

Highway Requirements Part 2

DESIGN PRINCIPLES

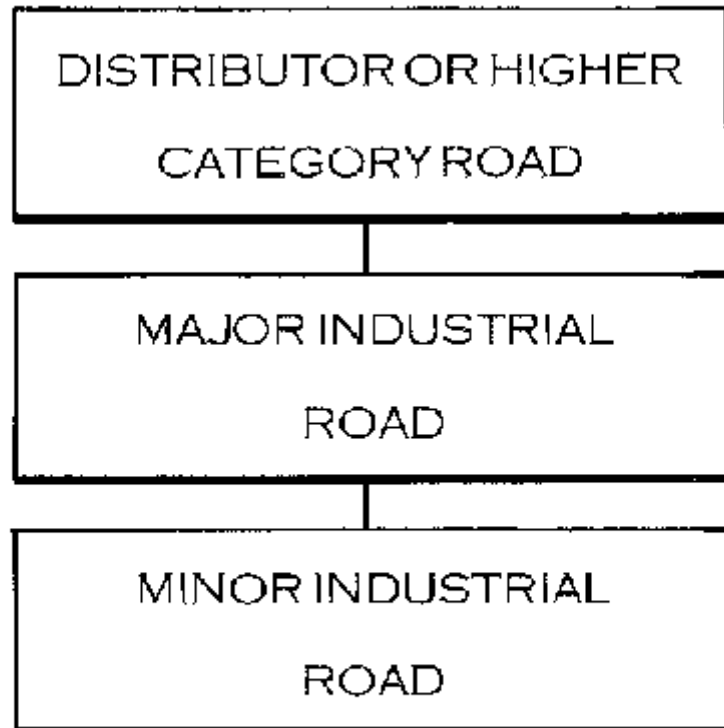
GENERAL PHILOSOPHY

1.1 The purpose of this section is to outline the basic reasoning and philosophy behind the requirements in this document which is intended to advise on matters affecting layout within areas to be adopted as publicly maintainable highway. Advice is also given on matters outside the area intended to become highway which would directly affect the safety of its users. In those areas which are intended to form part of the highway, those complying with this guide will normally be adopted as public highway.

1.2 Industrial and commercial development should always be sited with access to a distributor or higher category road so that traffic generated by such development does not have to pass through residential areas or areas where such traffic would create environmental problems, or use roads which are unsuitable for heavy goods vehicles.

ROAD HIERARCHY

1.3 The concept of a hierarchy of road types is used in industrial/commercial estate design, similar to that used in the residential estates described in Part One, but to a more limited extent as shown below.



1.4 It is recognised that flexibility is required in deciding whether a particular road falls into the major or minor category and therefore no criteria on the size of development served are used to determine this. The Highway and Planning authorities should be consulted over which category to use at an early stage in the design process. As a general guide-line, however, Minor Industrial Roads will always be cul-de-sacs and serve less than 2 hectares of development.

1.5 In development located on a Major Industrial Road provision must be made for manoeuvring of all heavy commercial vehicles to take place outside the public highway so that they can enter and leave the site in a forward direction. Also junctions and accesses should be designed so as to avoid heavy goods vehicles having to cross onto the wrong side of the road whilst turning, and for obvious reasons, therefore, roads which join distributor or higher category roads must be Major Industrial Roads.

1.6 On Minor Industrial Roads such constraints will not apply, although off-street parking and loading provision will still be required, the road itself may be used on occasions to form part of the manoeuvring area for larger commercial vehicles where their numbers are likely to be low. However, if frequent visits of such vehicles are expected provision will still be required for them to be manoeuvred outside the limits of the public highway.

STANDARDS

1.7 Both Major and Minor Industrial Roads should have a minimum carriageway width of 7.3 metres with footways on each side a minimum of 1.8 metres wide. If the road has development on one side only then the footway on the undeveloped side may be replaced by 1.0 metre wide maintenance margin at the discretion of the Highway Authority. Both categories shall have a minimum centreline radius of 55 metres.

