Transport Notes 1/95⁵⁰ and 2/95⁵¹ and in Chapter 6 of MfS1, which is complemented by the further advice in this section. While the focus is on pedestrian crossings the recommendations can also be applied in most instances to crossings designed for cyclists (other than zebra crossings). Crossings should be provided with appropriate tactile paving. The legal requirements for crossings are given in the Crossing Regulations⁵².

9.3.2 Crossings should be located on or close to desire lines so that pedestrians find them convenient and pleasant to use. Placing crossings away from desire lines will reduce their level of use, even when guardrailling or other deterrent features are used.



Stoke Newington - new zebra crossings and new routes through park, linking directly to one another.

9.3.3 The simplest form of uncontrolled or informal crossing involves the provision of dropped or flush kerbs so that mobility-impaired people can cross to and from the carriageway. A refuge in the centre of the carriageway enables pedestrians to negotiate one stream of traffic at a time, which can be of considerable help when flows are high. Combining a refuge with a kerb build out, so that the carriageway is narrowed, will provide additional assistance to pedestrians. Further guidance on the design of refuges is given in **Chapter 8**.

9.3.4 Informal crossings can also indicate clearly to drivers where pedestrians are encouraged - and are therefore likely - to be crossing. Designs can make use of contrasting paving materials, street furniture and changes in carriageway width and level to emphasise pedestrian movement. When done well, in a slow speed traffic environment, they will often encourage drivers to give informal priority to pedestrians.



Shrewsbury High Street – ‘courtesy’ crossings are paved in the same material as the footways and line up with pedestrian routes on either side. See *Traffic Advisory Leaflet 8/98*¹⁰³.

9.3.5 Informal crossings require no signs or markings and therefore do not add to visual clutter. They can be generous in width (to pedestrians) so that the crossing becomes a strong element within the street scene.

9.3.6 Replacing controlled crossings (ie zebra and signalised) with informal crossings can reduce delays to traffic. In the Newland Avenue MPR scheme all signal-controlled crossings were removed, which resulted in reduced vehicle travel times as well as a reduction in maximum vehicle speed. Road safety and vehicle emissions were also improved significantly - details are given in *LTN 3/08*¹.

9.3.7 Zebra crossings offer the greatest advantage to pedestrians as they give them priority over all other traffic. In some authorities there has been a move away from providing zebra crossings towards signalised crossings, on the basis that they represent an ‘upgrade’ but this is not necessarily the case. Research carried out in London found that it was not possible to ascribe a safety benefit directly to the conversion of zebra crossings to pelicans⁵³.

9.3.8 Zebra crossings also typically result in lower delays to traffic flow, except when pedestrian flows are heavy. They are more immediately visible to drivers than signalised crossings and can be located closer to junctions, which can help to put crossings on desire lines.



Zebra crossing located close to road junction.

9.3.9 Zebra crossings are generally only used when the speed limit is 30mph or below, as at higher speeds it may be more difficult for pedestrians to establish precedence.

9.3.10 There are four types of stand-alone signalised crossings - Pelican, Puffin, Toucan and Equestrian crossings, which are described in *LTN 2/95*⁵¹. Traffic signal junctions can also incorporate signalised crossings.

9.3.11 Signalised crossings can cause additional delay compared to zebras and informal crossings, due to the lost time caused by intergreen periods etc. Linking signalised crossings to upstream signalised crossings can bring traffic benefits but this can lead to long delays for pedestrians.

9.3.12 Signalised crossings need to be used when controlled facilities for mounted cyclists and equestrians are required, as these groups are not authorised to use zebra crossings. Older people and people with a visual impairment may express a preference for signalised crossings as they provide greater certainty when crossing.

9.3.13 All types of crossing can be provided on a raised surface, so that pedestrians cross between footways on a level surface. This slows traffic on the approach to the crossing, makes pedestrians more visible and emphasises their presence in the street, making it more likely that drivers will see them and cede priority.



Zebra crossing on raised table.



Simple raised crossing of minor arm, with tight corner radii.



Signalised crossing on extensive raised table, City of London

9.3.15 Zebra crossings can also be used across minor junctions close to the give way line, when it is judged desirable to provide clear pedestrian priority at this point.



Zebra crossing across minor arm, close to junction, on desire lines.



Raised table across side road at signalised crossing – Walworth Road MPR scheme.

9.3.16 Controlled crossings may be divided using central refuges. Straight ahead divided crossings are much more convenient for pedestrians than staggered crossings, which involve additional delay and deviation from the desire line, particularly where the stagger is large.

9.3.14 Raised crossings across the mouth of minor road junctions are very helpful to pedestrians, and provide an element of informal priority at this key conflict point. Tight corner radii help to reduce the speed of turning traffic and help make the crossing movements easier and safer. The Highway Code notes (Rule 170)²² that pedestrians who have started to cross a junction have priority.



Staggered signalised crossing without guardrail



High Street Kensington - replacement of staggered crossing with straight over crossing at signalised junction.

9.3.17 Divided zebra crossings operate as two separate crossings, with pedestrians having to establish priority on each side. The absence of a stagger does not affect the operation of a zebra crossing in terms of pedestrian priority.

9.3.18 Signalised crossings that are divided by a refuge, and which are to operate in traffic terms as two separate crossings, are normally staggered, although there are examples of straight ahead signalised crossings that operate under separate phases (see box out on Maid Marian Way, overleaf).

9.3.19 Pedestrian guardrailing is often used to reinforce staggers, but it is not essential. Some authorities have successfully used upstand kerbs or low walls to define the stagger at signalised crossings, which significantly reduces street clutter.

Maid Marian Way – Two Stage Straight Ahead Crossings

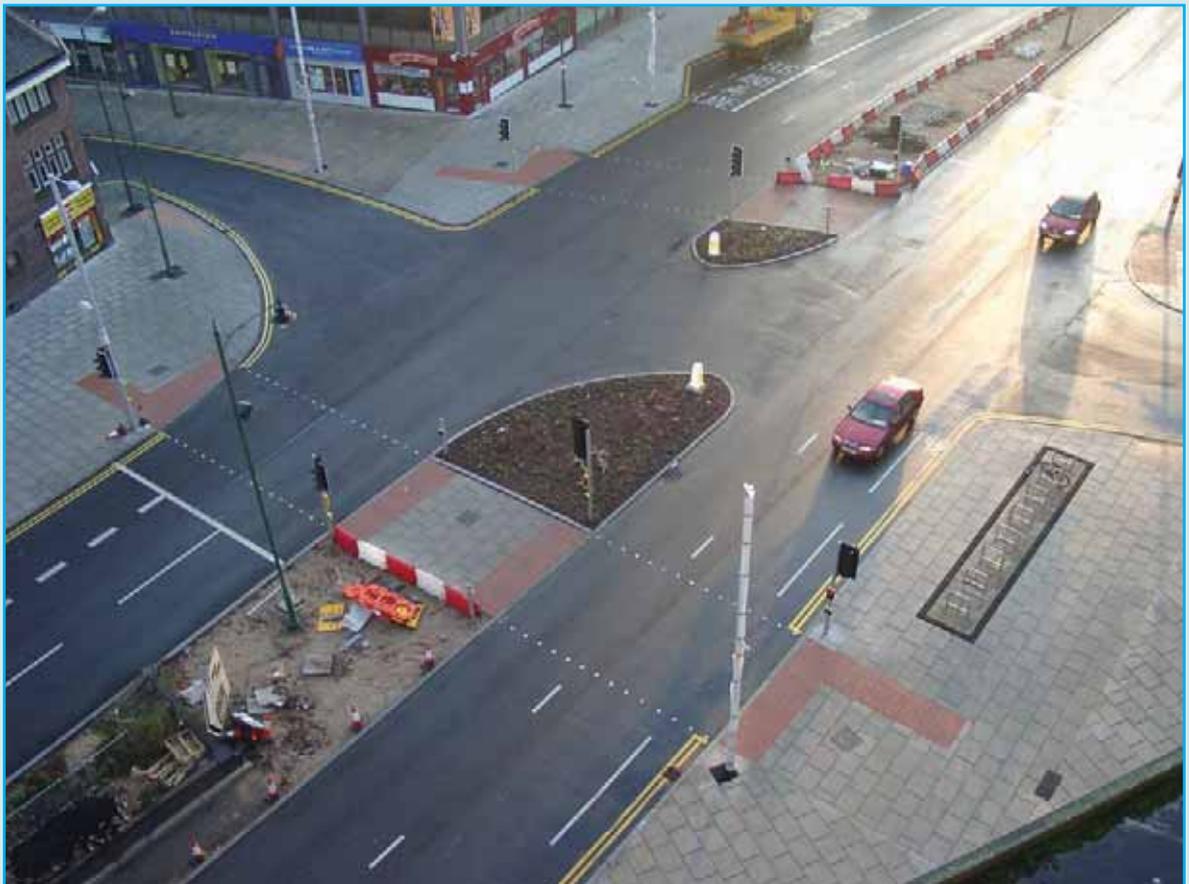
At the junction of Maid Marian Way and Friar Lane, Nottingham, a roundabout with pedestrian subways was replaced by a signal-controlled junction with pedestrian crossings.



Unwelcoming pedestrian subways were replaced by signal-controlled at-grade crossings.

Maid Marian Way is a busy dual carriageway and both crossings of this route needed to be signalled in two stages. Despite this requirement, straight ahead crossings were used, rather than relying on more conventional staggered layouts. Nearside pedestrian aspects were used, as farside aspects could have led to confusion.

Another non-standard aspect of the design is that one of the crossings is not perpendicular to the traffic flow and stop line, but rather follows the pedestrian desire line.



9.3.20 Pedestrian crossings at traffic signals are typically across each arm of the junction, but when an all-red (to traffic) phase is provided, consideration can be given to providing diagonal crossing facilities. These enable pedestrians to cross to the opposite corner of the junction in one movement instead of two, which is much quicker and more convenient. A high-profile scheme has recently been installed at Oxford Circus in London, but there are long-standing examples elsewhere, such as in Balham, at the junction of Bramford Road and Yarmouth Road in Ipswich, and in Wellingborough at the junction of Croyland Road, Doddington Road and Broadway near a school.



Diagonal crossing, Balham



Diagonal crossing, Oxford Circus

9.4_ Priority and Uncontrolled Junctions

9.4.1 The simplest junctions are where two or more streets meet at a point. These junctions may have marked priority so that there is a major route through the junction, or the junction may have no marked priority and is therefore uncontrolled. Uncontrolled junctions tend to increase driver uncertainty and lead to reduced speeds and are therefore appropriate to low volume and low speed environments, including in urban centres.

9.4.2 Detailed guidance on the design of priority junctions is given in TD42/95⁵⁴ but (as with all sections of DMRB) this is written specifically for trunk roads and, where used in other situations, should not be applied uncritically.

9.4.3 T and Y junctions have the fewest conflicting traffic movements. Where there is a straight or nearly straight through route drivers will tend to regard this as the major movement, and so even without road markings or signs, a natural priority will tend to develop.

9.4.4 Crossroads and multi-armed junctions have much higher numbers of conflicting traffic movements and therefore tend to perform worse in terms of road safety. However, grid-type networks with crossroads junctions are extremely legible and therefore encourage walking and cycling, and it is therefore important to strike the right balance. Well-connected street grids can also disperse traffic flows, which will tend to reduce the level of conflict at any particular point.

9.4.5 Reducing traffic speed will also improve safety, and one way of achieving this at the conflict point is to raise the junction onto a speed table.



Tabled crossroads

9.4.6 Keeping the number of approach lanes to the minimum will make the junction safer and easier to negotiate for pedestrians and cyclists. Research into cycle safety at T-junctions found that higher cycle collision rates are associated with two lane minor road approaches⁵⁵.

9.4.7 TD 42/95⁵⁴ recommends that consideration should be given to providing a right turning lane at priority junctions where the side road flow exceeds 500 vehicles per day, but this advice relates to trunk roads, where there is an emphasis on providing an unimpeded route for through traffic. It is a relatively low flow, and junctions without right turn lanes will often be able to cater for higher levels of turning traffic without resulting in significant congestion.

9.4.8 Right turning lanes make it more difficult for pedestrians to cross major roads and lead to higher traffic speeds and authorities should therefore consider carefully all of the effects before deciding to provide them. Removing unnecessary right turn lanes can also be considered, and will bring substantial benefits to non-motorised users.

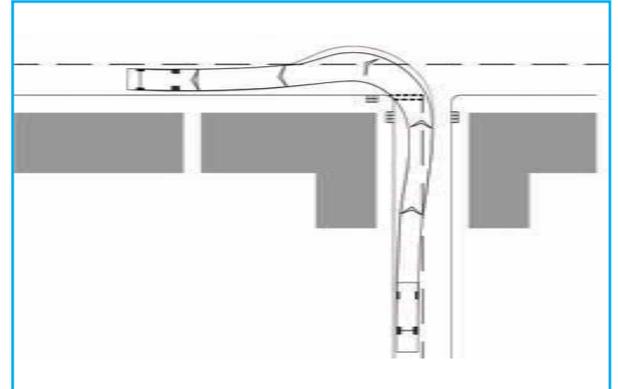
9.4.9 Where right turn lanes are to be provided or retained, refuges should be provided within ghost islands to facilitate pedestrians crossing.



Ghost island junction with pedestrian refuge

9.4.10 As noted in Sections 6.3 and 6.4 of MfS1, tight corner radii help pedestrians and cyclists to travel across and through junctions by reducing the speed of turning vehicles. Advice contained in TD 42/95⁵⁴, that minimum corner radii should be 6m in urban areas, should therefore not be taken as representing best practice when the needs of vulnerable road users are to be prioritised.

9.4.11 Larger vehicles can still negotiate junctions where minimal (1m or less) corner radii are used, depending on the width of the junction arms they are turning to and from. In many cases it will be better to have slightly greater carriageway widths at the junction, rather than generous corner radii, or accept that larger vehicles occasionally cross into the opposing lane. This approach allows the vehicle to take a larger radius than the junction kerb, as shown below. This can be tested by vehicle tracking software rather than relying on fixed standards.



Despite the small corner radius, with sufficient carriageway width (X) a long vehicle can still negotiate a junction.

9.4.12 Designers are sometimes reluctant to use tight corner radii on the grounds that vehicles slowing to turn into the minor arm may cause shunt collisions on the major road. This may be the case where speeds are high, but in urban areas the overall emphasis of MfS is that speeds should be reduced to appropriate levels of 30mph or below through design and the use of tight corner radii is consistent with this approach.



9.4.13 Moreover, there are junctions on very busy routes where tight corner radii have existed for a considerable time, as shown above.

9.4.14 Footway crossovers can be used instead of more formal priority junctions, which will give further prominence to pedestrians. Footway crossovers are often used successfully at accesses to commercial premises, as illustrated below, demonstrating that they can be used at busy locations.



Footway crossover access to commercial premises

9.4.15 Footway crossovers should maintain the normal footway cross-fall as far as practicable from the back of the footway (900mm), as recommended in MfS1. Designs which ramp up over the whole width of the footway make it difficult for people with a mobility impairment, including wheelchair users, to negotiate the crossover.

9.4.16 The safety aspects of visibility requirements at priority junctions are dealt with in **Chapter 10**. Junction capacity is also dependent on visibility, however, as the drivers on the minor arm will emerge more cautiously and slowly when visibility is limited. Standard junction capacity tools such as PICADY enable designers to consider the effect of minor road visibility on junction capacity.

9.5_ Squares

9.5.1 Squares are excellent opportunities for creating successful and attractive public spaces, where people will wish to spend time, and are natural sites for commercial and public buildings that add to vitality. Many towns and cities have public squares at their heart, and many designs for urban extensions incorporate public squares as a focal point for the new community.

9.5.2 Although squares are primarily regarded as public spaces, squares with traffic passing through them can also be regarded as a development of priority and/or uncontrolled junctions. Squares offer a good way of enabling complex turning movements to take place across a more dispersed area, rather than at a single point, thus reducing conflict and improving safety. Many squares successfully incorporate car parking within the space.



Poundbury, Dorset. This square, where four routes meet, forms part of a new urban extension. It includes parking and local shops

9.6_ Conventional Roundabouts

9.6.1 Conventional roundabouts are widely used in the UK. Detailed guidance on the design of roundabouts is given in TD16/07⁵⁶ but (as with all sections of DMRB) this is written specifically for trunk roads and, where used in other situations, should not be applied uncritically.

9.6.2 Roundabouts typically have the lowest rate and severity of motor vehicle collisions and cause low levels of traffic delay, and therefore reduced vehicle emissions, in off-peak conditions. They can deliver high levels of traffic capacity and can cater for junctions with more than four approach arms, although there is some evidence that this can lead to a reduction in road safety.

9.6.3 On the other hand, roundabouts generally have a poor collision record for cyclists and can be a significant barrier to pedestrian movement. Many roundabout designs make only minimal provision for pedestrians, requiring them to cross wide entry and exit arms. Where formal crossings are installed, whether as zebra or signal-controlled crossings, they are often placed well away from desire lines. Some designers have created subways beneath roundabouts in an attempt to give pedestrians more direct crossing routes, but as the Maid Marian Way Case Study shows, this has rarely been successful (**Chapter 14**).

9.6.4 Providing adequate deflection is important in reducing speed for motor vehicles, and normal practice is for the geometry to force vehicles to turn through a curve of less than 100m in radius. This is less important in urban areas with a speed limit of 30mph or below where speed can be limited by other means. Designs that use means other than deflection to achieve low speeds can also have a good safety record.

9.6.5 Roundabouts can have a large land requirement and their circular geometry does not sit comfortably in dense urban areas. The signs and road markings generally associated with roundabouts can be very intrusive, although advice is given in **Chapter 13** on how this can be minimised.

9.6.6 When roundabouts are proposed, the recommended approach is to make the overall diameter of the junction as compact as possible to minimise land take. This will reduce the disruption to pedestrian desire lines, with crossings placed close to entries and exits. This may have some impact on traffic flow, but this should not always be seen as an unacceptable outcome, given the underlying need to encourage walking and cycling. Placing crossings on pedestrian desire lines will avoid the need for guardrailing.

9.6.7 Entries, exits and circulatory carriageways should be as narrow as possible, ideally to a single lane, subject to capacity considerations. UK practice has generally been to have generous entry and exit radii and avoid re-entrant curves, but moving towards a more ‘continental’ or ‘compact’ geometry will result in slower traffic speeds on the entries, exits and circulatory carriageway, which will be of benefit to cyclists and pedestrians.

9.6.8 Compact roundabouts are recommended in TD16/07⁵⁶ for single carriageway roads, and are particularly suitable where there is a need to accommodate the movement of pedestrians and cyclists. Further guidance on providing for cyclists at compact roundabouts is given in Traffic Advisory Leaflet (TAL) 9/97⁵⁷.

9.6.9 The widths of circulatory carriageways should be checked using swept path analysis, considering the largest vehicle that will regularly negotiate the junction, rather than always designing for the largest legal articulated vehicle, and using predetermined widths based simply on diameter. This may well allow smaller roundabouts to be achieved, particularly in urban areas.

9.6.10 Roundabouts do not always have to be circular, and ovoid or less regular shapes can be used in constrained situations. Care should be taken however to avoid sharp curves which can result in an overturning hazard for long vehicles.

9.6.11 Left turn slip lanes are often used to increase traffic capacity when there is a heavy demand for this movement. These create a particular hazard for cyclists, however, when they are leaving the circulatory carriageway and find themselves between two moving traffic lanes. Designers should not use these designs without resolving this problem satisfactorily.



Cyclists leaving this roundabout can find themselves in the outside lane of a dual carriageway.

9.6.12 Central islands at roundabouts can be utilised as sites for public art and monuments, but this is likely to be much more successful when these sites can be reached and enjoyed by people on foot.



Although the Wellington Arch, London is situated on a large roundabout, the direct crossing facilities mean that it is accessible by people on foot, cycle and on horses.



The monument at Seven Dials, London, acts as a place to sit and linger, as well as a place to move through and is a public square where seven routes meet. Roundabout priority is established by the placing of signs only on the entries to the junction.

9.7_ Mini-Roundabouts

9.7.1 Mini-roundabouts are essentially the application of a road marking (TSRGD diag 1003.4)⁵⁸ which defines a give-way to the right rule, circulating the marked central island. Detailed guidance is given in TD 54/07⁵⁹ but (as with all sections of DMRB) this is written specifically for trunk roads and, where used in other situations, should not be applied uncritically.

9.7.2 In particular, although TD 54/07 states that new mini-roundabouts are not to be used at new junctions on trunk roads, no such presumption applies elsewhere, and mini-roundabouts remain a valid choice of junction type for new as well as existing junctions.

9.7.3 Further detailed guidance on the design of mini-roundabouts is given in the DfT and County Surveyors' Society (now ADEPT) publication 'Mini roundabouts good practice guidance'⁶⁰.

9.7.4 Many mini-roundabouts have been installed at existing junctions where they can bring advantages such as the reduction in traffic speed on all approaches and a reduction in overall traffic delay. The land requirement of this type of junction is small - they can be fitted into junctions with an overall diameter of around 12m or less and thus create little diversion for pedestrians. They are safer for cyclists than large conventional roundabouts.



This mini-roundabout has an overall diameter of around 12m. It was installed as part of a village traffic calming scheme and has resulted in a significant reduction in collisions.

9.7.5 Mini-roundabouts cannot easily achieve good entry deflection and so are only suitable in locations where approach speeds are 30mph or below. One way of achieving a slow approach speed is to raise the junction on a table.

9.7.6 Most designs are unlikely to deliver high traffic capacities; mini-roundabouts with multiple approach lanes have been used but these are less easy for pedestrians and cyclists to negotiate safely, and can lead to higher approach speeds.

9.7.7 Mini-roundabouts work best where the traffic flow on different arms is reasonably balanced, so that drivers on all approaches slow down in anticipation of having to give way. When one or more arms has a relatively light traffic flow, a means of reducing traffic speeds, such as placing the junction on a speed table, may be a solution.

9.7.8 The requirements for road markings and signs at mini-roundabouts do have a considerable visual impact and can be particularly intrusive.

9.7.9 Some authorities have responded to this by installing junctions that are designed to encourage drivers to adopt circulatory priority, but they are in fact uncontrolled junctions - see Example of Julian Road, Bath, overleaf.



Julian Road Bath – Before and After

The scheme involved the redesign and realignment of a stretch of busy road outside a primary school in the west of Bath between Marlborough Street and the junction with Harley Street. A ghost island junction was replaced by an uncontrolled junction that used pavement materials to encourage circulatory priority.

In the three years prior to the scheme, there were nine recorded serious accidents in the relevant area, including one fatality. There have been no recorded accidents in the three years since the scheme was completed. The scheme included removal of most signs, barriers and road markings, and the creation of simple informal “places” instead of sweeping priority junctions.

9.7.10 Mini-roundabouts can also have controlled crossings close to exits, on pedestrian desire lines.



Zebra crossing close to mini-roundabout exit.

9.8.2 Traffic signals and are widely used in urban situations and in rural locations and can cater for high traffic flows, although they are less appropriate than roundabouts when approach speeds are high. They generally have a worse road safety record than roundabouts in terms of vehicle-vehicle collisions, but are better suited to accommodate pedestrians and cyclists on their desire lines, although less so as the size and complexity of the junction increases.

9.8_ Traffic Signals

9.8.1 The principles of traffic signal control are set out in TAL 01/06⁶¹ and the design of pedestrian facilities at signals is covered by TAL 05/05⁶². Detailed guidance is given in TD 50/04⁶³ but (as with all sections of DMRB) this is written specifically for trunk roads and, where used in other situations, should not be applied uncritically.



Traffic signal junction with clear and simple pedestrian crossings and advance cycle stop lines. Note lack of guardrailing and buildings close to junction corner, and tight corner radii.

9.8.3 Traffic signals add to street clutter, particularly layouts that require large numbers of signal heads and other equipment. They can therefore have a severe visual impact. The minimum number of signals at crossings is specified in the Schedule to Direction 54 of TSRGD⁵⁸. For example, a non-staggered crossing only requires one primary and one secondary signal. Straight ahead crossings generally require fewer signal heads and therefore create less clutter.



Traffic signals can have a severe visual impact

9.8.8 Many traffic signal layouts include segregated left turn lanes, which may be signal-controlled or operate as give way junctions. Whilst they can increase capacity, they make pedestrian crossing movements much more difficult, adding an extra crossing which can significantly increase overall crossing times. They also add to the number of signal heads needed, and therefore clutter. These disbenefits should be expressly considered before this type of layout is adopted.



Segregated left turn lanes make pedestrian crossing movements more complex and slow, as well as adding to clutter.

9.8.4 Traffic signals generally occupy less land take than roundabouts, depending on the number of approach lanes and the need for separate turning lanes.

9.8.5 Even where it is judged that pedestrian phases at traffic signals are not justified, pedestrians can still cross more easily at traffic signals than at other locations, when traffic streams are stopped by red signals or during intergreen periods.

9.8.6 As with priority junctions, tight corner radii will make it easier for pedestrians to cross and will reduce the speed of turning traffic, although this will also reduce saturation flows and will need to be taken into account in capacity assessments.

9.8.7 Visibility requirements between arms of traffic signals as set out in TD 50/04⁶³ may affect the ability to position buildings close to the corners of traffic signal junctions, which can affect the ability to create a well-enclosed space. Reducing corner radii can enable stop lines to be brought forward to reduce this effect, but designers may need to consider whether the strict application of these visibility requirements is always appropriate, particularly in urban situations where speeds are low; or where stop lines are set back considerable distances due to swept path requirements or other reasons, giving rise to large intervisibility zones.

9.8.9 Traffic signal junctions in urban areas should generally incorporate advanced cycle stop lines to which enable cyclists to position themselves at the head of traffic streams where they are more visible and safer.

9.8.10 Outside peak hours traffic signals can cause greater levels of delay to all road users than other types of junction, due to the time lost when changing between signal stages. Keeping the number of signal stages to a minimum will reduce this disbenefit. Some authorities have begun to experiment with the removal of traffic signal control to reduce delays, and research studies have found this can lead to significant economic benefits⁶⁴.

9.8.11 Notwithstanding these potential benefits, care needs to be taken that the removal of traffic signals does not worsen road safety, or make conditions worse for pedestrians and cyclists.

9.8.12 Traffic signal controllers should be sited to allow unimpeded use of the footway by pedestrians. In the example below, a signal controller has been installed in a bench.



Bench containing traffic signal controller

9.8.13 Most highway authorities specify backing boards with white borders to traffic signals, but they are not legally required. Local Transport Note 1/98⁶⁵ notes that backing boards may be omitted at urban sites where speeds are low and there are no distracting backgrounds.



Signalised crossing with no white borders to signal heads

9.9_ Traffic Management and One-Way Systems

9.9.1 In many towns and cities traffic management systems, often involving networks of one-way streets, have been created. The usual aim of these systems is to increase network capacity by simplifying turning movements at junctions. These aims are understood, but the improvements in traffic flow capacity are offset by reductions in legibility and accessibility for all road users. One-way streets also tend to cause higher traffic speeds.

9.9.2 Cyclists are particularly disadvantaged by such systems, since the additional travel distance can be significant. Pedestrians can become disorientated by one-way streets, and fail to look for traffic in the correct direction before crossing. This is a particular problem where there are contraflow bus lanes.

9.9.3 However, with appropriate designs to minimise vehicle speeds, one-way streets can result in narrower carriageways which can create more space for pedestrians, cyclists and the public realm.

9.9.4 Some towns and cities have begun to simplify traffic management systems, judging that the benefits to other road users outweighs any additional travel time for motor vehicles. In South Kensington (see overleaf) a complex one-way system has been removed, whilst at the same time considerable areas of carriageway space have been given over to pedestrians.



Before



After

Changes at South Kensington - a complex one-way system has been simplified



Before

Area outside Underground station



After

9.10_ Direct Frontage Access

9.10.1 Providing direct access to buildings and public spaces is an important element in creating streets that are linked to their surroundings, rather than simply being conduits for passing traffic. Access is a key part of the place function of streets and should be facilitated where possible.

9.10.2 MfS1 referred to research which looked at the relationship between traffic flow and road safety on streets with direct frontage access to dwellings (MfS1 7.9.5). A limit of 10,000 vehicles per day (vpd) was advised, but this related to the limited number of sites considered with more than this level of traffic, rather than an indication that road safety declines above this level of flow.

9.10.3 Research referred to in TD 41/95³ examined the relationship between access frequency and collisions on 3,000km of all-purpose trunk roads in England, both urban and rural, dual and single carriageway. The research showed that there was no simple statistical relationship between the number of collisions and the number of vehicular connections in the form of minor junctions and direct accesses.

9.10.4 For rural roads, there was a statistically significant relationship between collisions and traffic flow, link length and the total number of all access connections. In the case of urban roads, however, only traffic flow had a significant effect on the number of collisions at this level of confidence, and was found no direct relationship between access provision and collision occurrence.

9.10.5 It is therefore clear that the advice given in MfS1 concerning direct access is applicable to all urban roads, and that providing direct frontage access is unlikely to have significant disbenefits in road safety terms.

10_Visibility

10.1_Introduction

10.1.1 This section of MfS2 incorporates Section 7.5 of MfS1. It is based on a combination of the research carried out by TRL²³, the research carried out by TMS Consultancy for MfS2⁶⁶, a review of recent research and international standards and the outcome of public inquiries since MfS1 was published (see Example below).

10.1.2 Sight distance parameters can be based on various models, such as stopping sight distance, overtaking distance or gap acceptance. UK practice generally focuses on Stopping Sight Distance (SSD). The effect of sight distance on the capacity of priority junctions is discussed in **Chapter 9** above.

10.1.3 This section provides guidance on SSDs for streets where 85th percentile speeds are up to 60 kph (37mph). This will generally be achieved within 30mph limits and may be achieved in some 40mph limits.



Inspectors at public inquiries have accepted that SSD guidance in MfS1 applies to non-residential streets. At an appeal into a development of some 100 dwellings, accessed from the B5215 Leigh Road in Wigan, the Inspector concluded that MfS1 did apply, notwithstanding the volume of traffic (approximately 1,700vph peak times) or the classification of the highway (part of the Strategic Route Network).

10.1.4 Stopping sight distance (SSD) is the distance drivers need to be able to see ahead and they can stop within from a given speed. It is calculated from the speed of the vehicle, the time required for a driver to identify a hazard and then begin to brake (the perception-reaction time), and the vehicle's rate of deceleration. For new streets, the design speed for the location under consideration is set by the designer. For existing streets, the 85th percentile wet-weather speed is used.

10.1.5 The basic formula for calculating SSD (in metres) is:

$$SSD = vt + v^2/2(d+0.1a)$$

where:

v = speed (m/s)

t = driver perception-reaction time (seconds)

d = deceleration (m/s²)

a = longitudinal gradient (%)

(+ for upgrades and - for downgrades)

10.1.6 The Desirable Minimum SSDs in general use prior to MfS1 were based on a driver perception-reaction time of 2 seconds and a deceleration rate of 2.45 m/s² (equivalent to 0.25g, where g is acceleration due to gravity (9.81 m/s²)). The Absolute Minimum SSD values kept the same reaction time of 2 seconds, but assumed a deceleration rate of 3.68 m/s² (0.375g).

10.1.7 The SSD values recommended in MfS1 were based on a perception-reaction time of 1.5 seconds and a deceleration rate of 0.45g (4.41 m/s²). This value is appropriate for cars and other light vehicles, but heavy goods vehicles and buses have different deceleration characteristics. When deciding whether to carry out separate checks for cars, HGV and bus SSDs, highway authorities should consider the following factors:

- Volume of HGVs and buses
- Proportion of HGVs and buses
- Presence of priority lanes which may enable higher bus/HGV speeds

10.1.8 As a guide, it is suggested that bus/HGV SSD should not need to be assessed when the combined proportion of HGV and bus traffic is less than 5% of traffic flow, subject to consideration of local circumstances.

10.1.9 Based on international vehicle standards (see Example) HGVs must be able to achieve peak deceleration rates of at least 0.509g. However, allowing for the delay in the maximum effectiveness of air braking systems, overall minimum stopping distances are also specified which reduce the minimum overall deceleration rate^A under the regulations to some 0.36g. Real life tests carried out by ROSPA (also see Example) indicate that these values are likely to be exceeded in practice and therefore the pre-MfS1 Absolute Minimum value of 0.375g is recommended for HGVs. These average deceleration rates already allow for the time taken for air braking systems to apply and therefore the same reaction time of 1.5 seconds should be used.

10.1.10 For buses, the limiting design factor is passenger comfort and safety rather than the ability of the vehicle to stop, and therefore for buses, the recommended maximum deceleration rate is the same as the pre-MfS1 Absolute Minimum value of 0.375g, as used for the pre-MfS1 Absolute Minimum SSD values.

^A The minimum overall deceleration rate means the deceleration rate, expressed as a uniform value, from the instant when the brakes begin to be applied when the vehicle stops, required by the standards.

10.1.11 Where designers wish to determine different SSD values for HGVs and buses it will be necessary to use appropriate design speeds for these classes of vehicle. Where SSD is being calculated for existing highways, actual 85th percentile values for these types of vehicles should be measured and the worst case SSD be used for horizontal measurements of visibility.

10.1.12 Based on free flow vehicle speeds travelling in 30mph limits given in Transport Statistics Bulletin 2008⁴⁵, buses travel at 90% of the average speed for all vehicles.

HGV Braking Performance

Minimum standards for lorry braking systems are set out in the UNECE Vehicle Regulation 13⁶⁷, which requires that the mean fully developed deceleration rate achieved by the braking system (with the engine disconnected) should be at least 5.0m/s² (0.509g). In addition, the stopping distance of the vehicle must be no more than $0.15v+v^2/130$, where v=vehicle speed in kph (up to 60kph), and $0.15v+v^2/103.5$ (v up to 90kph).

At 50kph the maximum allowable stopping distance is therefore 26.7m, and this is equivalent to a minimum overall braking rate of 3.6m/s² or 0.37g.

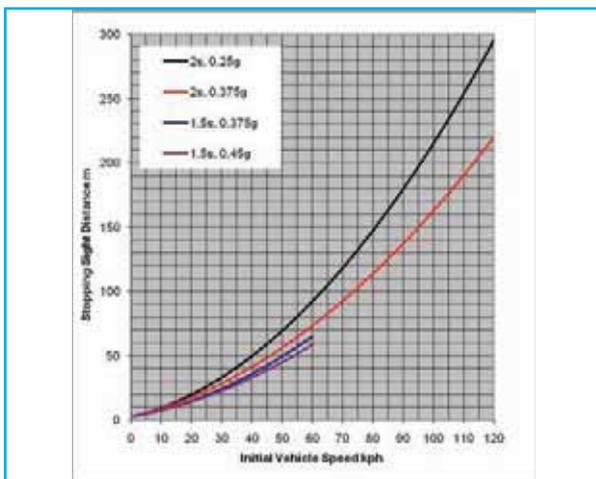
A series of real life braking tests were carried out by ROSPA using a wide range of vehicles in 2001, as reported in <http://www.rospa.com/RoadSafety/AdviceAndInformation/Driving/hgv-truck-braking-systems.aspx>

Deceleration rates have been calculated from the results of these tests which show that the minimum overall braking rate achieved was 0.44g, for a 36 tonne Foden vehicle, which stopped in 20.68m from 30mph. (One vehicle did take longer to stop, at 27m, but this was on a down slope). Cars were also tested by ROSPA, and the best performing of these was a Ford Mondeo, which stopped from 30mph in 7.14m, an overall deceleration rate of 1.27g.

10.1.13 In summary, recommended values for reaction times and deceleration rates for SSD calculations are given in **Table 10.1** below and the resulting SSD values for initial speeds of up to 120kph are shown on the graph beneath.

Design Speed	Vehicle Type	Reaction Time	Deceleration Rate	Comments
60kph and below	Light vehicles	1.5s	0.45g	
	HGVs	1.5s	0.375g	See 10.1.9
	Buses	1.5s	0.375g	See 10.1.10
Above 60kph	All vehicles	2s	0.375g (Absolute Min SSD)	As TD 9/93
	All vehicles	2s	0.25g (Desirable Min SSD)	As TD 9/93

Table 10.1: Summary of Recommended SSD Criteria



Graph showing recommended SSD values, allowing for bonnet length.

10.2_Visibility Requirements

10.2.1 Visibility should be checked at junctions and along the street. Forward visibility is measured horizontally and vertically.

10.2.2 Using plan views of proposed layouts, checks for visibility in the horizontal plane ensure that views are not obscured by vertical obstructions.

10.2.3 Checking visibility in the vertical plane is then carried out to ensure that views in the horizontal plane are not compromised by obstructions such as the crest of a hill, or a bridge at a dip in the road ahead. It also takes into account the variation in driver eye height and the height range of obstructions. Eye height is assumed to range from 1.05m (for car drivers) to 2m (for bus and HGV drivers).

10.2.4 Drivers need to be able to see obstructions from 2m high down to a point 600 mm above the carriageway. The latter dimension is used to ensure small children can be seen.

10.2.5 The SSD figure relates to the position of the driver. However the distance between the driver and the front of the vehicle is typically up to 2.4m, which is a significant proportion of shorter stopping distances. It is therefore recommended that for assessments of SSD, an allowance is made by adding 2.4m to the distance calculated using the formula.

10.3_ Forward Visibility

10.3.1 The minimum forward visibility required is equal to the minimum SSD, based on the design speed at the location being considered. It is checked by measuring between points on a curve along the centreline of the inner traffic lane (see Fig.10.1).

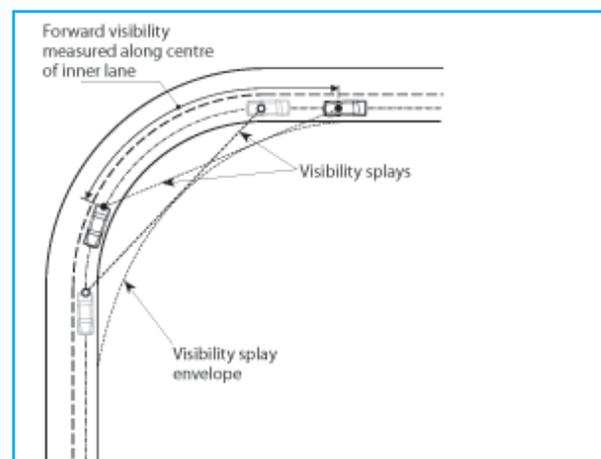
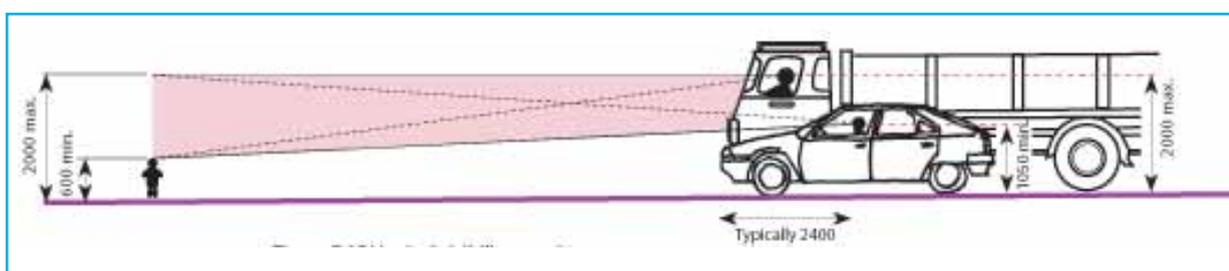


Figure 10.1 - Measurement of forward visibility

10.3.2 However there will be situations in locations with design speeds of 60kph or less where it is desirable and appropriate to restrict forward visibility to control traffic speed - research carried out for MfS1 describes how forward visibility influences speed. An historic example is shown below.



Spaniards Inn, Hampstead – historic building restricting forward visibility and carriageway width



10.4_ Visibility At Priority Junctions

10.4.1 The visibility splay at a junction ensures there is adequate inter-visibility between vehicles on the major and minor arms.

10.4.2 It has often been assumed that a failure to provide visibility at priority junctions in accordance with the values recommended in MfS1 or DMRB (as appropriate) will result in an increased risk of injury collisions. Research carried out by TMS Consultancy for MfS2⁶⁶ has found no evidence of this (see research summary below). Research into cycle safety at T-junctions found that higher cycle collision rates are associated with greater visibility⁶⁵.

High Risk Collision Sites and Y Distance Visibility

Introduction

The accepted approach to visibility at priority junctions has been to provide a minimum stopping sight distance value appropriate to a particular design speed. The assumption made by some designers and road safety auditors is that this value provides a minimum road safety requirement, and that collision risk will increase if the SSD is not achieved.

The purpose of this research was to examine this assumption and to identify whether or not a direct relationship can be established between variations in Y distance SSD and collision frequency at priority junctions.

Methodology

Site Selection

A series of “high risk” priority junctions was identified as the basis for research. Uncontrolled crossroads and T- junctions were selected for all classes of road throughout all 20, 30 and 40mph speed limits in Nottinghamshire, Sandwell, Lambeth, and Glasgow. For each area a list of all non-pedestrian collisions was ranked in descending order of collision total for a recent five-year period, with over 1500 collisions listed in total. Each location was then analysed in detail to identify specific collision characteristics.

Collision Analysis

Collisions involving vehicles emerging from junctions into the path of vehicles on the main road, together with nose-to-tail shunts on the minor road were identified as the type of incident that could have been caused by “poor visibility”. The locations were then ranked in descending order of these types of crashes, and site visits were carried out at the “worst” sites.

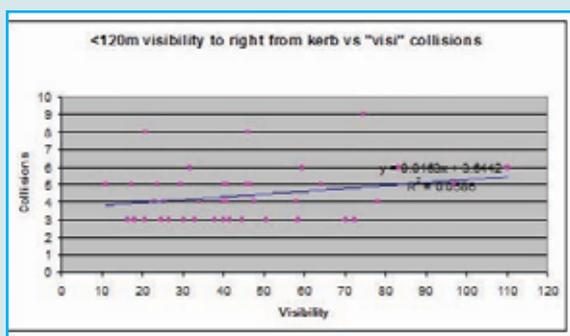
In addition to the 626 potential “poor visibility” collisions, a record was made of 203 collisions involving main road shunts, 46 collisions involving main road bus passengers, 22 collisions involving main road large goods vehicles, and 216 collisions involving main road two-wheeled vehicles. There is a concern that these types of collisions could be over-represented at locations with poor visibility.

Site Visits

Two investigators visited each location, and measured visibility to the left and right, from a point on the side road, 2.4m back from the main road channel line. Visibility was measured from a height of 1.05m, to a point at the kerb edge and a second point 1m out from the kerb edge, where observations showed that visibility increased.

Summary of Findings

- “High risk” sites were defined as locations that had three or more potential poor visibility collisions - in a five year period (94 in total). Of these 90 were on 30mph roads, with 3 on 40mph roads. At 55 of the 94 locations the worst case visibility (either to the left or right) was restricted to less than 120m. Thus in relation to the total number of uncontrolled junctions that exist, the proportion of “high risk” sites where visibility is less than that recommended for 70kph in DMRB is likely to be very low. It is possible that some former high risk priority junctions have been converted to other forms of junction control.
- In two thirds of the cases where visibility was less than 120m, the restriction was due to parked vehicles or street furniture. It is not possible to determine whether the parking was present at the time of the collision.
- Linear regression to compare potential poor visibility collisions with Y distance has a very low R² value, which shows that the variation in collision frequency was explained by factors other than Y distance visibility, for a large number of different situations. Therefore Y distance cannot be seen as a single deterministic factor at these high-risk collision locations (see example graph below).



Visibility measured to right, to nearside kerb.

	No. of sites	No. collisions	Collisions per year	Collisions per site per year
0-20m	4	16	3.2	0.80
20-40m	14	58	11.6	0.83
40-60m	15	64	12.8	0.85
60-80m	5	24	4.8	0.96
80-100m	2	11	2.2	1.10
100-120m	1	6	1.2	1.20
120m+	48	208	41.6	0.87

- A series of collision types at high risk locations where Y distance was less than 45m were compared with locations with more than 45m visibility. There were no statistically significant differences between the two sets of data. The data analysed included main road bus and large goods vehicle collisions, and the research did not find high numbers of collisions involving these types of vehicles at low visibility sites.

Collision type	No & % in sites - 45m vis	No & % in sites - 45m vis
Potential visi collisions in dark	40 (31.75%)	90 (30.3%)
Main road shunts	24 (8.79%)	50 (9.11%)
Bus passenger	10 (3.66%)	10 (1.82%)
Main road HGV	1 (0.37%)	5 (0.91%)
Main road two-wheeled.	38 (13.92%)	85 (15.58%)

Conclusions

- This study has been unable to demonstrate that road safety concerns regarding reduced Y distance are directly associated with increased collision risk at “high-risk” urban sites;
- Previous research for MfS1 demonstrated that main road speed is influenced by road width and forward visibility. Many of the locations in this study were straight roads with good forward visibility. The ability of the driver to stop is likely to be affected by more than just what is happening in the side road and an understanding of the factors influencing main road speed is important when assessing visibility requirements.

10.5_ X and Y Distances

Measurement of X and Y distances

10.5.1 The distance back along the minor arm from which visibility is measured is known as the X distance (**Figure 10.2**). It is generally measured back from the 'give way' line (or the main road channel line if no such markings are provided).

10.5.2 This distance is normally measured along the centreline of the minor arm for simplicity, but in some circumstances (for example where there is a wide splitter island on the minor arm) it will be more appropriate to measure it from the actual position of the driver.

10.5.3 The Y distance represents the distance that a driver who is about to exit from the minor arm can see to the left and right along the main alignment. For simplicity it has previously been measured along the nearside kerb line of the main arm, although vehicles will normally be travelling at a distance from the kerb line. Therefore a more accurate assessment of visibility splay is made by measuring to the nearside edge of the vehicle track. The measurement is taken from the point where this line intersects the centreline of the minor arm (unless, as above, there is a splitter island in the minor arm).

10.5.4 When the main alignment is curved and the minor arm joins on the outside of a bend, another check is necessary to make sure that an approaching vehicle on the main arm is visible over the whole of the Y distance. This is done by drawing an additional sight line which meets the kerb line at a tangent.

10.5.5 Some circumstances make it unlikely that vehicles approaching from the left on the main arm will cross the centreline of the main arm - opposing flows may be physically segregated at that point, for example. If so, the visibility splay to the left can be measured to the centreline of the main arm.

Recommended values for X and Y distances

10.5.6 An X distance of 2.4m should normally be used in most built-up situations, as this represents a reasonable maximum distance between the front of a car and the driver's eye.

10.5.7 Longer X distances enable drivers to look for gaps as they approach the junction. This increases junction capacity for the minor arm, and so may be justified in some circumstances, but it also increases the possibility that drivers on the minor approach will fail to take account of other road users, particularly pedestrians and cyclists. Longer X distances may also result in more shunt collisions on the minor arm. TRL Report No. 184⁶⁸ found that collision risk increased with greater minor-road sight distance.

10.5.8 A minimum X distance of 2m may be considered in some slow-speed situations when flows on the minor arm are low, but using this value will mean that the front of some vehicles will protrude slightly into the running carriageway of the major arm, and many drivers will tend to cautiously nose out into traffic. The ability of drivers and cyclists to see this overhang from a reasonable distance, and to manoeuvre around it without undue difficulty, should be considered. This also applies in lightly-trafficked rural lanes.

10.5.9 The Y distance should be based on the recommended SSD values. However, based on the research referred to above, unless there is local evidence to the contrary, a reduction in visibility below recommended levels will not necessarily lead to a significant problem.

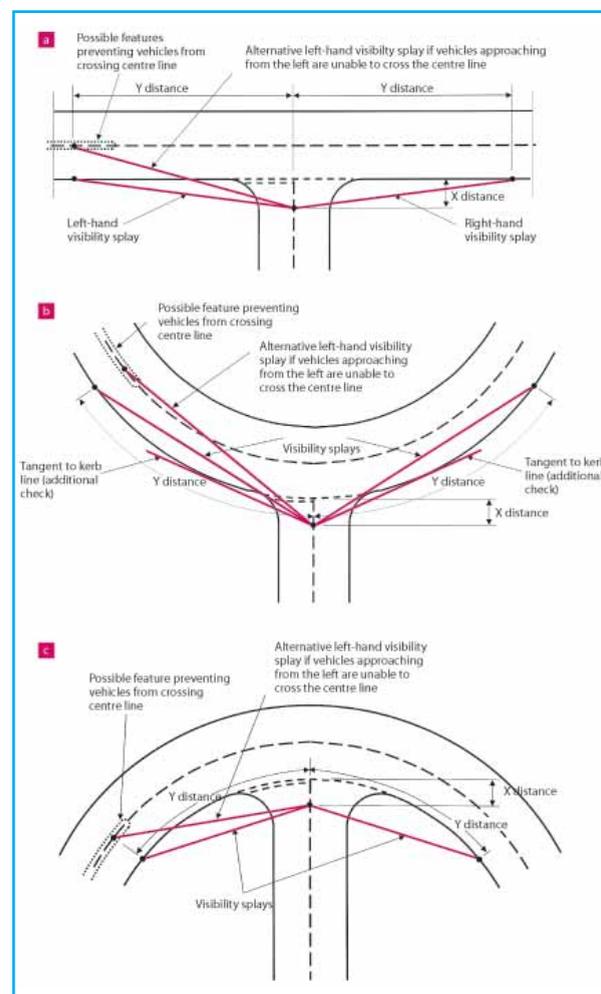


Figure 10.2

10.6_ Visibility Along The Street Edge

10.6.1 Vehicle exits at the back edge of the footway mean that emerging drivers will have to take account of people on the footway. The absence of wide visibility splays at minor accesses will encourage drivers to emerge more cautiously - similarly to how vehicles pull out when visibility along the carriageway is restricted (see Example below)

10.6.2 . Consideration should be given to whether this will be appropriate, taking into account the following:

- the frequency of vehicle movements;
- the amount of pedestrian activity; and
- the width of the footway.

10.6.3 When it is judged that footway visibility splays are to be provided, consideration should be given to the best means of achieving this in a manner sympathetic to the visual appearance of the street (**Figure 10.3**). This may include:

- the use of boundary railings rather than walls; and
- the omission of boundary walls or fences at the exit location.



Access to commercial property with limited visibility.

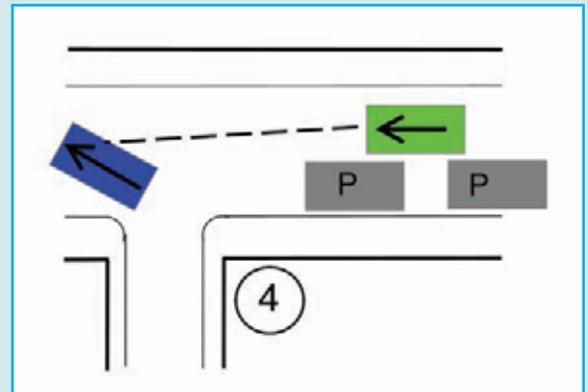
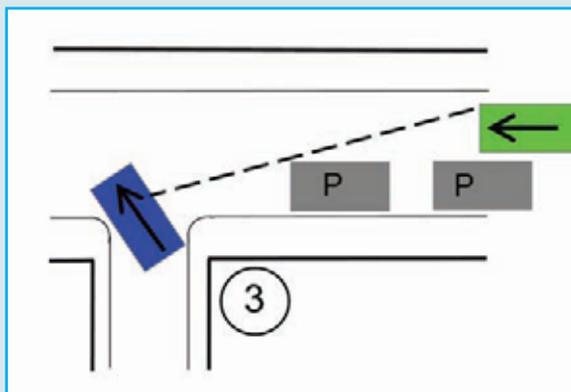
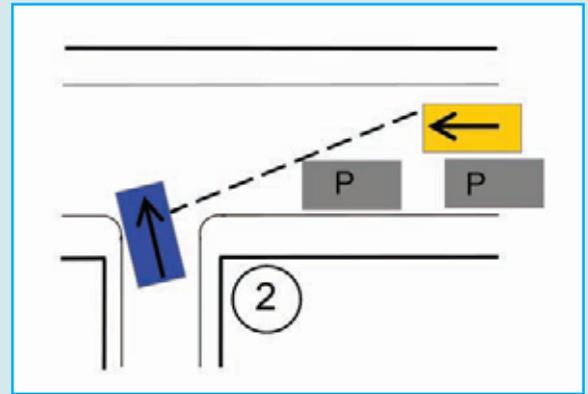
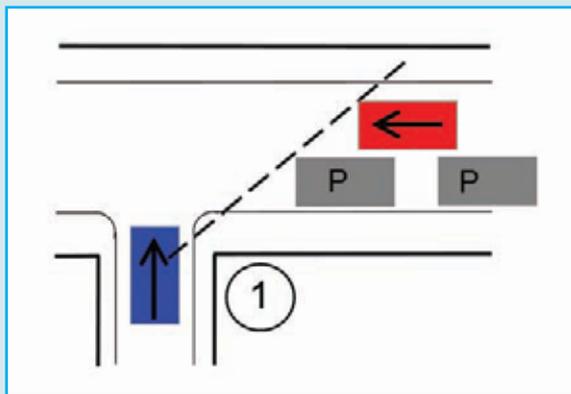


Figure 10.3

10.7_ Obstacles To Visibility

10.7.1 Parking in visibility splays in built-up areas is quite common, yet it does not appear to create significant problems in practice. Ideally, defined parking bays should be provided outside the visibility splay. However, in some circumstances, where speeds are low, some encroachment may be acceptable. (See Example below.)

10.7.2 The impact of other obstacles, such as street trees and street lighting columns, should be assessed in terms of their impact on the overall envelope of visibility. In general, occasional obstacles to visibility that are not large enough to fully obscure a whole vehicle or a pedestrian, including a child or wheelchair user, will not have a significant impact on road safety.



At urban junctions where visibility is limited by buildings and parked cars, drivers of vehicles on the minor arm tend to nose out carefully until they can see oncoming traffic, and vice-versa.

In the images above, the blue car moves forward slowly until it can see far enough past the parked vehicles to see that the gap to the next oncoming vehicle is long enough for it to pull out. Drivers on the major route will also be able to see the vehicle pulling forward slowly and may slow down or stop to allow it to pull out.

A.2 Mini Roundabouts Good Practice Guidance

mini roundabouts

good practice guidance



mini roundabouts

good practice guidance

FOREWORD

The modern concept of a mini-roundabout was introduced in the UK in the early 1970s as a means to improve capacity and reduce delays at existing junctions where there was limited scope to introduce other forms of control. Since that time, most local authorities have developed their use to address other issues such as casualty reduction and as a speed-reducing feature within traffic-calmed areas. There are about 5,000 mini-roundabouts around the country and a great deal of experience has been gained in their application.

The purpose of this document is to pull together this wealth of experience so that it can be shared with all those involved in the various aspects of highway management. It is important to note that this document is not intended as a design standard, but rather to provide guidance concerning appropriate locations and situations where mini-roundabouts should be considered.

We would like to thank all those involved in the production of this document for their commitment and hard work. In particular we wish to thank Faber Maunsell, members of the CSS, the Steering Group and the many authorities and organisations that have provided information and examples of good practice.

On behalf of the County Surveyors Society and the Department for Transport, we wholeheartedly commend *Mini-Roundabouts – Good Practice Guidance* to all with an interest in creating safer roads and the management of traffic within our urban streets.



A handwritten signature in black ink, appearing to read 'Gillian Merron'.

*Gillian Merron
Parliamentary Under-Secretary
Department for Transport*



A handwritten signature in black ink, appearing to read 'Mike Allister'.

*Mike Allister
Immediate Past President of CSS*

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1. INTRODUCTION AND BACKGROUND



1. Introduction and Background

1.1. General

Mini-roundabouts have been widely introduced on a variety of roads around the UK, from strategic routes (including trunk roads) to residential roads. Practice regarding the selection and design of mini-roundabouts varies between highway authorities, resulting in a degree of confusion regarding the safety and suitability of mini-roundabouts in some circumstances. There is also a lack of awareness of regulations relating to mini-roundabouts.

1.2 Purpose of Guidance

This document seeks to help practitioners understand what a mini-roundabout is and how it should be used. It explains the legislative basis for mini-roundabouts and establishes current practice based upon real examples of installation and lessons learned.

This document does not explain how a mini-roundabout should be designed; see section 1.4 for further information. The intention is to examine mini-roundabouts in terms of their current use, as a traffic engineering tool. The road markings for a mini-roundabout and related signs are prescribed in the Traffic Signs Regulations and General Directions 2002 (TSRGD). Detailed guidance on the correct use of these signs and markings can be found in Chapters 3 and 5 of the Traffic Signs Manual.

The objectives of this document are to:

- clarify the definition of a mini-roundabout;
- identify what can or cannot be done (i.e. regulations);
- illustrate what could, should or should not be done (i.e. examples of good and bad practice);
- identify issues to consider when thinking about introducing a mini-roundabout; and
- provide a structure to guide the decision and early design processes.

1.3 Background

This document considers the range of factors that may affect the suitability of a site for a mini-roundabout. When making a decision regarding its use, a comparison with other forms of junction will be undertaken. It is important to identify any factors present at a junction that may suggest a mini-roundabout is an unsuitable choice as early as possible in the assessment process. The mini-roundabout can then be discounted and another junction type investigated. The designer should use judgement and experience, as well as available guidance and advice, to decide whether a mini-roundabout is a practicable option.

This document is for use by highway authority engineers, or their consultants, and applies to mini-roundabouts on non-trunk roads.

1.4 Relationship with DMRB

Guidance on the design of roundabouts is provided in TD 16/93. This is to be supplemented with a new TD providing detailed guidance on mini-roundabouts, which is mandatory for trunk roads but advisory for applications on local roads. The design guidance contained in the standard would be applicable to all roads but the guidance on siting and use may differ on local roads, which are different in character to trunk roads.

1.5 Disclaimer

This document is intended as guidance. It does not remove or reduce the requirement for designers to exercise engineering judgement when deciding which standards or advice can be applied, nor does it prohibit the consideration of departures from standards or advice in exceptional circumstances.

Any justification for departures from the available advice and guidance should be recorded and must take into account the general 'duty of care' a highway authority has, in law, to the road user.

Where advice is thought to be safety critical, this is clearly identified. Mini-roundabout layouts will usually be subject to a road safety audit, in accordance with the highway authority's policy.

Although this document contains ranges of variables it is not implied that every combination is acceptable and some combinations may attract adverse comments during a safety audit.

This document is intended to represent current good practice but is not intended to cover all eventualities or situations that may arise during the consideration and design of a particular junction solution.

1.6 Structure of Document

The document is structured to reflect the decision-making process, starting with an understanding of what a mini-roundabout is and leading through the site assessment criteria to design details.

Chapter 2 provides a definition of a mini-roundabout and provides information on how a mini-roundabout can be used. Chapter 3 considers site assessment issues. Chapter 4 includes a review of existing practice, a summary of the results of the consultation exercise and answers frequently asked questions.

2. DEFINITION AND USE OF MINI-ROUNDBABOUTS



2. Definitions and Use of Mini-Roundabouts

A mini-roundabout is effectively a road marking. If the road marking is not in accordance with TSRGD diagram 1003.4 it is not a mini-roundabout.

2.1 Definition of a Mini-Roundabout

A mini-roundabout is a type or form of junction control at which vehicles circulate around a white, reflectorised¹, central circular road marking (central island) of between one and four metres in diameter, as shown in TSRGD diagram 1003.4.

Vehicles entering the junction must give way to vehicles approaching from the right, circulating the central island.²

The central road marking is either flush or slightly raised as a dome³ (no more than 125mm), in order that it can be driven over by larger vehicles that are physically incapable of manoeuvring around it. The dome is also raised to discourage vehicles from driving over the central island⁴. Three white arrows are painted on the carriageway, within the gyratory area, around the central road marking, showing the direction of circulation.

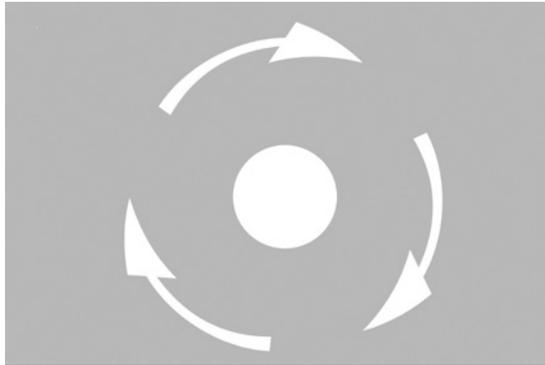


Figure 2.1.1: TSRGD diagram 1003.4

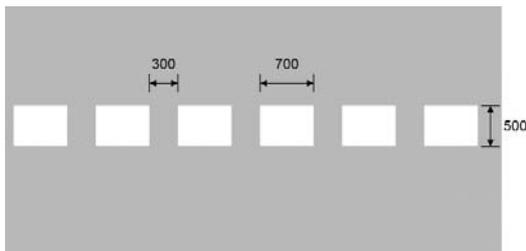


Figure 2.1.2: TSRGD diagram 1003.3

A blue mini-roundabout sign (illuminated if sited within 50 metres of a street lamp within a system of street lighting), as shown in diagram 611.1, precedes the mini-roundabout on each approach. This sign is usually accompanied by the transverse give way marking shown in diagram 1003.3. However, the mandatory give way markings (diagram 1003 and 1023), and give way sign (diagram 602), may be used in addition to diagram 611.1 where appropriate.⁵ Where diagrams

1003 and 1023 are used, diagram 602 should be placed above diagram 611.1 as illustrated below:

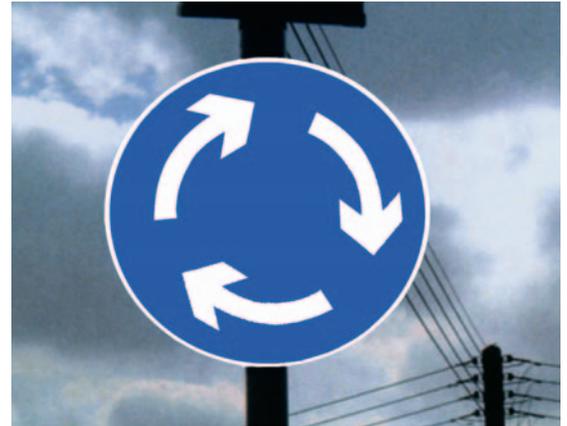


Photo 2.1.1: TSRGD diagram 611.1



Photo 2.1.2: TSRGD diagram 602 and TSRGD diagram 611.1

Warning of the approach to a mini-roundabout can also be provided using the roundabout ahead sign (diagram 510).

When negotiating a mini-roundabout drivers must pass round the central road marking on the left hand side unless the size of the vehicle or layout makes it impracticable to do so.

Research suggests there are considerable variations in construction of the roundabout central island. The central island of a mini-roundabout **does not conform** to diagram 1003.4 if:

- it has a diameter less than one metre or greater than four metres;
- it cannot be driven over;
- it has a surface colouring other than white;
- it is not reflectorised;
- it is constructed of granite setts, block paving or other textured material (unless coloured white);
- it contains street furniture⁶;

¹ TSRGD 2002, Regulation 31(1)

² TSRGD 2002, Regulation 25(5)

³ TSRGD 2002, Regulation 32(2)(c) – see also Section 3.13

⁴ See TSRGD Regulation 16(1) Table item "...a vehicle proceeding through the junction must keep to the left of the white circle at the centre of the marking shown in diagram 1003.4, unless the size of the vehicle or the layout of the junction makes it impracticable to do so"

⁵ See paragraph 8.17 of Chapter 5 of the Traffic Signs Manual, which explains where GIVE WAY signing should be used.

⁶ Traffic Signs Manual Chapter 5 Road Markings, para 8.10

Mini-roundabouts are generally used for one of four main reasons:

- to improve the operation of an existing junction;
- as an accident remedial measure;
- as part of a traffic calming scheme; and
- to provide an access to a new development

- it has a raised kerb (more than 6mm);
- it has non-prescribed road markings such as concentric rings;
- it incorporates road studs.



Photo 2.1.3: Non-conforming concentric rings



Photo 2.1.4: Street furniture on central island creating a small roundabout, not a mini-roundabout



Photo 2.1.5: Street furniture on a domed central island in tarmac creating a small roundabout, not a mini-roundabout



Photo 2.1.6: Non-conforming central marking in setts with white edge marking

2.2 Use of Mini-Roundabouts

Mini-roundabouts were initially developed as a method of improving safety at existing junctions, but are now increasingly included as part of new development proposals. Mini-roundabouts may be introduced at junctions that experience problems with safety or side road delay. They can be used at junctions to break up long, straight sections of road or to achieve a sharp deviation of the main route without the need for low standard radii.

Mini-roundabouts are often considered as an alternative to another junction type due to constrained highway space or because they are perceived to be less costly. Early examples were used as an alternative to traffic signals at very constrained sites where an alternative method of control was needed.

The four main reasons why practitioners consider mini-roundabouts as a potential option are:

- to improve the operation of an existing junction;
- as an accident remedial measure;
- as part of a traffic calming scheme; or
- to provide an access to a new development.

2.3 Improving the Operation of an Existing Junction

Mini-roundabouts are used to replace priority junctions, traffic signal junctions and conventional roundabouts to improve junction operation.

They are usually installed at T-junctions and crossroad junctions (3 or 4-armed junctions). Mini-roundabouts should not be used at junctions with five or more arms.



Photo 2.3.1: Before view of priority junction

Refer to MOLASSES and local accidents records when considering a mini-roundabout



Photo 2.3.2: After view of junction with mini-roundabout

A mini-roundabout can improve the operation of a junction by:

- **Reducing the dominance of one traffic flow**

As the mini-roundabout works on the principle of 'priority to circulating traffic from the right', a minor traffic flow can be given priority over a major traffic flow that would otherwise dominate the junction.

- **Giving priority to right turners**

Again the 'priority' principle of operation has been exploited for right-turning traffic, giving it priority over ahead movements from the opposing direction.

- **Facilitating access and reducing delay at side roads**

The 'priority to the right' rule effectively halves the traffic to which side road flow has to yield priority, making it easier for side road traffic to turn.

- **Improving capacity at overloaded junctions**

For a given road space, the mini-roundabout has a higher capacity than most alternatives and is very flexible in coping with variations in both volumes and proportions of traffic flow during the day.

2.4 As an Accident Remedial Measure

Mini-roundabouts are most commonly introduced as an accident remedial measure:

- to reduce the number of accidents at a junction. For 3-arm sites, the mean accident rate for mini-roundabouts is similar to that of priority T-junctions and about 30% less than for signalled junctions.
- to reduce the severity of accidents at a junction. The severity of accidents (percentage of fatal and serious accidents to all injury accidents) at 3-arm mini-roundabout sites is lower than at 3-arm signalled junctions and considerably lower than at 30 mph T-junctions.

Careful consideration should be given to introducing mini-roundabouts as part of a new development

The scope for accident reduction will clearly be dependent on specific junction characteristics, such as traffic flow and geometry, as well as accident types. When considering a mini-roundabout as an option, designers should refer to current guidance on accident numbers such as the MOLASSES database, and locally held records on accident levels.

2.5 As a Traffic Calming Measure

Mini-roundabouts are also used for traffic calming:

- **As part of a traffic calming scheme.** Mini-roundabouts are often considered as part of area-wide traffic calming schemes in which they are sometimes installed at the extremities of the scheme or at all or various junctions within it.
- **Reducing traffic speeds and increasing driver awareness.** The use of a mini-roundabout in isolation as a speed reducing measure is more contentious and has met with mixed success. They have also been used to indicate to drivers that they are entering a more residential area. A well designed mini-roundabout can reduce speeds and a poorly designed one may not.



Photo 2.5.1: Mini-roundabout in traffic calmed area

2.6 As an Access to a New Development

Many Local Authorities accept the introduction of mini-roundabouts as part of new development proposals.



Photo 2.6.1: Mini-roundabout as access to new development

Designers may use numerical criteria to determine whether a mini-roundabout is suitable for access to a new development, with some suggesting side road traffic flows should be not less than 500 vehicles per day (AADT). Some Local Authorities use different criteria. For example, Lancashire, Cheshire and Bedfordshire County Councils prefer to use a ratio, suggesting side road flow should be a minimum of 10-15% of the major road flow.

A lower flow limit is prescribed because difficulties can result from their use at lightly trafficked side roads, where emerging vehicles or turning movements are unexpected; if side road flows are too low then the main road will effectively operate under free flow conditions.

Consideration should also be given to the usual site constraints and design criteria.

On trunk roads it is unlikely that a mini-roundabout would be an acceptable design solution for a new junction.



Photo 2.6.2: Mini-roundabout on new estate road

Note: This and other photos illustrate a common error in the placing of TSRGD diagram 611.1; this one is upside down.

3. SITE ASSESSMENT



3. Site Assessment

3.1 General

Once a practitioner has established that a mini-roundabout may be an appropriate choice, the site needs to be examined to confirm its suitability.

Engineers need to be aware of the complexity of assessing the suitability of a site for the installation of a mini-roundabout. Many variables contribute to its suitability and potential success. Factors need to be quantified and their significance determined, including whether the initial design of the mini-roundabout can be modified to mitigate any potential problems.

3.2 Early Rejection

Mini-roundabouts are unlikely to be an appropriate junction treatment at the following locations:

- on a dual carriageway;
- at a junction with five or more arms; and
- where the 85th percentile speed exceeds 35 mph (see section 3.6 for further information); and
- where there is no scope to reduce approach speeds.

The procedure for assessing site suitability should be undertaken in two stages.

3.3 Stage 1 Site Assessment

As part of the assessment it is recommended that a record is kept of all relevant factors, including details of site surveys, in order that a fully informed decision can be made, and if necessary a comparison between other junction options. Site visits by the designer in daylight and during the hours of darkness are recommended. A sample site assessment form is provided at the back of this document.

The first stage of assessment will include several key decisions:

IS THERE ENOUGH SPACE AVAILABLE FOR THE CONSTRUCTION OF A MINI-ROUNDABOUT?

The width of the carriageway and extent of land designated as public highway will determine whether there is enough space available for the construction of a mini-roundabout. Available space at the junction may be sufficient to enable a conventional roundabout to be constructed instead. When investigating if space is sufficient, consideration will need to be given to the availability of private land.

Layouts that do not allow car drivers to negotiate the central island without overrunning are unlikely to be good designs.

Assessment should be undertaken in two parts.

The inscribed circle diameter (ICD) of a mini-roundabout is the diameter of the largest circle that can be inscribed within the junction kerbs. A suggested maximum ICD for a mini-roundabout is 28 metres. Above this dimension a conventional roundabout should be used. Designers should also consider a minimum ICD, taking account of the requirement for drivers to drive around, and not over, the central island. Figure 3.3 below shows the desirable minimum ICD based upon a medium sized car.

Layouts that do not allow car drivers to negotiate the central island without overrunning are unlikely to be good designs.

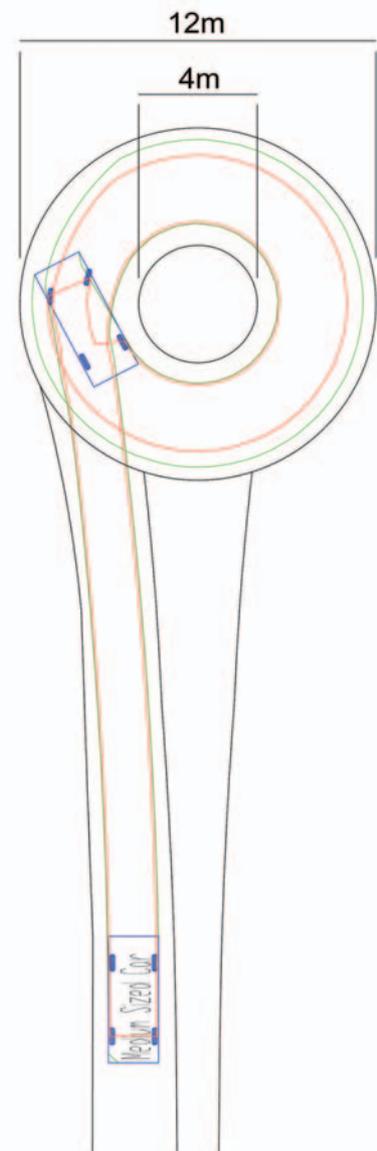


Figure 3.3: Sample Desirable Minimum ICD

A mini-roundabout should not be considered a simple lining and signing exercise.



Photo 3.3.1: Constrained site where all vehicles from side road have to overrun central island

WILL THE INSTALLATION OF A MINI-ROUNDAABOUT ADVERSELY AFFECT THE SAFETY PERFORMANCE OF THE JUNCTION, WHETHER OR NOT THE MINI-ROUNDAABOUT IS BEING INTRODUCED AS AN ACCIDENT REMEDIAL MEASURE?

It is essential that the accident record for an existing junction be investigated in order to predict the effect that a mini-roundabout would have on safety at a particular site.

The improved safety performance of a new mini-roundabout junction is also dependent on the improvements to the general road environment, such as the renewal of lines and signs, a new surface or improved lighting, as well as the change of junction control. However, sustaining this level of benefit will be dependent on regular junction maintenance.

IS A MINI-ROUNDAABOUT LIKELY TO BE AFFORDABLE AND ECONOMICALLY VIABLE?

Mini-roundabouts are often considered because they are perceived to be relatively inexpensive compared to other junction types and it is important that any junction improvement provides an economic solution in addition to improving operational and/or safety benefits.

When considering a mini-roundabout as a safety measure, economic justification is assessed, i.e. the first year rate of return (FYRR) should be calculated.

Whilst not providing a 'perfect' solution, a mini-roundabout may provide sufficient improvement over the existing junction performance to justify installation on a value for money basis.

However, it is also important that the whole life cost of the junction is taken into account. Mini-roundabouts incur ongoing maintenance costs and these should not be overlooked. For example, a domed central island subject to high turning movements by HGVs may be scuffed regularly and will need to be re-painted to maintain conspicuity.

Visibility will place a constraint on the design and measures required as part of the layout.

Consider the whole life costs not just construction costs and accident savings.

The successful design of a mini-roundabout may require:

- carriageway realignment;
- build-outs;
- street lighting (provision and modification);
- new crossing facilities;
- modifications to drainage;
- carriageway resurfacing; and
- traffic islands.

It is essential that these costs are not overlooked. A mini-roundabout should not be considered a simple lining and signing exercise.

The cost of a mini-roundabout can vary greatly depending on the level of work involved. Local authority consultation suggests the range of costs for 3 or 4-arm single mini-roundabouts are (at 2003 outturn prices):

3-arm	£10,000 - £30,000
4-arm	£15,000 - £50,000

3.4 Stage 2 Site Assessment

The second stage of assessment requires engineering judgement in order to ascertain whether a mini-roundabout is an appropriate junction improvement option by evaluating the following factors:

- visibility;
- vehicle speed;
- road character;
- traffic volume;
- number of arms;
- traffic composition;
- vulnerable road users;
- road network; and
- noise and vibration.

Following the Stage 2 Assessment the decision to introduce a mini-roundabout would be confirmed and issues to consider during the design process are identified. The conclusion may be that a mini-roundabout is not the best option.

3.5 Visibility

3.5.1 Visibility of the mini-roundabout

For a mini-roundabout to operate as intended, it is essential that the junction type can be recognised and that drivers have adequate forward visibility of the junction.

Parking on the approaches to mini-roundabouts is a particular problem and consideration should be given to applying parking restrictions on the approach arms.

Local practice regarding signing on the approach and visibility of the give way markings and signs varies.

3.5.2 Visibility of conflicting approaches

Some practitioners have commented that ‘excessive’ visibility to the right has been a problem, with drivers deciding whether to yield or not on the junction approach and not at the give way line.

However, this is seldom the case at mini-roundabouts with adequate entry angles.

Both the speed limit and the approach speeds should be taken into account.



Photo 3.5.1: Site with ‘excessive’ visibility on raised junction to encourage reduction in approach speeds

Having entered the junction, drivers will require adequate visibility on exit, particularly if there is a pedestrian crossing immediately downstream.



Photo 3.5.2: Site with restricted approach visibility

Observations of visibility and vehicle approach speeds have indicated that where visibility of side road traffic was more than 30 metres from a point 2.4 metres back from the offside give way marking then the speed reducing effect of the mini-roundabout was significantly reduced.



Photo 3.5.3: Site with good visibility on all approaches

3.6 Vehicle Speed

Mini-roundabouts are not a suitable junction option at locations where vehicles will approach the junction at high speed.

The location and design of the mini-roundabout should ensure that vehicles have slowed down to an appropriate speed prior to reaching the junction, can stop when necessary and should then maintain an appropriate speed around the circulatory carriageway.

The design of a mini-roundabout should also discourage drivers from accelerating through the roundabout and on exit. If, prior to entering the mini-roundabout, a driver can already see that they will be able to negotiate the junction quickly (and due to the small size of mini-roundabout junctions this is often possible) they may be encouraged to maintain a higher speed. Vehicles accelerating on exit may endanger pedestrians and/or cyclists and equestrians at nearby crossing facilities, whether controlled or uncontrolled.

Chapter 5 of the Traffic Signs Manual advises that mini-roundabouts should only be used on roads with a speed limit of 30 mph or less.⁷

Some local authority practitioners believe the speed limits on the approach roads are of less relevance than the actual approach speed of vehicles. Experience has shown that mini-roundabouts can work safely in 40 mph limit areas if the vehicle approach speeds are reduced prior to entry to say 20-25 mph.

In addition to noting existing speed limits and any proposals for changes, it is recommended that the approach speed of all arms is obtained as part of the assessment process. The photos show examples of mini-roundabouts outside 30 mph limits that have proven to operate safely in accident terms.

⁷ Chapter 5 Traffic Signs Manual 2003: “Mini-roundabouts should only be used when all approaches are subject to a speed limit of 30mph or less. Their use on roads with a higher limit is not recommended...”, para 8.11

Road characteristics will have an effect on the suitability of a mini-roundabout.



Photo 3.6.1: Example of mini-roundabout within 40 mph speed limit with constrained approach



Photo 3.6.2: Mini-roundabout on national speed limit road – at this site the approach roads are narrow country lanes where the speeds are constrained.

At some junctions, the approach speed of vehicles may be low due to the physical characteristics of the road or existing traffic calming features. At other junctions where a mini-roundabout is to be introduced, speed-reducing measures may need to be included as part of the junction improvements.

At sites where the current speed limit exceeds 30 mph, consideration should be given to changing the speed limit and/or other measures to reduce approach speeds. Simply reducing the speed limit may not affect approach speeds.

Mini-roundabouts are sometimes intended to act as speed control measures. It is important to ensure that the design, including the layout of islands, build-outs and approaches, enables the mini-roundabout to serve as a speed reducing feature without compromising the safety or operation of the junction.



Photo 3.6.3: Mini-roundabout on raised junction

3.7 Road Character

The individual characteristics of the road junction at which a mini-roundabout is being considered will determine the site's suitability.

The following factors relating to road character will therefore be discussed:

- gradients;
- highway status;
- number of carriageways or lanes;
- pedestrian and cycle facilities;
- public transport infrastructure;
- street lighting; and
- urban or rural nature of road.

GRADIENTS

Ideally, mini-roundabouts should be located on level ground or in sags but not at the top of hills. Installations at the bottom of long descents or on steep gradients should be avoided.

Drivers may have difficulty assessing the layout of a junction that they are approaching on an up gradient and there is a risk that large goods vehicles may lose control if approaching a junction on a down gradient.



Photo 3.7.1: Mini-roundabout on hill descent with speed reducing measures on approach

The slope of the mini-roundabout should follow the slope of the junction. Some adverse crossfall will be acceptable, provided approach speed can be controlled.

HIGHWAY STATUS

Particular care should be taken if constructing a mini-roundabout where one or more of the side roads do not form part of the public highway. This may become more common as mini-roundabouts are increasingly used as accesses to new development, e.g. as accesses to supermarket car parks, industrial estates etc.

A mini-roundabout is reliant on drivers adhering to traffic signs and road markings installed on the approaches. Visibility is a particular concern when this is over land not in the control of the highway authority and subsequent development may prejudice safety.

Good practice would suggest that a sufficient length of the approach road in question is adopted to retain control for signing and maintenance purposes.

NUMBER OF CARRIAGEWAYS OR LANES

It is not considered good practice to introduce mini-roundabouts on dual carriageway roads, although, at junctions with single-lane dualling, they may be acceptable.

Care must be taken when designing mini-roundabout junctions with multiple lane approaches as lane discipline may be poor and vehicular paths through the roundabout can vary. Two-lane approaches can encourage drivers to overrun the central island and can impair visibility. Sufficient deflection is difficult to provide and more attention may need to be given to reducing approach speeds.

The number of lanes on the approach to a mini-roundabout should not exceed the number of exit lanes.



Photo 3.7.2: Multi-lane approach

PEDESTRIAN AND CYCLE FACILITIES

The installation of a mini-roundabout may be considered at a junction that has existing pedestrian and cycle facilities such as:

- pedestrian refuges;
- Zebra, Pelican, Puffin or Toucan crossings;
- dropped kerbs and tactile paving;
- off-road cycle tracks;
- cycle lanes.

It is important to ensure the mini-roundabout does not compromise the use of existing facilities by pedestrians and cyclists. In some cases, existing facilities may need to be altered or relocated or new pedestrian and cycle measures introduced as part of the junction improvement. This may result in substantial additional cost.

Crossings located within 20 metres of mini-roundabouts have been shown to operate effectively. This may be due to relatively low speeds through the junction. Where crossings are further away, approach and

exit speed may be unaffected by the mini-roundabout.



Photo 3.7.3: Mini-roundabout incorporating segregated cycle facilities and zebra crossing

PUBLIC TRANSPORT INFRASTRUCTURE

Mini-roundabouts can cause difficulties for buses and it is unlikely that bus lanes can operate safely through a mini-roundabout because of left-turners. See TSM Chapter 5 para 17.10 for guidance on terminating bus lanes on the approach to a roundabout. The presence of a bus stop or bus bay should not result in problems, provided refuges and islands are designed with bus movements in mind.

Careful design is needed where mini-roundabouts are sited near railway level crossings. Designers need to be aware of the dangers of traffic queuing back from the mini-roundabout across the level crossing, or traffic from the level crossing blocking the mini-roundabout. The former situation is particularly dangerous. If a mini-roundabout is being considered at a junction near a level crossing, consultation with the railway authority is essential.



Photo 3.7.4: Mini-roundabout near level crossing

STREET LIGHTING

It is important that mini-roundabout junctions are visible to approaching drivers. If the mini-roundabout is to be installed in an unlit area consideration needs to be given to ensuring the mini-roundabout is conspicuous at night. This may mean improvements to signing or providing street lighting. Where a system of street lighting is provided then it should

Additional street lighting should be considered when introducing a mini-roundabout.

comply with the recommendations in BS 5489, and advice sought from a lighting engineer.

Flush central islands are considered to be more difficult for street lighting to illuminate than domed islands, as they have no profile. Successfully lighting mini-roundabout central islands in wet conditions is particularly difficult. A domed central island is more conspicuous.

The illumination of the 'give way' traffic signs (602 or 611.1) is a requirement where street lighting exists. For advance direction signs, the requirements are that either they are lit or they are reflectorised which also applies to 'New Roundabout Ahead' signs (7014), where used.

It should be noted that the TSRGD do not permit the use of reflective road studs to increase the conspicuity of the central island.

URBAN OR RURAL NATURE OF ROAD

The urban or rural character of a road is not generally considered to predetermine the appropriateness of a mini-roundabout as a junction solution, but consideration needs to be given to the visual impact on the rural environment.



Photo 3.7.5: Mini-roundabout in rural type location

Mini-roundabouts can be used on both rural village and urban roads.

Mini-roundabouts have been increasingly used in rural areas, particularly at busy intersections in villages or as part of rural traffic calming schemes. Some mini-roundabouts have been installed on rural roads away from settlements. There are many potential problems with the use of mini-roundabouts in such locations and their installation is discouraged (see 3.10).

3.8 Traffic Volume

Additional capacity could, under certain circumstances, be provided by the introduction of a mini-roundabout but there will be limits. Practitioners should refer to a capacity assessment programme such as ARCADY to assess capacity implications in greater detail.

It is suggested that 4-arm mini-roundabouts should not be introduced where total entry flows are below 500 veh/hr, or minor road

flows are less than 15% of the major road flow. Mini-roundabouts are particularly suited to handling high proportions of right-turning traffic.

3.9 Number of Arms

Originally, mini-roundabouts were only considered for junctions with three-arms. In 1975, the recommendations changed and mini-roundabouts on trunk roads were allowed at both 3 and 4-arm junctions. Since 1984, these recommendations have not specified the number of arms.

Mini-roundabouts are known to be widely introduced at both 3 and 4-arm junctions.

Adequate deflection may be difficult to achieve with more than three arms. The use of mini-roundabouts to accommodate one-way slip roads or very minor accesses may prove more advantageous than the alternatives.

However, the installation of mini-roundabouts at junctions with more than four arms is not recommended, even on local roads. 4 and 5-arm mini-roundabouts have a variable safety record and may not perform as well as alternative junction types.

Where a junction has five or more arms a double mini-roundabout may be used, although a signal-controlled junction may be more appropriate.

3.10 Traffic Composition

It is not considered advisable for mini-roundabouts to be sited at junctions that are used by a high proportion of heavy goods vehicles, agricultural vehicles or buses and coaches.

Although the design of mini-roundabouts is intended to allow long (or wide) vehicles to traverse the central road marking, the continual overrunning by vehicles will cause tyre scuffing and the rapid deterioration of the mini-roundabout road markings. Without regular inspection and maintenance, the central road marking will lose conspicuity and drivers will not be able to determine the circular path around the roundabout.



Photo 3.10.1: HGV scuffing of central island

Alternative junction types should be considered for 4 or 5 arm junctions.

Also, the overrunning of a domed central island may cause driver (and bus passenger) discomfort, noise and vibrations.

In addition to long vehicles, consideration should also be given to the appropriateness of siting mini-roundabouts on roads with high numbers of pedestrians, cyclists, motorcyclists, equestrians or other vulnerable road users.

It is recommended that the emergency services are consulted about proposals for a mini-roundabout, particularly one with a domed central island, in a location that may affect them on a regular basis.

Due to their size, many emergency service vehicles cannot manoeuvre around central islands and wish to avoid overrunning domed islands (domed central islands can cause difficulties for patients travelling by ambulance). Mini-roundabouts may therefore be perceived as affecting response times.



Photo 3.10.2: Fire engine negotiating mini-roundabout

3.11 Vulnerable Road Users

CYCLISTS

Cyclists are vulnerable at all types of road junction although roundabouts pose particular problems. Cyclists are particularly vulnerable when circulating and entering vehicles fail to yield, especially during hours of darkness, due to their lack of size and conspicuity.



Photo 3.11.1: Cyclists on mini-roundabout

Mini-roundabouts present fewer problems to cyclists than small conventional roundabouts with flared entries and large conventional roundabouts, which may result in high speeds.

Mini-roundabouts can provide useful assistance for cyclists turning right and where speeds need to be reduced.

Mini-roundabouts should be designed to be cycle-friendly, especially where they are on designated cycle routes, or on other roads used regularly by cyclists.



Photo 3.11.2: Mini-roundabout with off-highway cycle facilities

EQUESTRIANS

At junctions where there is regular use by equestrians, it is not felt a mini-roundabout is an appropriate form of junction.

However, provided speeds can be sufficiently reduced, an equestrian crossing facility on an approach has been shown to work satisfactorily.

PEDESTRIANS

If a mini-roundabout is being considered in congested urban areas with large flows of pedestrians, particularly children or elderly and disabled people, controlled crossing facilities should be considered.



Photo 3.11.3: Zebra crossing close to mini-roundabout

Note: The Zebra crossing does not have tactile paving to assist blind and partially sighted pedestrians.

Consider central island dome heights on bus routes to minimise discomfort to passengers.



Photo 3.11.4: Pelican crossing close to mini-roundabout

Signalled crossings on the approach to a mini-roundabout should be used with care to avoid confusion from the green signal and to ensure vehicles queuing back from the crossing do not cause conflict at the junction. The positive control offered by traffic signals may be a better junction alternative, particularly where co-ordination between junctions and crossings can be provided.

3.12 Consultation

Local consultation will help identify groups of users that may be disadvantaged by the introduction of a mini-roundabout.

3.13 Road Network

In addition to a road's specific characteristics, the character of the local road network will be influential in deciding that a specific junction is a suitable location for a mini-roundabout.

The following network characteristics should therefore be considered:

- existing traffic systems;
- local bus routes and bus priority schemes;
- local cycle and pedestrian routes;
- traffic calming schemes; and
- traffic management schemes.

EXISTING TRAFFIC SYSTEMS

Mini-roundabouts may not be compatible with local junctions if the area has an Urban Traffic Control (UTC) system that relies on the platooning effect of signals or the creation of green waves, or in areas with a high number of unlinked traffic signals.

This issue is particularly relevant at locations where the conversion from a traffic signal junction to a mini-roundabout is being considered.

Conversely, at locations with mostly roundabout junctions in the vicinity, a mini-roundabout may be a more appropriate option than a traffic signal junction, as consistency can help drivers negotiate a series of junctions safely.

A mini-roundabout may cause disruption in an UTC area.

LOCAL BUS ROUTES AND BUS PRIORITY SCHEMES

The location of the central island, and height of dome, should be carefully considered if a mini-roundabout is installed along a bus route due to potential overrunning of, or grounding on the central island by buses.



Photo 3.13.1: Bus at mini-roundabout with severe deflection

It is also important to consider the effect of installing a mini-roundabout within a bus priority scheme as the change may affect bus journey times.

However, in some circumstances mini-roundabouts can be integrated into a package of bus priority measures. One example, at a 3-arm T-junction, is to create a bus bypass lane across the junction if the carriageway width is available.



Photo 3.13.2: Bus bypass at 3-arm small roundabout shows a similar application

Where a bus route involves making a difficult right turn then an option could be to introduce a mini-roundabout to assist this movement and reduce bus delays. The photo above shows a similar application for a small roundabout.

LOCAL CYCLE AND PEDESTRIAN ROUTES

Mini-roundabouts may be considered for junctions that form part of local cycle networks or strategic pedestrian routes including Safer Routes to School. It is important that cycle and pedestrian routes are protected and consideration should be given to providing adequate pedestrian and cyclist facilities as part of the junction improvements.

Cyclists are particularly vulnerable at any road junction and the safety of all vulnerable road users should not be compromised by alterations to a junction.

Domed central islands can cause noise and vibration.



Photo 3.13.3: Off carriageway cycle facilities at a mini-roundabout

TRAFFIC CALMING SCHEMES

Mini-roundabouts are often introduced as part of a wider traffic calming scheme although whether they work as a speed-reducing feature will depend on the design. The 1990 Road Hump Regulations referred to mini-roundabouts as a speed-reducing feature but the current Regulations are silent on the specifics of a mini-roundabout.



Photo 3.13.4: Traffic calming on approach to mini-roundabout

TRAFFIC MANAGEMENT SCHEMES

It is important to consider how the introduction of a mini-roundabout will affect, or may be affected by, an existing or proposed traffic management scheme. Careful consideration should be given to installing a mini-roundabout within traffic management schemes in which banned right turns in or out of side roads are located near the junction in question and a mini-roundabout would provide the opportunity for drivers to U-turn (which may or may not be desirable or safe).

Designs should take account of possible U-turns.

