Place & Movement Planning and Design Guidance for Hertfordshire Part 3

Hertfordshire County Council Highways and Growth & Environment

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Hertfordshire

Chapter 1
Introduction to Preparing for a Planning Application including Design Menu Cards

Contents

Introduction

1.1 This Part of the Place & Movement Planning and Design Guide (P&MPDG) sets out how high-level principles established at the master planning stage, in accordance with Part 2 of this guidance, can be translated into the design of new or improved highways suitable for the emerging planning application or the general arrangement, in the case of permitted development schemes.

1.2 The shaping of sustainable transport schemes and development to meet Hertfordshire's Local Transport Plan 4 (LTP4) at the master planning stage should have proposed new or improved sustainable highways in environments of local character that provide a sense of place, encourage active travel and contribute positively to public health and social wellbeing.

1.3 The proposals will have reduced the need for travel and put walking, cycling and passenger transport at the core of the transport infrastructure provision.

1.4 Traditionally, development sites and their associated transport proposals could come forward based on flawed principles with the resulting planning applications focusing on road design requirements leaving the provision for sustainable modes to be fitted within the planning permission's 'red line' and within budget as best as possible much later in the process, which often resulted in sub-optimal solutions.

1.5 Planning for sustainable development needs greater consideration at the early planning stage if the resulting development is to keep within the 'red line' and be LTP4 compliant, without compromise.

1.6 Gaining a better understanding of the transport provision needs at an early stage will not only ensure there is adequate space made available for them but will also give a better understanding of their associated costs, which will be helpful for budgeting, land value and site viability calculations.

1.7 As sustainable modes are given the highest priority within the hierarchy of provision through Policy 1 of LTP4 it will be important that policy compliant provision for them is demonstrated within planning applications.

1.8 Similarly, strategies for earthworks and sustainable drainage need to demonstrate compliance at the planning application stage because they can significantly affect environmental impact and the 'red line'.

1.9 This part of the guidance covers the standardised project stages and LTP4 Compliance gateways for 'Outline Planning' and 'Full Planning':

- DfT Local Major Projects Business Cases
- HCC Medium Sized and Major Capital Projects included within the LTP4 Delivery Plan
- Minor schemes HCC Integrated Transport Projects within the Integrated Works Programme
- Developments

Project Type	Place & Movement Planning and Design Guide Part 3			
Dft Local Majors	**Business Case Preparation**			
HCC LTP Delivery Plan Transport Projects	**Stage 3: Preferred Option**	**Gateway 3: Project approval**	**Stage 4: Design**	**Gateway 4: Conditional Approval**
	Outline Design to 1:1250 & Consultation	Cabinet decision to seek powers. Dft Programme Entry	Design to 1:500 & Statutory Approval Process	Planning Permission granted. SoS decision on CPO. Stewardship Agreed
HCC ITP Schemes	**Stage 2 - WCS Design Functions**			
	Stage 2b - Outline Design			Confirmed in IWP
Developments	Pre - Plannning			Policy Compliant Planning Application
LTP4 Compliance Testing Gateways		Test 2B: Outline Planning - Committed Option (if applicable)		Test 3: Full Planning - Detailed Scheme Proposal

Integrated Planning & Design

2.1 This Part promotes an integrated approach to the planning and design for Place and Movement (P&M), accessibility, safety, health, security, local character, speed management, routes to school, parking, soft a hard landscaping with the aim of avoiding conflicting advice for potentially competing needs, whilst reinforcing the priorities for sustainable travel above other modes.

2.2 Design Menu Cards (DMCs), appended to this chapter, have been prepared for each P&M category to provide a handy guide and signpost to appropriate design standards and highway features. The DMCs provide a range of options from which engineering skill and judgement can be applied to select an optimum design solution that will best deliver the required outcomes.

2.3 A keen focus needs to be placed on how effective the selected combination of highway features and their associated design standards will deliver those outcomes. Whilst the DMCs draw together the design parameters into one place for ease of reference, they are not a substitute for consulting the more detailed, context setting chapters from which those parameters were derived.

2.4 It is the contexts that should influence the final selection of appropriate widths, vertical and horizontal alignments for links and the selection of accompanying features. This is particularly important when designing improvements to the existing network where it may be difficult to apply all the features to all the stated standards to create all the right conditions.