ADOPTION AS PUBLIC HIGHWAY

1.8 For development of less than 2 hectares (5 acres approx.) in area there is no requirement for industrial estate roads to be constructed or laid out to standards suitable for adoption, although their junctions with adopted roads and parking provision, loading and manoeuvring areas within the development must be in accordance with adoptable standards. For developments in excess of this area the County Council has resolved that these should normally be adopted as public highway and should be laid out in accordance with this document.

SINGLE POINT OF ACCESS

1.9 It is desirable to ensure that access by emergency vehicles can be maintained to all parts of the development at all times, as far as is possible, and that the necessary travel distances of service and delivery vehicles are minimised within estates. Wherever possible therefore, cul-de-sac access should be avoided and a system of loop roads used, with care that extraneous through traffic is discouraged from using estate roads. In normal circumstances, no more than 8 hectares (20 acres approx.) of industrial/commercial development should be served via a single point of access.

VISIBILITY

1.10 There is a need to ensure that visibility available to drivers is, at all times, appropriate to the speeds at which they and others will normally be travelling, at that point in the estate. Further details of visibility requirements at junctions and accesses are given in Section 3.

PARKING

1.11 Vehicles parked on the road are a major cause of accidents. They mask pedestrians from moving vehicles and screen vehicles from each other, can obstruct access to tenants and delivery vehicles and block up turning areas. On bus routes they can cause delays to services. It is essential therefore that sufficient convenient off-street parking is provided to meet all the normal needs of the development, details of the Highway Authority's requirements are contained in Part 4 of this document.

PUBLIC TRANSPORT

1.12 Provision has to be made for public transport to pass within reasonable walking distance of each unit, even though public transport may not be provided immediately following the construction of a new estate. A distance of 400 metres is considered to be a reasonable maximum. Within larger developments, provision should be made for public transport services to pass through the estate and bus laybys should be provided at appropriate locations. The planning and highway authorities should be consulted at an early stage in the planning process over the likely routes for public transport services.

UNDERGROUND SERVICES

1.13 Adequate provision must be made for statutory and other underground services to ensure that they are easily accessible to the undertakers and that maintenance work does not interfere unduly with the use of roads and footpaths or private property.

TURNING FACILITIES

1.14 Internal estate roads are often used by drivers who are unfamiliar with the estate, such as visitors or some delivery vehicles. Such drivers may become lost and wish to turn around and in order to allow them the opportunity to carry out such a turn in safety, rather than in a private access, junctions or turning heads should be provided at a maximum spacing of 200 metres.

GRADIENTS AND CROSSFALLS

1.15 In order to avoid problems of ponding on flat roads and sliding of vehicles and pedestrians on steep gradients, particularly in winter, the following criteria should be adhered to. At junctions the minor road gradient should not exceed 1:30 for the first 10 metres along the minor road from the major road nearside channel. Elsewhere, at no point shall the carriageway gradient exceed 1:15 nor be less than 1:150. On very steeply sloping sites, these criteria may be relaxed at the discretion of the highway authority. In normal circumstances, carriageway crossfalls of 1:40 are to be provided on all types of road apart from distributor roads which may have superelevation in accordance with the standards to which they are designed.

JUNCTIONS AND ACCESSES

1.16 Research has shown that the number of injury accidents which occur is related to the number of junctions and accesses for a given length of road. The number of junctions, particularly with higher category roads should therefore be kept to a minimum and, in general, no more than one point of access should be provided from the adopted highway to each site within the estate.

1.17 There is a general presumption against the construction of new junctions and accesses onto A and B class roads and the intensification of use of existing accesses. Use should be made of existing side road junctions where these are available, with improvements where necessary. In special circumstances where favourable consideration is given to the construction of a new access onto such roads, it shall be designed in accordance with Department of Transport Advice Note TA 20/84 for priority junctions, or Standard TD 16/84 and Advice Note TA 42/84 for roundabouts.

1.18 Junctions onto C class roads and busy urban unclassified roads should normally be designed in accordance with the above standards, but these requirements may be relaxed in special circumstances at the discretion of the Highway Authority.

JUNCTION SPACING

1.19 Within industrial estates the minimum opposite junction spacing shall be 40 metres. The minimum adjacent junction spacing shall be the major road visibility distance plus 10 metres.