Although U-turns are legal at mini-roundabouts, for which possible turning movements are the same as at conventional roundabouts, such movements are infrequent

and therefore usually unexpected. The perceived wisdom is that U-turns at mini-roundabouts are inevitable, and should not be prohibited, but the nature of the junction arrangement often precludes designs that can accommodate U-turns by all but the smallest vehicles, although this will depend on the space available at the junction.

3.14 Noise and Vibration

The overrunning of domed central islands by large vehicles can create noise and ground vibrations. Equally, the extra stopping and starting activities of vehicles caused by a roundabout can create additional disturbance. Although in some areas additional (and variable) vehicle noise caused by a mini-roundabout may not be intrusive, it is likely to be a cause of complaints in residential areas. In addition, some soil types are prone to vibration and therefore the type of soil in an area may need to be investigated if vibration is perceived to be a potential problem.

4. EXISTING PRACTICE



4. Existing Practice

4.1 Introduction

In developing this document consultation was undertaken with 23 local authorities across England and Wales with comments also received from other organisations.⁸ The document authors have also met with some local authorities and their officers to discuss issues and sites. This has provided a range of views on mini-roundabouts and examples of sites where they have been implemented.

4.2 Responses to Consultation

“It is easier to design a poor mini-roundabout than a poor set of traffic signals”.⁹ Due to the many factors and options involved in introducing a mini-roundabout there is more scope for poor design.

The following are key issues arising from user experience of which designers should be aware.

4.2.1 Speed Limits

In accordance with current guidance the majority of mini-roundabouts are installed on roads with a 30 mph speed limit. Mini-roundabouts should not be installed on high speed roads, i.e. 85th percentile speed of 35 mph or more.¹⁰ One local authority had examples where the national (60 mph) limit was in force and in both instances the accident record had led to the subsequent provision of a small solid island. It is worth noting that in both cases the original kerb lines were unaltered.

Where limits were greater than 30 mph measures were introduced to change the speed of approach. Some local authorities have successfully installed a limited number of mini-roundabouts on 40 mph roads.

Consideration should be given to the vehicle approach speeds and ensuring that the design will assist in influencing driver speeds. Reliance should not be placed on the central island itself as a speed-reducing feature.

4.2.2 Number of Arms

Generally mini-roundabouts have been implemented on 3-arm junctions with a preference for this number of arms. Equally most local authorities had examples where four had worked. No local authorities had examples of five arms or more, instead relying on double or even triple mini-roundabout junctions to handle such circumstances.

4.2.3. Position of Central Island

This is one of the most critical aspects of the design process. The most usual practice was to determine the position of the central island by the swept paths of turning traffic. This sometimes resulted in an island not at the centre of the inscribed circle and, where traffic might be tempted to pass the ‘wrong’ side of the island, use was made of splitter islands or build-outs to encourage ‘correct’ behaviour.



Photo 4.2.1: Driver passing over central island



Photo 4.2.2: Driver passing over central island

Good practice should ensure that drivers are not encouraged to either consistently pass over the central island, or drive the wrong side.

4.2.4 Domed Central Islands

There is a general practice to dome central islands, although preference was expressed in some cases not to dome in residential areas to avoid noise nuisance from heavy goods traffic. The purpose of the dome, where provided, was for improved conspicuity but it is generally used to encourage circulatory behaviour although in some instances this had resulted in traffic passing the wrong side. However, the few instances of domes being removed resulted from the complaints over noise rather than the behaviour of traffic.

Regulations allow for a maximum dome height of 125mm. In practice the maximum

Good design positions the central island so drivers are not encouraged to drive over, or on the wrong side, of it.

⁸ Responses to the questionnaire received from Cycling Touring Club, British Horse Society and North East Ambulance Service Trust.

⁹ Cambridgeshire County Council.

¹⁰ Two examples have been found of a mini-roundabout on derestricted road, one in Essex and one in Stirlingshire.

height is normally taken as 100mm to reduce unnecessary noise, vibration, and scuffing. In some cases especially where low-floor buses operate this should be reduced to 60mm or less to avoid grounding. In some cases it may be necessary to use flat central islands.

4.2.5 Deflection, Build-Outs and Splitter Islands

All respondents of the contact group felt that deflection was important. In practice many sites reviewed failed to provide adequate deflection. This is a key area, which should be addressed when a mini-roundabout is introduced.

Where deflection was provided this was done by up to three different methods:

- a nearside build-out provided before the Give Way line;
- a nearside build-out within the circulatory area;
- using central splitter islands.

Any combination may be used with the use of splitter islands the most common.

Where a build-out occurred prior to the Give Way line it was observed that overrunning of the central island was likely to be more common and could cause difficulty for cyclists.

Deflection is a key part of good mini-roundabout design.



Photo 4.2.5: Approach deflection with kerb alignment and traffic islands



Photo 4.2.6: Approach deflection through alignment and traffic islands



Photo 4.2.3: No deflection on approach or through junction

(Note: TSRGD diagram 611.1 incorrectly placed above TSRGD diagram 602)



Photo 4.2.4: Deflection through alignment and traffic island

4.2.6 Visibility

Appropriate visibility to the right, and of vehicles within the junction, was regarded as important by the entire contact group. Visibility to the left for turning traffic did not seem to be as critical a factor to satisfactory operation. Nor did approach visibility, with views of the roundabout or give way signing very limited in some examples.



Photo 4.2.7: View from side road at site with poor visibility

Some guidance on visibility design criteria has been developed; in particular the visibility distance to the right and forward visibility. The visibility distance to the right (D) could be considered the minimum sight distance required by a road user approaching the roundabout forward of a point at distance "F" from the give way line, measured along the centre of the offside approach lane. It enables the driver of an entering vehicle to

observe a vehicle coming from the right for 2 or 3 seconds, as appropriate, before it reaches the conflict point. Distance 'D' varies with the 85th percentile 'dry weather' approach speed on the arm to the right of an entering vehicle at 70 metres before the give way line. See Figure 4.1 and Table 4.2.1 below.

Table 4.2.1 Visibility Distance to the Right

85 th percentile speed of arm to right (mph)	D distance (m)	
	For an acceptance gap of 2 seconds	For an acceptance gap of 3 seconds
35	40	55
30	35	50
25	25	40

The 'F' distance should usually be 9 metres so that the first two vehicles in the queue have visibility of traffic from the arm to the right. In difficult circumstances, the 'F' distance may be taken as a relaxation from 9 metres to 4.5 metres on an arm where the traffic flow is less than 300 veh/hr. In exceptionally difficult circumstances, a further relaxation to 2.4 metres is the minimum permissible 'F' distance, as it enables a road user who has reached the give way line to see approaching vehicles without encroaching past the give way line. This will, however, allow only one vehicle at a time to enter safely and requires following drivers likewise to be prepared to stop and look. An 'F' dimension of 2.4 metres must only be used on an arm with a flow of 300 veh/hr or less and where there is no entry arm to the left. In such cases the mandatory give way markings and upright sign (diagrams 1003, 1023 and 602) must be used to require road users to give way to circulating traffic.

Excessive visibility between arms may result in approach and entry speeds greater than desirable, with a tendency for approaching drivers to take a decision too early about whether to give way. Road users approaching a mini-roundabout need to be able to stop if vehicles are circulating or if there is an obstruction on the junction. Although the 'D' distance should always be provided, if this is exceeded it may induce high approach speeds and take the driver's attention away from the immediate junction conditions. Consideration should be given to limiting the visibility to the right of adjacent entries to a maximum 'F' distance of 15 metres back on the approach and to no more than the 'D' distance.

Table 4.2.2 provides suggested forward visibility distances 'E'.

Table 4.2.2 Minimum Stopping Sight Distance

85 th percentile speed of arm to right (mph)	Minimum "E" Distance (m)
35	80
30	70
25	50

4.2.7. Use by Vulnerable Road Users

Moderate use by pedestrians and cyclists caused little concern to the contact group, but large numbers of cyclists, such as occurred at times in university towns, were found to cause safety problems and this has led to the replacement of at least two roundabouts by signals. In those instances, at least three quarters of the accidents involved cyclists. However in these situations the unusually large number of cyclists may have increased their exposure to such accidents.

No such problem has been noted with pedestrians although concern has been expressed that pedestrians could dominate a junction in town centres and signals would offer better positive control in such cases.

Equestrians are not normally present in the sort of situations where mini-roundabouts are used but there is an example in a horse-training town where a signal-controlled equestrian crossing operated satisfactorily on the approach to a mini-roundabout.

4.2.8. Use by Large Vehicles

The use of mini-roundabouts by heavy goods vehicles does not cause any particular problems except the overrunning of the central island at smaller sites. There is some reluctance to use domes on bus routes or where there are large numbers of emergency vehicles and where a noise nuisance could result in residential areas. In addition, a large number of turning manoeuvres by HGVs can lead to the rapid wear of road markings.



Photo 4.2.8: HGV driving through a mini-roundabout

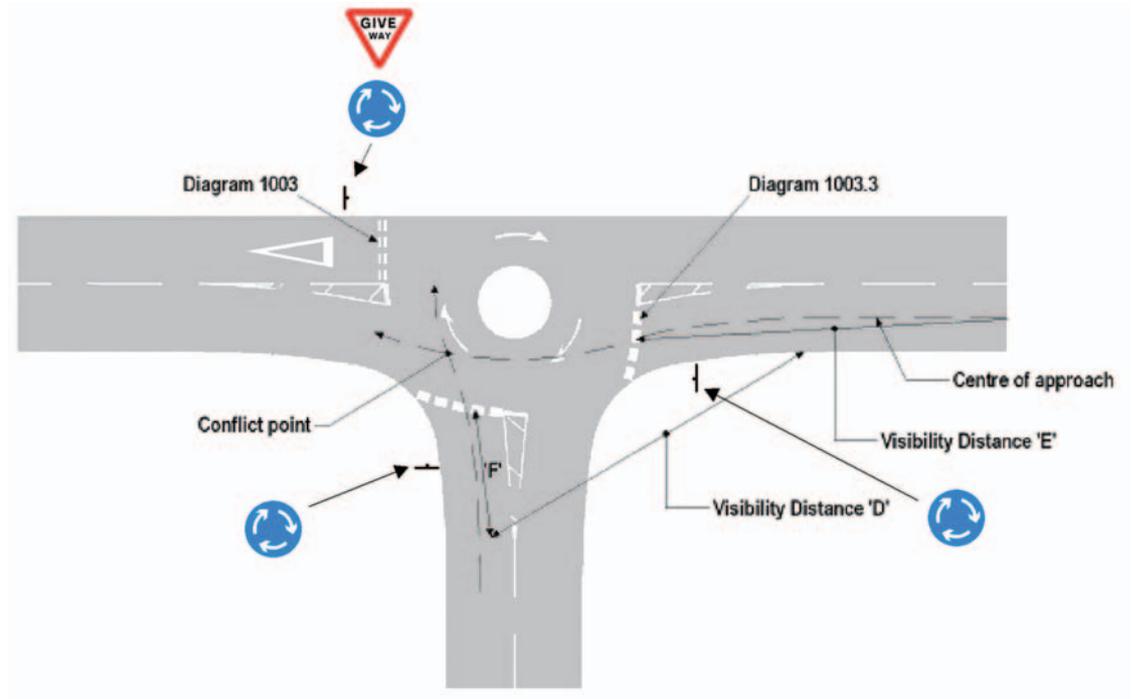


Figure 4.1 Mini-roundabout Visibility Distances

4.2.9. Overrun Areas and Surfacing

The use of overrun areas to permit turns by large vehicles whilst providing guidance for light vehicles was observed on a few occasions. These were constructed of a variety of materials, most commonly red tarmac or anti-skid and most often were applied on the left-turn radius of large or awkward junctions.



Photo 4.2.9: Mini-roundabout with overrun area

Similarly anti-skid, usually red, or buff, was applied on the approach to a roundabout as a result of anticipated rather than recorded problems.



Photo 4.2.10: Mini-roundabout with red anti-skid

4.3 Example Sites

As the process of deciding the suitability of a site for a mini-roundabout is a complex one where a range of variables comes into play, a number of sample sites have been collected to identify the issues involved. These sample sites will assist practitioners understanding of good and bad design issues, including several examples of mini-roundabout signs erected incorrectly.

Site: Treffry Lane – B3268
Location: Bodmin
Highway Authority: Cornwall County Council

Before:



After:



Site Description

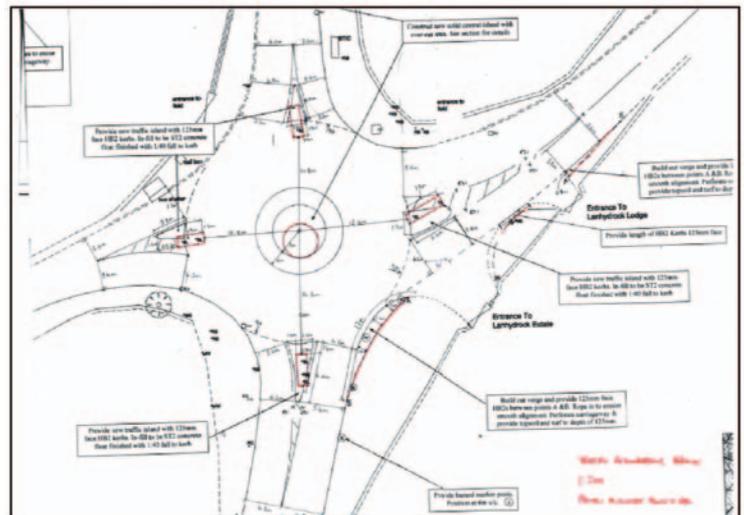
- 4-arm junction
- Derestricted road
- Rural location
- Large junction
- No street lighting

Issues

The County Council had problems with the mini-roundabout layout shown above.

These were:

- Unrestricted road leading to high speeds
- Unlit creating conspicuity problems at night
- Lack of deflection on approaches
- Forward marked give way
- Vehicles driving over central island



The mini-roundabout was removed and replaced with a conventional roundabout.

Site: A1134 Brooks Road - Brookfields
Location: Cambridge
Highway Authority: Cambridgeshire County Council



Brooks Road (north) approach



Brookfields (west) approach

Site Description

- 4-arm junction
- 30 mph speed limit
- Urban location
- Street lighting
- Junction located in university town with large number of cyclists

Issues

The County Council were concerned with the safety of this mini-roundabout due to the high number of accidents involving pedal cyclists.

The mini-roundabout was removed and replaced with traffic signals.

Site: Poppyfields
Location: Alsager
Highway Authority: Cheshire County Council



Site Description

- 3-arm junction
- 30 mph speed limit
- Access to new housing estate
- Street lighting

This mini-roundabout was installed by a developer as the access to a residential development.

Design Characteristics

- The mandatory give way marking and associated road sign have been used on the approach to the right turn.
- A 'Slow' road marking on red surfacing precedes the mandatory give way.

Issues

- The County Council have concerns over the design of this mini-roundabout due to the poor visibility both for and of vehicles emerging from the new estate road.
- The mini-roundabout road markings were repositioned following its installation.

Site: B5259 / B5260 junction
Location: Wrea Green, Kirkham
Highway Authority: Lancashire County Council

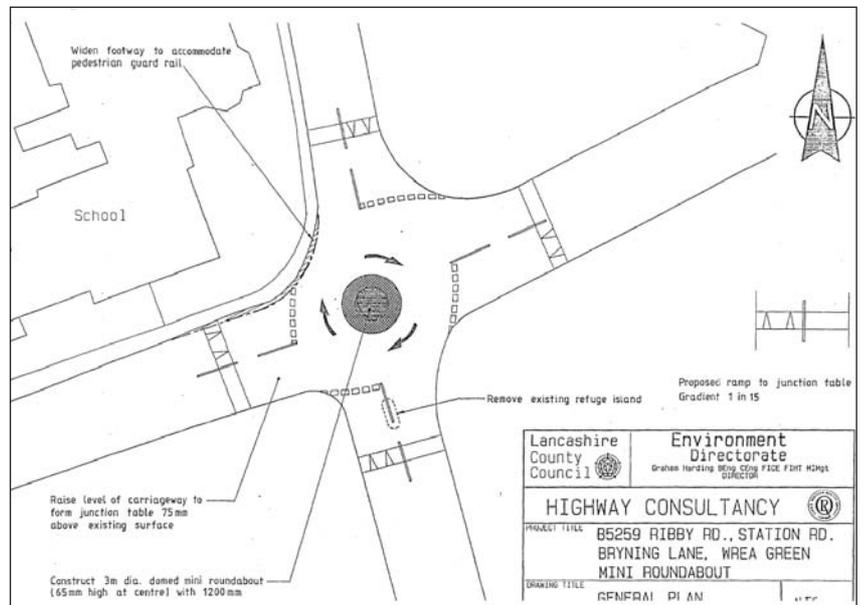


Site Description

- 4-arm junction
- 30 mph speed limit
- Rural location
- Street lighting

Design Characteristics

- The mini-roundabout is located on a raised table.
- The central island has an outer 'overrun' area surfaced in red.



Issues

- The visibility at this mini-roundabout is very good / excessive and the raised table is used to assist slowing vehicles.
- Right-turning vehicles often pass the wrong side of the roundel.

Site: Colchester Road - Freebournes Road
Location: Witham
Highway Authority: Essex County Council



Colchester Road (south) approach



Colchester Road (north) approach

Site Description

- 3-arm junction
- 30 mph speed limit
- Access to industrial estate
- Street lighting

Issues

- HGVs form a high proportion of the traffic using this mini-roundabout.
- Large vehicles driving over the central island have caused the white reflectorised surface of the roundel to deteriorate and lose conspicuity.

Site: Fox Lane - West Paddock
Location: Leyland
Highway Authority: Lancashire County Council

Before:



After:



Fox Lane (east)



Fox Lane (west)

Site Description

- 3-arm junction
- 30 mph speed limit
- Street lighting

Issues

- Private driveways within junction
- Visibility too good / excessive
- Failure to give way to right

The County Council revised the design of this mini-roundabout after it was installed, original layout shown in before photos.

The following features were added:

- Mandatory give way on Fox Lane (East) approach
- Traffic islands with illuminated 'keep left' bollards
- Advisory cycle lane on Fox Lane (west)
- Additional blue mini-roundabout signs
- Wide central hatching on approaches

Site: Treswithian Road - Weeth Road
Location: Camborne
Highway Authority: Cornwall County Council

Before:



After:



Site Description

- 3-arm junction
- 30 mph speed limit
- Street lighting

Design Characteristics

- domed central island
- traffic islands with illuminated bollards
- carriageway realignment / build-outs to provide deflection

Issues

This mini-roundabout was installed as part of a local safety scheme with the intention of:

- calming traffic speeds
- assisting right-turners

Site: Castle Road - Phillpotts Avenue
Location: Bedford
Highway Authority: Bedfordshire County Council



Phillpotts Avenue approach



Castle Road approach

Site Description

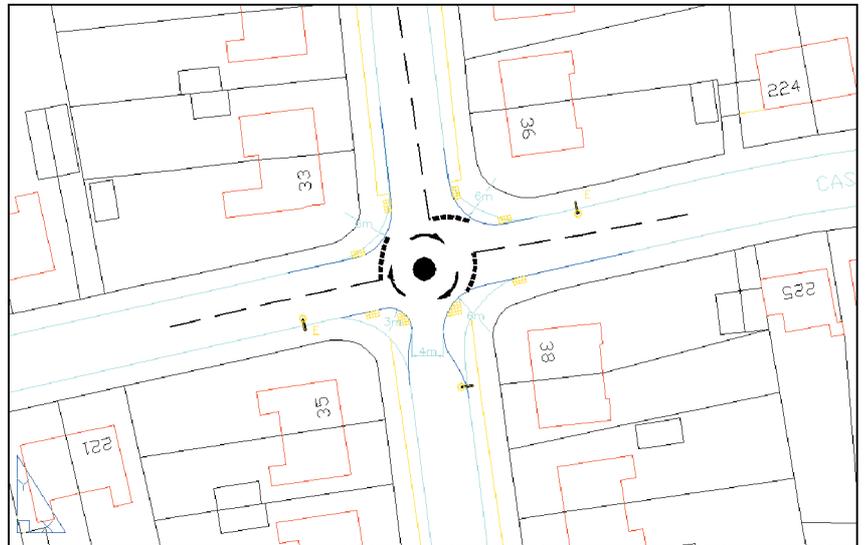
- 4-arm junction (one arm is one-way)
- 30 mph speed limit
- Urban location
- Street lighting

Design Characteristics

- Uncontrolled crossing facilities on each arm.
- Build-outs.

Issues

- Very low side road flows.
- Some drivers fail to give way but there have been no accidents.



Site: The Avenue (north) - The Avenue (south) - St Swithuns Road
Location: Kennington
Highway Authority: Oxfordshire County Council



The Avenue (north) approach



The Avenue (north) approach



The Avenue (south) approach



St Swithuns Road (approach)

Site Description

- 3-arm junction
- 30 mph speed limit
- On a hill
- Street lighting
- Part of traffic calming scheme

Design Characteristics

- Road humps on The Avenue (north)
- Mini-roundabout located on raised table
- Mandatory give ways are used on The Avenue even on the south approach.

Issues

- Poor visibility on The Avenue approaches due to gradient.

Site: Westgate - Sherborne Road
Location: Chichester
Highway Authority: West Sussex County Council



Sherborne Road approach



Westgate approach

Site Description

- 4-arm junction
- 30 mph speed limit
- Street lighting

Design Characteristics

- Buff-coloured overrun areas are used instead of build-outs to encourage deflection.

Site: High Road - Falkers Way (east)
Location: Trimley
Highway Authority: Suffolk County Council



High Road (east) approach



Falkers Way (east) approach

Site Description

- 3-arm junction
- 30 mph speed limit
- Street lighting
- Part of traffic calming

Design Characteristics

- Segregated cycleway/footway across High Road (east).
- Domed central island.
- Use of mandatory give way on High Road (east) approach.
- Build-outs and overrun areas to provide deflection.

Site: A414 Main Road - Well Lane
Location: Danbury
Highway Authority: Essex County Council



Main Road (west) approach



Main Road (east) approach



Well Lane approach

Site Description

- 3-arm junction
- 30 mph speed limit
- On a hill
- Outside a primary school
- Street lighting

Issues

- High traffic flow on side road
- Main Road very busy in peak periods
- Junction is within 50 metres of bus stop outside school on Main Road (west)

Design Characteristics

- Anti-skid surfacing on Main Road (east) approach.
- Mandatory give way on Main Road (west) approach.
- Zebra Crossing on Main Road (west) approach
- Traffic island with keep left signs / illuminated bollards on Main Road (west) approach.

Site: Kennington Road (north) - Kennington Road (south) - Upper Road
Location: Kennington
Highway Authority: Oxfordshire County Council



Kennington Road (south) approach



Upper Road approach

Site Description

- 3-arm junction
- 30 mph speed limit
- Street lighting
- Commencement of traffic calming scheme

This mini-roundabout has replaced a priority junction.

Design Characteristics

- Very small roundel
- Original give way line has been retained.
- Mini-roundabout is located on a raised table
- Mandatory give way on Kennington Road (north) approach

Comment: Non-prescribed sign erected below diagram 611.1

Site: The Glebe - Manor Road
Location: Camborne
Highway Authority: Cornwall County Council



Manor Road (east) approach



Manor Road (west) approach

Site Description

- 3-arm junction
- 30 mph speed limit
- Street lighting

Design Characteristics

- 2-lane approach on Manor Road (east) approach
- Mandatory give way on Manor Road (east) approach

Issues

- Vehicles overtaking cars parked on the Manor Road (west) approach often drive over the central island of the mini-roundabout
- The two lanes on the Manor Road (east) approach appear to be too narrow for two vehicles and therefore this approach tends to be used as a single lane
- Road markings becoming worn by continual overrunning of traffic

Site: A12 off-slip - Shell Garage Access
Location: Colchester
Highway Authority: Essex County Council



A12 off-slip approach



Shell Garage access approach

Site Description

- 4-arm junction
- 30 mph speed limit
- Street lighting

Design Characteristics

- 2 lanes on A12 off-slip approach
- Domed central island
- No circulatory arrows

Post implementation monitoring should include not just accidents but operational factors.

4.4 Post Implementation Monitoring

It is important after implementing a mini-roundabout that post implementation monitoring is undertaken. This is usual where accident remedial schemes are introduced but should be extended to all schemes.

Designers should monitor not only if the scheme is successful in accident terms but in terms of capacity, priority, etc dependent on the original scheme objectives. Experience has shown that it may be necessary to make amendments to a junction where works have been limited.

4.5 Maintenance

The ongoing success of a mini-roundabout is dependent on continued maintenance to ensure the lining and signing and other measures are kept to a good standard. It is clear that maintenance is an issue in some areas and a continued problem with wear can indicate a problem with the design of a mini-roundabout.



Photo 4.5.1: Poor lining maintenance indicating frequent central island overrunning



Photo 4.5.2: White paint wearing on blockwork central island



4.5.3: Well-maintained mini-roundabout

(Note: TSRGD diagram 611.1 incorrectly placed above TSRGD diagram 602)

4.5.1 Carriageway joints

When introducing a mini-roundabout to an existing junction consideration should be given to the existing joints and camber. The path of vehicles negotiating the new junction may direct them over the carriageway joint as shown below leading to maintenance problems. This can be resolved through resurfacing when the mini-roundabout is introduced.

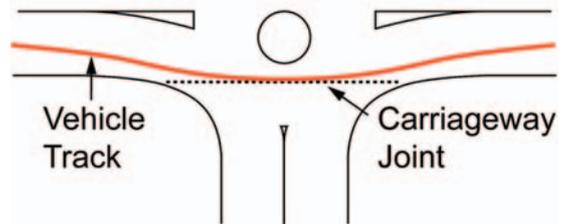


Figure: 4.5.1: Carriageway joints

4.6 Driver Behaviour

It is apparent that many drivers are either confused as to how to use a mini-roundabout or do not attempt to use them correctly. Through consultation with designers and general site observations it has been shown that both road users and Local Authorities are unclear as to the give way rules governing mini-roundabouts.

Although it is an offence for a car driver to disobey the mini-roundabout traffic sign, many drivers:

- overrun the central island;
- do not give way;
- do not indicate;
- do not slow down; and,
- drive to the right of the central island.

It is common for drivers to continue to negotiate a junction according to its layout prior to becoming a mini-roundabout. This is likely to be particularly true when a mini-roundabout is new or where there are few in

the surrounding area. Drivers on the major road often do not treat a mini-roundabout as a junction control mechanism but as an obstacle that must be negotiated.

The Highway Code states that mini-roundabouts should be approached in the same way as normal roundabouts and that 'all vehicles MUST pass round the central markings except large vehicles which are physically incapable of doing so'. It also reminds drivers that there is 'less space to manoeuvre and less time to signal'.

The mini-roundabout sign (611.1) tells drivers to give way to vehicles approaching from their right, as at a conventional roundabout, the transverse road marking (1003.3) informs drivers to give way to circulatory traffic.

The smaller scale of a mini-roundabout makes the 'give way to the right' rule less straightforward due to the short distances between vehicles. In practice, mini-roundabouts usually function well due to negotiation between drivers of vehicles approaching and on the circulatory carriageway.

Although any driver confusion resulting in hesitation is not considered to be a safety problem, it may lead to decreased capacity and longer queues.

Local Authorities appear to be particularly confused as to the use of mandatory give way signs, which are known to be sited at all approaches of some 4-arm mini-roundabout junctions. The correct siting and design of mini-roundabouts may be compromised by misunderstandings as to the correct use of the signs by practitioners. This is explained in detail in Chapters 3 and 5 of the Traffic Signs Manual.

4.7 Road User Education

In areas where a mini-roundabout would be a novel feature, or where a school or old people's home is nearby, it is appropriate to consider road user education and contact should be made with the relevant road safety staff. Budget provision of a small percentage of the construction cost is likely to be adequate.

Local awareness campaigns may also be considered advantageous in order to educate all road users about mini-roundabouts.

4.8 Frequently Asked Questions

As a result of the consultation work undertaken in compiling this document it is clear that there are a number of issues, which require clarification. We have compiled a response to a number of frequently asked questions below.

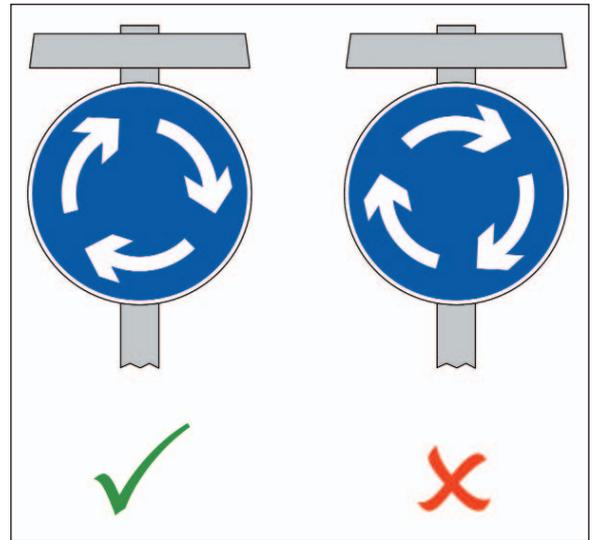
Question	Answer
Construction of Mini-Roundabouts	
Must the central island be white?	Yes. The central island of a mini-roundabout must be white (see TSRGD regulation 11 (1) and reflectorised (see TSRGD regulation 31 (1)).
Can the central island be constructed of granite setts, block paving or other textured material?	As the central island must be white and reflectorised (see above), it is not advisable for the island to be constructed of textured material. Any setts, blocks, etc used must have a white, reflectorised surface and there are problems in getting paint, thermoplastic or other materials to adhere successfully and this will create a maintenance issue and potential problems with the conspicuity of the roundabout. Setts or blocks can also result in longer term maintenance problems if overrunning vehicles cause the blocks to move or subside.
Can the central island have raised kerbs?	No. TSRGD does not permit raised kerbs to be used in association with the mini-roundabout road marking. Kerbing has been used with domed central islands as some designers use them as a retaining device for the dome construction, but such kerbs must be flush or have a maximum upstand of 6mm. In this form they are not functioning as kerbs, more as channel blocks.
Can setts be placed around the periphery of the central island?	Good practice suggests they should not be used. However there are examples and, provided the upstand does not exceed 6mm they are not precluded by TSRGD. They can present maintenance issues as overrunning, etc can make them shift.
Can reflective road studs be placed around the periphery of the central island?	No. TSRGD does not permit the use of road studs with the mini-roundabout road marking 1003.4. See TSRGD regulation 31.
Can the central island have an outer 'overrun' area/apron?	Yes. Overrun areas formed of contrasting material can contribute to the conspicuity of a mini-roundabout and this is not precluded by TSRGD. However, the size, colour and construction of such areas vary considerable across the UK. No standard approach is likely to be developed. See also TAL 12/93.
Can concentric circles/annular rings be marked on the road surface around the central island?	No. See Traffic Signs Manual, Chapter 5, Road Markings 2003 para 2.1.
Can a mini-roundabout be located within an area of carriageway with coloured surfacing?	Yes. Coloured surfacing has no significance except increasing conspicuity. The use of surfacing material of a contrasting colour within the junction area can benefit conspicuity of a mini-roundabout but that coloured surfacing should not be laid in any shape or pattern intended to convey a meaning as a road marking. However the visibility of white road markings is greatest when contrasted with a very dark background, not with a light surface.

Question

Answer

Is there a correct way to mount TSRGD diagram 611.1?

Yes. See figure below:



Can a mini-roundabout be located on a raised table?

Yes. Care is needed to ensure give way markings remain visible to approaching vehicles.

In which order should the give way (TSRGD diagram 602) and TSRGD diagram 611.1 be mounted?

See figure below:



Use of Mini-Roundabouts

Can a mini-roundabout be used as an access to a new development?

Yes. However, it is recommended that mini-roundabouts are not used solely to provide access to development where the traffic flows expected to use the development access are <500 veh/day (AADT) or minor road flows are less than 15% of the major road flow.

Question	Answer
Are mini-roundabouts cheaper to install than other junction types?	Not necessarily. A mini-roundabout is likely to incur costs as a result of associated measures, such as carriageway realignment and build-outs, street lighting, new crossing facilities, carriageway resurfacing etc. In addition, mini-roundabouts incur ongoing maintenance costs.
Location of Mini-Roundabouts	
Should a mini-roundabout be installed at a junction with five or more arms?	No. Although a mini-roundabout with five or more arms is not unlawful, it is not recommended for safety reasons. Where a junction has five or more arms, a double mini-roundabout may be used, although a signal-controlled junction may be more appropriate.
Can a mini-roundabout be installed where the approach roads have speed limits >30 mph?	Yes. However, the advice is that mini-roundabouts should be installed only on roads with a speed limit of 30 mph or less. Some local authorities have introduced mini-roundabouts in 40 mph areas where low approach speeds ensure drivers are able to use the junction safely. The installation of a mini-roundabout on a local road where the speed limit is >30 mph is acceptable only if the approach speeds are low and can be controlled. See Section 3.6.
What if my local authority has a number of mini-roundabouts on highways with speed limits exceeding 30 mph.	They are not necessarily unsafe as actual speeds are more important than the speed limit. Sites should be checked and, if operating safely, monitored on a regular basis. A local authority may instigate a programme of speed limit reviews to identify reductions in speed limit or may earmark mini-roundabouts for future junction improvement, using a more appropriate junction type.
Operation of Mini-Roundabouts	
What is the give way rule at a mini-roundabout?	The regulatory blue mini-roundabout sign (TSRGD diagram 611.1) requires drivers to cede priority to vehicles coming from the right. The (advisory) transverse road marking to TSRGD diagram 1003.3 requires drivers approaching a mini-roundabout to give way at or immediately beyond the line to traffic circulating on the carriageway of the roundabout. The TSRGD permits the use of TSRGD diagram 1023 with TSRGD diagram 1003.3 markings.
When should mandatory give way signs be used?	Mandatory give way signs (TSRGD diagram 602) may be used on approaches where drivers may not be expecting to give way to traffic to their right, e.g. on the main road approach to a former priority T-junction. Mandatory give way signs should not be used on approaches that have an entry to their left, as it is not intended for drivers at a mini-roundabout to cede priority to vehicles approaching the roundabout from the left, e.g. the stem of a T-junction or any arm of a 4-arm mini-roundabout. Where used the give way sign (TSRGD diagram 602) should be placed above the mini-roundabout sign (611.1).

Question	Answer
Are vehicles allowed to drive over the central island?	Yes, but only vehicles that are physically incapable of manoeuvring around the central island. See Highway Code, RTA 1988 Sect 36 & TSRGD 16(1). Drivers of vehicles that can manoeuvre around the central island are in danger of being prosecuted if they drive across it.
Can drivers U-turn at mini-roundabouts?	Yes. However, the Highway Code warns road users of drivers making U-turns at mini-roundabouts, as this can be an unexpected, and sometimes difficult, manoeuvre. Designers should consider the effect of nearby traffic management or junction arrangements that may encourage U-turning at the proposed mini-roundabout (for example prohibited or difficult turning movements) and try to avoid them.

5. ACKNOWLEDGEMENT AND REFERENCES



5. Acknowledgement and References

5.1 Acknowledgements

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- Cornwall County Council
- Devon County Council
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- Essex County Council
- Flintshire County Council
- Gloucestershire County Council
- Kent County Council
- Lancashire County Council
- Leicester City Council
- Middlesbrough Borough Council
- Nottinghamshire County Council
- Oxfordshire County Council
- Pembrokeshire County Council
- Powys County Council
- Roads Service - Western Division, Northern Ireland
- Suffolk County Council
- West Sussex County Council
- British Horse Society
- CTC
- North East Ambulance Service Trust
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5.2 References

- Traffic Signs Manual, Chapter 3: Regulatory Signs, 1986, TSO (New edition to be published in 2007)
- Traffic Signs Manual, Chapter 4: Warning Signs, 2004, TSO
- Traffic Signs Manual, Chapter 5: Road Markings, 2003, TSO
- The Highway Code
- Road Traffic Act 1988
- SI 2002 No 3113: The Traffic Signs Regulations and General Directions 2002; TSO
- British Standards Institution BS5489 Road Lighting: Part 4: Code of Practice for Lighting for Single-Level Road Junctions Including Roundabouts (1992)
- SI 1999 No 1025 – The Highways (Road Humps) Regulations 1999: TSO
- SI 1999 No 1026 – The Highways (Traffic Calming) Regulations 1999: TSO
- Traffic Advisory Leaflet 12/93 Overrun Areas

SITE ASSESSMENT FORM



Site Assessment Form

Location: _____ OSGR: _____
 No of Junction Arms: _____ Current Junction Type: Priority / Traffic Signal ICD: _____
 Street Lighting: Yes / No In UTC Region: Yes / No
 Area Type: Residential / Commercial / Industrial / Rural

Arm 1

Road Name: _____ Public Highway: Yes / No
 Classification: _____ Approach Speed (85%ile): _____ Speed Limit: _____
 Flows: _____ No of Approach Lanes: _____
 % HGVs: _____ Carriageway Width: _____ Gradient: _____
 % Pedestrians: _____
 % Cyclists: _____ Bus Route: Yes / No Cycle Route: Yes / No
 Pedestrian Crossing Nearby: Yes / No Distance: _____ Toucan / Puffin / Pelican
 Zebra / Central Refuge
 Additional Comments: _____

Arm 2

Road Name: _____ Public Highway: Yes / No
 Classification: _____ Approach Speed (85%ile): _____ Speed Limit: _____
 Flows: _____ No of Approach Lanes: _____
 % HGVs: _____ Carriageway Width: _____ Gradient: _____
 % Pedestrians: _____
 % Cyclists: _____ Bus Route: Yes / No Cycle Route: Yes / No
 Pedestrian Crossing Nearby: Yes / No Distance: _____ Toucan / Puffin / Pelican
 Zebra / Central Refuge
 Additional Comments: _____

Arm 3

Road Name: _____ Public Highway: Yes / No
 Classification: _____ Approach Speed (85%ile): _____ Speed Limit: _____
 Flows: _____ No of Approach Lanes: _____
 % HGVs: _____ Carriageway Width: _____ Gradient: _____
 % Pedestrians: _____
 % Cyclists: _____ Bus Route: Yes / No Cycle Route: Yes / No
 Pedestrian Crossing Nearby: Yes / No Distance: _____ Toucan / Puffin / Pelican
 Zebra / Central Refuge
 Additional Comments: _____

Arm 4

Road Name: _____ Public Highway: Yes / No
 Classification: _____ Approach Speed (85%ile): _____ Speed Limit: _____
 Flows: _____ No of Approach Lanes: _____
 % HGVs: _____ Carriageway Width: _____ Gradient: _____
 % Pedestrians: _____
 % Cyclists: _____ Bus Route: Yes / No Cycle Route: Yes / No
 Pedestrian Crossing Nearby: Yes / No Distance: _____ Toucan / Puffin / Pelican
 Zebra / Central Refuge
 Additional Comments: _____

A.3 CD 116 Geometric Design of Roundabouts

Design Manual for Roads and Bridges



Road Layout
Design

CD 116

Geometric design of roundabouts

(formerly TD 16/07, TD 50/04, TD 51/17, TD 54/07, TA 23/81, TA 78/97, TA 86/03, TD 70/08)

Version 2.1.0

Summary

This document provides requirements for the geometric design of roundabouts.

National Variation

This document has associated National Application Annexes providing alternative or supplementary content to that given in the core document, which is relevant to specific Overseeing Organisations. National Application Annexes are adjoined at the end of this document.

Feedback and Enquiries

Users of this document are encouraged to raise any enquiries and/or provide feedback on the content and usage of this document to the dedicated National Highways team. The online feedback form for all enquiries and feedback can be accessed at: www.standardsforhighways.co.uk/feedback.

This is a controlled document.

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 116	2.1.0	May 2023	Core document, England NAA, Northern Ireland NAA, Scotland NAA, Wales NAA	Incremental change to requirements

Revision 2.1.0 (Publication: May 2023) This version includes clause amendments, additional information, grammatical changes, references updated and/or figures amended (in all sections) to improve clarity for readers.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 116	2	April 2020		
CD 116	1	March 2020		
CD 116	0	July 2019		

Foreword

Publishing information

This document is published by National Highways.

This document supersedes TD 16/07, TD 51/17, TD 54/07 and TA 78/97 which are withdrawn. It also supersedes elements of TD 50/04, TD 70/08, TA 23/81 and TA 86/03 that relate to the geometric design of roundabouts.

Contractual and legal considerations

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

Introduction

Background

Roundabouts are junctions with a one-way circulatory carriageway around a central island. Vehicles on the circulatory carriageway have priority over those approaching the roundabout. This document provides the geometric design requirements for roundabouts applicable to new and improved junctions on trunk roads.

The principal objective of roundabout design is to minimise delay for vehicles whilst maintaining the safe passage of all road users through the junction. This is achieved by a combination of geometric layout features that, ideally, are matched to the flows in the traffic streams, their speed, and to any local topographical or other constraints such as land availability that apply. Location constraints are often the dominating factor when designing improvements to an existing junction, particularly in urban areas.

This document should be read in conjunction with other documents within the DMRB and other sources of best practice/guidance.

TD 16/07 was used as the main source of requirements for normal and compact roundabouts. The relevant requirements and corresponding advice from TD 16/07 are included in Section 3 of CD 116, though elements are also present in Sections 2, 8 and the appendices of CD 116.

TD 50/04 was used as the main source of requirements for signal-controlled roundabouts. The relevant requirements and corresponding advice from TD 50/04 are included in Section 4 of CD 116, though elements are also present in Section 2 of CD 116.

TD 54/07 was used as the main source of requirements for mini-roundabouts. The relevant requirements and corresponding advice from TD 54/07 are included in Section 5 of CD 116, though elements are also present in Sections 2, 8 and the appendices of CD 116.

TD 51/17 was used as the main source of requirements for segregated left turn lanes and subsidiary deflection islands. The relevant requirements and corresponding advice from TD 51/17 are included in Sections 6 and 7 of CD 116, though elements are also present in Sections 2, 8 and the appendices of CD 116.

Elements relating to the placement of pedestrian, cycling and/or equestrian crossings at roundabouts are included within this document. However, the specific details relating to the design of crossings themselves are covered in GG 142 [Ref 20.I], CD 195 [Ref 3.I] and CD 143 [Ref 2.N].

Assumptions made in the preparation of this document

The assumptions made in GG 101 [Ref 5.N] apply to this document.

Abbreviations and symbols

Abbreviations

Abbreviation	Definition
AADT	Annual average daily traffic flow
ADS	Advance direction sign
DAL	Differential acceleration lane
HGV	Heavy Goods Vehicles
ICD	Inscribed circle diameter
LTN	Local Transport Note
PCU	Passenger car unit
PTW	Powered two wheeler
SDI	Subsidiary deflection island
SLTL	Segregated left turn lane
SSD	Stopping sight distance
TAL	Traffic advisory leaflet
TRL	Transport Research Laboratory (now TRL Ltd.)
TSM	Traffic signs manual
TSRGD	Traffic Signs Regulations and General Directions
UTC Systems	Urban traffic control systems
WCHAR	Walking, cycling & horse-riding assessment and review GG 142 [Ref 20.I]
WCHR	Walkers, cyclists & horse-riders

Symbols

Symbol	Definition
e	Entry width
D	Inscribed circle diameter
l'	Average effective flare length
ϕ	Entry angle
S	Sharpness of flare
v	Approach half width

Terms and definitions

Terms

Terms	Definition
Advance direction sign (ADS)	a sign located before a direction decision point and designed as per UKSI 2016/362 (TSRGD) [Ref 9.N].
Approach half width	the width of the approach carriageway, excluding any hatching, in advance of any entry flare. NOTE 1: The symbol for the approach half width is v.
Central island	a physical or non-physical island situated in the centre of the roundabout. NOTE 1: The central island is typically circular. NOTE 2: On compact, normal and large roundabouts the central island is a kerbed physical island. NOTE 3: Mini-roundabouts utilise central markings rather than kerbed islands, as these are capable of being driven over where unavoidable.
Centripetal acceleration	property of the motion of a body traversing a circular path. The acceleration is directed radially toward the centre of the circle and has a magnitude equal to the square of the body's speed along the curve divided by the distance from the centre of the circle to the moving body.
Central overrun area	a raised low profile area around the central island. NOTE 1: A central overrun area is capable of being mounted by the trailers of HGVs, but unattractive to cars e.g. by having a slope and/or a textured surface.
Circulatory carriageway	the area of carriageway surrounding the central island that can be used by vehicles
Compact roundabout	a roundabout with a central island of at least 4 metres in diameter, and an ICD of between 28 metres and 36 metres. NOTE 1: A compact roundabout has single-lane entries and exits on each arm. NOTE 2: The circulatory carriageway on a compact roundabout has a width such that it is not possible for two cars to pass one another.
Concentric markings	markings that trace a complete path around the circulatory carriageway, dividing it into the number of circulating lanes that the carriageway width can allow.

Terms (continued)

Terms	Definition
Concentric-spiral markings	hybrid of concentric and spiral type markings. NOTE 1: The purpose is to direct off the outermost circulating lane or lanes, where the exit width allows, by running the circulatory marking smoothly into the existing road markings on the exit concerned.
Controlled area	a length of carriageway, which is adjacent to a crossing facility, and has zig-zag lines marked along each of its edges (with or without zig-zag lines also marked down its centre). NOTE 1: Further requirements and guidance for specific controlled areas on specific crossing types are provided in UKSI 2016/362 (TSRGD) [Ref 9.N].
Controlled crossing	a crossing controlled by signals.
Cycle design vehicle	a design vehicle used for the design of cycle facilities NOTE 1: The dimensions of the cycle design vehicle are a composite of the many types of cycle available and are used to provide the design criteria. NOTE 2: Refer to CD 195 [Ref 3.I] for further guidance on the cycle design vehicle.
Cycle track	a track separate from the main carriageway for use by cyclists. NOTE 1: Cycle tracks can be newly constructed or created through conversion of a footway. NOTE 2: Refer to CD 195 [Ref 3.I] for further requirements and advice regarding cycle tracks.
Design vehicle	The design vehicle for roundabouts is a 16.5 metres-long articulated heavy goods vehicle, unless stated otherwise in this document.
Desirable minimum stopping sight distance (SSD)	a value of SSD (the distance to see forward to be able to brake comfortably in average conditions), less than which a departure from standard or relaxation is to be sought. NOTE 1: The SSD is dependent upon the design speed and guidance / rules set in CD 109 [Ref 4.N].
Differential acceleration lane (DAL)	a WS2+1 section of road on which the overtaking lane is provided for traffic accelerating away from a roundabout to cater for the differential acceleration between vehicles.
Direct signal-control	the condition where signals are situated on one or more of the external approaches to a roundabout and the corresponding points on the circulatory carriageway.
Double roundabout	comprises two roundabouts separated by a short link. NOTE 1: The type of roundabouts in a double roundabout can be mini, compact or normal.

Terms (continued)

Terms	Definition
Double-through-about	a development of the through-about principle but with two conflicting traffic movements routed across the central island of the roundabout. NOTE 1: A double-through-about is also known as a "hot-cross-bun".
Downstream	something situated or moving in the direction in which the stream of traffic flows
Entry path radius	the smoothest, flattest path that a vehicle can take through the entry, round the central island and through the exit (in the absence of other traffic). NOTE 1: It is the fastest path allowed by the geometry.
Entry width	the width of the carriageway at the point of entry NOTE 1: The symbol for the entry width is e.
Exit width	the width of the carriageway on the exit. NOTE 1: Exit width is measured in a similar manner to the entry width. NOTE 2: Exit width is the distance between the nearside kerb and the exit median (or the edge of any splitter island or central reserve) where it intersects with the outer edge of the circulatory carriageway.
Full-time control	the condition where signals are permanently operating
Gap acceptance time	the time taken for a vehicle to travel from a stationary position at the give way line to the conflict point
Grade separated roundabout	a roundabout with at least one approach coming from a road at a different level NOTE 1: The geometric design of grade separated roundabouts follows the requirements for a normal roundabout.
Gyratory	a road system that consists of one-way links connected together, to make it possible for traffic to circulate along one or more links before exiting
Indirect signal-control	the condition where the signals are situated at such a distance away from the roundabout entry that the entry continues to operate in a self-regulating manner under normal priority control
Inscribed circle diameter (ICD)	the diameter of the largest circle that can be inscribed within the roundabout kerbs NOTE 1: The symbol for the ICD is D.
Intermediate give way line	a give way line at the end of the link between the two roundabouts, on a double roundabout

Terms (continued)

Terms	Definition
Intervisibility zone	at a signal-controlled roundabout, a zone identified for the purpose of assessing visibility within the junction between drivers at each stop line, or between drivers and pedestrians NOTE 1: The intervisiblility zone facilitates identification of measures to mitigate the effect of obstructions.
Lane bifurcation	one lane widening into two
Large roundabout	a roundabout with an ICD in excess of 100 metres NOTE 1: For design purposes, a large roundabout is classed as a normal roundabout.
Lateral shift	the alteration of the vehicle path to the side (laterally) NOTE 1: On the approach to a mini-roundabout, a lateral shift is used to create some deflection and is provided by the use of road markings.
Median line	the centre line (situated between the two opposing streams of traffic) on a single carriageway
Mini-roundabout	a roundabout where the central island is not kerbed, and with an ICD not exceeding 28 metres NOTE 1: A mini-roundabout has a flush or domed circular solid white road marking that is between 1 metre and 4 metres in diameter.
Near-side crossing	a crossing where the WCHR signal heads are located on the near-side, that is, on the side the WCHR is crossing from
Non-physical segregated left turn lane (SLTL)	a dedicated left turn lane from a roundabout entry to the first exit. Traffic is separated from the roundabout entry, circulatory carriageway and exit by means of a non-physical island delineated using road markings only. NOTE 1: This definition also applies to segregated lanes at three-arm and asymmetrically arranged roundabouts.
Non-physical subsidiary deflection island (SDI)	an island delineated by road markings alone, located between two entry lanes on the approach arm of a roundabout and shaped to direct, deflect and separate traffic movements onto the roundabout
Normal roundabout	a roundabout with a central island of at least 4 metres in diameter; and an ICD of between 28 metres and 100 metres NOTE 1: A normal roundabout can have dual or single carriageway approaches, and flared entries and exits to allow two or three vehicles to enter or leave the roundabout on a given arm at the same time.

Terms (continued)

Terms	Definition
Part-time control	the condition where signals are switched on at set times (generally peak periods) or under certain traffic conditions by queue detectors. When traffic flows are light the roundabout operates in a self-regulating manner under normal priority control.
Partial concentric markings	markings which vary from concentric markings in that their continuity around the circulatory carriageway is broken, usually adjacent to the entries and/or exits of the roundabout
Pedestrians / walkers	a person travelling by foot NOTE 1: The terms pedestrians and walkers are used interchangeably in this document.
Physical segregated left turn lane (SLTL)	a dedicated left turn lane from a roundabout entry to the first exit. Traffic is separated from the roundabout entry, circulatory carriageway and exit by means of a kerbed island and associated road markings. NOTE 1: This definition also applies to segregated lanes at three-arm and asymmetrically arranged roundabouts.
Physical subsidiary deflection island (SDI)	a raised kerbed island and associated road markings on the carriageway, located between two entry lanes on the approach arm of a roundabout and shaped to direct, deflect and separate traffic movements onto the roundabout.
Planting	this is vegetation, which includes grass, wildflowers, perennials, shrubs and trees
Reverse curve	a curve where two consecutive circular arcs curve in opposite directions and meet
Roundabouts	a junction with a one-way circulatory carriageway around a central island. Vehicles on the roundabout circulatory carriageway have priority over approaching vehicles.
Segregated lane	a lane from a roundabout entry to the first exit, separated from the roundabout entry, circulatory carriageway and exit by means of a kerbed island and associated road markings on a three-arm or asymmetrically arranged roundabout.
Signal-controlled roundabout	a roundabout with traffic signals on one or more of the approaches and at the corresponding point on the circulatory carriageway
Speed table	a raised platform to reduce traffic speeds

Terms (continued)

Terms	Definition
Spiral markings	a marking system involving a series of lane gains and lane drops around the circulatory carriageway so that drivers enter in the lane designated for their desired exit, and follow the lane around the roundabout to be led off at that exit NOTE 1: The width of a particular exit can determine how many circulating lanes lead off the roundabout.
Swept (turning) path	the path of different parts of a vehicle when that vehicle is undertaking a turning manoeuvre
Through-about	a signalised roundabout, which takes the major through-traffic movements from the circulatory carriageway, and routes them directly across the central island NOTE 1: Through-about junctions are also referred to as "hamburgers" and "fly-through roundabouts".
Traffic deflection island	a raised kerbed island and associated road markings on the carriageway, located between an entry and exit on the same roundabout arm. NOTE 1: A traffic deflection island is shaped to direct and also separate opposing traffic movements onto and from a roundabout circulatory carriageway.
Traffic island	a raised (kerbed) or marked-off area on the road NOTE 1: A traffic island can be used to accommodate pedestrian refuges and traffic signals, and as a means of separating lanes of traffic or opposing traffic flows.
Uncontrolled crossing	a crossing that is not controlled by signals
Upstream	something moving or situated in the opposite direction from that in which traffic flows

1. Scope

Aspects covered

1.1 This document shall be used for the geometric design of roundabouts, including signal-controlled roundabouts.

NOTE 1 This document is applicable to new and improved junctions on trunk roads.

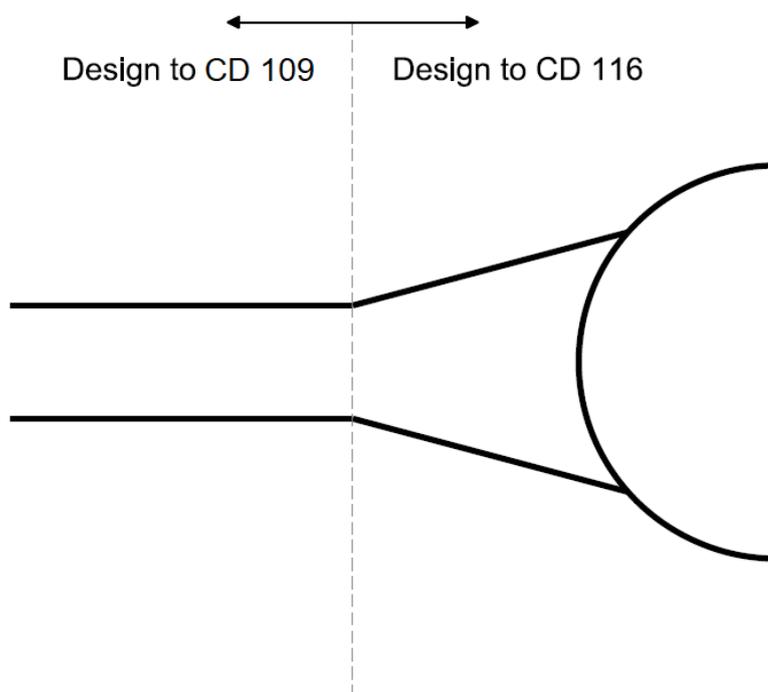
NOTE 2 The geometric design of roundabouts covers:

- 1) the selection of roundabouts;
- 2) circulatory carriageway;
- 3) central islands;
- 4) traffic islands;
- 5) entries and exits;
- 6) visibility;
- 7) differential acceleration lanes;
- 8) segregated left turn lanes; and
- 9) subsidiary deflection islands.

NOTE 3 Section 3 provides requirements and advice for all roundabout designs, including requirements and advice which are specific to normal and compact roundabouts (as indicated in specific clauses). Specific requirements and advice for the design of mini-roundabouts, signal-controlled roundabouts, segregated left-turn lanes, segregated lanes and subsidiary deflection islands are contained in their respective chapters.

1.2 Geometric design of the elements between the two points (the link upstream of the roundabout entry flare and the link downstream of the roundabout exit taper) shall be in accordance with the requirements of this document as illustrated in Figure 1.2, except for approach and exit stopping sight distance (SSD) visibility and differential acceleration lanes (DALs) design elements which have requirements that overlap the CD 109 and CD 116 thresholds shown in Figure 1.2.

Figure 1.2 Scope of roundabout CD 116



NOTE 1 Requirements for approach and exit stopping sight distance (SSD) visibility and differential acceleration lanes (DALs) are within Section 3, "Main geometric design features" and Section 4, "Additional requirements and advice for design of signal-controlled roundabouts".

NOTE 2 Requirements and advice for immediate approach SSD visibility to roundabouts are given in CD 109 [Ref 4.N] in addition to this document.

1.3 All traffic signs and road markings must conform to the UKSI 2016/362 (TSRGD) [Ref 9.N] and amendments thereof.

NOTE 1 Overseeing Organisation specific requirements are provided in the National Application Annexes.

NOTE 2 DfT Circular 01/13 [Ref 11.I] gives guidance on setting speed limits at roundabouts and TSM Chapter 3 [Ref 12.N] gives guidance on the positioning of speed limit signs.

Implementation

1.4 This document shall be implemented forthwith on all schemes involving the geometric design of roundabouts on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 5.N].

Use of GG 101

1.5 The requirements contained in GG 101 [Ref 5.N] shall be followed in respect of activities covered by this document.

2. Roundabout types

General

2.1 At-grade roundabouts shall not be provided on motorways.

NOTE *A roundabout designed as part of a grade separated junction follows the same requirements as a normal roundabout unless stated otherwise in this document.*

2.1.1 On all-purpose trunk roads, roundabouts should not be located:

- 1) on rural three-lane dual carriageway roads, as it is difficult to achieve suitable deflection;
- 2) where an approach road exceeds a gradient of 2% over the desirable minimum stopping sight distance (SSD) measured from the give way or stop line.

2.1.2 A roundabout should have 3 or more arms.

NOTE 1 *In addition to operating as a junction, a roundabout can also:*

- 1) *facilitate changes in road standard (for example, between dual and single carriageways or grade separated and at-grade junction roads);*
- 2) *emphasise the transition between rural and urban environments;*
- 3) *allow U-turns;*
- 4) *facilitate heavy right turn flows;*
- 5) *mitigate against the inconvenience of nearby banned right turns; and,*
- 6) *bring a route through a sharp or sudden change of direction.*

NOTE 2 *In providing a roundabout, combinations of the following factors are known to result in load shedding:*

- 1) *long straight high speed approach or circulatory of the roundabout;*
- 2) *inadequate entry deflection;*
- 3) *low circulating flow combined with excessive visibility to the right;*
- 4) *significant tightening of the turn radius partway round the roundabout;*
- 5) *excessive crossfall changes on the circulatory carriageway or the exit;*
- 6) *excessive outward sloping crossfall on a nearside lane of the circulatory carriageway; and,*
- 7) *excessive entry deflection.*

NOTE 3 *Roundabouts can include additional design features, such as segregated left turn lanes (SLTL), subsidiary deflection islands (SDI) and differential acceleration lanes (DAL) where these can assist the smooth flow of traffic through the junction.*

NOTE 4 *Designing roundabouts to the requirements and advice provided within this document can help reduce risks of accidents involving powered two-wheelers (PTWs). The IHE Guidelines for Motorcycling IHE GfM [Ref 5.I] provides guidance on PTW issues.*

2.1.3 On single carriageway roads, roundabouts may:

- 1) be sited to optimise the length of straight overtaking sections; and,
- 2) provide an overtaking opportunity by having a short length of two lanes on the exit arms of the roundabout.

2.1.4 Roundabouts should be made conspicuous through the provision of clear signage and road markings.

NOTE 1 *Guidance on signage and road markings for roundabouts is provided in TSM Chapter 3 [Ref 12.N](Regulatory Signs), TSM Chapter 4 [Ref 13.N](Warning Signs), TSM Chapter 5 [Ref 14.N](Road Markings) and TSM Chapter 7 [Ref 16.N](Design of Traffic Signs).*

NOTE 2 *The following measures can help improve conspicuousness of roundabouts:*

- 1) *repositioning and/or repeating (e.g. nearside and offside) of warning signs;*
- 2) *providing additional map type direction signs in advance of the roundabout, possible sign configurations include:*
 - a) *3 lane dual-carriageway (50, 60 or 70mph) - 1 mile ADS, 1/2 mile ADS and final direction sign and warning signs (3 lane dual-carriageway approaches to a roundabout are not preferred);*
 - b) *2 lane dual-carriageway (60 or 70mph) - 1 mile ADS (optional - site specific road safety issue / high traffic volume), 1/2 mile ADS and final direction sign and warning signs; or*
 - c) *any dual carriageway (lower than 50mph) - final direction sign and, if considered necessary, one pair of warning signs;*
- 3) *making the give way line more conspicuous;*
- 4) *extending the central island chevron sign further to the left to emphasise the angle of turn;*
- 5) *extending the central island chevron sign further to the right or providing additional chevrons on the approach central island where the approach geometry masks the roundabout entry from view; and/or,*
- 6) *on dual carriageway roads, placing additional chevron signs in the central reserve in line with the offside lane approach.*

NOTE 3 *Allowable positioning of chevrons is dependent on the 85th percentile approach speeds, visibility distance and guidance provided in UKSI 2016/362 (TSRGD) [Ref 9.N] and TSM Chapter 4 [Ref 13.N].*

2.2 Road lighting shall be provided on all roundabouts.

NOTE *Overseeing Organisation specific requirements related to roundabouts are provided in the National Application Annex.*

Normal and compact roundabouts

2.3 For roads with a speed limit of 50 mph or greater and traffic levels of greater than 8,000 two-way AADT on any approach, a normal roundabout shall be used.

2.3.1 Where the speed limit is 50 mph or greater regardless of traffic flow, normal roundabouts should be provided.

2.3.2 Where the speed limit is 50 mph or greater, and traffic levels are less than 8,000 two-way AADT on any approach and where single lane entries are provided, compact roundabouts may be provided.

2.3.3 For roads with a posted speed limit of 40 mph or below, either a compact or a normal roundabout may be provided.

NOTE 1 *On roads with speed limits exceeding 40 mph, the design of compact roundabouts is similar to that for normal roundabouts, but single-lane entries and exits are provided.*

NOTE 2 *Where the posted speed limit is 40 mph or less, compact roundabouts are recommended for traffic levels of less than 8,000 two-way AADT on all approaches and normal roundabouts are recommended for traffic levels of greater than 12,000 two-way AADT on any approach.*

NOTE 3 *Alternatives to normal or compact roundabout types (i.e., signalised, double, through-about and double-through-about, mini, or provision of an SLTL) can be used where the traffic modelling indicates a benefit.*

NOTE 4 *Where the design of a normal roundabout could lead to high circulatory speeds then a double roundabout or signalisation can be used to reduce speeds and to regulate traffic flow.*

NOTE 5 *Where visibility to the right cannot be achieved at normal roundabouts, signal-control can mitigate this problem due to application of alternative visibility requirements.*

NOTE 6 *New roundabouts positioned off-line from the existing link can result in approaching road users looking past the roundabout central island, creating a 'see-through' effect which could increase collision risk. Signing and lining, and physical cues located on approach and on the central island, help drivers interpret the layout of new off-line roundabouts.*

2.3.4 Normal roundabouts with five or more arms should not be provided.

NOTE 1 At a roundabout, the accident risk is likely to increase with the number of entries provided (based on a research study between 1999 and 2003; a summary of this provided in TRL PPR 206 [Ref 2.I]).

NOTE 2 The number of arms on a roundabout is linked to the ICD of the roundabout - the more arms, the larger the ICD. Larger ICDs can encourage higher circulatory speeds.

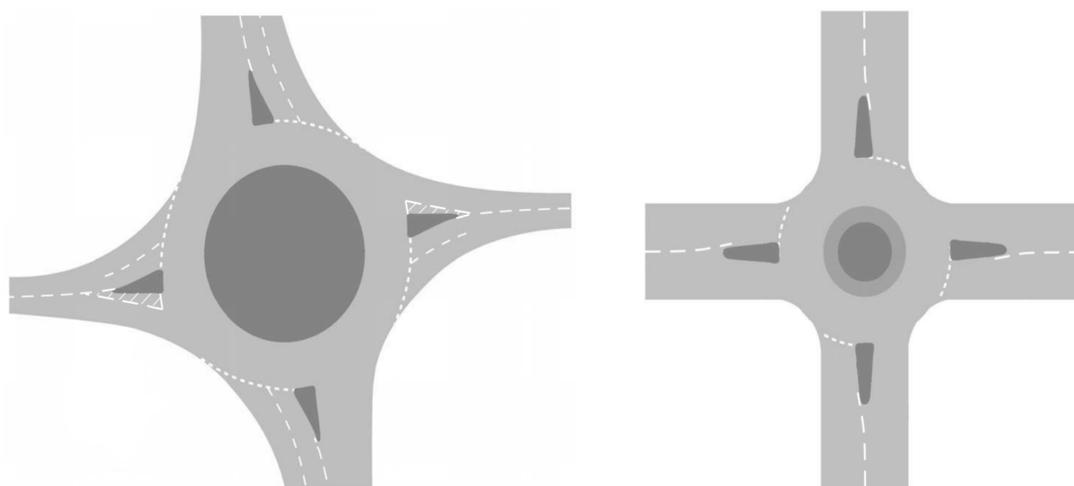
2.4 Compact roundabouts shall not be used at any location with a dual carriageway approach, irrespective of speed or AADT.

NOTE 1 A compact roundabout has less capacity than a normal roundabout but can be more suitable where there is a need to accommodate at-grade crossings for pedestrians or cyclists.

NOTE 2 Non-flared entries/exits of a compact roundabout give more flexibility for the inclusion of pedestrian crossings in the roundabout design.

NOTE 3 Normal and compact roundabouts are as illustrated in Figure 2.4N3.

Figure 2.4N3 Illustrative layout of a normal roundabout (left) and compact roundabout (right)



Signal-controlled roundabouts

2.5 Signal-controlled roundabouts shall be designed using the requirements for a normal roundabout unless stated otherwise in this document.

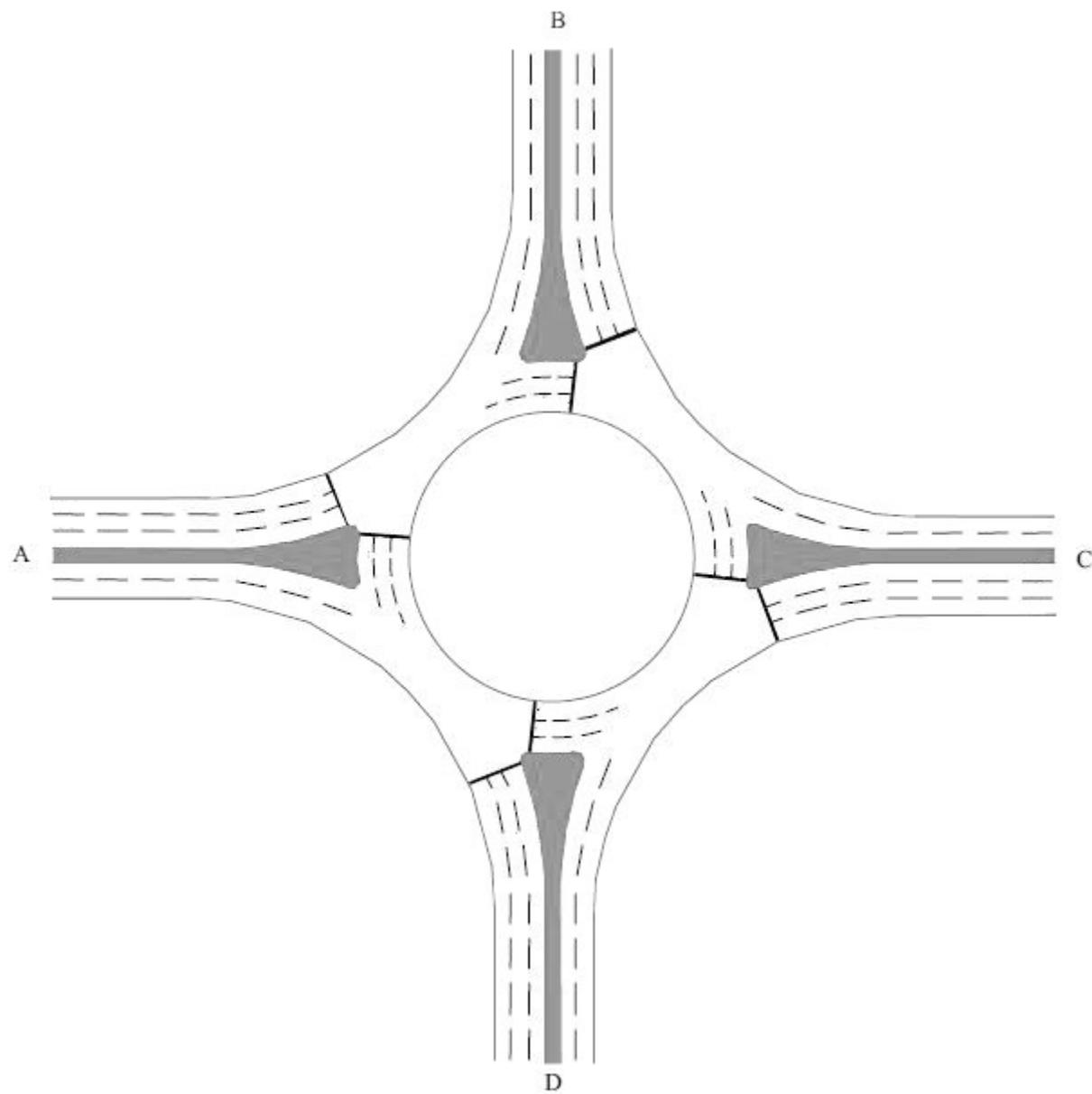
NOTE 1 General requirements and advice for signal-controlled junctions, including positioning of and visibility to signals, that are applicable to roundabouts and other junctions, are provided in Section 4 and CD 123 [Ref 3.N].

NOTE 2 Signal-controlled roundabouts include roundabouts which operate using direct signal-control or indirect signal-control.

2.6 Where a signal-controlled roundabout is designed using the requirements for a normal roundabout, the give way line reference for a normal roundabout shall be the stop line for a signal-controlled roundabout.

2.7 Direct signal-controlled roundabouts (as illustrated in Figure 2.7) shall have traffic signal-control (part-time or full-time) on one or more of the approaches and at the corresponding point on the circulatory carriageway.

Figure 2.7 Illustrative layout of a signal-controlled roundabout



NOTE Signal-controlled roundabouts include traffic signal-controlled gyratory systems that are not always a conventional (circular) roundabout shape.

2.7.1 When the traffic on a roundabout does not self-regulate, direct or indirect traffic signals may need to be installed either part-time or continuous at some or all of the entry points.

NOTE Where traffic on a roundabout does not self-regulate, this can be caused by:

- 1) an overall growth in traffic flow;
- 2) an overloading or an unbalanced flow at one or more entries;
- 3) high circulatory speeds; and/or
- 4) disparity of traffic flow patterns between peak and off-peak periods.

Through-abouts

2.8 Traffic signal-control shall be used on the through route conflict points on a through-about (as illustrated in Figure 2.8a) or double-through-about (as illustrated in Figure 2.8b).

Figure 2.8a Illustrative layout of a through-about

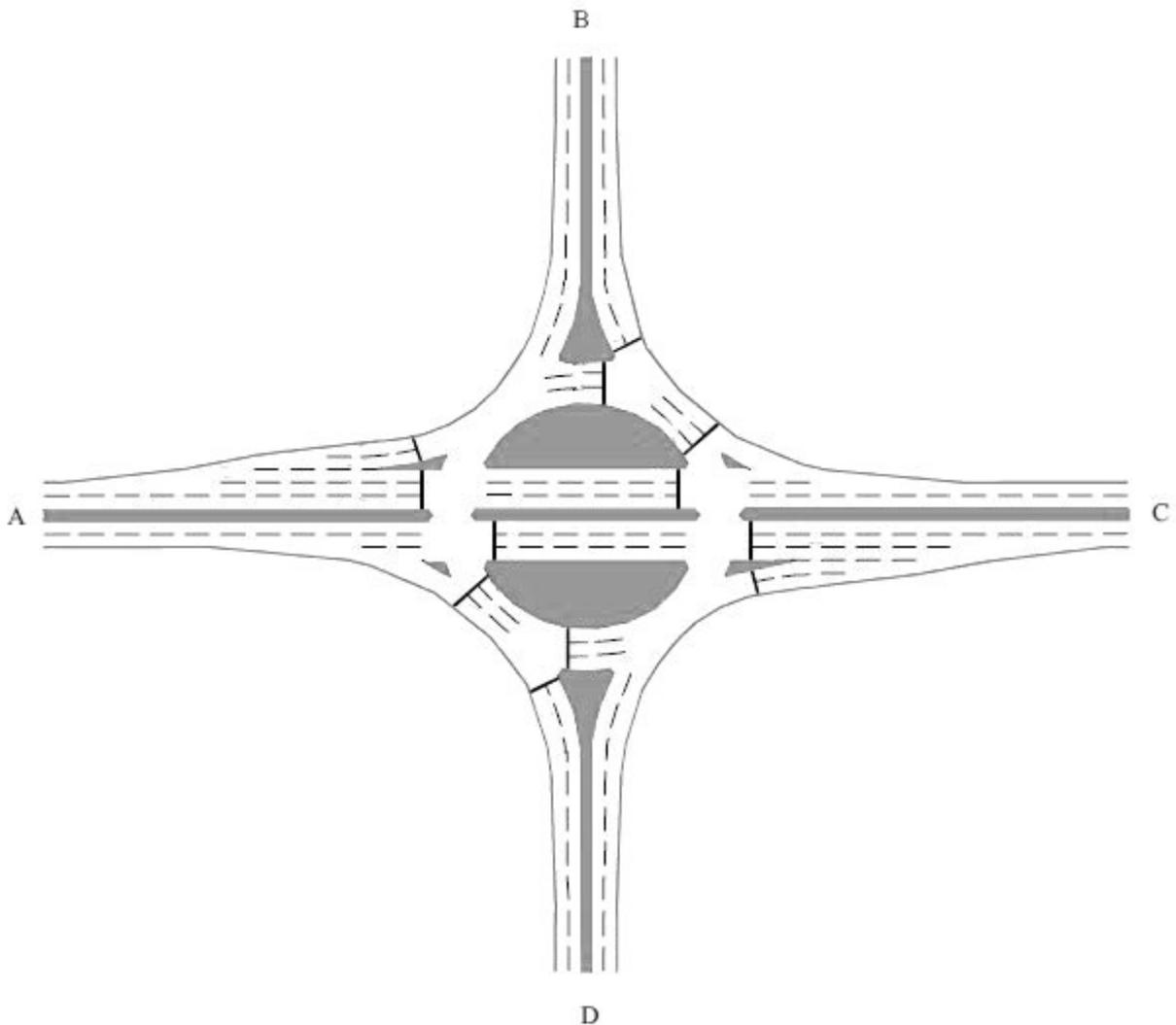
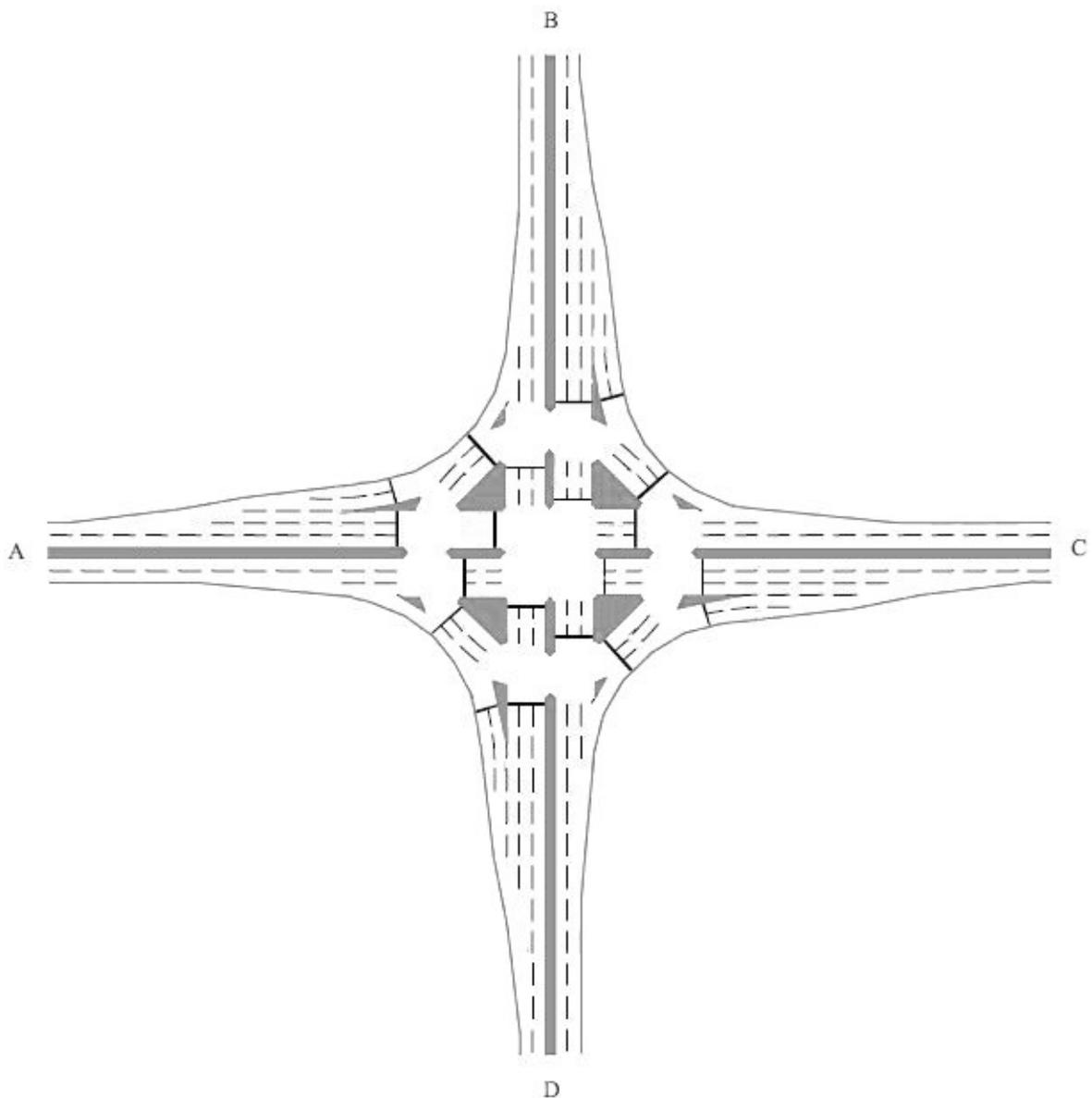


Figure 2.8b Illustrative layout of a double-through-about



- NOTE 1** Traffic signal-control on the through route conflict points on a through-about or double-through-about is the minimum requirement, additional signal-control can be added.
- NOTE 2** A through-about junction is less efficient in handling turning movements than a roundabout.
- NOTE 3** The benefit of a through-about junction is that major traffic movements are removed from some of the conflicts on the circulatory carriageway and this can provide increased capacity.
- NOTE 4** A double-through-about is useful if the dominant flows are the two straight ahead movements, reducing conflict on the circulatory carriageway.
- NOTE 5** Through routes on a through-about can have signal-controlled junction, highway link and roundabout design elements, as well as advanced signal technology, installed to control approach speeds and optimise capacity. Therefore, an 'aspect not covered' departure is necessary to be submitted to the Overseeing Organisation for any proposed through route so that all design elements can be considered holistically.
- 2.8.1** Through-about and double-through-about junctions should have clear directional signage, that includes

directions that right turning traffic needs to be in the left-hand lane.

NOTE 1 *Map type signing helps illustrate correct routing through through-about junctions.*

NOTE 2 *Map type signing for a through-about junction necessitates non-prescribed sign authorisation by the relevant national authority. Information regarding this process can be obtained from the Overseeing Organisation.*

Mini-roundabouts

2.9 Mini-roundabouts shall only be used on roads with a speed limit of 30 mph or less and where the 85th percentile speed of traffic is less than 35 mph within a distance of 70 metres from the proposed give way line on all approaches.

NOTE 1 *Traffic calming measures on the approach to a mini-roundabout can be used to reduce 85th percentile speeds to below 35 mph. Advice on speed reduction measures can be found in TAL 2/05 [Ref 17.I], LTN 1/07 [Ref 9.I], UKSI 1999/1026 [Ref 8.N], and UKSI 1999/1025 [Ref 14.I].*

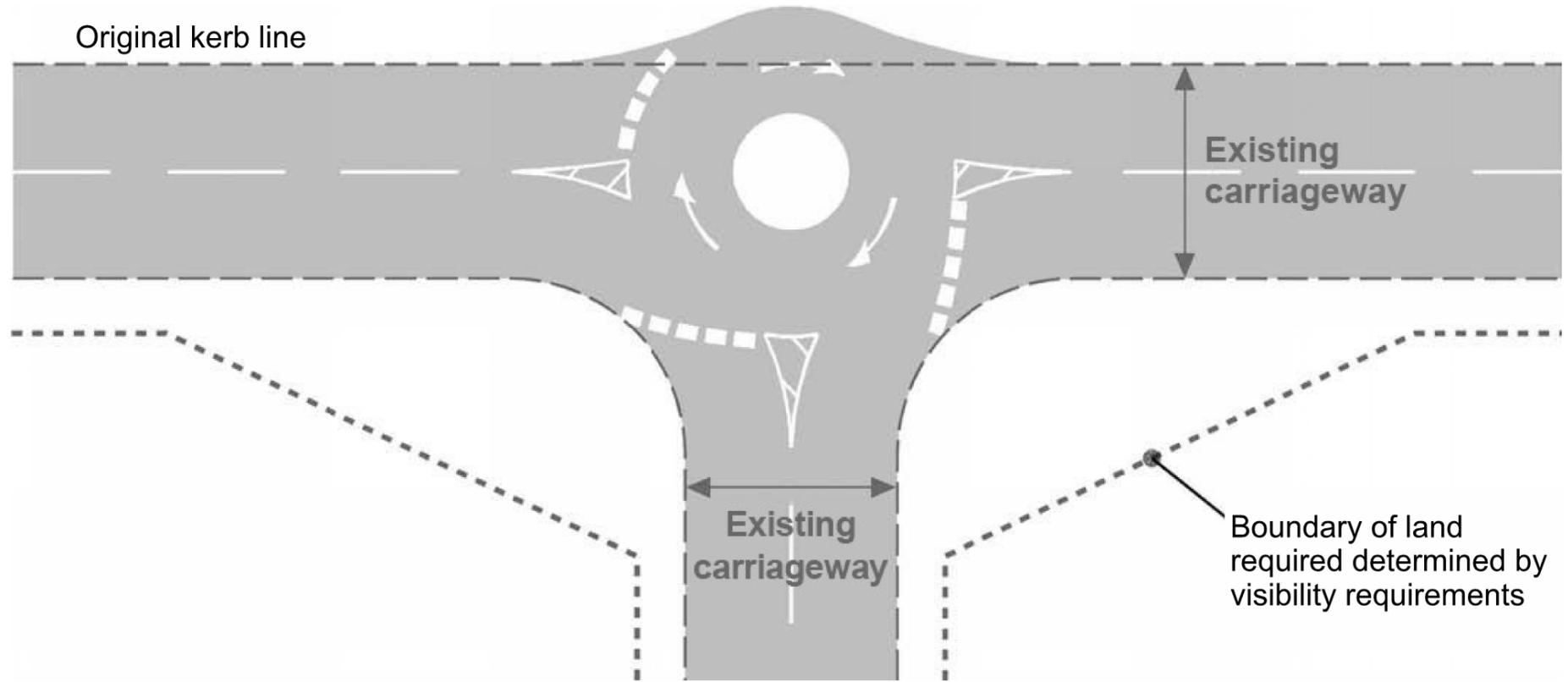
NOTE 2 *Mini-roundabouts can be inappropriate for use on routes frequently used by HGVs and buses due to difficulty in completing turning manoeuvres.*

NOTE 3 *Mini-roundabouts are not suitable where large volumes of cyclists, motorcyclists, or inexperienced cyclists (on routes to schools for example) are likely to use them except in conjunction with speed reduction measures.*

2.10 Mini-roundabouts (as illustrated in Figure 2.10) shall not be used at:

- 1) new junctions;
- 2) accesses linking directly to a site that serve, or are intended to serve, one or more properties; nor,
- 3) on dual carriageways.

Figure 2.10 Illustrative layout of a mini-roundabout



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2.10.1 Mini-roundabouts should not be installed where traffic flows or turning proportions differ significantly between arms.

NOTE When traffic flows are low, drivers can not anticipate conflict with other road users which can result in them approaching the junction at inappropriate speeds. Inadequate or excessive visibility can exacerbate this situation.

2.10.2 Mini-roundabouts should not be used where there is a risk that vehicles will use them to perform U-turns.

NOTE Where provided adjacent to prohibited turning movements at other junctions, there is a risk that drivers use the mini-roundabout for U-turns.

2.10.3 The introduction of a mini-roundabout should be assessed to check that queues created by the mini-roundabout do not adversely impact upon the operation and safety of the junction or adjoining network.

2.11 Mini-roundabouts shall only have 3 or 4 arms.

2.12 A 3-arm mini-roundabout shall not be used where the predicted two-way annual average daily traffic flow (AADT) on any arm of a junction is below 500 vehicles a day.

2.13 A 4-arm mini-roundabout shall not be used where the predicted two-way annual average daily traffic flow (AADT) on any arm of a junction is below 500 vehicles a day unless the design incorporates features to encourage vehicles to give way on all approaches.

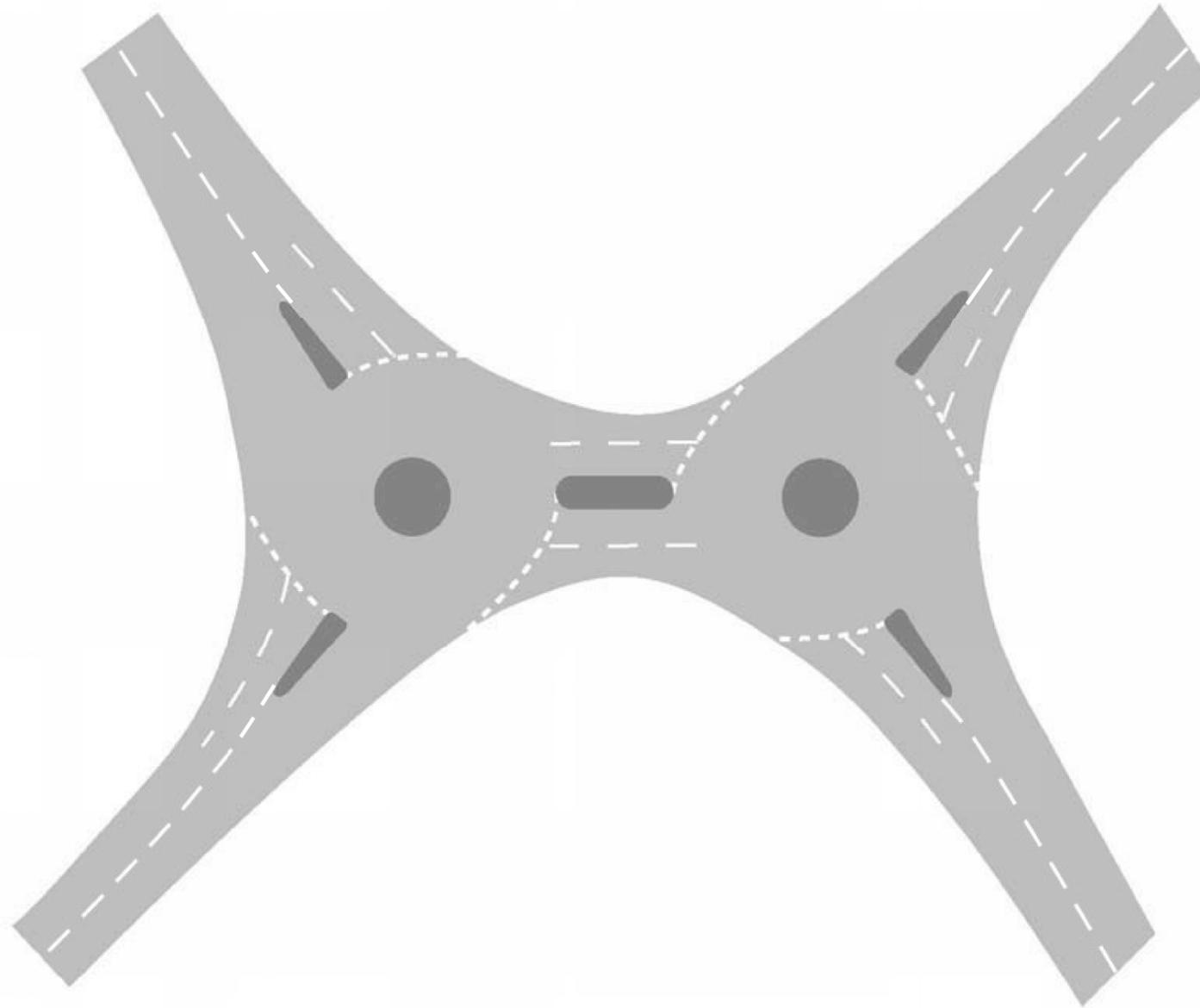
NOTE Four-arm mini-roundabouts introduce additional conflicts and can create difficulty for drivers' perceptions of the layout and turning flows.

2.13.1 A 4-arm mini-roundabout should not be used where the sum of the maximum peak hour entry flows for all arms exceeds 500 vehicles per hour.

Double roundabouts

2.14 A double roundabout (as illustrated in Figure 2.14) shall not be designed as two independent roundabouts.

Figure 2.14 Illustrative layout of a double roundabout



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5. Design of mini-roundabouts

Geometric design of a mini-roundabout

5.1 The maximum ICD of a mini-roundabout shall be 28 metres.

NOTE Main requirements and advice for the geometric design of all roundabouts are provided in Section 3.

5.1.1 For mini-roundabouts with two entry lanes the width of the circulatory carriageway should enable cars to travel two abreast around the white circle.

Mini-roundabout central islands

5.2 The white circle of a mini-roundabout shall have a maximum of 4 metres diameter and positioned using the inside of the swept path of cars.

NOTE A mini-roundabout does not have a kerbed central island. In its place is a flush or domed circular solid white road marking capable of being driven over where unavoidable by large vehicles or where the layout of the junction makes it impractical to do so. The circular marking can be edged with kerbs provided the maximum height above the road surface at the perimeter does not exceed 6 mm.

5.2.1 Where a white circle with a full diameter of 4 metres is not achievable on a mini-roundabout, a white circle with a diameter as large as possible between 1 metre and 4 metres should be provided.

NOTE A larger diameter up to the maximum 4 metres can improve conspicuousness of the central marking.

5.3 Additional circular rings shall not be added around the white circle of a mini-roundabout.

5.4 The centre of the design vehicle path shall be at least 1 metre from kerbs, the perimeter of the white circle, and from any road marking separating opposing traffic.

NOTE Figures 5.4Na and 5.4Nb provide examples of how the design vehicle path and white circle location of a mini-roundabout are determined using swept paths.