2.5 Departures from standards are considered by Design Review Panels (see Part 1, Chapter 8: Standards & Departures), which will look to ensure that whilst the geometric design proposals for highway improvements need to reflect the allocated Place & Movement category and the LTP4 user hierarchy, their overall spatial requirements should not do so at the unacceptable expense of other factors such as environmental impact, buildability, safety and whole life-costs.

2.6 Improving a highway within the confines of the existing highway boundary presents a greater challenge than planning for new highways and, therefore, departures from standards may be a more common requirement.

2.7 Departures from standards are considered by Design Review Panels (see Part 1, Chapter 8: Standards & Departures), which will need to take a balanced approach considering the following factors:

- The relative priority of users defined by LTP4
- Environmental impact
- Buildability
- Safety
- Whole life-costs

2.8 Whilst the geometric design proposals for highway improvements need to reflect the allocated Place & Movement category and the LTP4 user hierarchy, providing for their overall spatial requirements should not be made at the unacceptable expense of the other factors.

2.9 For example, it is unlikely to be acceptable in environmental terms, to make spatial provision for all modes to the acceptable limits defined within the Design Menu Cards if that dictates that valuable landscaping, biodiversity or sustainable flood management facility will be lost without opportunity for compensation. These factors, which are important in their own right, also contribute to the sense of place and encourage active travel.

Planning & Designing for Sustainable Travel

3.1 P&M categories should generally have been assigned at the master planning stage alongside the identification of Active Travel and Sustainable Travel Links, because their designation will influence the preparation of the planning application significantly.

3.2 This Part of the guidance sets out the geometric design requirements for active travel users, that promote well aligned, direct routes with suitable widths, gradients and junctions.

3.3 Guidance is given on the planning for the seamless use of passenger transport between new development and other major settlements through the provision of infrastructure, building on key principles established at the Master Planning stage.

3.4 It defines the differentiations between the various passenger transport types and how they should be provided for.

3.5 Guidance is given on how Transport Hubs should be designed to be recognisable and easily accessible places which integrate different transport modes and supplements them with enhanced facilities, services and information aimed at encouraging more sustainable travel, creating sense of place and improving journeys and travel choices.

3.6 Guidance on the design and construction of all-purpose highways is given, ensuring that the needs for active travel and passenger transport dictate the standards.

General Planning & Design Advice

4.1 Guidance on the preparation of strategies and outline designs are provided for:

- Drainage & Flood Management strategies and outline design which cover the whole site demonstrating how the highway and adjacent land will be managed for drainage to enable the resultant impact on the drainage of the public highway to be considered.
- Earthworks strategies demonstrating that sustainable resource management action will be taken, consideration has been made for any contamination remediation, materials recycling and needs for stabilisation and acceptable gradients for the intended provision for walking, cycling and equestrians can be achieved.
- Street lighting strategies and outline design aimed at reducing energy consumption and carbon impact, light pollution, street clutter and operational costs, whilst continuing to support the local economy, maintaining safety and accessibility and preventing crime and disorder.
- Intelligent Transport Systems (ITS) opportunities to enable 'SMaRT Journeys' to be made by Informed Travellers - Online, On Street and On the move, where 'SMaRT' means that journeys will be:

  - **S**afe

  - **M**anaged &

  - **R**esponsive through effective use of

  - **T**echnology

- Signing Strategy Plans to identify routes and destinations for all modes, consideration of environmental impacts, hazards and hazard mitigation and proposals for approximate signage sizes and positions to demonstrate feasibility.
- Structures and Road Restraint System strategies.

4.2 All schemes will require a draft 'Whole Life Management Plan' (WLMP) that provides clarity as to who it is proposed to own the various highways and transport assets, who is going to maintain and manage them and how they are going to be funded.

4.3 Even the smallest and simplest of schemes, will require a WLMP. In its simplest form this could simply be a few sentences under a heading 'Whole Life Management Plan' that includes:

- A clear reference to a plan that shows the proposed highway boundary
- A statement that says that there will be no-nonstandard assets within or affecting the highway to be used that will need special maintenance or incur commuted sum levies
- The proposal that the Highway Authority (HCC) will adopt, fund and manage the maintenance and operation of all the highway assets

4.4 In general, it will be the complexity of the scheme proposals in asset management terms rather than size that will dictate the scale of the WLMP.

4.5 Once a small development intends to include say a retaining wall or a SuDS feature then HCC will need the more detailed proposals set out in the Plan. It should not need more thinking than would have traditionally been taken, but it is captured and presented for mutual understanding, agreement and for the record all in one place.