2. TYPICAL LAYOUT (INDUSTRIAL & COMMERCIAL ESTATE ROADS)

drainage is given in Part 5; however, every effort should be made to ensure that manholes in the carriageway are located so that access can be obtained for maintenance without obstructing traffic flow.

TURNING HEADS

3.2 A turning head of one of the three designs shown on the typical layout drawing in Section 2 should be provided at the end of all cul-de-sacs or wherever vehicles would otherwise have to reverse over long distances or might turn in locations which could cause damage to adjacent verges or footways. The device of providing a dummy junction using a turning head to enable a road to turn through 90 degrees with very sharp radii and little or no visibility is, however, not acceptable, since the majority of drivers via habit do not treat such as junctions.

WIDENING ON BENDS

3.3 Carriageway widths on bends should be increased as follows:-

Centre-line radius(m)	55-149	150-299	300-400
Minimum widening(m)	1.2	0.9	0.6

Widening should be introduced gradually on the inside of the bend.

VERTICAL CURVES

3.4 Where changes in gradient occur, vertical curves will be required at crests and sags. The length of the vertical curve will depend upon the algebraic difference in gradients on the approaches to the curve. The length of curve is calculated using the formula

$$L=4A$$

where L is the length of curve in metres and A is the algebraic difference in gradients.

ROAD MARKINGS

3.5 Warning markings should be provided at all junctions with higher category roads in accordance with the Traffic Signs

Manual Chapter 5. Additional road markings and traffic signs may be required at busy junctions at the discretion of the highway authority.

FOOTPATHS AND BRIDLEWAYS

3.6 Sites for new development are often crossed by existing public footpaths and bridleways and due account should be taken of these in the design. If a public right of way must be diverted then a Diversion Order will be required before development commences and the planning authority should be consulted at an early stage over the proposals. In the case of bridleways, special care will be required in their design so as to prevent their misuse by vehicles and the detailed design should be discussed with the highway authority.

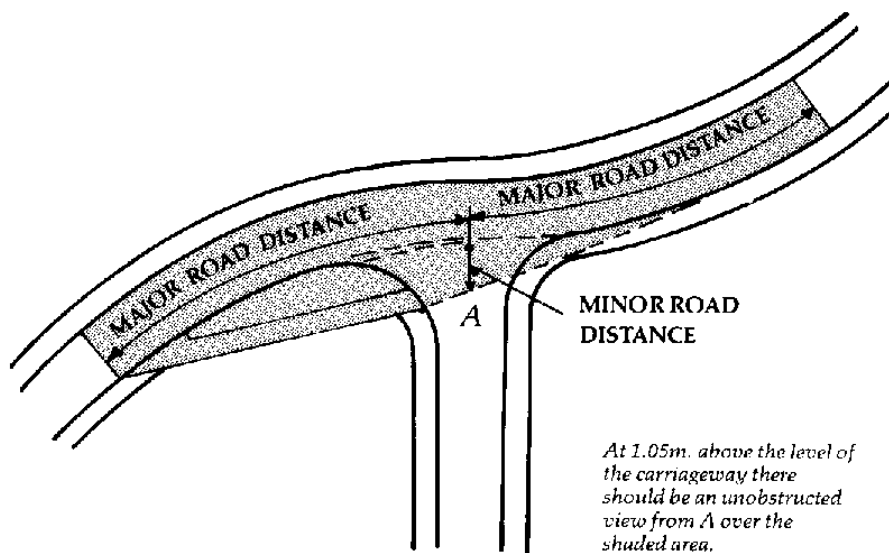
CYCLEWAYS

3.7 The local Planning Authority will consider the need for the provision of a separate cycleway network in relation to the area in which the development is taking place. Factors to be considered include the size of development, the hilliness of the area and the relationship to other areas of development. In general, facilities for cyclists will be justified where a large number of journeys of under 3 miles in length are likely to be made.

GATES AND GATEHOUSES

3.8 On all major industrial roads, any gates on the accesses to individual sites shall be set back at least 15 metres from the highway boundary and shall be so hung as to open inwardly only. Where large numbers of long vehicles are expected this distance should be increased to 30 metres. Security gatehouses, weighbridges and other facilities which may delay traffic entering the site shall also be well set back from the highway boundary.

