

Appendix 19

Warrington Design Guide Extract – Road Hierarchy

FOREWORD

It is acknowledged that increasing levels of traffic, nationally and locally, cannot be sustained and that a change to provide sustainable development is required. The location and nature of development affects the amount and method of travel and is itself influenced by the accessibility of transport infrastructure and transport policy.

The Local Transport Plan 2006-2011 for Warrington sets out the Council's policies, strategies and programmes for developing an integrated transport system in the borough. It identifies five transport priorities: Tackling Congestion; Delivering Accessibility, Safer Roads, Better Air Quality and Improving Quality of Life that will be targeted throughout the 5-year period of the plan and beyond. A key part in achieving these priorities is the development of an integrated transport system, with walking, cycling and public transport being the three key modes of transport that will be target for promotion and investment. It is therefore vitally important that new developments are designed with these five shared transport priorities in mind and that they are designed to be accessible on foot, cycle and public transport, thereby reducing the reliance on the private car.

This approach to mode of travel closely reflects the need to develop estate road layouts that put safety and accessibility for pedestrian and cyclists high in the design process.

Creating good estate layouts is important in that it shapes the environment in which we all live. It is important that a balanced approach is taken in designing layouts, which encourage creativity in design. Roads, best thought of as streets, should be seen as part of the overall urban design and their layout will play an important part in creating surroundings which are safe, convenient, nuisance free, visually attractive and economical to construct and maintain. They must not dominate the design process but safety for all road users remains of prime importance and therefore a need to provide certain minimum/maximum standards that will ensure that safety is not compromised. Other than providing for the minimum/maximum standards, the designer is not constrained to providing definitive or prescriptive types of layout and we actively wish to encourage the creation of innovative and individual layouts to suit particular sites.

There is never a perfect time to introduce new local design guidance as new advice and sharing of best practice constantly emerges which inevitably continually shapes and changes the emphasis on some aspects of the street layout. This revised design guide therefore takes on board the significant changes in approach brought about by policies which relate to sustainability, reduced reliance on the private motor car, and in turn, car parking provision. A key factor in encouraging more walking and cycling is improving road safety through the control of vehicle speeds. For this reason new estate roads are being designed to constrain speeds to 20mph or less, with the aim that they can be designated as 20mph Zones upon completion where considered appropriate.

The information in this Design Guide is aimed at successfully and sympathetically balancing the range of design elements in order to make the difference between a poor or mediocre, though functionally acceptable design and an environmentally successful one.

The document will be kept under review to ensure that it keeps pace with best practice, operational experiences, national research and policy initiatives and other relevant changes in circumstances.

1.0 INTRODUCTION

- 1.1 The guide reflects changes to government planning policy and guidance, particularly Planning Policy Statement 1: Delivering Sustainable Development (PPS1) & Planning Policy Statement 3: Housing PPS3). In addition, it also complements Planning Policy Guidance 13: Transport (PPG13), Guidance on Transport Assessment and Manual for Streets (MfS), all of which highlight the need to encourage maximum flexibility in creating sustainable and well designed residential, commercial and industrial areas. It is important to note that Manual for Streets published, March 2007 replaces Design Bulletin 32 and Places, Streets and Movement.
- 1.2 The guide describes the Council's planning policy framework and the process for obtaining planning permission. It provides a framework for detailed guidance at a local level, gives examples of successful design and useful checklists for inspiration and helps make sense of the many complex issues that have to be considered in preparing development proposals.
- 1.3 The design guide applies to all types of development, large or small, urban or rural, commercial or residential, private or public and concentrates on the transport and highway issues of planning applications and is only part of providing good design and should be read in conjunction with other planning guidance documents.
- 1.4 Safety for all road users remains of prime importance and therefore the need to provide certain minimum/maximum standards which will ensure that road safety is not compromised and that roads, footpaths and cycle tracks are fit for their intended purpose and can be maintained that way.
- 1.5 Greater emphasis has also been placed on provisions for pedestrians, cyclists and public transport. Speed control and the introduction of 20mph Zones feature more strongly, since the safety of all road users remains of paramount importance. It is only by reducing vehicle speeds that greater flexibility can be exercised in the application of highway design principles, and this can help with the aim of raising the overall standard of the layout.
- 1.6 There are a number of statutory procedures with which developers must be fully familiar, since they can affect both the cost and the programme of a development, as well as its eventual adoption. Part 3 covers these in detail, and particular attention needs to be paid to the sections on the Advance Payments Code, works required within the existing highway, Sections 38 and 278 Agreements, inspection procedures and 20mph Zones and the Traffic Regulation Orders require in connection with them.