4.6 The same principle for scale and detail applies to all of the required strategies set out in 4.1 above.

Part 3: Chapter 1 Appendix Design Menu Cards

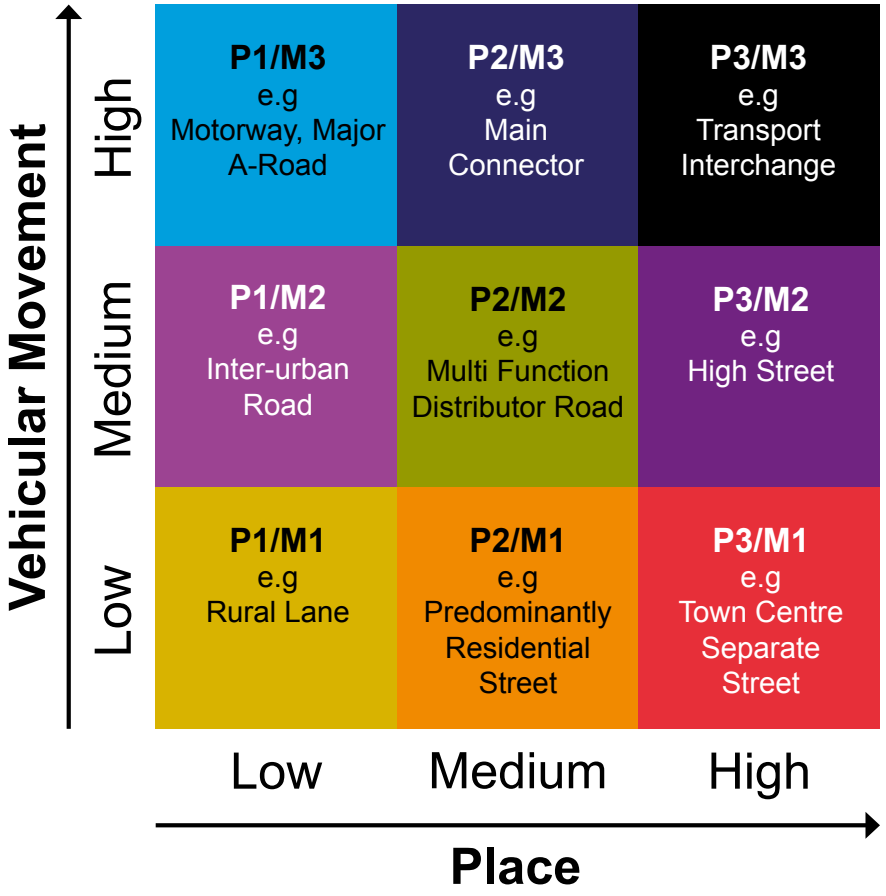
The following Design Menu Cards (DMCs) have been prepared for each P&M category to provide a handy guide and signpost to appropriate design standards and highway features. They provide a range of options from which engineering skill and judgement can be applied to select an optimum design solution that will best deliver the required outcomes.

The DMC tables have been subdivided vertically to aid screen reading software which makes computers accessible to blind and partially sighted people. Copies of the more compact original merged tables are available on request from dmplanning@hertfordshire.gov.uk.

Whilst they draw together the design parameters into one place for ease of reference, the DMCs are not a substitute for consulting the more detailed, context setting chapters from which the parameters were derived. It is the contexts that should influence the final selection of appropriate widths, vertical and horizontal alignments for links and the selection of accompanying features.

Departures from standards are considered by Design Review Panels (see Part 1, Chapter 8: Standards & Departures), which will look to ensure that whilst the geometric design proposals for highway improvements need to reflect the allocated Place & Movement category and the LTP4 user hierarchy, their overall spatial requirements should not do so at the unacceptable expense of other factors such as environmental impact, buildability, safety and whole life-costs.

Hertfordshire's Place & Movement matrix



Contents

P1/M3

Major A road or Motorway or Primary Road connecting two large urban settlements and carrying more strategic traffic. Identified using the Strategic Road Network, Primary Road Network and Major Road Networks.