VISIBILITY SPLAY REQUIREMENTS AT JUNCTIONS AND ACCESSES



MAJOR ROAD DISTANCES ARE DETERMINED AS FOLLOWS

Where measured or expected 85%ile speeds are known.

Speed(mph)	Distance(m)
11-15	23
16-20	33
21-25	45
26-30	60
31-37	90
38-44	120
45-53	160
54-62	215
63-75	295

Where measured or expected 85%ile speeds are not known.

Speed(mph)	Distance(m)
30	60**
30	90*
40	120
50	160
60	215
70	295

* Where major road is higher category road.

** Where major road is a medium category road with speeds universally below 30 mph.

MINOR ROAD DISTANCES ARE DETERMINED AS SHOWN BELOW:-

Junctions between	major		
minor	Dist/Local Distrib. Ex. Class	Major Industrial Road	Minor Industrial Road
Major Industrial Road	9.0	4.5	N/A
Minor Industrial Road	N/A	4.5	2.4

Industrial Access	N/A	4.5	2.4
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FORWARD VISIBILITY ON BENDS

3.10 Forward visibility splays will be required on bends below certain radii, dependant on the expected or measured speed of traffic on the road. An unobstructed view across these splays is required from a point 1.05 metres above the road surface (drivers' eye height) to a point 0.26 metres above the road surface (height of fallen child or other obstacle, etc.), both points being 1.5 metres from the nearside kerb. It is recommended that minor widening is accommodated within the footway and verge separating the footway and carriageway provided for widening in excess of 1 metre.

3.11 The required forward visibility splay on any bend is determined using a stopping distance proportional to the expected speed of traffic on the road. The following table gives the appropriate distances.

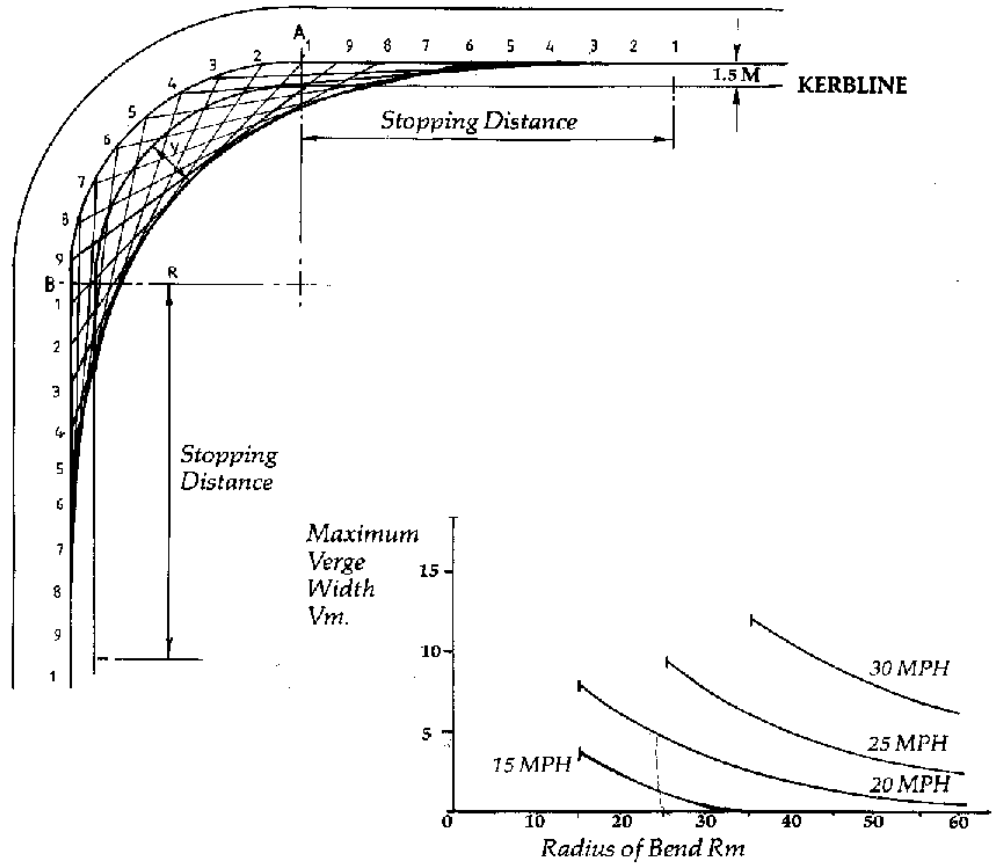
Expected speed (mph)	15	20	25	30*
Stopping distance (m)	23	33	45	60