2.0 POLICIES

2.1 The Design Guide supplements national and regional guidance, and aims to meet the transport and highways policy objectives in the Council's Local Transport Plan 2006-2011, Unitary Development Plan (Adopted January, 2006) and ultimately, Local Development Framework Plans.

2.2 In March 2006 the Council established through its Local Transport Plan for 2006 to 2011 its priorities for transport, based upon those agreed by the Department for Transport and the Local Government Association:

- Tackling Congestion;
- Delivering Accessibility;
- Safer Roads;
- Better Air Quality;
- Improving Quality of Life.

These five transport priorities will help deliver the Council's strategic vision for transport: "...we will develop an accessible, integrated, affordable, inclusive and safer transport network for Warrington, which will help deliver social inclusion, sustainable economic regeneration and environmental improvement within our community." It is developments that help to deliver on the strategic vision and the five priorities for transport that will be promoted by the Council, with the emphasis on the promotion of developments within urban areas.

2.3 The Council will not expect a rigid adherence to every guideline. Instead they will be used to assess if there are any significant design or planning disadvantages to a scheme and whether these are important individually or collectively to justify refusal of planning permission.

2.4 The Council will promote developments within urban areas in locations, which are highly accessible to public transport and other modes such as walking and cycling. Major developments which are high traffic generators will be required to assess its public transport accessibility and if necessary upgrade or provide public transport services to serve the development. Large commercial/industrial, school and hospital developments will also be required to produce their own Travel Plans, setting targets and measures to achieve modal shift for employees away from car borne travel. Provision for the pedestrian and cyclist needs to be considered and appropriately designed roads and routes provided where necessary. Links to existing cycle/pedestrian networks should also normally be provided.

2.5 In instances where the additional traffic generated by development proposals would have an adverse impact on the highway network in the vicinity of the development or beyond, a planning obligation may be sought to negate the impact of such development. Planning obligations, in line with the Supplementary Planning Document, would only be sought in instances where improvements are seen to be of benefit to the general public and may take the form of road or public transport improvements and/or financial contributions. Any highway or transport infrastructure required to support the development must integrate with the existing infrastructure and be built in a way that enhances the quality of a development.

3.0 DESIGN PRINCIPLES

3.1 The design of roads within residential developments should be made to fit around the desired form of the residential layout and must not dominate it. However, it is still important that a hierarchy of roads is developed which puts traffic on appropriate routes whilst avoiding the creation of attractive routes for non access traffic. Road safety and maintenance of the operational efficiency of the local highway network are fundamental to the design of all roads, therefore the design of residential roads should influence drivers to respond to their surroundings and be aware of the speed that they are travelling along it. This can be achieved by the use of different road types, which have different functions, characteristics and standards.