Classifications

- Primary Distributor and
- Urban Main Distributor

Characteristics

Speed limit

- Rural: National Speed Limit
- Semi-Urban: 50mph
- Urban: 40mph

Up to and including 40mph Active Travel Provision

Recommended Standard

- Segregated footway & cycle track separated from carriageway
- Shared Use separated from carriageway

Acceptable Standard

- Shared Use (Urban 40mph) separated from carriageway

Up to and including 40mph Active Travel Provision

- Signal Controlled crossing points or grade separation at junctions or desire lines
- Direction Signage
- Cycle priority at side roads up to 40mph limit only

Provision for Passenger Transport

- Bus Priority at Junctions
- Potentially laybys for safety or timetabling purposes only
- Bus lanes
- Bus stops & RTPI
- At least passive provision for shelters, seating & cycle parking.

Frontage access

- No

Other Access Forms

- Not generally.

Gateway

- No

Junction Forms

- Grade separation (Rural)
- Conventional Roundabouts
- Signalled Junctions
- Ghost Islands

Street Lighting

- Unlit except at safety features & roundabouts

Frontage access

- No

Gateway

- No

Pavement Materials

- Bituminous

Planting

- Standard specification trees, no need for enhancement
- No planting in SuDS features with slopes steeper than 1:5
- Shrubs used in edge planting not to be planted within 1.2m (national speed limit) or 0.6m (50mph) from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1.2m (national speed limit) or 1m (50mph)
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum Cover to pipes under carriageway
- 900mm minimum Cover to pipes under footway, cycleway and verge

Provision for Commercial Vehicles

- Laybys with separation islands

Car Parking

- Laybys

Restraint Systems

- Road restraint systems and passive posts.

Design Codes

DMRB

Geometric Design Parameters

Design Speed

Speed Limit	Design Speed
40mph	70kph
50mph	85kph
60mph	100kph
70mph	120kph

Min forward visibility: DMRB

Junction spacing: DMRB

Minimum Footway width

Recommended	Total: 2.6m	Effective: 2.6m
Acceptable	Total: 2m	Effective: 2m

Minimum Footway widths including cycle parking

Recommended	Perpendicular: 5.2m	Parallel: 4m
Acceptable	Perpendicular: 4m	Parallel: 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width
see P2/M1 Active Travel Links Design Menu Card below

Carriageway width

- National Speed Limit: 7.3m plus 1m hard strips
- 50mph and below: 7.3m
- Design Review Panel to consider proposals if separated cycle facilities are not included

Minimum horizontal curve (radius): DMRB Standard

Reverse curves (min separation): DMRB Standard

Transition Curves: DMRB Standard

Maximum distance between speed restraints: DMRB Standard

Min K value: DMRB Standard

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Access: DMRB Standard

Minimum Verge Width (with utilities): 2.5m

Minimum horizontal clearance to street lighting column

1.5m	@ National Speed Limit
1m	@ 50mph

Minimum horizontal clearance to other obstructions

1.2m	@ National Speed Limit
0.6m	@ 50mph

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)

3.5m (3m)	@ National Speed Limit 70mph
2.5m (2m)	@ National Speed Limit 60mph
2m (1.5m)	@ 50mph
1m (0.5m)	@ 40mph

P2/M3

Main Connector linking a strategic road (P1/M3) usually to a settlement. The roads should be over 5.5 m wide and are predominantly A roads.

Classifications

- Rural Main Distributor
- Rural Secondary Distributor

Characteristics

- Speed Limit 50

Active Travel Provision

Recommended Standard

- Segregated footways & cycle tracks
- Shared Use but segregated from carriageway

Acceptable Standard

- Unsegregated Shared Use

Active Travel Provision

- Signal Controlled Crossings
- Priority at side roads
- Direction Signage
- Bus stop bypasses or bus stop boarders

Provision for Passenger Transport

- Bus Priority at Junctions
- Bus stops & RTPI
- Potentially laybys for safety or timetabling purposes only
- At least passive provision for shelters, seating & cycle parking

Frontage access: Not normally

Other Access Forms: Not generally

Gateway: Town 'Welcome' Sign

Junction Forms

- Roundabouts (Conventional or Signalised)
- Signalled junctions
- Ghost islands

Street Lighting

- Part Night Lighting

Pavement Materials

- Bituminous

Planting

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 0.6m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1.2m minimum Cover to pipes under carriageway
- 0.9m minimum Cover to pipes under footway, cycleway and verge