Figure 5.4Na Determination of vehicle path and white circle location using swept paths (on a 3-arm mini-roundabout and a 4-arm mini-roundabout)

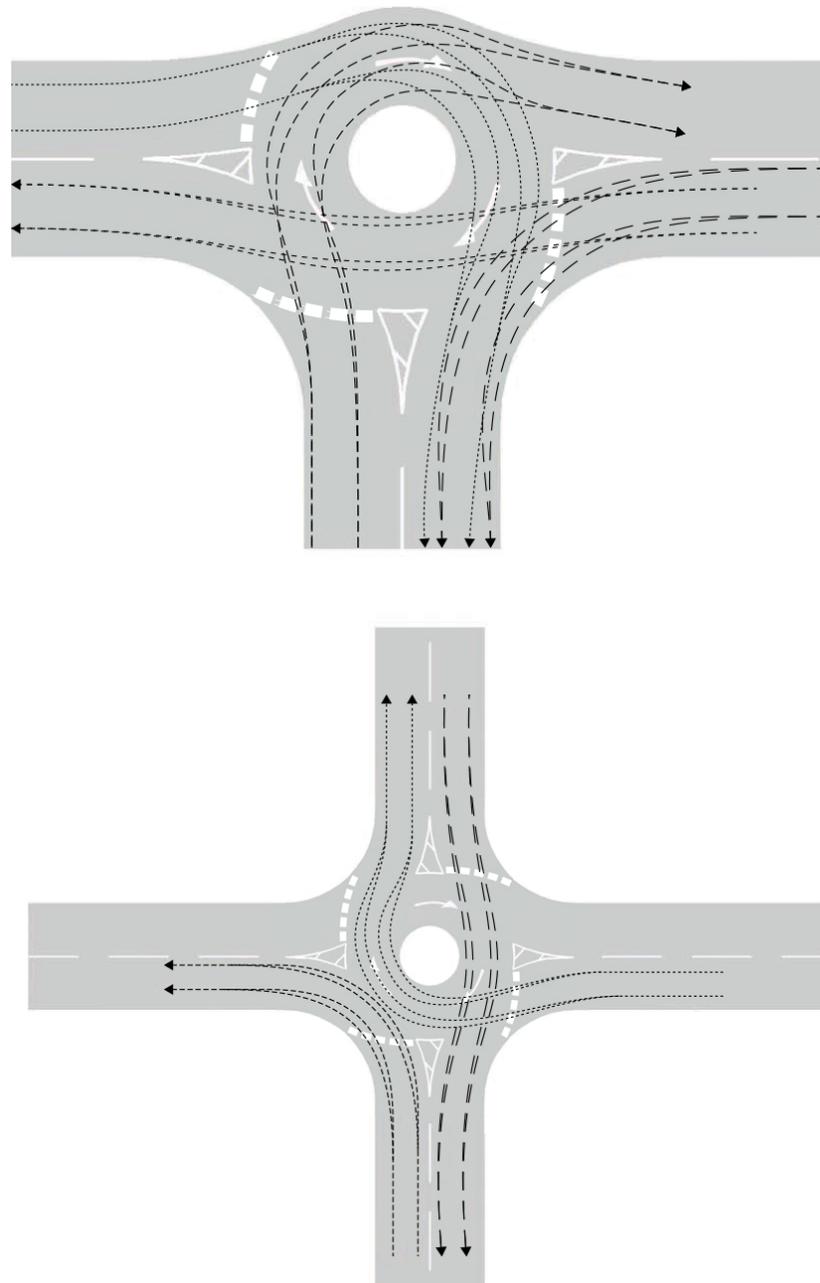
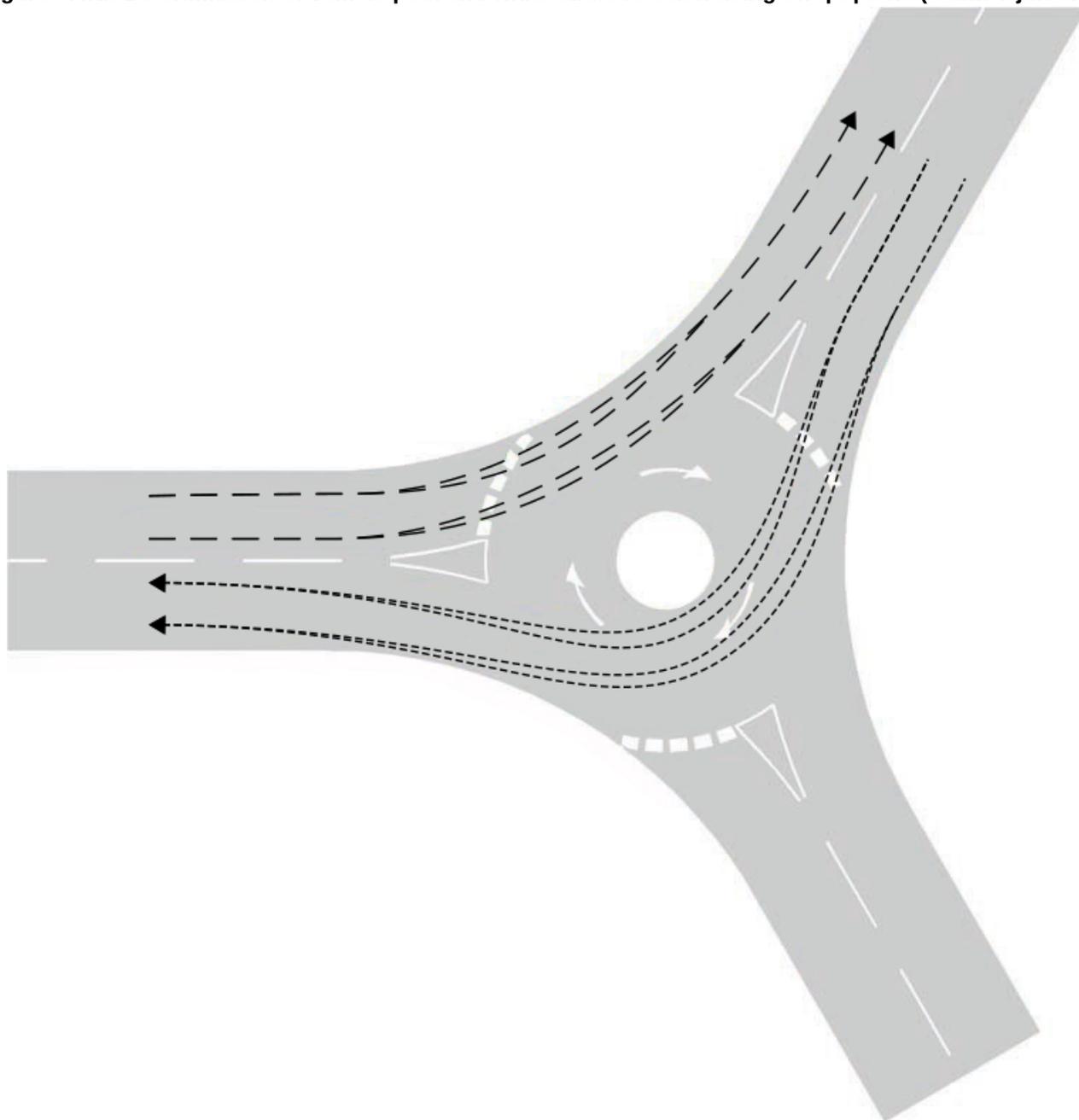


Figure 5.4Nb Determination of vehicle path and white circle location using swept paths (3-arm Y-junction)



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- 5.4.1 The white circle of a mini-roundabout should be sized and located so that drivers of cars are not encouraged to drive on it or pass on the wrong side of it when negotiating the junction.
- 5.5 For a right-turn design vehicle path on a mini-roundabout, a minimum design vehicle path radius of 6 metres, at the centre of the path, shall be used.
- 5.5.1 For the right turn minimum design vehicle path radius of 6 metres, the vehicle path should be widened to 3 metres at the apex of the turn.
- 5.6 The height of the dome of the white circle above the adjacent carriageway must be no greater than 125 mm at its highest point (including construction tolerance) (in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N]Schedule 9 Part 8 Paragraph 4).

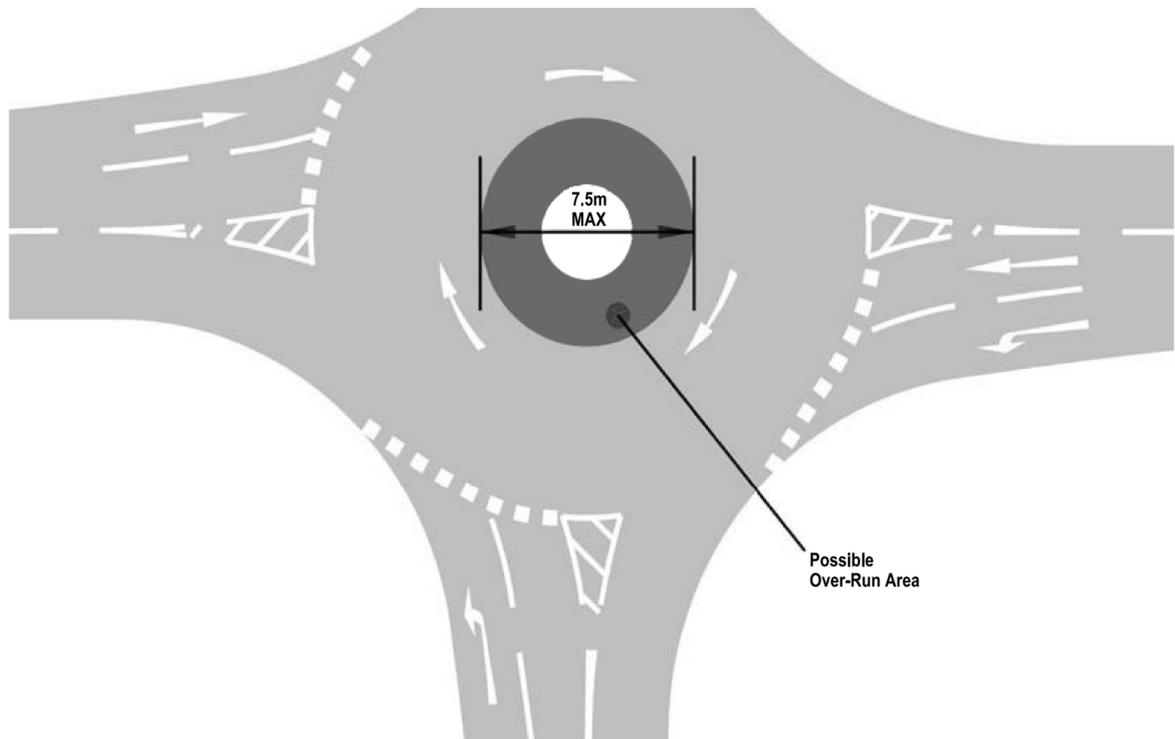
NOTE *A domed white circle marking can be used to deter light vehicles from overrunning and improve its conspicuousness. The dome can normally be formed from bituminous material, concrete or block paving.*

- 5.6.1 The white circle for a 4-metre diameter marking should be domed to a recommended height at the centre of 100 mm.
- 5.6.2 For smaller diameter markings the height of the dome should be reduced pro rata (i.e. by 25 mm per metre width of the white circle diameter).
- 5.6.3 A domed white circle should be avoided for mini-roundabouts regularly overrun by heavy goods vehicles or buses in residential areas.
- NOTE** *The use of a domed white circle can lead to the perception of vibration by residents and discomfort to bus drivers and passengers.*
- 5.6.4 Fire and ambulance services should be consulted about any proposal to introduce a mini-roundabout with a domed white circle.
- 5.7 The height of the white dome at its perimeter shall not exceed 6mm.

Overrun areas

- 5.8 The design of overrun areas must be in accordance with UKSI 1999/1026 [Ref 8.N].
- 5.9 The diameter of a mini-roundabout overrun area shall not exceed 7.5 metres, including the white circle.
- NOTE** *An example of a mini-roundabout overrun area is shown in Figure 5.9N.*

Figure 5.9N Flared approach with central overrun areas



5.9.1 A concentric overrun area may be used on a mini-roundabout to increase the deflection and its conspicuousness.

NOTE *Light vehicles are not legally obliged to avoid overrun areas in the same way as the white circle of a mini-roundabout and therefore concentric overrun areas cannot be relied upon for the purposes of achieving deflection.*

5.10 Additional road markings shall not be placed on or around the edges of a concentric overrun area.

5.10.1 The circulatory arrow markings of a mini-roundabout should be placed on the surrounding circulating area and not on the overrun area.

Mini-roundabout traffic islands

5.11 Where vehicles can pass on the wrong side of the white circle on a mini-roundabout, a kerbed traffic island shall be provided on the arms of a junction.

5.11.1 Traffic islands may be provided to separate opposing streams of traffic and, where appropriate, to serve one or more of the following purposes:

- 1) assist provision of deflection of the path of vehicles approaching the mini-roundabout;
- 2) increased conspicuousness for drivers approaching the mini-roundabout;
- 3) pedestrian use; or
- 4) calming feature.

5.11.2 Islands for separating opposing streams of traffic or deflecting approaching vehicles may be kerbed physical islands or created using road markings prescribed in UKSI 2016/362 (TSRGD) [Ref 9.N].

5.11.3 A kerbed island may be used at an entry to accommodate bollards and supplementary signs.

NOTE *Requirements and guidance on the appropriate signage for a mini-roundabout are provided in UKSI 2016/362 (TSRGD) [Ref 9.N] and TSM Chapter 3 [Ref 12.N].*

5.11.4 Any sign on a kerbed island should not restrict visibility to the right.

5.11.5 Kerbed islands designed to narrow the carriageway within 40 metres of the give way line of a mini-roundabout may be used as a calming feature to control the speed of approaching traffic.

NOTE *Guidance on the use of islands to narrow the carriageway is contained in TAL 7/95 [Ref 18.I].*

5.12 A kerbed island shall be positioned at least 0.5 metres clear of any vehicle swept path.

5.13 Solid or raised areas of markings shall not be used at mini-roundabouts, other than for the white circle.

Mini-roundabout entry width

5.14 For a single lane approach on a mini-roundabout, the lane width at the give way line shall be no less than 3 metres and no greater than 4 metres.

5.14.1 For a two lane approach on a mini-roundabout, the minimum lane width at the give way line may be reduced to 2.5 metres, provided heavy goods vehicles and buses do not frequently use the entry.

5.15 At an entry with multiple lanes on a mini-roundabout, no more than one lane shall be marked as being for a given exit arm.

NOTE *Markings are provided such that traffic going ahead or turning proceeds in single file for each movement.*

5.15.1 Three lane entries should not be used for mini-roundabouts.

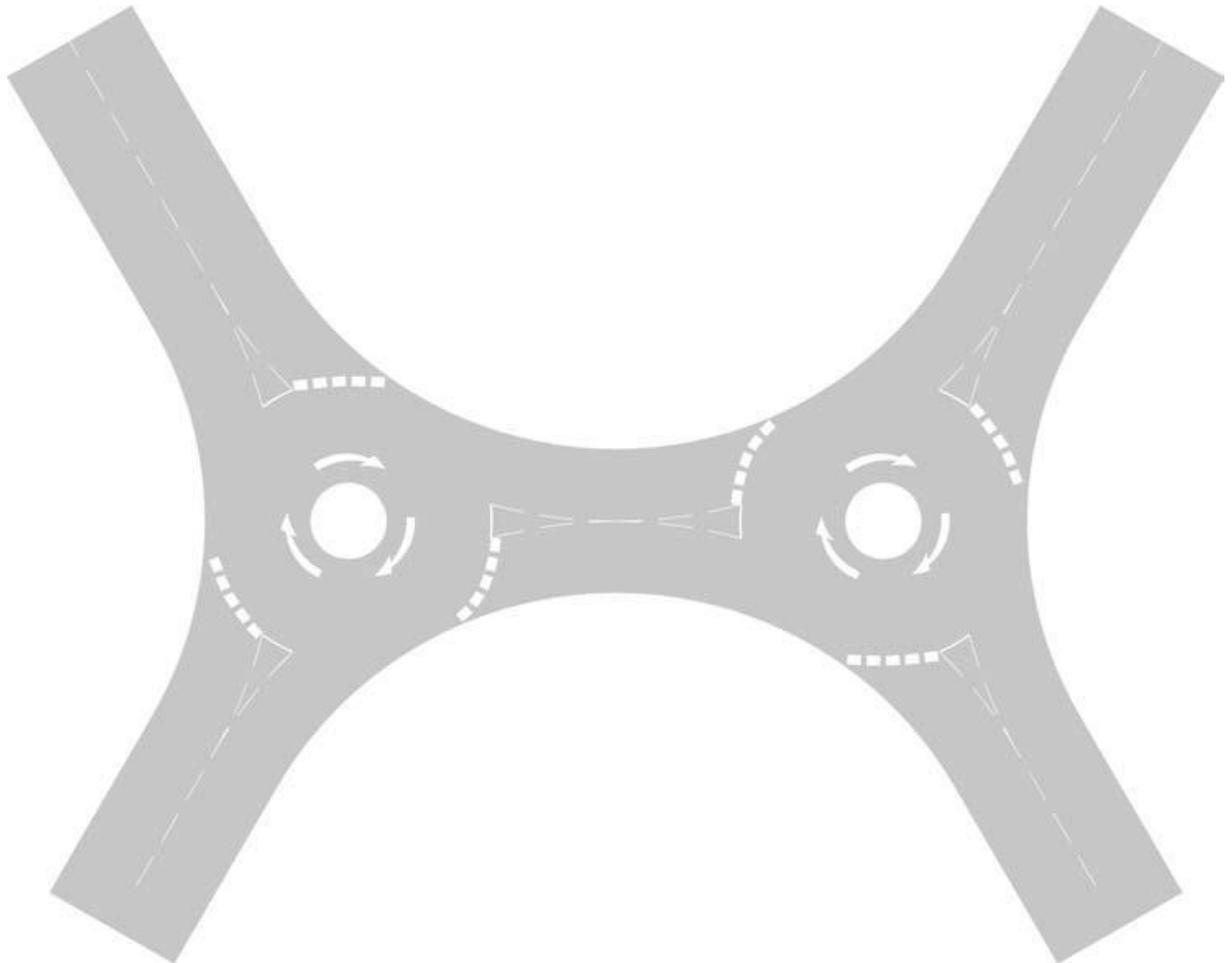
NOTE 1 *The presence of two or more approach lanes encourages two abreast flow through the mini-roundabout, increasing the number of potential conflicts. Additional signing and marking can be used where entries are divided into multiple lanes to ensure safe and efficient operation.*

NOTE 2 *Where a three-arm mini-roundabout with single lane approaches replaces a major/minor priority junction, the junction becomes easier to negotiate, as drivers only have to concentrate on one stream of traffic circulating at low speed from their right. However, as the number of arms and/or traffic lanes to the mini-roundabout increases, so does the potential for conflict.*

5.16 No more than two lanes shall be provided at an intermediate give way line between double mini-roundabouts.

5.16.1 On a double mini-roundabout, the short link between the two roundabouts should provide space for vehicles waiting at the intermediate give way lines, as illustrated in Figure 5.16.1.

Figure 5.16.1 Double mini-roundabout



NOTE 1 Where the link between the two roundabouts is not adequately sized, large opposing right-turning movements can lead to gridlock at double mini-roundabouts, particularly if the network is congested.

NOTE 2 The capacity at an intermediate give way line between double mini-roundabouts can be reduced by the effect of the first junction, and a queue at the intermediate give way line can interact with the first junction. Double junctions with short links of only one or two car lengths can be more susceptible to queuing than those with greater separation.

Mini-roundabout exit width

5.17 On mini-roundabouts, the exit width shall be measured as the distance between the nearside kerb and exit median (or the edge of any traffic island) where it intersects with the outer edge of the circulatory carriageway.

Deflection

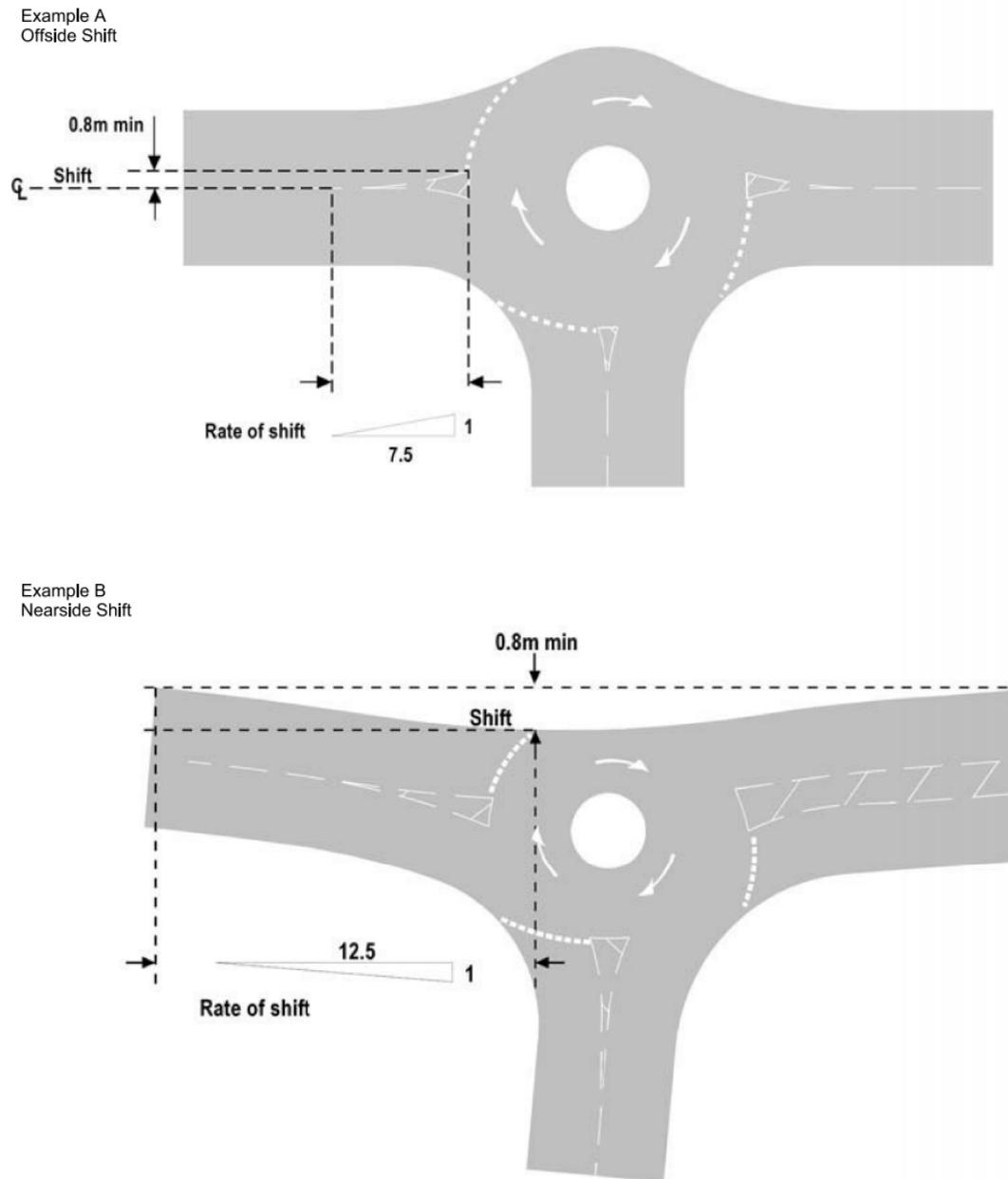
5.18 Deflection or other means of slowing vehicles on approach to the give way stop line shall be provided on a mini-roundabout.

NOTE 1 Other means of slowing vehicles include additional signage or narrowing of approach.

NOTE 2 Both the speed and path of a vehicle through a mini-roundabout are important factors in accident causation. Adequate deflection allows the approaching drivers to be aware of the circulatory nature of the junction ahead. Drivers need to be ready to stop if necessary on the approach so it is essential for entry (and circulatory) speeds to be managed by careful design.

- NOTE 3* Where vehicle speeds are already low on mini-roundabouts, full entry deflection as required for normal or compact roundabouts is not essential.
- NOTE 4* The introduction of some entry deflection on entry to the mini-roundabout helps to induce gyratory movement and increase efficiency.
- 5.18.1 A lateral shift (see Figure 5.18.3) of 0.8 metres minimum should be provided at entry.
- NOTE* The value of 0.8 metres for lateral shift corresponds to the minimum width required to accommodate hatched road marking to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1040 (Schedule 11 Part 4 Item 23). These markings are used to separate opposing traffic flows and further details can be found in UKSI 2016/362 (TSRGD) [Ref 9.N] (Schedule 11 Part 3) and TSM Chapter 5 [Ref 14.N].
- 5.18.2 Deflection (or lateral shift) should be introduced on the offside of the approach arm.
- 5.18.3 For offside shift, the lateral shift should be measured from the centre of the approach road, developed at a rate 1 in 7.5 as shown in Figure 5.18.3 Example A.

Figure 5.18.3 Illustration of lateral shift



5.18.4 Where there are constraints (for example, land restrictions, structural obstructions, environmental features) at a mini-roundabout, an alternative method, known as 'nearside shift' and illustrated in Figure 5.18.3 example B, may be used to develop shift along the nearside carriageway edge.

NOTE Nearside shift can be an effective way of introducing deflection in order to encourage low entry speeds. However, nearside shift can have the effect of deflecting traffic to the right, towards the central island, and is therefore often less effective in inducing a gyratory movement than offside shift. For this reason, nearside shift is deemed to be less desirable than offside shift.

5.18.5 For nearside shift, the lateral shift should be measured from the nearside edge of the approach road, developed at a rate 1 in 12.5, as illustrated in Figure 5.18.3 Example B.

5.18.6 Mandatory give way signs and markings to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 602 (Schedule 9 Part 2 Item 2), diagram 1003 (Schedule 9 Part 6 Items 3 and 9) and diagram 1023A (Schedule 9 Part 6 Item 4) should only be used on the approach to a three-arm mini-roundabout where there is another entry to the right but none to the left as shown in Figure 5.21 and in accordance with TSM Chapter 3 [Ref 12.N] and TSM Chapter 5 [Ref 14.N].

NOTE The use of give way signs and markings in other situations can confuse drivers as to who has priority and undermines the priority rule established for mini-roundabouts.

5.18.7 Where the lateral shift cannot be achieved or visibility to the right is limited, mandatory give way signs and markings to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 602 (Schedule 9 Part 2 Item 2), diagram 1003 (Schedule 9 Part 6 Items 3 and 9) and diagram 1023A (Schedule 9 Part 6 Item 4) may be used on the approach.

5.18.8 Where the give way sign is co-located with the mini-roundabout regulatory sign, the give way sign should be uppermost.

NOTE Further guidance on the classification of signs is provided in TSM Chapter 1 [Ref 11.N].

5.18.9 On a mini-roundabout where sufficient entry deflection of vehicle paths is not achieved by road markings, islands and existing kerbs, a reduction in vehicle speeds may be achieved by narrowing the approach.

5.18.10 On a mini-roundabout, overrun areas may be utilised instead of narrowing the approach, if narrowing the approach arm affects the swept path of long vehicles on the nearside of an entry.

5.19 Any vertical deflection for traffic calming at a mini-roundabout shall take the form of a speed table with the following requirements:

- 1) the top of the speed table covers the whole junction area; and
- 2) extends outwards a minimum of 6 metres upstream of each give way line.

Crossfall on a mini-roundabout

5.20 The design of crossfalls and gradients at mini-roundabouts shall not result in ponding of surface water within the roundabout carriageway including on and around the central white circle.

5.20.1 Gullies should not be installed adjacent to the white circle to drain ponding or accumulated run-off.

5.20.2 Where a mini-roundabout is constructed at the location of a former priority junction, channels, which can give the impression of a former priority junction layout, should be eliminated.

NOTE Mini-roundabouts have often been superimposed on the existing carriageway profile with little or no change in level.

5.20.3 Where the carriageway levels are re-profiled, crossfall should be outward sloping to avoid ponding and improve junction conspicuousness.

Mini-roundabout visibility

5.21 A minimum visibility distance 'D', as shown in Figure 5.21 and in accordance with Table 5.21, shall be the minimum sight distance required at a distance 'F' from the give way line in relation to the approach speed of the arm.

Figure 5.21 Mini-roundabout visibility distance 'D' and stopping sight distance 'F'

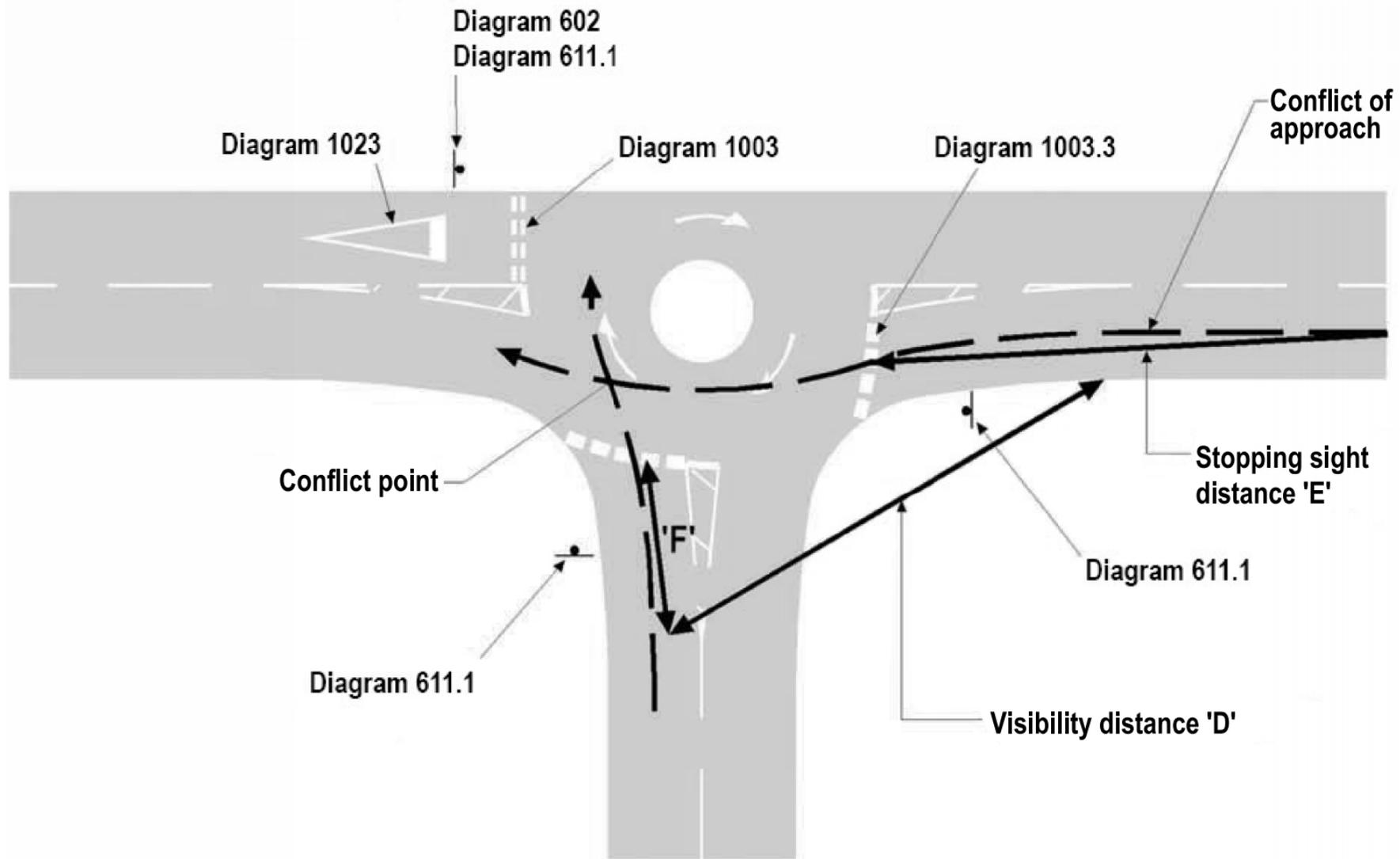


Table 5.21 Minimum visibility distance to the right

85 th percentile speed of arm to the right (mph)	'D' distance (metres)	
	For a gap acceptance time of two seconds	For a gap acceptance time of three seconds
35	40	55
30	35	50
25	25	40

NOTE 1 'D' is measured from the centre of the offside approach lane to the nearside carriageway edge of the arm to the right.

NOTE 2 Distance 'D' varies with the 85th percentile approach speed 70 metres before the give way line on the arm to the right and the 'gap acceptance time'.

NOTE 3 The 'gap acceptance time' is dependent on the size of the roundabout, it is two seconds when the distance from the give way line to the centre of the white circle is 7.0 metres or less, otherwise it is three seconds.

5.22 The visibility distance 'D' shall be unobstructed between driver's eye heights of 1.05 metres and 2.0 metres at the centre of the offside approach lane to object heights between 0.26 metres and 2.0 metres at the nearside edge of the arm to the right.

5.23 The SSD on the approach to a mini-roundabout (illustrated as 'E' in Figure 5.21) shall be provided in accordance with Table 5.23.

Table 5.23 Minimum SSD on approach to a mini-roundabout

85 th percentile speed (mph)	Minimum 'E' distance (metre)
35	80
30	70
25	50

5.24 The SSD on the approach to a mini-roundabout shall be provided within the whole of an envelope between eye heights of 1.05 metres and 2.0 metres at the centre of the path of an approaching vehicle to object heights of 0.26 metres to 2.0 metres at the give way line.

5.25 The minimum 'F' distance in Figure 5.21 shall be 9.0 metres, except in the following circumstances:

- 1) where the 9.0 metres cannot be achieved, the 'F' distance on an arm can be reduced to 4.5 metres, providing that the maximum peak hour entry flow on the arm is less than 300 veh/hr; or
- 2) where neither the 9.0 metres or the relaxed minimum 'F' distance of 4.5 metres can be achieved, the 'F' distance for an arm can be reduced to 2.4 metres, providing that the maximum peak hour entry flow on the arm is less than 300 veh/hr and where there is no entry arm to the left.

NOTE 1 A minimum 'F' distance of 9.0 metres is provided so that the first two vehicles in the approach queue have visibility of traffic coming from the arm on the right.

NOTE 2 'F' distances significantly greater than 9.0 metres can result in high approach speeds. Consider limiting the visibility to the right of adjacent entries to a maximum 'F' distance of 15 metres back on the approach and to no more than the 'D' distance.

NOTE 3 Excessive visibility between adjacent entries can result in approach and entry speeds greater than desirable for the junction geometry, with a tendency for approaching drivers to take a decision too early about whether to give way, particularly in locations with low turning movements. Road users approaching a mini-roundabout need to be able to stop if vehicles are circulating or if there is an

obstruction on the junction. There is little or no advantage in increasing the 'D' distance as this could lead to excessive approach speeds.

NOTE 4 *An 'F' dimension of 2.4 metres enables a road user who has reached the give way line to see approaching vehicles without encroaching past the give way line.*

NOTE 5 *An 'F' dimension of 2.4 metres can, however, allow only one vehicle at a time to enter safely and requires following drivers to be prepared to stop and look.*

5.26 Where 'F' dimension of 2.4 metres is used, the mandatory give way markings and upright sign must be in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003 (Schedule 9 Part 6 Items 3 and 9), diagram 1023A (Schedule 9, Part 6 Item 4) and diagram 602 (Schedule 9 Part 2 Item 2) to require road users to give way to circulating traffic at the give way line.

Additional signs and markings requirements and advice for mini-roundabouts

5.27 Where the give way sign UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 602 (Schedule 9 Part 2 Item 2) is used, it must be accompanied by the approach to a road junction triangle symbol UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1023A (Schedule 9 Part 6, Item 4) and by the give way marking to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003 (Schedule 9 Part 6 Items 3 and 9).

5.28 Where the swept path of the largest vehicle anticipated to use the junction crosses the inscribed circle, the give way markings for the affected arms shall be moved back such that they are not crossed by the outside edge of the swept path.

NOTE *The largest vehicle anticipated circulating past the entry is used for swept path analysis.*

5.28.1 Where mandatory give way markings (to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003 (Schedule 9 Part 6 Items 3 and 9)) are used at a mini-roundabout, they should be placed in a straight line at right angles to the vehicle path with no part of the marking inside the outer edge of the swept path.

NOTE *Typically, the give way line to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003.3 (Schedule 9 Part 6 Items 3 and 9) is placed on the circumference of the largest circle that can be inscribed within the junction kerbs.*

5.28.2 Where the regulatory sign to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 611.1 (Schedule 9 Part 2 Item 6) is not visible from 50 metres before the give way line or is not conspicuous, an additional sign to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 611.1 (Schedule 9 Part 2 Items 6) should be provided on a kerbed traffic island, together with the mandatory give way sign in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N].

5.28.3 A roundabout warning sign to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 510 (Schedule 2 Part 2 Item 7) should be provided where the visibility distance to the mini-roundabout regulatory sign (diagram 611.1 (Schedule 9 Part 2 Item 6)) is less than 50 metres and an advance direction sign does not precede the junction.

NOTE *Guidance on the design of the ADS is given in TSM Chapter 7 [Ref 16.N].*

5.29 The prescribed mini-roundabout markings must be in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003.4 (Schedule 9 Part 6 Item 5).

5.29.1 The domed white circle should be formed and maintained in white reflectorised materials that provide a clear and durable contrast with the adjacent surface in all conditions.

5.30 Where the white circle is to be edged, only kerbing or edging block of uniform shape shall be used.

5.30.1 Kerbing or edging block of uniform shape with an even surface may be used to contain the white circle provided that it is reflectorised, the maximum height above the road surface at the perimeter does not exceed 6mm and the appearance of the marking is in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1003.4 (Schedule 9 Part 6 Item 5).

NOTE *Types of white circle edging, other than kerbing and edge blocks, can be a hazard, particularly to cyclists.*

- 5.31 Warning lines must be provided on the approaches to kerbed physical islands in accordance with UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 1004 (Schedule 11 Part 4 Item 2) and TSM Chapter 5 [Ref 14.N].
- 5.31.1 The conspicuousness of a mini-roundabout should not rely solely on road markings, which can become worn or less conspicuous in the wet or in adverse lighting conditions.
- NOTE* *Where a build-out is provided, its conspicuousness and that of the junction as a whole can be enhanced if vertical features such as bollards, directional or regulatory signs can safely be located on the build-out while not obstructing the highway / road.*
- 5.31.2 The use of yellow backing boards for a mini-roundabout scheme should be reserved for identified problems of road users not seeing the sign in sufficient time, or not seeing it at all.
- NOTE* *Further guidance on the use of backing boards is provided in TSM Chapter 7 [Ref 16.N].*
- 5.31.3 The use of grey backing boards may be appropriate for enhancing the conspicuousness of the mini-roundabout regulatory sign or where a give way sign to UKSI 2016/362 (TSRGD) [Ref 9.N] diagram 602 (Schedule 9 Part 2 Item 2) is to be co-located with it.
- 5.31.4 Rather than applying backing boards, a larger size of sign may be used to improve the conspicuousness of the sign.
- 5.31.5 When using coloured surfacing as a remedial measure to improve the conspicuousness of a mini-roundabout, the level of contrast between the road markings and adjacent coloured surfacing should be assessed.
- 5.31.6 Coloured surfacing should not be laid in any shape or pattern intended to convey a meaning as a road marking on a mini-roundabout.

A.4 GG 101 Introduction to the DMRB

Design Manual for Roads and Bridges



Llywodraeth Cymru
Welsh Government



General Principles & Scheme Governance
General Information

GG 101

Introduction to the Design Manual for Roads and Bridges

(formerly GG 101 revision 0)

Version 0.1.0

Summary

This document provides information on the use of the Design Manual for Roads and Bridges.

Application by Overseeing Organisations

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

Feedback and Enquiries

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

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
GG 101	0.1.0	September 2021	Core document, England NAA, Northern Ireland NAA	Incremental change to requirements

The document has been amended to clarify the scope of the DMRB to include: works and assets not on the network, clarify the verb forms used within the DMRB, add a requirement for the oversight by the Design Panel or Devolved Administration equivalent, and add a requirement for a justification of any decision to not use recommended or good practice. National Application Annexes have been created for England and Northern Ireland. References to Highways England changed to National Highways.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
GG 101 (2019)	0	June 2018		

Foreword

Publishing information

This document is published by National Highways.

This document supersedes GG 101 revision 0, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

The Design Manual for Roads and Bridges (DMRB) is a suite of documents which contains requirements and advice relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations is highway or road authority.

The DMRB embodies the collective experience of the Overseeing Organisations, their agents, supply chain members and industry bodies. It provides requirements and advice resulting from research, practical experience of constructing and operating motorway and all-purpose trunk roads, and from delivering compliance to legislative requirements.

Assumptions made in the preparation of the DMRB

Competence

The DMRB has been prepared for use by competent practitioners, typically qualified professionals able to work independently in relevant fields, who are expected to apply their own skill and judgement when making decisions involving the information that the DMRB contains.

Link with regulation and legislation

DMRB documents are not statutory or regulatory documents or training manuals; neither do they cover every point in exhaustive detail.

In general, the DMRB does not duplicate National, UK and European legislative requirements. Anyone engaged in works on or relating to the Overseeing Organisations' motorway and all-purpose trunk roads is assumed to understand and comply with the relevant legislation.

Link with the MCHW

The requirements and advice given in DMRB documents are provided on the basis that the works are constructed in accordance with the Manual of Contract Documents for Highway Works (MCHW).

Verbal forms

The verb 'must' indicates a statutory or legislative requirement.

Note: Requirements with this verb form cannot be varied.

The verb 'shall' indicates a requirement of the Overseeing Organisation.

Note: Requirements with this verb form can be only be varied though the use of departures or in limited situations as relaxations.

The verb 'should' indicates advice expressed as a recommendation.

Note: Recommendations with this verb form are good practice and can be varied without recourse to the departures process, but require justification and a safety risk assessment where the recommendation is not followed.

The verb 'may' indicates advice expressed as a permissible approach.

Note: Permissible approaches with this verb form can be varied in accordance with internal review processes without recourse to the Overseeing Organisation.

The verb 'can' or verbs expressed in the present tense other than 'must', 'shall', 'should' and 'may' are used to introduce notes, which provide a short clarification of a concept or statement of fact.

Appendix A provides information about the document referencing used within DMRB documents.

Appendix B provides information about the clause numbering system used within DMRB documents.

Mutual recognition

Where there is a requirement in the DMRB for compliance with any part of a British Standard or other technical specification, that requirement may be met by compliance with:

- 1) a standard or code of practice of a national standards body or equivalent body of any EEA state or Turkey;
- 2) any international standard recognised for use as a standard or code of practice by any EEA state or Turkey;
- 3) a technical specification recognised for use as a standard by a public authority of any EEA state or Turkey; or
- 4) a European Technical Assessment issued in accordance with the procedure set out in regulation (EU) No. 305/2011;

provided that the relevant standard enables an equivalent level of performance and safety to be achieved to that provided for by the stated British Standard or technical specification.

Abbreviations

Abbreviations

Abbreviation	Definition
DMRB	Design Manual for Roads and Bridges
EEA	European Economic Area
MCHW	Manual of Contract Documents for Highway Works
NAA	National Application Annex

Terms and definitions

Terms

Term	Definition
British Standards	Any standard published by the British Standards Institution including adopted European or other international standards.
Bulk departure	Departure where the same non-standard method or material is proposed for use at more than one location in certain clearly defined circumstances.
Departure	Variation or waiving of a requirement carried out in accordance with the Overseeing Organisation's procedures.
Motorway and all-purpose trunk roads	Collective term to indicate those parts of the UK highway and road network for which one of the Overseeing Organisations is highway or road authority.
Overseeing Organisation	<p>The following organisations (or their successors):</p> <ol style="list-style-type: none"> 1. National Highways; 2. Transport Scotland; 3. The Welsh Government; 4. Department for Infrastructure (Northern Ireland). <p>NOTE 1: Where any document within the DMRB refers to any of the above organisations, this can be taken to mean the named organisation or its successors.</p> <p>NOTE 2: Where a local highway/road authority decides to use the DMRB in whole or part for development of its own highway/road network, the Overseeing Organisation is defined in accordance with their own procedures.</p> <p>NOTE 3: This can also be another organisation that assumes the roles, responsibilities and duties of the Overseeing Organisation through delegation by the Overseeing Organisation.</p>
Roads	The term "roads" is used in Northern Ireland and Scotland as an alternative term for "highways".

All standard terms and definitions are in accordance with BS 6100 [Ref 1.] Building and civil engineering - vocabulary. Where the term is not provided in BS 6100 [Ref 1.], it is defined in the document-specific terms and definitions section of the specific document.

All International System of Units, their derivatives and their notation are in accordance with BS EN ISO 80000-1 [Ref 4.].

1. Scope

Aspects covered

1.1 The requirements in this document shall be used in conjunction with all appropriate DMRB documents.

NOTE The requirements in this document cover the following aspects:

- 1) *defining the scope of the DMRB;*
- 2) *provision of general requirements for all DMRB documents;*
- 3) *provision of requirements relating to the application of the DMRB.*

1.2 The requirements of this document shall be used for:

- 1) the appraisal, design, construction, maintenance and operation, inspection and assessment, demolition and disposal of motorway and all-purpose trunk roads for which the Overseeing Organisations is highway or road authority;
- 2) all assets located on Overseeing Organisation land, within the highway boundary;
- 3) all assets located on Overseeing Organisation land, not within the highway boundary; and,
- 4) where appropriate, assets on land leased by the Overseeing Organisation for which the Overseeing Organisation is responsible.

NOTE 1 Overseeing Organisation land can be near to the motorway or all-purpose trunk road network, for example, land containing a maintenance vehicle access roads (which are not public highway), service and rest areas, or drainage balancing ponds remote from the highway.

NOTE 2 Overseeing Organisation assets remote from the motorway or all-purpose trunk road network, can include depots, warehouse buildings, or office buildings.

1.2.1 Requirements may be applied to other roads with the approval of the specific highway or local authority acting as the Overseeing Organisation.

1.2.2 Where these requirements are applied to other roads, the specific highway or local road authority acting as the Overseeing Organisation should decide on the extent to which the requirements are appropriate in any given situation.

Implementation

1.3 Individual documents shall be implemented in accordance with any implementation requirements in a particular DMRB document.

NOTE Failure to implement a document that addresses statutory or legislative obligations can place the Overseeing Organisation at risk of legal action or consequence.

1.4 Where there are no specific implementation requirements in a particular DMRB document, the document shall be implemented immediately after publication except:

- 1) where the contract has reached a stage that, in the opinion of the Overseeing Organisation, use of a new or revised document would result in significant additional expense or delay; or,
- 2) where an existing contract has terms which apply specifically to the implementation of new requirements.

1.5 Where the contract has reached a stage that, in the opinion of the Overseeing Organisation, use of a new or revised document would result in significant additional expense or delay, the decision whether to use a new or revised document shall be recorded in accordance with the Overseeing Organisation's procedure.

1.6 Where the role of Overseeing Organisation has been delegated, the delegated authority shall assume the risks, responsibilities and duties of the Overseeing Organisation to the extent defined by the contract and permitted under National, UK and EU Legislation.

NOTE *Delegated authorities can include contractual vehicles such as DBFO (Design, Build, Finance and Operate) and NRTS (National Roads Telecommunications Services) contracts.*

Health and safety

1.7 Where undertaking any activity that does or can have an impact on safety, either directly or indirectly, for any affected populations, risk assessment and management shall be carried out in accordance with legislation and the procedures set out by the Overseeing Organisations.

Equality, diversity and inclusion

1.8 Where undertaking any activity that can have an impact, either directly or indirectly, on people with protected characteristics, an equality impact assessment (EqIA) screening shall be carried out to determine the applicability of a full EqIA.

1.9 Where the EqIA screening indicates that a full EqIA is needed, an EqIA shall be carried out.

1.10 Where EqIA indicates that people with protected characteristics can be disadvantaged or put at additional risk, solutions to mitigate that impact shall be proposed.

1.10.1 Consultation and engagement with affected people and groups should be carried out to identify solutions or mitigation.

2. Application of the DMRB

2.1 All works, including inspections on motorway and all-purpose trunk roads, on land owned, leased or managed by the Overseeing Organisation shall be undertaken in accordance with DMRB requirements appropriate to the intended use of the asset or road.

NOTE The requirements appropriate to the new use or status of an asset or road are applied where there is a change in use or status. For example, the change in use or status can be improving a road to remove lower mandatory speed limits, or the upgrading of an all-purpose trunk road to motorway.

2.1.1 Where the road is to be reduced in status, e.g. de-trunked or where the works are to be carried out on roads that are not part of the trunk road network and the use of the DMRB could result in significant over-specification, alternative documents such as the Manual for Streets [Ref 3.I] or Designing Streets 2010 [Ref 2.I] may be used with the approval of the Overseeing Organisation.

National Application Annexes of the Overseeing Organisations

2.2 National Application Annexes (NAA) shall be used where they exist.

NOTE 1 NAAs allow Overseeing Organisations to complement, supplement or replace the requirements and advice contained in the main DMRB document.

NOTE 2 Other highway authorities or local authorities can develop their own application annexes to complement, supplement or replace the requirements and advice contained in the main DMRB document.

Departures from requirements

Scope

2.3 Statutory and legislative requirements must always be followed.

NOTE Departures are not applicable to statutory and legislative requirements.

2.4 Where requirements of the Overseeing Organisation are not met, a departure application shall be submitted in accordance with the procedures required by the relevant Overseeing Organisation and approved:

- 1) before the design is finalised; and,
- 2) prior to their incorporation into the works.

2.4.1 Where requirements of the Overseeing Organisation are not met, departures should be submitted where:

- 1) it can be justified that a requirement is inappropriate in a particular situation;
- 2) the application of a requirement would have unintended adverse consequences;
- 3) innovative methods or materials are to be proposed;
- 4) a requirement not in the DMRB, NAA or MCHW is adopted as more appropriate in a particular situation; or,
- 5) an aspect not covered by requirements is identified.

NOTE Departure applications are approved on a location-specific basis and relate to the particular circumstances identified in each submission; however, an approved departure can be quoted to support a new and similar submission.

2.4.2 Bulk departure applications should be submitted in preference to a number of individual departures, where the individual departures share common methods or materials.

2.5 Each departure application shall be approved in accordance with the Overseeing Organisation's procedures before the design is finalised and prior to its incorporation into the works.

NOTE *An approved departure is deemed to meet the Overseeing Organisation's requirements for that element of the works, provided that any mitigation measures proposed or conditional to that approval are also incorporated into the design and works.*

Interactions with local roads

2.6 Where works that will subsequently be adopted by a local highway/road authority are to be carried out by an Overseeing Organisation, any departure applications shall be submitted in accordance with the Overseeing Organisation's requirements for departures.

Departure applications for aspect not covered by requirements

2.7 Where an aspect of the works is not covered by existing requirements, a departure application for an aspect not covered by requirements shall be submitted.

2.7.1 Where an aspect of the works is not covered by existing requirements, the principles of current and relevant guidance should be followed.

Non-compliance with requirements

2.8 Where it is discovered that works have been undertaken that are not in accordance with the requirements of the DMRB or the requirements of a departure, the party responsible for undertaking such works shall amend the works to rectify the non-compliance.

Relaxations

2.9 Relaxations shall only be applied where they are explicitly permitted in a DMRB, NAA or MCHW document and in accordance with the instructions in that document.

2.10 Adoption of a relaxation and its reasoning shall be recorded by the design organisation.

2.11 A departure application shall be submitted for any proposed variation beyond the limits permitted by a relaxation.

Deviation from recommendations

Justification

2.12 A justification shall be developed to support any decision where a recommendation (verb form - should) contained in the DMRB and related NAAs is not followed.

2.13 Justifications to support all design decisions shall be recorded by the design organisation as part of the project record.

2.13.1 The justification should include a comparison of costs / time / resources of the proposed solution to the recommended approach.

2.13.2 Where the decision is made for non-commercial or non-programme (i.e. sustainability, environmental, historical, cultural or aesthetic) reasons, the reasons and their justification should be included.

2.13.3 The justification for deviating from a recommendation may be produced for a single project or alternatively for multiple projects on a scheme, where relevant.

2.13.4 Where the justification for deviating from a recommendation is covered within documents already required by other standards/processes, a reference to the relevant, alternative source may be included in lieu of a detailed description.

NOTE *Examples of other relevant formal procedures are the technical approval process and environmental assessments.*

2.14 Any deviation from a recommendation along with the supporting justification shall be available to the Overseeing Organisation as required.

Safety risk assessment

- 2.15 The justification for deviating from a recommendation shall include a safety risk assessment undertaken in accordance with legislation.

A.5 Warwickshire County Council Departures from Standards

Departures from Standards

1. Introduction

1.1. Purpose of This Document

This procedure has been written for assessing Departures from Standards and for designers preparing submissions. It sets out the process of recording the judgements of the professionals involved in the delivery of the scheme. This procedure may be applied to schemes on non-trunk roads within Warwickshire. For schemes that interface with the trunk road network, the National Highways' processes should be used.

Within this procedure, the term "Designer" refers to Warwickshire County Council's design team or an external Design Organisation. "Highway Authority" can refer to Warwickshire County Council or other local authority clients. Details of the Designer and Highway Authority shall be recorded on the Departure from Standard form (QF045).

1.2. The Benefits of Departures

Departures from standard are often necessary to deliver lean designs that lead to potential cost savings or other forms of "added value", or to resolve issues where there are physical constraints such as available highway land. Departures from standard can enable designs to fit the overarching project objectives, and to take advantage of new innovative techniques.

Despite the range of flexibility with standards that exists with respect to virtually all the significant road design features, there are situations in which the application of even the minimum criteria (including any allowable Relaxations) would result in safety, technical, programme, financial or environmental negative impacts greater than the benefits that would be obtained by incorporating the proposed Departure.

In other circumstances, innovation, cost or performance considerations may result in a Departure being proposed, providing it takes account of durability/maintenance and network resilience considerations and is consistent with current legislation, policy and the long-term route management strategy.

If the proposed design contradicts or is below the Mandatory Requirements of the current standards, or permitted as a Relaxation, then it is a Departure.

When deciding if the Departures process needs to be applied, the designer should compare the design against the Declared Standard, which may not always be the DMRB.

Design standards are developed with future maintenance and whole life costs in mind. Such issues must be considered in any non-standard situation and without effective safeguards there is a possibility that future problems may be built into designs.

Where departures from standard are accepted and implemented, the demonstration of a suitable process and provision of an audit trail is of high importance in defending the decisions taken.

1.3. Legal Position

It is only trunk roads that are required to be designed according to the Design Manual for Roads and Bridges. For all other roads the decisions on the choice of standards and their incorporation into designs remain in the hands of local highway authorities. As the DMRB sets out the current best practice for highway design, it shall be used for the design of highway improvement schemes within Warwickshire.

In the case of risks related to construction of the works or future roadworker activity, the duty under Health and Safety legislation is to reduce risks so that they are “As Low As Reasonably Practicable”. This is reinforced by the CDM Regulations.

Following an accident investigation, the discovery of the implementation of a design that was not in accordance with a recognised standard may be cited as a material consideration in any accusation of a failure in a duty of care. In these circumstances both the Design Organisation and the highway authority would need to be able to demonstrate that they exercised a reasonable level of professional skill and care in the submission and determination of a Departure. The risk of a highway authority being held liable in law is potentially lessened if any Departures from its standards could be shown, via records, to have been adequately considered. The completion of QF045 and an accompanying risk assessment using QF181 will make this process easier and less expensive.

All persons involved in processing a Departure, whether preparing, submitting or determining an application, have a duty and responsibility to apply reasonable professional skill and care to that task.

Other Documents

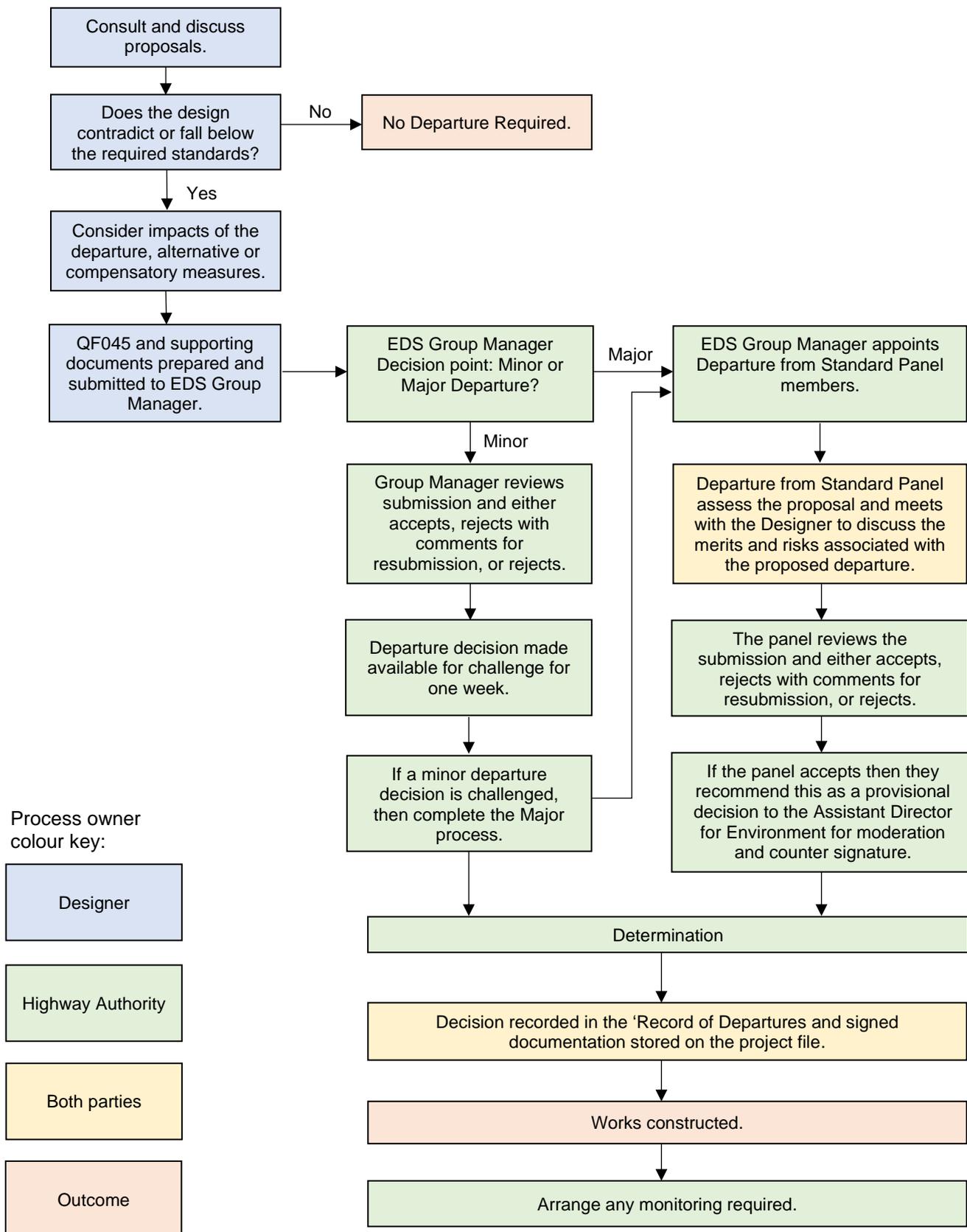
The principle of the departure from standards process is set out in DMRB GG101, and designers should familiarise themselves with this document in conjunction with the procedure set out below.

For highway structures, DMRB CG300 provides additional advice on Departures and technical approval.

2. The Procedure

2.1. Principles

An overview of the Departure from Standard procedure is given below.



2.2. Roles and Responsibilities: Design Organisation

The primary responsibility for the assessment of a proposed Departure lies with the Designer. Design Organisations not appointed by the highway authority (e.g., on developer schemes) should satisfy themselves and the highway authority that they are competent to carry out highway design work of the type submitted and have the appropriate professional indemnity insurance.

All DMRB applicable designs shall be in accordance with the DMRB and/or any alternative WCC Local Highway Authority specific requirements. Applicable design standards must be set out in the Quality Plan as the Declared Standards. The Designer is responsible for the identification of **all** Departures from **all** Declared Standards including **all** aspects not covered by Standards involved in a particular design. Where the process of identification of standards that comprise the Declared Standards has not taken place (by the highway authority), the Designer should at the outset of the design seek clarification from the highway authority of the appropriate standards to use. Departure applications shall be submitted to the Highway Authority using template QF045, or suitable equivalent.

Whilst Designers should be mindful of the design standards it is important that they remain open to the possibility of adding value by proposing designs that may be variants from those presented in standards.

The Designer should assess the risks, negative impacts and benefits involved with a proposed Departure. This assessment process should be recorded on a risk assessment. For schemes where WCC are the designer, QF181 may be used. The assessment should consider safety, technical issues, programme, economic and environmental issues as well as durability, routine and major maintenance requirements, disruption during the works and network resilience. The needs of any group that may be affected should also be considered, for example, residents, businesses, non- motorised users and motorised users.

As part of the assessment of a proposed Departure, Designers should carry out all necessary consultations as advised by the highway authority. All such consultations should be summarised on QF045.

The Designer should be able to confirm that the residual risks are acceptably low and that the negative impacts are outweighed by the benefits associated with the Departure and the benefits associated with the scheme as a whole.

The Designer should compare the proposed Departure with a design fully in accordance with standards. Where a design fully in accordance with standards is clearly not a feasible option, such a design need not necessarily be formally prepared to a detailed level. The level of preparation of a compliant design should be limited to the point that a broad understanding of the likely consequences of a compliant design can be gained

The Designer should consider alternatives and reasons for promoting the proposed option rather than an alternative.

The Designer is responsible for the accuracy, comprehensiveness and validity of the statements made regarding their proposals. By submitting an application for a Departure from Standard, the Designer is indicating that they have used reasonable professional skill and care.

The Designer shall retain responsibility for the quality of design incorporating the Departure, including user safety, buildability, maintainability, compliance with the CDM Regulations and environmental legislation.

2.3. Roles and Responsibilities: Highways Authority

The role of the highway authority is to determine if a Departure, based on the details submitted by the Designer with the QF045, represents a convincing argument that may be brought forward at any future date to assist in explaining the actions taken. The highway authority should be convinced that the case shows that the benefits outweigh any disbenefits. Where impacts cannot be easily monetarised, this requires professional judgement.

In reflecting upon a submission, the highway authority should recognise that firm evidence may not always be available to the Designer, particularly for innovative designs. The absence of firm evidence is not sufficient reason on its own to reject a design concept but may be reason enough to justify a higher level of scrutiny and consultation.

Where a Departure application is found to be incomplete or inaccurate, inadequately prepared or with insufficient justification, it should be rejected and returned to the Designer for revision along with the reasons for rejection. An indication as to whether a Departure may be approvable once additional justification is available should also be given.

Warwickshire County Council Engineering Design Services (WCC EDS) should not compile part or all of a Departure application on behalf of a Designer unless where the design function is undertaken in-house. In this case the normal rules of “distance” between a designer and a client should be applied to ensure an appropriate level of scrutiny and challenge.

In situations where the Designer is not competent to produce the necessary documentation (e.g., some developers with insufficient expertise) then the highway authority should ask the scheme promoter to seek specialist assistance from a suitably competent engineer with highway design expertise and appropriate professional indemnity cover.

2.4. Timing of Departures

The timing of Departure applications should be discussed with the Project Manager who may need to consult with other staff or external advisors. Bearing in mind different procurement routes, key stages may include:

- Entry into programme
- Prior to Public Consultation
- Before completion of preliminary design
- Before completion of detailed design
- After Public Inquiry/before Works Commitment
- In respect of developer-funded highway works, prior to the grant of planning permission for the associated development

The Project Manager is best placed to make decisions on timing because inevitably decisions on Departures are likely to be affected by contractual, financial and programme considerations. Project Managers should satisfy themselves that due weight is given to these issues. Individual standards also normally mandate that Departures are agreed for inclusion in designs before the appropriate design stage is completed and signed-off.

All departures from standard must be determined prior to inviting tenders to minimise the risk of contractual issues.

At the early stages of schemes some design concepts may be insufficiently developed to allow a full risk assessment to be carried out. For example, surveys and investigations may

be ongoing to determine if a structure is to be retained or demolished. In these cases, an agreement in principle may be more useful than a full agreement to a Departure. However, at an appropriate later stage an agreement in principle should be converted into a full Departure determination.

“Retrospective” Departures should not normally be considered, and it is important that design decisions and related standards issues are agreed before site work commences.

“Retrospective” Departures are where a Departure is discovered after construction. In such cases it is likely to be appropriate to use the contractual provisions to determine the desired process. Where the design changes during construction works, any new Departure or any necessary amendment to a pre-works Departure that results from the design change can still be dealt with using this Procedure.

Previous Departure approvals will normally be considered as potentially invalid if one or more of the following apply:

- If the construction works have not commenced within a period of 3 years from Departure approval.
- Where a replacement or complementary Standard has been published.
- If a material change in a scheme design parameter generates additional risk (e.g., if a new traffic forecast shows a material change compared to the previous forecast).
- Where verifiable research or legislation in force affects the basis on which the Departure was approved.
- If either the Designer or highway authority considers that a change in any other factor may affect the previous approval.

3. Assessment of Departures

3.1. Introduction

When all the design issues have been considered and evaluated, a review of the proposed Departure should be carried out by the WCC EDS project team and submitted to EDS' Group Manager for review. The Group Manager will review the proposal and decide if the Departure is minor or major. Major Departures from Standard have the potential for significant or overlapping issues and risks or potential to be controversial and susceptible to challenge.

Minor Departures will be assessed and determined by the EDS Group Manager. The Group Manager's decision will be shared with the designer, the responsible team's Section Manager, Transport and Highways' Service Manager and the Assistant Director for Environment Services who will have a period of one week to challenge the decision. If challenged, the proposal will be treated as a Major Departure.

Major Departures will be assessed by a Departure from Standard Panel and passed to the Assistant Director for Environment Services with a recommendation for acceptance or rejection.

Due to the varying nature of Departures, their interaction with each other and the existing and future route conditions, each Departure is unique. Therefore, there are no rigid criteria as to whether a particular Departure will be approved or rejected. However, the following would normally be among the factors considered during assessment:

- It should be demonstrable that the benefits significantly outweigh any negative impacts of the proposed Departure through a comparison with a design fully in accordance with Standards.
- The avoidance of introducing a discontinuity into the route in terms of its current and known future strategy; e.g., future operational performance requirements.
- The avoidance of a road design that is ambiguous to users. The assessment of this factor will need to take account of the normal range of operating conditions that users can be expected to encounter including varying traffic flows and weather conditions.
- Any significant increase in risk to any user or potential user of the route because of the incorporation of the Departure into the works should be considered for compensatory measures.
- The proposed design should be consistent with scheme objectives, current legislation, authority policy and long-term Route Management / Regional Investment Strategies.

3.2. Departure from Standard Submissions

Submissions for Departures from Standard should consist of a copy of QF045 with the relevant sections completed by the Designer, along with all supporting design drawings, specifications, test reports, product data sheets and other literature. A risk assessment as detailed in section 3.4 must accompany the submission. Copies of a cost benefit analysis and Road Safety Audits may also be required if applicable.

Attachments to the Departure application should be clearly identified and listed (e.g., drawing numbers) so that the reader can ascertain the scope of the submission and the information he is being expected to read.

3.3. Departure from Standard Panel

A panel of three or more professionally qualified and suitably experienced Tier 3 or Tier 4 engineers shall assess Major departure submissions using the criteria set out in 3.1 above. The panel members shall have experience in the field of engineering related to the topic of the proposed departure and should ideally be from outside the project team to ensure an impartial viewpoint. The panel should also include representatives from the Delivery and Commissioning teams.

The panel members should be selected by the EDS Group Manager. A list of potential WCC EDS panel members can be viewed here:

[Departures Panel Members List](#)

The Designer shall meet with the Departure from Standard Panel to discuss the merits and risks associated with the proposed departure. The panel will make a recommendation for the proposed departure to be approved, rejected or rejected with comments for resubmission. If the Panel recommends that a proposal is approved, then it shall be passed to WCC EDS's Assistant Director for Environmental Services for the final decision on whether the proposal is approved or rejected.

If a departure is rejected by either the EDS Group Manager, the Departure from Standard panel or the Assistant Director, then the Designer shall be provided with details of their reasoning for rejecting the proposal. An indication as to whether a Departure may be approvable once additional justification is available should also be given.

Further details on the process of determining departure applications are given in section 4.

3.4. Risk Assessments

The Designer should fully assess the risks associated with Departures being proposed. Risks to road user safety, financial, programme (including land and statutory procedures), environmental and network resilience (e.g., congestion and loss of capacity) should be considered. The Management of Health & Safety Regulations also require that a "suitable and sufficient assessment" is made of risks to people, and in the context of Departures this relates to the safety of operatives and other road based staff during construction, inspection and future maintenance.

For designs prepared in-house by WCC EDS QF181 should be used to assess the risks present by proposed departures from standard.

The most critical element of the risk assessment is the identification of a full range of individual hazards and factors within the design and full consideration of the road user groups, including maintainers, that could be affected. This process should not be treated as an appendage to a design but should be used in preparing an appropriate design. Risk assessments should not only be prepared at the end of the design process as such a process becomes merely one of identifying residual risks. Completing risk assessments at the commencement of the process, and periodically reviewing and updating them throughout the design process will frequently enable risks to be better understood and/or designed-out, thus also reducing the need for Departures.

The Designer should record a summary of the primary design options that have been considered and the reasoning behind rejected options in section 2f of QF045. This approach is useful in demonstrating the thoroughness of the design process.

The overall risk assessment and selection of options should have regard to the intended life

cycle, including construction, operation, maintenance and foreseeable modifications (e.g., where a wide pavement may be needed in the near future it may be preferable to construct the maximum width at the outset, but with hatching to reduce the width in the interim). It may be appropriate to 'trade-off' risks between different stages of the life cycle to obtain the safest solution overall.

3.5. Road Safety Audit

Road safety auditors must be made aware of the prospect of Departures being included in road layout designs before they commence a Road Safety Audit. The input of a road safety auditor should be beneficial to the overall process that includes consideration of safety and non-safety issues.

4. Determination of Departures

4.1. General

The highway authority has three choices when deciding whether to accept a Departure application. It can determine that a Departure be approved, rejected or, if the proposal may be acceptable following alteration or further justification, rejected with comments.

The highway authority may be content to approve a Departure if it believes that:

- a sufficiently strong case has been made by the applicant; and
- the explanation is comprehensible to an outside professional observer with no inherent scheme knowledge; and
- sufficient consultation with stakeholders has been carried out

If a Departure is rejected it would be appropriate to explain the reason for the rejection. If a Departure proposed by a designer other than WCC EDS is rejected with comments, it should be noted that written comments that positively direct the design may attract designer's responsibilities to the highway authority. It would normally be preferable to prompt the designer to consider these issues in the next design iteration. For example, a highway authority may have noted that a proposed traffic sign is inappropriate as a compensatory measure. Rather than the highway authority directly asking for such a sign to be removed from the design it is likely to be preferable for the Design Organisation to be asked to review the need for such a sign with reference to the Traffic Signs Manual and any local policies, e.g., in the cases of signs, any policy on urban design and street clutter.

When a departure is rejected with comments, it is often desirable for the Panel members to reference comments with a numbering system so that they can be easily understood and subsequently managed by the applicant.

5. Monitoring

Post-construction safety monitoring for each scheme should be undertaken in accordance with the contract and include a Stage 3 Safety Audit where appropriate. Acceptance and routine safety inspections should also be undertaken as required by the DMRB and MCHW.

Very occasionally the use of post opening “conflict analysis” may be warranted to allow an early opinion to be formed of the likely accident performance.

The Designer should consider the desirability of safety monitoring or other post-opening monitoring and advise what arrangements are considered desirable.

The highway authority may also advise if a different level of monitoring is required as a condition when approving Departures for more innovative, unusual or contentious schemes. This may be particularly important when a new concept may have wider application in future years.

Where durability of a product in-service is required to be measured, the process put in place should take account of the likely accessibility and techniques for such scrutiny. Additionally, the timeframe should take account of any maintenance periods in contracts and any warranties supplied by manufacturers.

Imprecise statements should be avoided. If a Departure requires specific monitoring, this should be stated and details of responsibility, frequency and duration included in the application or approval comments.

6. Record Keeping

Copies on the completed Departure from Standard documents and all supporting documentation must be stored together on the project file. The outcome of the Departure from Standard assessment shall be recorded on the [Record of Departures](#)

Because Departure records may be called upon in the event of any accident some time after a road opens, it is not uncommon for long periods of storage to be required. Documents should be stored according to WCC’s current policy for document retention. Details should also be stored on the relevant asset management systems in use within the County Highways, Traffic Control and Information Systems and Bridge Maintenance.

A.6 GG 119 Road Safety Audit



General Principles and Scheme Governance
General information

GG 119

Road safety audit

(formerly HD 19/15)

Revision 2

Summary

This document provides the requirements for road safety audit for highway schemes on the trunk road and motorway network.

Application by Overseeing Organisations

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

Feedback and Enquiries

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

This is a controlled document.

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Release notes

Version	Date	Details of amendments
2	Jan 2020	Revision 2 (January 2020) is for an update to superseded references. Revision 1 (January 2019) was for the removal of the health and safety plus equality, diversity and inclusion clauses that are now covered in GG 101. Revision 0 (October 2018) GG 119 replaces HD 19/15. This full document has been re-written to make it compliant with the new Highways England drafting rules. Technical content changes have also been incorporated throughout where relevant.

Foreword

Publishing information

This document is published by Highways England.

This document supersedes HD 19/15, which is withdrawn.

Contractual and legal considerations

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

Introduction

Background

The objective of the road safety audit process is to provide an effective, independent review of the road safety implications of engineering interventions for all road users.

The Overseeing Organisations attach great importance to the improvement of road safety on the motorway and trunk road network. The application of DMRB requirements, that are based on road safety considerations, help achieve this objective.

However, even with the careful application of design standards by competent professionals, the design process will not remove all hazards for road users.

The road safety audit process, as set out in this document, helps manage the interaction of different design requirements for highway schemes.

The objective of road safety audit is to identify aspects of engineering interventions that could give rise to road safety problems and to suggest modifications that could improve road safety. It is important to note that road safety audit is not intended to be a technical check of compliance with design requirements.

Although road safety has always been considered during design, road safety audit has existed for a number of years to provide an independent check that the design characteristics do not contribute to collisions and/or incidents on highway schemes.

Road safety audit is undertaken by staff with experience of collision data analysis, road safety engineering experience and a reasonable understanding of highway design principles such as design requirements and best practice. 2008/96/EC [Ref 1.N] has mandated the road safety audit process and associated qualification requirements across the European Community. It is undertaken at key stages in the design, construction and early operation of a highway scheme.

Although Overseeing Organisations and design teams do not necessarily contain staff with collision data analysis and road safety engineering experience, these organisations play an equally important role alongside road safety audit teams in achieving the objectives of the process. The road safety audit process does not change the Overseeing Organisation's duty to manage safety for all populations and undertake an appropriate level of risk assessment.

This document is sub-divided into sections aimed at the different parties in the road safety audit process. It is expected that all parties will work in partnership (where appropriate) to identify, manage and mitigate the hazards in the most appropriate way.

Assumptions made in the preparation of this document

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

It is assumed that the Overseeing Organisation involved in the road safety audit process will provide the appropriate staff resources and technical support to undertake the process. This may include seeking advice from other appropriate individuals.

It is assumed that staff with the appropriate competency and authority within the Overseeing Organisation will be involved in the decision-making process when responding to RSA and deciding upon subsequent actions.

It is assumed that RSA teams have an awareness of the principles of road design.

It is assumed that RSA teams have an awareness of the principles of road safety risk assessments, and that identified RSA actions will be subject to formal design organisation risk assessments prior to implementation.

It is assumed that the design organisation may not be present to assist in stage 4 road safety audits.

Mutual Recognition

Where there is a requirement in this document for compliance with any part of a "British Standard" or other technical specification, that requirement may be met by compliance with the mutual recognition clause in GG 101 [Ref 2.N].

Abbreviations

Abbreviations

Abbreviation	Definition
TERN	Trans-European Road Network
RSA	Road Safety Audit

Terms and definitions

Terms

Term	Definition
Collision data analysis	The collection and examination of historical road traffic collision data over a period of time in order to identify common trends and factors which can justify corrective action.
Design organisation	The organisation(s) commissioned to undertake various phases of scheme preparation. NOTE 1: At some stages of road safety audit, this can be the contractor.
Exemption file note	A note held on file, produced by the Overseeing Organisation, which includes the reasons why road safety audit is not applicable to a highway scheme. NOTE 1: An exemption file note is not a substitute for the production of a departure from standard where road safety audit is applicable but the process is not applied. NOTE 2: An exemption file note template can be found in Appendix A.
Highway scheme	All works that involve construction of new highway or permanent change to the existing highway layout or features. This is also considered to include the EC Directive 2008/96/EC 2008/96/EC [Ref 1.N] term "Infrastructure Project". NOTE 1: Road safety audit is not applicable to all highway schemes and applicability is determined by the Overseeing Organisation. NOTE 2: The applicability requirements for road safety audit can be found in section 2. NOTE 3: The term highway scheme includes road schemes in Scotland.
Interim road safety audit	The application of the road safety audit process to the whole or part of a highway scheme at any time during its design and construction. Interim road safety audit is neither mandatory nor a substitute for the stage 1, 2, 3 and 4 road safety audits.
Like for like maintenance highway schemes	A highway scheme proposed as maintenance works, that solely involves the replacement or refurbishment of a highway feature with a corresponding feature, which as a minimum, will appear the same, be located in the same position, perform the same and be constructed of comparable materials as the feature it replaces.
Maintaining agent	The organisation responsible for the ongoing maintenance of the motorway and all-purpose trunk road network at the highway scheme location.

Terms (continued)

Term	Definition
Overseeing Organisation specialist	<p>A person from the Overseeing Organisation that has the appropriate training, skills and experience in the road safety discipline.</p> <p>NOTE 1: For Highways England, this will be an appropriate person from the Safer Roads-Design team.</p> <p>NOTE 2: For Transport Scotland this will be the Head of Standards.</p> <p>NOTE 3: For Welsh Government this would be a specialist within the Network Management Division of the Transport Department.</p> <p>NOTE 4: For the Department for Infrastructure Northern Ireland this will be a specialist within the Engineering Directorate.</p>
Road safety audit	<p>The review of highway schemes at the completion of preliminary design, completion of detailed design, the completion of construction and as a post opening monitoring exercise.</p> <p>NOTE 1: At stages 1, 2 and 3 the aim is to identify relevant road safety matters and communicate these in the form of road safety audit problems and recommendations.</p> <p>NOTE 2: At stage 4 the aim is to communicate road safety audit problems and recommendations based on collision data analysis.</p>
Road safety audit action	<p>An agreed action recorded in the road safety audit decision log in response to each road safety audit problem raised.</p>
Road safety audit brief	<p>The instructions to the road safety audit team defining the scope and details of the highway scheme to be subject to road safety audit, including sufficient information for the stage of road safety audit to be undertaken.</p>
Road safety audit decision log	<p>A table within the road safety audit response report to record the road safety audit problems and recommendations, the design organisation and Overseeing Organisation responses and agreed road safety audit actions to road safety audit problems.</p>
Road safety audit problem	<p>An identified road safety matter together with a resultant potential road traffic collision type, identified highway scheme location and summary.</p> <p>NOTE 1: This can include road user injuries where there is no identifiable road traffic collision type.</p> <p>NOTE 2: This includes existing road safety matters where the proposed highway scheme impacts the existing road safety matter or vice versa.</p>
Road safety audit recommendation	<p>A proportionate and viable suggestion for improvement to eliminate or mitigate an identified road safety audit problem.</p> <p>NOTE 1: In some circumstances, the recommendation can include further work to be undertaken by the design organisation to establish an appropriate mitigation measure or improvement.</p>

Terms (continued)

Term	Definition
Road safety audit report	The report produced by the road safety audit team describing any road safety problems identified by the road safety audit team and the associated road safety recommendations.
Road safety audit response report	<p>A report produced by the design organisation following road safety audit stages 1, 2 and 3. The report includes both a design organisation and Overseeing Organisation response to each problem and recommendation raised in the road safety audit report.</p> <p>NOTE 1: The road safety audit decision log is part of the road safety audit response report.</p> <p>NOTE 2: The road safety audit response report is produced collaboratively by the design organisation and Overseeing Organisation.</p> <p>NOTE 3: A road safety audit response report is not produced for stage 4 road safety audits.</p>
Road safety audit site visit	A visit to the location of a proposed or completed highway scheme by the road safety audit team and other invitees.
Road safety audit team	<p>A team that works together on all aspects of the road safety audit, independent of the highway scheme conception, design, construction and operation.</p> <p>NOTE 1: The road safety audit team comprises a road safety audit team leader and at least one road safety audit team member.</p> <p>NOTE 2: The road safety audit team observer is not part of the road safety audit team.</p> <p>NOTE 3: The individuals within the road safety audit team can be drawn from different organisations including the Overseeing Organisation and the design organisation.</p>
Road safety audit team leader	<p>A person with the appropriate training, skills and experience who is approved for a particular highway scheme and road safety audit stage by the Overseeing Organisation.</p> <p>NOTE 1: The road safety audit team leader is responsible for leading the road safety audit team through the process and managing the production of the road safety audit report.</p>
Road safety audit team member	A member of the road safety audit team with the appropriate training, skills and experience necessary for a particular highway scheme and road safety audit stage, working with the road safety audit team leader.
Road safety audit team observer	<p>A person with the appropriate training, skills and experience accompanying the road safety audit team to gain experience of the road safety audit process and/or highway scheme type.</p> <p>NOTE 1: The road safety audit team observer is encouraged to contribute to the road safety audit team discussions.</p>

Terms (continued)

Term	Definition
Road safety engineering	The design and implementation of highway schemes intended to reduce the number and severity of collisions involving road users, drawing on the results of collision data analysis.
Road safety matters	An element of the existing road environment or proposed road environment that could potentially contribute to a road traffic collision or features that could present a risk of injuries to road users.
Road traffic collision	As defined as personal-injury road traffic accident in Reported Road Casualties in Great Britain STATS19 [Ref 3.I].
Specialist advisor	A person approved by the Overseeing Organisation to provide specialist independent advice to the road safety audit team where the scheme includes features outside the experience of the road safety audit team. NOTE 1: Features can include complex traffic signal controlled junctions or smart motorway technology.
Strategic decision	A decision agreed by the Overseeing Organisation on an element that already reflects an appropriate balance of a number of factors including road safety. NOTE 1: This can include items such as route choice, junction type and standard of provision.
Third party organisation	Organisations that are not working on behalf of the Overseeing Organisation and are promoting a highway scheme on the Overseeing Organisation's highway network. NOTE 1: A third party organisation can be a government department, government owned company, developer, local authority, statutory undertaker, private individual, private organisation or consultant working for any of these parties.

1. Scope

Aspects covered

1.1 This document shall be used to implement road safety audit on highway schemes on motorways and all-purpose trunk roads.

NOTE 1 Highway schemes include:

- 1) work carried out under agreement with the Overseeing Organisation resulting from developments that affect the trunk road and motorway network; or*
- 2) a highway scheme being promoted by third party organisations.*

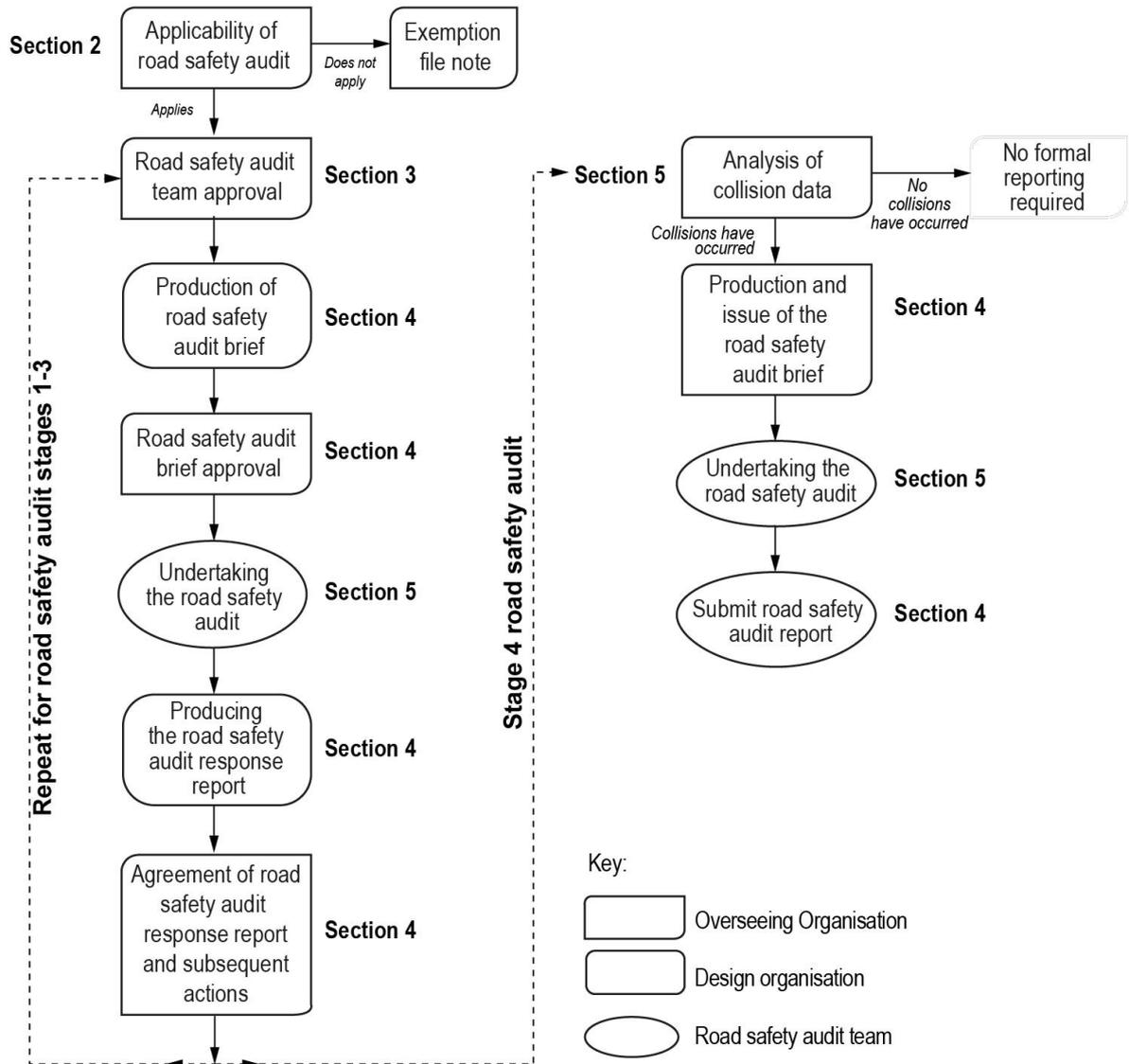
NOTE 2 The operational safety of temporary traffic management for the construction of highway schemes is covered by chapter 8 of the Traffic Signs Manual TSM Chapter 8 [Ref 3.N].

1.2 The Overseeing Organisation shall determine the applicability of road safety audit to highway schemes using section 2 of this document.

1.3 Where road safety audit is applied to a highway scheme, it shall be undertaken at each of the following stages:

- 1) Stage 1 - Completion of preliminary design.
- 2) Stage 2 - Completion of detailed design.
- 3) Stage 3 - Completion of construction.
- 4) Stage 4 - Post opening monitoring.

Figure 1.3 Road safety audit process overview



NOTE Figure 1.3 provides an overview of the road safety audit process and the relevant sections of this document.

Implementation

1.4 This document shall be implemented forthwith on all highway schemes on the Overseeing Organisations' motorway and all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 2.N].

NOTE 1 Like for like maintenance highway schemes are excluded from road safety audit.

NOTE 2 An exemption file note is not required for like for like maintenance highway schemes.

Use of GG 101

1.5 The requirements contained in GG 101 [Ref 2.N] shall be followed in respect of activities covered by this document.

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2. Applicability of road safety audit

Trunk road and motorway network

- 2.1 Where there are physical changes to the highway impacting on road user behaviour or resulting in a change to the outcome of a collision on the trunk road and motorway network, road safety audit (RSA) shall apply, regardless of the procurement method.

NOTE Temporary traffic management and temporary changes to the highway not associated with the construction of a highway scheme, and that last longer than 6 months in duration, are considered to be physical changes to the highway.

- 2.2 RSA shall not apply where a physical change to the highway will not impact on road user behaviour, or change the outcome of a collision on the trunk road and motorway network.
- 2.3 The Overseeing Organisation shall produce an exemption file note to be kept on the scheme file (or equivalent) where there is no need to apply RSA on the trunk road and motorway network.

NOTE An exemption file note template is provided in appendix A.

Trans-European Road Network (TERN)

- 2.4 In accordance with the European Directive on Road Infrastructure Safety Management 2008/96/EC [Ref 1.N], RSA must be applied to highway schemes on the TERN.

3. Road safety audit team requirements

RSA team structure

- 3.1 At all RSA stages the RSA team shall be comprised of the RSA team leader and at least one RSA team member.
- 3.1.1 RSA team observers may observe the RSA team to gain experience in carrying out RSA.
- 3.2 The number of RSA team observers shall be limited to a maximum of two.
- 3.3 The RSA team shall be independent from the highway scheme conception, design, construction and operation.

Specialist advisors

- 3.4 Where required by the RSA team, specialist advisors shall be approved by the Overseeing Organisation.
- 3.5 A specialist advisor shall be independent of the RSA team and highway scheme conception, design, construction and operation.

Audit team approval

- 3.6 The Overseeing Organisation shall approve the proposed RSA team before the RSA is undertaken.
- 3.6.1 The Overseeing Organisation may ask the design organisation to propose a RSA team on their behalf for approval by the Overseeing Organisation.
- 3.7 RSA team approval shall be recorded within the highway scheme file and communicated to the RSA team.
- 3.7.1 Approvals of the RSA team are scheme and RSA stage-specific and the use of personnel or organisations on previous RSAs should not guarantee their suitability to undertake a RSA on other schemes.
- 3.8 Proposed members of the RSA team shall demonstrate their competency by means of a road safety specific curriculum vitae (CV) detailing training, continuing professional development (CPD) and experience.
- 3.8.1 Experience should be relevant to the type of scheme being subject to RSA and identified in the proposed RSA team members' CV.