Expected speed (mph) 15 20 25 30*

Stopping distance (m) 23 33 45 60

*Speeds in excess of 30 mph may be considered in layouts with long straight or nearly straight sections.

3.12 The splay requirement may be constructed using the method illustrated in the diagram below. For ways of reference the graph shows the widening required for various combinations of speed and radius at the mid-point of the curve.



HIGHWAYS AGENCIES WITHIN LEICESTERSHIRE

3.13 Within Leicestershire, six District Councils which Operate as sic District Councils which operate Agency areas for the whole or part of their administrative areas. These Authorities and the extent of their agencies are as follows: -

DISTRICT COUNCIL	ADDRESS	AGENCY AREA
Borough of Charnwood	Borough Surveyor, Macaulay House, Cattle Market, Loughborough,	Loughborough.

	<p>Leicester LE11 3DH.</p> <p>Tel: 01509 263151.</p>	
<p>Harborough District Council</p>	<p>Chief Housing and Environmental Services Officer,</p> <p>Adam and Eve Street,</p> <p>Market Harborough,</p> <p>Leicester</p> <p>LE16 7AG.</p> <p>Tel: Mkt. 01858 821100.</p>	<p>None, however you should contact the LCC in the first instance for information on the new working Agreement within the District Harborough.</p>
<p>Hinckley and Bosworth Borough Council</p>	<p>Director of Development, Council Offices,</p> <p>Argents Mead,</p> <p>Hinckley,</p> <p>Leicester LE10 1BZ.</p> <p>Tel: 01455 238141</p>	<p>Burbage and Earl Shilton.</p>
<p>Melton Borough Council</p>	<p>Chief Manager of Planning and Technical Services,</p> <p>Council Offices,</p> <p>Nottingham Road,</p> <p>Melton Mowbray,</p> <p>Leicester LE13 OUL.</p> <p>Tel: 01664 567771.</p>	<p>Melton Mowbray.</p>
<p>North West Leicestershire District Council</p>	<p>Technical Services Officer,</p> <p>Council Offices,</p>	

	London Road, Coalville, Leicester LE6 2JF. Tel: 01530 833333	
Oadby and Wigston Borough Council	Engineer and Surveyor, Bushloe House, Station Road, Wigston, Leicester LE8 2DR Tel: 0116 2888961	Whole Borough.

LEICESTERSHIRE COUNTY COUNCIL DIVISIONAL AREAS

3.14 The County Council's Highways and Waste Management Branch is responsible for supervision of construction, highway drainage, adoptions and day to day network management and is split into three divisional areas and one "maintenance partnership". These areas and their extent are as follows:-

Northern Divisional Surveyor, Leicestershire County Council, Leicester Road, Melton Mowbray, Leicester LE13 0DA Tel: 01664 565731.	Charnwood and Melton
Southern Divisional	Blaby

<p>Surveyor,</p> <p>Divisional Office (Client),</p> <p>Coventry Road,</p> <p>Croft,</p> <p>Leicester LE9 6GP</p> <p>Tel: 01455 283341</p>	
<p>Harborough Highways Partnership</p> <p>Adam and Eve Street,</p> <p>Market Harborough,</p> <p>Leicester</p> <p>LE16 7AG.</p> <p>Tel: 01858 821060</p>	<p>Harborough, but contact LCC in the first instance for information on the new working Agreement within the District</p>
<p>Western Divisional Surveyor,</p> <p>Kilwardby Street</p> <p>Ashby-de-la-Zouch,</p> <p>Leicester LE6 5FR.</p> <p>Tel: 01530 414151.</p>	<p>Hinckley and Bosworth and North West</p> <p>Leicestershire</p>