3.2 In developing a framework for new layouts, priorities for all movements need to be established. Priority should be given to walking, public transport and cycling before the single occupancy car. The needs of people with disabilities should also receive particular attention and by so doing making movement easier for everyone. Developments should be designed to emphasize a sense of place and community, with routes for the movement of people established which would enhance those qualities. It is essential to provide certain standards in the interests of road safety and future maintenance and the characteristics and specifications of residential roads with different functions reflect this. However, it is emphasised that innovative and imaginative design solutions are actively encouraged and will be given due consideration. To encourage maximum flexibility developers should follow the main changes in the approach to street design recommended by MfS, which are as follows:

- applying a user hierarchy to the design process with pedestrians at the top;
- emphasising a collaborative approach to the delivery of streets;
- recognising the importance of the community function of streets as spaces for social interaction;
- promoting an inclusive environment that recognises the needs of people of all ages and abilities;
- reflecting and supporting pedestrian desire lines in networks and detailed designs;
- developing masterplans and preparing design codes that implement them for larger-scale developments, and using design and access statements for all scales of development;
- creating networks of streets that provide permeability and connectivity to main destinations and a 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 with reference to both the place and movement functions for each street;
- encouraging innovation with a flexible approach to street layouts and the use of locally distinctive, durable and maintainable materials and street furniture;

4.0 ROAD DESIGN AND STANDARDS

- 4.1 The layout and design of roads and footpaths within any new residential and commercial/industrial development form an integral part of the overall design concept and therefore cannot be considered in isolation. In line with an integrated transport policy, the concept of road hierarchy has been adopted within residential and commercial/industrial estates, from a small-scale cul-de-sac where pedestrian movements are predominant and vehicle speeds are restricted, to distributor roads catering for the free flow of the largest of vehicles.
- 4.2 The design of the estate using this hierarchy should prevent areas where people live or work being intruded upon by traffic from outside their immediate area whilst maintaining ease of access for residents, visitors and service vehicles to their homes and workplaces. The Guide is not intended to present a rigid set of rules to be followed in the design of layouts or to present standard layouts that can be applied but gives guidance on flexibility of use and where in some cases, minimum or maximum standards must be met.
- 4.3 There are several issues to consider when designing a residential layout and amongst these are:
- Function;
 - Street widths and components;
 - Junctions;
 - Features for controlling vehicle speeds;
 - Forward visibility on links;
 - Visibility splays at junctions;
 - Servicing;
 - Parking.
- 4.4 The road hierarchy for different types of roads require different road widths to accommodate its intended use and there are various factors that need to be considered in determining appropriate street widths. In most cases within residential areas, the road width will vary between 4.8m and 5.5m. Some of the factors to be considered are:
- The level of vehicular traffic and pedestrian activity;
 - Whether parking is to be allowed on-street and its distribution, occupation and enforcement;
 - The design speed for the road;
 - Whether any traffic measures such as traffic calming are to be included.
- 4.5 In lightly trafficked streets, carriageways may be narrowed over short lengths to a single lane as a traffic calming feature. In such single working sections of the street measures should be taken to prevent parking with a maximum width of 3.5m between constraining vertical features such as bollards. In certain circumstances this may be reduced to a minimum of 2.75m, which will still allow for the occasional large vehicles. In most cases widths between 3.1m and 3.9m should be avoided since they could result in drivers trying to squeeze past cyclists.

Figure 1: Road Hierarchy



4.6 District Distributor Roads

Distributor roads provide for the movement of vehicles between the different districts of a town or urban area. They will normally be designed in accordance with the Design Manual for Roads and Bridges (DMRB) issued by the Highways Agency, an executive agency of the Department for Transport (DfT). They are beyond the scope of this design guide and reference should be made to the appropriate national standards and Technical Advice/Design Notes.

4.7 Local Distributor Roads

Local distributor roads form the links between residential access roads and the district distributor roads. The function of the distributor road is to distribute access traffic and provide bus routes to residential developments. Where a speed limit of 30mph applies, direct frontage access is permitted on the distributor road as long as the daily traffic flow is no more than 10,000 vehicles. The roads will normally be designed in accordance with DMRB after referring to the local parameters as follows:

Table 1: Local Distributor Road Summary Design Parameters

	Typical Parameter	Notes
Provides access to:	Major residential roads, Minor access roads, Shared surface roads	
Serves	Over 300 dwellings	
Anticipated vehicle types	HGVs and all other types (assessment of likelihood of HGVs should be made depending on type of development and context of area)	Mandatory parameter range is pantechnicon
Min carriageway width	6.75m	
Min centreline radius	40m	
Design Speed	30 mph	
Distance between speed restraint features	80m to 120m	
Frontage access	Yes	Direct access will not be permitted within 20m of its junction with a classified road.
Footway	Minimum width 2.0m	Provided on both sides
Segregated cycle track	Optimum width 3.0m. Minimum 3.5m if combined with footway (assuming facility open on both sides)	Required on both sides. Transition between on & off street treatment at side roads/junctions require careful design
Verge	Required on both sides between carriageway edge and cycleway/footway. Minimum 1.5m wide	
Min forward visibility	60m	
Junction visibility - x	4.5m	
Junction visibility - y	90m	May be reduced if it can be demonstrated that vehicle speeds will be less than 30 mph
Min junction spacing - adjacent	90m	

Table 1: Local Distributor Road Summary Design Parameters (cont'd)

	Typical Parameter	Notes
Min junction spacing - opposite	45m	
Max gradient	1 in 12 (8.33 %)	Gradient may only be increased due to local topography
Min gradient	1 in 150 (0.67 %)	
Vertical curve min K value	6.5	May be reduced subject to a minimum curve length of 30m
Kerb radius	10m	
Kerb height	125mm	

4.8 Major Residential Access Roads

Access roads form the major part of residential road networks and provide direct access to individual dwellings and parking spaces (for properties with direct frontage access in sensitive locations, on site turning areas may be requested) and often links several residential areas to a local distributor road. They may serve between 50 and 300 dwellings (or equivalent mixed uses) including those located on other access roads feeding onto it. It should preferably have two points of access or take the form of a loop road with a short connection to a single point of access and a secondary emergency access link. Any through route must be designed so as it discourages non-essential through traffic. Cul-de-sac may be permitted on sites, which are too small to accommodate a loop road, or on sites where existing allocated or consented land is involved. Any such roads should however serve no more than 150 dwellings. The design speed for this access road is 20mph.

Table 2: Major Residential Access Road Summary Design Parameters

	Typical Parameter	Notes
Provides access to:	Minor Residential Access roads Shared Surface roads Private drives	
Gains access from	Classified Roads & Local Distributor	
Serve	Between 50 and 300 dwellings	
Anticipated vehicle types	Low pantechnicon, refuse vehicle, fire tender, car	Recommended parameter range is pantechnicon
Turning head	Yes, if cul-de-sac	
Frontage access	Yes	Direct access will not be permitted within 20m of its junction with a classified or Distributor road
Min carriageway width	5.5m	(6.0m for Bus Routes)
Min centreline radius	20m	
Design Speed	20 mph	25mph may be considered where vehicles would have to travel over a kilometre (0.6 miles) by '20 mph' roads.
Distance between speed restraint features	Between 60m and 80m	See advice on speed restraint features
Footway	Minimum width 2.0m	Required on both sides
Segregated cycle track	Optimum width 3.0m. Minimum 3.5m if combined with footway (assuming facility open on both sides)	Required on at least one side or both sides where appropriate. May not be required if design speed is demonstrably 20mph and or a large no of side junctions/drives interrupt route

Table 2: Major Residential Access Road Summary Design Parameters (cont'd)

	Typical Parameter	Notes
Verge	Required on both sides between carriageway edge and cycleway/footway. Minimum 1.5m wide	
Min forward visibility	35m	
Junction visibility – x	4.5m	May be reduced to 2.4m if side road is minor access road or lower category
Junction visibility – y	70m	May be reduced if it can be demonstrated that vehicle speeds will be less than 20 mph
Min junction spacing – adjacent	60m	May be reduced to 30m dependent on vehicle speed
Min spacing – junction opposite R/L	15m	Cross roads should be avoided, unless other features such as a roundabout is provided
Min spacing – junction opposite L/R	30m	
Max gradient	1 in 12 (8.33 %)	Gradient may only be increased due to local topography
Min gradient	1 in 150 (0.67 %)	
Vertical curve min K value	4	May be reduced subject to a minimum curve length of 25m
Kerb radius	6m	
Kerb height	125mm	