NOTE 1 *The CPD record in the CV used to demonstrate competence for a proposed member of the RSA team can include other areas such as highway design, traffic management and highway maintenance.*

NOTE 2 *Relevant CPD does not have to take the form of formal training courses.*

NOTE 3 *Outcome-based structured reading, the preparation and presenting of relevant material and work based learning can all form part of a CPD record.*

- 3.8.2 Table 3.8.2 should be used for reference when reviewing the training, CPD and experience of the RSA team:

Table 3.8.2 RSA team competency

	RSA team observer	RSA team member	RSA team leader
Training	10 days of formal collision data analysis or road safety engineering/road design training	10 days of formal collision data analysis or road safety engineering/road design training	10 days of formal collision data analysis or road safety engineering/road design training
CPD	N/A	A minimum of 2 days CPD in the field of RSA, collision data analysis or road safety engineering in the last 12 months	A minimum of 2 days CPD in the field of RSA, collision data analysis or road safety engineering in the last 12 months
Experience	1 year of collision data analysis or road safety engineering/road design experience	2 years of collision data analysis or road safety engineering/road design experience	4 years of collision data analysis or road safety engineering/road design experience
	N/A	5 RSAs completed within the last 24 months as team leader, member or observer	5 RSAs completed within the last 12 months as team leader or member

- NOTE 1* Whilst it is not intended that the RSA team have extensive detailed design knowledge, it is important to include RSA team members with experience or training in road design.
- NOTE 2* Experienced road safety professionals who are proposed for the RSA team can have developed their careers from a range of backgrounds.
- NOTE 3* RSA team observers are not part of the RSA team.
- 3.8.3 Proposed members of the RSA team with the recommended experience of collision data analysis and road safety engineering should not be accepted where this is not evident within the previous 24 months.
- 3.9 At least one individual within the RSA team undertaking RSA on the motorway and/or trunk road network must hold a certificate of competency in RSA in accordance with the requirements of the European Directive on Road Infrastructure Safety Management 2008/96/EC [Ref 1.N], acquired according to appendix G of this document.

4. RSA process requirements

- 4.1 The Overseeing Organisation shall initiate the RSA process at all stages, allowing time for all parties to complete the full RSA process.

Producing the RSA brief

- 4.2 The design organisation shall prepare the RSA brief for submission to the Overseeing Organisation for stage 1, 2 and 3 RSAs.
- 4.3 The Overseeing Organisation shall have responsibility for approving and issuing the RSA brief to the RSA team.
- 4.4 For stage 4 RSAs, and where there is no design organisation available, the Overseeing Organisation shall prepare and approve the RSA brief for submission to the RSA team.

NOTE A RSA brief template is provided in appendix C.

- 4.5 Where the RSA team has identified that the RSA brief is insufficient for their purpose, a request for further information shall be made to the Overseeing Organisation.
- 4.5.1 Any information requested but not supplied to the RSA team should be identified in the introduction to the RSA report.

Producing the RSA report

- 4.6 The RSA team leader shall be responsible for leading the RSA team through the process and managing the production of the RSA report.
- 4.7 The RSA team shall produce and issue a RSA report directly to the Overseeing Organisation for all stages.
- 4.8 Any misinterpretations of the highway scheme proposals shall be identified by the Overseeing Organisation and discussed with the RSA team.
- 4.9 Anything agreed to be outside of, or not covered by the RSA process or RSA brief shall be identified by the Overseeing Organisation and discussed with the RSA team.
- 4.10 Where changes are agreed to a RSA report between the RSA team and Overseeing Organisation, a revised version of the RSA report shall be produced by the RSA team and issued to the Overseeing Organisation.

NOTE A RSA report template for RSA stages 1, 2 and 3 is provided in appendix D.

Producing the RSA response report

- 4.11 A RSA response report shall be produced for stage 1, 2 and 3 RSAs.

NOTE A RSA response report is not be required for stage 4 RSAs.

- 4.12 The design organisation shall manage the production of the RSA response report in collaboration with the Overseeing Organisation.
- 4.13 The RSA response report shall include a summary of the scheme, the stage of RSA, the RSA report document reference and date of the RSA report it relates to.
- 4.14 The RSA response report shall contain details of the representatives from the design organisation who prepared the RSA response report.
- 4.15 The RSA response report shall contain a RSA decision log to include a reiteration of each road safety problem and recommendation made in the RSA report.
- 4.16 The design organisation shall, for each RSA problem and recommendation, do one of the following:
- 1) accept the RSA problem and recommendation made by the RSA team;

- 2) accept the RSA problem raised, but suggest an alternative solution, giving appropriate reasoning; or
- 3) disagree with the RSA problem and recommendation raised, giving appropriate reasoning for rejecting both.

- 4.17 The RSA response report shall contain a response from the Overseeing Organisation and a RSA action for each problem agreed between the design organisation and Overseeing Organisation.
- 4.18 The RSA response report shall be signed by the Overseeing Organisation and design organisation to indicate their agreement on the RSA actions.
- 4.18.1 The RSA response report should be produced and finalised within one month of the issue of the RSA report.

NOTE Appendix F shows a RSA response report and RSA decision log template.

- 4.19 For each RSA action, either the design organisation or Overseeing Organisation shall be responsible for its implementation.

Subsequent actions

- 4.20 The Overseeing Organisation shall keep a record of all RSA reports and RSA response reports on the highway scheme file.
- 4.20.1 The Overseeing Organisation should provide electronic copies of the RSA reports and RSA response reports to the Overseeing Organisation specialist.
- 4.20.2 The Overseeing Organisation should provide an electronic copy of the RSA response report to the RSA team for information.

Repeating a RSA stage

- 4.21 Where the Overseeing Organisation deems a repeat RSA to be necessary, the repeated RSA shall only be concerned with the elements of the scheme that have been changed.

NOTE The design organisation or Overseeing Organisation can request a RSA stage to be repeated where multiple changes or significant changes to the highway scheme are likely to have an impact on road user behaviour or the outcome of a collision.

- 4.22 Stage 1 and stage 2 RSAs shall be repeated if the previous RSA for the relevant stage is more than 5 years old.

Communication

- 4.23 The design organisation and Overseeing Organisation shall agree an appropriate method of communication with the RSA team to maintain the RSA team independence.
- 4.23.1 All communication should be recorded, including minutes of meetings if these are held.

5. Undertaking the road safety audit

Scope of road safety audit

5.1 RSA shall only be concerned with road safety matters.

NOTE 1 RSA is not a technical check that the design conforms to standards and/or best practice guidance.

NOTE 2 RSA is not a check that the scheme has been constructed in accordance with the design.

NOTE 3 RSA does not consider structural safety.

NOTE 4 RSA does not cover health and safety issues concerning road workers during the construction, maintenance and operation of the road.

5.2 Road safety matters resulting from the operation of facilities for highway maintenance that affect road users shall be included in the scope of RSA.

5.3 The needs of all road users shall be assessed when undertaking the RSA.

Road safety audit brief

5.4 The RSA brief shall define the scope of the RSA to be undertaken.

5.5 Where the design of the highway scheme includes strategic decisions, this shall be clearly identified within the RSA brief.

5.5.1 The Overseeing Organisation should give sufficient notice to the RSA team of when the scheme will be ready for RSA and the date by which the RSA report will be required.

5.6 A RSA brief shall be stage-specific.

5.6.1 The RSA brief should contain the relevant information for each stage as identified within appendix C.

Road safety audit report

5.7 At all stages, the RSA team shall prepare a written RSA report.

5.8 The RSA report shall contain a separate statement for each identified RSA problem describing the location and nature of the problem and the type of collisions or road user injuries likely to occur as a result of the problem.

5.9 Each RSA problem shall be followed by an associated RSA recommendation.

5.10 The RSA team shall provide proportionate and viable RSA recommendations to eliminate or mitigate the identified RSA problems.

5.11 RSA recommendations including the words "consider" and "must" shall not be used.

NOTE The use of the word 'must' in RSA recommendations has the potential to be misinterpreted as an instruction from the RSA team.

5.12 Recommendations to 'monitor' shall only be made where a need to supplement the stage 4 RSA is specifically identified in terms of frequency and incidence of particular vehicle manoeuvres or collision contributory factors and the monitoring task can be specifically allocated.

5.13 RSA reports shall include:

- 1) identification of the RSA stage including a unique document reference number and any details of revisions;
- 2) a brief description of the highway scheme including details of its location and its objectives;
- 3) details of who supplied the RSA brief, who approved the RSA brief and who approved the RSA team;
- 4) identification of the RSA team membership as well as the names of others contributing such as the police, maintaining agent and specialist advisors;

- 5) details of who was present at the site visit, the date and time period(s) when it was undertaken and what the site conditions were on the day of the visit (weather, traffic congestion, etc.);
- 6) a location plan based on the scheme plan(s), marked up and referenced to problems and if available, photographs of the problems identified;
- 7) a statement, signed by both the RSA team leader and the RSA team member(s) in the format given in appendix D;
- 8) a list of information provided to the RSA team.

5.14 The RSA team shall not include any issues in the RSA report that have no implications on road user safety or any other items not covered by the RSA brief.

NOTE Examples of inappropriate issues include maintenance defects observed during site visits and health and safety issues.

5.15 The RSA team leader shall report any comments on issues that are not covered by the RSA brief directly to the Overseeing Organisation.

5.15.1 Maintenance defects noted during site visits should be immediately reported directly to the maintaining agent and the Overseeing Organisation.

Stages of road safety audit

5.16 Highway schemes shall be subject to RSA at stages 1, 2, 3 and 4.

NOTE 1 General aspects to be addressed at RSA stages 1, 2 and 3 are provided in the lists in appendix B of this document.

NOTE 2 The lists provided in appendix B are not intended to be exhaustive and provide a prompt for optional supplementary checks.

NOTE 3 A RSA report template is shown in appendix D for stages 1, 2 and 3 and a stage 4 RSA report template is contained in appendix E.

5.16.1 Interim RSA may be applied at stages 1, 2 and 3.

Stage 1 road safety audit - Completion of preliminary design

5.17 Stage 1 RSA shall be undertaken at the completion of preliminary design, (for example at the order publication report stage) before publication of draft orders.

NOTE The end of the preliminary design stage is often the last occasion at which land requirements can have the potential to be changed.

5.17.1 Stage 1 RSA should include road safety matters which have a bearing upon land take, licence or easement before the draft orders are published or planning consent is applied for.

5.17.2 Where preliminary design is not undertaken, a stage 1 RSA may be combined with a stage 2 RSA at the detailed design stage.

5.18 The RSA team shall review the preliminary design information provided with the RSA brief.

NOTE Aspects that typically form the focus of the stage 1 RSA are included as appendix B.

5.19 Site visits shall be carried out in accordance with the requirements under section 5 road safety audit site visits.

Stage 2 road safety audit - Completion of detailed design

5.20 Stage 2 RSA shall be undertaken at the completion of the detailed design stage.

NOTE At stage 2, the RSA team focuses on the more detailed aspects of the highway scheme.

5.21 The RSA team shall review the detailed design information provided with the RSA brief.

- NOTE Aspects that typically form the focus of the stage 2 RSA are included as appendix B.*
- 5.22 The stage 2 RSA shall include a review of the RSA actions in the stage 1 RSA response report.
- 5.23 RSA problems and recommendations relating to incomplete RSA actions in the stage 1 RSA shall be reiterated at the stage 2 RSA.
- 5.24 Site visits shall be carried out in accordance with the requirements under section 5 road safety audit site visits.

Stage 3 road safety audit - Completion of construction

- 5.25 The stage 3 RSA shall be undertaken when the highway scheme construction is complete.
- 5.25.1 The stage 3 RSA should be undertaken before the scheme has opened to avoid the need for the RSA team to traverse the site when fully open to traffic.
- 5.25.2 Where the stage 3 RSA cannot be undertaken before opening, alternative arrangements should be agreed with the Overseeing Organisation.

NOTE Alternative arrangements include the RSA being carried out a short time after opening or in phases where a scheme is subject to phased completion and opening.

- 5.25.3 The RSA team leader should discuss any alterations recommended at the stage 3 RSA with the Overseeing Organisation to give the opportunity for modifications to be undertaken before opening.

NOTE Early implementation of alterations recommended at the stage 3 RSA has the potential to provide a safer working environment for the workforce and minimise delays to road users.

- 5.26 Stage 3 RSAs shall be carried out within 1 month of opening unless otherwise agreed with the Overseeing Organisation.
- 5.27 RSA problems and recommendations raised in the stage 1 and stage 2 RSA shall be reviewed at the stage 3 RSA and reiterated if the associated RSA actions are not complete.
- 5.28 The RSA team shall review the information provided with the RSA brief.
- NOTE Aspects that typically form the focus of the stage 3 RSA are included as appendix B.*
- 5.29 Site visits shall be carried out in accordance with the requirements under section 5 Road safety audit site visits.
- 5.29.1 Where there is an accessibility issue that restricts the RSA team from accessing areas of the site, reference to this should be included in the introduction of the RSA report.

NOTE An example of an accessibility issue is an area of live motorway that cannot be accessed on foot.

- 5.30 The RSA team shall examine the highway scheme from the viewpoints of all road users.
- 5.30.1 The RSA team may decide to drive, walk, cycle and/or ride a horse through the scheme to assist their evaluation.
- 5.31 The RSA team shall visit the site together in daylight and during the hours of darkness.

NOTE The purpose of a site visit during darkness is to identify hazards specific to night time operation.

Stage 4 road safety audit - Post-opening monitoring

- 5.32 The Overseeing Organisation shall arrange for stage 4 RSA to be undertaken.
- NOTE The stage 4 RSA is an evidence-led review of road traffic collisions that have occurred in the vicinity of the highway scheme.*
- 5.33 Stage 4 RSA shall be carried out using 12 months of validated post highway scheme-opening road traffic collision data.

- NOTE 1* Stage 4 RSAs are carried out so that any post highway scheme-opening road safety matters can be identified and remedial action taken.
- NOTE 2* The lag in availability of validated road traffic collision data means the RSA can occur later than 12 months from the opening of the highway scheme.
- NOTE 3* The availability of validated road traffic collision data varies depending on the individual Overseeing Organisation.
- 5.34 A stage 4 RSA report shall be produced where road traffic collisions have been recorded in the vicinity of the highway scheme over the 12 month period of validated road traffic collision data.
- NOTE* A stage 4 RSA report is not needed where no road traffic collisions have been recorded in the vicinity of the highway scheme over the 12 month period of post-opening validated road traffic collision data.
- 5.35 If the Overseeing Organisation decides not to proceed further with the stage 4 RSA reporting, this decision shall be recorded, and kept on the highway scheme file (or equivalent).
- 5.36 Where a stage 4 RSA report is required, a RSA brief shall be prepared and issued to the RSA team by the Overseeing Organisation.
- 5.36.1 The production of the RSA brief may be delegated to the design organisation where they are retained post highway scheme completion.
- 5.36.2 Where there have been highway layout changes following the period the scheme first became operational, the stage 4 RSA brief should make reference to these changes.
- 5.36.3 Where operational data exists, this should be provided with the RSA brief to enable the RSA team to understand the implications of any road safety matters that have not resulted in reported collisions.
- 5.37 The stage 4 RSA report shall include any RSA problems indicated by the road traffic collision data analysis and operational data, and where necessary, include RSA recommendations for remedial action.
- NOTE* A stage 4 RSA report template is provided in appendix E.
- 5.38 During the stage 4 RSA, road traffic collision data shall be analysed in detail by the RSA team to identify:
- 1) higher than expected numbers of road traffic collisions that have occurred since the scheme became operational (when compared to control data);
 - 2) locations at which road traffic collisions have occurred; and
 - 3) road traffic collisions that appear to arise from similar causes or show common factors or trends.
- 5.38.1 The analysis of road traffic collision data should include identification of changes in the collision trends in terms of number, rate (taking account of any traffic flow changes), types and other collision variables, and comparisons with control data.
- 5.39 The RSA team shall visit the sites of highway schemes if characteristics within the road traffic collision data show:
- 1) higher than expected numbers of road traffic collisions have occurred since the scheme became operational (when compared to control data); or
 - 2) the road traffic collision rate or severity has increased since the scheme became operational; or
 - 3) common trends (e.g. a high frequency of road traffic collisions during the hours of darkness or on a wet road surface); or
 - 4) road safety matters related to vulnerable road users.
- 5.39.1 Where a site visit is needed, the RSA team should decide if the road traffic collision data analysis justifies an inspection during a particular time period and record their decision making within the RSA report.
- NOTE* A particular time period could be during the hours of darkness or a peak period.

Road safety audit site visits

5.40 Site visits shall be carried out by all members of the RSA team together.

5.41 Site visits shall be limited to a maximum of 6 people.

NOTE Site visit numbers include the RSA team and any additional specialist advisors, police and maintaining agent representatives.

5.42 Table 5.42 shall be used for determining site visit requirements for each RSA stage:

Table 5.42 RSA site visit requirements

RSA stage	Visits	Attendees	Invitees
Stage 1	Daytime	RSA team	As determined by RSA team
Stage 2	Daytime		
Stage 3	Daytime and darkness		Police representative Maintaining agent representative
Stage 4	As required by clause 5.39 (section 5, stage 4 road safety audit - post-opening monitoring)	RSA team	As determined by RSA team

NOTE Police and maintaining agent representation can be included at all stages of RSA if deemed beneficial and approved by the Overseeing Organisation.

5.43 The RSA team shall determine the need to vary the time of the site visit to observe specific traffic conditions at all stages of RSA.

NOTE Specific traffic conditions can include peak periods, the beginning or end of the school day or during frequent events.

Interim RSA

5.44 The Overseeing Organisation shall decide whether to undertake an interim RSA.

NOTE 1 Interim RSA can provide the benefit of early identification of potential road safety problems leading to savings in both programme and design costs.

NOTE 2 Interim RSA is particularly beneficial to larger projects with accelerated programmes, such as highway schemes involving early contractor involvement.

NOTE 3 Interim RSA supplements the RSA at stages 1, 2 and 3.

NOTE 4 Interim RSA does not replace a particular stage of RSA.

5.45 The RSA process for an interim RSA shall be completed in accordance with the requirements of the relevant RSA stage.

5.45.1 Interim RSA may be undertaken during the construction process with the agreement of the Overseeing Organisation.

5.45.2 Elements of the constructed scheme may be subjected to interim RSA, when works are partially complete or when individual elements or sections of the scheme are complete and opened to road users in stages.

Third party organisation-led RSA

5.46 Where third party organisation-led schemes have the potential to result in highway schemes on the trunk road and motorway network, the process set out in this document shall be followed for all stages of RSA including appointment and approval of the RSA team.

NOTE The highway scheme can be designed by an organisation working for the third-party organisation rather than an organisation working for the Overseeing Organisation.

5.46.1 A stage 1 RSA report should be undertaken before planning consent is applied for as this demonstrates that the potential for road user safety issues has been addressed.

NOTE The third party organisation-led scheme is submitted for planning approval to the local planning authority and, where there are highway implications, the highway or Overseeing Organisation is consulted.

6. Certificate of competency curriculum

Training and assessment

6.1 The curriculum core modules provided in appendix G shall be used to provide appropriate RSA certificate of competency training and assessment.

NOTE 1 There are two routes through which a certificate of competency can be obtained – a portfolio of evidence route or a training route.

NOTE 2 Details of the two routes are also provided in appendix G.

Authorisation of certificate of competency

6.2 Organisations wishing to offer a certificate of competency shall have their assessment and certification processes reviewed and accepted in writing by the Highways England Safer Roads-Design team.

NOTE Highways England's Safer Roads-Design team fulfils this role on behalf of the other Overseeing Organisations.

6.3 Organisations offering a certificate of competency training course shall be independent of the candidate's employer.

6.4 Prior to the issue of a certificate of competency, organisations offering a training course shall assess the candidate's suitability as RSA team member and RSA team leader against the training, skills and experience guidance in section 3.

Certificate of competency validity

6.5 The certificate of competency shall not have a finite validity period.

NOTE It is not intended that holding a certificate of competency will require a mandatory membership of an organisation.

Certificates of competency awarded before implementation of EC Directive

6.6 Certificates of competency awarded before the implementation of the 2008/96/EC [Ref 1.N] shall be recognised.

6.6.1 Certificates of competency in RSA awarded in other European Union countries outside the UK may be acceptable.

7. Normative references

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

Ref 1.N	2008/96/EC, 'Directive 2008/96/EC of the European Parliament and of the Council of 19 November 2008 on road infrastructure safety management '
Ref 2.N	Highways England. GG 101, 'Introduction to the Design Manual for Roads and Bridges'
Ref 3.N	The Stationery Office. TSM Chapter 8, 'Traffic Signs Manual Chapter 8 - Road works and temporary situations'

8. Informative references

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

Ref 1.l	The Stationery Office. Legislation.gov.uk. CM&CHA 2007, 'Corporate Manslaughter and Corporate Homicide Act (2007)'
Ref 2.l	The National Archives. legislation.gov.uk. Highways Act 1980, 'Highways Act 1980'
Ref 3.l	gov.uk. STATS19, 'Reported road casualties in Great Britain'
Ref 4.l	National Policing Improvement Agency. Association of Chief Police Officers. RDIM, 'Road Death Investigation Manual'
Ref 5.l	The National Archives. legislation.gov.uk. Road Traffic Act 1988, 'Road Traffic Act 1988'
Ref 6.l	The Stationery Office. Roads(S) 1984, 'Roads (Scotland) Act 1984'
Ref 7.l	Highways England. GG 142, 'Walking, cycling and horse-riding assessment and review'

A.7 CD 123 Geometric Design of Priority Junctions



Road Layout
Design

CD 123

Geometric design of at-grade priority and signal-controlled junctions

(formerly TD 41/95, TD 42/95, TD 40/94, and those parts of TD 50/04 and TD 70/08 relating to priority and signal-controlled junctions.)

Version 2.1.0

Summary

This document provides requirements for the geometric design of at-grade priority and signal-controlled junctions.

Application by Overseeing Organisations

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

Feedback and Enquiries

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

This is a controlled document.

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Latest release notes

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 123	2.1.0	November 2021	Core document	Incremental change to requirements

Revision 2.1.0 – the scope of use for direct accesses has been expanded to include single use public utilities site and single use highway maintenance site; the definition of a through-route now includes 'for public use'; new geometrical parameters for such junctions where right turns out of the minor road are prevented have been included; the minimum spacing distance between the end of dual carriageway to a priority junction has been reduced from 1km to 500 metres (para 2.11); the way that traditional relaxation clauses are presented has been updated to be clearer; plus various wording improvement/corrections.

Previous versions

Document code	Version number	Date of publication of relevant change	Changes made to	Type of change
CD 123	2	August 2020		
CD 123	1	June 2020		
CD 123	1	January 2020		
CD 123	0	August 2019		

Foreword

Publishing information

This document is published by National Highways.

This document supersedes TD 41/95 and TD 42/95. In combination with CD 122 [Ref 4.N], this document supersedes TD 40/94. In combination with CD 116 [Ref 1.I], this document supersedes TD 50/04. This document also supersedes elements of TD 70/08 that relate to priority and signal-controlled junctions.

Contractual and legal considerations

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

Introduction

Background

This document provides requirements and advice on the geometrical design of at-grade priority and signal-controlled junctions.

In addition to signal controlled junctions, this document provides a single point of reference for the geometric design of at-grade priority junctions that has been historically split across a number of documents. It merges and rationalises the content of TD 41/95 and TD 42/95 and incorporates the priority junction elements of compact grade separated junctions and wide single 2+1 lanes, which were previously covered by TD 40/94 and TD 70/08 respectively.

In order to remove duplication across the various types of priority junctions defined by the previous documents, priority junctions are now formed of two key elements. These two elements are the priority junction (the layout of the minor road arm) and the major road central treatment (the layout of the major road aspect of the junction, e.g. a ghost island arrangement). This approach allows for flexibility of varying the form of the layout of the minor road and/or major road while removing the repetition and ambiguity resulting from the entire junction being treated as a single component in the previous documents.

In order to rationalise and remove duplication between direct access layouts, the definition of a direct access is now only used for a single field, single dwelling, single-use public utilities site or single-use highway maintenance site. A priority junction is for anything greater; however, the requirements/advice for a priority junction differ depending on whether the road provides a through route or not (i.e. an entrance to a business park or development). (i.e. an entrance to a business park or development).

Other notable changes/additions from the previous documents listed above include:

- 1) advice on permitting particular movements at single lane dualling and dual carriageway priority junctions (predominantly relating to the right turns out of the minor road), along with new geometrical parameters for such junctions where right turns out of the minor road are prevented;
- 2) expanded advice on the use of nearside passing bays, including recommended dimensions; and,
- 3) improvements made to the way visibility splays are defined at priority junctions to ensure that a full splay is provided rather than just a line of visibility from the minor road set back point.

Assumptions made in the preparation of this document

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

Abbreviations

Abbreviations

Abbreviation	Definition
AADT	Annual average daily traffic
ASL	Advance stop-line
HGV	Heavy goods vehicle
SLD	Single lane dualling
SSD	Stopping sight distance
S2	Single carriageway cross-section, 1 lane each direction (see CD 127 [Ref 1.N])
WS2	Wide single-carriageway cross-section, 1 lane each direction (see CD 127 [Ref 1.N])
WS2+1	Wide single 2+1 carriageway cross-section, 2 lanes one direction, 1 lane opposing direction (see CD 127 [Ref 1.N])

Terms and definitions

Terms

Term	Definition
Auxiliary lane	An additional lane provided on the nearside of the major road carriageway at junctions to increase merge or diverge opportunity and/or provide additional space for weaving traffic.
Changeover	A carriageway layout which effects a change in the designated use of the middle lane of a WS2+1 road from one direction of traffic to the opposite direction.
Collector road	A road separate to the junction which collects other local roads and accesses into a link that connects to the minor road in advance of the junction.
Compact grade separated junction	A grade separated junction designed with a two-way unsegregated connector road between the major and minor road. The connector road joins the major road via a priority junction designed to this document.
Corner taper	A short taper following the corner radius provided to accommodate the swept path of larger vehicles.
Crossroads	For the purpose of this document, crossroad junctions are where the centre line of a minor road, when extended across the major road, fits within the carriageway of an opposing priority junction.
Design vehicle	The design vehicle for at-grade priority and signal controlled junctions is a 16.5 metres long articulated heavy goods vehicle (HGV).
Desirable minimum stopping sight distance	Desirable minimum stopping sight distance (SSD) is as defined in CD 109 [Ref 5.N].
Direct access	A connection to an all-purpose trunk road providing access to only one of the following, which does not provide a through route: 1) a single dwelling; 2) a single field; 3) a single-use public utilities site (such as an electric substation) where access is needed for maintenance of that specific site only; or, 4) a single-use highway maintenance site (such as an attenuation pond) where access is needed for maintenance of that specific site only.
Duplicate primary signal(s)	Where there is more than one primary signal, additional signals erected to the offside are duplicate primary signal(s).
Ghost island	A major road central treatment that uses road markings to create an additional lane to allow traffic waiting to turn right from the major road into the minor road to do so without impeding through traffic movement.

Terms (continued)

Term	Definition
Hatched area	An area of road marking hatching used to discourage and/or channel vehicle movements.
Intervisibility zone	The area within a signal-controlled junction that ensures road users can see other road users (including pedestrians) between each stop line.
Major road central treatment	A collective term for the central treatments associated with ghost island, single lane dualling or dual carriageway junctions.
Major road	A road on which traffic has priority of movement over adjoining roads.
Minor road	A road on which traffic concedes priority to traffic on the major road.
Overtaking sections	Sections of two-lane single carriageway where the combination of horizontal and vertical alignment, visibility and or width is such that there are clear opportunities for overtaking using the opposing lane, as described in CD 109 [Ref 5.N].
Phase	The sequence of conditions applied to one or more streams of vehicular traffic or pedestrian traffic which always receive identical light signal indications.
Primary signal	A light signal erected near the stop line. NOTE: Where there is more than one signal located near a stop line, the signal on the nearside is the primary signal.
Priority junction	A junction controlled by a 'Give Way' or 'Stop' arrangement. NOTE 1: Stop arrangements are only used where there are severe visibility restrictions. NOTE 2: Direct accesses can operate in a similar manner but are not classed as priority junctions. NOTE 3: A priority junction can include a merge taper where the formal 'Give Way' road marking is replaced by an edge of carriageway road marking.
Reservoir length	The length required for queuing between the opposing arms of a staggered junction.
Rural roads	Rural roads are as defined in CD 109 [Ref 5.N].
Secondary signal	Traffic signals located beyond the primary signal, facing the same direction of traffic flow. NOTE: The information given by a secondary signal is the same as that given by the primary signal with which it is associated, but additional information compatible with that of the primary can also be given.
Signal-controlled junction	A junction that has full or part-time signals on one or more of its arms.

Terms (continued)

Term	Definition
Simple priority junction	A form of priority junction where there is no major road central treatment, such as a ghost island or single lane dualling, and no merging/diverging tapers or auxiliary lanes.
Single lane dualling	A single carriageway major road central treatment that uses physical traffic islands to provide space for right turning movements in and/or out of the minor road in order to not impede through traffic movement.
Stagger distance	The distance along the major road between the centre lines of the two minor roads at a staggered junction.
Staggered junction	A junction arrangement where the major road is continuous through the junction and two opposing minor roads form priority junctions that are offset from one another. NOTE: Two opposing priority junctions are not staggered when the layout of any central treatments do not overlap or the junction spacing is greater than the major road SSD.
Storage length	Storage length is the length over which vehicles can queue without causing obstruction to, or being obstructed by, vehicles in the adjacent lane.
Swept path	The swept path of a vehicle is the movement and path of different parts of a vehicle when that vehicle is undertaking a turning manoeuvre. It is the envelope swept out by the sides of the vehicle body, or any other part of the structure of the vehicle.
Taper merge / diverge	An area of additional carriageway that is tapered to/from the major road, which is provided on the nearside of the major road carriageway at junctions to increase merge or diverge opportunity.
Through route	A road that is for public use, which provides a connection to the wider road network. NOTE: A road that does not form part of a through route requires a road user to access and leave a site through the same junction.
Traffic island	A traffic island is a raised (kerbed) or marked-off area on the road. NOTE: A traffic island can be used to accommodate pedestrian refuges and traffic signals, and as a means of separating lanes of traffic or opposing traffic flows.
Urban roads	Urban roads are as defined in CD 109 [Ref 5.N].
WS2+1 roads	A wide single carriageway road with two lanes of travel in one direction and a single lane in the opposite direction, with a 1 metre hatch separating opposing traffic flows.

1. Scope

Aspects covered

- 1.1 This document shall be used for the geometric design of at-grade priority junctions and signal-controlled junctions.

NOTE 1 This document is applicable to both new and improved junctions.

NOTE 2 This document does not cover the general provision of walking, cycling and horse riding facilities at at-grade priority junctions. Requirements and advice relating to this are provided in CD 143 [Ref 3.N] and CD 195 [Ref 2.N].

- 1.2 This document shall be used for the geometric design of the priority junction element of a compact grade separated junction.

NOTE Requirements for the link road element of a compact grade separated junction are provided in CD 122 [Ref 4.N].

Implementation

- 1.3 This document shall be implemented forthwith on all schemes involving the geometric design of at-grade priority and/or signal controlled junctions on the Overseeing Organisations' all-purpose trunk roads according to the implementation requirements of GG 101 [Ref 6.N].

Use of GG 101

- 1.4 The requirements contained in GG 101 [Ref 6.N] shall be followed in respect of activities covered by this document.

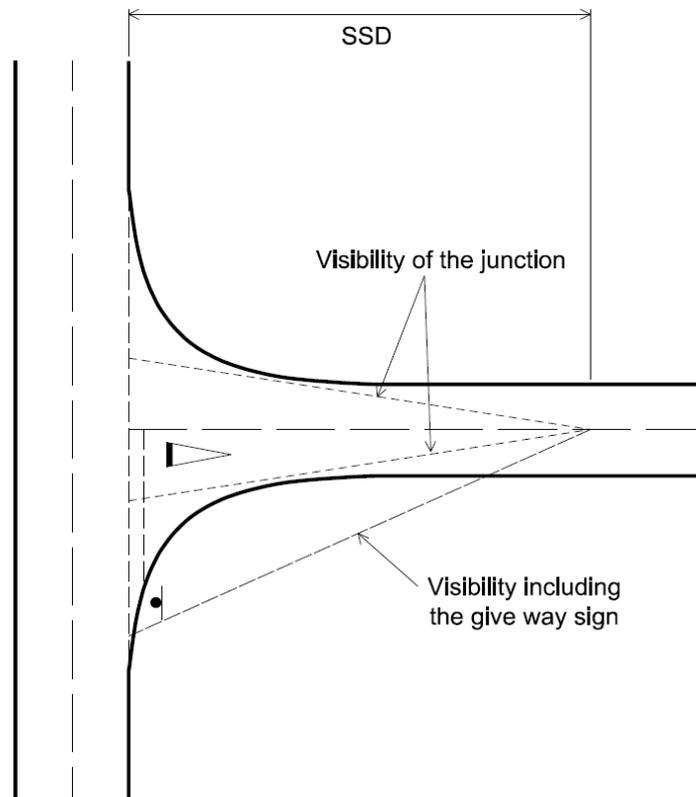
3. Visibility

Minor road approach visibility

Priority junctions

- 3.1 On a minor road approach to a priority junction, there shall be unobstructed visibility of the junction from a distance corresponding to the desirable minimum SSD for the design speed of the minor road, including the 'give way' sign where present, as illustrated in Figure 3.1.

Figure 3.1 Priority junction approach SSD visibility



NOTE SSD is measured from the eye heights and to the object heights given in CD 109 [Ref 5.N].

- 3.2 An approaching road user shall be able to clearly see the junction form from a minimum distance of 15 metres back along the centreline of the minor road, measured from the continuation of the line of the nearside edge of the running carriageway of the major road (as illustrated in Figure 3.2a and 3.2b).

Figure 3.2a Priority junction approach visibility

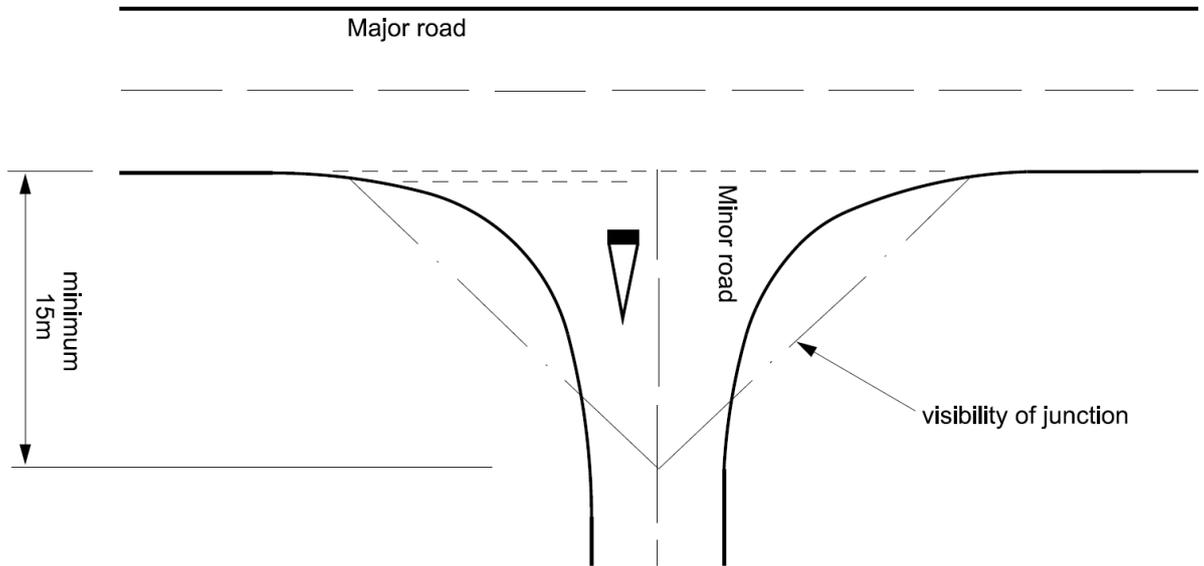
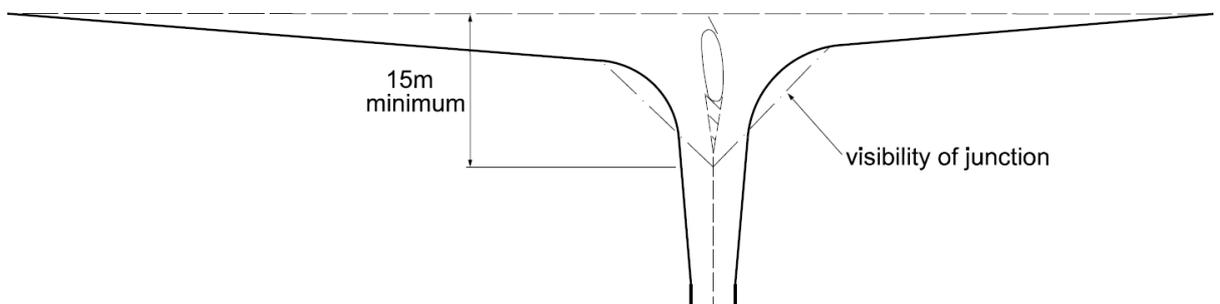


Figure 3.2b Priority junction approach visibility (incorporating tapers on the mainline and traffic island on the minor road)



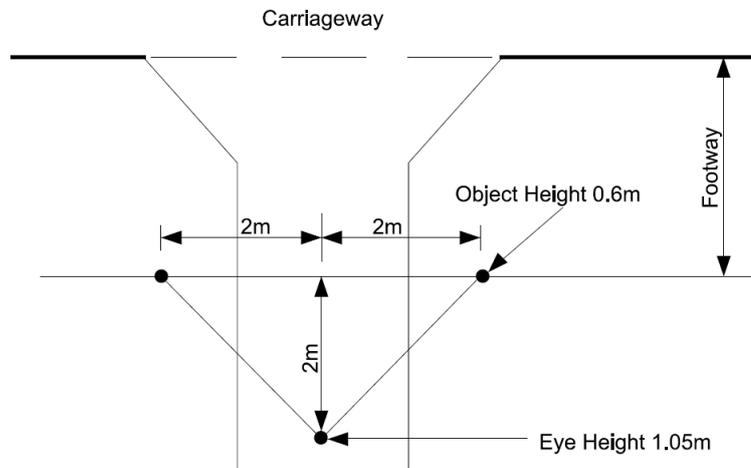
NOTE 1 The 15 metre measurement is from the continuation of the line of the nearside edge of the running carriageway not the continuation of the back of the major road hard strip if present.

NOTE 2 Visibility is measured from the eye heights and to the object heights using the envelope of visibility in CD 109 [Ref 5.N].

Direct accesses

3.3 Where a direct access crosses a footway, a visibility splay shall be provided in accordance with Figure 3.3.

Figure 3.3 Visibility at the back of footway crossing



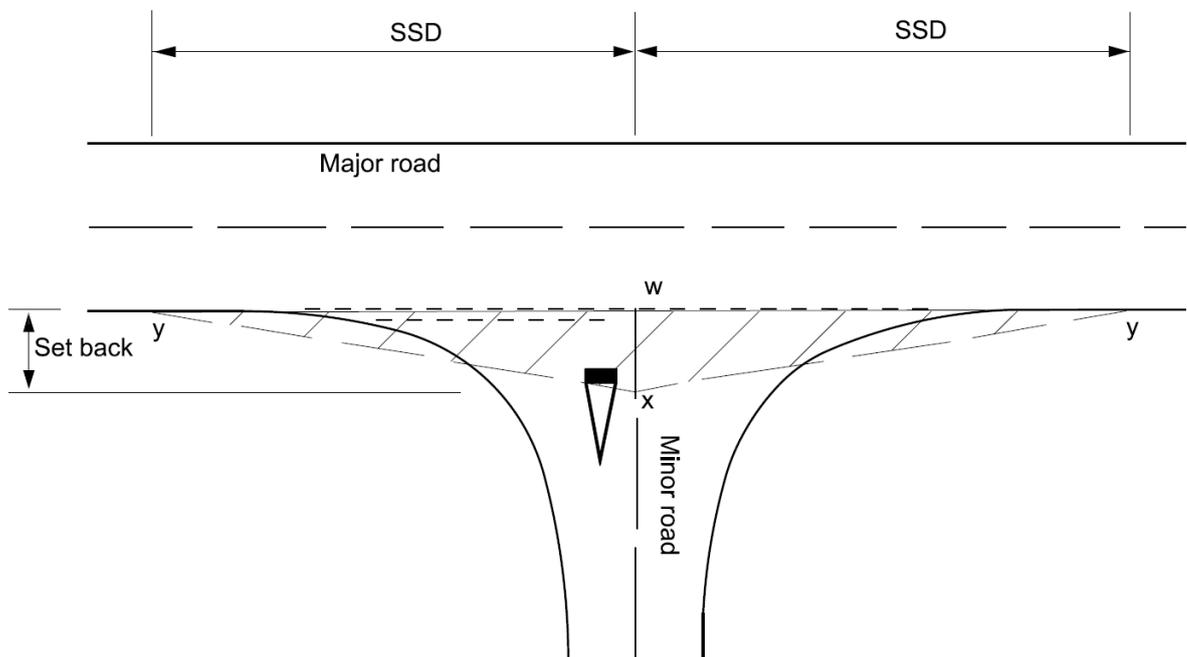
Junction visibility

Measurement of visibility at minor roads and direct accesses

3.4 Unobstructed visibility shall be provided at all priority junctions and direct accesses by a visibility splay formed between the following three points, as illustrated in Figure 3.4:

- 1) a point W corresponding to the intersection point between the minor road centreline and the major road edge of carriageway;
- 2) a point X setback along the minor road centreline measured from the continuation of the line of the nearside edge of the running carriageway of the major road; and,
- 3) a point Y on the major road nearside edge of carriageway, corresponding to the desirable minimum SSD for the speed of the major road measured along the edge of the major road carriageway from point W.

Figure 3.4 Priority junction visibility splays

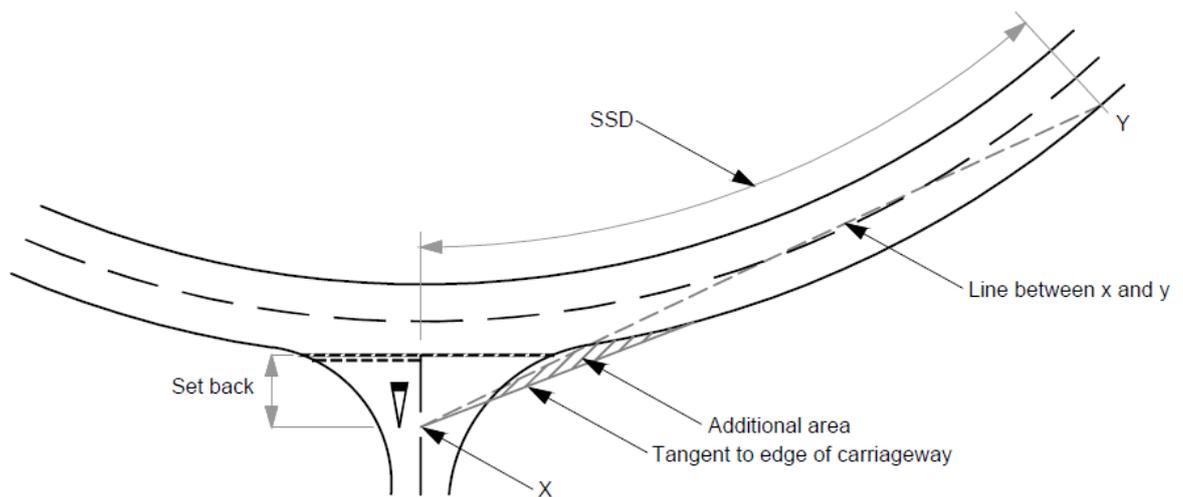


- NOTE 1* Visibility is measured from the eye heights and to the object heights given in CD 109 [Ref 5.N].
- NOTE 2* The visibility splays shown are for a junction where left and right splays are required.
- NOTE 3* Where there are hard strips on the major road, point X is measured from the continuation of the line of the nearside edge of the running carriageway of the major road.
- NOTE 4* Inappropriate positioning of lay-bys, bus stops, traffic signs and other street furniture can result in obstruction to visibility splay.
- NOTE 5* Parked vehicles can obstruct visibility splays and where necessary restrictions can be introduced to mitigate this risk.
- 3.5 The speed of the major road for determining point Y in the visibility splay shall be based on:
- 1) design speed only for direct accesses and priority junctions on new major roads;
 - 2) design speed only for priority junctions that form part of a through route on existing major roads; and,
 - 3) design speed or speed measurement for direct accesses and priority junctions that do not form part of a through route on existing major roads.
- NOTE* Speed measurement of an existing major road involves calculating the 85th percentile speed of traffic.
- 3.6 A visibility splay to the right on the minor road shall be provided:
- 1) at all priority junctions and direct accesses where minor road traffic can join a 2-way major road; and,
 - 2) at all priority junctions and direct accesses where minor road traffic can turn left to join a 1-way major road.
- 3.6.1 Visibility splays to the right on the minor road should also be provided at priority junctions and direct access where minor road traffic can turn right to join a 1-way major road and there are contraflow provisions (e.g. for cyclists).
- 3.7 A visibility splay to the left on the minor road shall be provided:
- 1) at all priority junctions and direct accesses where minor road traffic join a 2-way single carriageway major road;
 - 2) at all priority junctions and direct accesses where minor road traffic can turn right to join a 2-way dual-carriageway road and the central reserve gap is not wide enough to accommodate a waiting design vehicle; and,
 - 3) at priority junctions and direct accesses where minor road traffic can turn right to join a 1-way major road.
- 3.7.1 Visibility splays to the left on a 1-way road should also be provided at priority junctions and direct access where minor road traffic can turn left to join a 1-way major road and there are contraflow provisions (e.g. for cyclists).
- NOTE* Where the minor road is one way leading from the major road, no visibility splays for vehicles turning out of the minor road are required as these movements are not permitted.
- 3.7.2 On a 1-way major road, visibility splays may be provided in both directions for vehicles turning out of the minor road.
- NOTE* Visibility splays in both directions at a 1-way major road provides a level of future proofing, and accommodates potential traffic management arrangements.
- 3.8 The minimum distance used to locate point X shall satisfy one of the following:
- 1) for direct access:
 - a) 4.5 metres; or,
 - b) 2.0 metres.
 - 2) for simple priority junctions:

- a) 9.0 metres; or,
- b) 2.4 metres.
- 3) for all other priority junctions:
 - a) 9.0 metres; or,
 - b) 4.5 metres.

- 3.8.1 The minimum distance used to locate point X should be in accordance with a) for each junction/access type.
- 3.8.2 Where it is not feasible to locate point X fully in accordance with a), the minimum distance used to locate point X should be as close to a) as practicable, but no less than b).
- 3.9 Where the line between points X and Y falls partially within the major road carriageway, an additional area shall be added to the visibility splay formed by drawing a line from X to a point tangential to the nearer edge of the major road running carriageway, as illustrated in Figure 3.9.

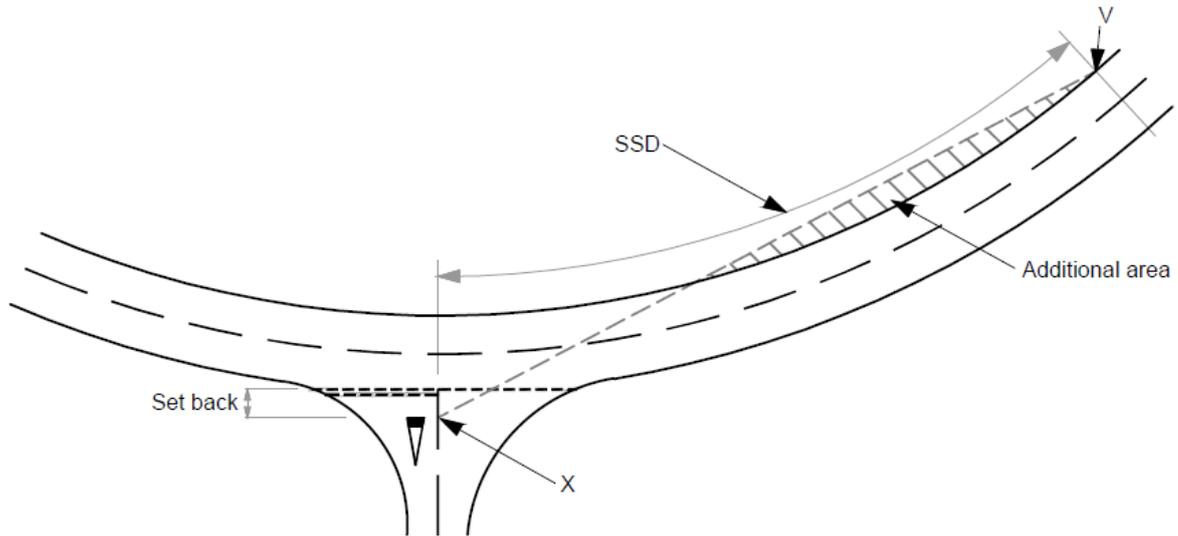
Figure 3.9 Additional area of visibility on the outside of a curved major road



NOTE *The additional area of visibility on the outside of the curve (as illustrated in Figure 3.9) applies to both the left and right of a priority junction/direct access.*

- 3.10 Where a priority junction/direct access is located on the outside of a major road curve, an additional area shall be added to the visibility splay in the verge on the inside of the major road curve, formed by a line between the following two points, as illustrated in Figure 3.10:
 - 1) a point X at a set back distance of 2.4 m; and,
 - 2) a point V on the major road offside edge of running carriageway, corresponding to the desirable minimum SSD for the speed of the major road.

Figure 3.10 Additional area of visibility on the inside of a curved major road



NOTE 1 The additional area of visibility on the inside of the curve (as illustrated in Figure 3.10) applies to both the left and right of a priority junction/direct access.

NOTE 2 Where there are hard strips on the major road, point V is measured to the nearside edge of the running carriageway not the back of the major road hard strip.

NOTE 3 Providing the additional visibility in the verge on the inside of a major road curve allows drivers to see the full extent of the carriageway and approaching vehicles for the desirable minimum SSD.

3.11 The desirable minimum SSD at all priority junctions shall not be available from an X distance greater than 9 metres.

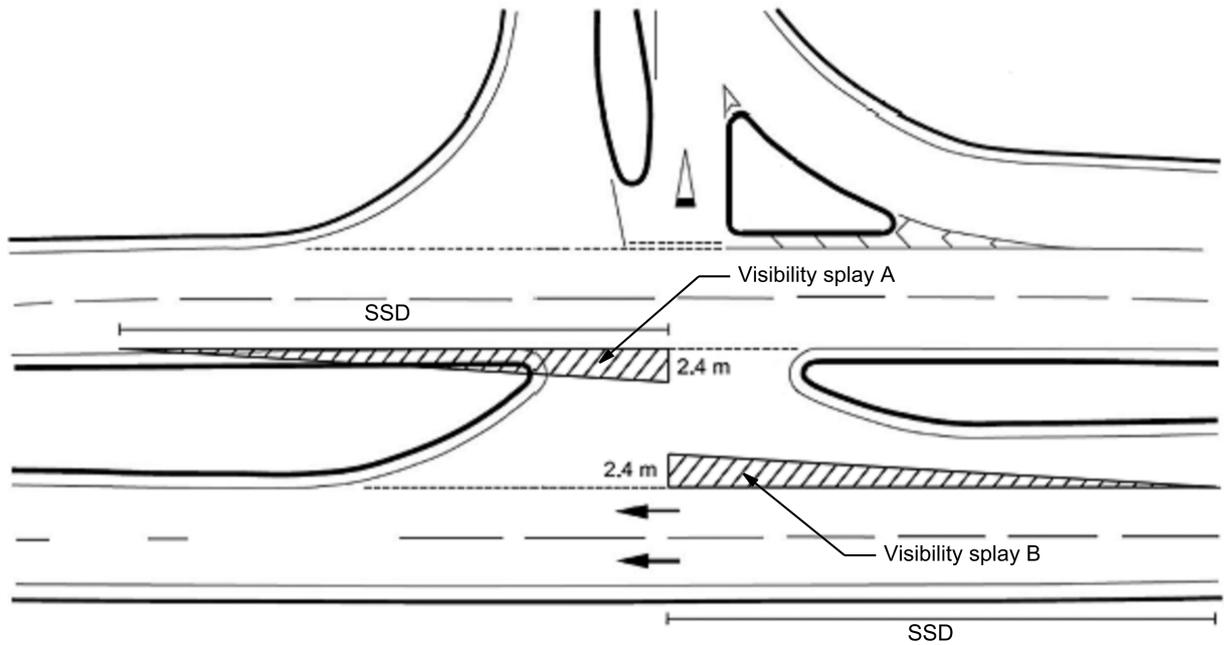
NOTE In open areas, it can be necessary to artificially restrict the visibility splay to prevent the desirable minimum SSD being available from an X distance of greater than 9 metres.

Measurement of visibility in the central reserve

3.12 Unobstructed visibility shall be provided in the centre of the major road, on dual carriageway and SLD junctions where right turns are permitted, by a visibility splay formed between the following three points, as illustrated in Figure 3.12:

- 1) the intersection point between the centre of the opening and the offside edge of major road carriageway;
- 2) a point 2.4 metre setback along the centre of the opening measured from the continuation of the line of the offside edge of the running carriageway of the major road; and,
- 3) a point Y on the major road offside edge of carriageway, corresponding to the desirable minimum SSD for the design speed of the major road measured from the 2.4 metre setback point.

Figure 3.12 Central reserve visibility splays



NOTE Visibility is measured from the eye heights and to the object heights given in CD 109 [Ref 5.N].

3.13 Visibility splays in the central reserve of dual carriageways or SLD shall be provided in the following circumstances:

- 1) visibility splay A, as illustrated in Figure 3.12, where right turn into the minor road is permitted/and/or;
- 2) visibility splay B, as illustrated in Figure 3.12, where right turn out of the minor road is permitted.

A.8 TRL Report – Traffic Calming in Villages on Major Roads



Traffic calming in villages on major roads: Final report

**Prepared for Charging and Local Transport Division,
Department of the Environment, Transport and the Regions**

A H Wheeler and M C Taylor

Executive Summary

In 1994 the Village Speed Control (VISP) Working Group reported on its initiative which examined ways of reducing the speed of traffic passing through villages. A range of techniques was considered but the success of many of the schemes in reducing speeds was limited, especially those schemes lacking physical measures or any measures in the village itself.

Changes to legislation and special authorisation procedures now enable local authorities to install a wider range of measures in villages on busy roads. This Report describes research to assess the effectiveness of more comprehensive schemes, especially those with physical measures, which have been applied to roads carrying high levels of traffic, particularly of heavy vehicles. These schemes aim to reduce 85th percentile speeds at least to the village speed limit, and thereby to improve safety and the quality of life for local residents.

All but one of the schemes assessed were developed by the Highways Agency and its agents, then the relevant Local Highway Authorities. The research to monitor scheme effectiveness was undertaken by TRL under contract to the Charging and Local Transport Division of the Department of the Environment, Transport and the Regions.

Schemes on the main roads through nine villages across England were assessed. All but one scheme was on a trunk road and several had two-way daily flows of more than around 10,000 vehicles; the weekday percentage of heavy vehicles ranged from 10-20%. The scheme at Costessey is on minor roads but was included since those roads carry lorries accessing local gravel pits. The villages varied widely in size and population. Four villages already had a 30mph speed limit in force but at two, the national (60mph) speed limit applied. After scheme installation, no speed limit exceeded 40mph. The schemes were installed between 1995 and 1997.

All of the schemes involved village gateways. These mainly comprised prominent signing and marking measures, together with an area of coloured surfacing. Measures involving physical narrowing were introduced at some gateways. The most common features employed within the villages themselves were repeated patches of coloured surfacing and coloured areas along the centre of the road with centre lining/hatching superimposed. Extensive physical measures were introduced in Costessey (speed cushions, one-way working narrowings, flat-top hump); Craven Arms (speed cushions, mini-roundabouts); and Thorney (chicanes, mini-roundabout).

Before and After monitoring was undertaken to establish the effect of the schemes on traffic speeds and flow. At the three schemes with extensive physical measures, surveys of vehicle and traffic noise and of public opinions were also undertaken. Additionally, noise was measured at Hayton, and vehicle journey times and ground-borne vibration were recorded at Craven Arms and Thorney. The results were as follows:

- i As was expected, neither traffic flows nor the proportion of heavy vehicles was affected by the introduction of the schemes. In Costessey, however, the use of speed cushions and carriageway narrowings appeared to stem an expected increase in flow levels.
- ii Vehicle speeds have been reduced almost everywhere. 85th percentile speeds decreased by between 3mph and 15mph, both inbound at gateways, and in the villages themselves. However, they remained above the new/retained speed limit, albeit generally by only a few mph within the village. Mean speed reductions were generally up to about 2mph less than reductions in 85th percentile speeds.
- iii The use of a range of different measures in combination makes it difficult to compare their effect, especially as some schemes were accompanied by a reduction in the speed limit. Large speed reductions at the gateways occurred with physical measures but reductions of the order of 10mph also occurred where there was signing and marking at the gateway with a strong visual impact. Additional approach signing was beneficial, as was speed camera signing.
- iv Within the villages, physical measures resulted in mean and 85th percentile speed reductions of 7-12mph. Without such measures, reductions were more modest and large proportions of vehicles still exceeded the speed limit at some locations. The addition of speed cameras had a small effect. At Costessey, the speed cushions reduced speeds and maintained them at a constant level, through optimum spacing.
- v Outbound speeds at gateways were also reduced (but to a lesser extent than inbound speeds) and speeds were often reduced most at night and at weekends. This reflects the fact that the speeds of the faster vehicles tended to be affected the most. Only a small erosion in speed reductions was observed after one year, suggesting that the measures studied are likely to have long term impact. Where monitored, journey times increased with the introduction of the measures. This has resulted, at Craven Arms, in concern by the fire and ambulance services over increased response times.
- vi The speed reductions resulted directly in decreased noise levels where noise was measured. Maximum vehicle noise levels, for light and for heavy vehicles, reduced by up to about 10dB(A), and traffic noise levels reduced typically by up to about 5dB(A). However, many village residents believed that noise levels had in fact increased. This was thought to be due to: an increase in the number of short-duration, high noise events, resulting for example from heavy vehicles 'clipping' speed cushions; changes in driver behaviour or the use of different surface materials causing a change in the characteristics of noise

emitted; and variability of low frequency noise from heavy vehicles. These properties may be perceived as annoying, especially at night.

- vii Heavy vehicles at Craven Arms produced ‘worst case’ vibration levels in a house near the speed cushions no greater than those generated by normal household activities, and below the threshold for human perception. However, the soil conditions in Thorney resulted in peak levels of ground-borne vibration in a house adjacent to the imprinted surface at the gateway which marginally exceeded the threshold for human perception. The level was nowhere near that which would result in structural damage.
- viii Reactions from residents in the villages with schemes comprising extensive physical measures were less encouraging than the measured speed reductions would have suggested. Even quite large speed reductions seemed not to be widely recognised. In Costessey, villagers were disappointed that speeds had not been brought down below the new 20mph speed limit; in Thorney, plans for a long-awaited bypass had recently been scrapped and this probably influenced views.
- ix Despite residents’ limited enthusiasm for the schemes, some of the component measures were regarded favourably, but the preferred measures varied from scheme to scheme. In all three villages with extensive physical measures, about 40% of residents expressed concern about the appearance of the scheme.
- x The results indicate a small overall reduction (not statistically significant) in injury accident frequency in the periods immediately following scheme installation (between 1 and 3 years). The reduction for the three schemes with extensive physical measures is greater (about 25%). However, there is a much stronger indication of a reduction in accident severity, with only one serious accident occurring since scheme installation, across all 9 schemes.

Conclusions and recommendations

- i The size of the speed reductions following the installation of a traffic calming scheme at a village on a main road is likely to be affected by the pre-existing speed limit, the magnitude of the Before speeds, the new speed limit and the traffic calming measures used.
- ii Signing and marking measures can bring about large speed reductions at entries to villages on trunk roads, when used in combination to give high visual impact. Repeated use through the village can also reduce speeds there but is unlikely to achieve 85th percentile speeds below the posted speed limit.
- iii Speed cushions, mini-roundabouts and chicanes can be used in trunk road villages to bring about greater speed reductions than signing and marking measures alone. However, care is needed, particularly with the design and siting of vertical deflections, where there are high flows of heavy vehicles or emergency service vehicles,

or where the soil type is especially prone to transmit vibration. It is important that measures are appropriately spaced, so as to induce constant speeds.

- iv Narrow cushions, 1.5m wide, allow heavy vehicles and emergency vehicles to straddle them. They can be effective in bringing mean speeds down to below 30mph but the results presented here support other work which suggests that they are unsuitable for reducing speeds to 20mph.
- v Residents are unlikely to be satisfied with schemes that do not achieve their expectations of reducing speeds below the new/retained speed limit and it is important not to raise their hopes unrealistically. They often do not perceive even quite large reductions in vehicle speeds and noise levels, with changes in the characteristics of the noise generated apparently nullifying reductions in overall noise levels in terms of the annoyance created.
- vi It is possible that, if the improvement in accident severity that is apparent to date is sustained, this may help to influence residents’ views for the better.
- vii As far as the design of new traffic calming schemes in villages is concerned, the study has highlighted the importance of involving residents in the development of schemes and providing them with an understanding of what can be achieved. Inevitably there will usually be a trade-off between scheme effectiveness (in terms of vehicle speed and accident reduction) and potential unwanted effects (such as visual intrusion). The optimum solution will vary widely according to the situation.

A.9 CD 109 Highway Link Design



Road Layout
Design

CD 109

Highway link design

(formerly TD 9/93, TD 70/08)

Revision 1

Summary

This document provides requirements and advice for all aspects of highway link design to be used for both new and improved all-purpose and motorway trunk roads including connector roads.

Application by Overseeing Organisations

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

Feedback and Enquiries

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

This is a controlled document.

Table 2.10 Design speed related parameters

Design speed kph	120	100	85	70	60	50	V ² /R
Stopping sight distance (metres)							
Desirable minimum	295	215	160	120	90	70	-
One step below desirable minimum	215	160	120	90	70	50	-
Horizontal curvature (metres)							
Minimum R* with adverse camber and without transitions	2880	2040	1440	1020	720	520	5
Minimum R* with superelevation of 2.5%	2040	1440	1020	720	510	360	7.07
Minimum R* with superelevation of 3.5%	1440	1020	720	510	360	255	10
Desirable minimum R (superelevation 5%)	1020	720	510	360	255	180	14.14
One step below desirable Minimum R (superelevation 7%)	720	510	360	255	180	127	20
Two steps below desirable minimum radius (superelevation 7%)	510	360	255	180	127	90	28.28
Vertical curvature							
Desirable minimum* crest K value	182	100	55	30	17	10	-
One step below desirable min crest K value	100	55	30	17	10	6.5	-
Desirable minimum sag K value	37	26	20	20	13	9	-
Overtaking sight distances							
Full overtaking sight distance FOSD (metres)	-	580	490	410	345	290	-
FOSD overtaking crest K value	-	400	285	200	142	100	-
* Not recommended for use in the design of single carriageways (see Section 9)							
The V ² /R values shown above simply represent a convenient means of identifying the relative levels of design parameters, irrespective of design speed.							

Appendix B – LCC S278 Email

Rogers, Timothy

From: Gailey, Stewart
Sent: 31 July 2023 14:45
To: Rogers, Timothy; Stevens, Neil
Cc: Yeates, Steve (CSDP)
Subject: RE: Lancashire County Council
Attachments:

Hi Timothy

The comments below are generic and should be considered as part of any formal section 278 submission.

As part of the initial section 278 technical submission the following minimum details will be required:-

- Full construction details, including layout and levels.
- All layout plans to have scale bars.
- Copy of the planning permission decision notice.
- Copy of the planning application's approved site location plan with the site edged red.
- The developers address; contact name; telephone number and email address.

Following the initial section 278 technical submission or as part of a more detailed section 278 technical submission the following details may also be required [this list is not exhaustive]:-

- A street lighting assessment/design for the extents of the section 278 works.
- Confirmation the utility companies been consulted on the proposed works and the depth of the services in the new site access have been agreed. [can be provided when works start on site].
- A copy of the CBR results at the centre of the site access / 25m centres for the full length of any land to be dedicated as highway. [can be provided when works start on site].
- An independent Stage 2 safety Audit and designer's response.
- Specific details for all works associated with the site access and off-site works (bus stops, signals, traffic regulation orders etc).

The highway construction to be to the current Lancashire County Council Specification for Estate Roads and Lancashire County Councils Surfacing Matrix and Pavement Construction requirements. Further information and advice can be found at www.lancashire.gov.uk/media/81452/EstateRoads.pdf

Before our legal section can be instructed to draft a section 278 agreement the following information is required : -

- The attached "Model 1 initial Instructions sheet" needs to be completed.
- A PDF copy of the HM Land Registry documents (plans and text) for all of the land associated with the approved planning application.
- A PDF copy of the coloured "S278 Land Plan", to be coloured as the attached S278 diagrammatic Land Plan.
 - Full sight boundary to be edged in red (within developers land ownership)

- Works within existing adopted highway, edged in brown
 - All land to be dedicated as highway to be in solid pink (within developers land ownership)
 - Drawing to be titled "S278 Land Plan at *****".
- All details to be clearly seen when printed on A3 paper (use inserts where appropriate).

The following additional agreements may also be required before the section 278 agreement can be entered [this list is not exhaustive]:-

- A copy of the consent to discharge from the Environment Agency for work within the banks of any main river
- A copy of the consent to discharge from the Flood Risk Management Team at Lancashire County Council for work within the banks of any ordinary watercourse from suds@lancashire.gov.uk
- A copy of the consent to connect to a Highway drainage system from highways@lancashire.gov.uk
- A copy of the consent from United Utilities for the additional highway drainage connections
- A Structures agreement has been entered with Lancashire County Council as part of the Section 278 process

Please note – before any works begin within the adopted highway: -

- The scheme must be technically approved.
- The Certificate of Estimated Costs for Design Check and Supervision, to be paid.
- The section 278 legal agreement must be signed.
- The Road Space Booking Form (PA1) has to be registered with the Highway Regulation Team.
- The New Roads & Street Works permit has to be issued by the Highway Regulation Team.

The following attachments have been included within the email:-

- S278 Road Space Booking Form (PA1) #
 - S278 diagrammatic Land Plan .
 - S278 Model 1 Instructions Sheet
- # only to be returned filled in when the entering of the S278 agreement is imminent.

Design check and inspection fees

Our finance section will be instructed to issues our invoice for the design check and inspection fees for the section 278 works when we receive the developers address, contact name and email address to forward our invoice.

Street Lighting

To allow the street lighting to be assessed please provide an AutoCAD . DWG file for the site access and off-site access

Lancashire County Council's Street Lighting Section are offering a service for the design for the street lighting if you would like a quotation for the street lighting design, please provide a location plan in DWG format and the post code for the site and forward to:-

Area West (Chorley, Fylde, Preston, South Ribble, West Lancs and Wyre)
Barrie Stoddard at Barrie.stoddard@lancashire.gov.uk

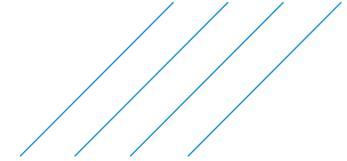
Area East (Burnley, Hyndburn, Lancaster, Pendle, Ribble Valley and Rossendale)

Paul Allen at Paul.Allen@lancashire.gov.uk

Lancashire County Council's Operations Section are offering a service for the installation of the street lighting. If you would like a quotation for the installation the street lighting and details of the smaller infrastructure works being offered, please contact Kevin Reedy at kevin.reedy@lancashire.gov.uk for a quotation. Lancashire County Council's Operations Section will need to be employed as a sub-contractor.

Stewart Gailey
Highway Development Control Engineer
Section 278/38
Highways and Transport
Lancashire County Council
01772 530162
www.lancashire.gov.uk

Appendix C – Local Evidence on Design Departures

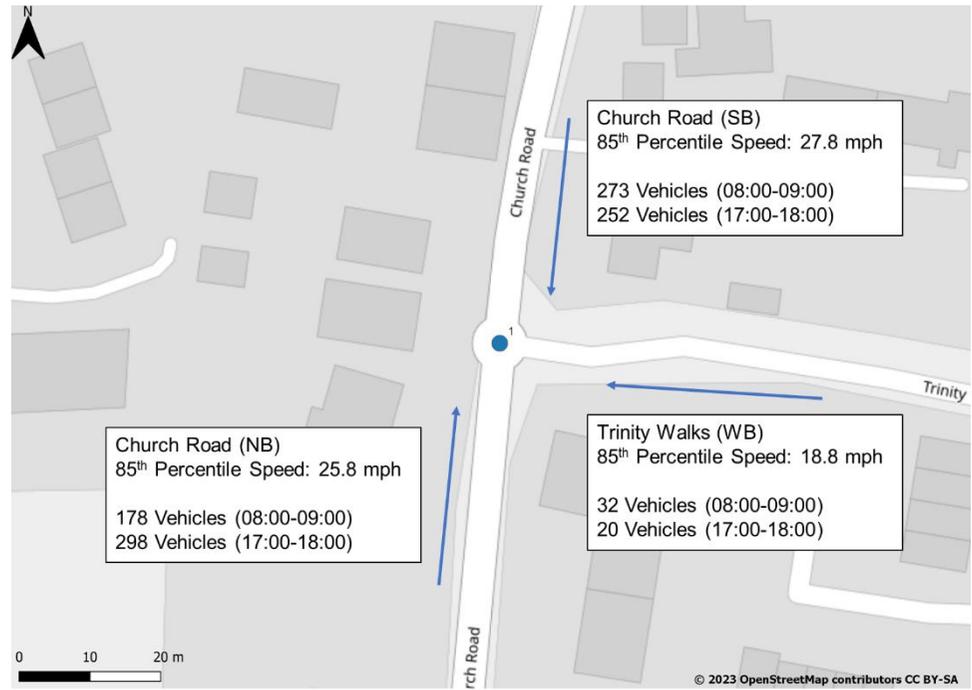


ID	Junction Name	Total Junction Flow 2023 (AM Peak Hour)	Total Junction Flow 2023 (PM Peak Hour)	Average 85 th Percentile Speed (All Approach Arms)	DMRB CD 116 Compliant? (Visibility to the Right)	PIA Record (2017 – 2021)		
						Slight	Serious	Fatal
N/A	A581/Ulnes Walton Lane (Existing Layout)	1102	1156	31.0	N/A	1	1	0
N/A	A581/Ulnes Walton Lane (Proposed Layout)	1375*	1433*	N/A	No	N/A	N/A	N/A
1	Church Road/Trinity Walks	483	570	24.1	No	1	0	0
2	Church Road/Gorse Lane	843	892	24.9	No	0	0	0
3	Station Road	726	727	27.1	No	0	0	0
4	Aughton Street/B5197	1110	1264	27.6	No	2	0	0
5	Fielding Lane/High Street	433	387	28.8	No	1	0	0
6	Brunshaw Road/Brownside Road	991	917	27.3	No	0	0	0
7	Red Lane/Birtwistle Avenue	537	441	23.9	No	0	0	0
8	West End Road/Balmoral Road	499	540	26.1	No	1	0	0
9	Torrisholme Road/Scale Hall Lane	1063	922	26.5	No	1	0	0
10	A581/Leyland Lane	1627	1537	30.1	No	1	0	0

*2026 with Development Scenario

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
1	Church Road/Trinity Walks	345066, 420330	6km	1	0	0

Location Plan	85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)
----------------------	--



100
Millimetres
0 10



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Licence No. AL1000 18595

Key:

Existing visibility to the right

----- Required visibility to the right (9.0m set back)

----- Achievable visibility to the right (9.0m set back)

Notes:

1. Preliminary design only - based on Ordnance Survey data.

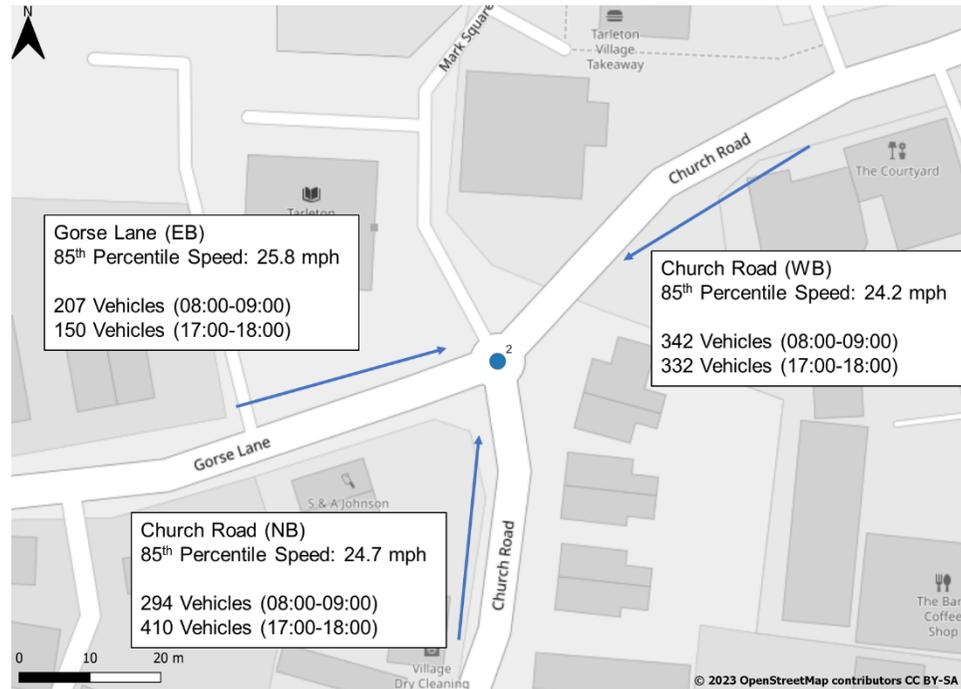
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:			
CONSTRUCTION			
NONE			
MAINTENANCE/CLEANING			
NONE			
DECOMMISSIONING/DEMOLITION			
NONE			
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			
Rev.	Date	Description	By
P1	03.07.23	DRAWING CREATED	AE
			Chk'd
			App'd

Drawing Status		S2		Project Title		HMP GARTH	
FOR INFORMATION				Drawing Title		EXISTING JUNCTION VISIBILITIES CHURCH ROAD/TRINITY WALKS	
ATKINS		2 Chamberlain Square Birmingham West Midlands B3 3AX		Scale		1:250	
Copyright © Atkins Limited (2023)		Tel: +44 (0)1214 835000 Fax: +44 (0)1214 835252 www.atkinglobal.com		Designed		AE	
Client		MINISTRY OF JUSTICE		Date		03.07.23	
				Drawn		AE	
				Checked		TR	
				Date		03.07.23	
				Authorised		SY	
				Date		03.07.23	
				Project Ref. No.		P1	
				Originator		GARTH - ATK - HGN -	
				Volume		A581 - DR - D - 0022	
				Role		P1	
				Number			

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
2	Church Road/Gorse Lane	345175, 420642	6km	0	0	0

Location Plan

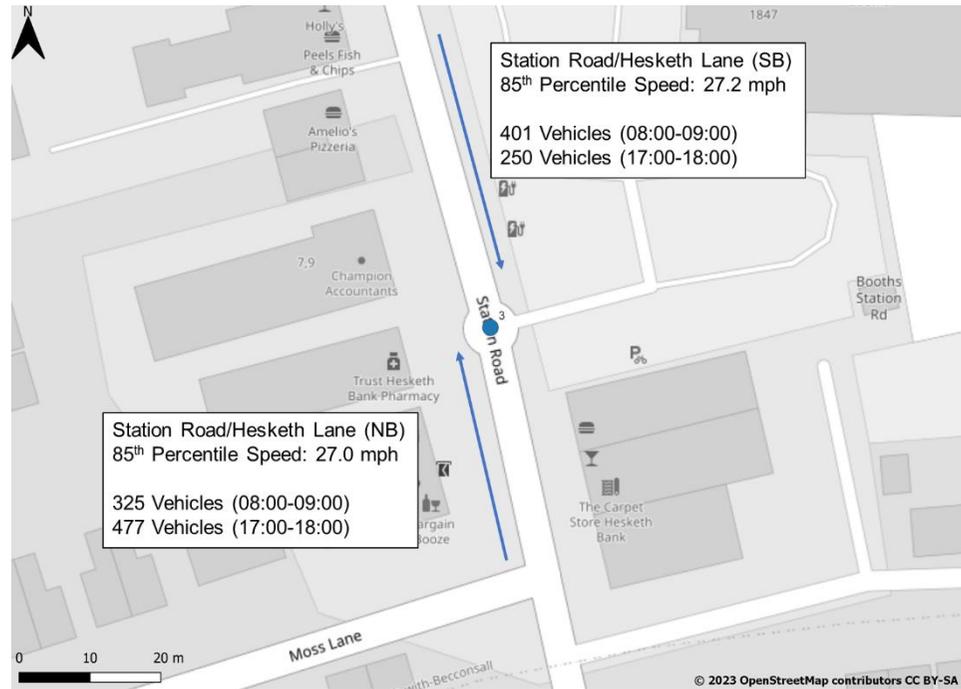
85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)



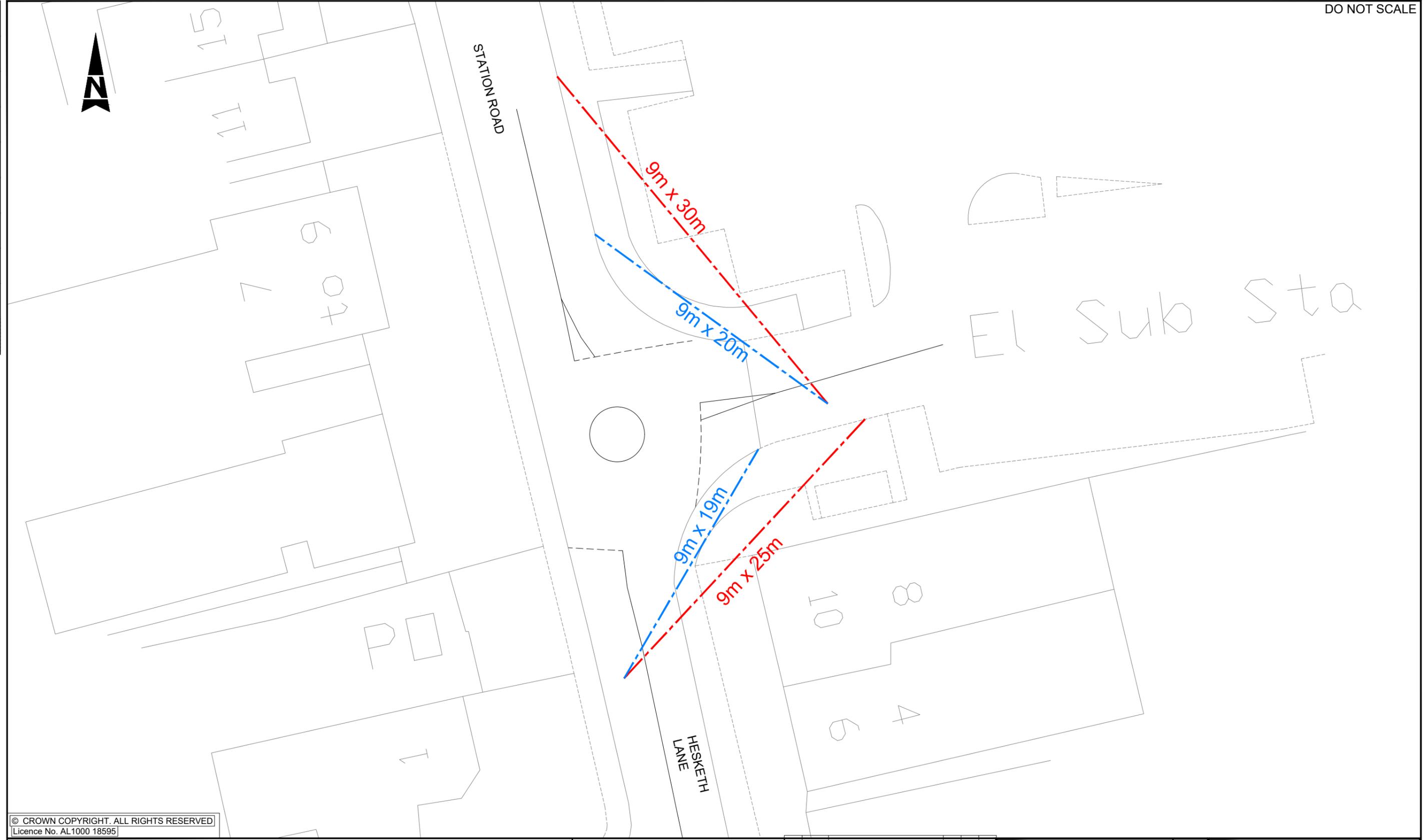
Junction ID	Name	Easting and Northing	Distance from A581/Ulles Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
3	Station Road	344746, 422715	7km	0	0	0

Location Plan

85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)



100
Millimetres
0 10



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Key:

Existing visibility to the right

----- Required visibility to the right (9.0m set back)

----- Achievable visibility to the right (9.0m set back)

Notes:

1. Preliminary design only - based on Ordnance Survey data.

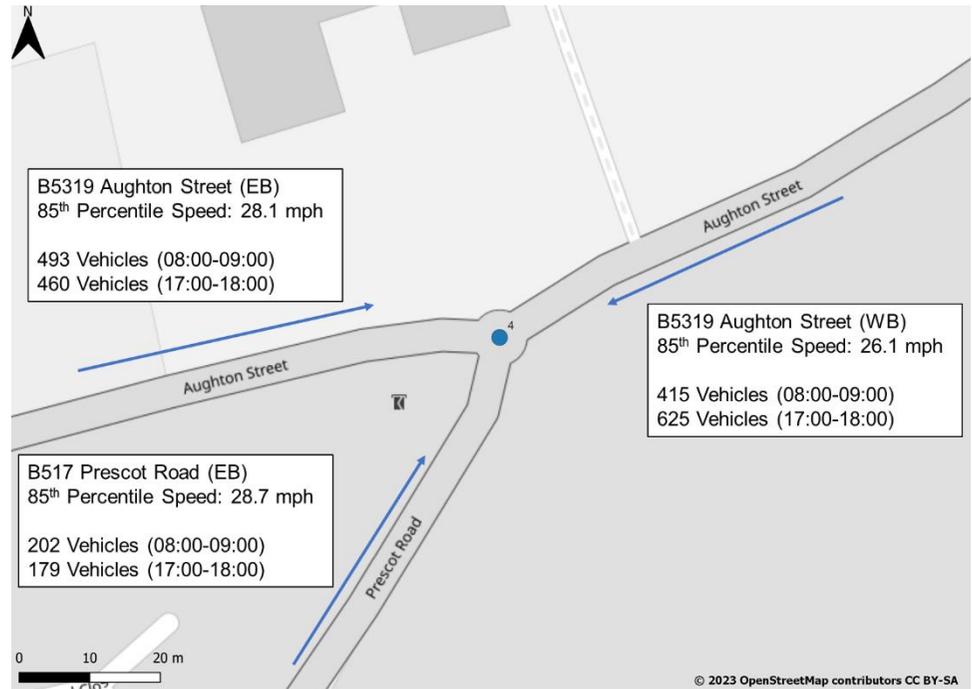
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:			
CONSTRUCTION			
NONE			
MAINTENANCE/CLEANING			
NONE			
DECOMMISSIONING/DEMOLITION			
NONE			
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			
Rev.	Date	Description	By
P1	03.07.23	DRAWING CREATED	AE
			App'd

Drawing Status		S2		Project Title		HMP GARTH	
FOR INFORMATION		ATKINS		2 Chamberlain Square Birmingham West Midlands B3 3AX		EXISTING JUNCTION VISIBILITIES STATION RD./HESKETH LANE	
Copyright © Atkins Limited (2023)		www.atkinsglobal.com		Tel: +44 (0)1214 835000 Fax: +44 (0)1214 835252			
Client		MINISTRY OF JUSTICE		Scale		1:250	
				Original Size		A3	
				Designed		Date	
				AE		03.07.23	
				Drawn		Date	
				AE		03.07.23	
				Checked		Date	
				TR		03.07.23	
				Authorised		Date	
				SY		03.07.23	
Drawing Number		GARTH - ATK - HGN -		Volume		I	
HA PIN		A581 - DR - D - 0020		Revision		P1	
Location				Type		Role	

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
4	Aughton Street/B5197	341054, 407871	14km	2	0	0

Location Plan

85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)





TCB

AUGHTON STREET B5139

AUGHTON STREET B5139

LB

9m x 33m

PRESCOT ROAD
B5197

9m x 14m

9m x 36m

9m x 42m

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MAINTENANCE/CLEANING

NONE

DECOMMISSIONING/DEMOLITION

NONE

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Rev.	Date	Description	By	Chk'd	App'd
P1	03.07.23	DRAWING CREATED		AE	

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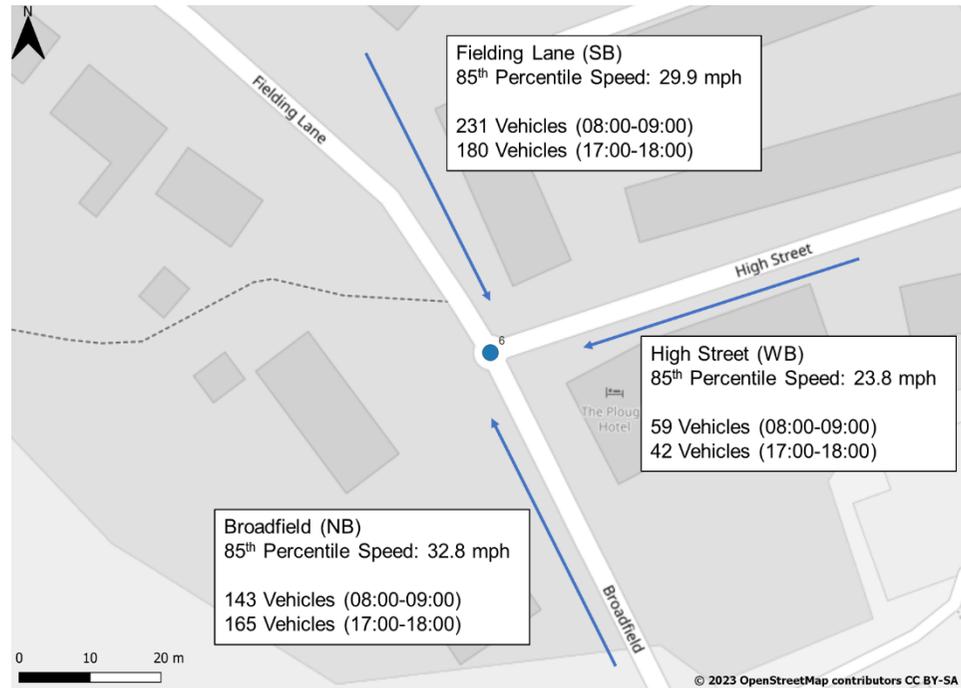
Suitability: **S2**

Project Title: **HMP GARTH**

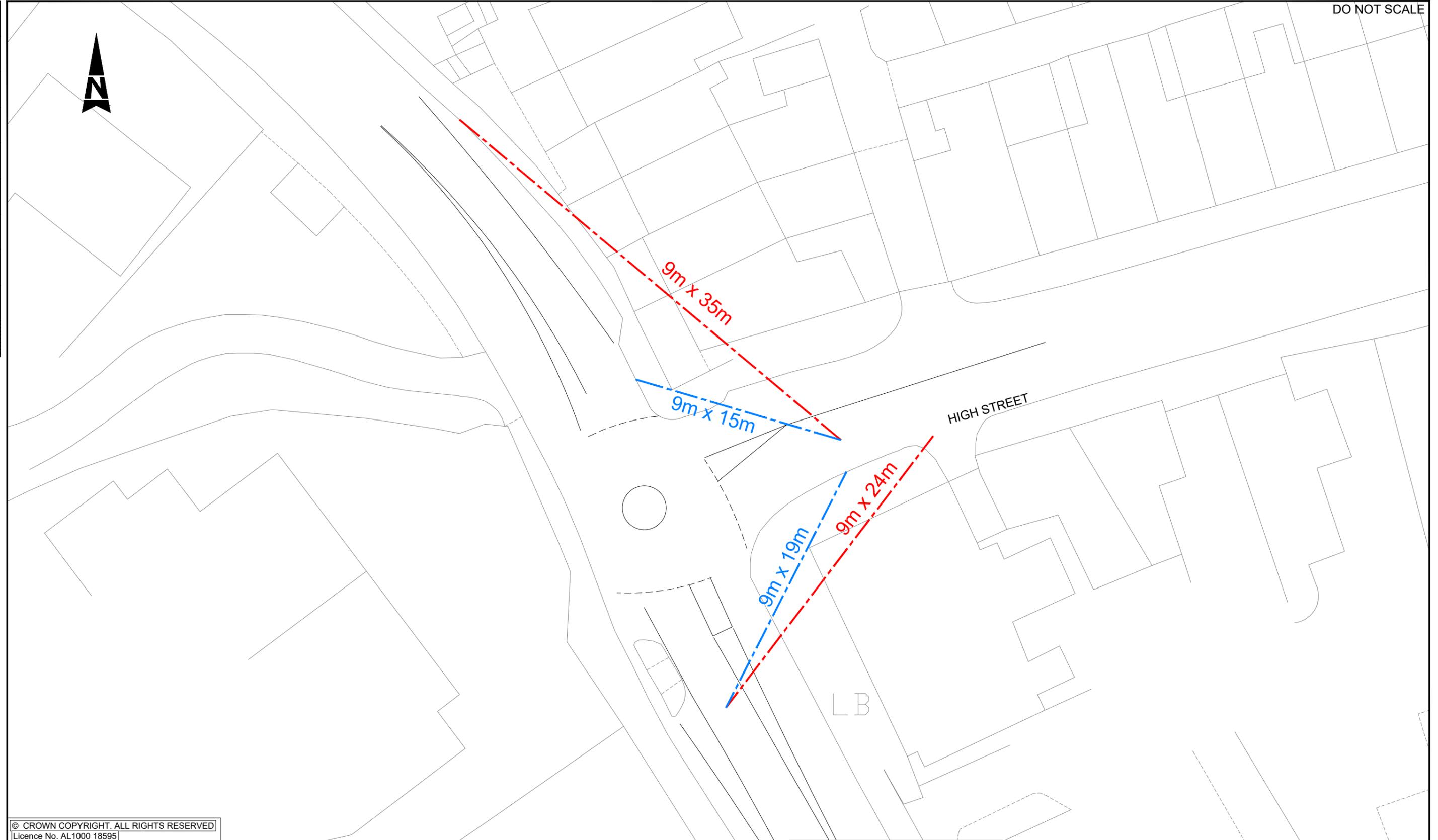
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AUGHTON STREET/B5197**

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Drawing Number	Originator	Volume	Project Ref. No.	
A581	GARTH - ATK - HGN - DR - D - 0023		P1	

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
5	Fielding Lane/High Street	374632, 427039	25km	1	0	0
Location Plan			85 th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)			



100
Millimetres
10
0



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NONE

MAINTENANCE/CLEANING

NONE

DECOMMISSIONING/DEMOLITION

NONE

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Suitability: **S2** Project Title: **HMP GARTH**

Drawing Title: **EXISTING JUNCTION VISIBILITIES FIELDING LANE/HIGH STREET**

Scale	Designed	Drawn	Checked	Authorised
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Original Size	Date	Date	Date	Date
A3	03.07.23	03.07.23	03.07.23	03.07.23
Drawing Number	Originator	Volume	Project Ref. No.	
HA PIN	GARTH	ATK - HGN -	Revision	
A581	- DR - D -	0017	P1	
Location	Type	Role	Number	

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
6	Brunshaw Road/Brownside Road	386221, 432291	37km	0	0	0

Location Plan

85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)



100
Millimetres
10
0



BURNSHAW ROAD

BROWNSIDE ROAD

9m x 43m

9m x 29m

9m x 24m

9m x 46m

GP

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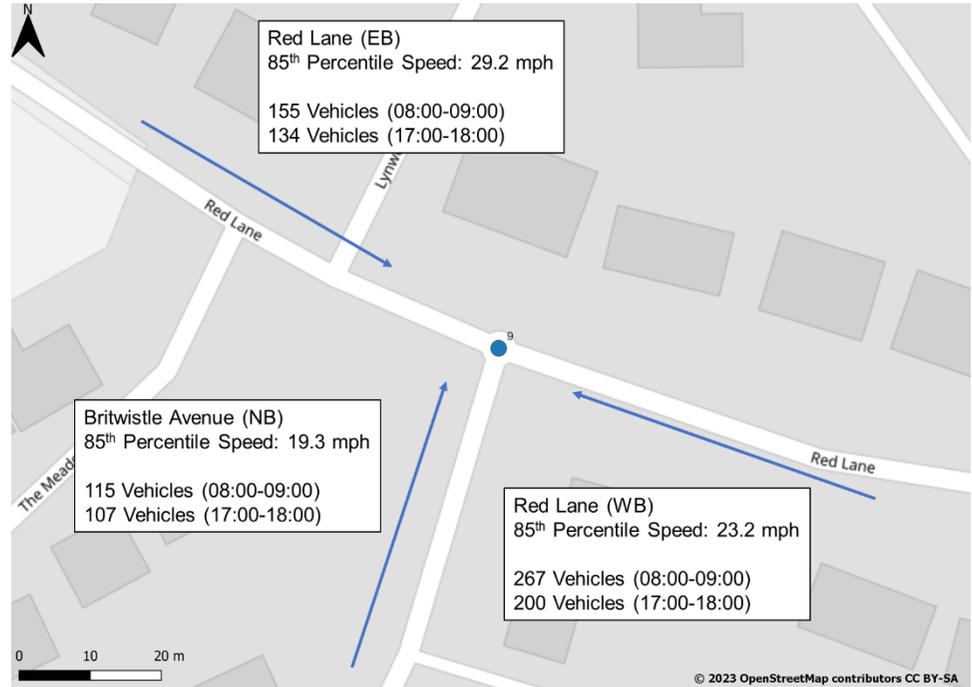
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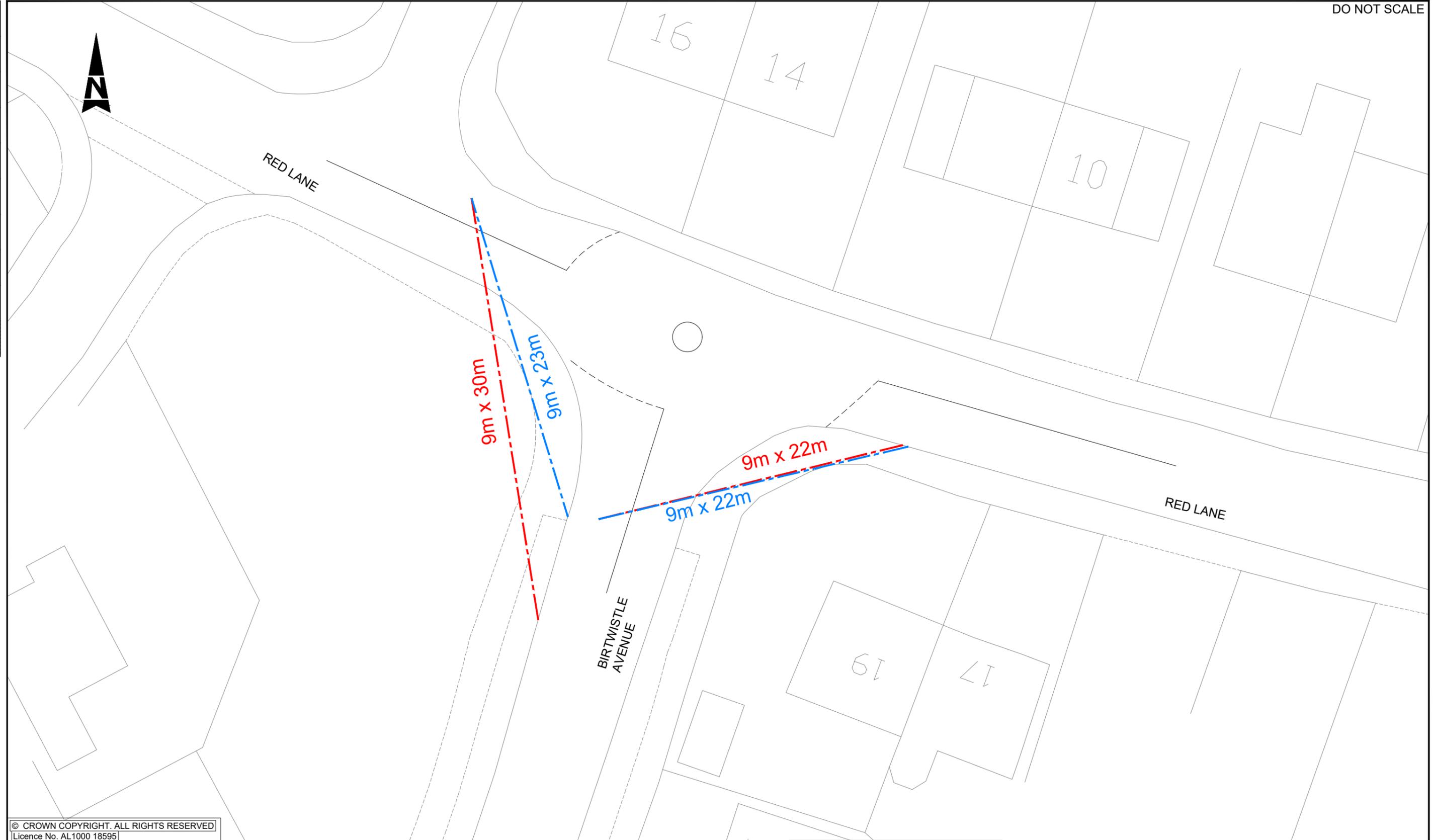
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DECOMMISSIONING/DEMOLITION			
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P1	03.07.23	DRAWING CREATED	AE

Drawing Status		S2		Project Title		HMP GARTH	
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				Drawn		AE	
				Date		03.07.23	
				Checked		TR	
				Date		03.07.23	
				Authorised		SY	
				Date		03.07.23	
				Original Size		A3	
				Drawing Number		GARTH - ATK - HGN -	
				HA PIN		A581 - DR - D - 0015	
				Originator		Volume	
				Type		Role	
				Number		P1	

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
7	Red Lane/Birtwistle Avenue	388978, 441021	43km	0	0	0
Location Plan			85 th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)			



100
Millimetres
10
0



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P1	03.07.23	DRAWING CREATED	AE		

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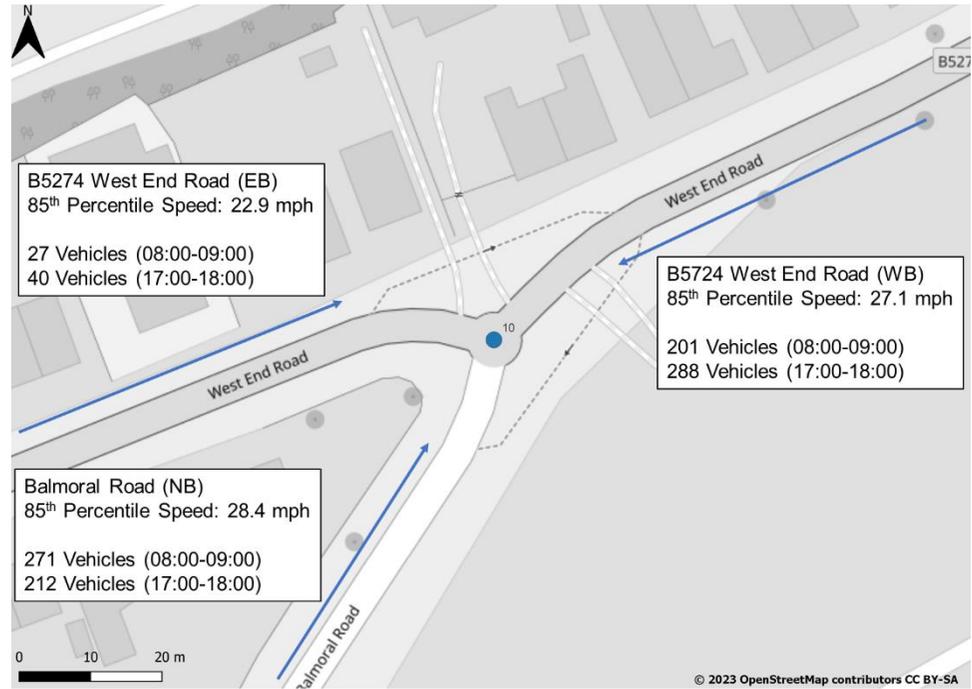
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EXISTING JUNCTION VISIBILITIES RED LANE/BIRTWISTLE AVE.					
Scale	Designed	Drawn	Checked	Authorised	
1:250	AE	AE	TR	SY	
Original Size	Date	Date	Date	Date	
A3	03.07.23	03.07.23	03.07.23	03.07.23	
Drawing Number	Originator	Volume	Revision	Project Ref. No.	
GARTH	- ATK	- HGN	-		
A581	- DR	- D	- 0013		P1

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
8	West End Road/Balmoral Road	343060, 463907	45km	1	0	0
Location Plan			85 th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)			



100
Millimetres
10
0



92

9m x 35m

9m x 180m

9m x 70m

9m x 18m

9m x 45m

9m x 47m

601

1210

889

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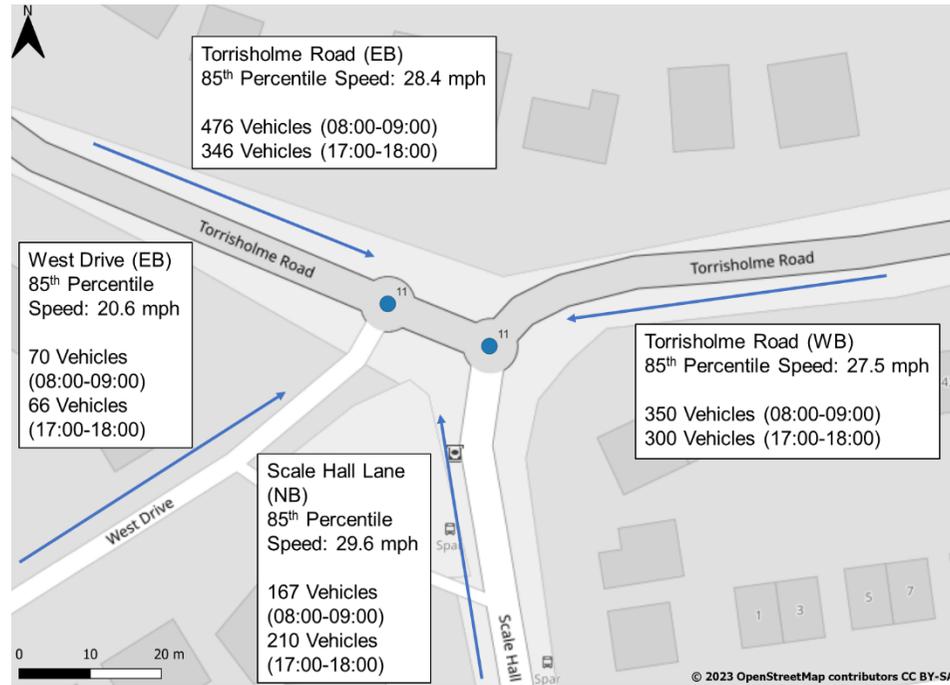
Client: **MINISTRY OF JUSTICE**

S2		Project Title: HMP GARTH			
Drawing Title: EXISTING JUNCTION VISIBILITIES WEST END RD./BALMORAL RD.					
Scale: 1:250	Designed: AE	Drawn: AE	Checked: TR	Authorised: SY	Date: 03.07.23
Original Size: A3	Date: 03.07.23	Date: 03.07.23	Date: 03.07.23	Date: 03.07.23	Date: 03.07.23
Drawing Number: GARTH - A581	Originator: ATK	Volume: HGN	Project Ref. No. 0011		
Location: A581	Type: DR	Role: D	Number: 0011	Revision: P1	

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
9	Torrisholme Road/Scale Hall Lane	346585, 463011 346599, 463005	44km	1	0	0

Location Plan

85th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)



100
Millimetres
10
0



TORRISHOLME ROAD
B5321

TORRISHOLME ROAD
B5321

WEST DRIVE

TCB

SCALE HALL
LANE

9m x 31m

9m x 21m

9m x 93m

9m x 34m

9m x 32m

9m x 45m

9m x 23m

9m x 49m

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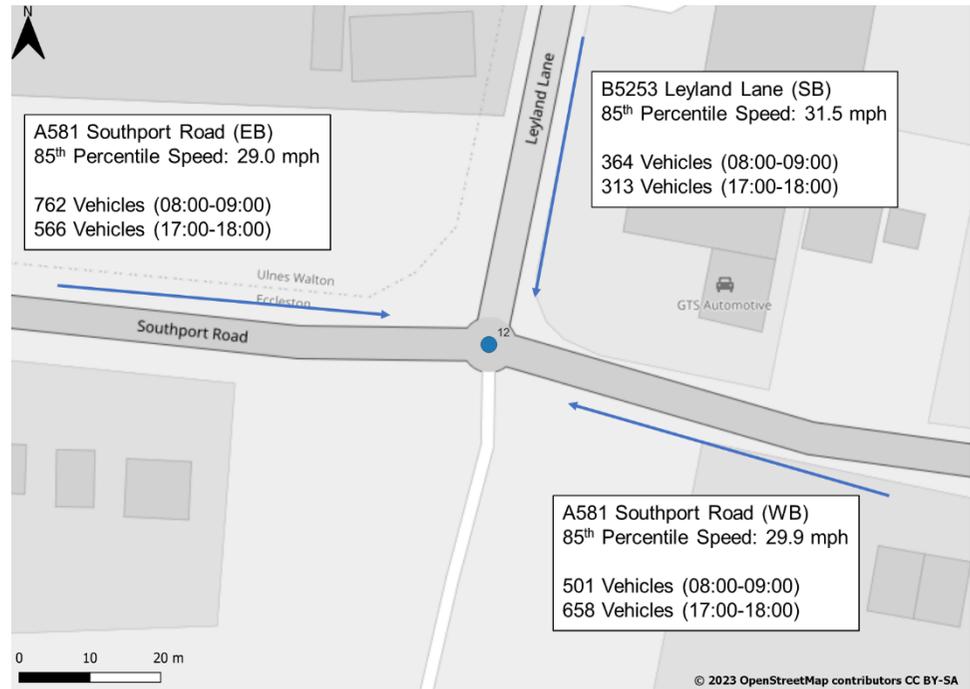
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Client: **MINISTRY OF JUSTICE**

Project Title: HMP GARTH				
Drawing Title: EXISTING JUNCTION VISIBILITIES TORRISHOLME RD./SCALE HALL LANE				
Scale: 1:250	Designed: AE	Drawn: AE	Checked: TR	Authorised: SY
Original Size: A3	Date: 03.07.23	Date: 03.07.23	Date: 03.07.23	Date: 03.07.23
Drawing Number: GARTH - A581	Originator: ATK	Volume: HGN	Revision: D - 0012	Project Ref. No: P1

Junction ID	Name	Easting and Northing	Distance from A581/Ulnes Walton Lane Junction	PIA Record (2017 – 2021)		
				Slight	Serious	Fatal
10	A581/Leyland Lane	352188, 418633	1km	1	0	0

Location Plan	85 th Percentile Dry Weather Speed and Peak Hour Entry Flows (70m from the give way line)
---------------	--



100
Millimetres
10
0



LEYLAND LANE
B5253

9m x 52m

9m x 33m

9m x 33m

9m x 19m

SOUTHPORT ROAD A581

SOUTHPORT ROAD A581

GP

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DECOMMISSIONING/DEMOLITION	
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Client: **MINISTRY OF JUSTICE**

Project Title: **HMP GARTH**

Drawing Title: **EXISTING JUNCTION VISIBILITIES SOUTHPORT RD/LEYLAND LANE**

Scale	1:250	Designed	AE	Drawn	AE	Checked	TR	Authorised	SY
Original Size	A3	Date	03.07.23	Date	03.07.23	Date	03.07.23	Date	03.07.23
Drawing Number	GARTH - ATK - HGN -			Volume	-		Revision	P1	
HA PIN	A581 - DR - D - 0019			Number			Location		

Appendix D – Appeal History

D.1 (APP/P1805/W/20/3245111)



Appeal Decision

Inquiry opened on 17 November 2020

Site visits made on 24 November 2020

by Richard Clegg BA(Hons) DMS MRTPI

an Inspector appointed by the Secretary of State

Decision date: 9th February 2021

Appeal Ref: APP/P1805/W/20/3245111

Land at Whitford Road and Land at Albert Road, Bromsgrove

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a failure to give notice within the prescribed period of a decision on an application for outline planning permission.
 - The appeal is made by Catesby Estates Ltd & Miller Homes Ltd against Bromsgrove District Council.
 - The application, Ref 16/1132, is dated 30 November 2016.
 - The development proposed is: on site A (land off Whitford Road), provision of up to 490 dwellings, class A1 retail local shop (up to 400m²), two new priority accesses onto Whitford Road, public open space, landscaping, and sustainable urban drainage; on site B (land off Albert Road), demolition of the Greyhound public house, provision of up to 15 dwellings, a new priority access onto Albert Road, landscaping, and sustainable drainage.
 - The inquiry sat for four days: 17-20 November 2020
-

Decision

1. The appeal is allowed and outline planning permission is granted for provision of up to 490 dwellings, class A1 retail local shop (up to 400m²), two new priority accesses onto Whitford Road, public open space, landscaping, and sustainable urban drainage, on land at Whitford Road, Bromsgrove (site A); and demolition of the Greyhound public house, provision of up to 15 dwellings, a new priority access onto Albert Road, landscaping, and sustainable drainage, on land at Albert Road, Bromsgrove (site B); in accordance with the terms of the application, Ref 16/1132, dated 30 November 2016, subject to the conditions in the attached schedule.

Application for costs

2. At the inquiry an application for costs was made by Catesby Estates Ltd & Miller Homes Ltd against Bromsgrove District Council (the Local Planning Authority). This application is the subject of a separate Decision.

Procedural matters

3. Worcestershire Acute Hospitals NHS Trust had served a statement of case in accordance with Rule 6(6) of The Town and Country Planning Appeals (Determination by Inspectors) (Inquiries Procedure) (England) Rules 2000, and it participated in the inquiry. The Trust's concern is to ensure that a planning obligation secures a financial contribution towards its services. A statement of common ground on this matter was agreed with the Appellants (Core Document K1 (CD K1)), and the Local Planning Authority (LPA) had

made it clear that it considered that the question of whether a financial contribution would be fairly and reasonably related to the development would be a matter for the Inspector and the Appellants. Having regard to the views expressed by the main parties, I took the view that formal oral evidence was not necessary on this subject. Proofs of evidence submitted on behalf of the Trust have been considered as written representations, and the Trust's representatives referred to the financial contribution sought during the session on planning obligations.

4. On the application form the location of the proposed development is given simply as land at Whitford Road, Bromsgrove. There are, however, two sites, as is clear from the description of development: site A at Whitford Road and site B at Albert Road. I have identified the location accordingly in the appeal details above.
5. The planning application was submitted in outline form, with approval sought for access at this stage. In the case of site B, the plan of the proposed access does not show the implication of achieving the visibility splay to the south-east on a nearby protected willow tree which is in an elevated position above Albert Road¹. At the inquiry, the Appellants suggested that the plan of this access (plan ref 7033-SK-012 revision A) should be treated as illustrative. The principle of the access would remain for consideration, and no objection was raised to the approach suggested by the Appellants. I do not consider that prejudice would be caused to any other parties by treating access to site B as a reserved matter, and I have proceeded accordingly. An indicative masterplan was submitted for site A and an indicative site layout for site B², and I have had regard to these documents in my considerations.
6. An environmental statement accompanied the planning application (CDs A10-A12). The original environmental statement was largely superseded by an amended version in 2018³ (CDs C7-C10), and further information was submitted in 2019 (D1-D9), during the consideration of the application by the District Council. In April 2020, after the appeal had been lodged, the Secretary of State made a request under Regulation 22 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011 for further information in respect of landscape and visual impact assessment, flood risk, noise, socio-economic matters, and the implications of the timing of the development. The Appellants responded to this request in May 2020 (CDs I1-I8), and the Regulation 22 submission has been the subject of publicity. The environmental statement relates solely to the proposal on site A, since that part of the development proposed for site B is relatively small and was not considered to give rise to any significant environmental effects. At the inquiry, no objection was pursued to the adequacy of the environmental statement. I do not consider that prejudice would be caused to any party by taking the 2020 Regulation 22 information into account, and I have proceeded accordingly. I am satisfied that the composite environmental statement meets the requirements of the 2011 Regulations.

¹ The tree preservation order is CD O17.

² CD C6 figure 2, and CD A13 Appendix A figure 4.

³ The Appellants' statement of case (CD F2) says that the original environmental statement was superseded by the 2018 version, but (for example) the 2018 Transport Assessment Addendum (in CD C8) makes clear that parts of the 2016 environmental statement remain valid.

7. A planning agreement has been submitted in connection with the appeal proposal (CD N1). It contains obligations concerning open space, the retail unit, affordable housing, a travel plan, and the payment of a range of infrastructure contributions.
8. A set of core documents was prepared for the inquiry. Certain additional documents and documents submitted after the inquiry opened are detailed in the lists appended to this decision.

Main Issues

9. The appeal was made against the failure of the Council to give notice of its decision on the planning application within the prescribed period. The LPA subsequently resolved that planning permission would have been refused because the scheme would have an unacceptable impact on highway safety and the residual cumulative impacts on the road network would be severe⁴.
10. Having regard to the positions of the Appellants, the LPA and the NHS Trust, together with the representations from other parties, I consider that the main issues in this appeal are:
 - i) The effect of the proposed development on traffic movement and highway safety.
 - ii) Whether the proposal would be consistent with the Development Plan.
 - iii) The effect of other considerations on the overall planning balance.

Background

11. In 2015, an appeal for similar development on site A to the current proposal, and including the intended diversion of Whitford Road traffic, was dismissed, the Inspector concluding that the scheme would have a severe residual cumulative impact on traffic congestion, movement and highway safety (CD O8). At that time, the then draft Bromsgrove District Plan was at examination stage: it identified site A as a town expansion site to include a minimum of 490 dwellings and associated community infrastructure. The District Plan was subsequently adopted in 2017⁵, and includes site A as a town expansion site under Policy BDP5A.

Planning policies

12. The Development Plan comprises the Bromsgrove District Plan 2011-2020. Policy BDP2 sets out a settlement hierarchy, in which Bromsgrove is the only main town: this policy also lists four main aspects to housing delivery, including previously developed land within settlements and expansion sites around Bromsgrove. There is a target for the provision of 7,000 additional dwellings over the period 2011-2030 (Policy BDP3), and reference is made to the immediate release of town expansion sites in this regard. Policy BDP5A identifies three town expansion sites at Bromsgrove.: Site BROM3 is appeal site A, which is expected to include approximately 490 dwellings and associated community infrastructure. Amongst other requirements, the policy stipulates that it will be necessary to manage the cumulative traffic impact generated by the new development. In accordance with Policy BDP6,

⁴ Document O2, section1.

⁵ The Bromsgrove District Plan 2011-2030.

proposals are expected to contribute towards measures to mitigate their impact through the use of planning obligations, and Policy BDP16 makes specific reference to contributions in respect of public transport, pedestrian, cycle and highway infrastructure.

13. The Greyhound Inn public house (now closed) on site B is recognised by the Appellants and the LPA as a non-designated heritage asset⁶. Policy BDP20 requires that development affecting heritage assets should not have a detrimental impact on their character, appearance or significance. Other policies of relevance to the appeal proposal include those concerned with affordable housing (Policy BDP8), housing mix and density (Policy BDP7), green infrastructure (Policy BDP24), and improving the management of the natural environment (Policy BDP21).

Reasons

Traffic movement and highway safety

14. The proposal would involve the construction of up to 505 dwellings, the great majority of which (up to 490) would be on site A, a strategic town expansion site in the District Plan. This site is on the western edge of the built-up area of Bromsgrove. Whitford Road is a local road which joins Kidderminster Road (the A448) at a staggered crossroads about 0.4km to the north of site A (the Kidderminster Road junction). To the south, the road continues as Fox Lane to a priority junction with Rock Hill (the Fox Lane junction - about 0.4km from the site): with Worcester Road and Hanover Street, Rock Hill forms the B4091, which runs between the town centre and the A38 to the south side of Bromsgrove. A short distance to the north of Fox Lane the B4091 meets Charford Road (the Charford Road junction), and at its northern end, it joins Kidderminster Road at a junction with St John Street on the edge of the town centre (the Hanover Street junction). The A38 is an important road, which provides connections to the north and south of the town. A series of junctions provide links from its route through the eastern part of Bromsgrove: of most relevance to the appeal proposal are the junctions with the A448 and Regents Park Road (the A448 Road junction), with New Road (the New Road junction), and with Charford Road/ Stoke Road (the Stoke Road junction). It is clear from the Appellants' modelling that, without mitigation, the additional traffic generated by this large housing site would increase pressure on the highway network. The Fox Lane junction is identified as being close to capacity, and both the Charford Road and Hanover Street junctions would be approaching that point in the 2030 baseline scenario.

Mitigation measures

15. The scheme includes a package of mitigation measures to address the effects on the highway network. The Fox Lane priority junction would be altered with the formation of a roundabout, alterations would be made to the mini-roundabout at the Charford Road junction, and a signalisation scheme is proposed for the staggered crossroads at the Kidderminster Road junction. Conditions have been suggested which would ensure the provision of these junction works. Through planning obligations, financial contributions would be made to schemes at other junctions. The sum of £744,681.58 would be paid to Worcestershire County Council (as the Local Highway Authority (LHA))

⁶ CD G8, para 3.1.

towards alterations at the Hanover Street junction and at Market Street/ St John Street, and a separate obligation would involve a contribution of £1,312,706.94 towards the County Council's A38 Bromsgrove Route Enhancement Programme. In addition, the proposal includes new pedestrian crossing facilities on Whitford Road and Kidderminster Road, and financial contributions towards a bus service between the development, the town centre and the railway station, and towards cycle and pedestrian links.

The site accesses

16. There would be two vehicular accesses into site A from Whitford Road. Both accesses would have visibility splays of 120m to the left and 73m to the right. The speed limit on Whitford Road is 40mph, and traffic moves freely along the road past the site. In the Design Manual for Roads & Bridges (DMRB), part CD109 indicates that where the design speed is 40mph, the desirable minimum stopping sight distance is 120m, and the road safety audit refers to this distance⁷. Speed surveys have recorded the northbound 85%ile wet weather speed as approximately 36mph, and taking account of this and the change in character of the road resulting from the proposal, the Appellants suggest that the visibility advice from Manual for Streets can be applied, and that this would indicate a requirement for splays of about 62m⁸. On the other hand, Whitford Vale Voice (WVV) refers to northbound 85%ile dry weather speeds of 38.9mph and 45.8 mph from LHA surveys in May and June 2017⁹. The location of the June survey is close to the north-eastern corner of site A, beyond both points of access, and speed recorded here is not directly relevant for the consideration of northbound traffic approaching the proposed priority junctions. The May survey position is located on the approach to the northern site access, and the speed recorded is not materially greater than that referred to by the Appellants. Manual for Streets 2 explains that it is only where actual speeds are above 40mph for significant periods of the day that DMRB parameters for stopping sight distance are recommended. Below that level, Manual for Streets parameters are recommended.
17. Visibility is restricted to 75m to the left and 19m to the right for emerging drivers at the southern junction of Deansway with Whitford Road¹⁰. This junction lies between the two points of access to site A: it is on the same stretch of road, where traffic conditions are similar, and no record of accidents has been reported. I note, moreover, that in approving the Appellants' response to the Stage 1 Road Safety Audit, the LHA referred to a review of existing visibilities along Whitford Road as showing that the proposed visibilities would be acceptable. On the evidence before me, I am satisfied that adequate visibility splays would be provided at both vehicular accesses to site A.
18. Vehicular access to site B would be taken from Albert Road, at a point where a bell-mouth has been formed in connection with a previous planning permission for housing. The plan showing the site access includes visibility splays which are annotated as having a minor road distance of 2.4m. However, as WVV pointed out, that distance appears to be drawn broadly in line with the back of the footway, which the parties agreed at the site visit has

⁷ Stage 1 Road Safety Audit para 2.3.1, CD O10 Appendix 1.

⁸ CD O10 paras 2.3.7 & 2.3.8.

⁹ CD O13 page 7.

¹⁰ CD O10 Appendix C.

a depth of 1.02m on the north-west side of the access. From 2.4m back, the splay to the north-west would include a small part of open grassed areas at the front of nearby houses. As the splay would also cross the end of at least one drive, there is the potential for parked cars to partially restrict visibility to the left. However, Albert Road is a relatively short residential street with some on-street parking. I anticipate that traffic speeds are low, and vehicles approaching the access from the north-west would be on the opposite side of the road, where they would be less affected by any restrictions on visibility. To the south-east, a bank encroaches slightly into the visibility splay, above which is a protected willow tree. There is no assessment before me as to whether it would be possible to cut back the bank without adversely affecting this tree, but, given the short distance of about 20m from the junction, vehicles approaching from this direction would not have had the opportunity to increase speed markedly after entering Albert Road, and I do not consider that the existing form of the bank would compromise highway safety.

19. On the information before me, I am satisfied that the proposed vehicular accesses to sites A and B would not reduce highway safety.

The Fox Lane junction

20. During the morning and afternoon peak periods, the Appellants' modelling predicts that just over half of the vehicles travelling to and from site A would pass through the Fox Lane junction¹¹. This is a junction which is already close to capacity, and it is constrained by its surroundings. In order to accommodate the traffic flow from the Whitford Road site, the existing priority junction would be replaced by a roundabout, using land from site B.
21. In 2030, with the roundabout in place, the additional capacity provided would result in an improved performance in terms of traffic movement. Although a queue of 18 vehicles and delay of 71.9 seconds are predicted in the afternoon peak on the Rock Hill south-west arm, a marked improvement would occur on Fox Lane¹². On this approach the 2017 baseline indicates queues of 20 vehicles in the morning peak with delays of over 200 seconds, increasing to queues of 42 vehicles with delays of over 400 seconds in the 2030 baseline. In contrast, with the development and the junction alteration in place those figures reduce to 3 vehicles and 15.1 seconds. Moreover, a ratio of flow to capacity (RFC) in excess of 1 is shown here in the 2030 baseline, which is an indicator of severe congestion. On all approaches, following the alteration to the junction, the RFC value is calculated as below 0.85, the point at which moderate congestion is recognised.
22. A short distance from the junction, on the Rock Hill north-east arm, is a signalised pedestrian crossing. The LPA had expressed concern that vehicles waiting at the crossing would be likely to have an impact on the performance of the junction. At the inquiry, revised modelling results for the junction were submitted which took into account the presence of the pedestrian crossing (CD 04), and the LPA acknowledged that the results shown were acceptable. WV maintained an objection, referring not only to the position of the crossing, but also to its usage. However, although the Appellants' model has a lower input of 51 pedestrians in the morning peak hour than the 197

¹¹ Transport Assessment Addendum, January 2018, figures 5-1 & 5-2, in CD C8.

¹² CD O16, tables 1, 2 & 5.

pedestrians recorded in a survey by WVV¹³, the Appellants' highways witness argued that each pedestrian input relates to an activation of the signals when several pedestrians could use the crossing. In any event, the model results submitted by WVV with a higher level of pedestrian input (CD O23) do not indicate that there would be a material problem at the roundabout due to the use of the signalised crossing.

23. There is a dispute between the Appellants and the LPA concerning the extent of deflection on the north-east arm of the roundabout. It is common ground between the highway witnesses that DMRB provides the appropriate standards for roundabout design in this respect. Deflection is determined by the entry path radius, and Part CD 116 of DMRB stipulates that, in the case of normal roundabouts, this dimension should not exceed 100m. The DMRB continues to explain that this factor is the most important determinant of safety at roundabouts, since it governs the speed of vehicles through the junction and whether drivers are likely to give way to circulating vehicles. In this case, the Appellants submitted a plan which identifies the line of deflection for vehicles approaching from the north-east arm with an entry path radius of 192m (revision J - CD O5), markedly above the upper limit in the DMRB. At the inquiry, the Appellants' highways witness suggested that the line of deflection shown on this plan simply represented a worst case entry radius, and did not lead to one of the other two arms. A further plan submitted by the Appellants refers to an entry path radius of 110m from the north-east (revision K - CD O15). However the position taken at the inquiry and plan revision K are not consistent with the submission for a departure in respect of highway geometry. That document clearly refers to a proposed deflection of 192m and subsequently to 'straight through' movements from the north-east arm to the south-west arm of the roundabout¹⁴. Whilst the Appellants acknowledge that deflection would not accord with the standard in the DMRB, the extent of the difference is not clear from the evidence before me.
24. Technical approval has been given by the LHA for the new junction arrangements. Rock Hill is subject to a 30mph speed limit, and the presence of the pedestrian crossing may act as a cautionary factor on driver behaviour. Nevertheless, I do not consider that deflection is unimportant in this situation: even with speeds below 30mph, the absence of adequate deflection could lead to an increased risk of conflict on the roundabout. Whilst the Appellants' highway witness pointed to signage and carriageway markings indicating the presence of the roundabout, these features are not identified in DMRB as appropriate measures to use where deflection cannot be achieved. The juxtaposition to the crossover providing access to the convenience shop and a nearby house is also a relevant factor when considering the safety implications of the north-east approach to the roundabout. I turn next to consider access arrangements to and from Rock Hill on this side of the roundabout.
25. On the south-east side of that part of Rock Hill where the roundabout would be constructed are a house (No 5 Rock Hill), a parcel of land which is used for parking, and a convenience store. There is direct vehicular access from Rock Hill to each of these properties. The surfacing and kerbs plan and a swept

¹³ CD O13 pages 26 & 27.

¹⁴ Departures Note 7033-RH-Dfs-04, in CD J1 Appendix A1.

path analysis show that access to the dwelling and parking area would be taken from the point where the north-east approach of Rock Hill would join the roundabout¹⁵. Given the position of the crossover it is most likely that its use would involve vehicles approaching from Fox Lane and the south-west arm of Rock Hill turning off the roundabout immediately after passing the Rock Hill north-east entry, although at the inquiry the Appellants' highways witness suggested that vehicles would leave the roundabout and then turn right across Rock Hill. Vehicles reversing from the dwelling and the land used for parking would be able to manoeuvre onto an adjacent grasscrete area before joining the roundabout in forward gear. This would not be a typical arrangement at a roundabout and adds a potential source of conflict between vehicles approaching along Rock Hill from the north-east and those leaving and arriving at the house and adjacent land.

26. I have also taken into account the existing situation at No 5 Rock Hill and the adjacent land used for parking. Whilst there appears to be space at No 5 for a car to turn around and leave the property in forward gear, there is less space for manoeuvring on the adjacent land and vehicles are likely to reverse onto or from Rock Hill. Vehicles approaching, other than from Rock Hill north-east, would need to turn right into these properties across the flow of traffic on the through road. These manoeuvres have the potential to reduce highway safety and interrupt traffic flow, and I do not consider that the changes to these access arrangements introduced by the junction alterations would in themselves be materially more harmful.
27. On the south-west side of the convenience shop is a hardstanding, to which a swept path analysis shows access for a 7.5 tonne box van and a 4.6 tonne light van¹⁶. The hardstanding is of restricted depth and width and is used to accommodate several storage containers. There is photographic evidence of a car parked here¹⁷, and a light van would probably also be able to use this space. However I agree with WVW that a box van would not be able to park on the hardstanding. The swept path analysis shows vehicles accessing the parking space by reversing on the south-west exit from the roundabout. Unless heading in that direction, vehicles leaving the shop would cross the south-west exit and turn right into the south-east approach lanes at the roundabout entrance. Given the restricted size of the hardstanding, it is likely that some service vehicles would park on the crossover, as occurs in the existing lay-by, which could also necessitate reversing. At present, use of the parking space would involve reversing from the through road, and although the extent of the lay-by which continues across the shop frontage may avoid the need for reversing to access space there, as a photograph from WVW illustrates¹⁸, some service vehicles cross Rock Hill to reach the lay-by, increasing the risk of conflict. It does not seem to me that the construction of the roundabout would worsen the position in respect of highway safety and traffic movement in this location.
28. The existing lay-by extends from the shop as far as the first junction to the south-west. It is intended that about one third of its length, providing space

¹⁵ Swept path analysis, plan ref 7033-S278-151 revision D; Surfacing & kerbs plan ref 7033-S278-701 revision F. Both plans are included in CD O21.

¹⁶ Swept path analysis, plan ref 7033-S278-154 revision B, in CD O21.

¹⁷ Document O6, page 97.

¹⁸ Document O6, page 98.

for three cars, would be removed¹⁹. WVV has expressed concern about the loss of spaces, and has suggested that it may lead to parking occurring on paved, grassed and grasscrete areas near the shop. However no detailed assessment of use of the lay by has been drawn to my attention, and I note that the LHA has taken the loss of some parking spaces into account in agreeing to the junction works. Accordingly, I give only limited weight to the loss of lay-by parking close to the shop.

29. WVV has raised concern about the extent of forward visibility on the Fox Lane and Rock Hill south-west approaches to the roundabout. On Fox Lane, forward visibility of 71m is available and there is a shorter distance of 43m on Rock Hill. For a design speed of 60kph the desirable minimum stopping sight distance specified in DMRB is 90m, and this distance is mentioned in the departures submissions. However reference to the speed limit of 30mph would indicate a lower stopping sight distance of about 70m which would be achieved on Fox Lane. Manual for Streets (which has relevance to lower speed urban areas) specifies a shorter stopping sight distance of 43m on a 30mph road, and I note that, other than a single vehicle at the give way line on Rock Hill, vehicles in a queue on this arm would be visible at a greater distance than 43m. For these reasons, I do not consider that these aspects of the roundabout design would adversely affect highway safety. Having regard to the constraints of the existing junction, I have reached the same view about other detailed criticisms made by WVV.
30. There are aspects of the proposed roundabout junction which would not fully accord with modern design expectations, notably the entry path radius from Rock Hill, given its relationship to vehicle movements to and from adjacent premises. Whilst that is not desirable, and a few parking spaces in the lay-by would be lost, most of the changes proposed would not worsen highway safety or hinder traffic movement. Importantly, the additional capacity provided by the proposed roundabout would result in improved performance of the Fox Lane junction.

The Charford Road junction

31. With mitigation in place, there would be a marginal improvement in the performance of this junction compared with the 2030 baseline. At 0.92, the RFC figure for the Worcester Road arm of the roundabout would exceed the 0.85 threshold in the morning peak, but that simply maintains the situation expected in 2030 without the development in place.
32. WVV criticises the capacity assessment for not including trips from the Perryfields development, having regard to the location of employment sites within Bromsgrove. Perryfields is the largest of the town expansion sites in the District Plan (BROM2), and is further north than site A. In their Transport Technical Note 5 (CD E3), the Appellants' highways consultants have reviewed the distribution of traffic generated by the residential and employment elements of the Perryfields proposal. That approach, which does not include routing traffic through the Charford Road roundabout has been agreed with the LHA and the LPA's own highway consultants (Mott McDonald (MM)). The latter have commented that the distribution is reasonable and that the use of journey to work census data is a suitable method for distributing trips²⁰.

¹⁹ CD F2.14 para 1.2.73. The length of the lay by to be removed is shown on the plan at CD O14.

²⁰ CD F2.16 section 2.9.

There is no detailed technical evidence to indicate that the cumulative assessment undertaken is unreliable.

33. The LPA has drawn attention to one aspect of the modelling of this junction. A capacity correction in the form of an intercept adjustment relating to queueing has been applied on the Worcester Road arm. The adjustment has been removed in the mitigation modelling, whereas the LPA maintains that the small scale of the mitigation is unlikely to have any impact on the local characteristics relating to queueing, and that it is unclear why the correction should be removed, leading to uncertainty about performance at the junction.
34. The question of intercept corrections is addressed in the Junctions 9 User Guide²¹. It explains that a correction may be appropriate in a new design where minor changes are made to the geometric parameters used in the capacity calculations, and it gives the example of moving a kerb line to increase entry width. However the Guide continues to say that the use of previously calculated corrections is not appropriate if other changes are made, with examples including re-marking of the junction and complete re-surfacing. In this case, the mitigation proposed at this junction would involve widening each of the approaches to provide additional capacity, but the plan (ref 7033-SK-013 revision E) also indicates that re-marking would occur. It seems to me that, notwithstanding the altered position of the kerbs, that is sufficient to permit omission of the intercept correction in the mitigation modelling, and the evidence before me does not indicate that the approach taken to modelling at this junction was inappropriate.
35. A consequence of widening the roundabout approaches would be a reduction in width of certain lengths of footway. On the south side of the junction with Highfield Road, the footway along Rock Hill would be reduced to about 1.8m in width²², below the minimum width of 2m for lightly used streets set out as guidance in Manual for Streets. I note that only a short section of footway would be narrower than 2m, and that the Appellants' make reference to the Department for Transport document *Inclusive Mobility* indicating that a footway width of 1.5m is acceptable in most circumstances. However Rock Hill is not a lightly used street, but a well-used local road leading to the town centre, and the Local Transport Plan identifies Worcester Road/ Rock Hill as a key corridor for the improvement of infrastructure for all suitable transport modes. I share the view of the LPA's highway consultants that the loss of footway is undesirable, although this is a marginal change.
36. As a consequence of the alterations proposed, the junction would accommodate development traffic without an adverse effect on its capacity. A reduction in width below 2m of a short section of footway would be a negative but minor consequence of the works.

The Hanover Street junction

37. WVV has expressed concern about the validation of models with regard to queue lengths. Specific mention is made of the Hanover Street junction where WVV argues that the bend on Hanover Street prevented the video surveys showing the full extent of the queue on that approach. This matter

²¹ The Junctions 9 ARCADY module is a software package for modelling roundabouts.

²² WVV suggested that the width would be reduced below 1.5m, but the Appellants are clear that the design is for 1.8m.

has been considered in detail by the LPA's highways consultants²³. MM acknowledge that the visibility of potential queues from fixed camera positions is a common challenge when undertaking traffic surveys. They also point out that there is often a large daily variation in queue lengths during peak periods, and consider that the data from the LHA surveys demonstrates that the queue lengths at the times of the surveys were largely within the maximum visible distance. Moreover queue length values are not a direct input into the modelling program, but are compared with other outputs to determine if a particular junction model is validated. I note also that MM points out that the model outputs show that the arms identified by WVV are at or close to capacity. The concern raised by WVV has been rigorously reviewed by MM, and I am satisfied that it does not call into question the validity of the modelling exercises at Hanover Street and other junctions.

38. The Appellants have proposed a scheme at Hanover Street which would involve some realigning and widening of the approach arms to accommodate two formal lanes. I observed that, on occasions, vehicles do approach in two lanes. However marking out the arms to show two lanes is likely to encourage drivers to enter the roundabout from two lanes as a matter of course, and provide capacity to accommodate additional traffic flow.
39. As at Charford Road, the LPA raised the question of treatment of an intercept correction, which was included in the first instance on the Kidderminster Road approach, but which has not been applied to the mitigation modelling. Re-marking of the junction, including relocating the centre island is a change which indicates that the use in a new design of previously calculated intercept corrections is not appropriate (above, para 34).
40. With mitigation in place and the housing on site A, the junction would operate satisfactorily, with RFC levels below 0.85 and relatively modest queues on all arms during the peak periods²⁴. Whilst the theoretical capacity at a roundabout is reached with an RFC value of 1, in my experience a value of 0.85 indicates that acceptable capacity has been exceeded, and the Appellants' Transport Assessment Addendum (TAA) refers to values below 0.85 as desirable for consistent junction performance. When the Perryfields development is taken into account in the cumulative assessment, RFC values would exceed 0.85 on the St John Street and Hanover Street arms in the afternoon peak and on the Kidderminster Road arm in the morning peak²⁵. The latter is the highest figure, at 0.92, accompanied by a queue length of 9 vehicles. This is an undesirable consequence, although the additional size in queue length of 4 vehicles and a further 10 seconds delay are not of great magnitude.

The A38 junctions

41. The LHA is promoting a package of measures to improve the A38 through Bromsgrove, and a planning obligation will provide for a financial contribution towards these works. Detailed concerns have been expressed by the LPA in respect of three junctions on the A38; the A448, New Road and Stoke Road junctions.

²³ See CD F2.15, section TN BDC 17.

²⁴ CD O16, table 9.

²⁵ CD O16, table 10.

42. At the A448 roundabout, the proposed works include the formation of an additional entry lane on the A38 north-east arm. In consequence the splitter island on this arm would be reduced in size. It was suggested by the LPA's highways witness that the proposed scheme would reduce deflection on this approach, and that the required level of deflection would not be achieved. This claim is not, however, supported by any clear evidence.
43. Intercept corrections have been made to validate the queues with survey data. The LPA makes the point that queues exceeded the camera limits for at least some of the peak hours. As previously noted (para 37), however, there is often a large daily variation in queue lengths during peak periods, and queue length values are compared with other outputs to determine if a particular junction model is validated. It does not seem to me that application of the intercept correction would have led to unreliable modelling. The increase from two to three approach lanes on the A38 north and A448 east approaches represents a significant change in the junction arrangement, and as such I am satisfied that it was not necessary to retain the intercept correction in the mitigation modelling.
44. Splitter islands at this junction provide pedestrian crossing facilities. It is the LPA's view that, due to the proposed reduction in width of the islands on the A38 north and A448 east arms, adequate crossing facilities would not be able to be maintained there. This was disputed by the Appellants, and their highways witness expressed the view that a width of 3-5m would be sufficient to provide a pedestrian refuge. More significantly, the plan of the junction (ref 473946.LS.00.10-07) indicates that following the alterations, the two splitter islands in question would be comparable in width to others there which do include crossing facilities. The evidence before me does not show that the scheme proposed at the A448 junction would preclude the retention of crossing facilities.
45. Although the model results give RFC values above 0.84 on two arms during the morning peak in the cumulative development scenario, the results represent a marked improvement compared with the 2030 baseline. In that scenario, most RFC values would be above 0.84 with the theoretical capacity of roundabout arms exceeded in four instances. The mitigation is also predicted to bring about a reduction in queue lengths: in the 2030 baseline queues of over 50 vehicles are predicted on the A38 south in both peak periods, of 51 on the A448 west in the morning peak, and of 49 on the A448 east in the afternoon peak. The comparable figures with the development and mitigation in place are queues of 10 and 8 vehicles on the A38 south in the morning and afternoon peak periods, and 19 and 3 vehicles on the A448 west and east.
46. At the two signalised junctions to the south, New Road and Stoke Road, there are two straight ahead lanes on the A38, apart from the north-east approach at New Road. The lanes merge at distances of between 100m and 200m beyond the junctions. Modelling has proceeded on the basis of even traffic flows across the two straight ahead lanes. Surveys indicate greater use of the nearside lane on the A38 south-west at Stoke Road, but the balance of traffic does not differ markedly in the other two cases²⁶. The Appellants acknowledge that the pedestrian phase of the signals at the New Road

²⁶ The survey results are at CD D5 Appendix F.

junction has not been included in the assessment on the basis that it is not expected to be called very often. The modelling has been accepted by the LHA and MM: the model results predict a higher degree of saturation at New Road on the A38 south arm, but overall there is expected to be an improvement in performance at both these junctions in comparison with the 2030 baseline, and there is no clear evidence before me to demonstrate that that would not occur.

The Millfield area

47. The Millfield area comprises a network of residential streets situated between Fox Lane and Rock Hill/ Worcester Road. Concern has been expressed by WVW that the appeal proposal could lead to more traffic passing through this area. In dismissing the appeal concerning site A in 2015, the Inspector found that that development would be likely to have a severe adverse impact on traffic and highway safety there. That would have been a consequence of the proposal for a Whitford Road diversion failing to achieve its aim, and a resultant increase in congestion and queueing at the Fox Lane junction, for which there would have been no direct mitigation.
48. The situation now is very different. A new roundabout would be built at the Fox Lane junction, and performance here would represent a clear improvement in comparison to both the 2017 and 2030 baselines, particularly on Fox Lane itself (above, para 21). Travelling through the Millfield area would involve negotiating narrow streets and several sharp turns. In places there is no footway. It does not offer a direct alternative to travelling through the Fox Lane junction, and the nature of the roads would inevitably lead to lower journey speeds. In view of the improved performance of the Fox Lane junction, there would be no incentive for drivers to leave the through roads, and to cut through the Millfield area.

Other traffic and highway matters

49. Eleven junctions were considered in the transport assessment, including those referred to above (para 14). WVW argued that this exercise should have been extended to Parkside and Market Street/ St John Street in the town centre and to Catshill to the north. The first two junctions are to the north of the Hanover Street junction which is within the study area. In the statement of common ground between the Appellants and the Highway Authority (CD G9), it is agreed that only a small percentage of trips would arrive at Parkside. Trip distribution has been agreed with the LHA and MM. The town centre has been identified as the destination for 8.32% of peak period development trips. Although the plan shows the town centre route extending to the Parkside junction, I note that this is intended to show a route into the centre, and there are parking opportunities and destinations before this point is reached. Consequently I would expect only a small proportion of the development traffic to pass through the Parkside junction. More development traffic would be expected to pass through the Market Street/ St John Street junction, but the amount would still be relatively modest. Moreover, I have read that the LHA is preparing a scheme for the route through this junction, which would address the effect of traffic from site A and Perryfields. A planning obligation would provide a contribution towards works at this junction and the nearby Hanover Street junction.

50. The Appellants acknowledge that there will be some level of traffic impact in Catshill. Whilst 33.2% of trips are expected to be made to the north through Catshill, there are several routes in that area which could be used, diluting the effect. MM has calculated that in this scenario, traffic levels could increase by between 1.3% and 6%²⁷. For these reasons I do not consider that it was necessary for further assessment to have been made of the locations referred to above.
51. A related matter concerns the assignment of traffic heading north to reach the M42 and M5 motorways. WVV points out that MM has identified that a main local option for such journeys would be via the town centre²⁸, but that no such trips are included in the assessment of the development in the town centre. MM has explained that a core assumption is that the A38 Bromsgrove Route Enhancement Programme will have been implemented by 2030, and that as the town centre roads would continue to be busy, it was a reasonable assumption that drivers would choose the A38 where that option is available, without going through the town centre. I agree that this was a reasonable basis on which to proceed, and I do not consider that the modelling has under-estimated vehicle movements through the Hanover Street junction. That said, the reference by MM to use of the town centre as a main local option in journeys to the north is inconsistent with their view about the nature of the local road network in 2030; however their calculations of the impact of northbound traffic are based on journeys to Catshill using Stourbridge Road and not the A38 from the town centre.
52. WVV maintains an objection that more vehicle trips would head south towards the Fox Lane junction from site A than allowed for in the Appellants' modelling. This position is based on a survey of the Friarscroft estate, whereas the TAA used census journey to work data, a recognised approach for determining distribution. The average distribution from the three Friarscroft surveys is for 37% of trips to be made to and from the north and 63% from the south. The comparable proportions from the TAA are 43% and 57%. The previous appeal decision noted that the surveys referred to by WVV suggested that the development's effects on Fox Lane may be understated. However there is variation between the Friarscroft surveys, and I agree with MM that caution must be adopted when using a small sample size. I do not consider that the distribution of trips along Whitford Road suggested by the Friarscroft should be preferred to that used in the TA modelling.
53. WVV also makes specific mention of school escort trips, and suggests that the impact of development trips on parts of the local road network has been under-estimated by considering journeys to work. MM acknowledges that separate consideration of school trips can be robust in certain situations but points out that school specific and catchment data is not available in this case and that such journeys would need to be extracted from other journey data used to avoid double-counting. As mentioned above (para 52), the use of census journey to work data is a recognised approach for trip modelling, and MM makes the point that car trips to primary schools are generally bypass or diverted trips, and do not add more than a small number of vehicles to the network at peak times.

²⁷ CD F2.15 table 8.

²⁸ See CD F2.15 page 9.

54. Councillor Mallett suggested that the proposed development would remove the opportunity to provide a cost-effective western distributor road. Worcestershire's Local Transport Plan states that a longer-term transport strategy is under development for Bromsgrove, and refers to a range of options, including the case for a potential Western Bypass. There is, though, no policy in the current Local Transport Plan which provides for a western bypass at Bromsgrove. Of greater significance is the allocation of site A for housing in the District Plan. That is not outweighed by a non-specific reference to a bypass as a possible option for the future.
55. WVV has referred to the downgrading of Perryfields Road to discourage through traffic as part of the development of the town expansion site there. The inquiry was advised that a north-south route will remain with the Perryfields development in place, a point which was not disputed by WVV. It is common ground between the Appellants and the LHA that traffic travelling to and from the north would use this route. Perryfields Road provides a relatively direct route to the north, and, given the position of this route in the local road network, I do not doubt that it would fulfil an important role in carrying development traffic.
56. At the southern end of Perryfields Road, the existing staggered crossroads would be signalised. Although degrees of saturation are predicted to exceed 90% on the A448 west and Whitford Road arms in the morning peak, that represents a clear improvement over the existing arrangement with the junction predicted to exceed capacity on both minor road arms, with lengthy queues, by 2030²⁹. Moreover signalisation would also reduce the prospect of conflict at this junction. That arrangement is put forward for the appeal proposal alone. Should the Perryfields development come forward, it includes an alternative scheme which would involve the construction of a separate junction on the north side of Kidderminster Road.
57. Trips generated by the proposed housing on site B have not been included in the modelling. Site B is a minor part of the overall appeal proposal, involving a maximum of 15 dwellings, and would result in approximately 10 additional peak hour trips. That is a modest increase in traffic movement, and having regard to the improved performance of the nearby Fox Lane (above para 21), I do not consider that inclusion of site B in the assessment would have materially altered the outcome.

Conclusions on traffic and highway matters

58. Several junctions on the local highway network are under pressure, and the appeal proposal would generate a significant amount of additional traffic from site A. An extensive package of mitigation measures is proposed, and the implications of the development have been assessed in detail by the LHA, MM and WVV. Taking into account the extensive documentation submitted, I am satisfied that, considered overall, the increased capacity which would be provided would offset the effect of the extra vehicle movements to and from the proposed development in accordance with Policy BDP1.4(a) of the District Plan. There would, however, be certain negative consequences: the extent of deflection on the north-east arm of the Fox Lane roundabout in close proximity to individual accesses on the south-east side of the road, the loss of a few parking spaces in the lay-by at this junction, and the narrowing of a

²⁹ CD E2 table 31 & TAA table 14 in CD C8.

short section of footway to below 2m at the Charford Road roundabout. In each case these adverse effects would be limited in extent, and I do not consider that they would give rise to an unacceptable impact on highway safety. In addition, in the cumulative scenario with the Perryfields development there would be a limited increase in RFC levels at the Hanover Street junction, although that is not of sufficient magnitude to call into question the prospect of that other town expansion site coming forward. I conclude that the proposed development would not have an unacceptable impact on highway safety, and that the residual cumulative impacts on the road network would not be severe: it would not, therefore be contrary to paragraph 109 of the National Planning Policy Framework (NPPF). The proposal would manage the cumulative traffic impact generated as required by Policy BDP5A.7(e), and it would incorporate safe and convenient accesses, thereby complying with Policy BDP16.1.

Consistency with the Development Plan

The settlement strategy

59. Site A is on the edge of Bromsgrove and site B is within the built-up area of the town, which is the main settlement in the District. As site A is one of the development sites identified in the District Plan and site B comprises previously developed land, the principle of housing in these locations is consistent with Policy BDP2 and the settlement hierarchy set out therein. Both sites would contribute to the target of 7,000 additional homes for Bromsgrove District specified in Policy BDP3, and site A is one of the town expansion sites which this policy earmarks for immediate release.

Town expansion site BROM3

60. The proposed development on site A would be consistent with that sought on town expansion site BROM3 under Policy BDP5A, including up to 490 dwellings, public open space and small scale local retail provision. Affordable housing of 40%, as required under part 7a of the policy, would be secured by a planning obligation. This part of the policy also requires the provision of a high proportion of 2 and 3 bedroom properties to reflect local need. It is intended that a mix of 1, 2, 3, 4, and 5 bedroom properties would be built on the land. Layout is a reserved matter, and details of the housing mix could be the subject of conditions.
61. On the opposite side of Whitford Road a combined cycle and footpath leads through Sanders Park towards Kidderminster Road and the town centre. A planning obligation provides for the payment of £708,252.55, to be used for the provision of a new cycleway between Whitford Road, St John Street and Kidderminster Road through the park, and for the enhancement of pedestrian and cycle links through the town centre. A toucan crossing of Whitford Road is proposed, a short distance from the access into Sanders Park, and a signalised crossing on the A448 would facilitate journeys on foot to the north of Kidderminster Road. The Appellants have no objection to conditions to secure footway/ cycleway links to the southern boundary of the site where there is a public footpath and to Timberhonger Lane to the north. These routes, and the nearby Monarchs Way footpath provide opportunities to access the open countryside to the west of the site. I am satisfied that the overall transport proposals for the development of site A would maximise opportunities for walking and cycling in accordance with criterion (c).

62. Criterion (d) requires significant improvements to passenger transport including bus services providing a connection to the railway station which is on the other side of Bromsgrove. There are existing bus services along Kidderminster Road, Worcester Road and Rock Hill, which provide access to other parts of the town centre and also to Birmingham, Kidderminster, Redditch and Worcester, although the nearest stops are in excess of recommended maximum walking distances from site A³⁰. A contribution of £233,822.71 would be provided to the County Council's public transport strategy which will take into account all of the allocated sites. No route has been finalised, but the service from site A is intended to provide a link to the town centre and the railway station. Should other schemes not come forward as expected, the planning agreement also includes an obligation for an additional contribution to support the bus service. The proposal would provide the significant improvement sought to passenger transport in the area, and although it would be needed to serve the new housing on the Whitford Road site, the additional service would provide a benefit to the wider community.
63. I have found that the package of transport proposals would manage the cumulative traffic impact generated as required by Policy BDP5A.7(e). A financial contribution towards travel plan initiatives is intended to encourage the use of more sustainable modes of transport.
64. Site A is close to the M5, with part of the western boundary running alongside the motorway. Housing would be set back from this side of the site, and a noise attenuation barrier is proposed on the north-west part. No objection has been raised to the development by Worcestershire Regulatory Services on air quality or noise grounds (the subject of criterion (f)), and with the safeguard of a condition concerning provision of the noise barrier, I do not consider that there would be an adverse effect in respect of these matters.
65. Financial contributions would be provided, not only for transport matters, but also towards other areas of infrastructure provision, notably education and healthcare. These obligations would meet the requirements of criterion (p) in Policy BDP5A and also of Policies BDP6 and BDP16 (paras 76-78, below).
66. There is nothing before me to indicate that the proposed development on site A would fail to comply with any other of the requirements of Policy BDP5A. Certain matters, such as those concerning character and topography, would be fully assessed as part of the consideration of reserved matters. Conditions would be appropriate to ensure that the site is properly drained, and that landscape features and habitats are the subject of a management plan.

Heritage

67. It is common ground between the Appellants and the LPA that the former Greyhound Inn (site B) is a non-designated heritage asset. The building itself is situated on the north side of the junction of Fox Lane and Rock Hill where it is elevated above the latter road. Within the site, a car park extends to the north-west along Fox Lane, and there is an open area with trees between the building and Albert Road. The building dates from at least the mid-nineteenth century: the Appellants' heritage statement and the LPA's conservation officer

³⁰ Recommended maximum walking distances to bus stops by the Chartered Institution of Highways & Transportation are given in Document O6 page 169.

both explain that the tithe map of 1839/40 refers to a house and shows a building in the position of the present structure³¹. Shortly afterwards there are references to the occupier of the building being a beer seller, and subsequently to a public house on the site.

68. The Appellants and the LPA agree that the oldest part of the building appears to be the southern corner. It has subsequently been considerably altered and extended, and much of the main Rock Hill elevation comprises twentieth century additions. The building has some historic value as an example of a vernacular dwelling which has evolved into a public house, and it acts as a reference to the limited built development in the area at a time when it was outside Bromsgrove. Whilst the form of the building's evolution can be discerned, extensive alterations and additions have eroded the evidential value of the former public house, and in this regard I note that the Appellants and the LPA agree that there is little internal evidence of the age of the building. Sections of roof over the left hand side of the front elevation and above the front gable have been badly damaged, and the brickwork has been painted. These factors all reduce the significance of the Greyhound Inn, which I consider is of limited value. Redevelopment of site B would conflict with Policy BDP20 which seeks to safeguard heritage assets. However, I give only moderate weight to the loss of the building, given its limited value. If demolition were to take place, the building should be recorded given its status as a heritage asset, and a condition could be imposed for this purpose.

Other policies

69. Policy BDP8 is concerned with affordable housing. On greenfield sites or any site accommodating 200 or more dwellings, provision should be at a level of up to 40%, and up to 30% affordable housing should be provided on brownfield sites accommodating less than 200 dwellings. By means of a planning obligation, the appeal proposal would provide 40% affordable housing on both sites, and details of the location and size of the dwellings could be secured by condition. The development would comply with Policy BDP8.
70. With the maximum number of dwellings provided, site A would have a density of 31 dwellings per hectare (dph), and site B would have a density of 54dph. A higher density is appropriate on site B, which is within a built-up area where there are some closely-grouped properties nearby and which is also closer to existing bus routes. Both sites would make efficient use of land in accordance with Policy BDP7. The policy also requires proposals to take account of identified housing needs in terms of the size and type of dwellings, and a condition could be imposed requiring the submission of these details.
71. The development on site A would include substantial areas of open space, notably on the western side of this land, and a linear park is shown on the illustrative masterplan extending across the site from Whitford Road. The LPA has calculated that the open space requirements set out in Policy BDP25 would be exceeded, and the areas of open space within the site would contribute to the network of green infrastructure on this side of Bromsgrove, consistent with Policy BDP24.

³¹ The heritage statement is CD A17, and the Conservation Officer's comments are in a consultation response to the planning application.

72. An updated ecological walkover survey report (CD D8) records that three trees on the western boundary of site A have the potential to support roosting bats: these trees are within the area identified as open space and do not need to be removed for the proposed development. A subsidiary badger sett is present on site A, which would require closure as a consequence of the development proposals. The main sett is considered to be outside the site, and it is recommended that corridors of movement be established to enable continued connectivity to the off-site areas used by badgers. I note, moreover, that, subject to the imposition of conditions, there is no objection by Worcestershire Wildlife Trust to the proposed development. Conditions suggested concern a construction environmental management plan, a landscape and ecological management plan, sustainable drainage and lighting. The landscape and ecological management plan should include measures for badger connectivity, and with conditions on these matters in place I consider that the proposed development would not cause harm to protected species, and would comply with Policy BDP21 which seeks to achieve better management of Bromsgrove's natural environment.

Conclusions on the Development Plan

73. The proposal would conflict with Policy BDP20 of the District Plan due to the loss of the Greyhound Inn, a non-designated heritage asset. However that conflict concerns a relatively small part of the overall development, and the significance of the building on site B has been reduced by alterations and damage. Otherwise the proposal, on both sites, would be consistent with policies in the District Plan, and notably the development of site A would bring forward town expansion site BROM3, an important allocation in the Plan. I conclude that the proposed development would comply with the Development Plan considered as a whole.

Other considerations

Whether site A is a sustainable location for housing

74. Site A is on the edge of the built-up area, and significantly the site is allocated as a town expansion site in the District Plan. The supporting text to Policy BDP5A refers to the town expansion sites as sustainable urban extensions, and explains that Bromsgrove Town is the most sustainable location for development in the District due to the wide variety of services, facilities and employment opportunities available. There is a combined cycle and footpath leads through the nearby Sanders Park towards the town centre, a distance of approximately 2km. Whilst this is greater than the preferred maximum distance for journeys on foot to shops and other services, journeys of this length are suitable for cycling. A number of schools are within walking distance of the site, as is the convenience store at the Fox Lane/ Rock Hill junction. Moreover the development proposal would take opportunities to augment accessibility through enhancing pedestrian and cycle links and contributing to a bus service (above, paras 61 & 62), and the inclusion of a local shop within the scheme. I consider that site A would be a sustainable location for the housing development proposed.

Housing land supply

75. The LPA's most recent housing land supply report calculates a requirement for an additional 2,643 dwellings in the five years from April 2020 to March

2025³². A supply of 1,684 dwellings is recorded which would only be sufficient for 3.18 years, rather than the five years required by paragraph 67 of the National Planning Policy Framework (NPPF). The supply includes the delivery of 410 dwellings from site A: if this site does not come forward, the supply of available housing land would only be sufficient for 2.41 years³³. It is clear that the availability of site A is crucial to the provision of housing land in Bromsgrove, a matter to which I give considerable weight.

Healthcare

76. The NHS Trust provides planned and emergency hospital services for Worcestershire, and a contribution is sought towards its services. The Trust explained that its hospitals were operating at full capacity (without taking account of the current covid-19 pandemic), and that the development would bring new people into the area who would make use of its services. I have read that 85% bed occupancy is taken as a benchmark for patient safety, whereas in the three years from 2016/17 – 2018/19 occupancy of the general bed base exceeded 93%³⁴. In response to increasing demand, programmes have been introduced to improve patient flow and the efficiency of outpatient clinics. Funding is not provided until at least eighteen months after the new population has occupied the development, and does not apply retrospectively. The Trust argued in its written representations that the only way in which it can maintain its 'on time' service delivery without compromising quality requirements is with the receipt of contributions towards the cost of providing the necessary additional capacity during the first year of the occupation of each phase of the development.
77. The Appellants and the LPA agree that a payment should be made towards the Trust's services. This is a view which I share: the occupants of the new development would clearly make use of healthcare services, and a contribution is needed to bridge the gap until the funding mechanism reflects the increased activity. A detailed explanation of how the contribution sought has been calculated is set out in the evidence of the Trust's planning witness³⁵. Having regard to migration rates, it is calculated that 44% of the population of sites A and B (603 persons) would be new to Worcestershire. The level of healthcare activities in the local area and their cost have been applied to the incoming population of 603 persons to provide the cost of 12 months service provision. On this basis, a contribution of £289,027.87 is sought, and this amount would be provided by means of a planning obligation. No other calculation is before me, and the methodology employed by the NHS Trust has not been disputed by the other main parties. I am satisfied that the payment of this contribution is necessary to make the development acceptable in planning terms, and that it would meet the other requirements in Regulation 122(2) of The Community Infrastructure Regulations 2010.

Education

78. The nearby Millfields First School has recently increased its intake from 45 to 60 reception pupils, and the Local Education Authority (LEA) has advised that

³² CD O19 tables 11 & 9.

³³ CD O20.

³⁴ CD M1 Appendix 3.

³⁵ CD M2 section 5.

admissions are expected to be at about this number for the foreseeable future³⁶. South Bromsgrove and North Bromsgrove High Schools both serve the area in which the appeal sites are situated. Whilst there has been a recent dip in numbers at South Bromsgrove High School, there is limited capacity to support the numbers of pupils expected to arrive from the middle schools. The LEA seeks contributions towards the provision of additional capacity in both the first and high school sectors. Insofar as first school accommodation is concerned £885,000 (9/60ths) is sought towards the cost of a new school or the expansion of an existing establishment. A contribution is also sought towards education facilities at South Bromsgrove High School on the basis of the following rates for market housing: £867 per two or more bedroom flat, £2,168 per two/ three bedroom unit (except flats), and £3,252 per four or more bedroom unit (except flats). Given the size of the overall development and the lack of capacity in nearby first and high schools to accommodate children from the new housing, I consider that contributions towards the expansion of local education provision are necessary, and that the amounts sought, which are included in planning obligations, are fairly and reasonably related in scale and kind to the development.

The tree preservation order

79. The protected willow tree on site B is situated in an elevated position close to the position of the proposed access from Albert Road. It is intended to retain the tree within the residential development on this site. The bank below the tree encroaches slightly into the visibility splay to the right from the access. No assessment is before me as to whether it would be possible to cut back the bank without affecting the viability of the tree. However, even if that were not possible, I do not consider that it would be necessary to remove the tree, given the limited impact on highway safety of retaining the bank in its existing form (para 18, above).

The NPPF

80. Paragraph 59 of the NPPF refers to the Government's objective to significantly boost the supply of homes, and continues to say that it is important that a sufficient amount and variety of land comes forward where it is needed. LPAs should identify a supply of specific deliverable sites to provide a minimum of five years' worth of housing (paragraph 73). Site A is currently part of the District's housing land supply, and as a large strategic site it has an important role in efforts to ensure that sufficient land for housing becomes available. The District Plan makes clear that there is a significant unmet demand for affordable housing in Bromsgrove, and the proposal would provide this on-site, in accordance with paragraph 62 of the NPPF. In putting forward a mix of house sizes, the development would also be consistent with the intention of paragraph 62 to provide housing for different groups in the community.
81. The development would not be unacceptable in respect of highway safety or traffic movement: it would not, therefore be contrary to paragraph 109, and appropriate opportunities to promote sustainable transport modes have been included in the scheme, in line with paragraph 108(a). Paragraph 192 refers to the desirability of sustaining and enhancing the significance of heritage assets, whereas the proposal would involve the loss of the former Greyhound

³⁶ See Education Planning Obligations Assessment in CD O25.

Inn. In accordance with paragraph 197, that is a matter which I take into the balance in my overall conclusions.

82. The provision of green infrastructure and a local shop would align with paragraph 91(c) of the NPPF, which seeks to support healthy lifestyles, and with the safeguard of conditions concerning a construction environmental management plan, a landscape and ecological management plan, sustainable drainage and lighting, the impact on biodiversity would be minimised, as required by paragraph 170(d).

Planning obligations

83. I have already referred to planning obligations concerning financial contributions to junction alterations, a bus service, cycle and pedestrian links, and education and healthcare provision. The planning agreement also contains obligations providing for several other contributions. Waste and recycling bins, which are a necessary service for new housing, would be funded by a contribution. I agree with the LPA that the appeal proposal would increase pressure on facilities in Sanders Park and the scout and guide huts on Kidderminster Road which are available for community use, and the contributions in the agreement which would be used to enhance provision there are reasonably related in scale and kind to the development. A contribution towards personal travel plan initiatives is intended to encourage the use of more sustainable modes of transport, an objective which is in accord with paragraph 102(c) of the NPPF, and this would be necessary to make the development acceptable in planning terms.
84. A planning obligation concerns arrangements for the provision of affordable housing, which is required by Policy BDP8 of the District Plan. It is important that public open space is not only provided, but maintained thereafter, and this would be secured by the terms of the agreement. To ensure compliance with Policy BDP5A, details of the retail unit on site A are required to be submitted to the LPA.
85. I find that the statutory tests in Regulation 122 of the Community Infrastructure Levy Regulations are met, and that the provisions of the planning agreement are material considerations in this appeal.

Conditions

86. An extensive list of possible conditions was discussed at the inquiry (CD N3). Conditions concerning an acoustic barrier, recording of the former Greyhound Inn, housing mix, a construction environmental management plan, a landscape and ecological management plan, sustainable drainage and lighting have already been referred to in this decision, and each of these conditions would be necessary for the development to proceed.
87. A condition specifying the relevant drawings would be important as this provides certainty, and other conditions should require reserved matters to be prepared in accordance with the parameters plan, masterplan, and design and access statements to ensure that the development would be consistent with this outline proposal and that it would be in keeping with the surroundings. For the same reasons the number of dwellings on each site and the size of the retail unit should be specified. Given the size of site A, phasing should be approved to ensure that expansion of the built-up area occurs in a satisfactory

manner. Other conditions required to ensure that the development would be in keeping with its surroundings concern approval of the cut and fill works and level details on site A, refuse storage arrangements, and safeguarding the protected tree on site B.

88. In the interest of highway safety, conditions would be required concerning the provision of the accesses to site A, and the pedestrian crossings proposed on Whitford Road and Kidderminster Road. The works proposed at the Fox Lane, Charford Road and Kidderminster Road junctions should also be the subject of conditions to assist with the free flow of traffic. In line with policy objectives to promote more sustainable modes of travel, it would be important to provide cycle parking and to secure intended footway and cycleway links. For wider reasons of sustainability, details of the installation of telecommunications and broadband infrastructure should be submitted and electric vehicle charging points should be provided.
89. Paragraph 170(d) of the NPPF encourages the provision of net gains for biodiversity. To this end, a scheme of bird and bat boxes would need to be submitted for approval. In order to protect ground and surface water, and to ensure a satisfactory environment for future residents, it would be necessary to require that an investigation for contamination and any remedial work be undertaken. To ensure that the sites would be satisfactorily drained, schemes for the disposal of foul and surface water should be submitted for approval. The Environmental Statement refers to trial trenching on site A ahead of construction, and the County Archaeological Service has suggested a condition for a programme of archaeological. I agree that this is necessary to safeguard potential archaeological interest.
90. Conditions concerning materials, landscaping, boundary treatment and the access to site B would be unnecessary as these matters should be addressed at reserved matters stage. Similarly a condition requiring the provision of public open space in accordance with an approved scheme should not be imposed, as it would duplicate provisions of a planning obligation.

Conclusions

91. I have found that the appeal proposal would comply with the Development Plan, considered as a whole. Other material considerations must also be taken into account, and paragraph 197 of the NPPF requires that a balanced judgement takes account of the effect on the significance of the non-designated heritage asset of the former Greyhound Inn.
92. As a consequence of the appeal proposal there would be limited negative effects of inadequate deflection on the north-east arm of the Fox Lane roundabout, the loss of a few parking spaces in the lay-by at that junction, and the narrowing of a short section of footway to below 2m at the Charford Road roundabout. The performance of the Fox Lane junction would, however, improve in terms of traffic movement. Limited increases in RFC levels at the Hanover Street junction when the Perryfields development is included in the assessment would not prejudice that other scheme. Overall the proposal would have neither an unacceptable impact on highway safety nor on traffic movement. Taking account of mitigation measures, in most other areas the scheme would have a neutral effect. The former Greyhound Inn on site B would be demolished, although as the value of this building is limited, I give only moderate weight to its loss.

93. Not only does the appeal proposal comply with the Development Plan as a whole, it would bring forward one of the key town expansion sites allocated under Policy BDP5A. Site A has a crucial role in contributing to the supply of housing land, and its development would boost the provision of market and affordable housing in Bromsgrove. These are considerable benefits which clearly outweigh the limited harm which I have identified.
94. The appeal proposal would involve the same amount of residential development on site A as in the previous scheme which was dismissed on appeal for reasons concerning highway safety and traffic movement. There are, however, differences to the highway elements of the scheme, notably the construction of a roundabout at the Fox Lane junction which would improve its performance, and no diversion of traffic from Whitford Road through the site. Furthermore a different methodology has been used for modelling the traffic implications of the development, and the model results have been accepted by the LHA and MM. The District Plan has now been adopted, and, although substantial weight was previously given to relevant policies, their status is now enhanced as they form part of the Development Plan.
95. For the reasons given above, and having regard to all matters raised, I conclude that the appeal should be allowed.

Richard Clegg

INSPECTOR

Schedule of conditions

Conditions relating to sites A and B

- 1) On each phase of site A details of the appearance, landscaping, layout, and scale (hereinafter called "the reserved matters") shall be submitted to and approved in writing by the local planning authority before any development takes place, and on site B details of the access, appearance, landscaping, layout, and scale shall be submitted to and approved in writing by the local planning authority before any development takes place. The development shall be carried out as approved.
- 2) Application for approval of the reserved matters shall be made to the local planning authority not later than three years from the date of this permission and shall be carried out as approved.
- 3) On each phase of site A and on site B the development hereby permitted shall begin not later than three years from the date of approval of the last reserved matters to be approved.
- 4) The development hereby permitted shall be carried out in accordance with the following plans:
 - i) Composite location plan ref 16912/1015
 - ii) Location plan land off Whitford Road ref 16912/1004
 - iii) Location plan Greyhound public house ref 16912/1014
 - iv) Proposed site access Whitford Road (north) ref 7033-SK-031 revision A
 - v) Proposed site access Whitford Road (south) ref 7033-SK-032 revision A
 - vi) Proposed informal pedestrian crossing Whitford Road ref 7033-SK-033 revision A
 - vii) Potential toucan crossing location ref 7033-SK-009 revision B
 - viii) Fox Lane/ Rock Hill schematic proposed arrangement ref 7033-SK-005 revision F
 - ix) Potential mitigation for Rock Hill/ Charford Road mini-roundabout ref 7033-SK-013 revision E
 - x) Potential A448 signalised crossing ref 7033-SK-015 revision A
 - xi) Whitford Road/ Perryfields Road proposed junction arrangement ref 461451-D-014.
- 5) The reserved matters submitted pursuant to this permission shall be in accordance with the indicative masterplan for site A ref 16912/1012 revision B, the development areas parameters plan for site A ref 16912/1017B, and the principles described in the Design & Access Statement received by the local planning authority on 7 January 2016 and the Design & Access Statement Addendum dated 3 January 2018. Any reserved matters application shall include a statement providing an explanation as to how the design of the development responds to the relevant Design & Access Statement.
- 6) The reserved matters submitted pursuant to this permission shall be in accordance with the maximum scale parameters for buildings as set out in paragraph 5.5.4 of section 5.5 of the Design & Access Statement for

site A and paragraph 5.3.1 of Section 5 of the Design & Access Statement for site B.

- 7) No development in a particular phase of site A or on site B shall take place until details of sheltered and secure cycle parking on that land, including a programme for implementation, have been submitted to and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details and implementation programme. Thereafter the cycle parking shall be kept available for the parking of bicycles.
- 8) No part of the development shall be occupied in a particular phase of site A or on site B until bat and bird boxes (to include swift boxes) have been installed on that land in accordance with a scheme which has been submitted to and approved in writing by the local planning authority.
- 9) No development in a particular phase of site A or on site B shall take place until the following components of a scheme to deal with the risks associated with contamination of that land have been submitted to and approved in writing by the local planning authority:
 - i) A site investigation scheme, based on the Preliminary Risk Assessment and Environmental Site Assessment prepared by RSK Ltd December 2012, to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.
 - ii) The site investigation results and the detailed risk assessment and, if necessary, a scheme and programme of remediation measures.
 - iii) A verification plan providing details of the data that will be collected in order to demonstrate that any remediation measures have been completed and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

Should remediation measures be required, no part of the development on that phase of site A or on site B shall be occupied until a verification report demonstrating completion of the measures has been submitted to and approved in writing by the local planning authority.
- 10) Should any contamination be found when carrying out the development that was not previously identified it must be reported in writing immediately to the local planning authority. An investigation and risk assessment must be undertaken in accordance with a scheme which has been submitted to and approved in writing by the local planning authority. Where necessary, remediation measures must be implemented in accordance with a scheme which has been submitted to and approved in writing by the local planning authority. No part of the development on that phase of site A or on site B shall be occupied until a verification report demonstrating completion of the remediation measures has been submitted to and approved in writing by the local planning authority.
- 11) No development shall take place on a particular phase of site A or on site B until a Construction Environmental Management Plan (CEMP) for that land has been submitted to and approved in writing by the local planning authority. The CEMP shall include a foundation works risk assessment and general details of measures to avoid risks to controlled waters during

construction, pollution control measures, tree and hedge protection measures, dust suppression, construction lighting, hours of operation, measures to ensure that vehicles leaving the site do not deposit mud or other detritus on the public highway, details of site operative parking areas, material storage areas and the location of site operative facilities, the hours that delivery vehicles will be permitted to arrive and depart, and arrangements for unloading and manoeuvring, details of any temporary construction accesses and their reinstatement, a highway condition survey, timescale for re-inspections, and details of any reinstatement. The development shall be carried out in accordance with the approved CEMP.

- 12) No development shall take place on a particular phase of site A or on site B until details of the mix of type and size of market dwellings to be provided on that land have been submitted to and approved in writing by the local planning authority. The development shall be carried out in accordance with the approved details.
- 13) No part of the development shall be occupied on a particular phase of site A or on site B until external lighting has been provided in accordance with a scheme which has been submitted to and approved in writing by the local planning authority. The scheme shall include scaled plans and drawings illustrating the design of the light units and columns. The external lighting shall be retained thereafter.
- 14) Any reserved matters application relating to layout shall include details of the facilities for the storage of refuse to be provided on that phase of site A or on site B. No dwelling nor the retail unit shall be occupied until the refuse storage facilities to serve that dwelling or the retail unit have been constructed in accordance with the approved details.
- 15) No development shall take place on a particular phase of site A or on site B until details of the installation of fixed telecommunication infrastructure and high speed broadband on that land have been submitted to and approved in writing by the local planning authority. No dwelling nor the retail unit shall be occupied before the telecommunication infrastructure and broadband to serve that dwelling or the retail unit have been installed in accordance with the approved details.
- 16) No development shall take place on a particular phase of site A or on site B until a sustainable urban drainage system (SUDS) has been constructed on that land in accordance with a scheme which has been submitted to and approved in writing by the local planning authority. The scheme shall include measures to secure the on-going maintenance of the SUDS following the completion of the development. Thereafter, the SUDS shall be maintained in accordance with the approved scheme.
- 17) No dwelling shall be occupied on a particular phase of site A or on site B until a drainage system for the disposal of foul and surface water on that land has been completed in accordance with a scheme which has been submitted to and approved in writing by the local planning authority.

Conditions relating to site A (land off Whitford Road) only

- 18) The number of dwellings on site A shall not exceed 490.

- 19) No development shall take place until details for the timescale and order of the delivery of the development have been submitted to and approved in writing by the local planning authority. The phasing of the development shall be carried out in accordance with the approved details.
- 20) No development in a particular phase shall take place until a scheme involving a full engineering design, specification, extent and methodology of the cut and fill works for that phase has been submitted to and approved in writing by the local planning authority. The scheme should clarify how the undisturbed ground at higher levels is to be retained in a stable manner, together with the foundation design at lower levels. The development shall be carried out in accordance with the approved scheme.
- 21) The first reserved matters application relating to layout shall include a plan identifying the number and location of the affordable housing units to be provided on the site. The plan shall identify the size (bedroom numbers), type and tenure of each affordable housing unit. The development shall be carried out in accordance with the approved details.
- 22) No dwelling shall be occupied until the acoustic fencing on the north-western part of the site has been erected in accordance with a scheme which has been submitted to and approved in writing by the local planning authority. The acoustic fencing shall be retained thereafter.
- 23) No dwelling shall be occupied until an electric vehicle charging point to serve that dwelling has been provided. Where apartments are provided, one electric charging point per three parking spaces shall be provided. The electric vehicle charging points shall be retained thereafter.
- 24) The retail unit shall have a maximum gross floor space of 400m².
- 25) No part of the development shall be occupied until the junction of Fox Lane/ Rock Hill has been altered in accordance with the scheme for a roundabout shown on the plan *Fox Lane/ Rock Hill schematic ref 7033-SK-005 revision F*.
- 26) No part of the development shall be occupied until detailed drawings of the site accesses and the pedestrian crossings on Whitford Road, together with a programme for their implementation, have been submitted to and approved in writing by the local planning authority. The detailed drawings for the site accesses shall be prepared in accordance with the plans *Proposed site access Whitford Road (north) ref 7033-SK-031 revision A* and *Proposed site access Whitford Road (north) ref 7033-SK-032 revision A*, and the detailed drawings for the pedestrian crossings shall be prepared in accordance with the plans *Proposed informal pedestrian crossing Whitford Road ref 7033-SK-033 revision A* and *Potential toucan crossing location ref 7033-SK-009 revision B*. The development shall be carried out in accordance with the approved detailed drawings and implementation programme.
- 27) No more than 99 dwellings shall be occupied until the junction of the A448/ Whitford Road/ Perryfields Road has been altered in accordance with the plan *Whitford Road/ Perryfields Road proposed junction arrangement ref 461451-D-014*, and until a pedestrian crossing on the A448 has been provided in accordance with the plan *Potential A448 signalised crossing ref 7033-SK-015 revision A*.

- 28) No more than 249 dwellings shall be occupied until the junction of Charford Road/ Rock Hill/ Worcester Road has been altered in accordance with the scheme for a roundabout shown on the plan *Mitigation for Rock Hill/ Charford Road mini-roundabout ref 7033-SK-013 revision E*.
- 29) No development shall take place until a site A wide landscape and ecological management plan (LEMP) for the long-term protection and management of the trees, hedgerows, habitats and species present on the site has been submitted to and approved in writing by the local planning authority. The LEMP shall incorporate a mitigation strategy based on Chapter 11 of the Environmental Statement and the Ecological Walkover Survey Report (April 2019), and a programme for implementation. The development shall be implemented in accordance with the approved LEMP and implementation programme.
- 30) No development in a particular phase shall take place until details of the finished ground floor levels of all the buildings and the finished ground levels for all other areas of the site have been submitted to and approved in writing by the local planning authority. The details shall include sections which show the development relative to the ground levels adjoining the site. The development shall be carried out in accordance with the approved details.
- 31) No development shall take place until a scheme for archaeological investigation, including a programme for implementation, arrangements for the publication of the results, and archive deposition, has been submitted to and approved in writing by the local planning authority. The archaeological investigation shall be carried out in accordance with the approved scheme and programme.
- 32) No dwelling shall be occupied until a footpath/cycle path up to public footpath BM-587 at the southern boundary of site A and a footpath/cycle path up to Timberhonger Lane at the northern boundary of the site have been constructed in accordance with schemes which have been submitted to and approved in writing by the local planning authority.

Conditions relating to site B (land off Albert Road) only

- 33) The number of dwellings on site B shall not exceed 15.
- 34) The reserved matters application relating to layout shall include a plan identifying the number and location of the affordable housing units to be provided on the site. The plan shall identify the size (bedroom numbers), type and tenure of each affordable housing unit. The development shall be carried out in accordance with the approved details.
- 35) The development shall be carried out in accordance with the Arboricultural Method Statement and Tree Protection Plan covering site B.
- 36) No demolition shall take place until heritage recording of the former Greyhound Inn has been undertaken, in accordance with a scheme to be submitted to, and approved in writing by, the local planning authority. The scheme shall include the timescale for recording, the methodology to be used, and details of how the record will be maintained.

END OF CONDITIONS

APPEARANCES³⁷

FOR THE LOCAL PLANNING AUTHORITY:

Miss S Clover of Counsel She called Mr T Colles BEng(Hons)	Instructed by the Council's Solicitor Associate Director – Engineering, Design & Project Management, Atkins Ltd Development Management Manager, Bromsgrove DC
Mr D Birch BA(Hons) DipTP MRTPI	

FOR THE APPELLANTS:

Mr R Warren QC He called Mr R Hutchings BSc CEng MICE FCIHT EurIng Mr G Mitchell BA(Hons) DipTP MRTPI	Instructed by Mr Mitchell Director, WSP UK Ltd Director, Frampton Town Planning Ltd
Mr D Dixon MSc MCIHT Mr D Morris	Associate Director, WSP UK Ltd Planning & Operations Director, Catesby Estates Ltd

FOR WORCESTERSHIRE ACUTE HOSPITALS NHS TRUST:

Ms Antaa-Collier Dr L Peaty Mr A J Roberts BSc (Joint Hons) AssocRTPI	Partner, The Wilkes Partnership LLP Worcestershire Acute Hospitals NHS Trust Director, DLP Planning Ltd
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INTERESTED PERSONS:

Councillor L Mallett	Member of the District Council for Hill Top Ward, and Member of the County Council for Bromsgrove West Division
Mr A Bailes CTPP MSc FCILT FCIHT TPS	Transport planning & traffic engineering professional. Transport advisor to Whitford Vale Voice
Mr R Skidmore	Chair of the Environment Committee, The Bromsgrove Society

CORE DOCUMENTS SUBMITTED BEFORE THE INQUIRY OPENED

G0 Mr Mitchell's proof of evidence.
H0 Mr Hutchings' proof of evidence.

CORE DOCUMENTS SUBMITTED AFTER THE INQUIRY OPENED

CD N1 Planning agreement relating to the appeal proposal.

³⁷ Mr Birch, Mr Dixon, Mr Morris, Dr Peaty and Mr Roberts were not called formally to present evidence to the inquiry, but they contributed to the sessions on planning obligations and possible conditions.

- CD 01 Mr Warren's opening statement on behalf of the Appellants.
- CD 02 Miss Clover's opening statement on behalf of the LPA.
- CD 03 Ms Antaa-Collier's opening statement on behalf of the NHS Trust.
- CD 04 Revised appendix H13 to Mr Hutchings' proof of evidence.
- CD 05 Plan of the proposed general arrangement of Rock Hill/ Fox Lane roundabout, ref 7033-S278-101 Revision J. Submitted by the Appellants.
- CD 06 Bundle of plans of proposed alterations to junctions on the A38. Submitted by the Appellants.
- CD 07 Plan of Kidderminster Road/ St John's Street/ Hanover Street junction, potential mitigation option with swept paths, ref 7033/ATR/003 revision A. Submitted by the Appellants.
- CD 08 Appeal decision ref APP/P1805/A/14/2225584 for up to 490 dwellings and associated development on site A.
- CD 09 Highway Authority's approval of CD 10. Submitted by the Appellants.
- CD 010 The Appellants' Response to Stage 1 Road Safety Audit at the Proposed Site Accesses – site A. Submitted by the Appellants.
- CD 011 Highway Authority's approval of CD 12. Submitted by the Appellants.
- CD 012 The Appellants' Response to Stage 1 Road Safety Audit at the Greyhound Inn Site – site B. Submitted by the Appellants.
- CD 013 Mr Bailes' presentation to the inquiry.
- CD 014 Rock Hill/ Fox Lane roundabout schematic proposed arrangement showing features on south-east side of Rock Hill, ref 7033-SK-005 revision F.
- CD 015 Rock Hill/ Fox Lane roundabout general arrangement – approach deflection, ref 7033-SK-29 revision K. Submitted by the Appellants.
- CD 016 Summary tables of junction performance.
- CD 017 Tree preservation order (No 15) 2016.
- CD 018 Rock Hill/ Fox Lane roundabout – plans of approach deflection. Submitted by Mr Colles.
- CD 019 Housing Land Supply in Bromsgrove District 2011-2020, Bromsgrove DC, April 2020.
- CD 020 Email dated 19 November 2020 from Mr Mitchell concerning housing land supply and Rock Hill/ Fox Lane junction.
- CD 021 Bundle of documents concerning the Rock Hill/ Fox Lane junction referred to in Document CD 020.
- CD 022 Mr Bailes' comments on Documents CD 09 - CD 012.
- CD 023 WVV note, Modelling the Rock Hill/ Fox Lane Junction.
- CD 024 Extract from the Perryfields Transport Assessment. Submitted by WVV.
- CD 025 The County Council's CIL compliance statement and supporting documents.
- CD 026 Ms Antaa-Collier's closing submissions on behalf of the NHS Trust.
- CD 027 Miss Clover's closing submissions on behalf of the LPA.
- CD 028 Appeal decision and report for mixed use development at Newton Abbot. Submitted by Ms Antaa-Collier.
- CD 029 Mr Warren's closing submissions on behalf of the Appellants.