4.9 Minor Residential Access Roads

Minor residential access roads generally serve up to 100 dwellings including those in other residential areas which feed onto it and give direct frontage access to dwellings. It can either be a through road or a Cul-de-sac. If a cul-de-sac it should serve not more than 50 dwellings and have a secondary link for pedestrians and cyclists, capable of being used by emergency vehicles. (See 4.19 for further details). The design speed of this access road is 20mph.

Table 3: Minor Residential Access Roads Summary Design Parameters

	Typical Parameter	Notes
Provides access to:	Shared Surface roads Private drives	
Serve	Up to 50 dwellings	
Turning head	Yes, if cul-de-sac	
Anticipated vehicle types	Low pantechnicon, refuse vehicle, fire tender, car	Recommended parameter range is refuse vehicle
Frontage access	Yes	Direct access will not be permitted within 20m of its junction with a classified or Distributor road
Min carriageway width	4.8m	
Min centreline radius	15m	
Design Speed	20 mph	
Distance between speed restraint features	40m to 60m	
Footway	Minimum width 2.0m	Required on both sides where there is frontage access
Cycleway	No separate provision	
Verge	Required on both sides if no footway provided. Min width 2m	
Min forward visibility	25m	
Junction visibility - x	2.4m	
Junction visibility - y	60m	May be reduced if it can be demonstrated that vehicle speeds will be less than 20 mph
Min junction spacing – adjacent	30m	
Min spacing – junction opposite R/L	15m	Cross roads should be avoided, unless other features such as a roundabout is provided
Min spacing – junction opposite L/R	15m	
Max gradient	1 in 12 (8.33 %)	
Min gradient	1 in 150 (0.67 %)	
Vertical curve min K value	2	May be reduced subject to a minimum curve length of 20m
Kerb radius	6m or 4m	
Kerb height	125mm	

4.10 Shared Surface Roads

The primary purpose of these roads is to provide direct access to dwellings with shared use by vehicles and pedestrians. They are engineered with low traffic speeds and help create a sense of community. Since pedestrians and vehicles share the same surface it is most important that all road users are made aware of the separate and distinctive nature of these roads. The distinction between other residential estate roads must be made, not only by the presence of traffic calming measures, but also by the use of differing carriageway surfacing materials subject to the approval of the Local Highway Authority. It is not appropriate to provide formal footways adjacent to the shared surface road and therefore any road where footway links are required will need to be designed as Minor Access Road.

Table 4: Shared Surface Roads Summary Design Parameters

	Typical parameter	Notes
Provides access to:	Shared Surface roads Private drives	
Serve	Up to 50 dwellings if formed as a loop road	25 dwellings if formed as a cul-de-sac
Turning head	Yes, if cul-de-sac	
Anticipated vehicle types	Low pantechnicon, refuse vehicle, fire tender, car	Recommended parameter range is refuse vehicle
Frontage access	Yes	
Min carriageway width	4.8m total width	5.5m with frontage access
Min centreline radius	15m	
Design Speed	Below 20 mph	
Distance between speed restraint features	40m	
Footway	No separate provision	
cycleway	No separate provision	
Verge	Required on both sides. Min width 2m	
Min forward visibility	25m. Overrun widening on bend if required	
Junction visibility - x	2.4m	
Junction visibility - y	45m	
Min junction spacing – adjacent	30m	
Min spacing – junction opposite R/L	15m	Cross roads should be avoided, unless other features such as a roundabout is provided
Min spacing – junction opposite L/R	15m	
Max gradient	1 in 12 (8.33 %)	
Min gradient	1 in 150 (0.67 %)	
Kerb radius	6m or 4m	
Kerb height	25mm	