- CD 030 Plan of proposed access (north) to site A, ref7033-SK-031 revision A.
- CD 031 Plan of proposed access (south) to site A, ref7033-SK-032 revision A.
- CD 032 Plan of proposed toucan crossing location (site A), ref 7033-SK-009 revision B.
- CD 033 Plan of Kidderminster Road/ St John's Street/ Hanover Street junction, potential mitigation option, ref 7033/SK/010 revision B. Submitted by the Appellants.
- CD 034 Plan of proposed informal pedestrian crossing (site A), ref 7033-SK-033 revision A.
- CD 035 Emails from the Appellants and the LPA concerning possible conditions Nos 4 & 28.

OTHER DOCUMENTS

- O1 The Appellants' supplementary statement of case, March 2020.
- O2 The LPA's statement of case.
- O3 The LPA's supplementary statement of case, March 2020.
- O4 The NHS Trust's statement of case.
- O5 Supporting documents to Document O4.
- O6 Mr Bailes' statement, June 2020.
- O7 Whitford Vale Voice's comments on the Appellants' proof of evidence on highways and transport matters.
- O8 Cllr Mallett's letter about the appeal.
- O9 Supporting documents to Document O8.

D.2 (APP/X2410/A/12/2173673)



Department for
Communities and
Local Government

Mr R J Gardner
GVA Grimley Ltd
3 Brindley Place
BIRMINGHAM
B1 2JB

Our Ref: : APP/X2410/A/12/2173673
Your Ref: Jelson Barrow on Soar

14 May 2013

Dear Sir,

**TOWN AND COUNTRY PLANNING ACT 1990 – SECTION 78
APPEAL BY JELSON HOMES
LAND AT MELTON ROAD, BARROW UPON SOAR, LEICESTERSHIRE, LE12 8NN
APPLICATION REF: P/10/1518/2**

1. I am directed by the Secretary of State to say that consideration has been given to the report of the Inspector, Keith Manning BSc (Hons) BTP MRTPI, who held a public local inquiry on 7 days between 9 October 2012 and 16 January 2013 into your clients' appeal against the refusal of Charnwood Borough Council ("the Council") to grant outline planning permission for residential development at land at Melton Road, Barrow Upon Soar, Leicestershire, LE12 8NN, in accordance with application ref: P/10/1518/2.
2. On 18 June 2012, the appeal was recovered for the Secretary of State's determination, in pursuance of section 79 of, and paragraph 3 of Schedule 6 to, the Town and Country Planning Act 1990, because it involves a proposal over 150 units on a site of more than 5 ha which would significantly impact on the Government's objective to secure a better balance between housing demand and supply and create high quality, sustainable mixed and inclusive communities.

Inspector's recommendation and summary of the decision

3. The Inspector recommended that the appeal be allowed and planning permission granted. For the reasons given below, the Secretary of State agrees with the Inspector's conclusions and recommendations. A copy of the Inspector's report (IR) is enclosed. All references to paragraph numbers, unless otherwise stated, are to that report.

Matters arising following the close of the inquiry

4. Nicky Morgan MP wrote to the Planning Inspectorate on 2 April 2013 to point out that the Council's Cabinet would be considering their draft Core Strategy document at a meeting on 11 April with a view to approving it for consultation, and the Parish Council

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wrote to the Secretary of State on 7 May 2013 drawing attention to the revocation of the *East Midlands Regional Plan 2009 (RS)* and to the Council's approval of the Core Strategy for public consultation. Copies of this correspondence can be obtained by written application to the address at the bottom of the first page of this letter, and the points raised are covered in paragraph 5 below.

Policy considerations

5. In deciding this appeal, the Secretary of State has had regard to section 38(6) of the Planning and Compulsory Purchase Act 2004 which requires that proposals be determined in accordance with the development plan unless material considerations indicate otherwise. In this case, following the revocation of the RS with effect from 12 April 2013, the Development Plan consists of the saved policies of the Charnwood Local Plan 1991-2006. The Secretary of State does not consider that the revocation of the RS raises any matters that would require him to refer back to the parties for further representations prior to reaching his decision on this appeal, and he is satisfied that no interests have thereby been prejudiced. He has also had regard to the fact that the Council is progressing work on its Core Strategy. However, as that is at an early stage in its preparation, he gives it little weight.
6. Other material considerations which the Secretary of State has taken into account include the National Planning Policy Framework (The Framework); *Technical Guidance to the National Planning Policy Framework* (March 2012); Circular 11/1995: *Use of Conditions in Planning Permission*; and the *Community Infrastructure Levy (CIL) Regulations 2010* as amended.

Main issues

7. The Secretary of State agrees with the Inspector that the main issues in this case are those identified by the Inspector at IR219.

Housing land supply

8. The Secretary of State agrees with the Inspector that, for the reasons given at IR220-221, the presumption in favour of sustainable development set out in paragraph 14 of the Framework is engaged and the failure to demonstrate a 5 year supply of deliverable housing sites is a matter to which substantial weight must be accorded.

Sustainability

9. For the reasons given at IR222-232, the Secretary of State agrees with the Inspector's conclusion at IR233 that the appeal site's basic credentials in terms of natural resource conservation, potential for good design, choice of sustainable transport modes and scope for future improvement of public transport in response to demand are highly conducive to development of the type proposed. Like the Inspector (IR234), the Secretary of State recognises that other considerations impinge on the overall sustainability of the site, and he goes on to consider those individually below.

Highway safety

10. The Secretary of State notes (IR236) that the Highway Authority has not objected to the appeal proposals but that the junction of Grove Lane with Sibley Road/South Street does not provide the visibility to the left that, ideally, it should. Having carefully

considered the evidence summarised by the Inspector at IR235-243, the Secretary of State agrees with him (IR244) that it is appropriate to consider the matter of the safety of the Grove Lane junction in the round. He therefore agrees with the Inspector (IR244-245) that, despite its perceived deficiency in respect of visibility to the left, the junction operates safely and should not trigger prevention of the proposed scheme unless the impact of the proposed development on its continued safe operation would be demonstrably severe in the sense intended by paragraph 32 of the Framework.

11. Accordingly, for the reasons given at IR247-248, the Secretary of State agrees with the Inspector that it would not be unreasonable to conclude that the safety of the junction would not be materially diminished by the extra traffic from the proposed development. He also agrees with the Inspector (IR249) that, on the basis of the evidence seen by the Inspector, there would seem to be no reason why safety should be reduced for pedestrians or cyclists. Overall, therefore, he agrees (IR250) that the balance of evidence points to a judgement that highway safety would not be materially compromised by the appeal scheme and that only limited weight should be afforded to the perception of any such risk.
12. With regard to the site access itself (IR251-253), the Secretary of State agrees with the Inspector that there is no reason to disagree with the Highway Authority with regard to the need for a separate emergency access (IR252); and that no weight should be accorded to any potential deficiencies in the forward visibility to the access roundabout from the north east (IR253).

Traffic circulation in Barrow Upon Soar

13. Having regard to the Inspector's consideration of the traffic circulation issues arising from the concentration of traffic onto the listed Barrow Road bridge, and the periodic inundation of the alternative route via Slash Lane placing more pressure on the bridge when such flooding occurs (IR254-256), the Secretary of State agrees with the Inspector at IR257 that the key question is whether the extra traffic impact of the proposed development on flood days would be so severe as to render it untenable. Taking account of the Inspector's deliberations at IR258-264, including the appellant's off-site proposals to improve capacity through traffic management measures and the fact that the highway authority is satisfied with them, the Inspector concludes that he has seen no cogent evidence to suggest that the position would be untenable; and the Secretary of State sees no reason to disagree with that conclusion.

Flood risk

14. Like the Inspector, the Secretary of State considers that, despite the apprehension of local residents, the proposed development should not make matters worse in any significant way for the existing population (IR265-267) and may possibly improve the position for some existing householders (IR274). The Secretary of State also agrees with the Inspector (IR268) that, although the evidence produced so far has been sufficient to satisfy the Environment Agency that relevant objectives could be met, if more detailed investigation subsequently shows that they could not actually be satisfied, the development would not be able to proceed. Overall, for the reasons given at IR269-274, the Secretary of State agrees with the Inspector's conclusions at IR275-276 that there is no significant conflict with the intentions of the development plan or the Framework in respect of flood risk, and that any potential impact on foul

drainage and risk of surcharge arising from flooding of Fishpool Brook can be addressed by the imposition of conditions.

Infrastructure

15. Like the Inspector (IR301), the Secretary of State appreciates the local perception in the community of growth and consequent pressure. Nevertheless, having carefully considered the Inspector's deliberations on infrastructure provision at IR277-300 (and taking account of his conclusions on the terms of the planning obligation at paragraph 20 below), the Secretary of State agrees with the Inspector at IR 301 that the proposed development would provide the necessary mitigation, but little more, of its own impact and so should not lead to the deterioration in the quality of life which the Parish Council and others assert. He therefore also agrees with the Inspector (IR302) that the proposed development would not lead to a deterioration in the quality of life of existing residents sufficient to warrant dismissal of the appeal.

Accordance with the development plan and the Framework

16. For the reasons given at IR303-311, and taking account of the revocation of the RS, the Secretary of State agrees with the Inspector's conclusion at IR312 that the appeal scheme displays a very substantial degree of accordancy with the development plan as a whole apart from the conflict with the protection of the countryside outside defined settlement boundaries - where the local plan intention has to be tempered by the presumption in favour of sustainable development in the Framework. The Secretary of State also agrees with the Inspector's more detailed conclusions with regard to accordancy with the Framework at IR313-323.

17. Furthermore, like the Inspector, he has given careful consideration to the core principle with regard to "empowering people to shape their surroundings" (IR324), but he agrees with the Inspector that that pulls in the opposite direction to the presumption in favour of sustainable development that is engaged in this case. In coming to this conclusion, the Secretary of State agrees with the Inspector (IR326) that, as the aspiration to prepare a neighbourhood plan is clearly some time from fulfilment, with no firm programme for preparation, paragraph 14 of the Framework is inescapably influential in the context of the Framework as a whole, bearing in mind the sustainability of the appeal scheme in terms of its location and characteristics.

The planning balance

18. For the reasons given at IR327-337, the Secretary of State agrees with the Inspector at IR338 that, while there are harmful aspects to the appeal scheme to which weight should be accorded, these have to be weighed against the very substantial contribution to housing needs that the site is capable of providing in the context of an acknowledged shortage of suitable land and the inherent sustainability of the location. He also agrees that those aspects of the planning obligation which help to mitigate the impact of the proposed development should be accorded due weight and that, bearing in mind the policies of the Framework as a whole and the development plan taken as a whole, the presumption in favour of sustainable development should be the decisive factor.

Conditions and obligations

19. The Secretary of State has considered the Inspector's reasoning and conclusions on planning conditions as set out at IR197-215, and he is satisfied that the conditions as proposed by the Inspector and set out at Annex A to this letter are reasonable, necessary and comply with Circular 11/95.
20. With regard to the Planning Obligation (IR4, IR216-218, and IR283-301), the Secretary of State is satisfied that the provisions set out in the signed and sealed Planning Agreement dated 4 October 2012, as varied by the Deed of Variation dated 15 January 2013 (to make its provisions conditional upon their items being determined by the Secretary of State to meet the statutory tests) can be considered to be compliant with CIL Regulation 122. For the reasons given at IR286, the Secretary of State agrees with the Inspector at IR287 that no weight should be given to the Travel Plan Penalty element of the planning obligation.

Overall Conclusions

21. The Secretary of State gives significant weight to the fact that the Framework indicates that, in the absence of a 5 year housing land supply in an up-to-date, adopted development plan, planning permission should be granted for the proposal. He is satisfied that the appeal site is in a sustainable location for housing development, and that, as the adverse impacts of granting planning permission would not significantly and demonstrably outweigh the benefits when assessed against the Framework taken as a whole, he does not consider that there are any material considerations of sufficient weight to justify refusing planning permission.

Formal Decision

22. Accordingly, for the reasons given above, the Secretary of State agrees with the Inspector's recommendations. He hereby grants outline planning permission for residential development at land at Melton Road, Barrow Upon Soar, Leicestershire, LE12 8NN, in accordance with application ref: P/10/1518/2.
23. An applicant for any consent, agreement or approval required by a condition of this permission for agreement of reserved matters has a statutory right of appeal to the Secretary of State if consent, agreement or approval is refused or granted conditionally or if the Local Planning Authority fail to give notice of their decision within the prescribed period.
24. This letter does not convey any approval or consent which may be required under any enactment, bye-law, order or regulation other than section 57 of the Town and Country Planning Act 1990.

Right to challenge the decision

25. A separate note is attached setting out the circumstances in which the validity of the Secretary of State's decision may be challenged by making an application to the High Court within six weeks from the date of this letter.

26. A copy of this letter has been sent to the Council. A notification e-mail / letter has been sent to all other parties who asked to be informed of the decision.

Yours faithfully

JEAN NOWAK

Authorised by Secretary of State to sign in that behalf

CONDITIONS

1. Details of the appearance, landscaping, layout, and scale, (hereinafter called "the reserved matters") shall be submitted to and approved in writing by the local planning authority before any development begins and the development shall be carried out as approved.
2. Application for approval of the reserved matters shall be made to the local planning authority not later than three years from the date of this permission.
3. The development hereby permitted shall begin not later than two years from the date of approval of the last of the reserved matters to be approved.
4. No development shall commence until both a Master Plan in general conformity with the submitted Illustrative Masterplan 4045_SK_001 rev E and a Design Code for the site have been submitted to and approved in writing by the local planning authority. Both shall substantially accord with the submitted Design and Access Statement Rev G. Any amendment to either shall be submitted to and approved in writing by the local planning authority. The Design Code shall address the following:-
 - i) Architectural and sustainable construction principles
 - ii) Character areas
 - iii) Lifetime home standards
 - iv) Car parking principles
 - v) Cycling provision including pedestrian and cycle links to adjoining land
 - vi) Street types and street materials
 - vii) Boundary treatments
 - viii) Building heights (which should be limited to a maximum height of three storeys, being located on the main street only, as indicated on pages 33/34 of the Design and Access Statement, and two storeys for the remaining parts of the development)
 - ix) Building materials
 - x) Provision of public open spaces (including timetable for implementation)
 - xi) Design of the site to accord with Secure by Design principles.
 - xii) Phases of development.

Applications for approval of the reserved matters submitted pursuant to condition 2) above shall be in accordance with the Master Plan and Design Code as approved. In addition to the Design and Access Statement previously referred to, The Master Plan and Design Code and the reserved matters submitted for approval shall also accord with the principles set out in the following submitted documents: Flood Risk Assessment June 2010; Addendum to Flood Risk Assessment January 2011; Ecological Appraisal June 2010; Bats in Trees Addendum December 2010; Tree Assessment Report Rev A; and Badger Mitigation Strategy December 2010. Development shall be carried out in accordance with all matters approved pursuant to this condition.

5. Notwithstanding the generality of condition 4) above, the development hereby permitted shall be carried out in accordance with the following approved plans:

4045_SK_005 Site Location Plan
 0940/SK/010 rev C Typical Badger Tunnel Detail
 0940/SK/013 rev E Melton Road Alternative Site Access Roundabout
 0940/SK/014 rev A Site Access Roundabout
 0940/SK/022 rev B Fishpool Brook Pedestrian Footbridge Crossing
 0940/ATR/002 rev A Proposed Site Access – Swept Path Analysis
 4045-L-01 rev D Types of Open Space

4045-L-02 rev A Extended Floodplain Area to be Regraded
4045-L-04 Public Open Space Phasing Plan
NTW/307/Figure 4 Rev A Indicative Floodplain Sections
NTW/307/Addendum Figure 1 Rev A Fishpool Brook Modelled Floodplain Extent

6. The maximum area of residential development on the site (excluding the areas of public open space, structural landscaping, meadow and SUDS) shall be defined on the Master Plan to be approved pursuant to condition 4) above and shall not exceed 8.32 hectares, and no more than 300 dwellings shall be constructed on the site.
7. No construction on any phase of the development hereby permitted shall commence until such time as the following details in respect of that phase have been submitted to and approved in writing by the local planning authority:
 - a) Siting including details of proposed levels of ground surfaces and finished floor levels of all buildings and a number of selected typical sections across the phase.
 - b) A landscaping scheme including details of all trees and hedgerow to be retained, full planting specification, timing or phasing of implementation, services above and below ground; and a landscape management plan covering a minimum period of 10 years following completion of the development. Any trees or plants removed, dying, being severely damaged or becoming seriously diseased within 5 years of planting shall be replaced in the following planting season by trees or plants of a size and species similar to those originally required to be planted;
 - c) Treatment of all hard surfaced areas, including types and colours of materials street furniture, signing and lighting of all public spaces.
 - d) Boundary treatment to all open areas where the site bounds other land (where confirmed in writing by the local planning authority to be required) including design, height, materials and colour finish.
 - e) Details of the proposed standard signage for the footpaths at the points where footpath I 23 is proposed to be crossed by the new estate roads.
 - f) Layout and design of children's play areas; Multi Use Games Area/skate park area and any other play/ recreation area within the development;
 - g) Details of external lighting.

Development shall be carried out in accordance with the approved details.

8. No development shall commence until the applicant or developer has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted to and approved in writing by the local planning authority, and no development shall take place except in accordance with the approved scheme details.
9. No development shall commence until drainage plans for the disposal of foul sewage have been submitted to and approved in writing by the local planning authority. No dwelling, in any phase of construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details.
10. No development shall commence until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydro-geological context of the development, including any requirement for the provision of a balancing pond, has been submitted to and approved in writing by the local planning authority. No dwelling, in any phase of construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details. The balancing pond, if required, shall be completed and be in operation before the occupation of the first dwelling on any phase.

11. No development shall commence until a scheme to install trapped gullies has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented in accordance with the approved details. No dwelling, in any phase of construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details.
12. If during development contamination not previously identified is found to be present at the site then no further development should be carried out in that location until such time as a remediation strategy has been submitted to and agreed in writing by the local planning authority and the works carried out in accordance with the agreed strategy prior to re-commencement on that part of the site.
13. Prior to the commencement of development, a scheme for the protection of trees and hedges to be retained on site shall be submitted to and approved in writing by the local planning authority. The scheme shall include:-
 - Details of all trees and hedges to be retained on site.
 - Details of any works proposed in respect of any retained trees and hedges on site.
 - Details of operational and physical measures proposed for the protection of trees and hedges
 - Details of any ground works that are to be carried out within 10 metres of any tree or hedge identified as being retained.
 - Details of the methodology to be employed when carrying out ground or other works within 10 metres of any tree or hedge to be retained.

Development shall be carried out in accordance with the approved details.

14. No development shall commence on any phase until the tree/hedge protection measures for that phase approved pursuant to condition 13) above have been fully implemented. The approved tree/hedge protection measures shall be retained and maintained in their approved form until development on the phase in which they are located is complete. Within the areas agreed to be protected, the existing ground level shall be neither raised nor lowered, and no materials or temporary building or surplus soil of any kind shall be placed or stored thereon unless approved as part of the details submitted to discharge the condition.
15. No development shall commence until a scheme of noise attenuation/mitigation measures (in order to reduce noise likely to be experienced in dwellings and private gardens from the use of the railway corridor to the south west of the site) has been submitted to and approved in writing by the local planning authority. No dwelling in any phase of the site identified by the scheme as being affected by railway noise shall be occupied until the required measures have been implemented in accordance with the approved scheme.
16. No development shall commence until details of the construction of the proposed access roundabout (as shown indicatively on drawing 0940/SK/013 Rev E) and the footpath/cycleway bridge across the Fishpool Brook (as shown indicatively on drawing 0940/SK/022 rev B) have been submitted to and approved in writing by the local planning authority. No dwelling on the site shall be occupied until the access roundabout and pedestrian bridge have been constructed in accordance with the approved details.
17. No development shall commence until a detailed scheme of works for the improvement of traffic flow at the Barrow Road Bridge of the type illustrated on WSP UK drawing numbered SK/017 Rev A has been submitted to and approved in writing by the local planning authority. No dwelling on the site shall be occupied until the improvement works at the bridge have been fully implemented in accordance with the approved details.
18. No development shall take place until a Construction Method Statement has been submitted to, and approved in writing by, the local planning authority. The approved Statement shall be adhered to throughout the construction period. The Statement shall provide for:

- i) the parking of vehicles of site operatives and visitors
- ii) the routing of construction traffic throughout the construction process and the mechanism for securing adherence to approved routes
- iii) loading and unloading of plant and materials
- iv) storage of plant and materials used in constructing the development
- v) the erection and maintenance of security fencing
- vi) wheel washing facilities
- vii) measures to control the emission of dust and dirt during construction
- viii) a scheme for recycling/disposing of waste resulting from the construction works
- ix) precautionary measures to ensure that no badgers become trapped or injured during development work

19. No development shall commence until procedures have been initiated to upgrade the existing public footpaths I 23 and I 24 (part) beyond the edge of the meadow boundary to the eastern boundary of the application site to footpaths/cycleways. The upgrading works (including those approved through Condition 7) shall be completed prior to the occupation of 50% of the dwellings on the site.
20. No development shall commence until a scheme of electronic or other suitable signing to warn of flooding on Slash Lane has been submitted to and approved by the local planning authority. No dwelling on the site shall be occupied until the scheme has been fully implemented in accordance with the approved details.
21. No development shall commence until a scheme of public art to be delivered on site has been submitted to and agreed in writing by the local planning authority. Those elements of the approved public art scheme which are to be delivered on a particular phase of the development shall be delivered prior to the occupation of 80% of the dwellings in that phase.
22. No development shall commence until an assessment of the anticipated energy requirements arising from the development has been submitted to and approved in writing by the local planning authority. That assessment must demonstrate how a minimum of 10% of the energy requirements shall be secured from decentralised and renewable or low-carbon energy sources. Details and a timetable of how these measures are to be achieved, including details of any physical works on site, shall be submitted to and approved in writing by the local planning authority. The approved details shall be implemented in accordance with the approved timetable and retained as operational thereafter.



Report to the Secretary of State for Communities and Local Government

by Keith Manning BSc (Hons) BTP MRTPI

an Inspector appointed by the Secretary of State for Communities and Local Government

Date: 13 March 2013

TOWN AND COUNTRY PLANNING ACT 1990

CHARNWOOD BOROUGH COUNCIL

APPEAL BY

JELSON HOMES

Inquiry opened on 9 October 2012

Land at Melton Road, Barrow Upon Soar, Leicestershire LE12 8NN

File Ref(s): APP/X2410/A/12/2173673

File Ref: APP/X2410/A/12/2173673

Land at Melton Road, Barrow Upon Soar, Leicestershire LE12 8NN

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant outline planning permission.
- The appeal is made by Jelson Homes against the decision of Charnwood Borough Council.
- The application Ref P/10/1518/2, dated 12 July 2010, was refused by notice dated 9 December 2011.
- The development proposed is residential development.

Summary of Recommendation: The appeal be allowed, and planning permission granted subject to conditions

Procedural Matters

1. The Inquiry sat for seven days in total, from 9 October – 12 October and on 13 November 2012, and on 15 and 16 January 2013, having been unfortunately delayed in its completion by the serious illness of one of the parties' representatives. I visited the site and various other locations in Barrow Upon Soar, on an accompanied basis, on 6 December 2012.
2. For consistency, I use the spelling Barrow Upon Soar throughout. 'The Council' is a reference to the Charnwood Borough Council. 'The County Council' is a reference to the Leicestershire County Council and 'The Parish Council' is a reference to the Barrow Upon Soar Parish Council.
3. The application subject to appeal is in outline with all matters except access reserved for subsequent approval.
4. A Planning Agreement dated 4 October 2012 was submitted at the Inquiry, accompanied by a Deed of Variation dated 15 January 2013. This does not affect the substance of the Agreement, the signatories to which are Jelson Limited, the Council of the Borough of Charnwood and Leicestershire County Council.
5. The agreement provides for financial contributions in respect of Community Facilities, Healthcare, Policing, Education, Libraries, Pedestrian and Cycle Routes, Travel Passes, Travel Packs and Bus Shelters. It provides for a financial penalty in respect of the Travel Plan in prescribed circumstances.
6. The agreement also provides for the provision and maintenance of open space within the site and for the provision of Affordable Housing as part and parcel of the residential development proposed in accordance with an Affordable Housing Scheme to be approved by the Council prior to the commencement of the proposed development. 30% of the dwellings would be Affordable Housing as defined in the National Planning Policy Framework or any successor document.
7. A Statement of Common Ground (SoCG) between the Council and the appellant was agreed in May 2012 confirming a good measure of agreement across a broad spectrum of considerations. It lists the following as having been submitted in support of the application: Planning Statement (PS); Design and Access Statement (DAS); Transport Assessment (TA) , Addendum Transport Assessment (ATA), Framework Travel Plan (FTP), Updated Framework Travel Plan (UFTP), VISSIM Modelling Report (VMR), Stage One Road Safety Audit (RSA1); Flood Risk Assessment (FRA); Arboricultural Survey (AS); Ecological Survey (ECOS);

Archaeological Information (AI); and an Acoustic Report (AR). There is also a submitted Addendum (AFRA) to the Flood Risk Assessment dated 17 January 2011. [The abbreviations are mine for the purposes of this report].

The Site and Surroundings

8. The site comprises approximately 15 hectares of agricultural land on the eastern edge of Barrow upon Soar. None of the land falls within the category of Best and Most Versatile. It is predominantly Sub-grade 3b with small pockets of Sub-grade 3c.¹
9. The site fall into two distinct parts; a relatively low-lying area of meadow surrounded by mature hedgerows and semi-mature trees on its western side, associated with the line of Fishpool Brook and Breachfield Road; and a large sloping field surrounded by mature hedges and trees. The field slopes gently upwards towards the north-east and gives the impression of being part of a shallow bowl or valley side in the broader scale rural landscape beyond, with much of the existing built-up area of the village occupying a corresponding slope to the north-west. West of Fishpool Brook, houses on Breachfield Road stand elevated above much of their back garden areas, which are susceptible to flooding.
10. To the south, the site is bounded by the Midland Main Railway.
11. The site is traversed by two public footpaths.

Planning Policy

12. National Planning Policy, which is a material consideration, is contained in the Framework.
13. The development plan currently comprises the East Midlands Regional Plan (RSS) and saved policies of the Charnwood Local Plan 1991-2006 ('the local plan').
14. The Council's Core Strategy has not progressed since 2008 (Issues and Options stage) and it is common ground between the main parties that it should be accorded no weight in the determination of the appeal.²
15. It is common ground between the main parties that the Council's Supplementary Planning Guidance (SPG) documents *Leading in Design* and *S106 Developer Contributions* are relevant material considerations.³
16. While many policies in the development plan taken as a whole are relevant, an agreed range being set out in Section 4 of the SoCG, there are few which are in contention as policies which the proposed development would conflict with and these are confined to the local plan. The policies of the RSS were in force at the time of the Inquiry and remain in force at the time of my report. They may be accorded due weight on that basis. The following local plan policies merit explanation at this point, whereas other policies may need to be referred to and their gist explained at the relevant point in my conclusions. The text of the

¹ Doc 35

² SoCG paragraph 5.7

³ Ibid paragraph 5.6

following policies is reproduced in Appendix 2⁴ to the evidence of Mr Thorley and elsewhere.

17. Local plan policy **TR/6** concerns the impact on highways of development on non-designated sites. Its first requirement (i) is that such development should not result in “unsafe and unsatisfactory operation of the highway system”. This is not inconsistent in principle with the relevant intentions of the Framework, albeit paragraph 32 creates a test of “severity” for the residual impacts after mitigation that the local plan policy does not. The latter refers in its explanation to the “acceptability” and “unacceptability” of such impacts with relevant adopted standards to be fully taken into account.
18. Local plan policy **ST/1** is a multi-faceted policy concerning the development needs of the Charnwood Borough and, inter alia; promotes sustainable development; aims to conserve, protect and enhance those features of the environment particularly valued by the community; and seeks to protect the character and appearance of the countryside for its own sake, especially within areas of particularly attractive countryside and other areas of local landscape value. In principle, such intentions are not inconsistent with broadly equivalent intentions of the Framework.
19. Local plan policy **ST/2** effectively confines built development (subject to specified exceptions) to allocated sites and other land within identified limits to development. To the extent that such an intention supports the concept of development being plan-led, it is not inconsistent with the intentions and core principles of the Framework.
20. Policies **CT/1** and **CT/2** together seek to strictly control development in the open countryside, i.e. outside the development limits defined for settlements. Insofar as they recognise the intrinsic character and beauty of the countryside and seek to conserve environmental assets, the policies are not inconsistent with broadly equivalent intentions of the Framework.
21. A wide range of other relevant policies, including RSS policies, is listed in the SoCG, albeit with no suggestion of conflict. I refer to policies from this list only if it is necessary to do so.

Planning History

22. A previous application for residential development of the appeal site, Ref P/09/2376/2, was refused by the Council in March 2010 for nine reasons. In addition to concerns over the Grove Lane junction, these related primarily to an absence of certain supporting technical information and a number of site specific matters since addressed. It is common ground that none of the reasons concerned the principle of residential development on the site.
23. The application subject to appeal was refused for the following single reason:

“The existing junction of Grove Lane with South Street/Sileby Road* is lacking in adequate visibility to the left out of Grove Lane. The proposal if approved would lead to increased dangers for road users and not be in the interests of highway safety. Accordingly, the development is contrary to policy TR/6 of the Borough of Charnwood Local Plan 2004.” (* NB For convenience, I refer to this throughout as ‘the Grove Lane junction’.)

⁴ A1a

The Proposals

24. Although the application is in outline, considerable supporting information to explain and illustrate the intended manner of development of the site has been submitted, encapsulated in the Illustrative Masterplan.⁵
25. Within the envelope created by the existing boundary vegetation comprising hedgerows and trees, up to 300 dwellings of varying size and type would be constructed, arranged around a central loop road and access ways off. The loop would be designed to accommodate buses and access to the existing highway system would be via a new roundabout constructed on Melton Road at the north west extremity of the site, linked to an internal roundabout by a short stretch of road incorporating a badger tunnel and designed with the roundabouts to facilitate “run-over” for emergency access purposes in the event of carriageway blockage.
26. The public footpath crossing the site west to east would be retained, as would a route from Breachfield Road across to the south east extremity of the site, where the old footbridge across the railway has been demolished pending replacement by Network Rail. A new pedestrian/cyclist bridge across Fishpool Brook to Breachfield Road is proposed.
27. Open space would generally be disposed around the periphery of the site but a more substantial area of open space would correspond to the existing meadowland in the floodplain of the Fishpool Brook, the capacity of which would be increased by limited excavation and re-grading of the existing landform. A broadly equivalent area of open space would be created in the lower lying southern margin of the site near the railway. This would incorporate an attenuation pond. A multi-use games area, a play area and a community orchard would be located in the main area of open space in the south and west of the site.

Other Agreed Matters Defining the Common Ground

28. The SoCG sets out in detail what is agreed as common ground. The following points agreed by the main parties are salient:
 - Following a lengthy period of negotiation and discussion between the appellant and officers of the Council, the application was reported to the Council's Development Control Committee in December 2011 with a recommendation for approval.
 - The only robust and evidence-based housing targets for the Borough of Charnwood at present are those within the RSS and that these should be used to assess the five year supply for the purposes of the Framework. As at October 2011 the housing land supply for the period April 2012 to April 2017 was 2.63 years for the district as a whole. The position has not materially altered (for the better) since the application was refused and that it will not improve during the anticipated determination period of the appeal. Indeed, the August 2012 Addendum to the SoCG shows that as at June 2012, the supply position had worsened significantly, with only 1.98 years' supply of deliverable sites being available when a 20% buffer to compensate for under-

⁵ Drawing No 4045_SK_001 rev E.

delivery, as per the Framework, has been added to the base calculation. When divided between the Principal Urban Areas and the Non-Principal Urban Areas, this deficit equates to 0.59 years and 3.55 years supply respectively. It is common ground that the allocations in the local plan only cover the period to 2006 and are now expended. The Council will be unable to meet its needs on brownfield land alone and the majority of new housing will need to be on greenfield sites.

- Barrow Upon Soar is a sustainable location for development on the scale proposed. In the "Further Consultation" version of the emerging Core Strategy it is suggested as a "Service Centre", a higher order settlement for nearby villages with a range of community facilities including a supermarket, post office, primary school, secondary school, health centre, pharmacy, optician, library, cash points and public houses. It is suggested that the village could accommodate in the region of 500 new homes in the period to 2026.
- The site is within easy walking distance of the community facilities in the village centre of Barrow upon Soar, existing bus stops and the Barrow upon Soar railway station. It is also common ground that this gives ready access to the major centres of Leicester, Loughborough and Nottingham.
- The site is suitable and sustainable and that the proposals represent sustainable development for the purposes of paragraphs 14, 49, and 197 of the Framework and that the proposals comply with the intentions of paragraphs 37 and 38.
- The proposals accord with relevant policies of the RSS, notably Policy 3 and Policy 12, and that they will help to meet the housing needs of the district as set out in Policies 13a and SRS3.
- The proposals accord with a wide range of local plan policies but conflict with the intentions of policies ST/2, CT/1 and CT/2 which generally seek to restrict development in the countryside. Insofar as these policies concern the supply of housing land, it is common ground between the main parties that these should not be considered up-to-date in the context of paragraph 49 of the Framework bearing in mind the lack of a five-year supply of deliverable housing sites.⁶
- The residential development of the site is acceptable in principle.
- Save for the Grove Lane junction, the base data used in the preparation of the highways and transport assessments are robust and fit for purpose and that the inclusion of the FTP accords with the intentions of paragraphs 35 and 36 of the Framework.
- Save for the Grove Lane junction, all other impacts on the highways network would be satisfactorily mitigated by the package of highways measures proposed, including those for the Barrow Road Bridge.

⁶ SoCG paragraph 6.12

- Save for the impact on the Grove Lane junction, the proposals fully comply with the relevant transport policies of the local plan and the intentions of paragraphs 32 and 35 of the Framework.
 - The proposals demonstrate a high standard of design and that they comply with the design policies EV1 and H16 of the local plan, the Council's *Leading by Design* SPG and Section 7 of the Framework 'Requiring good design'.
 - There would be no adverse impact on the living conditions of existing residents in the vicinity of the site and that an adequate standard of residential amenity for up to 300 dwellings within the site can be achieved and that this would not be compromised by noise from the railway. There would, it is agreed, be no conflict with the intentions of the relevant local plan policies in this respect.
 - The interests of nature conservation would not be compromised and that biodiversity would be maintained or enhanced, satisfying relevant policies in the local plan and according with the relevant intentions of paragraph 118 of the Framework.
 - Existing flooding in the area would not be exacerbated by the proposed development and that the resulting increased capacity of the floodplain of Fishpool Brook would be a benefit with the potential to reduce the risk of flooding in the gardens of the adjacent properties on Breachfield Road. It is therefore agreed that the relevant policies and intentions of the local plan and the Framework in respect of flood risk and climate change would be complied with.
 - Save for the policing contribution, the provisions of the planning obligation accord with relevant local policy, meet the intentions of the Framework and comply with the CIL Regulations.
29. The only area of disagreement between the main parties concerns the safety of the Grove Lane junction, specifically with regard to visibility to the left.

The Case for Jelson Homes (Docs 2, 44, A1, A2, A3 & A4)

The salient material points are:

30. This is an appeal in respect of a single reason for refusal, on highway grounds, issued contrary to the advice of the Council's own officers and that of the highway authority.
31. It is agreed that the proposal represents sustainable development in a sustainable location that would contribute to overcoming a severe shortfall of housing land, would provide needed affordable housing and that the presumption in favour of sustainable development applies.
32. Policies 1, 3, 12, 13a, 14, 15 and SRS3 of the RSS are complied with and it was accepted by the Council that this was so. The proposal would deliver market and affordable housing in accordance with the relevant targets adjacent to a service centre without infringing any environmental restraint in the RSS.
33. The local plan contains policies to prevent development in the countryside outside settlements defined to accommodate a level of housing need that is now historical. It was prepared in the 1990s. Current needs cannot be met by the

- local plan and require that development takes place on substantial areas of land classified by the local plan as “countryside” adjoining urban areas or settlements, the boundaries of which reflect historical needs. There is therefore a conflict within the development plan and section 38(5) of the Planning and Compulsory Purchase Act 2004 requires that the RSS prevails.
34. The development plan as a whole is complied with and the alleged conflict with policy TR/6 of the local plan is not accepted.
 35. In any event the Framework now provides, at paragraph 32, that proposals should only be refused (on highways grounds) where the impacts are severe. The second bullet point thereof clearly refers to the access to the site itself, a matter that can be controlled by the developer, whereas the third bullet point refers to the wider highway network. Safety is important, but real evidence of danger has not been demonstrated. The risk referred to by the Council and others is theoretical.
 36. Overall, the proposals conform to the development plan and should be approved without delay according to paragraph 14 of the Framework.
 37. It is agreed that the policies preventing development in the countryside are out-of-date and they are in any case deemed to be so by virtue of paragraph 49 of the Framework. The proposition put by Mr Reid for the Council, that they should nevertheless attract substantial weight, is untenable. His approach was rejected in two recent appeal decisions in Charnwood⁷ and he accepted the approach in the Bishop’s Cleeve decision⁸ that such policies should be given substantially reduced weight. Following the approach in the Worsley decision⁹, very little weight should be accorded to the Council’s 27 September 2012 decision regarding what may be an emerging local plan strategy. These are simply early thoughts on its part.
 38. The objection to the proposal on highway grounds cannot be sustained. There is no material shortfall in visibility. On the basis of appropriate calculations¹⁰, visibility to the left (‘Y –distance’) of some 38 metres is required but some 42 metres¹¹ is actually available.
 39. The accident record over many years confirms the Grove Lane junction to be a safe junction. The evidence of experience clearly demonstrates this to be so. Circa 1.5 million vehicles per annum use it, together with many pedestrians and cyclists. Its physical circumstances have remained constant and over the eight years for which formal accident records are now available there have been none recorded relating to visibility. There have been two recent accidents¹² but one (3 October 2012) occurred 500 metres to the east and there is no evidence that lack of visibility played any part in the accident of 27 September 2012.

⁷ Documents 36 & 37

⁸ Appendix 7 to evidence of Mr Thorley

⁹ Appendix 6 to evidence of Mr Thorley

¹⁰ Evidence of Mr Young paragraph 6.3.12 and Appendix H

¹¹ Subsequently confirmed to be 42.5 metres with one metre encroachment or 40.3 metres with 0.75 metres encroachment (Doc 20).

¹² Docs 8 and 10

40. In any event Manual for Streets¹³ states that there is no evidence of a relationship between reduced visibility and the potential for accidents and there is no evidence that an increase in traffic will lead to any increased risk of accidents. The TMS report¹⁴ shows that the statistical correlation is nowhere near that which would be required to demonstrate a reliable relationship between the two factors. This junction has huge spare capacity. Increasing flows will not have any effect on the potential for accidents.
41. There is no evidence that the relevant criterion (i) of local plan policy TR/6 would be breached and no evidence of any harmful impact on the highway network.
42. It should be borne in mind as context that the proposed development will add only 30 movements to the left turn in the peak hour, which would be imperceptible, the average "queue" over this period being less than one vehicle. Any delays will be minimal and will not lead to frustrated drivers taking risks.
43. Two factors should be taken into account in calculating the appropriate visibility requirement, the appropriate 85th percentile speed and the appropriate MfS2 calculations.
44. The speed survey of the appellant's consultant, Mr Young, is to be preferred to that of the Council's consultant, Mr Bancroft. It complied with the mandatory TA22/81 requirement of 200 readings. Furthermore these readings were taken beyond the potential influence of local or bank holidays. The appropriate wet weather correction was made, whereas no such correction was made by Mr Bancroft whose recorded speed of 31.4 mph was not so corrected despite conditions being observed as merely damp/intermittent rain. The further readings¹⁵ were inappropriately contrary to TA22/81 methodology being over a 24 hour period and thereby distorting the results with high speeds.
45. Mr Young's Stopping Sight Distance (SSD) calculation correctly made no allowance for HGVs and buses in compliance with the guidance because 2.9% HGV/bus content in the recorded vehicles was by reference to 2 X 3 hour periods rather than simply peak hours. It is therefore reliable.
46. If it is assumed that such vehicles should be included then the MfS2 reduction for buses of 10% (not accounted for by Mr Bancroft) should be applied to HGVs also. This is consistent with everyday observation and the admittedly small sample of readings referred to by Mr Young which show a 10.03% reduction. This approach results in a SSD of 40.83m.¹⁶
47. The amended figures from Mr Bancroft¹⁷ are wrong because they do not make any speed reduction and the Council's preferred figure of 47.5 makes no speed reduction at all. In summary, the 43.86 metre splay distance requirement is based on the incorrect speed of 31.48mph; the 42.93 metre requirement is based on the WSP speed but uncorrected for wet weather; the 38.21 metre requirement is correct; and all the figures in the right hand column are wrong as they fail to allow for the lower speeds of HGVs and buses.

¹³ Referred to generally as MfS (or more specifically MfS1 or MfS2 as appropriate)

¹⁴ Doc 9

¹⁵ C1b Appendix I to the evidence of Mr Bancroft

¹⁶ Rebuttal evidence of Mr Young, but based on Mr Bancroft's speed, not Mr Young's.

¹⁷ 09/10/12 *Statement to address amendment to visibility calculation* (Mr Bancroft C1c)

48. As far as the available visibility is concerned, there is agreement between all three highway witnesses following a visit to the junction observed by the Inspector. From 2.4m on the centre line of Grove Lane (a starting point accepted by Mr Bancroft) there is a Y distance of 42.5m to a 1m off-set and Mr Bancroft accepted¹⁸ a 1.3m off-set, so on his evidence there would be materially more than 42.5m. From 2.4m offset by 1m to the centre of the left turning lane there is a Y distance of 40.3m to a 0.75m off-set. But such a small offset cannot be justified because there is a virtually non-existent possibility of a motorcycle being closer into the kerb on approach from the east.
49. Mr Young's measurements are not only vindicated but found to be understated and there plainly is no material shortfall in visibility, even on the basis of unreliable speeds.
50. However the requirement should be calculated the junction has proved to be very safe and drivers in any event take more care at restrictions on the road network. If the objection were to prevail, moreover, needed development would be stifled at countless locations as Mr Young explained that the majority of junctions in most towns and cities are substandard; and that would be flatly contrary to the intentions of the Framework. The conventional approach to such matters is used in the recent appeal decision¹⁹ at Bramcote Road, Loughborough and a similar approach is advocated here. In any event, if ever the operation of the junction required improvement, there is adequate scope for improvement.
51. The additional points raised by the Parish Council and others have no support from either the Council or the highway authority.
52. The highways objections raised by the Parish Council cannot be substantiated. First, at the site access it is inappropriate to rely on DMRB²⁰, which is primarily for motorways and trunk roads when the proper guidance for this location, applied by the highway authority, is MfS. If the 85th percentile speed of 34.5mph is correct the required SSD is 52.5m which is achievable.²¹ There is no problem with levels.
53. The visibility requirements of MfS are not absolute and applying the necessary wet weather reduction gives a 28.5 mph speed generating a requirement of 38 metres, which is available.
54. The single point of access contested as inappropriate by the Parish Council raises no objection from the highway authority whose own guidance advocates assessment of the matter on a site-by-site basis and concludes that a cul-de-sac may be the best solution in certain circumstances.
55. Thirdly, conflict with local plan policy TR/6 or the Framework does not arise at the Barrow Road Bridge as in the peak hour the development would add an imperceptible 93 vehicles and there is no evidence that this would make any difference to the safety or satisfactory operation of the bridge. The proposed

¹⁸ Paragraph 5.5 of the evidence of Mr Bancroft

¹⁹ Doc 37, para. 29

²⁰ *Design Manual for Roads and Bridges*

²¹ Rebuttal evidence of Mr Young Appendix D

- improvements would more than offset any impact as is shown by the LINSIG output in the ATA.
56. The VISSIM model showed the effects of the MOVA system proposed as reducing delay by around 13% with a consequential 2-3% improvement in capacity at the bridge accepted as an improvement arising from the development by the highway authority. It was accepted by Mr Cage in cross-examination that paragraph 6.3 of the later report,²² which stated that the CD modelling the traffic flows showed the impact of development at the bridge, was misleading.
 57. Mr Cage's second proof is of no assistance because the model deployed assumes fixed timings which ignores the reality and negates the purpose of the MOVA system proposed, which shares out capacity according to demand at any given time. In fact, table 3.2/3.3 of the relevant report shows an improvement in capacity that exceeds the impact of the development with consequential benefits for base traffic. There would be a decrease not an increase in queuing at the bridge.
 58. There are other problems with the figures and results and, in summary, the report is not reliable evidence, whereas the WSP model is.
 59. So far as Appendix B to the report²³ is concerned, it simply ignored the proposed improvements to hatching which would enable the optimum location of stop lines for a 9/10 second intergreen phase.
 60. The occasional flooding at Slash Lane cannot be a highway objection to the proposed development. Unlike the Redland development²⁴, there is no proposal to take access at this location. A number of the other points raised in respect of the bridge scheme are matters for detailed design.
 61. Two thirds of the development will be within 400 metres of a good bus service to Leicester and Loughborough and the extremities within 800 metres, which is comfortably accessible and both the Council and the highway authority consider this a sustainable location. Access to the rail station and good services is also easy.
 62. Even without the rail footbridge to the south-east corner of the site the accessibility of the proposed development would be good and the Council and the highway authority are satisfied that is so. In any event Network Rail are pursuing its replacement, having obtained permission and approached landowners. Mr Cage thinks it could be built within five years.
 63. The Breachfield Road junction with Grove Lane (a short one-way stretch) is an existing situation with no record of accidents. The developer is entitled to assume that people will continue to observe the law here.
 64. The concern of the Parish Council as set out in its statement of case is with the impact of the proposed development on the existing community and its facilities, as set out in evidence by Mr Cattle, not the proposition in its closing submissions that deliverability over a five year period is in doubt. The technical material

²² Doc 26

²³ Ibid.

²⁴ Ref T/APP/X2410/A/95/259402/P4 at Appendix A to PC3

- supporting the proposal satisfies the Council and the highway authority in that context and the appellant is an experienced developer well versed in addressing practical issues.
65. Service capacity constraints in Barrow (identified by the Council as a service centre appropriate for growth) are to be addressed by the section 106 obligation that meets the requirements of the relevant statutory providers. This also provides for benefits sought by the Parish Council.
 66. The benefits of the proposed development for the whole settlement will include; increased floodplain capacity; improvements at Barrow Road Bridge; the introduction of warning signs to alert people of flooding on Slash Lane; upgraded pedestrian and cycle links to the centre of the village; the services of a Travel Plan Co-ordinator; additional public open space and some additional community facilities.
 67. Despite this, the Parish Council maintains that Barrow has had enough of development and can take no more, a position adopted by many residents and Barrow upon Soar Community Association (BUSCA). It is not for the developer to remedy the perceived deficiencies referred to by the latter, but the substantial S106 contributions are agreed as appropriate by the local planning authority and the statistics demonstrate that Barrow's growth has been comparable to other settlements and relatively less in some cases. It is calculated that less than 20% of the village population object to the proposal, rather than the overwhelming majority as claimed.
 68. 'Amber' values in the Council's assessment of potential service centres²⁵ do not preclude growth, simply some constraints. Several of the potential service centres are constrained in some respect. The 'amber' status in respect of health services is historic and rectified and the appropriate contribution in the planning obligation is supported by the Primary Care Trust and the Council. The excellence of care at the health centre was explained by Dr Parker who was careful to explain not that this would be jeopardised but that future improvement would be more challenging. Similarly, education is not threatened and very substantial contributions to education are provided for with the support of the relevant authorities.
 69. Parking difficulties in the village centre are aggravated by commuter parking and is not a matter peculiar to this village, being also a question of management. Few objectors refer to landscape and visual impact and the site has no special designations. In the Worsley decision previously referred to substantial harm in that respect was outweighed by the benefits of housing gain.
 70. No part of the developed area would be outside Flood Zone 1 according to the FRA which has been rigorously assessed by the Environment Agency, whose findings have subsequently been verified by the new hydraulic model of the Fishpool Brook catchment it has created. The proposals comply with the relevant policies of the Framework and there will be some betterment in that although gardens on Breachfield Road will continue to flood the occurrence and severity of

²⁵ *Charnwood 2028 Local Development Framework (LDF) Core Strategy Service Centre Capacity Assessment (Final Report) December 2011 ('SCCA')* – Appendix D to Evidence of Mr Cantle (PC4) and Appendix 2 to Evidence of Mr Thorley (A1a)

such events will be reduced. With appropriate planning conditions as recommended by the EA, there is no reason to resist the proposal on surface or foul water drainage grounds.

71. **In conclusion**, the proposals comply with the development plan as a whole and should be approved without delay.

The Case for Charnwood Borough Council (Docs 4, 43, C1 & C2)

The salient material points are:

72. The application was refused because members disagreed with their officer's view. This was based on advice from the highway authority. Although this recognised the Grove Lane junction to be deficient it decided, all other objections having been addressed, that it could not support an objection on the basis of the one single issue of visibility alone.
73. At the time of application the appellant recognised that the junction fell short of the relevant visibility standard but now claims it will be met.
74. This standard is that the 'x' distance should be measured from a point 2.4m back from the give way line in the centre of the carriageway. The 'y' distance depends on variables affecting the SSD.
75. On a robust assessment the visibility splay is inadequate and the junction will not operate safely, giving rise to conflict with policy TR/6(i) of the local plan and the intentions of the Framework.
76. The conflict with the development plan is not outweighed by other considerations and the appeal should be dismissed.
77. Two recent appeals²⁶ in the Charnwood District have been allowed because of the inadequate housing land supply but that makes little difference to the merits of this case. In particular the junction inadequacy on its own should preclude the grant of permission in this case. None of the appeal decisions referred to in evidence by the appellant²⁷ involved determinative highway inadequacies and they are of limited assistance in this case.
78. The Council is cognisant of the benefits of the proposed development (these are set out for example in the officer's committee report) and the appellant has not suggested that the Council was not aware of them.
79. The main issue for the Council is the adequacy of the visibility for left turning traffic at the Grove Lane junction.
80. UK practice (as explained by MfS2) generally focuses on SSD. Paragraph 10.3.1 explains how the minimum SSD is deployed. This shows why a cautious approach is necessary to permitting additional traffic at junctions with inadequate visibility.
81. Although MfS2 explains, on the basis of research undertaken by TMS, that there was no evidence to suggest that failure to provide standard visibility at junctions

²⁶ Docs 36 & 37

²⁷ Appendices 3 – 7, 12 – 14 and 16 – 18 to A1 Evidence of Mr Thorley

- resulted in an increase in injury collisions at 'high-risk' urban sites, it did not conclude that the evidence disproved the assumption that this would be so. The outcome of the research should be treated with caution and it is significant that MfS2 does not jettison the concept of adequate visibility splays being required.
82. Without local evidence to the contrary, it says, a reduction from recommended visibility will not necessarily lead to a significant problem.
 83. Local evidence goes beyond the Personal Injury Accident (PIA) record. It means all relevant local circumstances, including the particular features of the junction.
 84. In this case these include: frequent overrunning of the kerb (where it is dropped to facilitate crossing by pedestrians) by left turning vehicles so as to avoid encroaching onto the westbound lane used by oncoming vehicles; the route is also well used by cyclists; there are a number of private drives impinging on the junction layout, adding to potential conflicts; marked turning lanes are often ignored; and bus turning manoeuvres using the entire carriageway cause oncoming vehicles to brake suddenly.
 85. This local evidence militates in favour of caution as it may simply be good fortune that there are no recorded PIAs, rather than the junction being safe as the appellant suggests.
 86. It became common ground that the appropriate point in the carriageway to measure the 'y' distance to is 1 metre in from the carriageway edge.
 87. Based on one day surveys the parties variously calculated the appropriate wet weather speed for calculating SSD as 28.51mph (appellant) and 31.38mph (Council). In view of these differences a subsequent survey was undertaken by the Council between Thursday 30 August and Monday 3 September 2012, giving a 7 day average 85th percentile speed of 32.8mph.
 88. The Council's interpretation is that wet weather conditions do not have a major impact on speeds at this junction and it may therefore be unwise to rely on the lowest 85th percentile speed of 28.51mph advocated by the appellant.
 89. Notwithstanding criticism from the appellant that the Council's survey did not comply with TD22/81 guidance, aspects of its own work failed to comply, including reliance on single day surveys. Moreover, informed interpretation of the guidance by experienced professionals is more important than the quantity of vehicles included. Therefore surveying only 100 vehicles rather than the 200 advocated by the guidance is common practice among professionals, usually acceptable to highway authorities. The Council's results are reliable.
 90. Buses and HGVs have different characteristics in this context, with slower deceleration making for longer SSD and hence longer visibility splays, but guidance suggests that, in combination, bus and HGV traffic of less than 5% of total flow need not be assessed, subject to local circumstances. The appellant's TA did not contain information on the composition of traffic flow but both the appellant and the Council commissioned further survey work to address the point.
 91. However, the appellant's survey covered only the AM and PM peak hours, contrary to MfS2 guidance, whereas the Council's work covered 24 hour periods in which the proportion of HGVs/buses significantly exceeds the 5% threshold.

- The only criticism by the appellant was that the survey was 30 August to 3 September, which, although school term time locally, was not entirely neutral given that results could still be affected by the holiday period. This is a flimsy criticism, not based on guidance, which should be rejected.
92. It was agreed by the appellant that on the basis of the Council's data HGVs/buses should be taken into account. However, no separate survey of HGV/bus speeds has been undertaken by any party and therefore the information is imperfect.
93. In these circumstances the 85th percentile speed for all vehicles should not be used as it includes buses and HGVs.
94. Although MfS2 does not recommend it, the appellant sought to argue that there should be a 10% reduction of the 85th percentile speed for HGVs as well as buses, indicating how constrained the junction is. No such reduction is warranted in relation to HGVs. The practical consequences are that an overtaking HGV driver might not see a driver emerging from Grove Lane until it is too late to stop.
95. The available splay measured to the agreed 1 m point in the carriageway is agreed to be 42.5m.²⁸
96. The appellant considers the required splay length to be 38m, but this assumes a wet weather 85th percentile speed of only 28.51mph, much lower than that observed by the Council in wet weather and lower than the ATC data suggests the average 7 day 85th percentile speed is. The appellant's splay length takes no account of the different deceleration rate for HGVs and buses.
97. The Council concludes that the required splay length is 47.5m, using an 85th percentile speed of 31.48mph, which is reasonable given that it is in the middle of the three available measured speeds, also reasonably not discounting buses and HGVs as there is insufficient data upon which to do so. The Council's assessment is more robust and is to be preferred.
98. That leads to a shortfall against the available splay of 5m which is in excess of 10% and not de minimis. MfS2 does not endorse unlimited flexibility but rather says that 'y' distances should be based on the recommended SSD values. While a reduction in visibility will not necessarily lead to road safety problems, that depends on local evidence.
99. The Council submits that the shortfall in visibility is a serious one and should not be accepted. Its evidence is that adding additional traffic as proposed would lead to a situation on the highway that is unsafe and unsatisfactory and hence there is conflict with policy TR/6 of the local plan.
100. This policy is not out-of-date and is in any event consistent with the aims of the Framework.
101. The threshold of severity the appellant claims to be the meaning of paragraph 32 of the Framework is not relevant to this as there is either a well founded highway safety concern or there is not and it would be extraordinary if planning permission could not be refused on the basis of a really serious (as opposed to

²⁸ Doc 20

severe) risk to highway safety. It is more likely that the “safety” part of paragraph 32, the second bullet point, applies here, whereas the third bullet point is concerned with convenience, delay etc where severity is a more meaningful concept.

102. **In conclusion**, the appeal should be dismissed.

The Case for Barrow Upon Soar Parish Council (Docs 3, 42 & PC1 - PC4)

The salient material points are:

103. The Parish Council does not oppose the principle of residential development in the settlement but believes it cannot support substantial development of the type proposed in this case without major infrastructure improvements, principally the upgrading of Slash Lane to provide two flood free links to the A6 and the provision of a new or significantly upgraded health centre. These concerns are evidenced by the Parish Plan final report, the NHS response to the application and the lack of permissions for major house building in the last 12 years.²⁹
104. But for the Secretary of State’s intervention and consequent inquiry, the application would not have been sufficiently scrutinised in terms of deliverability in the context of meeting the Charnwood shortfall in housing land supply. Moreover, the proposed development is not “sustainable development” of the type envisaged by the Framework and insufficient mitigation is provided in respect of local infrastructure constraints, the consequences of which are articulated by those with local knowledge and experience.
105. The Parish Council’s concerns lead to technical objections concerning traffic impact, safety, sustainability and flood risk management and practical objections in respect of the ability of the village infrastructure to cope with this and other housing development that may occur.
106. The Council’s emerging core strategy shifts the emphasis away from the identified service centre settlements such as Barrow Upon Soar.
107. The proposed development will increase the risk of accidents at the Grove Lane junction and the wider highway network is severely constrained. The approaches to the village are subject to capacity issues as a consequence of growth in traffic with attendant safety concerns, notably when Slash Lane is flooded for typically 2 or 3 days around 12 times a year. The exacerbation of these concerns by the proposed development will not be adequately mitigated.
108. The site access arrangements and external linkages are inadequate.
109. There should be at least two points of access for a development on this scale, one of which could be an emergency access. This should be separate from the principal access and the proposed arrangements in this case are unacceptable. The development could be marooned by a road accident or a fuel spillage.

²⁹ Appendix G to the Parish Council’s evidence in fact records, inter alia, the grant of permission for 360 dwellings to David Wilson homes (land between Cotes Road and Willow Way Ref P/04/0999/2 in outline and subsequent reserved matters P/05/2778/2)

110. There is insufficient assurance from the submitted material that adequate forward visibility to the access roundabout on approach from the north east could be achieved without tree removal and re-grading of third party land.
111. There will be a risk that the short section of Grove Lane that is one-way to the north of its junction with Breachfield Road will be increasingly abused by impatient drivers, an occurrence which anecdotal evidence suggests to be periodic and which led to a recorded accident with a pedestrian on 17 December 2008. This is a further indicator that the main vehicular route to the site is constrained.
112. The Grove Lane junction has been considered in great detail and the Parish Council endorses the case made by the Council. The second scenario agreed by the parties³⁰ is considered appropriate, i.e. Splay 2: 2.4 (offset 1 metre east of centreline) x 40.3 x 0.75 (encroachment) metres. This is because right turning vehicles constrain the observed propensity of left turning drivers to position themselves at the centreline for maximum turning advantage.
113. The majority of vehicles turning left emerge from the junction and impinge on the opposite carriageway to avoid overrunning the kerb.
114. Even with speed cushions the surveyed wet weather speed recorded by the Council is 31mph and should not be reduced further for the purposes of calculating the splay requirement. The requisite 45m visibility is not available.
115. Both MfS2 and the WSP supporting research paper are caveated by cautions as to their conclusions regarding the relationship between visibility at junctions and accidents. It is common sense that constrained visibility to the left reduces the necessary attention that drivers can give to traffic approaching from the right.
116. This is the principal route from the site and it is unsuitable for serving significant new housing development.
117. With regard to the proposed improvements at the Barrow Road Bridge, the ATA acknowledges that MOVA control is only likely to result in a 2-3% increase in capacity. Moving the stop lines closer prevents HGVs passing or causes vehicles passing to take additional time. The humpback of the bridge restricts visibility and deters efficient use of the green phase. Cyclists now have a dedicated phase that will negate the proposed capacity improvements. The absence of an adverse impact from this has not been demonstrated. The location of the signal heads cannot be optimised because the bridge is a listed structure.
118. The anticipated MOVA improvements will only materialise if both approaches are not at saturation. The WSP VISSIM model underestimated the queues and therefore didn't account for queuing vehicles beyond the purview of the model, a deficiency that will be exacerbated by anticipated traffic growth. The proposed 'hurry loop' to prevent vehicles queuing back onto the Jerusalem roundabout will cause excessive queuing from the west in the AM peak.
119. Barrow upon Soar is a constrained location due to periodic flooding of Slash Lane and the Barrow Causeway. It is primarily a dormitory settlement and travel beyond it to work and for main food shopping and leisure is a constant necessity.

³⁰ Doc 20

- No meaningful improvements to current travel patterns are proposed and the principles of paragraph 32 of the Framework need to be applied.
120. The sustainability credentials of the proposal are questionable as far as travel is concerned, with most residents travelling to work by car outside the settlement. There is no new employment proposed and no linkage across the railway and parking facilities in the village centre are inadequate.
121. Without the replacement footbridge, the programme for which is uncertain, over one third of the site would be in excess of 400m from a bus stop. The footpath crossing of Fishpool Brook will be within the flood alleviation area and if raised to avoid the water would impede flow, a scenario that has not been modelled.
122. The proposed improved pedestrian routes to the village centre are subject to a number of deficiencies and it has not been demonstrated that the £40,000 provided for improvement will be adequate. It is questionable whether the routes are truly “walkable” and hence whether the centre is within 10 minutes walk of the site as advised by MfS.
123. The Travel Plan target of a 14% modal shift away from the private car is unlikely to be realised as it has no real incentives. There is no proposed increase in the level of bus services and no proposed changes to train services or accessibility to the train station.
124. The train station suffers from the lack of car parking or drop-off facilities; it is only accessible by a large number of steps and is unmanned with an isolated platform with little in the way of shelter. It is an overstatement to say that it offers an excellent level of service. Its existence does not automatically make the appeal site sustainable. Only 1% of the Barrow Upon Soar population used the train to travel to work in 2001 and despite increased rail patronage the level of service remains unaltered, indicative of the usage made. Similarly the existence of a half-hourly bus service does not automatically make the appeal site sustainable. It is the practical ability to use such services on a sustained basis that is material. The Travel Plan does not and cannot provide that level of reassurance. The Travel Plan Co-ordinator may be of some benefit but without improved services there is little that can be achieved. The Travel Plan Penalty is nowhere near the level of funding that would be required to improve services.
125. The gaps in the technical information concerning the site development profile, sewage disposal and ground conditions mean that there is insufficient means to assess whether the houses proposed can be delivered within five years, with question marks also in respect of highway capacity, traffic flow and surface water drainage.
126. Ground conditions including a Phase 1 contamination survey have yet to be investigated but it is known that there are lime kilns within the site and old mine workings in the vicinity. The effect on works required to drain the site is unknown.
127. The potential increase in surface water flows have not been properly assessed and flood risk and flood management issues will be exacerbated, together with foul drainage difficulties. There is doubt about the ability of the site to contain its surface water flows so as to ensure no further increase in flood risk to adjoining land and this could affect layout and hence housing yield.

128. The exacting requirements of the Environment Agency's suggested condition (8)³¹, the lack of discussions with Severn Trent Water and the configuration of the existing drainage diminish confidence in the occupation of any dwellings on the site within 5 years. This is highlighted by the fact that the appellant has not had discussions with Severn Trent Water and the knowledge that the sewer is at capacity due to gradient and already discharges at times of peak flow. The opportunities for redirecting the flow away from this catchment are limited and the construction of a new sewer would require a tunnel under the railway and the crossing of third party land, possibly with a need to upgrade a pumping station. There is therefore no certainty that any houses on the site could be occupied within 5 years.
129. There are concerns about the impact of the culvert under the railway being blocked and the revised modelling that took some account of this took no account of the impact of serviceable pedestrian crossing points for Fishpool Brook.
130. EA acceptance of the revised FRA was not without reservation and the exacting requirements of the suggested conditions (5), (7) and (8)³² should be borne in mind.
131. The EA response is detailed and prescriptive and indicates that much detailed work is yet to be done, including soakage tests. No assessment of the consequences of exceedance of the propose drainage systems in extreme events such that water flows directly into Fishpool Brook and no conclusions can be drawn on the adequacy of the drainage proposals.
132. The EA remains concerned because it advocates the lifting of floor slabs to 48m AOD. However, a large element of the proposed development is below 48m AOD and the raising of slab levels to that height has unknown consequences for the layout.
133. The absence of blockage modelling highlights the issue that at a flood level of 48m there would be an impact on the floor slabs of existing houses on Breachfield Road.
134. The proposed and any additional pedestrian crossings of Fishpool Brook will cause more flooding of properties upstream than has currently been modelled.
135. There will be a greater risk of debris in the brook and consequent blocking of the culvert during significant events with deeper flooding of the properties on Breachfield Road as a consequence.
136. The local health centre will be placed under unacceptable pressure and the mitigation proposed in the form of a contribution for extra car parking spaces will not address the underlying concern regarding a health centre operating at capacity.
137. The education contributions, which are phased, will not guarantee the provision of new classrooms and the same applies to contributions to community facilities and other contributions. The proposed mitigation will not deliver the necessary

³¹ Doc 29 Revised Draft Conditions

³² Ibid

facilities to achieve the improvements now required from the planning system by paragraph 9 of the Framework.

138. **In conclusion**, the proposals will not lead to a better quality of life or positive improvements as advocated by the Framework but rather it will lead to deterioration in the quality of life currently enjoyed by Barrow Upon Soar residents. Although they seek to meet the Charnwood housing shortfall, they remain incomplete and uncertain in delivery with harmful impacts such as not to be the type of sustainable development the Framework encourages. The grant of outline consent would have a number of adverse effects and the appeal should be dismissed.

The Cases for Interested Parties

The salient material points are:

Mr Hilsdon (Docs 32 & 34)

139. Gardens in Breachfield Road flood on a regular basis. This won't affect the new residents but the situation for existing residents will be made worse. There is a danger that the culvert under the railway will block, making the situation worse. What guarantee do the residents have that these things will not occur? Old mine workings could exacerbate drainage and flood problems.

Mr Willcocks

140. The travel plan will not work. Experience of commuting to Leicester prior to retirement is that the service is poor, unreliable and overcrowded. There are only two carriages on the relevant trains and the station is rudimentary. The railway is only useful for a journey to work if the stations are walkable at both ends of the journey.

Dr Sarah Parker (Doc 5 re: GPs' practice at the Barrow Upon Soar Health Centre)

141. The health centre was purpose built in 1980 around which time the practice list of 4,500 was broadly comparable to the population. The current population of Barrow Upon Soar is circa 6,320 but the practice list is around 8,650. New types of patient place new demands on a practice and at present the clinical skills available match the demographic profile.
142. The premises have adapted in response to a rising population, with S106 monies from another development being used for refurbishment in 2011, bringing into use rooms vacated by district nurses, health visitors and school nurses pursuant to NHS re-organisation. The limited surgery space is shared to manage clinical availability and evening appointments are offered on a Wednesday.
143. The practice boundary has been redrawn to curtail pressure and patients are no longer accepted from outside the boundary. The appeal site is within it and will therefore have an impact, as only under exceptional circumstances can GPs lists be closed.
144. The objection arises because the appeal proposal comes hard on the heels of the challenge posed by the ongoing construction of 360 houses elsewhere in Barrow Upon Soar.

145. The Practice is challenged by the rising population, having been rated “deep amber” by the PCT prior to refurbishment and there are ongoing uncertainties arising from further NHS reorganisation. The health centre is currently operating at 70% over capacity and will be 90% over if the appeal scheme is developed. There is no prospect of NHS funded capital investment at present. Adding patients to the current practice list will cause deterioration in the services offered.
146. The central location of the health centre is appreciated by patients for its good public transport links but at busy times the car park is often full.
147. The quality of care provided is good and the Practice is keen to improve it further. The continued rapid growth of the Practice population would make achieving improvement extremely challenging and would be detrimental to the care of both existing and future patients.
148. The appeal should be dismissed.

Nicky Morgan MP (Doc 16 on behalf of constituents in Barrow Upon Soar)

149. First, the former Planning Minister Greg Clark and the former Local Government Minister Bob Neill have both emphasised the Government’s commitment to Localism and empowering communities to shape their neighbourhoods through neighbourhood plans as the Parish Council wants to do. This is clear in the Framework. To ignore residents’ concerns is to ignore the policy intentions of Localism. I have not been contacted by a single resident of Barrow Upon Soar in favour of this development. The community has had more than its fair share of new development through the large Willow Road development. This proposal outside the village limits is a step too far.
150. Secondly, the Secretary of State needs to be aware of the vulnerability of Councils such as Charnwood, which does not yet have a core strategy in place, to speculative applications such as this. The framework says weight can be given to an emerging core strategy and in September 2012 the Council indicated its intention that service centres including Barrow upon Soar would share 200 homes between them over 15 years, whereas this proposal is for 300 homes in Barrow Upon Soar alone.
151. Thirdly, the development would put intolerable strains on the physical and social infrastructure of the settlement and it is inconceivable that the residents of the proposed development would use public transport rather than their cars. The development cannot be considered sustainable.
152. The appeal should be dismissed.

Mr Rowland (Doc 18 Landmark Planning for Barrow Residents’ Action Group)

153. BRAG supports the Council’s reason for refusal.
154. The appeal site is on rising land and prominent. The proposed development would harm the landscape and the harm could not be mitigated by the proposed landscaping scheme. It would therefore be contrary to saved local plan policies CT/1 and CT/2.
155. The harm to the rural landscape and the danger to highway safety would outweigh the benefit of reducing Charnwood’s housing land deficit.

156. The appeal should be dismissed.

Councillors Ranson and Fryer (Docs 17 & 40)

157. We support the Parish Council, the Barrow Residents' Action Group (BRAG) and the residents in their opposition to the development.

158. Its adverse effects would significantly outweigh its benefits when assessed against the Framework as a whole. It is over dominant and alters the whole character of the village. The roads will not cope and access to the schools is under stress as roads serving them do not have the scope to be improved. More than 500 houses have been built or approved in 10 years and the High Street facilities suffer from lack of parking already. It is unrealistic to suppose people will walk to the shops and back.

159. Slash Lane is often closed by flooding and more warning signs would do little to help drivers already committed to using the route through the village, which takes traffic from other villages en route to the A6, M1 and A46.

160. The health centre is heavily oversubscribed and access to it from the appeal site would be by car, adding to congestion.

161. Existing residents have made welcome the occupiers of many new houses in recent years. They are not "NIMBYs" but do object to the sheer scale of what is proposed. The changing climate is increasingly disrupting the road system through flooding around the village and the measures proposed will not help. Huge investment is needed, for example at Slash Lane.

162. The appeal should be dismissed.

Mr Wilson

163. Experience suggests that, with the fire station being based in Loughborough, there will be problems of accessibility for it if the roads are congested at times of flood.

Mr Burton (Doc 39)

164. This is the first area to flood in Leicestershire, up to 12 times per year. Traffic congestion is always caused, with of a mile in length. The police put signs up and additional signs will not help as most people know when roads will be closed.

165. The abuses of the one-way system between Breachfield Road and Melton Road are not reported to the police. The station is inaccessible due to the many steps and people are more likely to drive in any event because they can visit superstores and the like during the course of their journeys, or they will drive to the station and park on roads near the station.

166. The sewer is at capacity and subject to storm overflows, but Severn Trent Water tends not to object. However, there has been no mention of the water Framework Directive which requires rivers to be improved by 2027. It is doubtful if surface water can be dealt with using SUDS

167. Previous applications in the countryside have been rejected and nothing has changed to justify this one.

Mr Smith (Doc 19)

168. There is a highway danger at the Melton Road/Breachfield Road/Babington Road junction close to the appeal site as illustrated on my annotated plan.³³
169. MOVA might help with Barrow Road Bridge but the wider area including Slash Lane needs to be looked at.

Councillor Forrest (Chair of BRAG)

170. Local residents are not "NIMBYs". Lots of them have had new houses "in their back yard". Barrow Upon Soar is a great place to live and we do welcome newcomers, but we are at saturation point and enough is enough. The infrastructure will not cope.

County Council (represented by Mr Prendergrast, Mrs Owen, Mr Kettle and Mr Tyrer) (Docs CC1 & CC2)

171. In its essentials, the position of the County Council is as set out in the written evidence submitted and there is little to add. A Civic Amenities site is no longer required as one has been provided at Mountsorrel.
172. The adopted County Council policy in respect of developer contributions is the *Statement of Requirements for Developer Contributions in Leicestershire* (SRDCL) which is the starting point for negotiating appropriate contributions, the latest review of which was in 2007.
173. There are written submissions from Mr Tyrer, the Developer Contributions Officer and Mr Cook in respect of highways and transportation matters.

Mrs Anderson (Doc 15 for Leicestershire and Rutland Primary Care Trust)

174. The concerns expressed by the practice regarding the pressure of extra patients are echoed³⁴ but in terms of consequential capacity improvements to premises the need would be for extra parking capacity, for which a £30,000 contribution is sought.

Mr Page

175. Traffic on Grove Lane/Melton road is at the capacity of the highway and creates a potential danger to children.

Mrs Noon (Doc 28 for CPRE Charnwood District Group)

176. The County Council has given insufficient weight to the appeal decision referenced T/APP/X2410/A/95/259402/P4³⁵ regarding the disruptive effect to traffic of flooding on Slash Lane. This is relevant to any additional development in Barrow Upon Soar. The circumstances have not changed in the 14 years that have since elapsed but rather they have been exacerbated.
177. This is an important appeal decision and consideration should be given to the increased volumes of traffic that the proposed development would add to various

³³ Doc 19

³⁴ Doc 15

³⁵ Included also as Appendix 2 to Doc 28

routes in Barrow Upon Soar that are already disrupted by flooding and the appeal should be dismissed for this reason.

Mrs Reed

178. Parked vehicles disrupt the flow of traffic, especially lorries, on the eastern approach to the Barrow Road Bridge and this will undermine the proposed improvements.

Mr Pepper

179. Cyclists will inevitably slow traffic as it passes over Barrow Road Bridge because of the configuration of the highway and cycling has been encouraged in Barrow Upon Soar. Mountsorrel Lane also floods and that practically leaves the bridge as the only route. 30% of residents in a Parish Plan survey cited flood disruption as a reason not to build.

Mr Hobbs

180. A trial run of MOVA should be considered as set out in letter.³⁶

Mrs Rodgers (Doc 41 for Barrow Upon Soar Community Association)

181. BUSCA is looking to build a new purpose built community centre in the village to accommodate a variety of activities in response to identified needs.³⁷ Dual use of the Humphrey Perkins School facilities, including the sports hall, has been curtailed for practical reasons. Little attention has been given by the developers, or by the Council, to the detrimental impact of a large influx of new residents and the social consequences.

182. In order to maintain social cohesion it is imperative that the village has the facility BUSCA hopes to build at an estimated cost of around £1.5 million. This is an essential facility that would be necessitated by the proposed development and the sum proposed in the planning obligation (£100,000) will not cover the cost.

Written Representations

The salient material points are:

The County Council

183. The signing of the S106 planning obligation obviated the need for the representatives of the County Council who had prepared evidence to be called as witnesses. That evidence therefore effectively becomes written submissions.

184. The gist of the evidence in respect of financial contributions to education and library services is that they are based on formulae in the SRDCL,³⁸ adopted by the County Council as Supplementary Planning Guidance.

185. In respect of education, the proposed development will not affect the high school but will impact on the primary and upper schools, which are full and predicted to remain so. This will give rise to a need for funding of school places

³⁶ Doc 31

³⁷ Detailed in Doc 41

³⁸ *The Statement of Requirements for Developer Contributions in Leicestershire*

at circa £12,099 per primary school place and circa £18,355 per upper school place, the deficit in the number of places relative to the number of dwellings being calculated according to standard formulae.

186. The contributions sought are proportionate, necessary and directly related to the development. They are therefore CIL compliant.
187. In respect of library facilities, the contribution would be used to improve the lending stock and computing facilities at Barrow Upon Soar Library and reconfigure its internal space to provide for additional public access. Calculated by standard formulae, the contribution sought is proportionate, necessary and directly related to the development. It is therefore CIL compliant.
188. The contributions for public transport and pedestrian and cycle improvements stem from the core principle of the Framework that patterns of growth should be actively managed to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable.
189. The proposed enhancements to the walking and cycling routes to the High Street, the Humphrey Perkins High School and the Sileby Road bus stops are necessary to cater for and encourage increased use in accordance with travel plan objectives. £40,000 is proportionate and the need stems from the development given the likely demand that development on this scale will give rise to. The Travel Packs Contribution, 6 month public transport passes and the funding of two bus shelters are necessary, proportionate and directly related to the proposed development, the object being to facilitate and encourage public transport use from the outset.
190. The Travel Plan Penalty will become payable if monitoring demonstrates that the modal shift target of 14% in the Travel Plan is not achieved. This penalty will incentivise the developer to seriously implement the travel plan and give comfort to the County Council that further funding would be available to encourage modal shift if targets are not met. The penalty is necessary, directly related and proportionate.

Nicky Morgan MP

191. The application was refused prior to the finalisation of the Framework. This clarifies the meaning of sustainable development and the impact on the roads, schools and health services in particular render it unsustainable in terms of the Framework. There is a five year land supply in the local area. The development will, by taking open countryside, harm the character and visual amenity of the area contrary to saved policies CT/1 and CT/2 of the local plan. It is also contrary to saved policy ST/1(ii) because it is clear from the level of objection that this landscape is "particularly valued by the local community". The refusal on highway safety grounds is supported.

Barrow Upon Soar Parish Council

192. It is misleading for the appellant to suggest that the Borough Council has previously supported the proposed development "in principle". The application is speculative and exploits the Borough Council's failure to deliver a Local Development Framework. It is unsustainable because it is on greenfield valuable

agricultural land outside the limits to development, visually dominant on high ground, and will overload healthcare and schools in the village.

Leicestershire Constabulary

193. The policing contribution is necessary, proportionate and directly related to the development. It is therefore CIL compliant.

Barrow Residents' Action Group

194. The appeal site is on rising land and prominent. The proposed development would harm the landscape and the harm could not be mitigated by the proposed landscaping scheme. It would therefore be contrary to saved local plan policies ST/1(ii), CT/1 and CT/2. The harm to the rural landscape and the danger to highway safety would outweigh the benefit of reducing Charnwood's housing land deficit.

Private Individuals

195. There is a great weight of correspondence from local residents. In reading this I have discerned a number of consistent themes:

- First, there is a widespread feeling that the village community has witnessed rapid expansion and that it is outgrowing the physical and social infrastructure available to it.
- Secondly, there is a concern at the loss of countryside around the village.
- Thirdly, there is a concern with highway safety, especially at the Grove Lane junction
- Fourth, many people believe that the capacity of the highways is near its limit, certainly at peak times, and that the problems are particularly intense because periodic flooding already disrupts flows.
- Fifth, there is a perception that the proposed development will increase flooding.

196. In addition, there are numerous comments raising concerns which include; the effect on the living conditions of neighbouring residents, parking pressure in the village centre, noise and disturbance to existing residents, destruction of trees and hedges, inadequate public transport, harm to biodiversity, loss of agricultural land, unsuitable ground conditions, potential to increase crime and disorder, the slow progress or halting of existing residential developments for lack of demand, encouragement of car-based travel building and the disregard of the opportunities for using existing empty properties.

Conditions and the Planning Obligation

Conditions

197. A number of suggested conditions (SC) were agreed between the Council and the appellant.³⁹ Discussion of these at the Inquiry was inclusive of the Parish Council and interested local residents.

³⁹ Doc 29

198. I have reviewed the SC in the light of the advice in Circular 11/95 *The Use of Conditions in Planning Permissions* and the relevant tests therein, together with the advice of the Framework. Some require minor rewording to more closely accord with the relevant advice of the circular and others may usefully be combined for economy, but in general they are appropriate.
199. The standard timescales (SC1) for an outline permission and submission of reserved matters are appropriate but these should be more precisely expressed so as to define the reserved matters and the associated timescales.
200. Accordance with the definitive plans (SC2) should be prescribed by condition for the avoidance of doubt and in the interests of good planning but general accordance with supporting documents is an imprecise approach. However, precision may be introduced by requiring the submission of details for approval by the local planning authority in relevant cases to be in accordance with the principles contained therein. Bearing in mind, inter alia, the planning obligation, I do not consider the approach appropriate for the TA, the ATA, the UFTP or VISSIM modelling. It is inappropriate to address the proposed off-site works at Barrow Road Bridge in this fashion as the land involved is not in the control of the appellant. However, bearing in mind that these are essentially traffic management measures susceptible to refinement and I am not persuaded, having considered the evidence and observed the relevant circumstances of the bridge on site, by the proposition [117] that there would be impediments to its detailed implementation in practice that could not be readily resolved, I consider it could appropriately be dealt with separately through a Grampian style condition. (See also my comments on SC15 below.)
201. The various assessments have been based on a maximum of 300 new houses and as this number is not specified in the description of the development or the application, which is simply for "residential development" it is necessary to limit the number to a maximum of 300 (SC3) by specific condition. Moreover, it is necessary to prescribe the maximum developable area bearing in mind the importance of flood alleviation, the scope for SUDS and the role of the structural landscaping, with a Master Plan creating an overarching framework for the submission of reserved matters. However, the submitted masterplan is purely illustrative. This difficulty may be overcome by the approach advanced in SC4, as this builds on the general principle illustrated to create a firm framework and phasing programme, the latter being necessary for a development on this scale, in my view. I see no difficulty in requiring general conformity to the illustrated principles according to which the proposal has been advocated as a sustainable form of development. This would not fail the test of precision as those principles are spatially expressed on the illustrative masterplan and articulated in the Design and Access Statement. It would be for the Council to reasonably consider whether or not the Master Plan and Design Code submitted pursuant to the relevant condition were in general conformity with them.
202. SC5 increases the focus on the detailed implementation of any particular phase approved pursuant to SC4 and this seems to me to be an entirely necessary and reasonable approach.
203. The site is known to have some archaeological potential including the remains of lime kilns of varying age from early post-medieval until perhaps as recently as the nineteenth century, but the Archaeological Services team at the University of

Leicester is satisfied that the matter can be addressed by a programme of work following a written Scheme of Investigation.⁴⁰ This may be secured by a condition such as SC6.

204. Although SC7 – SC9 are all essentially concerned with drainage it seems to me that, in the circumstance of the site, the matters addressed are most practically dealt with by separate conditions specifically concerned with sustainable surface water drainage, foul sewage and the specific detail of trapped gully provision in each phase of development.
205. The site is currently in arable use and there is no reason to suspect widespread contamination. However, its archaeological characteristics suggest that disturbance of buried deposits might, in places, give rise to concern and hence, on balance, a precautionary condition of the type suggested (SC10) is appropriate.
206. SC11 seeks to protect retained trees and hedges on the site as the development progresses through phases. It would require an overall scheme to be first approved, supplemented as necessary by the implementation of the approved measures as each phase commences (SC12). This seems to me to be a logical and methodical approach to this important matter that it is necessary to address in the interests of sustainability.
207. SC13 reflects the concerns regarding the impact of the railway on the living conditions of future occupiers of parts of the site and while there is no reason to constrain development in principle for that reason, suitable detailed measures to secure amenity are necessary.
208. SC14 effectively requires the precise details of the access applied for to be resolved and the works, including the pedestrian and cyclists' bridge over the Fishpool Brook to be fully implemented before any dwelling is occupied; and I consider this to be necessary as these involve the sole vehicular access and the principal pedestrian route anticipated.
209. SC15, in effect, partially replicates the suggested content of SC2 insofar as it specifically concerns the off-site works for the Barrow Road Bridge traffic management scheme to improve its capacity, and involves further consideration of the details of the improvement, notwithstanding the satisfaction of the highway authority with the details submitted to date. This is necessary and will potentially cater for the effects of the cyclists phase subsequently introduced. Being off-site on land not controlled by the appellant, it needs to be negatively expressed in 'Grampian' style and to ensure early delivery and benefit the condition should, as suggested, make first occupation of a dwelling contingent upon its implementation.
210. SC16 – SC18 are best combined within the purview of a standard form of construction management condition suitably adapted to include, inter alia, the precautions to be taken in respect of badgers passing through the works.
211. SC19, if appropriately cross-referenced to the details of design, would require the retained public footpaths within the site to be upgraded by the time half the houses are occupied. This seems a reasonable and necessary precaution to

⁴⁰ Doc 24

ensure that such improvements are incorporated in the development in a timely fashion whilst accommodating any unavoidable delay.

212. The Slash Lane Flood warning system (SC20) is promoted as a benefit of the proposal and a means of mitigating the impact of extra traffic on such occasions and is seen as such by the highway authority. Despite some scepticism amongst third parties as to its value or efficacy I am nevertheless satisfied that it is necessary to secure the benefit by condition.
213. Insofar as public art (SC21) is required by the provisions of the development plan, it is necessary to secure its implementation by condition. Local plan policy EV/43 seeks to make public art integral to the design of major developments and, given this development plan rationale for the condition, it is not in my view inappropriate, in this instance, to seek to reinforce the quality of the detailed scheme design in this way.
214. Insofar as the Framework encourages renewable energy as an important aspect of sustainability, it is necessary to reinforce this locally on a development of this scale by a condition such as SC22.
215. The Parish Council promoted a condition to minimise the risk of flooding caused by the blocking of the Fishpool Brook culvert under the railway line, suggesting that the land as far as the culvert is in the control of the appellant and that the test of necessity is met by the need to avoid such blockage. However, I am not persuaded that this is appropriate or necessary as the potential blockage of culverts is a universal and ongoing matter for the appropriate authorities rather than the developer of any particular site. Moreover, I do not consider the risk of blockage to be demonstrably increased by the proposed development as the risk of unauthorised disposal of items likely to cause such a problem would arguably be reduced by the greater surveillance of the Fishpool Brook that is likely.

Planning Obligation

216. The Framework sets the tests for planning obligations consistent with the statutory requirements of the Community Infrastructure Levy Regulations 2010 (CIL Regulations). The Council's evidence addresses in some detail⁴¹ the developer contributions provided for and concludes, with reservations regarding the Travel Plan Penalty, that all bar the Policing Contribution are compliant with the relevant tests and the CIL Regulations. The separate matter of Affordable Housing in the obligation is justified on the basis of local and national policy and the relevant local evidence base. The precise level of affordable housing is a matter of negotiation on the specifics of any particular site, but it seems to me that 30% affordable, to be tailored to local needs as regards the mix of Social Rented Dwellings and Intermediate Affordable Dwellings, is a reasonable expectation on a greenfield site of this nature. The rationale for the Education and Library Facilities contributions is set out in the written evidence of the County Council,⁴² which also refers to the original request for a Civic Amenity contribution, subsequently dropped as a result of convenient local facilities with adequate capacity having been provided.

⁴¹ C2 Evidence of Mr Reid, Section 3

⁴² CC1 Evidence of Mr Tyrer

217. I have no reason to depart from the Council's analysis in respect of Public Open Space/Recreation and Community Facilities, Education and Library Services, all of which are calculated on the basis of established practice locally and with a view to specific provision in response to the predicted impacts of the proposed developments. Full weight may be accorded to those elements of the Planning Obligation. They are necessary to make the development acceptable in planning terms, directly related to the development, and fairly and reasonably related in scale and kind to the development.

218. More substantial comment, to which I return in due course in the context of my conclusions regarding infrastructure, is necessary on the financial contributions provided for in respect of Highways and Transport, Policing and Health.

Conclusions

References are made, where appropriate, to previous parts of the report by indicating the relevant paragraph number thus [0].

Main Considerations

219. I have identified the following main considerations in this case:

- (i) Whether the Council can demonstrate a five year supply of deliverable housing;
- (ii) The sustainability of the proposed development;
- (iii) The effect of the proposed development on highway safety, in particular its effect on the safe operation of the junction of Grove Lane with Sibley Road and South Street ('the Grove Lane junction');
- (iv) The effect of the proposed development on traffic circulation within Barrow Upon Soar, including at times of flooding;
- (v) The effect of the proposed development on flood risk;
- (vi) The effect of the proposed development on the infrastructure of the village and whether its impacts may be adequately mitigated by the provisions of the planning obligation;
- (vii) Whether the proposed development accords with the development plan for the area in respect of highway safety and the protection of the countryside;
- (viii) The accordance of the proposed development with the intentions of the National Planning Policy Framework ('the Framework') regarding the delivery of a wide choice of high quality homes, good design and the promotion of healthy communities; and
- (ix) Whether any harm arising from the proposals would be outweighed by other considerations, i.e. the planning balance.

(i) Housing Land Supply

220. The Council accepts that it cannot demonstrate a five year supply of deliverable housing sites and there was no substantive, evidence-based, challenge from any party regarding this. Accordingly, the Council accepts that the local plan policies

concerning housing land supply, specifically, cannot be considered up-to-date. [28]

221. I have no reason to doubt the position and it merits no further discussion other than to note that the presumption in favour of sustainable development set out in paragraph 14 of the Framework is thereby engaged. The failure to demonstrate a five year supply of deliverable housing sites is a matter to which substantial weight must be accorded.

(ii) Sustainability

222. Sustainability is a multi-faceted concept most authoritatively articulated in the Framework for present purposes. It merits some attention in that the sustainability credentials of the site are questioned by many, albeit not the Council [28], including numerous local residents who object to the proposals.

223. In land resource terms it has been established that the site does not comprise Best and Most Versatile land [8] and hence the loss of farmland does not weigh significantly against the proposal in sustainability terms, given the inevitability of having to develop greenfield sites in the Council's area.

224. Moreover, I am satisfied that there are no seriously adverse implications from the point of view of biodiversity. Again this is common ground between the main parties [28]. It seems to me that, if anything, the enrichment of habitat through extensive landscaping with appropriate species and the additional benefits afforded by individual suburban gardens in the fullness of time would be a benefit, notwithstanding that some species associated with farmland would be unlikely to return to the site itself.

225. Insofar as design is an important facet of sustainability, the qualities of the layout are such that it is common ground [28] between the main parties that relevant objectives would be met or would be capable of being achieved at the detailed design stage. It seems to me that the proposals balance the need to make efficient use of the site with the need to provide adequate open space to not only create a pleasant setting but also to accommodate appropriate SUDS measures and flood attenuation in a practical fashion.

226. The majority of the site is within a reasonable walking distance of the village centre. I noted that at reasonable walking pace it is 10-15 minutes and the upgrading of the routes would encourage their use. The south eastern part of the site is the least accessible at present, including to the bus stops on Sileby Road to the south. However, the evidence before me suggests [62] that Network Rail fully intends to replace the closed pedestrian crossing point of the railway that currently disrupts the footpath network with a footbridge and I have no reason to believe that this replacement will not in due course be implemented. The layout of the site makes for the encouragement of trips on foot and by bicycle and certainly facilitates such modes for those who wish to utilise them in preference to using a car for local journeys.

227. More strategically, the existence of the railway station, which provides access to major centres for employment, shopping and leisure, is a major advantage of the settlement of Barrow Upon Soar which would be readily shared by residents of the proposed development. I acknowledge that the station is perhaps more properly described as a 'halt' rather than a 'station', insofar as the latter is more

commonly understood as a substantial building or group of buildings with ticket office, staff and possibly shops and cafés. Nevertheless, the fact of the matter is that it exists and enables the population of Barrow Upon Soar to make ready use of the railway to travel to a variety of important destinations for employment, shopping, leisure and many other services, should they choose to do so. It may not be the most comfortable of facilities but for the majority of able-bodied people it is a perfectly practicable proposition.

228. This is an important consideration in terms of the concept of sustainability, to which the long view is intrinsic. Transient factors such as the state of the rolling stock or the quality of the service are less important than the fact of heavy and permanent infrastructure investment having already been undertaken, thereby representing an asset to be capitalised upon as needs dictate. The fact that usage is apparently low at present [124]⁴³ does not detract from the fundamental long term advantage of the railway as a focus for residential development.
229. The Framework⁴⁴, importantly, puts it thus: (Planning should)... *“actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus development in locations which are or can be made sustainable”*. This core principle places Barrow Upon Soar in a category of existing settlements which are inherently sustainable and, moreover, the appeal site itself is all within an entirely comfortable walking distance of the station⁴⁵. Many of the houses would be within 800m and none would be further than one kilometre, equivalent to a 10-15 minute comfortable walk for most. [28,61]
230. In addition, the existence of regular local bus services, for the most part within 400m⁴⁶ of the proposed houses with the potential for diversion through the site in due course, complements the more strategic accessibility afforded by the railway. [25,28,61]
231. It is relevant in this context to note in full the reported comments of the County Council’s Director of Environment and Transport, set out in full in Appendix 3 to *Charnwood 2028 Local Development Framework (LDF) Core Strategy Service Centre Capacity Assessment (Final Report) December 2011* (‘the SCCA’) [68]. These were that Barrow Upon Soar... *“is well served by bus services, and has a railway station but accessibility for pedestrians is currently limited to stairs only. However, existing public transport levels are insufficient to cater for the level of modal shift away from the car that would be required in order for the village to be considered suitable for a further significant expansion in housing provision.”*
232. The third key element in the equation as regards the sustainability of the location is the existence of a village centre with a good range of services that is already accessible on foot for those with the time and inclination to walk, and can be made more pleasantly so by the measures provided for in the planning obligation. There is no reason to regard the site as disadvantageous or discouraging to the use of bicycles.

⁴³ PC1 Evidence of Mr Cage, Appendix 1

⁴⁴ Paragraph 17

⁴⁵ ATA fig 3.2

⁴⁶ ATA Fig 3.1

233. For the above reasons I conclude that the appeal site's basic credentials in terms of both natural resource conservation, potential for good design, choice of sustainable transport modes and, importantly, scope for future improvement of public transport in response to demand, are in fact highly conducive to development of the type proposed.

234. It is of course the case that many other considerations impinge on the overall sustainability of the site and those that are of potentially decisive importance, namely highway safety, traffic circulation, flood risk and village infrastructure are separately considered below in order that an assessment in the round within the context of the development plan and the Framework can be made.

(iii) Highway safety

235. Grove Lane joins Sileby Road/South Street in the form of a section of one-way street with left turning and right turning lanes. The visibility to the right is entirely adequate but the visibility to the left is constrained by an existing property and it was agreed,⁴⁷ on the basis of on-site measurement during the course of the Inquiry, that the available visibility was, in practical terms, 42.5 metres to a 1 metre offset from the kerb. [48].

236. Much evidence was adduced regarding observed speeds on the road, adjustments for wet weather conditions and the composition of the traffic, to which I have given careful consideration. It seems to me, bearing in mind not only the totality of the evidence but also the response of the Highway Authority, which does not object to the proposals that, were the junction being constructed today, a more generous 'Y' distance of around 45 metres would be provided as a matter of course. Correspondence between the appellant's highway engineers and the highway authority⁴⁸ indicates its view that 45 metres was the appropriate standard to work to and that this could be achieved by the use of a 1.31m offset from the kerb. In other words, the layout of the junction does not provide the visibility to the left that, ideally, it should [114] [38 - 50, 73-99 and 112 – 114 for detail of the cases put].

237. This perceived deficiency must, in my view, be considered in the light of a number of factors, including the, albeit cautious, conclusion in MfS2 that there is no invariable relationship between visibility and collision risk. A second contextual factor is the reality that numerous junctions in urban areas are below current standards but are not normally reconfigured unless there is evidence of safety problems arising on a regular basis as a consequence. Otherwise they are left alone to carry volumes of traffic far in excess of those that originally typified the streets, on the basis that drivers exercise the necessary degree of caution as circumstances demand. The proposition was advanced that, if absolute standards were to be routinely applied to junctions in the network at a distance from individual application sites, this would unnecessarily inhibit the development of urban areas [50].

238. In response to my questions on that matter, Mr Young, for the appellant, explained the reality of the general picture very clearly and I concur with the commonsense assessment that he gave. Moreover, the Framework, at

⁴⁷ Doc 20

⁴⁸ ATA, Appendix A email from Younus Seedat to Stephen Yeates 25/01/11 @16:46

paragraph 32, sets out an approach which takes account the need for safety at the site access itself and residual cumulative impacts on the network that must be severe if development is to be prevented or refused. While it was submitted on behalf of the Council [101] that severity is a concept that that is inapplicable to the safe operation of a junction, i.e. it is either safe or it is not, I do not consider that the real world operates in that way. It would of course be wrong to sanction any development that self-evidently gave rise to significant deterioration in road safety without effective mitigation of the problem, but there is no cogent evidence to suggest that would be the case here.

239. MfS advises that local evidence should be taken into account in exercising the necessary judgement about any junction and the evidence in this instance is a sustained freedom from recorded accidents at the Grove Lane junction. It is of course the case that lack of accidents related to visibility is not proof that a substandard junction is inherently safe, but it does strongly suggest that it operates in practice in a safe manner because of its particular circumstances and the response of the drivers using and approaching the junction to such circumstances.
240. I observed the operation of the Grove Lane junction both as a driver and as a bystander on a number of occasions during the course of my visit to the area. There is no doubt that larger vehicles emerging from the junction to turn left do impinge on the far side of the carriageway, but they appear to do so in a cautious manner which gives adequate time where necessary for vehicles approaching from the east to adjust their speed to accommodate the manoeuvre. I also observed that certain other vehicles turning left do cross the lowered kerb so as to remain within the nearside of the highway whilst effecting the manoeuvre, whereas the great majority had no need to do that. The tyre marks and the evidence of my own eyes suggest that this is a regular, if not unduly frequent, occurrence, but the fact remains that large numbers of vehicles have exited the junction over the years without mishap. On the basis of agreed flows the junction carries in excess of 1.5 million vehicles annually, albeit right turning as well as left turning [39].
241. The reasons for the evidently safe operation of the junction may well include driver knowledge of its characteristics, including the lack of turns into it by reason of its one-way flow. But I also note that the approach to the junction from the east is up a perceptible gradient which is traffic calmed to some extent with occasional speed cushions and subject to the "friction" of parked cars where parking is not restricted and the improved forward visibility that results where it is, the net result being that drivers unfamiliar with the road are likely to approach the junction from the east with appropriate caution rather than assuming that they may proceed with impunity at a constant speed, as would be the tendency for instance on a free-flowing rural road. The urban and complex driving conditions give rise to a driver response that meets the circumstances, as is the case in countless situations throughout the country.
242. Competing assessments on the part of the appellant and the Council⁴⁹ make for a range of required visibility from 38.21m to 43.86m when appropriate reductions in average speeds to account for HGVs and buses are made [47].

⁴⁹ Doc 44, paragraph 25

The actual visibility based on what I consider to be an appropriate offset from the kerb of 1 metre, inside of which the highly unlikely and extremely rare occurrence of a motorcycle overtaking another vehicle overtaking a parked vehicle would not be entertained by its rider owing to the risk of kerb clipping, grids etc, is 42.5m from the centre line of Grove Lane⁵⁰. This comfortably exceeds the mid-point of the range, which is fractionally over 41m. Therefore, if the appellant is right in its calculation of 38m⁵¹ being the appropriate distance there is clearly no deficiency at all but the Council's more cautious approach without speed reductions for HGV/Bus content in the flows would produce a deficiency of the order of 3% against the 42.5m available. Using the appellant's surveyed speed uncorrected for wet weather, the 42.93m requirement would give a deficiency of around 1%. Only the most extreme requirement canvassed of 47.5 metres (Council's preferred figure with no speed reductions at all) would give a deficiency of around 10%.

243. Clearly a deficiency of that order would not be de minimis, but it is material that a more pragmatic approach was taken by the highway authority itself, which regarded 45 metres as being the desirable visibility and in any event does not object to the proposed development, and that the appellant's approach, in my view, more closely accords with the totality of the relevant available advice, little of which is wholly prescriptive, and contains the necessary ingredient of judgement on the circumstances and evidence.

244. I therefore consider it is appropriate to consider the matter of the safety of the Grove Lane junction in the round, bearing in mind the contextual considerations I have described, the lack of recorded accidents that could be ascribed to visibility, and the fact that the highway authority has at no time considered the junction to be in any sense a priority for improvement, notwithstanding that it is one of the principal junctions in the settlement of Barrow Upon Soar. I am also conscious that its one-way operation makes for a simpler pattern of movement and interaction between road users than would be the case if it were a conventional two-way flow with traffic entering it from the main road. It is pertinent to bear in mind the advice originally set out in MfS1⁵² concerning driver reaction and stopping sight distances, the various strands of local evidence and the revised guidance in MFS2⁵³. All things considered, I conclude that, despite its perceived deficiency in respect of visibility to the left, the junction, on the basis of that local evidence, operates safely and would not, understandably, be a priority candidate for improvement on the basis of current usage.

245. In my estimation, the deficiency, such as it is, is of marginal significance when the judgement is made in the round and should not trigger prevention of the proposed development unless the impact upon its continued safe operation would be demonstrably severe in the sense intended by paragraph 32 of the Framework. In the ordinary course of events developers cannot reasonably be expected to address imperfections in the existing network unless the impact of the proposals would be significantly adverse.

⁵⁰ Doc 20

⁵¹ Doc 44 paragraph 19

⁵² MfS1 7.5

⁵³ MfS2 10.1 – 10.5

246. That begs the question in this instance of whether the impact of additional traffic on the junction would be so significant as to undermine its currently safe operation.
247. The traffic forecast calculations accepted by the highway authority and the parties as the correct basis of calculation show that with no allowance for modal shift as a result of the Travel Plan but with allowance for unreduced⁵⁴ traffic growth to 2020 the proposed development would add some 62 right turners and some 30 left turners during the am peak hour to the one way exit from Grove Lane. PICADY results show that the consequential delays per vehicle at 2020⁵⁵ would be of the order of a few seconds only for left turners and a little longer for right turners, with less than one vehicle being added to the left turning queue and 1.3 vehicles being added to the right turning queue. The ratio of flow to capacity would be 0.401 for left turners and 0.58 for right turners, well within the accepted capacity threshold of 0.850. Similarly, the pm peak flows would be well within capacity.
248. On that basis, it is evident that the junction would continue to operate comfortably within capacity at the busiest times, with little additional delay for drivers that might otherwise cause impatient behaviour that could potentially undermine the demonstrably safe current operation of the junction. It seems to me that the evidence demonstrates conclusively that the junction should continue to operate without significant change when the additional traffic from the development has built up to its maximum anticipated level, which would in any event be a gradual process which would allow drivers to adjust their habits to compensate for any perceptions of additional delay in any event. Bearing all the relevant considerations in mind, I see no reason why, on a robust assessment, the safety of the junction would be materially diminished by the extra traffic from the proposed development.
249. Nor do I see any reason on the basis of the evidence before me [39, 83 - 85] why pedestrian safety in the vicinity of the junction should be any less than it is now, or that safety for cyclists would be diminished. In relation to the latter, I am conscious that MfS2 notes that greater visibility at T- junctions is associated with higher cycle collision rates.
250. For all the above reasons, while I understand the perception of the Council and the Parish Council that the imperfection of the Grove Lane junction with regard to its geometry and visibility to the left would be a cause for concern [72 - 101, 112 - 116] albeit not one ultimately shared by the highway authority, if the proposed development were to go ahead, I consider that the balance of evidence points conclusively to the judgement that highway safety would not be materially compromised by it. I therefore accord only limited weight to that perception and accordingly, I am unable to conclude that the effect of the proposed development would have an unacceptable impact in those terms as far as the Grove Lane junction is concerned. It follows that the claimed conflict with criterion (i) of local plan policy TR/6, set out in the Council's sole reason for refusal [23], is not, in my estimation, substantiated.

⁵⁴ Surveyed flows at the junction have decreased between 2009 and 2012

⁵⁵ Capacity assessment updated to 2020 at request of highway authority and summarised in evidence of Mr Young at table 5.3 of his evidence (A2)

251. I turn now briefly to the matter of the site access itself. The Council raises no objection to the proposed site access [28] and neither does the highway authority. The Parish Council, on the other hand maintained that the vehicular access to the site itself would be unsatisfactory in two principal respects, namely the single access point (with no separate emergency access) and the forward visibility to the access roundabout from the north east [109, 110].
252. The more usual approach is to provide for two or more access points on a development of this size, or a separate emergency access, but that is not always possible, a fact recognised by the highway authority's own guidance⁵⁶ which advocates assessment on a site-specific basis [54]. In this case, the requisite emergency access would be 'designed in' to the access roundabouts and short connecting road by the provision of over-run areas to be constructed sufficiently firmly and kept free of obstruction so as to allow emergency vehicles the option of leaving the carriageway itself to get round any obstruction within it. Clearly there is always the possibility that an incident such as a road traffic accident or fuel spillage could close the access itself for a while, but in such circumstances emergency vehicles would be able to reach the relevant area and no doubt by-pass it on the over-run area provision in the event that a simultaneous emergency occurred within the housing area beyond. The highway authority is entirely satisfied on this point [28] and I have no reason to disagree. There are no objections from the relevant emergency service providers in any event.
253. As far as the forward visibility to the roundabout is concerned, the relevant and appropriate guidance in MfS2 suggests that on the current observed speeds the necessary distance is around 52 metres and that, it is claimed by the appellant can be achieved, even when the changing levels of the land and adjacent land are taken into account as the Parish Council suggests. Having carefully studied the levels information on Drawing No 0940/SK/014 rev A and the drawing at Appendix D to Mr Young's rebuttal evidence,⁵⁷ and having observed the lie of the land and positioning of retained trees at my site visit I am satisfied that is so. The Highway authority has no objection to the proposed geometry either. Moreover, the speeds measured by the Parish Council in this 30 mph limit are clearly a driver response to the highway geometry as it currently exists, not the geometry proposed, which would include a signified roundabout and a more curved road, both of which would tend to reduce speeds in any event. This is not, in my estimation, a significant point against the proposed development which would create conflict with the intentions of the development plan or the Framework in respect of highway safety and no weight should be accorded to it [52,53,110].

(iv) Traffic circulation in Barrow Upon Soar

254. The particular geography of Barrow Upon Soar tends to concentrate traffic entering and leaving the settlement via the nearby A6 onto the historic Barrow Road Bridge, a listed structure. The alternative route to and from the A6 via Slash Lane to the east of the settlement is regularly inundated by flooding, albeit there appear to be no reliably precise records of exactly how many days in the year it is wholly impassable to motor vehicles.⁵⁸ Nevertheless, from all that I

⁵⁶ The so-called '6 C's' guidance (Appendix C to PC1 Evidence of Mr Cage)

⁵⁷ A3

⁵⁸ See for example paragraph 13.1 of evidence of Mr Cage on flooding (PC3)

saw and heard I have no doubt that this is a strategic difficulty for the settlement, indeed a difficulty that contributed to the dismissal of an appeal in of an appeal in 1997 [60,176]. I have studied this decision carefully and it seems to me that the circumstances of the site were different in that it was directly related to the possibility of providing a flood reduced link via Slash Lane to ensure the accessibility of the business premises at that time proposed, but there were in any event a range of other substantiated objections to the proposal and the Inspector concluded, amongst other things, that... *“such consequences of poorly sited development are particularly unnecessary at this time when there is no urgent need for further employment land to be released and when there is to be debate over how to best provide for future needs in the context of the emerging Local Plan.”*⁵⁹

255. At the strategic level a further distinguishing feature was the lack of demonstrable need for the release of employment land at the time and I am also conscious that housing development has continued apace in Barrow Upon Soar, especially on its northern fringe, despite the obvious difficulty that the periodic severance of Slash Lane and other routes causes. Nevertheless, it seems to me that in the ordinary course of events the expansion of the settlement without resolution of the problem via public investment in the necessary works, however funded, does weigh against the current proposal in the absence of a clear mechanism, set out for example in an up to date development plan, so as to overcome the difficulty, which, unresolved, must ultimately limit the growth of the settlement, especially if climate change increases its frequency.
256. Against that, the settlement is established and must continue to thrive despite those intermittent difficulties which load additional traffic onto the more reliable route across Barrow Road Bridge, leading on such occasions to additional and widespread congestion. The relationship of the proposed development to the Slash Lane difficulty is not so direct or unique that it would be reasonable to require resolution of the problem, which is common to the entire settlement, to be funded by the appellant in this case and there is no suggestion from the Council or the highway authority (neither of which objects to the proposed development on the grounds of the Slash Lane situation) that it should be. Some mitigation of the extra impact of the proposed development on ‘flood days’ is arguably necessary but has been catered for by the commitment to extra warning signs, albeit these do not address the root cause of the difficulty.
257. The key question is whether the extra traffic impact of the proposed development on flood days would be so severe as to render the development untenable as a consequence of the extra loadings on the Barrow Bridge route on those occasions which disrupt the traffic flow and cause congestion in the settlement in any event, but I have no cogent evidence to suggest that a critical threshold would be crossed so as to render the existing unfortunate situation wholly unacceptable.
258. Moreover, the appellant’s off-site proposals to improve the capacity of the Barrow Road Bridge through the use of some additional traffic management measures, including the repositioning of the traffic lights and stop-lines and the installation of MOVA technology would serve to ease, it seems to me, the position

⁵⁹ Ibid paragraph 33

on flood days in the same way that it would on the ordinary days when Slash Lane and sometimes Mountsorrel Lane, apparently, are closed. Clearly the congestion would be greater and more enduring on such occasions but that simply reflects the current position without the proposed Barrow Road Bridge improvements necessitated by the additional traffic from the development proposed in this instance.

259. The effectiveness of those proposed improvements was questioned by the Parish Council [117,118], albeit not the Council or the highway authority, on a number of counts. While I can see that an overly ambitious approach to repositioning the stop lines could potentially cause difficulties in the event of large vehicles meeting at the point of constriction, I have no doubt that precise positioning at the point of implementation would minimise the risk of such an occurrence. Moreover, there is no cogent evidence that the listing of the structure would necessarily inhibit the most advantageous re-positioning of the traffic signals. It does seem that the recent introduction of a dedicated cyclists' phase by the highway authority has the potential to require further modification to the proposals, but the highway authority is the instigator of that and I have no doubt that adjustments could be made as it considers necessary.
260. Fundamentally, it seems to me, the MOVA system proposed, being a dynamic means of traffic management in response to the prevailing circumstances, has the potential for continuous adjustment, for example in the event of the so-called 'hurry loop' introducing unintended consequences⁶⁰, to achieve the optimum outcome at a bridge which has served the settlement and will continue to do so on the basis of alternating one-way flows. The appellant's VISSIM modelling was criticised as being too limited in its scope on the approach roads, for example stopping short of the 'Jerusalem Roundabout' but the inclusion of the additional traffic in a wider purview would tend to dilute its significance in any event. Ultimately, all such modelling has its limitations and the Parish Council's evidence failed to convince me that its VISSIM modelling ultimately gave a more accurate prediction. It seems to me that the CD visualisation of the predicted traffic movement failed to take into account matters that would be properly addressed by experienced drivers on a day to day basis, such as minimising delays caused by right turners into Proctor's Park Road.
261. In any event, the addition of around 90 vehicles in the peak hour or around 1.5 vehicles per minute, whilst not perhaps, at 6% increase, imperceptible as the appellant claims⁶¹, would certainly not give rise to insurmountable or unacceptable levels of increase in congestion relative to the existing situation, even if the installation of the proposed measures were to be less effective than predicted. While I have no doubt that there are occasions when the bridge does give rise to difficulties in the settlement, I observed it on a number of occasions, including my formal site visit (timed to observe am peak conditions at the Jerusalem Roundabout.) I can only conclude, having done so, that, given the constriction in the network that the bridge must inevitably create, for the most part it operates as well as can reasonably be expected and that, with the benefit of the improvements proposed, it will continue to do so and may even experience some improvement as the appellant claims. It is significant that the highway

⁶⁰ Doc 42 paragraph 5.16

⁶¹ Doc 44 paragraph 39

authority is satisfied with the proposed mitigation of additional flows on the network in this respect and that there is in any event continuing scope for refinement of a system that is intrinsically sensitive to demand at any time and allocates the available capacity of the bridge accordingly, i.e. an intelligent system. A 'trial run', as has been suggested by a local resident [180], would, in the circumstances, neither be practical, nor, in my view, necessary.

262. All in all, given the proposed improvements, there is no reason to consider that the increased traffic at the Barrow Road Bridge would lead to any conflict with the intentions of the development plan or those of paragraph 32 of the Framework, which says that decisions should take account of, inter alia, whether...

"improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe." The residual impact of the proposal on the Barrow Road Bridge following the introduction of the proposed MOVA system, even if were to fail to fully live up to its promise of more than compensating for the impact of the proposed development⁶², could by no stretch of the imagination be described as 'severe' even though some adverse impact might at some point on some occasions conceivably occur.

263. Moreover, the visibility towards the bridge is perfectly adequate from both directions and would remain so even after the adjustments proposed to the signal heads were effected. There is no convincing evidence to demonstrate that visibility at the bridge, or the layout of the road, is in any sense a cause of undue danger. The bridge is an inconvenience known, logically, to most drivers in the peak hours and almost certainly to a sizeable majority of those using it outside those hours. The only potentially decisive question is one of consequential materially and unacceptably reduced capacity on the highway network and, for the reasons previously explained, I do not consider that to the case in any event.

264. Finally, as regards the day to day operation of the highway network elsewhere, there was contention; from the Parish Council [111]⁶³ that abuse of the short stretch of one-way routeing between the junction of Breachfield Road with Grove Lane, between it and Melton Road; and from Mr Smith [168]⁶⁴ regarding the speed of traffic passing the junction of Babbington Road with Melton Road in the vicinity of the northern end Breachfield Road; that both were potential sources of danger, underlining constraints in the network. With regard to the latter point, I consider that the introduction of the proposed site access roundabout (Drawing No 0940/SK/014 rev A) would advantageously change the geometry of Melton Road, improving visibility whilst calming traffic. As regards the former point, it can only reasonably be assumed that local motorists will obey the law and resist the temptation to short-cut. If anything, a perception of increased flow, such as it would be, would reduce that temptation rather than increase danger, in my view. I do not consider that either point would amount to a conflict with local plan policy TR/6 or the intentions of Framework policy concerning road safety and, again, I am conscious that there is no objection from the highway authority.

⁶² Ibid paragraph 45

⁶³ Doc 42 paragraph 5.4

⁶⁴ Doc 19

(v) Flood risk

265. Flood risk is not an objection raised by the Council, which is satisfied on the basis of the technical evidence and the position of the Environment Agency (EA) that, with the imposition of appropriate conditions, the appropriate standard of mitigation will be achieved, principally through siting the dwellings wholly within Flood Zone 1 within a specified maximum area, by SUDS techniques to maintain run-off rates of surface water at the existing greenfield level and by an engineered increase in the capacity of the existing floodplain of Fishpool Brook. The latter would ameliorate⁶⁵, it is suggested, albeit not eliminate, the problems for existing householders on Breachfield Road with rear gardens bounded by the brook.
266. Having visited certain of the gardens and studied, in particular, the photographs⁶⁶ submitted by Mr Hilsdon and Mr Burton, as well as those appended⁶⁷ to the FRA and AFRA, I can well appreciate the apprehension of residents [139] that flooding of Fishpool Brook would be exacerbated, notwithstanding that their gardens are clearly designed and profiled to cope with such periodic flooding. It plainly occurs. It cannot be pleasant, and the prospect of it increasing would be a cause for dismay. However, such a prospect is not borne out by the evidence, even though it was not possible for the FRA to survey this private land specifically, causing reliance on so-called 'glass wall' modelling techniques.
267. Understandable apprehension is no substitute for robust evidence and the FRA and its submitted addendum to address masterplan amendments provides just that. The evidence of Mr Rassool, sections 3.00 – 6.00 in particular, demonstrates very effectively that a robustly pessimistic or conservative approach in the modelling has been taken and that there could well be the prospect of a slight improvement in the experience of the householders, albeit that flooding of their lower gardens will still occur. The proposed development would not, therefore, be a panacea. However, I am satisfied that a careful approach has been taken, rooted in the appropriate scientific principles and, on that basis, the proposed development should certainly not make matters worse in any significant way. The EA's updated modelling⁶⁸ provides a further level of comfort on the issue. Moreover, the note prepared by Mr Rassool⁶⁹ in response to Mr Hilsdon's concerns about drainage from old mine workings⁷⁰ deals authoritatively, in my view, with that matter.
268. The Parish Council's submissions on flooding⁷¹ are extensive but miss the essential point that, whilst stating that its requirements would be "exacting", the work undertaken satisfies the EA, and the essential point also that such requirements can be secured through the imposition of appropriate planning conditions such that the development could not proceed if more detailed investigations belie the conclusion that, in principle, all relevant requirements

⁶⁵ AFRA paragraphs 1.16, 1.17 and 1.23

⁶⁶ Docs 32 and 39 respectively

⁶⁷ Appendices I and A respectively

⁶⁸ Ref NTW307/TN1 (Appendix B to A4 Evidence of Mr Rassool)

⁶⁹ Doc 38

⁷⁰ Doc 32

⁷¹ Doc 42 Section 4.0

appear capable of being satisfied on the basis of the work undertaken to date. This is an outline application for a large development with sufficient scope for flexibility, for example in attenuation capacity, regarding SUDS techniques built into the basic masterplan; and it would negate the spirit and purpose of the outline procedure if the expense of comprehensive and definitive investigation and design of the end state solution were to be required in advance of the certainty of planning permission that might be withheld for other reasons. It is sufficient at this stage to demonstrate to the EA and, with the benefit of its advice, the decision maker, that the most up to date and refined modelling available, in combination with a site layout that incorporates the principles that would enable the relevant objectives to be met, give sufficient comfort that a practicable solution is in prospect. I have seen no evidence sufficiently compelling to convince me that is not the case.

269. Moreover, it seems to me that future investigation of the permeability of the sub-strata in detail, bearing in mind the above, may improve upon the situation, if it proves better than has been portrayed,⁷² although there would be no adverse consequences if it did not.

270. Further, while I note the contention that the modelling did not account for any reduction in capacity of the floodplain of Fishpool Brook if, for example, a causeway approach were to be adopted in its design, I am conscious that other solutions could be considered which would allow the free passage of floodwater in any event, whilst maintaining the passage of pedestrians across the low lying area. Alternatively, acceptance of the partial submergence of an at grade pedestrian route as a temporary inconvenience would not significantly undermine the sustainability credentials of the site as alternative routes would be available via the principal access to the site. Although perhaps not ideal, I do not consider the consequences of the pedestrian link crossing the floodplain to be intrinsically insurmountable and I have no reason to consider that the consequences in terms of flood risk would be sufficient to change my overall assessment that the flood risk modelling is adequate.

271. Nor do I consider the alleged increase in risk of the culvert under the railway blocking to be a matter to which weight should be accorded. The culvert is presently rather inaccessible and consequently rarely observed. Hence debris potentially causing a blockage is likely to go unreported. More natural surveillance of the Fishpool Brook could just as readily reduce the risk of blockage as more public access to the adjacent land might increase it. I have no evidence to suggest that this is a serious criticism of the scheme which should carry any weight. Similarly, the maintenance of the culvert is ultimately the responsibility of Network Rail and I have no evidence that the potential for increased scour is a serious threat to its structural integrity or continued effectiveness.

272. The Parish Council's submission [132] that the EA recommendation to keep floor slabs at 48 metres AOD or above to cater for potential 50% blockage of the culvert in the 1 in 100 year plus climate change event would cause significant problems is not borne out by the evidence. The western edge of the development area shown on the masterplan, within which the layout is

⁷² Ibid paragraph 4.6

illustrative, broadly corresponds with the 48m contour shown on the site survey drawing included as Appendix A to the FRA. It is plain to me that the necessary precautionary minimum slab level which the EA recommends would readily be achieved by the scheme as currently conceived without unduly radical revisions to the layout. Moreover, the AFRA⁷³ shows the 100 year plus 20% for climate change modelled floodplain to be well below this level, such that any blockage would have to cause flooding at significant additional depth over a very extensive area to cause significant problems in that respect. That possibility is plainly remote in the extreme when the relevant contours are studied.

273. In the final analysis, the expert responsible statutory consultee is content that the approach to flood risk at outline stage is sufficient to engender confidence that its requirements can be met in practice. This is powerful evidence of the ability of the scheme to comply with relevant policy regarding flood risk in the Framework and associated technical guidance and a position to which substantial weight and credence is to be accorded. The logic of the approach to flood risk within the design of the scheme is compelling and I am satisfied that in principle it effectively addresses the matter, with a firm prospect of the broad approach to the disposition and extent of land uses illustrated being retained in broadly the same form at detailed design stage. The illustrative masterplan has a logic to it that has clearly taken into account the relevant precautionary requirements regarding flood risk. In short, I am satisfied that the evidence shows that, subject to the imposition of the EA's requirements, the proposed development would not be subject to fluvial inundation on any reasonable assessment of risk and nor would it materially increase flood risk elsewhere in the catchment.

274. For all the above reasons I am able to conclude that, whilst the definitively detailed measures have not been designed at this stage, the evidence, including the evident satisfaction of the EA, which is fully aware of the master plan proposals for the site, clearly indicates that in practice they will be effective in avoiding any increase in flood risk; and may possibly give rise to betterment that could, on occasion, improve the position of certain of the existing householders whose lower rear gardens are currently affected by flooding.

275. There is, therefore, no significant conflict with the intentions of the development plan or the Framework in respect of flood risk.

276. As to the potential impact of the flooding of Fishpool Brook on foul drainage and the risk of surcharge, I see no reason in principle why appropriate design measures could not be incorporated to secure the system, thereby effecting an improvement on the current situation. The matter is capable of being addressed as necessary by planning condition.

(vi) Infrastructure

277. It is apparent that Barrow Upon Soar, over a number of decades, has expanded through the development of housing estates from its original core. Its location on the north east side of the of the River Soar, which effectively separates the settlement from the group of settlements comprised of Loughborough, Quorn and Mountsorrel, makes it relatively freestanding but there is little to suggest that it is notably self-contained despite its identification as a 'Potential Service Centre' in

⁷³ Figure 1

the evidence base for the Council's forthcoming Core Strategy. Nevertheless, in the context of an expansion of the total Charnwood population of 15.4%, the document in question (SCCA) [68] indicates, at Table 7, that other settlements - Mountsorrel (36.9%), Rothley (30%) and Wymeswold (24.5%) – have expanded in population terms relatively more in the period 1991 – 2009. Barrow Upon Soar, by comparison, has expanded by some 20.6% in population terms over the same period, with 619 houses having been built. Clearly, this expansion is ongoing with the continuing development at the Willow Road site in the northern part of the settlement, together with smaller sites, as the Parish Council's evidence clearly indicates, suggesting a likely increase of the order of 50% since 2001 if the proposed development in this case were to be allowed and constructed.⁷⁴

278. Table 12 of the SCCA broadly classifies the range of facilities on a comparative basis as between their level of provision in the identified Service Centres. In the case of Barrow Upon Soar 'Services and facilities', 'Quality of centre', 'Opportunities for improvement' and 'Planning constraints' are ranked as "reasonable" with a moderate level of capacity constraint, whilst 'Transport access', 'Employment self-containment' and 'Infrastructure capacity' are ranked as "fair" with a significant level of capacity constraint. No category is ranked as poor or as giving rise to a very significant or potentially overriding level of constraint.
279. The classification is broad and has yet to be tested through independent examination. Moreover, the development strategy itself for the district has yet to be settled in terms of the emerging plan and it is common ground between the main parties that it should be accorded no weight in the determination of the appeal [14]. Nevertheless, the evidence base presents a picture that is perhaps less constrained than the very clear perception of the Parish Council and the numerous local residents [103 -105, 136,137, 141-148,151,158-161,170,174,181,182 185] who have made representations that the physical and social infrastructure of Barrow Upon Soar is unduly stretched, although elsewhere in the SCCA [68] specific concerns are highlighted. For example, Table 2 notes the highway authority's concern that the Barrow Road bridge is constrained in capacity terms and that the settlement is prone to disruption when Sibley Road and Slash lane are flooded, together with the comment that *"it is not readily apparent how these issues might be addressed in order to accommodate further housing growth in the village"*.
280. I also note that Table 11 of the SCCA indicates, inter alia, that there is potential for improvement through contributions to *"capacity of services and facilities where justified"* and that there is the opportunity to... *"Improve provision for buses, cycling and walking plus better traffic management to help reduce pressures. New highway capacity only considered where no other reasonable alternative can address traffic related problems."*
281. These matters go to the heart of my previous consideration of the suggested planning conditions and the planning obligation submitted and what, because of the statutory CIL tests, may or may not be accorded weight in the decision making process as far as the latter is concerned, notably in relation to the

⁷⁴ PC4 Evidence of Mr Cattle paragraphs 2.2 – 2.7

- financial contributions provided for in respect of Highways and Transport, Policing and Health.
282. The County Council's written evidence to inform the Inquiry [183 – 190] includes details⁷⁵ of the manner in which specified contributions for Highways and Transport are intended to be spent and my conclusions are summarised below.
283. The bus shelter and pedestrian and cycle routes contributions relate to physical works and infrastructure so as to more effectively serve the proposed development by public transport and physically link it into the existing built village with improved access to the village centre and the Humphrey Perkins High School. They involve capital expenditure which is necessary to make the development acceptable in the sense of keying it in to the fabric of the settlement and this is directly related to the development and, it seems to me, fairly and reasonably related to it in scale and kind. Full weight may be accorded to this element of the Planning Obligation.
284. It is common ground between the main parties that the site is sustainably located. The 'Travel Pass Contribution' is essentially a form of revenue expenditure effectively, albeit indirectly, subsidising the provision of rail and bus services for a temporary period to induce good habits in potential customers. There can be no guarantee that such habits will continue. People tend to be rational in the exercise of transport choice and, if it suits their needs to make use of the public transport services to which the site is inherently accessible, they will do so; otherwise they will use other means, whether that be bicycle, motorcycle or motor car. However, insofar as it would promote sustainable transport habits to capitalise on the advantages of the site's location, thereby contributing to the promotion of sustainable transport advocated by the Framework, the contribution may be regarded as a necessary complement to help ensure that the sustainability credentials of the development are maximised at the outset.
285. The obligation also provides for a 'Travel Packs Contribution'. Such packs are undoubtedly good practice. They may influence the behaviour and travel choices of a proportion of the occupants of the proposed houses, initially at least. Again, to the extent that they would promote sustainable transport habits from the outset, they may be regarded as a necessary complement to help ensure that the sustainability credentials of the development are fully utilised early on. The packs would clearly be directly related to the development proposed and I have no reason to consider the sums of money involved disproportionate.
286. However, the Travel Plan Penalty (CC2, para. 3.3) cannot, logically, be necessary to make the development acceptable in planning terms. It caters for the possibility that, notwithstanding the services of a Community Travel Plan Co-ordinator (CTC) for a temporary period⁷⁶ whilst the development takes place, the Travel Plan fails to meet its target of 14% modal shift away from the private car, which of itself is a laudable objective in policy terms. However, by the time that failure had become apparent, the houses would have been built and occupied and the additional measures to pursue modal shift objectives that the £45,000 penalty would fund would be further physical measures or travel packs and passes, it is said, but the latter would only be for a temporary period. It is also

⁷⁵ CC2 Evidence of Mr Cook

⁷⁶ Fourth Schedule to planning obligation, paragraph 5.3.7

said that the penalty provides an incentive for the developer to seriously implement the measures in the travel plan but, realistically, in the context of a development of 300 new houses and, possibly, a commensurate reduction in the base value of the land in any event, I cannot see that this would be so. It may have merit as a signal that necessary good practice is expected, but I do not consider such an arrangement to be necessary to make the development acceptable in planning terms in the longer term. The concept of necessity, in my view has to be more robust than a measure that, at best, would seek to retrofit good practice and unspecified physical measures at some point in the future after the development had been implemented in any event.

287. For these reasons, I do not consider that any weight should be accorded to that particular element of the planning obligation.

288. The 'Police Authority Contribution' is for £177,255. The manner in which the authority would seek to spend it is set out in the Third Schedule to the Planning Obligation. By letter to the Planning Inspectorate of 6 August 2012, the Leicestershire Constabulary explained in some detail its approach to the use of S106 monies for police infrastructure throughout the county, supported by a number of appeal decisions in which it was concluded that the contributions in each case passed the relevant tests and could therefore be accorded weight. The letter appends (Appendix 2) a useful note from the Association of Chief Police Officers which draws the distinction between capital expenditure on equipment and premises, the basic infrastructure of policing, and revenue expenditure which might reasonably be expected to be supported by the increased number of households. A January 2012 policy statement from the Leicestershire Police Authority *Policing Contributions from Development Schemes* is also included. This sets out its approach to the increased pressure on policing from additional housing development. The document includes at Section 7 the principles whereby financial contributions will be deployed, including provision for repayment if the police authority fails to spend the contributions, linkage to the development in question and use for additional needs arising from it and a "clear audit trail demonstrating that financial contributions have been used in a manner that meets the tests" (in the subsequently cancelled Circular 05/2005 Planning Obligations.)

289. Those tests are essentially the same as those of the extant CIL Regulations and hence there is a clear recognition by the Leicestershire Police Authority that development is not simply a source of additional finance to be spent in an unspecified or unrelated way. Moreover, the appellant in this case has "signed up" to the Policing Contribution, albeit under, it seems, protest. The evidence of Mr Thorley⁷⁷ addresses this matter at Section 12 and his Appendix 10⁷⁸ is a paper on the topic that refers to a number of appeal decisions where a contribution to policing has not been supported, for example the appeal in Sapcote (Ref APP/T2405/A/11/2164413) in which the Inspector comments, in paragraph 41 of his decision, that... *"it has not been shown, in the light of the statutory tests, that the contribution would be directly linked to the impacts arising from the appeal proposal."*

⁷⁷ A1

⁷⁸ In A1a

290. Equally, the material submitted by the Police Authority under cover of its letter of 6 August 2012 includes a number of appeal decisions pointing in the opposite direction, for example the appeal in Bottesford (Ref APP/Y2430/A/11/2161786) where the Inspector comments, in paragraph 68, that *“there was also specific justification of the individual elements within this global sum directly related to the circumstances of the appeal proposal. Therefore the contribution does meet all three tests for CIL compliance.”*
291. The Inspectors will have reached their own conclusions on the particular evidence and submissions put to them at appeal and I shall approach the evidence in this case in the same way, i.e. on its merits. It seems to me that the introduction of additional population and property to an area must have an impact on policing, in the same way as it must on education and library services, for example. Moreover, it also seems to me that the twelfth core planning principle of the Framework, that planning should... *“take account of and support local strategies to improve health, social and cultural wellbeing for all, and deliver sufficient community and cultural facilities and services to meet local needs”*, can only be served if policing is adequate to the additional burdens imposed on it in the same way as any other local public service. The logic of this is inescapable. Section 8 of the Framework concerns the promotion of healthy communities and planning decisions, according to paragraph 69, should aim to achieve places which promote, inter alia, *“safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion.”*
292. Adequate policing is so fundamental to the concept of sustainable communities that I can see no reason, in principle, why it should be excluded from the purview of S106 financial contributions, subject to the relevant tests applicable to other public services. There is no reason, it seems to me why police equipment and other items of capital expenditure necessitated by additional development should not be so funded, alongside, for example, additional classrooms and stock and equipment for libraries.
293. In this case, the planning obligation clearly sets out in its third schedule the items anticipated to be needed as a consequence of policing the proposed development alongside the existing settlement and apportioned accordingly. It seems to me to be sufficiently transparent to be auditable and at a cost equivalent to, perhaps (if 300 dwellings are constructed) £590.85 per dwelling, it does not equate to an arbitrary “roof tax” of the type complained of, whatever previous practice may have been.
294. For these reasons I am of the view that the ‘Police Authority Contribution’ is compliant with the CIL Regulations and that weight should therefore be accorded to it as a means of mitigating the predicted impact of the development.
295. The ‘Healthcare’ contribution of £30,000 is solely for the improvement of the health centre car park rather than, for example, additional consulting space, albeit more efficient use of space and hence easier parking should, in principle, help to improve the efficiency of throughput as people have less difficulties in prompt attendance. The PCT,⁷⁹ despite its reservations about the impact of the proposed development on its ability to deliver continuously improving services

⁷⁹ Doc 15

through the health centre, nevertheless sees this specific action as complementary to premises improvement funded by previous S106 monies. Given the inevitable increase in patient numbers that the proposed development would give rise to, it does appear to be a considered and specified use of funds for a relevant capital project to cater for additional demand rather than simply a bid to overcome an existing deficiency. In the circumstances that have been described to me [145,146,174] it would therefore meet the relevant tests and may be accorded weight.

296. For the above reasons, I consider the contributions to the infrastructure of Barrow Upon Soar and encouragement of public transport use that would be delivered via the executed obligation should be accorded weight in the planning balance, but that the Travel Plan Penalty ought not to be accorded weight.
297. The majority of the provisions in the obligation are necessary to the grant of planning permission and do otherwise meet the relevant tests, the upshot being that the concerns of the residents and the Parish Council concerning pressures on the physical and social infrastructure of the village are capable of being met, but only barely so in the context of individual applications for development such as this one. The reality is that the mitigation of impact is confined to that which may directly be ascribed to the proposed development. Therefore, whilst the impact of development might be mitigated in the sense of services and infrastructure ultimately remaining no more stretched than previously, the perception is one of increased pressure on a finite quantum of service provision; hence the sentiment expressed in the Parish Council's closing submissions that the proposals will not lead to a better quality of life or positive improvements as advocated by the Framework but rather it will lead to deterioration in the quality of life currently enjoyed by Barrow Upon Soar residents [138].
298. I have previously drawn conclusions in respect of traffic and the highways infrastructure which, with the measures proposed, the highway authority considers will cope and I do not consider that the residual cumulative impacts would be severe. Therefore, bearing in mind the principle set out in paragraph 32 of the Framework and notwithstanding that the existing situation is perceived as unsatisfactory, certainly on flood days when one or more routes out of the settlement is closed, refusal would not be warranted on that ground, albeit the prospects for further growth in the absence of more radical measures would in my view be questionable and would ideally be addressed in the context of the development plan.
299. As I have noted, the planning obligation makes sufficient provision to mitigate the impacts of the proposed development on schools, libraries, policing, open space and recreation facilities and community facilities. In other words, the status quo would be broadly maintained at the existing level of pressure, whereas, it seems to me that local residents and the Parish Council feel that the existing level of pressure is already unsatisfactory due to the pace of growth in the relatively recent past. Perhaps understandably in the circumstances, a single proposal to construct up to 300 additional dwellings is perceived as too much for the community to absorb. It would of course be built out over a period of time, albeit relatively short, and the planning obligation makes provision for that in terms of stepped contributions as specified thresholds are crossed in respect of, for example, education. In other words, funds would be released proportionate to the impact over time.

300. The Health Centre and its services are clearly under pressure from an increasing population [141-148], albeit its commitment to excellence suggests that it would cope even if anticipated improvements are delivered less rapidly than might be hoped for. However, notwithstanding my previous observations on the generality of public services for the community in the context of policing, I do not consider that the limits to growth of a settlement can in principle be determined by the availability of health service resources that the increasing population would have to avail itself wherever it was housed in any event. It seems to me that such services are inherently malleable and capable of being expanded locally to meet demand, much in the same way as commercially provided services in a settlement respond to the opportunities created by additional population, albeit in the case of public services the necessary funding is prone to different disciplines and priorities. Put simply, it would be absurd to turn away needed housing simply because the present number of medical staff in a particular settlement was set at a finite number. The answer is clearly to improve upon their availability through the established funding channels to match population growth. The adequacy or otherwise of such funding is not a matter for me to address. Provision is made, in this instance, for the physical improvement of the capacity of the Health Centre car park so as to improve efficiency and help mitigate the impact [145] of significantly increased patient numbers.

301. In all the circumstances, while I can appreciate the local perception in the community of growth and consequent pressure, the reality is that in accordance with the CIL Regulations and the relevant formulae where applicable used by the public services, the proposed development would provide for the necessary mitigation, but little more, of its own impact and on that basis should not lead to the deterioration in the quality of life that the Parish Council and others assert. If additional benefits were to be provided for in the sense of positive but extraneous improvements not directly related to the proposed development, I would not be able to recommend that they should be given weight in the determination of the appeal. The most obvious example of this would be the funding sought by BUSCA for a community centre. I have no doubt that it would be perceived as a substantial benefit by the community, but funding of that order is not on offer and could not weigh in favour of the proposed development if it were.

302. In the final analysis, the approach adopted by the appellant, the Council and the County Council to the provision of physical and social infrastructure is, in the main, the correct one insofar as it aims to provide for proportionate mitigation of impact. There is no lack of such mitigation that would weigh decisively against the proposed development in this case, whatever the perception to the contrary might be. The provision made is sufficient, in accordance with relevant legislation and local and national policy. Given that position, I do not accept the proposition that in those terms the proposed development would lead to a deterioration in the quality of life of existing residents sufficient to warrant dismissal of the appeal.

(vii) Accordance with the development plan

303. The appellant maintains that the proposed development accords with the development plan as a whole [32-34,71]. I consider it more correct to say that there is substantial accordance with many aspects of the development plan, but clear conflict with certain key elements of it.

304. It is common ground between the main parties that the proposed development accords with a wide range of policies [21,28], both in the RSS and in the local plan. I have no reason to depart from that analysis.
305. The Council [23] alleges conflict with policy TR/6 but I have concluded that there is no conflict with that policy.
306. It is common ground that the proposals conflict with the intentions of policies ST/2, CT/1 and CT/2 which generally seek to restrict development in the countryside [28].
307. More specifically: ST/2 seeks to confine development to allocated sites within the defined limits of settlements and the appeal site lies outside the defined limit for Barrow Upon Soar. CT/1 seeks to strictly control development in the open countryside outside such limits to specified categories of essentially rural development. CT/2 permits development that would not harm the character and appearance of the countryside and which would safeguard its historic, nature conservation, amenity and other local interest value.
308. The conflict with ST/2 is self-evident. Moreover, suburban housing estates do not fall within the purview of what is contemplated by policy CT/2. The rural ambience of the appeal site would be transformed into that of such an estate and in that sense the conflict with CT/2 is clear, albeit there is no objection on the grounds of nature conservation or historic value in this instance.
309. Third parties [191,194] have specifically cited conflict with local plan policy ST/1(ii) in the sense that the nature of the many objections was indicative of the value ascribed by the community to the appeal site. Policy ST/1 states that, in providing for the development needs of the Borough measures will be taken to, amongst other things.....*"conserve, protect and enhance those features of the natural, historic and built environment which are particularly valued by the community"*... but gives no objective criteria by which to identify such features, specifically, albeit the explanation associated with the policy at paragraphs 2.24 – 2.27 appears to imply by its topic coverage that criterion (ii) is primarily concerned with heritage assets and designated sites, rather than the more nebulous concept simply of environment that is valued. On that basis, there would be no conflict with the policy as the appeal site contains no such assets or designations or features otherwise formally recognised.
310. Notwithstanding the groundswell of objection to the prospective loss of the site to development, I therefore do not consider the policy as originally conceived and drafted would be contravened in the manner that has been suggested and there is no suggestion from the Council that this would be the case, either in the SoCG or the evidence of Mr Reid. In terms of impact the loss of "ordinary" undesignated countryside that the appeal site represents would undoubtedly be keenly felt by a significant section of the community. However, although pleasant in its present rural appearance, the site is well contained by the vegetation at its margins that has the potential to be retained and strengthened in the overall landscaping scheme that would be necessary. The sloping nature of the site does make for prominence but the nature of the topography is such that this would be largely confined to visibility from within the existing settlement and the outer margins would be below the skyline given the nature of the topography [9] and would in some respects mirror the existing development on the gently sloping land to the west of the Fishpool Brook. This is particularly

evident when the site is viewed in context from its north-eastern margin. If it is necessary to release this greenfield site for development, there are, in my estimation, no overriding aesthetic objections to doing so based on development plan policy.

311. What the SoCG does confirm is the Council's view that policies ST/2, CT/1 and CT/2, being adopted prior to 2004, may only be given weight commensurate with the extent that they comply with the provisions of the Framework.⁸⁰ Moreover, it also confirms the Council's view that the policies, whilst generally restricting development in the countryside, also relate to the supply of housing and are "out of date" when considered in the context of paragraph 49 of the Framework because the Council is unable to demonstrate a five year supply of deliverable housing land [28]. I have no reason to depart from that analysis.
312. For the above reasons, I consider the proposed development displays a very substantial degree of accordance with the development plan as a whole, bar conflict with the protection of the countryside outside defined settlement boundaries. However, that local plan intention must be tempered by the presumption in favour of sustainable development as set out in paragraph 14 of the Framework. The Council accepts that the proposed development represents sustainable development [28] and I have drawn a similar conclusion in my initial broad analysis of its sustainability credentials. Nothing in my subsequent analysis of the main considerations would lead me to an alternative view.

(viii) Accordance with the Framework

313. The Framework promotes sustainable development and I have concluded that the proposal represents sustainable development in a sustainable location where a variety of transport choices, including rail travel, are already available and could in principle be improved upon.
314. I have also concluded, with the pedestrian and cycling measures provided for, that safe and suitable access to the site can be achieved for all and that the improvements to the operation of the Barrow Road Bridge would help to limit the impact of additional traffic and that the residual cumulative impacts of the proposed development in transport terms would not be severe and that the Grove Lane junction geometry is not, in the light of local evidence and circumstances, a sufficient reason to withhold planning permission.
315. The Travel Plan measures provided for can only serve to improve the situation and at least encourage the sustainable transport choices necessary to serve broad policy intentions articulated in the Framework. This represents good practice that accords with the spirit of the Framework's intentions in respect of promoting sustainable transport, albeit I do not consider the Travel Plan Penalty to be justified. Moreover, the site is capable of being readily linked in to the existing fabric of the settlement in terms of footpaths and cycleways and there is no reason to doubt that this objective will ultimately be better realised at the south-eastern extremity of the site when Network Rail fulfils its putative obligations⁸¹ by constructing a footbridge to restore the footpath connection across the tracks.

⁸⁰ SoCG paragraph 6.13

⁸¹ Submitted Planning Statement, paragraphs 8.15 – 8.23 and Doc 44, paragraph 56

316. The layout of the site avoids placing residential development in the floodplain of the Fishpool Brook, allows for increasing its capacity and, moreover would enable houses to be placed above the required level to future proof them in respect of the potential effects of climate change, whilst allowing sufficient scope through SUDS techniques not to increase levels of run-off. The generous provision of open space within the proposed development required to achieve these outcomes would also facilitate recreational activity, a pleasantly landscaped setting and the promotion of biodiversity.
317. Many of the above characteristics assist the promotion of a healthy community and the housing proposed, which would be 30% affordable would make a valuable contribution to the delivery of a wide choice of high quality homes. Although there is evident and widespread concern that the existing community of Barrow Upon Soar will struggle to accommodate the additional population, especially in view of ongoing expansion as a result of permissions granted in the relatively recent past, the executed planning obligation would at least mitigate the impact of additional population in a proportionate manner commensurate with statutory requirements, even if compensating provision for perceived pressure already arising from existing expansion would not be added to that mitigation. The proposed development achieves what it must in terms of the latter.
318. The design of the proposed houses themselves is a reserved matter but given the carefully conceived layout to address a number of the above matters, I have no reason to consider that a standard of design appropriate to the essentially suburban nature of the existing settlement could not be achieved. The layout itself is also a reserved matter but its importance to the acceptability of the proposal is such that it would be necessary to secure its essential principles through the imposition of a planning condition (SC4 as previously referred to). The Framework of course provides for that approach.
319. As the proposed development is able to adequately address flood risk, the appeal site is not subject to any specific policies in the Framework that would inhibit its development in the manner indicated by paragraph 14 (Footnote 9 to the Framework refers). Nor would the development involve the loss of Best and Most Versatile land as discouraged by paragraph 112.
320. Bearing all of the above in mind and the acknowledged inability of the Council to demonstrate a five year supply of deliverable housing sites, together with its acknowledgement that policies ST/2, CT/1 and CT/2 may thereby not be considered up-to-date, and my conclusion that in any event the proposed development displays a very substantial degree of accord with the development plan as a whole, I have no doubt that the presumption in favour of sustainable development is, in principle, engaged.
321. The Parish Council submitted [125 – 131] that the practical difficulties associated with bringing the site into development would inhibit its full development within a five year period, but that approach is in my view a misconception as to the relevant approach to land availability as conceived by the Framework at paragraph 47. To enter the five year land supply an unallocated site such as this must be granted planning permission, not necessarily full permission, with a realistic prospect that housing will be delivered on the site within five years. There is no clear evidence in this case that the scheme would

- or could not be delivered over a five year period. There is no evidence to suggest that it is not viable, or that there is no longer a demand for the types of units (primarily family housing) proposed. For practical reasons the build-out of a site such as this should and would be phased, but that is a sequence of events, not in this case a means of preventing development prior to specified dates.
322. There would of course be practical matters to address, conditions precedent to discharge and consents to be gained before development could commence, but that is by no means unusual for a greenfield development on this scale. There is nothing to suggest that that an experienced developer, with the surety of an outline planning permission, would not invest heavily and with alacrity in the necessary up-front efforts to bring a site such as this into development. It is in no way dependent on a significant publicly funded infrastructure programme that might have to be implemented in advance. Even though other agencies such as Severn Trent Water and the highway authority may be involved in various ways they have statutory obligations in any event and the major financial resources needed would be in the control of the developer, to be deployed through other agencies where necessary.
323. It cannot of course be guaranteed that all the dwellings would be built and occupied within five years but there is, in my view, a realistic prospect of substantial delivery, thereby facilitating the availability of needed houses as the Framework intends. At this juncture, there is no cogent evidence that would significantly belie the appellant's intention or ability to secure substantial delivery within an appropriate timescale. I have no reason to doubt that, building on the work undertaken so far, vigorous concerted action by an experienced house builder would bring the development into being within a realistic timescale. Approval in principle is the essential catalyst to the necessary action on a site such as this. Little weight should, in my view, therefore be placed on the Parish Council's submissions in this respect.
324. The Framework does incorporate the core principle that decision taking should be... *"genuinely plan-led, empowering people to shape their surroundings, with succinct local and neighbourhood plans setting out a positive vision for the future of the area"*. This principle was most forcefully put by Nicky Morgan MP [149] and is without doubt material. It pulls in the opposite direction to the presumption in favour of sustainable development that is engaged by this case and I have given considerable thought to those representations, summarised below.
325. The Council itself specifically states that no weight should be accorded to its emerging core strategy and it is clear that with the exception of the single highway safety reason for refusal based on conflict with local plan policy TR/6 it considers the proposal to be not only sustainable but substantially in accordance with the development plan as it currently stands, with the obvious exception of policies ST/2, CT/1 and CT/2, which it says are "out-of-date". Bar its conclusion on policy TR/6 I have no reason to take a different view in this case and therefore place less weight on Mrs Morgan's proposition than might be appropriate in other circumstances.
326. Moreover, in respect of the neighbourhood planning process, Mr Cattle confirmed, in response to my question on the matter, that it was the Parish Council's intention, following discussions with the Council, to follow the progress

and context of the core strategy insofar as its aspiration to prepare a neighbourhood plan was concerned. That is clearly some time off and Mr Cattle confirmed that the Parish Council did not have 'Frontrunner' status in the neighbourhood planning initiative. Nor do I have any evidence of a firm programme of preparation (albeit reference is made by the Parish Council to the spirit and implementation of the Localism Act 2011).⁸² Accordingly, although the representations on the point merit weight in the context of the first core principle of the Framework, and might be regarded as an adverse impact in terms of public expectations, the presumption set out in paragraph 14 is inescapably influential in the context of the Framework as a whole, bearing in mind the sustainability of the proposal in terms of its location and characteristics.

(ix) The planning balance

327. The background to this appeal includes an uncontested shortfall in residential land supply in Charnwood Borough. A development of the order of 300 dwellings, deliverable at pace once necessary investigative and detailed design work and associated approvals are achieved, would make a significant contribution to reducing that shortfall, representing around 10% of the current deficit.⁸³ Nearly a third of the dwellings would be affordable. This quantum of housing in that context is a benefit which merits substantial weight.
328. Notwithstanding the existing disruption to road traffic that the settlement periodically experiences as a consequence of the flooding of strategic highway connections, the evidence demonstrates that on a day to day basis the traffic flows generated by the proposed development would be accommodated by the highway network, with specific improvements to the Barrow Road Bridge provided for, without the modal shift intended by the Travel Plan and its associated incentives and penalty. If that shift occurs it would be a bonus and a significant benefit, but I am unable to conclude that it would be necessary for the development to go ahead, or that it would be necessary to make it sustainable.
329. The essential characteristics of the settlement in this context are that it is served by a railway and bus services. The infrastructure for public transport is already in place, with connections to a variety of significant destinations. The existence of such infrastructure is particularly advantageous in the case of rail. Services are potentially capable of being improved in response to demand as the operators may see fit. The settlement has an accessible centre, albeit with parking difficulties as many are, but can be reached on foot from the site by those wishing to do so, relatively easily. Given the existence of the settlement and the public transport infrastructure, the location of the site is inherently sustainable. This weighs heavily in favour of the proposed development.
330. Other aspects of sustainability, including the direction of development away from Best and Most Versatile land and the protection and promotion of biodiversity, would be well served by the proposals.
331. While the highway safety arguments of the Council and others are not in my estimation substantiated in all the local circumstances, the perception that further traffic growth should not be contemplated is understandable in a

⁸² PC4 Evidence of Mr Cattle, paragraph 4.3

⁸³ Addendum to SoCG shows a shortfall of 2,980 units at June 2012

settlement that is regularly disrupted by flooding on the highway network. This is a matter to which some, weight should, in my view, be accorded. If it is a problem that merits significant investment to overcome it, it is an existing and long-established problem that cannot reasonably be resolved by private funding from an individual developer such as the appellant. The proposed development would not worsen the flooding, but its occupants are potentially inconvenienced by it, if they choose to travel by car on flood days. While the problems of Barrow Upon Soar in this regard must ultimately inhibit the further growth of the settlement if not resolved, I am unable to conclude on the evidence that the present periodic disruption is a sufficient reason in itself to refuse permission for the development at issue, large though it may be. The matter does weigh against the development but not, in my view, decisively so.

332. The outline design of the development has the potential to at least adequately mitigate the potential run-off through SUDS techniques. It would not place the new dwellings proposed at risk from fluvial inundation and could create some marginal improvement for existing homeowners with gardens prone to flooding. Importantly, the Environment Agency is satisfied that, with the measures it recommends, the development may go ahead without causing harm in this context.
333. Given the expansion of the village, recently and in previous decades, the concerns of the community regarding its social as well as its physical infrastructure are understandable and should, in the circumstances, be accorded weight. This is a material concern. However, within the constraints of what is permitted by the CIL Regulations, the appellant has made provision to mitigate the impact of the proposed development, calculated in the main according to the established formulae of the relevant service providers. Clearly, there will be additional pressure but, given that provision, the existing situation should not be materially worsened even if no tangible improvements are perceived. Due weight should be therefore accorded to the planning obligation entered into by the appellant, the Council and the County Council.
334. While the dismay of the local health centre at the prospect of additional pressure on its services must be acknowledged, I do not accept that such pressure should count decisively against the development. Such services must perforce adapt to demand within the budgetary constraints within which they operate and the obligation provides for physical improvements to the operation of the centre, albeit to the car park, in any event. Only limited weight should therefore be accorded to the representations made against the proposals on such grounds.
335. There is no significant conflict with an extensive range of policies identified in the SoCG [21] and this is a factor to which significant weight should be accorded. Nor have I found there to be significant conflict, in practice, with the intentions of local plan policy TR/6. Again, this is a factor to which significant weight should be accorded. There is clear conflict with the intentions of local plan policies ST/2, CT/1 and CT/2 but, insofar as the effective operation of these policies is contingent upon an adequate supply of housing land in the form of specific allocations or unallocated land within the existing settlement boundaries, these policies are rendered out-of-date by paragraph 49 of the Framework and it is common ground that is so. I have no reason to take a different view and the

weight that might otherwise be accorded to such harmful conflicts is thereby reduced.

336. The conflict with local plan policy ST/1 alleged by certain parties [191,194] is not borne out, on analysis, by the terms of the policy and its explanation. The sense of prospective loss expressed by local residents regarding the appeal site as a positive contribution to the rural setting of Barrow Upon Soar is real nevertheless and merits weight insofar as the intrinsic character and beauty of the countryside is valued by the Framework.

337. The intentions embodied in the first core principle of the Framework concerning plan-led development and local empowerment at the neighbourhood level is also a material consideration to which weight should be accorded. However, substantial harm or potential harm in that respect has not been demonstrated in this instance, and there is substantial accordance with the intentions of the Framework to promote sustainable development, in this case contributing to the delivery of a wide choice of high quality homes in a well designed scheme that facilitates healthy lifestyles.

338. While I am bound to report that there are harmful aspects to this development to which weight should be accorded, these must be weighed against the very substantial contribution to housing needs that the site is capable of providing in the context of an acknowledged shortage of suitable land and the inherent sustainability of the location. Those aspects of the planning obligation which may be taken into account to mitigate the impact of the proposed development should also be accorded due weight. The presumption in favour of the sustainable development, bearing in mind the policies of the Framework as a whole and the development plan taken as a whole, should therefore be the decisive factor in this case.

Overall Conclusion and Recommendation

339. In the light of the above main considerations and having taken full account of all other matters raised, I consider the balance of planning advantage to be in favour of the scheme. I therefore recommend that the appeal be allowed and planning permission granted, subject to the conditions set out in the attached annex.

Keith Manning

Inspector

Annex: Schedule of Recommended Conditions

- 1) Details of the appearance, landscaping, layout, and scale, (hereinafter called "the reserved matters") shall be submitted to and approved in writing by the local planning authority before any development begins and the development shall be carried out as approved.
- 2) Application for approval of the reserved matters shall be made to the local planning authority not later than three years from the date of this permission.
- 3) The development hereby permitted shall begin not later than two years from the date of approval of the last of the reserved matters to be approved.
- 4) No development shall commence until both a Master Plan in general conformity with the submitted Illustrative Masterplan 4045_ SK_ 001 rev E and a Design Code for the site have been submitted to and approved in writing by the local planning authority. Both shall substantially accord with the submitted Design and Access Statement Rev G. Any amendment to either shall be submitted to and approved in writing by the local planning authority. The Design Code shall address the following: -
 - i) Architectural and sustainable construction principles
 - ii) Character areas
 - iii) Lifetime home standards
 - iv) Car parking principles
 - v) Cycling provision including pedestrian and cycle links to adjoining land
 - vi) Street types and street materials
 - vii) Boundary treatments
 - viii) Building heights (which should be limited to a maximum height of three storeys, being located on the main street only, as indicated on pages 33/34 of the Design and Access Statement, and two storeys for the remaining parts of the development)
 - ix) Building materials
 - x) Provision of public open spaces (including timetable for implementation)
 - xi) Design of the site to accord with Secure by Design principles.
 - xii) Phases of development.

Applications for approval of the reserved matters submitted pursuant to condition 2) above shall be in accordance with the Master Plan and Design Code as approved. In addition to the Design and Access Statement previously referred to, The Master Plan and Design Code and the reserved matters submitted for approval shall also accord with the principles set out in the following submitted documents: Flood Risk Assessment June 2010; Addendum to Flood Risk Assessment January 2011; Ecological Appraisal June 2010; Bats in Trees Addendum December 2010; Tree Assessment Report Rev A; and Badger Mitigation Strategy December 2010. Development shall be carried out in accordance with all matters approved pursuant to this condition.

- 5) Notwithstanding the generality of condition 4) above, the development hereby permitted shall be carried out in accordance with the following approved plans:

4045_SK_005 Site Location Plan
0940/SK/010 rev C Typical Badger Tunnel Detail
0940/SK/013 rev E Melton Road Alternative Site Access Roundabout
0940/SK/014 rev A Site Access Roundabout
0940/SK/022 rev B Fishpool Brook Pedestrian Footbridge Crossing
0940/ATR/002 rev A Proposed Site Access – Swept Path Analysis
4045-L-01 rev D Types of Open Space
4045-L-02 rev A Extended Floodplain Area to be Regraded
4045-L-04 Public Open Space Phasing Plan
NTW/307/Figure 4 Rev A Indicative Floodplain Sections

NTW/307/Addendum Figure 1 Rev A Fishpool Brook Modelled Floodplain Extent

- 6) The maximum area of residential development on the site (excluding the areas of public open space, structural landscaping, meadow and SUDS) shall be defined on the Master Plan to be approved pursuant to condition 4) above and shall not exceed 8.32 hectares, and no more than 300 dwellings shall be constructed on the site.
- 7) No construction on any phase of the development hereby permitted shall commence until such time as the following details in respect of that phase have been submitted to and approved in writing by the local planning authority:
 - a) Siting including details of proposed levels of ground surfaces and finished floor levels of all buildings and a number of selected typical sections across the phase.
 - b) A landscaping scheme including details of all trees and hedgerow to be retained, full planting specification, timing or phasing of implementation, services above and below ground; and a landscape management plan covering a minimum period of 10 years following completion of the development. Any trees or plants removed, dying, being severely damaged or becoming seriously diseased within 5 years of planting shall be replaced in the following planting season by trees or plants of a size and species similar to those originally required to be planted;
 - c) Treatment of all hard surfaced areas, including types and colours of materials street furniture, signing and lighting of all public spaces.
 - d) Boundary treatment to all open areas where the site bounds other land (where confirmed in writing by the local planning authority to be required) including design, height, materials and colour finish.
 - e) Details of the proposed standard signage for the footpaths at the points where footpath I 23 is proposed to be crossed by the new estate roads.
 - f) Layout and design of children's play areas; Multi Use Games Area/skate park area and any other play/ recreation area within the development;
 - g) Details of external lighting.Development shall be carried out in accordance with the approved details.
- 8) No development shall commence until the applicant or developer has secured the implementation of a programme of archaeological work in accordance with a written scheme of investigation which has been submitted to and approved in writing by the local planning authority, and no development shall take place except in accordance with the approved scheme details.
- 9) No development shall commence until drainage plans for the disposal of foul sewage have been submitted to and approved in writing by the local planning authority. No dwelling, in any phase of construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details.
- 10) No development shall commence until a surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydro-geological context of the development, including any requirement for the provision of a balancing pond, has been submitted to and approved in writing by the local planning authority. No dwelling, in any phase of construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details. The balancing pond, if required, shall be completed and be in operation before the occupation of the first dwelling on any phase.
- 11) No development shall commence until a scheme to install trapped gullies has been submitted to and approved in writing by the local planning authority. The scheme shall be implemented in accordance with the approved details. No dwelling, in any phase of

construction, shall be occupied until all the works necessary in respect of that phase have been implemented in accordance with the approved details.

- 12) If during development contamination not previously identified is found to be present at the site then no further development should be carried out in that location until such time as a remediation strategy has been submitted to and agreed in writing by the local planning authority and the works carried out in accordance with the agreed strategy prior to re-commencement on that part of the site.
- 13) Prior to the commencement of development, a scheme for the protection of trees and hedges to be retained on site shall be submitted to and approved in writing by the local planning authority. The scheme shall include: -
 - Details of all trees and hedges to be retained on site.
 - Details of any works proposed in respect of any retained trees and hedges on site.
 - Details of operational and physical measures proposed for the protection of trees and hedges
 - Details of any ground works that are to be carried out within 10 metres of any tree or hedge identified as being retained.
 - Details of the methodology to be employed when carrying out ground or other works within 10 metres of any tree or hedge to be retained.

Development shall be carried out in accordance with the approved details.

- 14) No development shall commence on any phase until the tree/hedge protection measures for that phase approved pursuant to condition 13) above have been fully implemented. The approved tree/hedge protection measures shall be retained and maintained in their approved form until development on the phase in which they are located is complete. Within the areas agreed to be protected, the existing ground level shall be neither raised nor lowered, and no materials or temporary building or surplus soil of any kind shall be placed or stored thereon unless approved as part of the details submitted to discharge the condition.
- 15) No development shall commence until a scheme of noise attenuation/mitigation measures (in order to reduce noise likely to be experienced in dwellings and private gardens from the use of the railway corridor to the south west of the site) has been submitted to and approved in writing by the local planning authority. No dwelling in any phase of the site identified by the scheme as being affected by railway noise shall be occupied until the required measures have been implemented in accordance with the approved scheme.
- 16) No development shall commence until details of the construction of the proposed access roundabout (as shown indicatively on drawing 0940/SK/013 Rev E) and the footpath/cycleway bridge across the Fishpool Brook (as shown indicatively on drawing 0940/SK/022 rev B) have been submitted to and approved in writing by the local planning authority. No dwelling on the site shall be occupied until the access roundabout and pedestrian bridge have been constructed in accordance with the approved details.
- 17) No development shall commence until a detailed scheme of works for the improvement of traffic flow at the Barrow Road Bridge of the type illustrated on WSP UK drawing numbered SK/017 Rev A has been submitted to and approved in writing by the local planning authority. No dwelling on the site shall be occupied until the improvement works at the bridge have been fully implemented in accordance with the approved details.
- 18) No development shall take place until a Construction Method Statement has been submitted to, and approved in writing by, the local planning authority. The approved Statement shall be adhered to throughout the construction period. The Statement shall provide for:
 - i) the parking of vehicles of site operatives and visitors

- ii) the routing of construction traffic throughout the construction process and the mechanism for securing adherence to approved routes
 - iii) loading and unloading of plant and materials
 - iv) storage of plant and materials used in constructing the development
 - v) the erection and maintenance of security fencing
 - vi) wheel washing facilities
 - vii) measures to control the emission of dust and dirt during construction
 - viii) a scheme for recycling/disposing of waste resulting from the construction works
 - ix) precautionary measures to ensure that no badgers become trapped or injured during development work
- 19) No development shall commence until procedures have been initiated to upgrade the existing public footpaths I 23 and I 24 (part) beyond the edge of the meadow boundary to the eastern boundary of the application site to footpaths/cycleways. The upgrading works (including those approved through Condition 7) shall be completed prior to the occupation of 50% of the dwellings on the site.
- 20) No development shall commence until a scheme of electronic or other suitable signing to warn of flooding on Slash Lane has been submitted to and approved by the local planning authority. No dwelling on the site shall be occupied until the scheme has been fully implemented in accordance with the approved details.
- 21) No development shall commence until a scheme of public art to be delivered on site has been submitted to and agreed in writing by the local planning authority. Those elements of the approved public art scheme which are to be delivered on a particular phase of the development shall be delivered prior to the occupation of 80% of the dwellings in that phase.
- 22) No development shall commence until an assessment of the anticipated energy requirements arising from the development has been submitted to and approved in writing by the local planning authority. That assessment must demonstrate how a minimum of 10% of the energy requirements shall be secured from decentralised and renewable or low-carbon energy sources. Details and a timetable of how these measures are to be achieved, including details of any physical works on site, shall be submitted to and approved in writing by the local planning authority. The approved details shall be implemented in accordance with the approved timetable and retained as operational thereafter.

* * *

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Melissa Murphy	Of Counsel
She called	
Mr Chris Bancroft Adv Tip TS FCILT	Director, Bancroft Consulting
Mr Iain Reid DipTP DipLD MRTPI	Director, Iain Reid Landscape Planning Limited

FOR THE APPELLANT:

Christopher Lockhart-Mummery QC	
He called	
Mr Robert Thorley BA (Hons) DipTP MRTPI	Associate Planner, GVA
Mr Alan Young BSc (Hons) MBA CEng MICE FCIHT	Senior Technical Director, WSP
Mr Iqbal Rassool BEng (Hons) CEng MCIWEM	Service Director, BWB

FOR THE BARROW UPON SOAR PARISH COUNCIL:

John Pugh-Smith	Of Counsel
He called	
Parish Councillor Peter Cantle CertEd DipComEd	Barrow Upon Soar Parish Council
Mr Jonathan Cage Eng (Hons) MSc CEng MCIHT MICE	Managing Director, Create Consulting Engineers Limited

INTERESTED PERSONS:

Councillor P Ranson	Ward Councillor
Councillor H Fryer	Ward Councillor
Dr Sarah Parker	GP Barrow Upon Soar Health Centre, on behalf of Dr NHR Simpson and Partners
Mrs Nicky Morgan MP	MP for the Loughborough constituency
Councillor S Forrest	Chair of BRAG
Mr P Rowland	Landmark Planning on behalf of BRAG
Mr J Prendergrast	Solicitor, Leicestershire County Council (LCC)
Mrs Owen	LCC
Mr Kettle	LCC
Mr A Tyrer	Development Contributions Officer LCC
Mrs A Anderson	Primary Care Premises Manager, Leicester, Leicestershire and Rutland PCT Cluster
Mrs J Noon	CPRE Charnwood Group
Mrs S Rodgers	Vice Chair Barrow Upon Soar Community Association
Mrs P Reed	Local resident

Mr K Pepper	Local resident
Mr T Burton	Local resident
Mr C Smith	Local resident
Mr P Hilsdon	Local resident
Mr A Willcocks	Local resident
Mr D Wilson	Local resident
Mr K Page	Local resident
Mr G Hobbs	Local resident
Mrs Burrows	Local resident
Mr R Billson	Local resident
Mr T Anderson	Local resident
Mrs C Hilsdon	Local resident
Mr D Ellison	Local resident

INQUIRY DOCUMENTS

- 1 Council's notification letter
- 2 Appellant's opening submissions
- 3 Parish Council's opening submissions
- 4 Council's opening submissions
- 5 Dr Sarah Parker's speaking notes
- 6 Report to Cabinet of 27 September 2012 re local development framework
- 7 Minutes of Cabinet meeting of 27 September 2012
- 8 Email exchange of 9 October 2012 between Create Consulting Engineers and Leicestershire Police re Incident 82: 03/10/2012 and Incident 460: 27/09/2012
- 9 Extract (pages 13 – 16) from TMS report *Safer Roads for Everyone*
- 10 Email exchange of 4 October between Parish Council and Leicestershire Police re Incident 460: 27/09/2012
- 11 Tables of Estimated Population Increase in Barrow Upon Soar
- 12 Letter dated 5 May 2011 from Parish Council with Parish Council minutes of 02/11/10, 7/12/10, 13/04/11, 03/07/11 and 06/07/11
- 13 Email from Alison Saunders (08 October 2012 @ 14:24) with Technical notes from Create Consulting Engineers Ltd re Micro-simulation Traffic Model, email exchange with Leicestershire Police re Incident 460: 27/09/2012 and Telephone Note by Mark Allen (dated 08/10/120 re conversations on 3/10/12 with Richard Clay and Kingsley Cook of Leicestershire County Council.
- 14 2001 Census data re Travel to Work
- 15 Representation from Primary Care Trust re impact of proposed development on GP practice at Barrow Health Centre
- 16 Statement by Nicky Morgan MP
- 17 Statement by Councillors Ranson and Fryer
- 18 Statement by Barrow Residents Action Group
- 19 Annotated map of local road network by Mr Charles Smith
- 20 Agreement by Bancroft Consulting, WSP and Create Consulting re achievable visibility at South Street/Sibley Road/ Grove Lane junction
- 21 Report of the Overview Scrutiny Group re Local Development Framework Position Report and Way Forward: Cabinet – 27 September 2012
- 22 East Midlands Trains Timetable (Leicester-Nottingham-Cleethorpes) 09/12/12 to 18/05/13
- 23 Committee Report of 9 December 2009 on Application Ref P/09/2376/2
- 24 University of Leicester letter dated 5 July 2010 concerning archaeological work
- 25 Various emails (12/01/10, 11/11/10 & 14/02/11) from Network Rail (Margaret Lake) to Council (Neil Thompson)
- 26 CCE VISSIM Model Report
- 27 Email from GVA 24/10/12 re CCE VISSIM Model Report and response from Parish Council (Lesley Bell 29/10/12) with comments from Jonathan Cage of CCE
- 28 Statement from Charnwood District Group CPRE
- 29 Revised Draft Conditions
- 30 Extract (R A Crowder) Chapter 7 Hydraulic Analysis and Design
- 31 Letter from Mr Hobbs to PINS dated 27/11/12
- 32 Letter from Mr Hilsdon received by PINS 24/12/12 'Record of Flooding, Fishpool Brook. Barrow upon Soar 1983-2012'
- 33 Email from Parish Council dated 10/01/13 with Analysis of Comments
- 34 Letter from Mr Hilsdon received by PINS 10/01/13 re; mine workings (Soar Valley Local Plans) Agricultural Land Classification of appeal site
- 35 Appeal Ref. APP/X2410/A/12/2177327 (Iveshead Road, Shepshed)
- 36 Appeal Ref. APP/X2410/A/12/2177036 (Bramcote Road, Loughborough)
- 37 Appeal Ref. APP/X2410/A/12/2177036 (Bramcote Road, Loughborough)
- 38 Note by Mr Rassool in response to letter from Mr Hilsdon (Doc 32 above)

- 39 Set of photos of flooding at locations in Barrow Upon Soar submitted by Mr Burton
- 40 Concluding statement from Councillors Ranson and Fryer
- 41 Statement from Barrow Upon Soar Community Association
- 42 Closing Statement – Barrow upon Soar Parish Council
- 43 Closing Submissions – Charnwood Borough Council
- 44 Closing Submissions – Appellant

S106 Planning Agreement dated 4 October 2012 (with Deed of Variation dated 15 January 2013)

Proofs of Evidence

Appellant

- A1 Evidence of Mr Thorley
- A1a Appendices to A1
- A2 Evidence of Mr Young (Volume 1)
- A2a Appendices to A2 (Volume 2)
- A3 Rebuttal evidence of Mr Young
- A4 Evidence of Mr Rassool

Council

- C1 Evidence of Mr Bancroft (Volume 1)
- C1a Appendices A-E to C1 (Volume 2)
- C1b Appendices F-N to C1 (Volume 3)
- C1c Statement to address amendment to visibility calculation (Mr Bancroft)
- C2 Evidence of Mr Reid

Parish Council

- PC1 Evidence of Mr Cage – highways, transport, sustainability
- PC2 Evidence of Mr Cage – flood risk and drainage
- PC3 Evidence of Mr Cage – Slash Lane flooding
- PC4 Evidence of Councillor Cattle
- PC5 Appendices to PC4

County Council

- CC1 Evidence of Mr Tyrer
- CC2 Evidence of Mr Cook



Department for Communities and Local Government

RIGHT TO CHALLENGE THE DECISION IN THE HIGH COURT

These notes are provided for guidance only and apply only to challenges under the legislation specified. If you require further advice on making any High Court challenge, or making an application for Judicial review, you should consult a solicitor or other advisor or contact the Crown Office at the Royal Courts of Justice, Queens Bench Division, Strand, London, WC2 2LL (0207 947 6000).

The attached decision is final unless it is successfully challenged in the Courts. The Secretary of State cannot amend or interpret the decision. It may be redetermined by the Secretary of State only if the decision is quashed by the Courts. However, if it is redetermined, it does not necessarily follow that the original decision will be reversed.

SECTION 1: PLANNING APPEALS AND CALLED-IN PLANNING APPLICATIONS;

The decision may be challenged by making an application to the High Court under Section 288 of the Town and Country Planning Act 1990 (the TCP Act).

Challenges under Section 288 of the TCP Act

Decisions on called-in applications under section 77 of the TCP Act (planning), appeals under section 78 (planning) may be challenged under this section. Any person aggrieved by the decision may question the validity of the decision on the grounds that it is not within the powers of the Act or that any of the relevant requirements have not been complied with in relation to the decision. An application under this section must be made within six weeks from the date of the decision.

SECTION 2: AWARDS OF COSTS

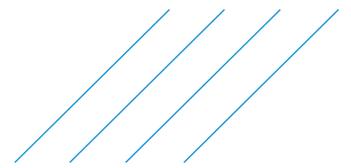
There is no statutory provision for challenging the decision on an application for an award of costs. The procedure is to make an application for Judicial Review.

SECTION 3: INSPECTION OF DOCUMENTS

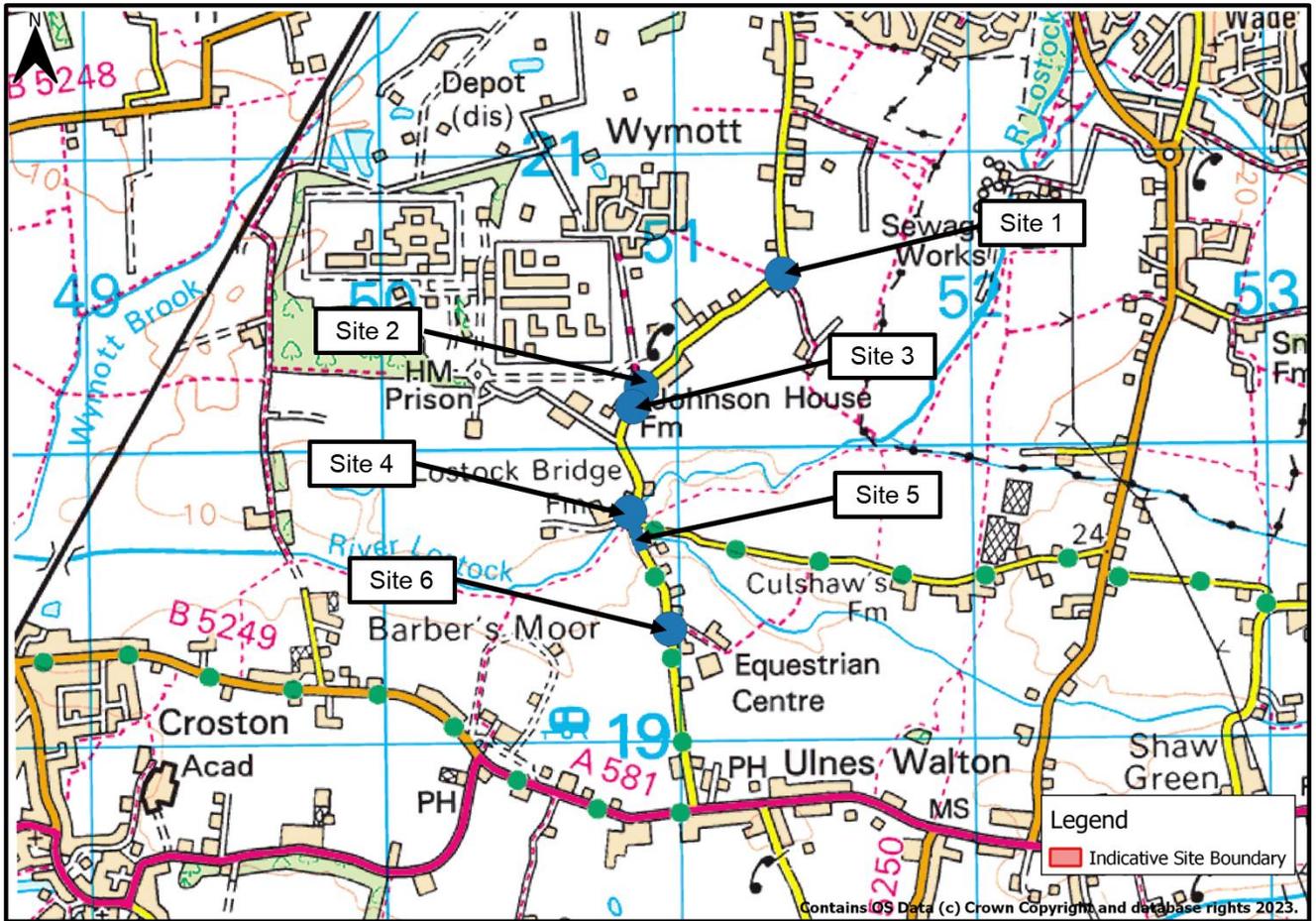
Where an inquiry or hearing has been held any person who is entitled to be notified of the decision has a statutory right to view the documents, photographs and plans listed in the appendix to the report of the Inspector's report of the inquiry or hearing within 6 weeks of the date of the decision. If you are such a person and you wish to view the documents you should get in touch with the office at the address from which the decision was issued, as shown on the letterhead on the decision letter, quoting the reference number and stating the day and time you wish to visit. At least 3 days notice should be given, if possible.

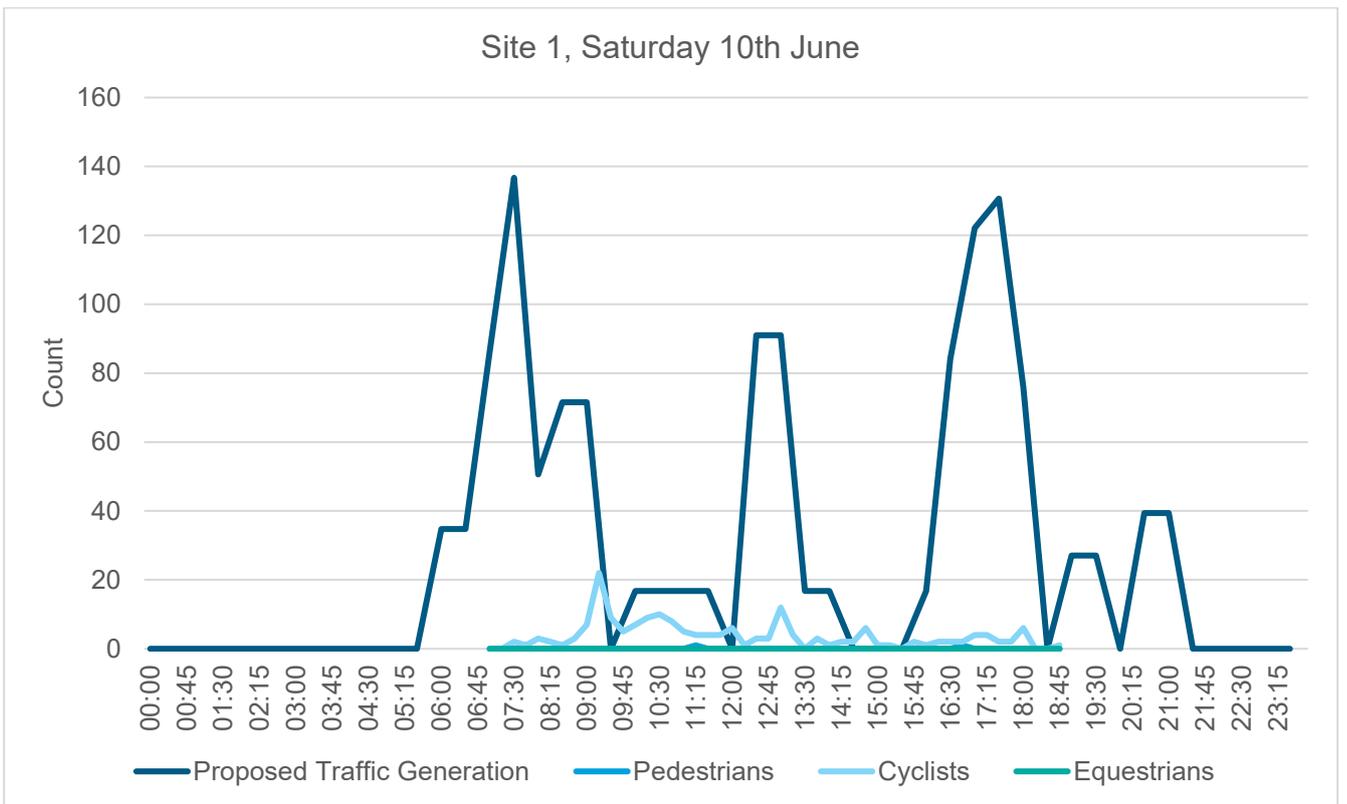
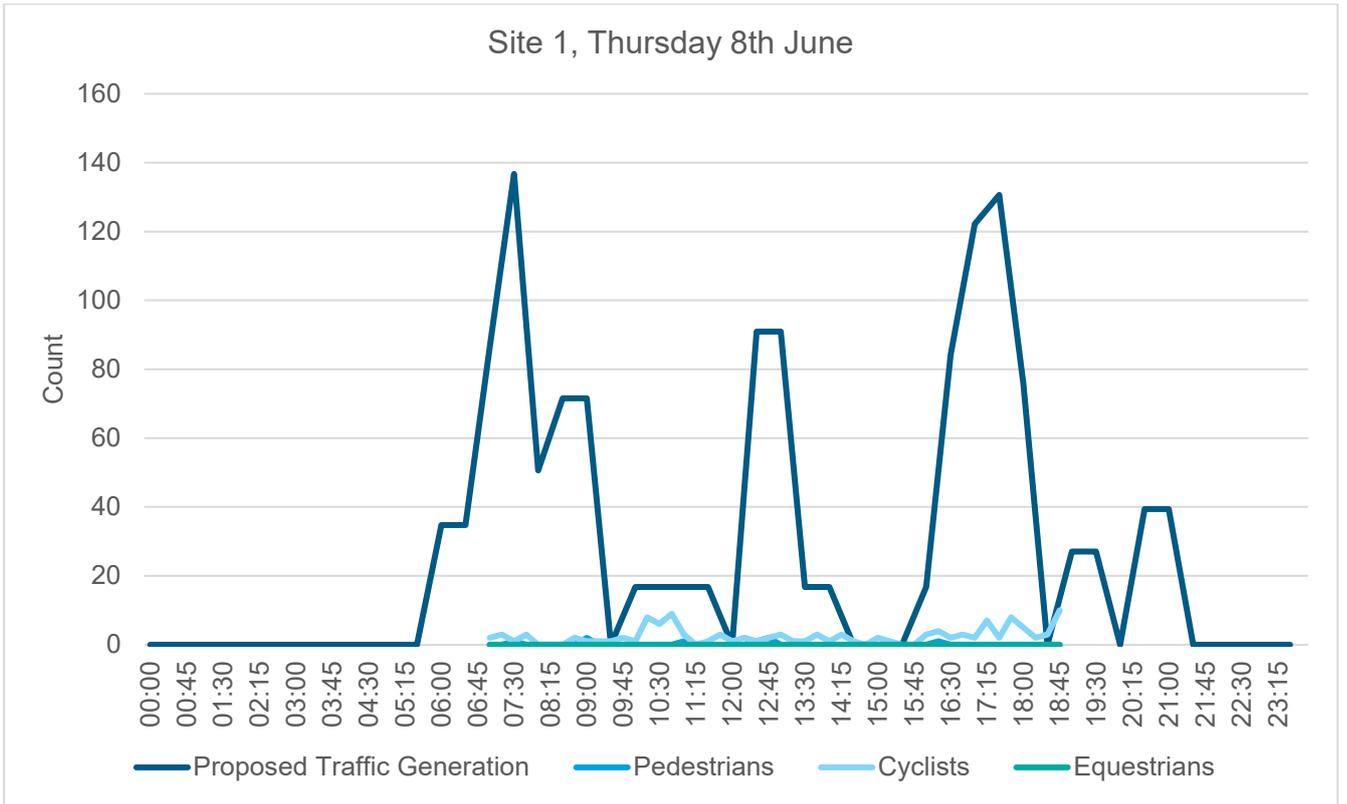
<https://www.gov.uk/government/organisations/department-for-communities-and-local-government>

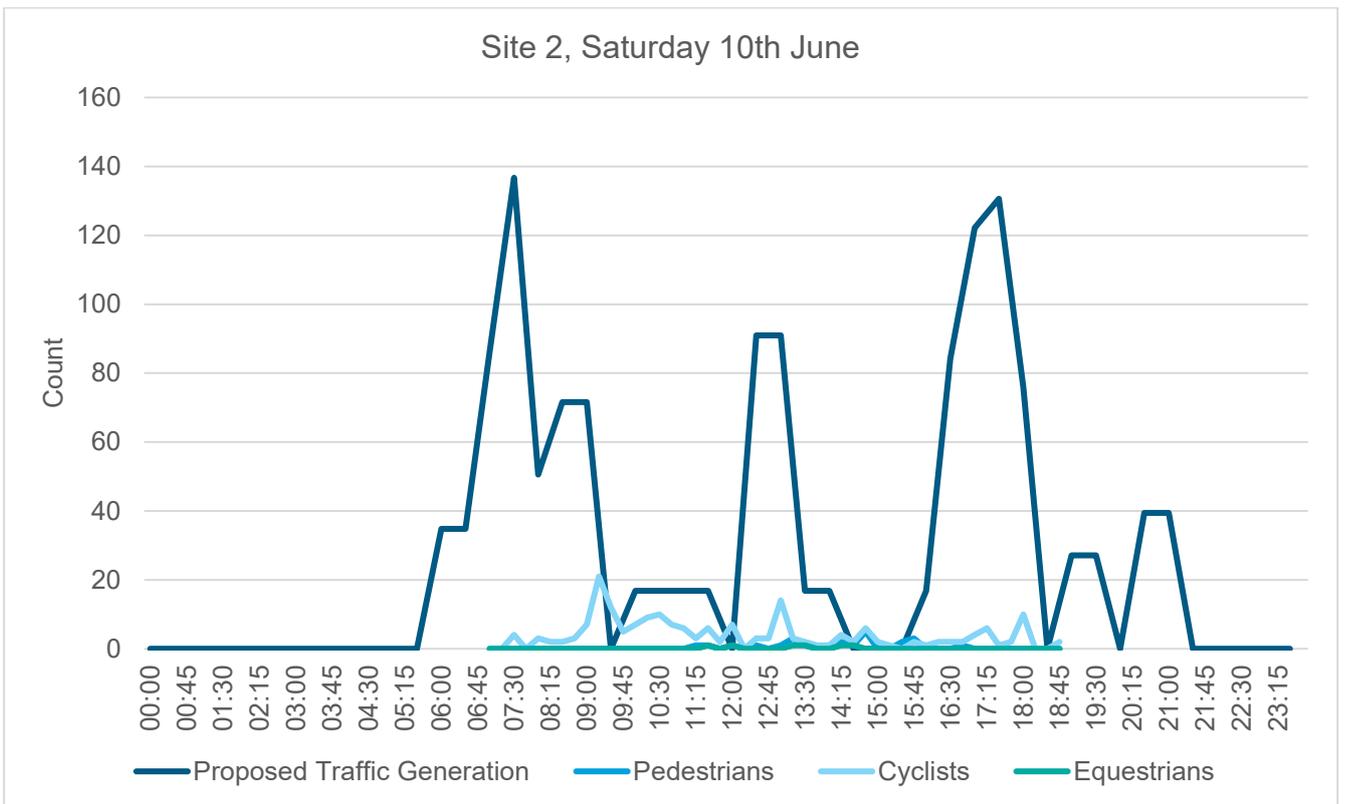
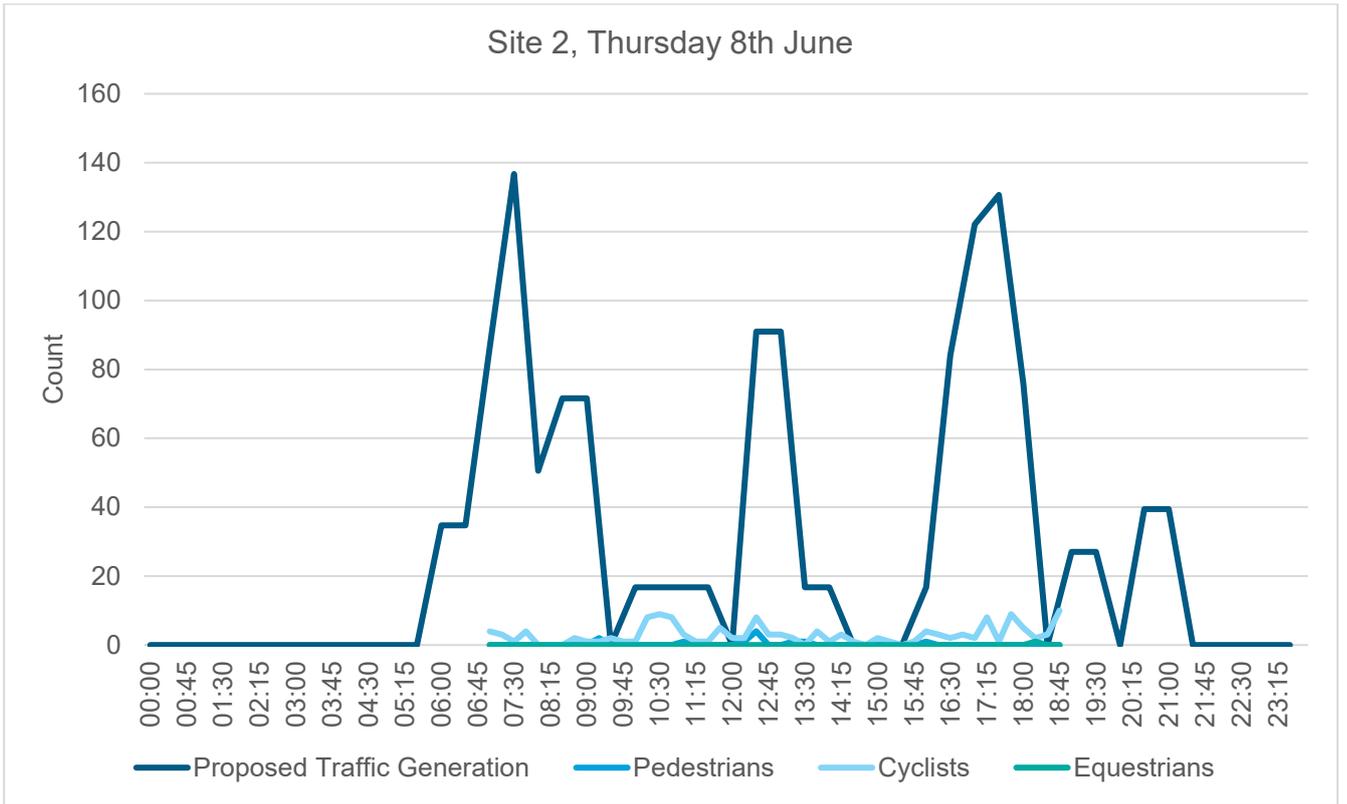
Appendix E – NMU Survey

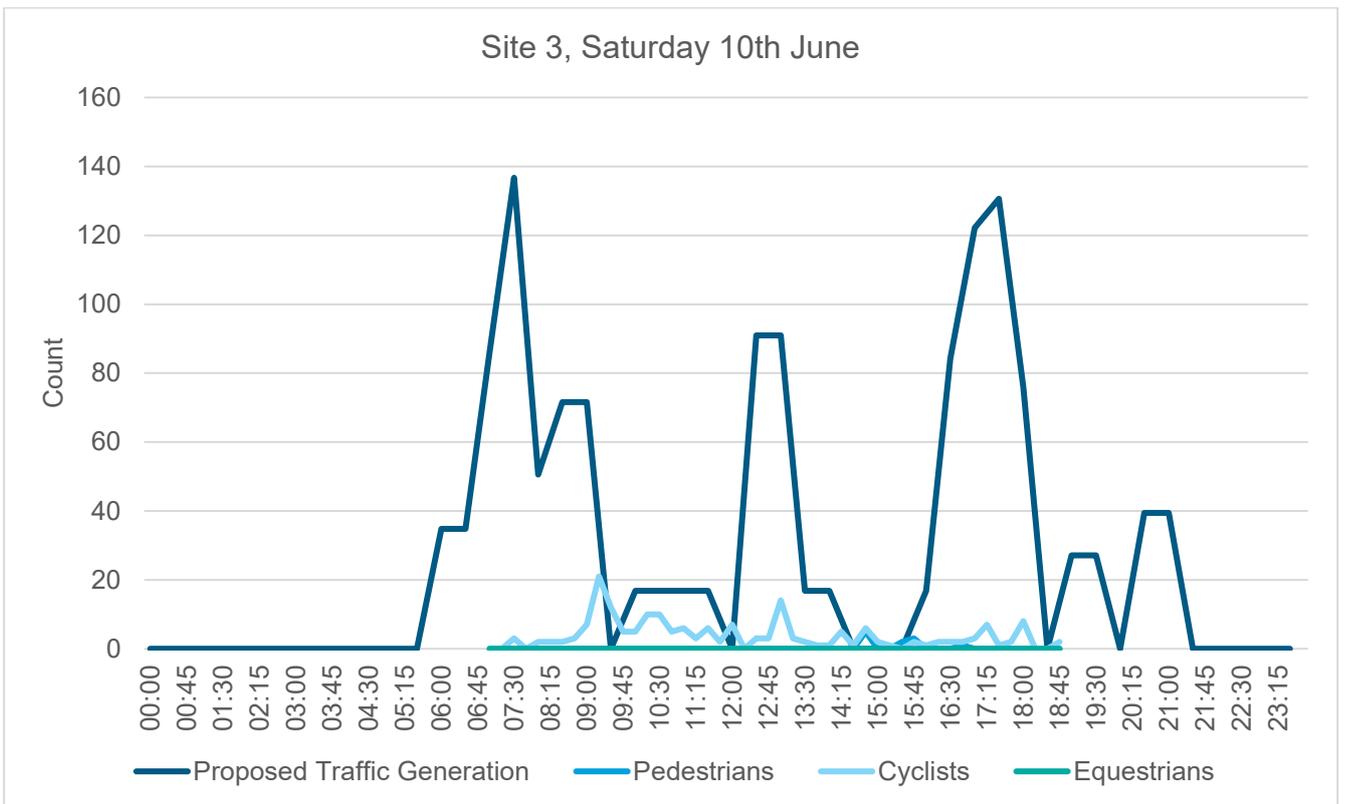
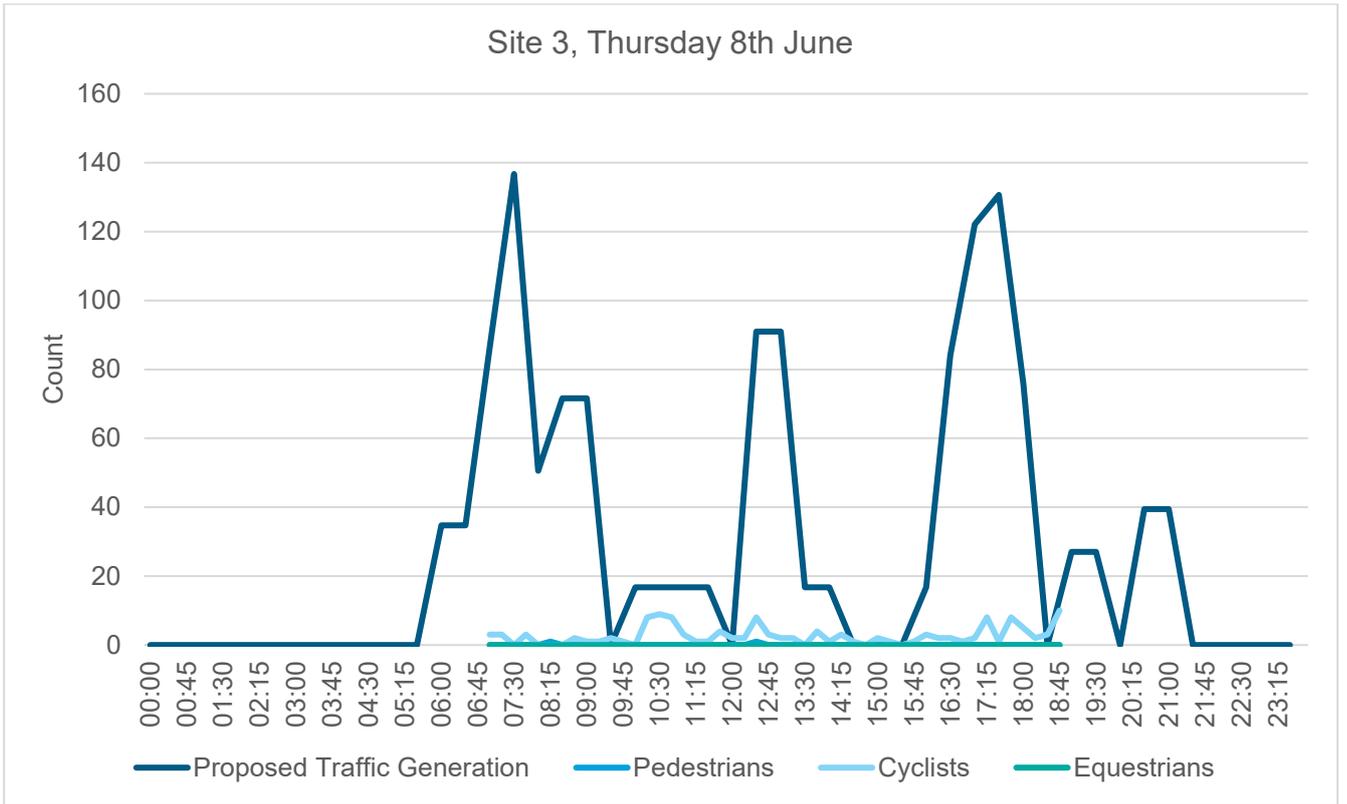


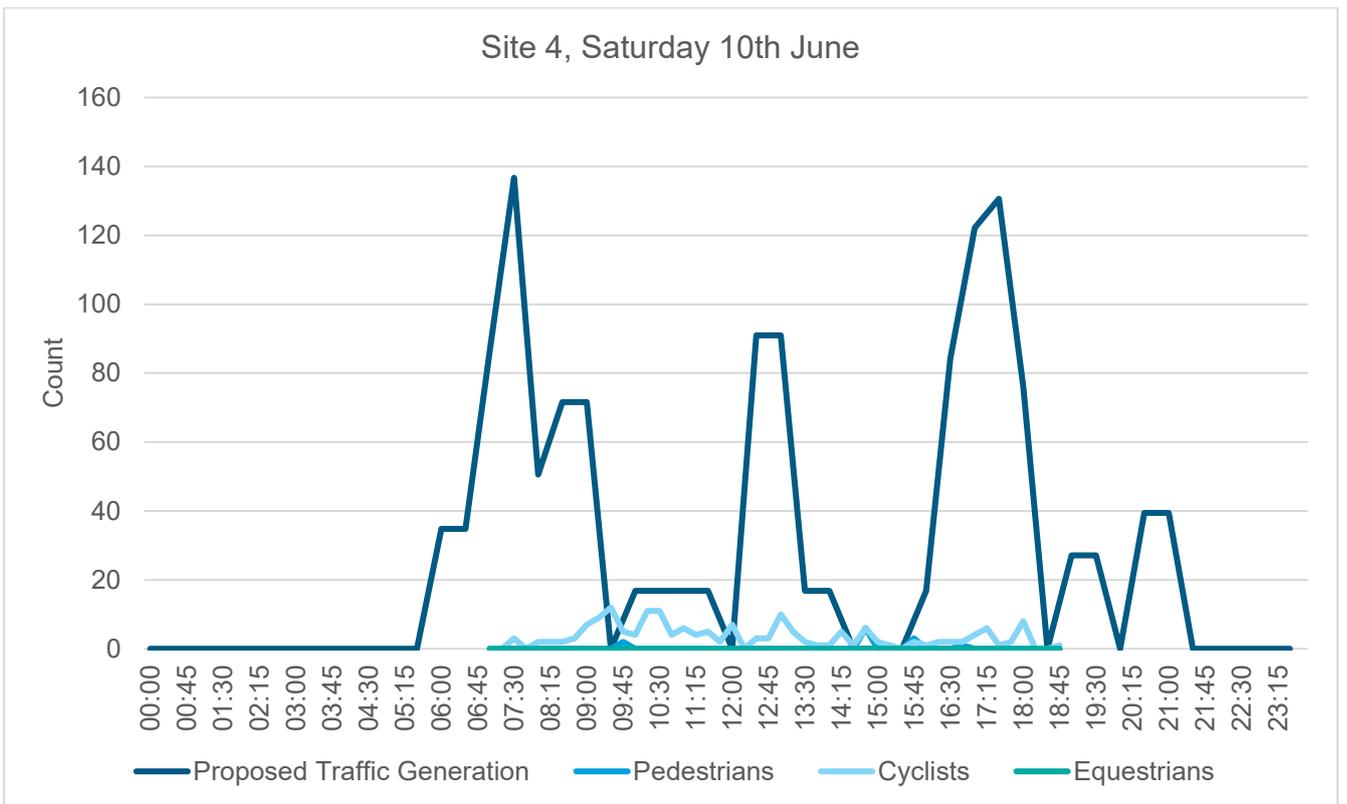
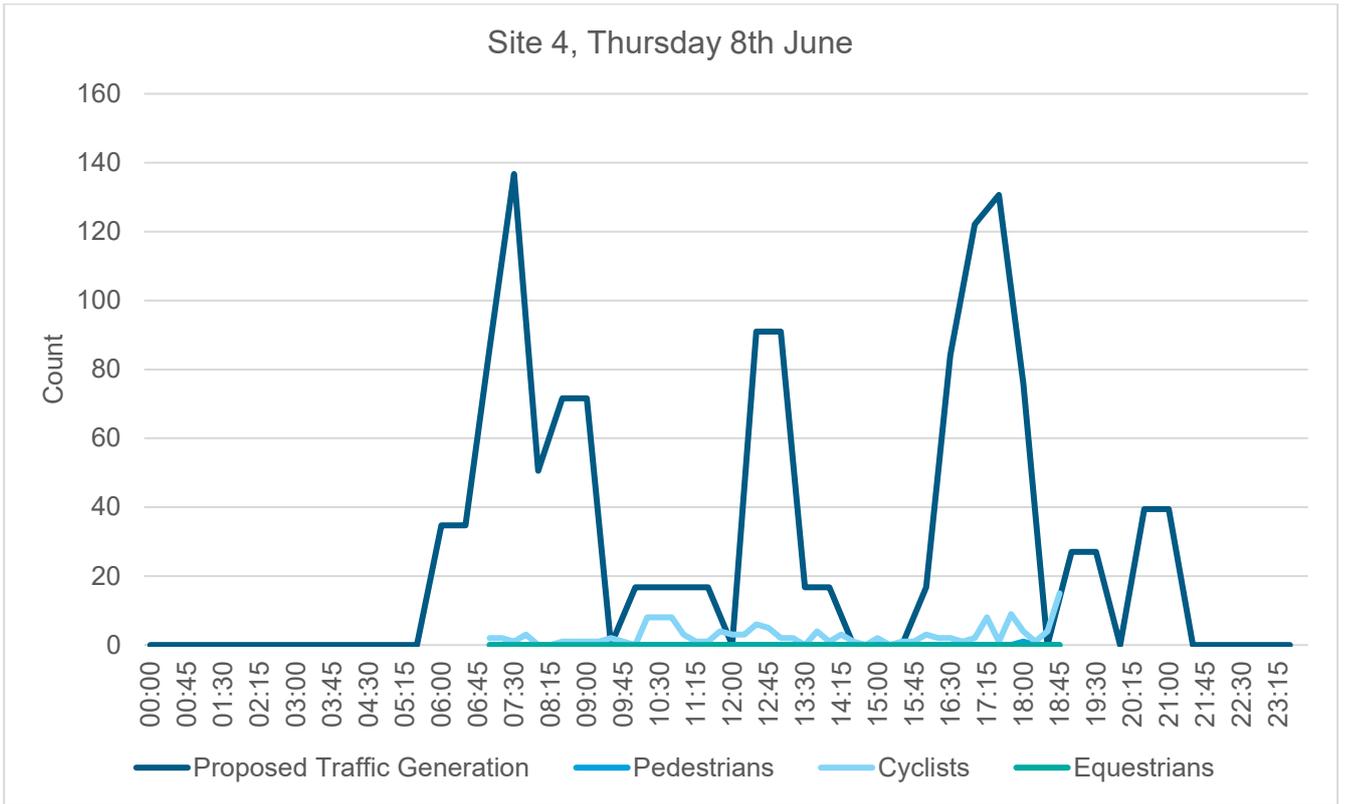
Survey Site Location Plan

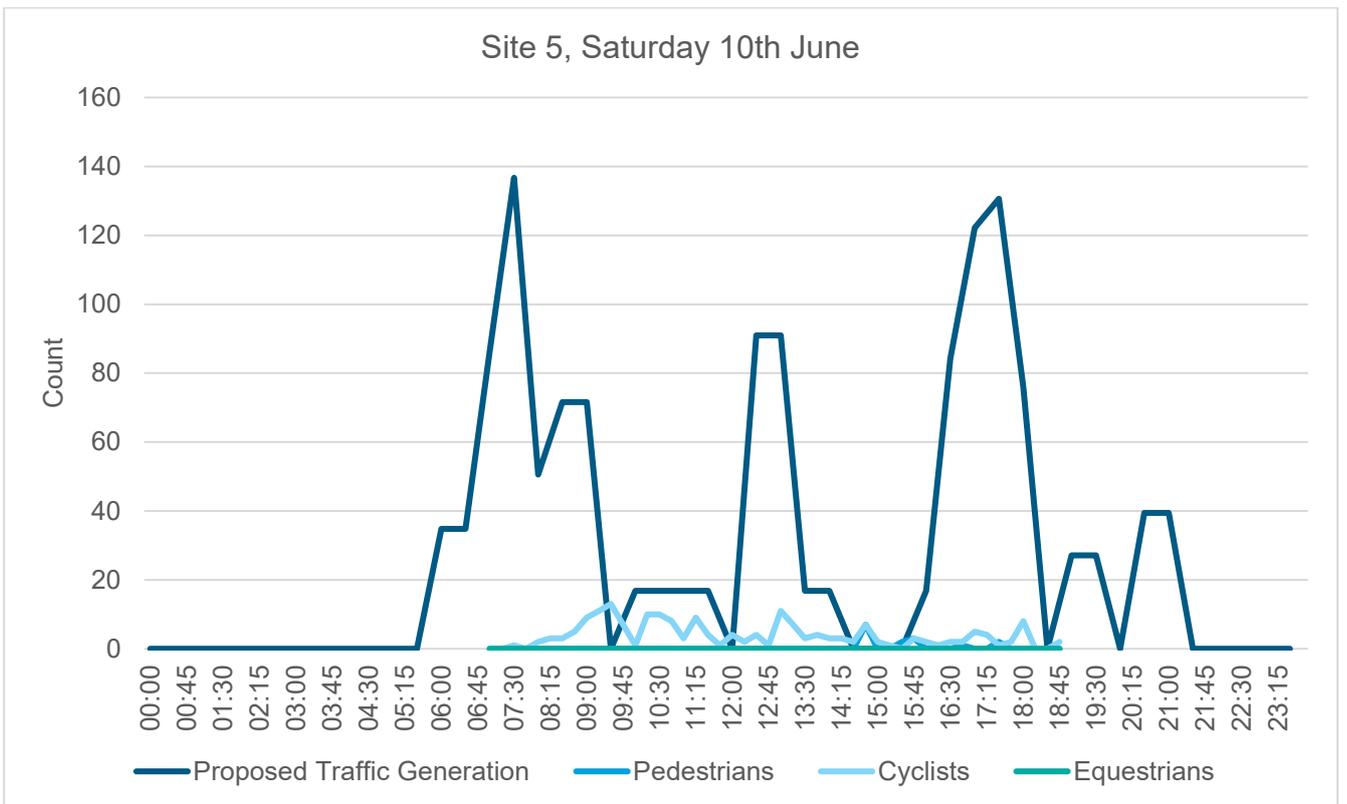
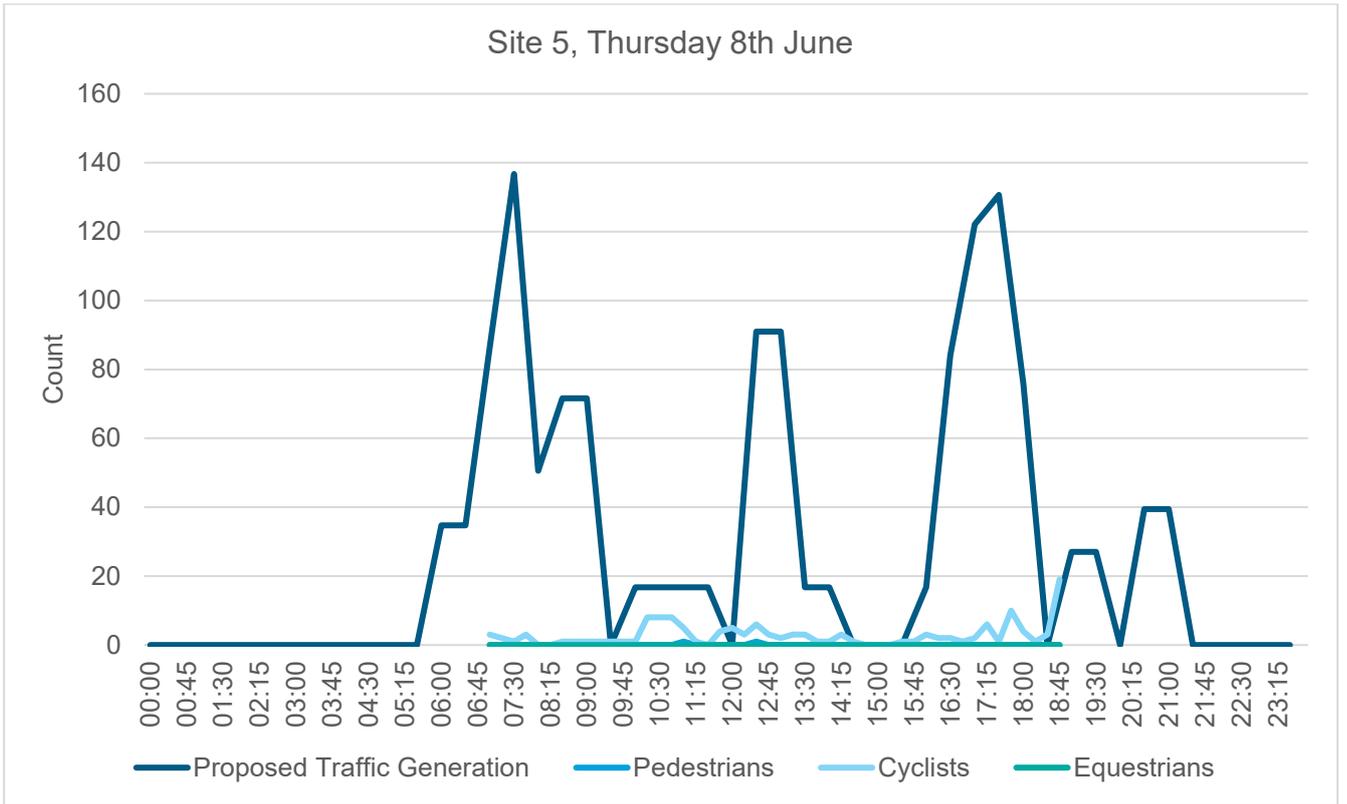


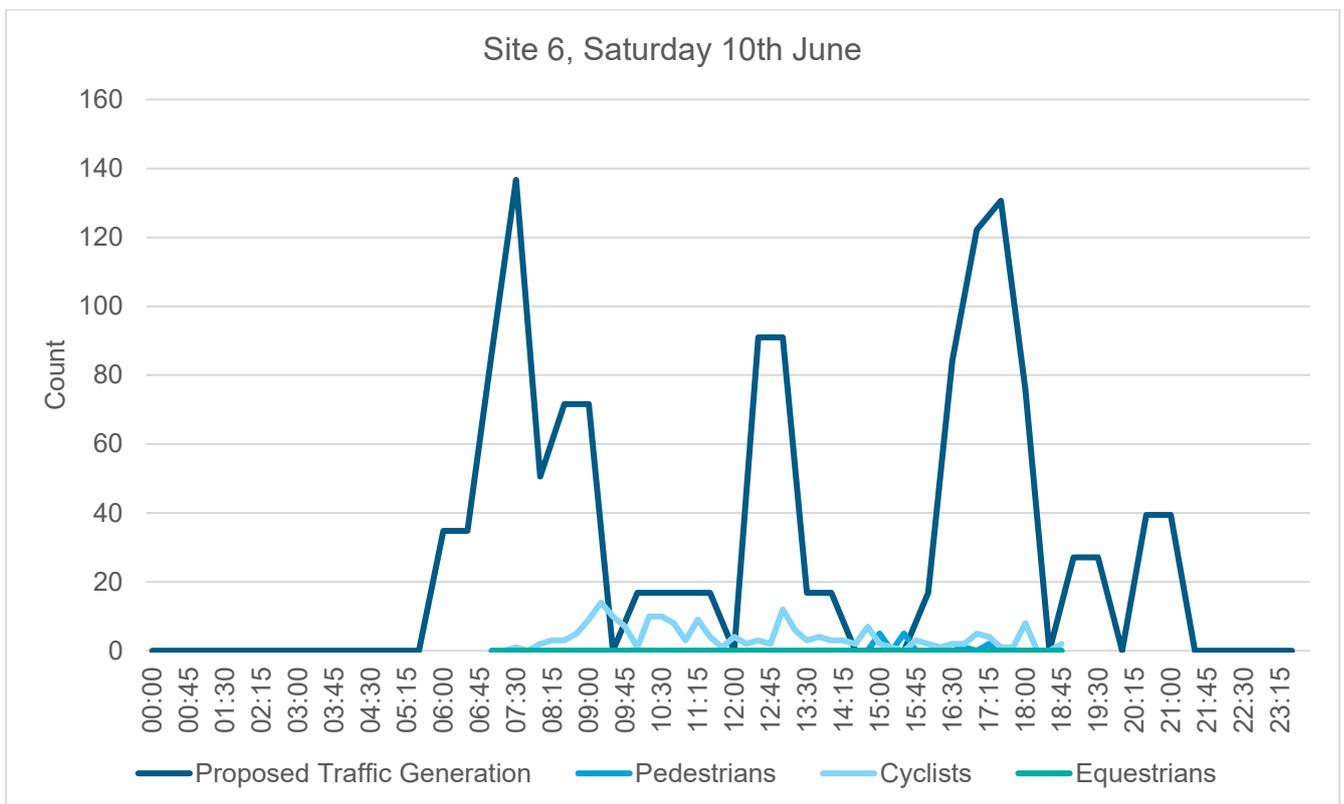
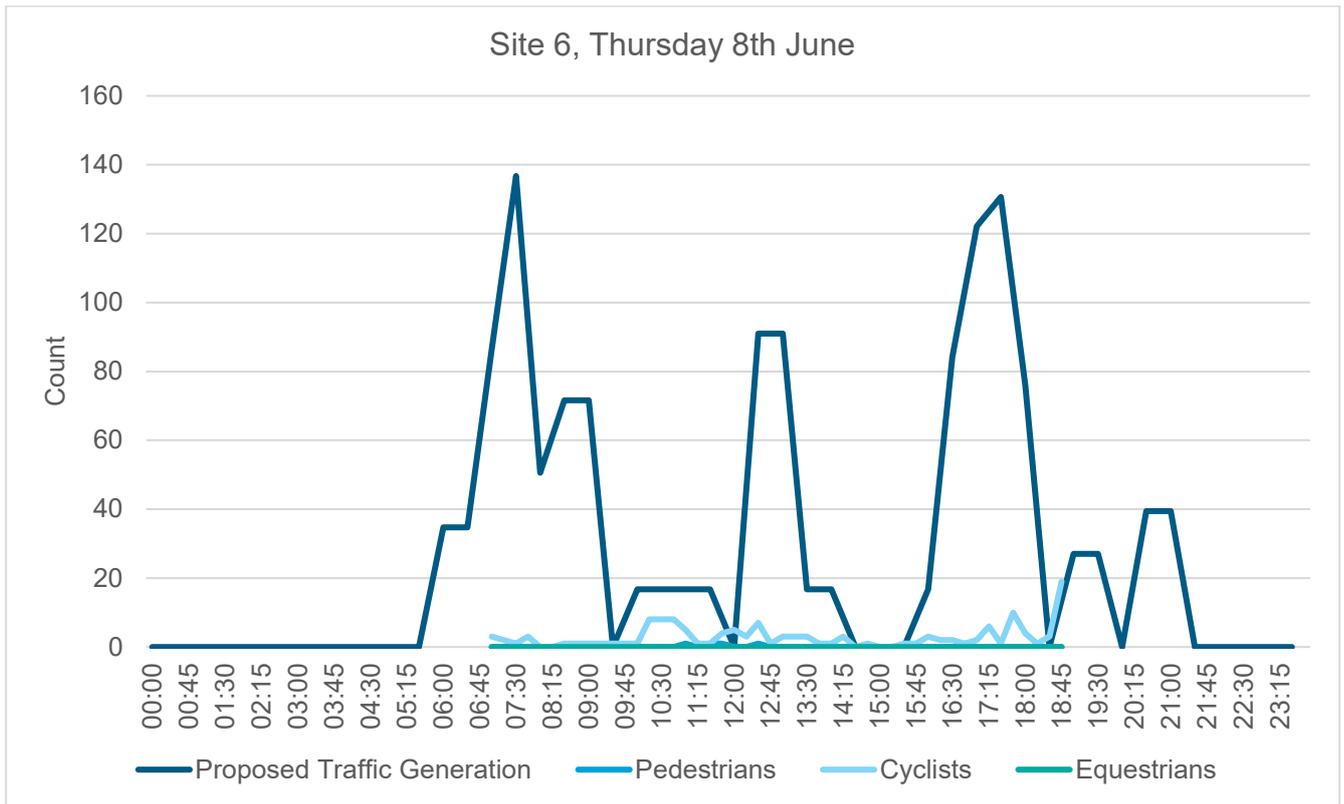












Appendix F – NDC Survey Report



North

**Dearden House,
Dearden St,
Ossett,
WF5 8NR**

Tel: 01924 288040
Fax: 01924 278670

**ATKINS
LANCASHIRE NMU
NON-MOTORISED USER
SURVEY REPORT
JUNE 2023**

PROJECT NO.	14208
CHECKED	CW
DATE	18/07/2023
CONTACT	P. ROHWER
REVISION	

Site Notes

Manual count Site Notes

The manual count was carried out with no incidents or disruptions likely to affect the results.

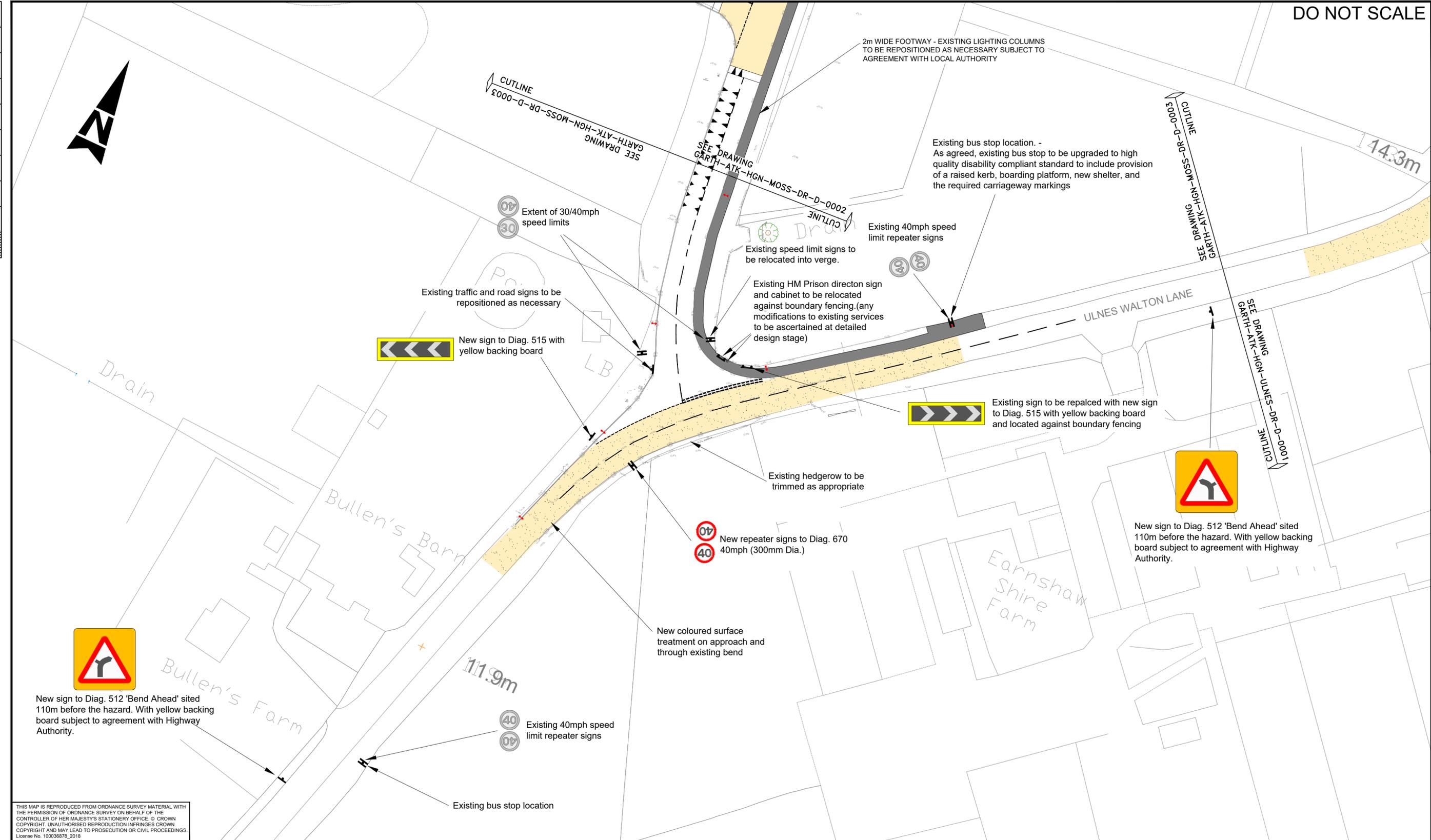
Site 2 – No observations of pedestrians using post box throughout survey periods.

Weather: 8th – Fine
10th – Fine

Appendix G – DWG Pack

DO NOT SCALE

Millimetres
0 10 100



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Key:

	Red carriageway surfacing
	Proposed footway
	Raised table
	Proposed/ Existing Sign face
	Existing lighting column

- Notes:**
- Layout is preliminary design 'for information' only and subject to approval from Highway Authority.
 - Layout is based on Ordnance Survey. Subject to detailed design on Topographical Survey base.
 - All proposed road markings and signage to be in accordance with the 'Traffic Signs Regulations and General Directions 2016'.
 - On completion of works all affected infrastructure including hedging, fencing, ditches, footways, kerbing, verges and road surfacing shall be reinstated in accordance with the Overseeing Organisation's requirements.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION			
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:			
CONSTRUCTION			
NONE			
MAINTENANCE/CLEANING			
NONE			
DECOMMISSIONING/DEMOLITION			
NONE			
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement			
Rev.	Date	Description	By
P1	27.01.23	DRAWING CREATED	JA PDE TR

Drawing Status: **FIT FOR INFORMATION**

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Birmingham
West Midlands
B1 1TF

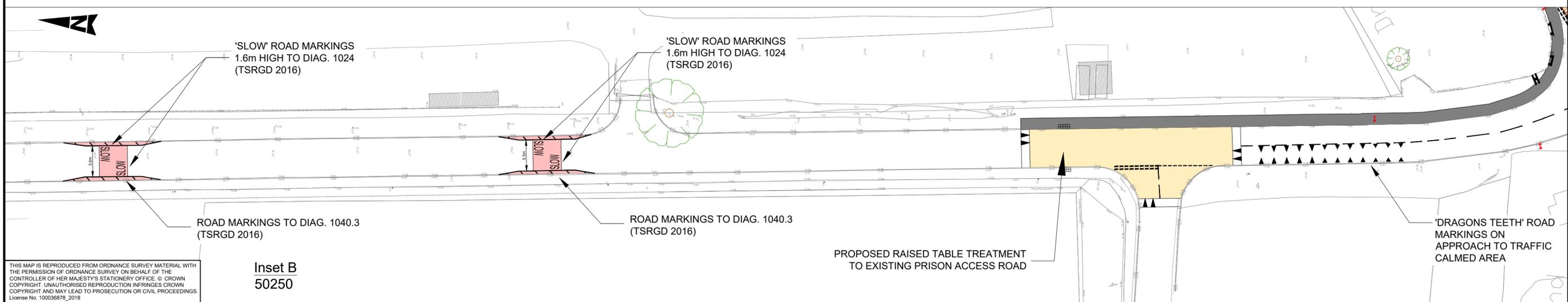
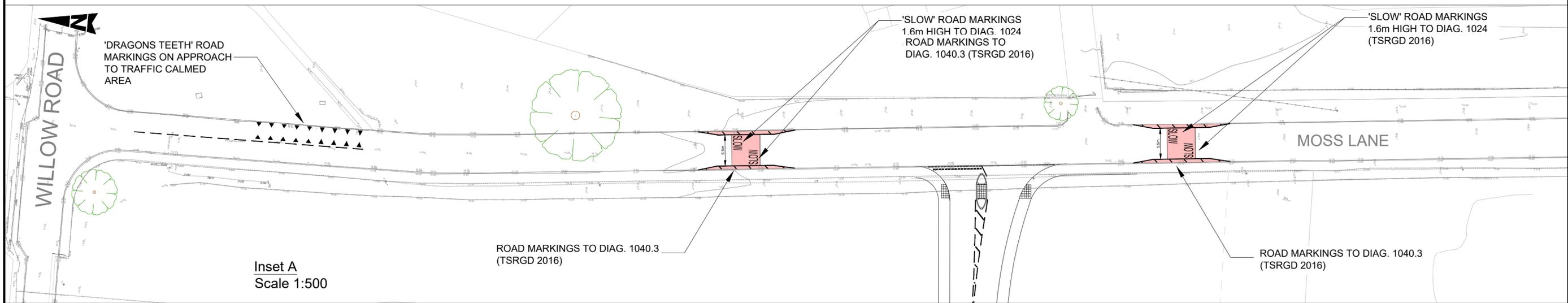
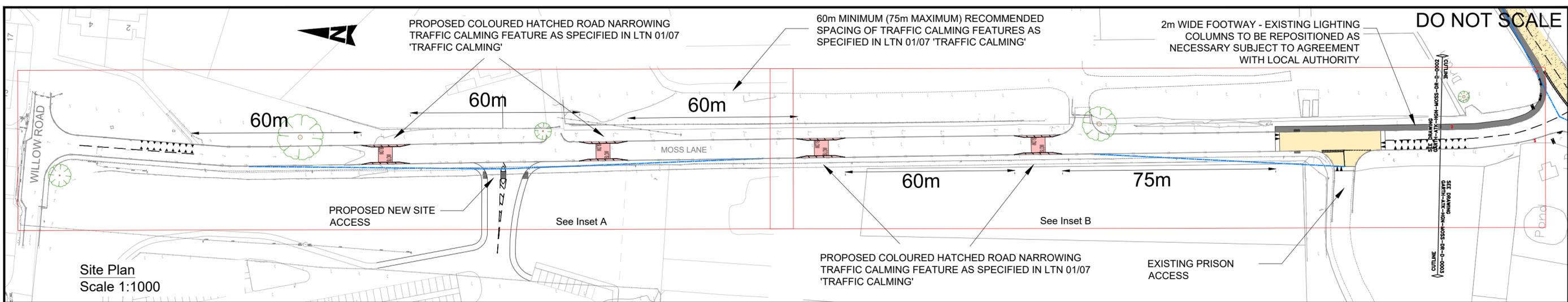
Tel: +44 (0)1214 835000
Fax: +44 (0)1214 835252
www.atkinsglobal.com

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Client: **MINISTRY OF JUSTICE**

Project Title		HMP GARTH			
Drawing Title		PROPOSED NEW TRAFFIC CALMING			
Scale	Designed	Drawn	Checked	Authorised	
AS SHOWN	JA	JA	PDE	TR	
Original Size	Date	Date	Date	Date	
A2	27.01.23	27.01.23	27.01.23	27.01.23	
Drawing Number	Originator	Volume	Project Ref. No.		
HMP PIN	GARTH - ATK - HGN -	5200124	5200124		
	MOSS - DR - D - 0003		Revision		
			P1		

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Millimetres
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Key:

	Red carriageway surfacing
	Proposed footway
	Raised table
	Proposed / Existing 90m visibility splay

- Notes:**
1. Layout is preliminary design 'for information' only and subject to approval from Highway Authority.
 2. Layout is based on Ordnance Survey. Subject to detailed design on Topographical Survey base.
 3. All proposed road markings and signage to be in accordance with the 'Traffic Signs Regulations and General Directions 2016'.
 4. On completion of works all affected infrastructure including hedging, fencing, ditches, footways, kerbing, verges and road surfacing shall be reinstated in accordance with the Overseeing Organisation's requirements.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION					
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:					
CONSTRUCTION NONE					
MAINTENANCE/CLEANING NONE					
DECOMMISSIONING/DEMOLITION NONE					
It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement					
Rev.	Date	Description	By	Chkd	App'd
P3	27.01.23	TRAFFIC CALMING FEATURES MODIFIED	JA	PDE	TG
P2	05.07.21	TRAFFIC CALMING FEATURES MODIFIED	AE	PDE	
P1	30.03.21	DRAWING CREATED	AE	PDE	

Drawing Status: **FIT FOR INFORMATION**

Suitability: **S2**

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Client: **MINISTRY OF JUSTICE**

Project Title: HMP GARTH					
Drawing Title: PROPOSED NEW TRAFFIC CALMING					
Scale: AS SHOWN	Designed: AE	Drawn: AE	Checked: PDE	Authorised:	
Original Size: A2	Date: 30.03.21	Date: 30.03.21	Date: 30.03.21	Date:	
Drawing Number: GARTH	Originator: - ATK	Volume: - HGN	Project Ref. No. 5200124		
HA PIN: MOSS	Role: - DR - D	Number: - 0002	Revision: P3		
Location:	Type:	Role:	Number:		

100
0 10
Millimetres

DO NOT SCALE

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION
Working adjacent to live traffic. Utility considerations

MAINTENANCE/CLEANING
NONE

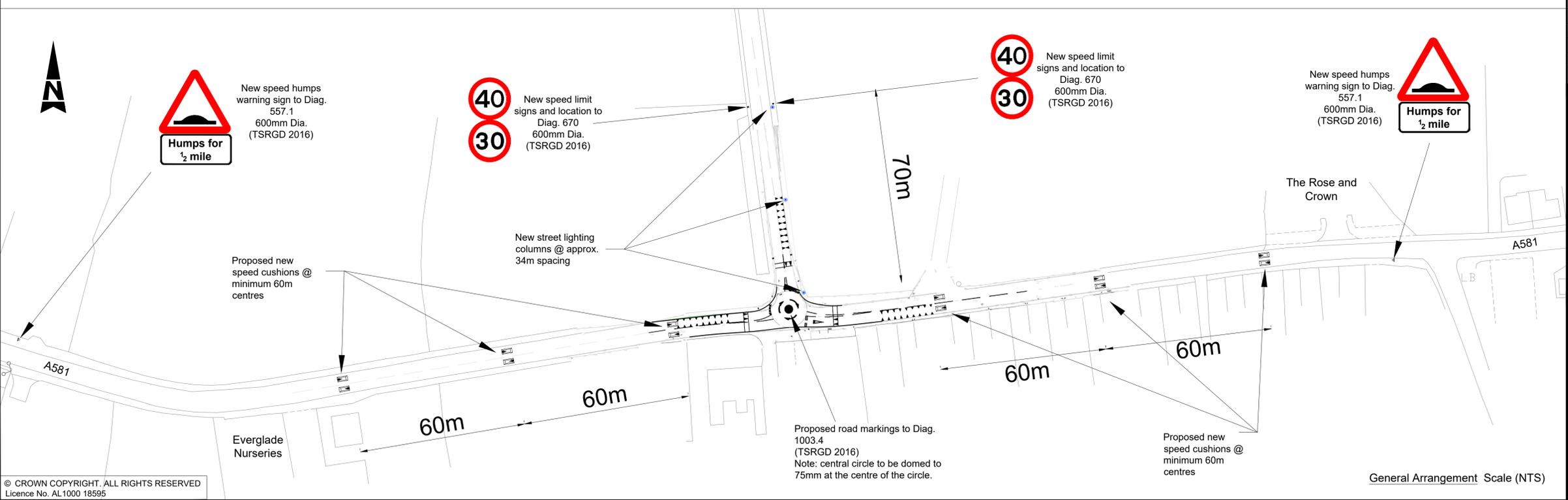
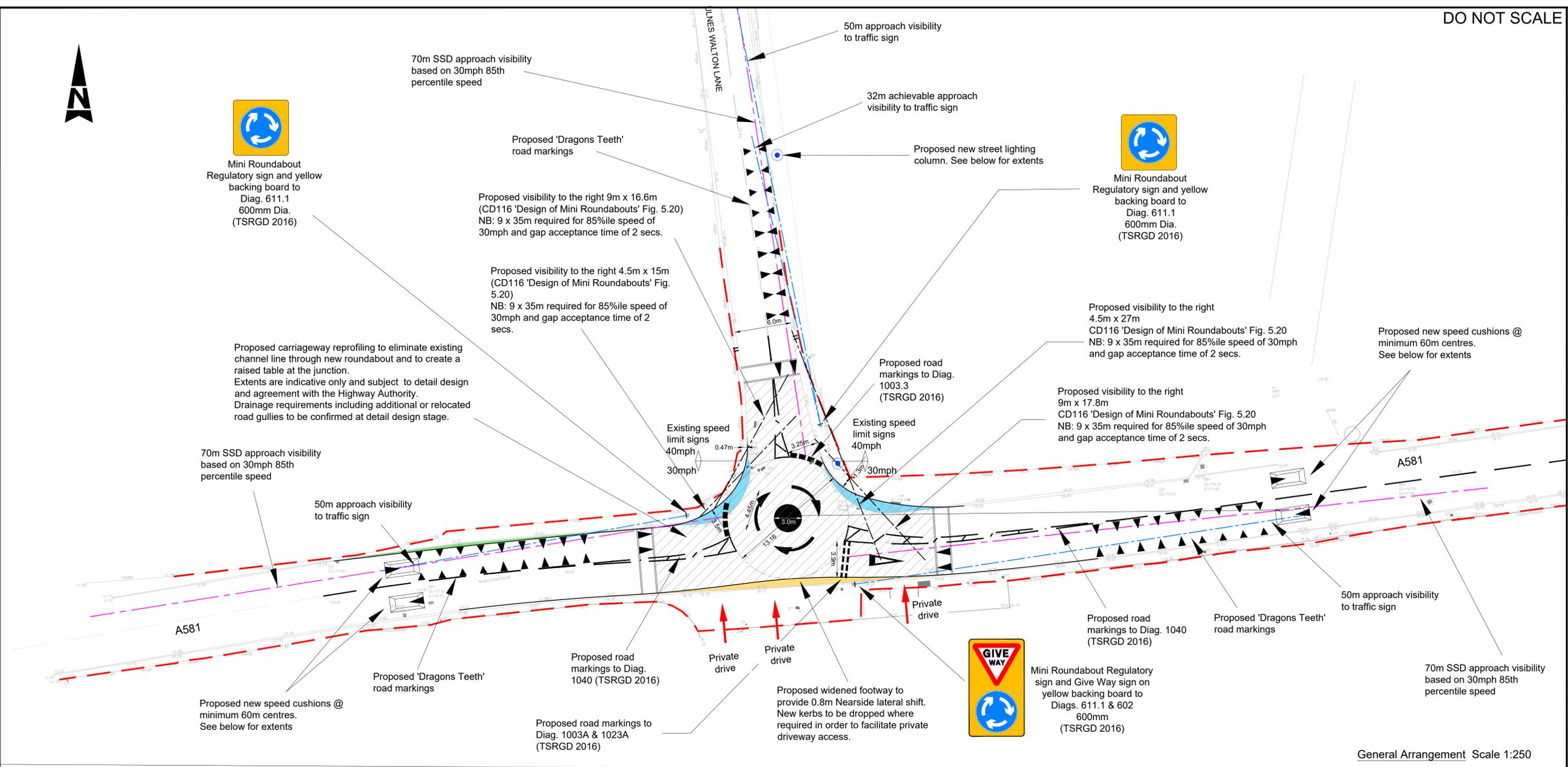
DECOMMISSIONING/DEMOLITION
NONE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

- Notes:
- Layout is preliminary design 'for information' only and subject to approval from Highway Authority.
 - Layout is based on Topographical Survey base.
 - All proposed road markings and temporary signage to be in accordance with the 'Traffic Signs Regulations and General Directions 2016'.
 - Design based on the provisions of CD 116 The Geometric Design of Roundabouts (DMRB)

Key:

	Proposed carriageway widening
	Proposed footway widening
	Proposed verge widening
	Proposed raised table junction
	Proposed speed cushion
	Proposed new street lighting column
	Highway Boundary
	Forward Visibility
	Visibility to road signs
	Visibility to right on approach



Rev.	Date	Description	By	Chk'd	App'd
P3	09.02.23	REDESIGN AND TRAFFIC CALMING ADDED	AE		PDE
P2	31.01.23	RAISED TABLE AND DRAGONS TEETH ADDED	AE		PDE
P1	09.02.23	DRAWING CREATED	AE		PDE

FOR INFORMATION **S2**

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Client
MINISTRY OF JUSTICE

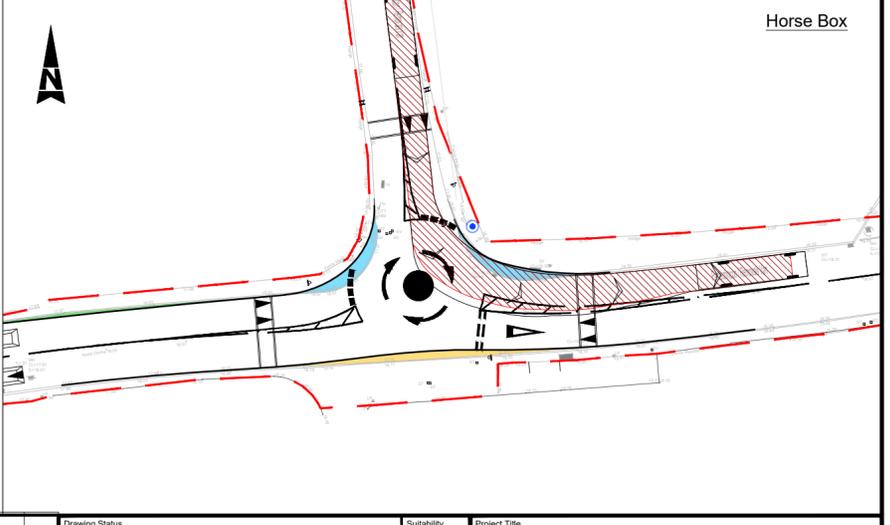
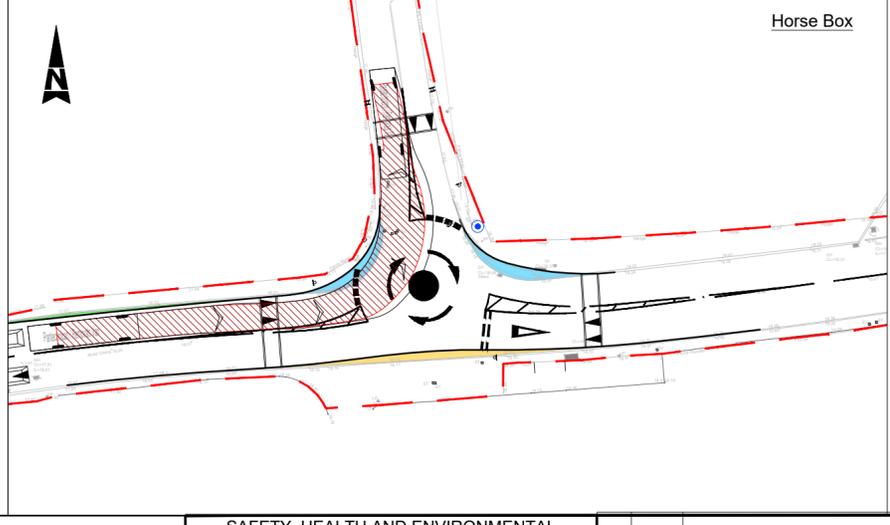
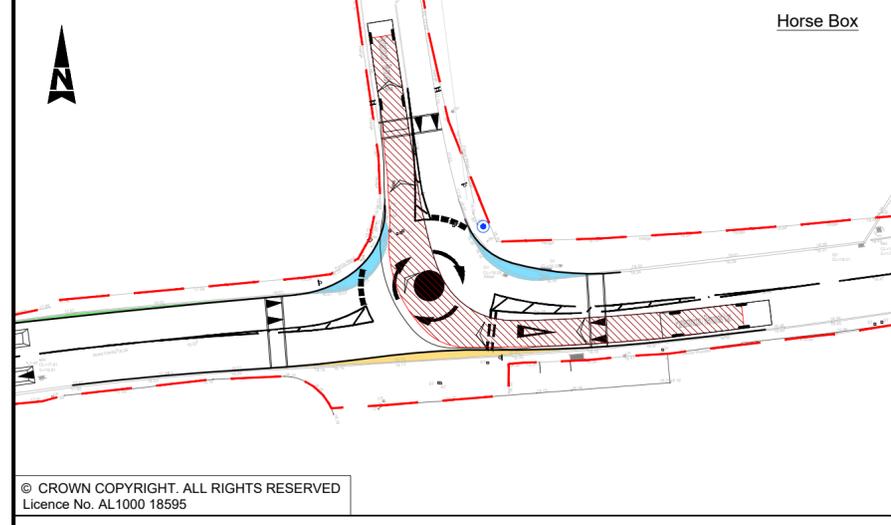
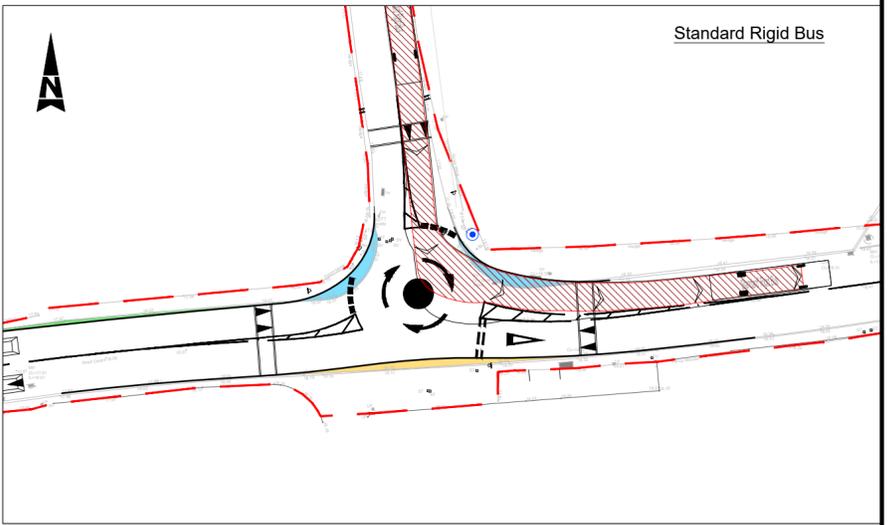
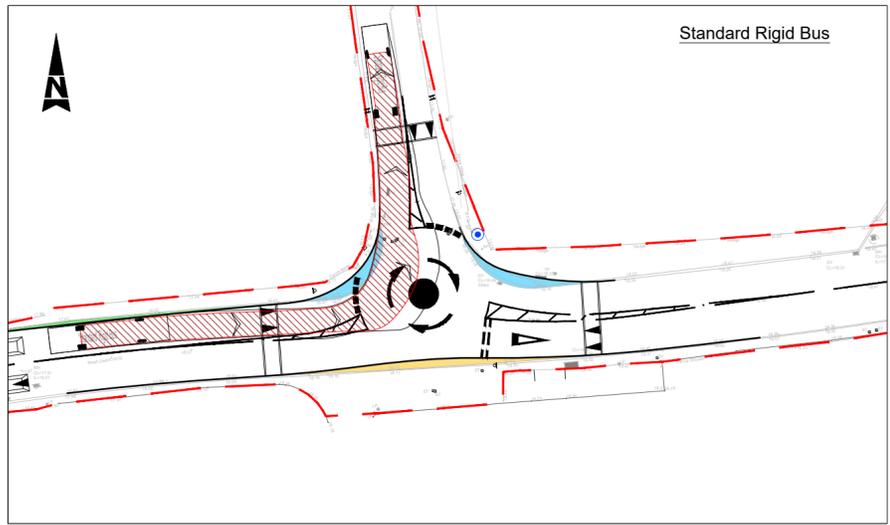
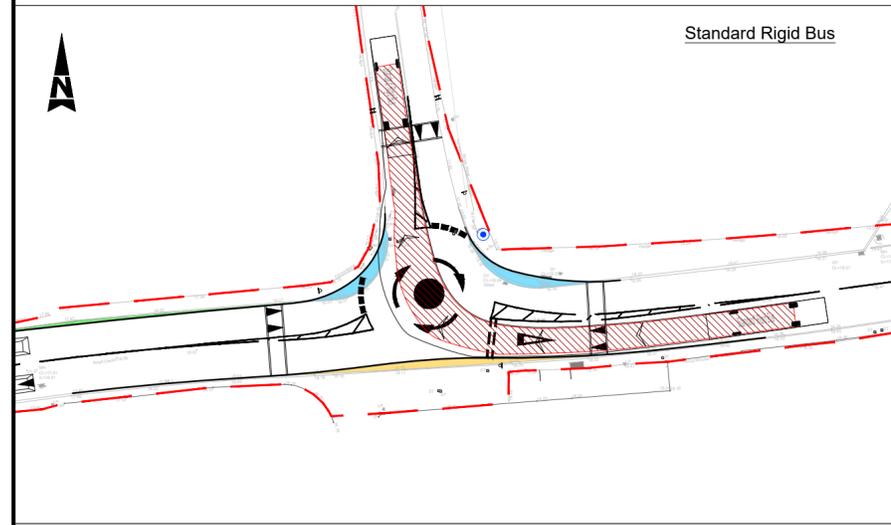
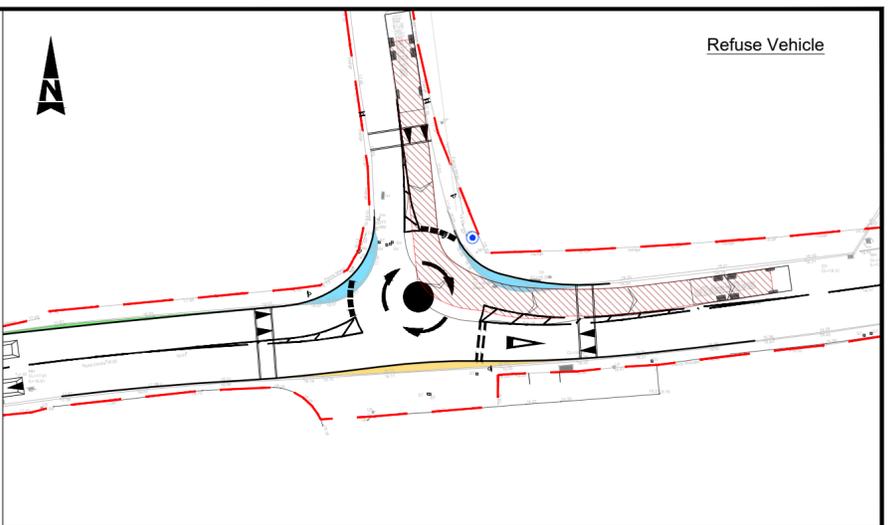
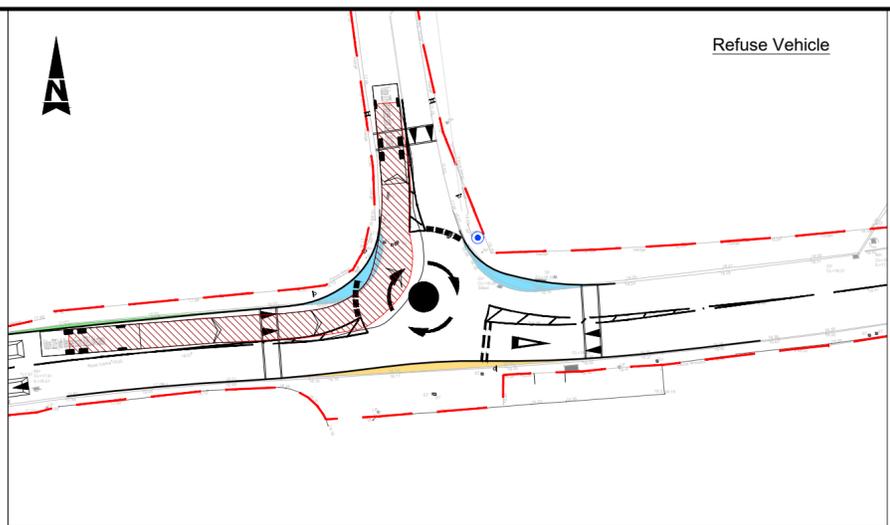
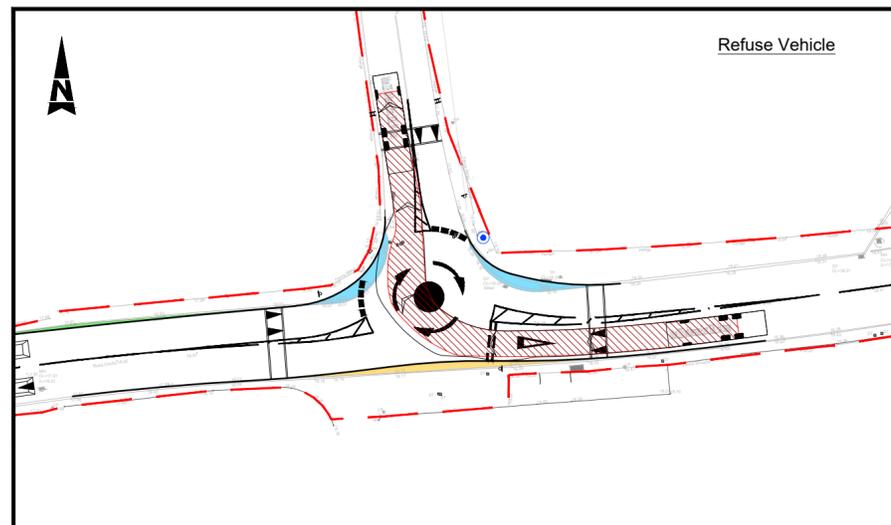
Project Title
HMP GARTH

Drawing Title
**PROPOSED MITIGATION WORKS
ULNES WALTON LANE / A581
PROPOSED MINI ROUNDABOUT**

Scale	Designed	Drawn	Checked	Authorised
NTS	AE	AE	PDE	
Original Size	Date	Date	Date	Date
A1	25/01/23	25/01/23	25/01/23	
Drawing Number	Originator	Volume	Project Ref. No.	
GARTH	ATK	HGN	5200124	
A581	DR	D	0005	Revision
Location	Type	Role	Number	P3

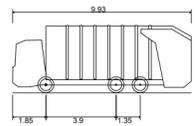
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Millimetres
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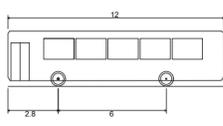


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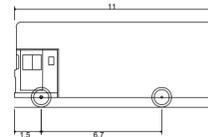
Key:



Vulture 2225 (with Mercedes Econic 2628LL 6x4 chassis)
Overall Length 9.930m
Overall Width 2.490m
Overall Body Height 3.749m
Min Body Ground Clearance 0.302m
Track Width 2.490m
Lock to lock time 4.00s
Wall to Wall Turning Radius 9.100m



'Standard' Rigid Bus
Overall Length 12.000m
Overall Width 2.550m
Overall Body Height 3.069m
Min Body Ground Clearance 0.309m
Track Width 2.350m
Lock to lock time 4.00s
Wall to Wall Turning Radius 10.771m



Pantechicon / Removals Van / Horse Box
Overall Length 11.000m
Overall Width 2.500m
Overall Body Height 4.730m
Min Body Ground Clearance 0.541m
Track Width 2.500m
Lock to lock time 6.00s
Kerb to Kerb Turning Radius 12.200m

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION
NONE

MAINTENANCE/CLEANING
NONE

DECOMMISSIONING/DEMOLITION
NONE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Rev.	Date	Description	By	Chkd	App'd
P1	25.01.23	DRAWING CREATED		AE	PDE

Drawing Status: **FIT FOR INFORMATION**



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Suitability: **S2**

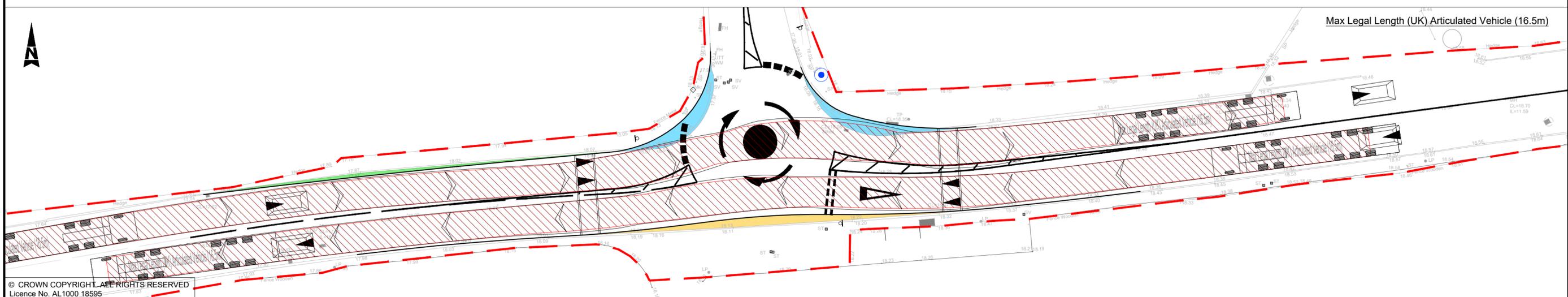
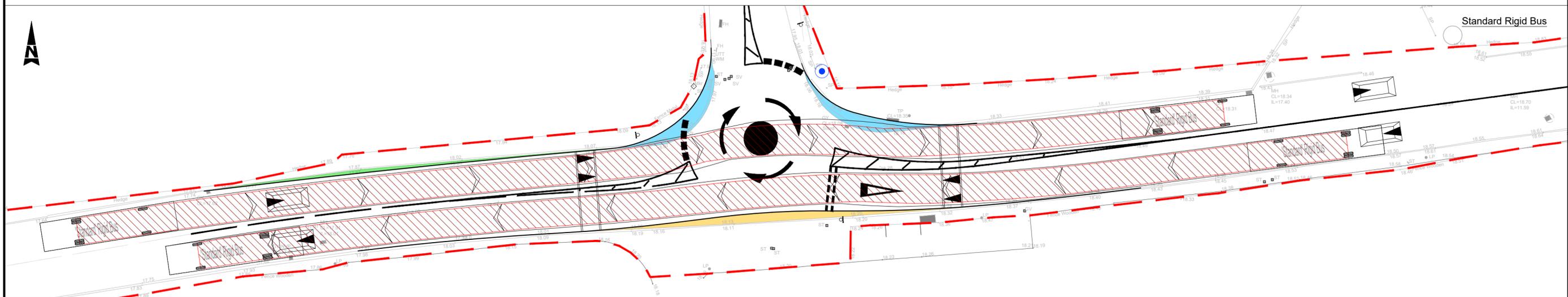
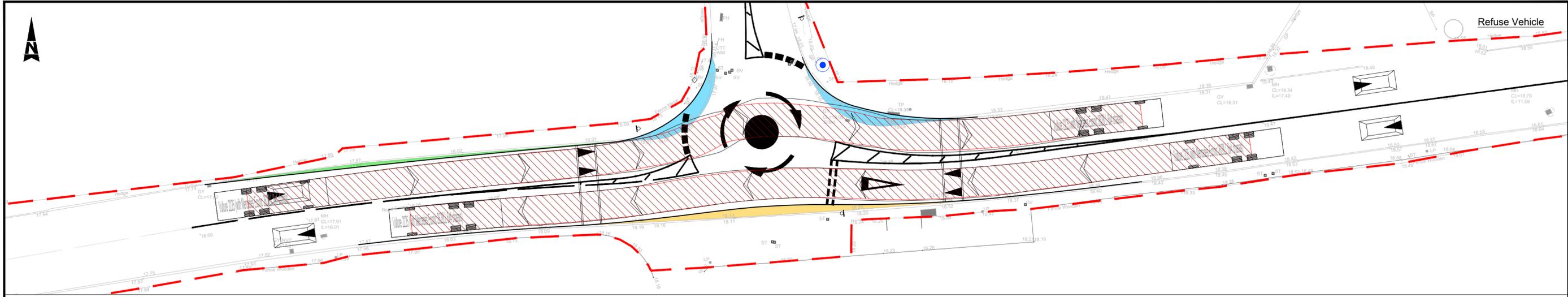
Project Title: **HMP GARTH**
Drawing Title: **PROPOSED MITIGATION WORKS
ULNES WALTON LANE / A581
PROPOSED MINI ROUNDABOUT
SWEPT ATH ANALYSIS**

Scale	Designed	Drawn	Checked	Authorised
1:500	AE	AE	PDE	
Original Size	Date	Date	Date	Date
A2	25.01.23	25.01.23	25.01.23	
Drawing Number	Originator	Volume	Project Ref. No.	
GARTH	ATK	SPA	5200124	
HA PIN	- DR - D -	- 0005	Revision	
A581			P2	
Location	Type	Role	Number	

MINISTRY OF JUSTICE

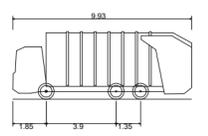
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GARTH_ATK_SPA_A581_DR_D_0005_P2_S
PA3

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Millimetres

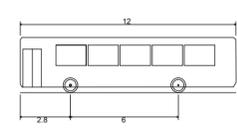


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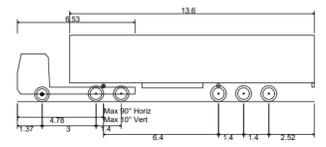
Key:



Vulture 2225 (with Mercedes Eonic 2628LL 6x4 chassis)
 Overall Length 9.930m
 Overall Width 2.490m
 Overall Body Height 3.749m
 Min Body Ground Clearance 0.302m
 Track Width 2.490m
 Lock to lock time 4.00s
 Wall to Wall Turning Radius 9.100m



'Standard' Rigid Bus
 Overall Length 12.000m
 Overall Width 2.550m
 Overall Body Height 3.069m
 Min Body Ground Clearance 0.309m
 Track Width 2.350m
 Lock to lock time 4.00s
 Wall to Wall Turning Radius 10.771m



Max Legal Length (UK) Articulated Vehicle (16.5m)
 Overall Length 16.500m
 Overall Width 2.550m
 Overall Body Height 3.681m
 Min Body Ground Clearance 0.411m
 Max Track Width 2.500m
 Lock to lock time 6.00s
 Kerb to Kerb Turning Radius 6.530m

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION
NONE

MAINTENANCE/CLEANING
NONE

DECOMMISSIONING/DEMOLITION
NONE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Rev.	Date	Description	By	Chkd	App'd
P1	25.01.23	DRAWING CREATED		AE	PDE

Drawing Status: **FIT FOR INFORMATION**

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Client: **MINISTRY OF JUSTICE**

Project Title: **HMP GARTH**

Drawing Title: **PROPOSED MITIGATION WORKS
ULNES WALTON LANE / A581
PROPOSED MINI ROUNDABOUT
SWEPT ATH ANALYSIS**

Scale	Designed	Drawn	Checked	Authorised
1:500	AE	AE	PDE	

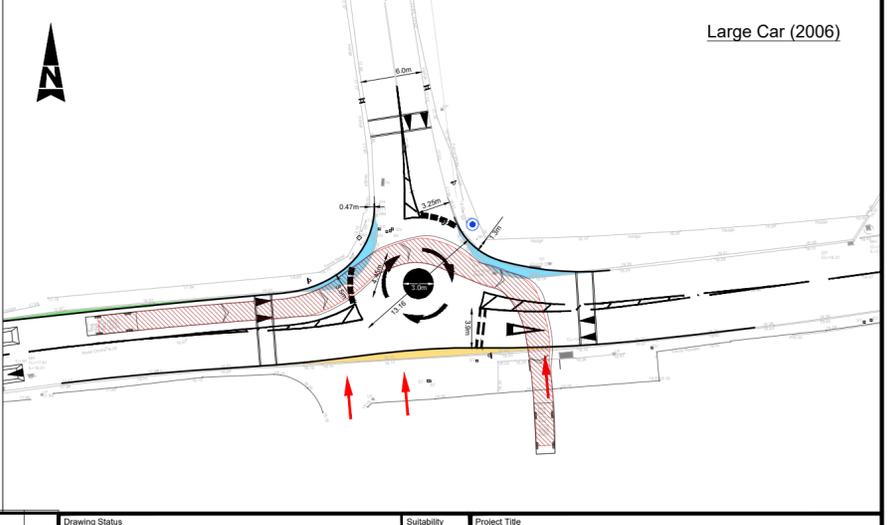
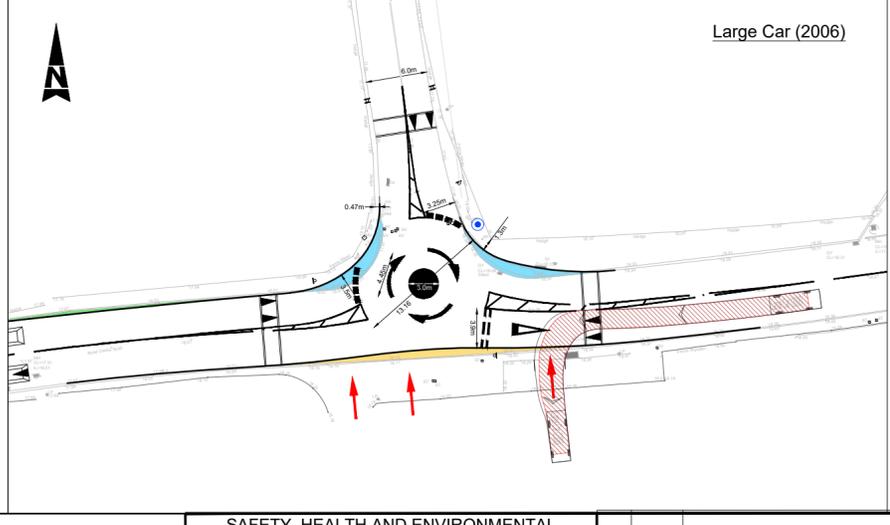
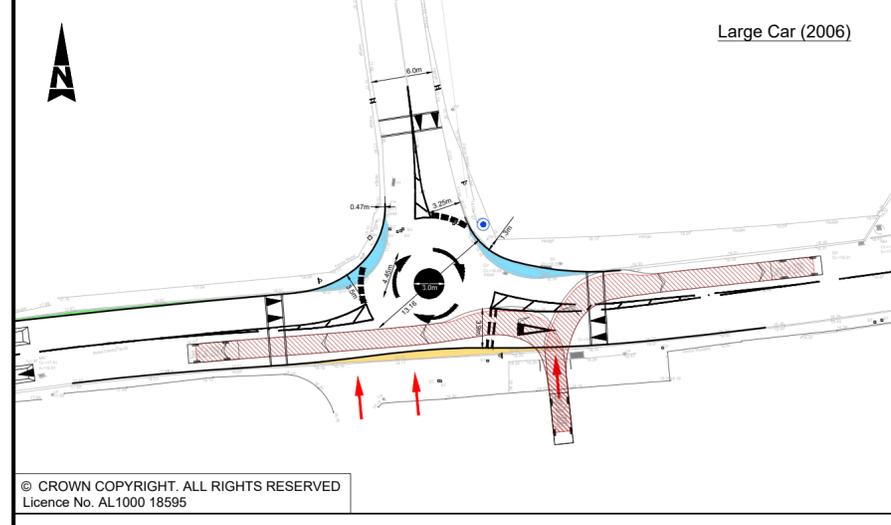
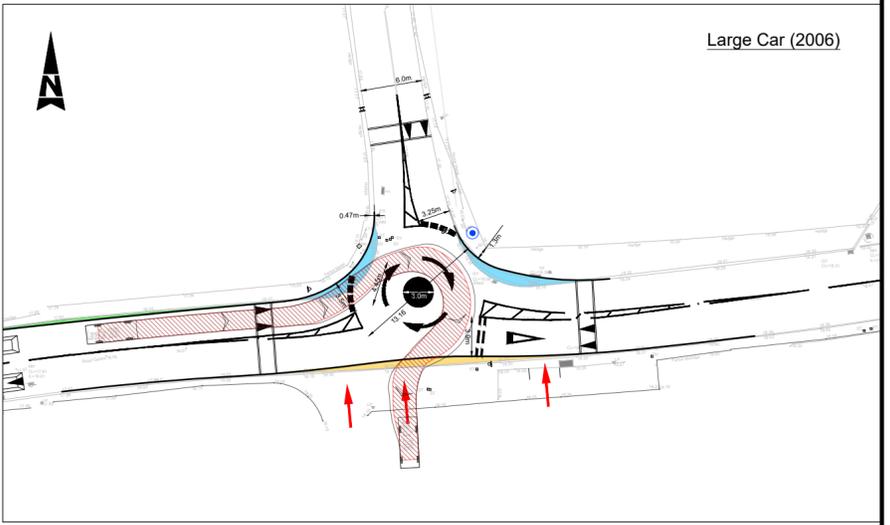
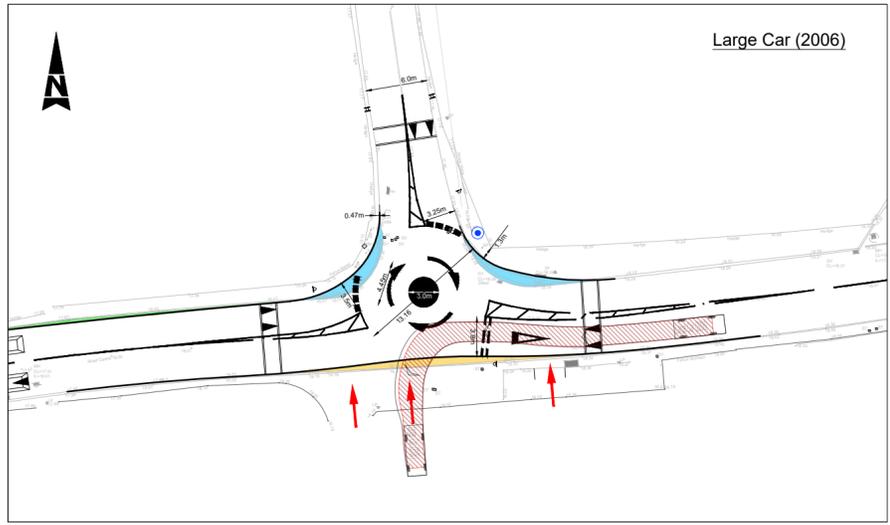
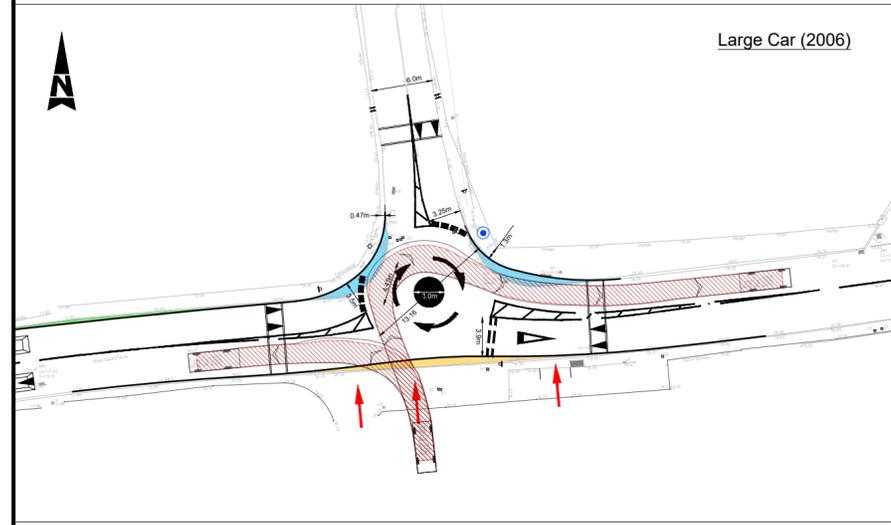
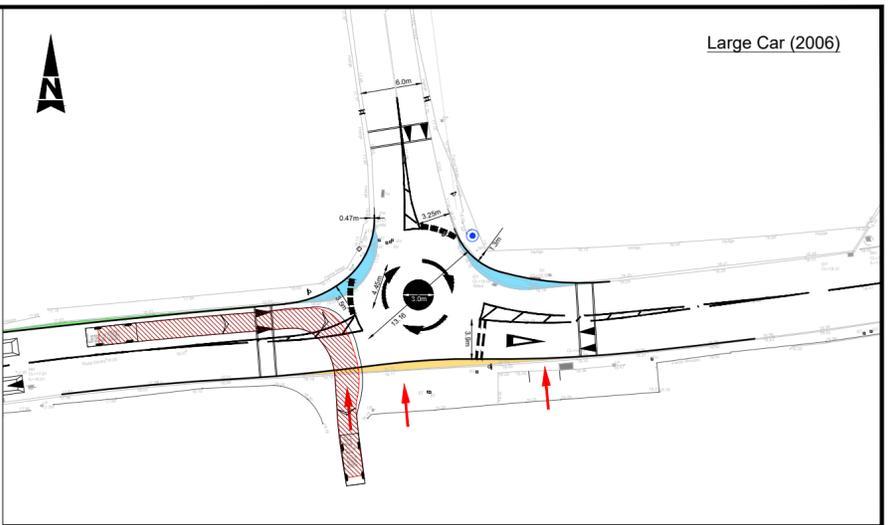
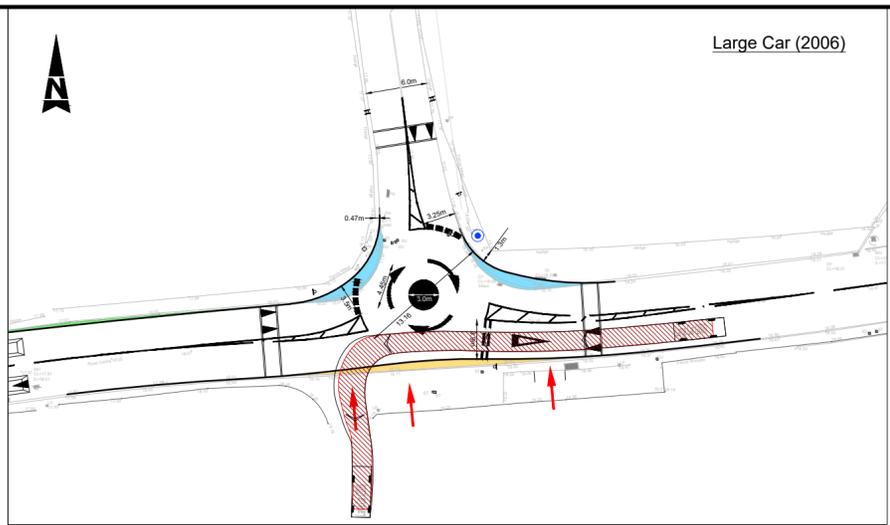
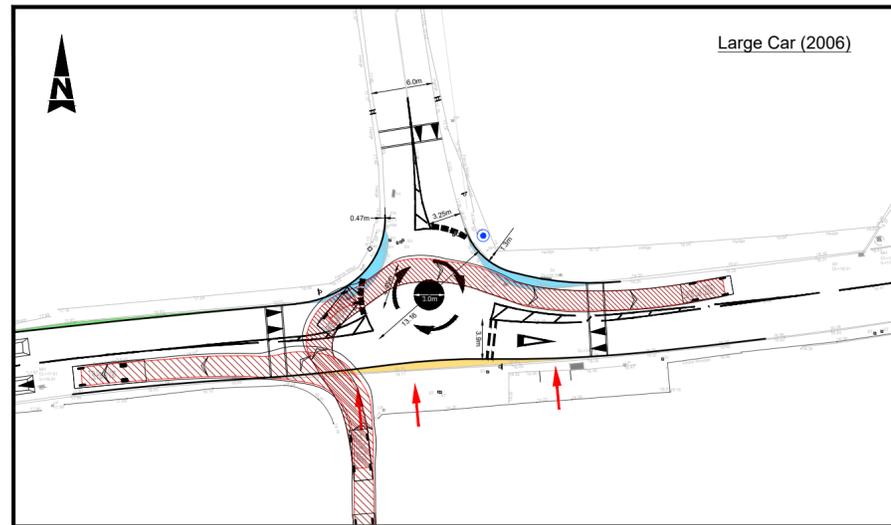
Original Size	Date	Date	Date	Date
A2	25.01.23	25.01.23	25.01.23	

Drawing Number	Originator	Volume	Project Ref. No.
GARTH	ATK	SPA	5200124

Revision	Type	Role	Number
P2	-DR	-D	-0005

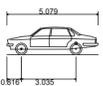
Appendix J -
GARTH_ATK_SPA_A581_DR_D_0005_P2_S
PA4

100
0 10
Millimetres



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Key:



Large Car (2006)
Overall Length 5.072m
Overall Width 1.872m
Overall Body Height 1.525m
Min Body Ground Clearance 0.310m
Max Track Width 1.831m
Lock to lock time 4.00s
Kerb to Kerb Turning Radius 5.900m

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

NONE

MAINTENANCE/CLEANING

NONE

DECOMMISSIONING/DEMOLITION

NONE

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

Rev.	Date	Description	By	Chkd	App'd
P1	25.01.23	DRAWING CREATED		AE	PDE

Drawing Status
FIT FOR INFORMATION

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MINISTRY OF JUSTICE

Suitability
S2

Project Title
HMP GARTH

Drawing Title
**PROPOSED MITIGATION WORKS
ULNES WALTON LANE / A581
PROPOSED MINI ROUNDABOUT
SWEEP PATH ANALYSIS**

Scale	Designed	Drawn	Checked	Authorised
1:500	AE	AE	PDE	
Original Size	Date	Date	Date	Date
A2	25.01.23	25.01.23	25.01.23	

Drawing Number	Originator	Volume	Project Ref. No.
GARTH	ATK	SPA	5200124
HA PIN	Revision	Number	Date
A581	- DR - D - 0005		P2