Design Codes

DMRB

Geometric Design Parameters

Design Speed: 40mph

Min forward visibility: 120m

Junction spacing

40m	opposite
66m	adjacent

Minimum Footway width

Recommended	Total: 2.6m	Effective: 2.6m
Acceptable	Total: 2m	Effective: 2m

Minimum Footway widths including cycle parking

Recommended	Perpendicular: 5.2m	Parallel: 4m
Acceptable	Perpendicular: 4m	Parallel: 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: see P2/M1 Active Travel Links Design Menu Card below

Carriageway width

- 7.3m
- Design Review Panel to consider proposals if separated cycle facilities are not included

Minimum horizontal curve (radius): DMRB standard

Reverse curves (min separation): DMRB standard

Transition Curves: DMRB standard

Maximum distance between speed restraints: N/A

Min K value: DMRB standard

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Minimum Verge Width (with utilities): 2m

Minimum horizontal clearance to street lighting column: 1m

Minimum horizontal clearance to other obstructions: 0.6m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable): 2m (1.5m) 50 mph

P3/M3

An urban interchange between two or more modes of transport, for example a railway station/bus station/taxi rank/cycle hub.

Characteristics

Hub signage & pillar, public realm improvements including public art, community facilities, minor retail, cash machines

User Provision

- Shelter
- Seating
- Changing facilities, showers, lockers
- Traveller information (routing, weather, docking station location etc)
- Direction signage
- Mobile device charging

Walking Provision

- Footways & crossing facilities

Cycling Provision

- On-highway cycling
- Highway, cycleway and crossing facilities
- Secure storage / parking sufficient for both interchange users and those needing parking for other local facilities.
- Depot space for cargo bikes

Provision for Passenger Transport

- Busway
- Bus Priority
- Taxi rank and/or waiting area and drop-off

Gateway

- Hub signage & pillar

Lighting

- Full Night Lighting

Paving Materials

- Bituminous
- Bituminous with block paved features
- Standard block paving

Planting Requirements

- Tolerant to the high quantities of road salt, pollution, compaction and heavy pruning
- No planting in SUDs features with slopes steeper than 1:5

Provision for Commercial Vehicles

- Provision for service and delivery vehicles
- Parking and depot for cargo bikes

Car Parking

- Pick-up/drop area
- Short stay parking
- Potentially long-stay parking

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum Cover to pipes under carriageway
- 900mm minimum Cover to pipes under footway, cycleway and verge

P1/M2

Inter-urban road (A, B or C but excluding the SRN and MRN network), above 5.5 metres and with a centre line, connecting two settlements within a rural setting.

Classifications

- Main Distributor
- Secondary Distributor

Characteristics

Speed Limit

- Rural: National Speed Limit
- Semi-Urban: 50mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle tracks
- Shared Use but segregated from carriageway

Acceptable Standard

- Unsegregated Shared Use

Active Travel Provision

- Signal Controlled Crossings
- Priority at side roads.
- Direction Signage
- Bus stop bypasses or bus stop boarders

Provision for Passenger Transport

- Bus Priority at Junctions
- Bus stops & RTPI
- Potentially laybys for safety or timetabling purposes only
- At least passive provision for shelters, seating & cycle parking

Frontage access: Not normally

Other Access Forms: DMRB Standard

Gateway: None

Junction Forms

- Roundabouts (Conventional or Signalised)
- Signal Junctions
- Ghost islands

Street Lighting: Unlit except at safety features & roundabouts

Pavement Materials: Bituminous

Planting: Standard specification trees, no need for enhancement

Provision for Commercial Vehicles: Laybys with separation islands

Car Parking: Clearways and laybys

Design Codes

- Manual for Streets 2

Geometric Design Standards

Design Speed: 40mph

Min forward visibility: 120m

Junction spacing

40m	opposite
66m	adjacent

Minimum Footway width

Recommended	Total: 3.1m	Effective: 2.6m
Acceptable	Total: 2m	Effective: 1.5m

Minimum Footway widths including cycle parking

Recommended	Total: 5.2m	Effective: 4m
Acceptable	Total: 4m	Effective: 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: see P2/M1 Active Travel Links Design Menu Card below

Minimum horizontal curve (radius): DMRB standard

Reverse curves (min separation): DMRB standard

Transition Curves: DMRB standard

Maximum distance between speed restraints: N/A

Min K value: DMRB standard

Minimum Verge Width (with utilities): DMRB standard

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Minimum horizontal clearance to street lighting column

1.5m	@ National Speed Limit
1m	@ 50mph

Minimum horizontal clearance to other obstructions

1.2m	@ National Speed Limit
0.6m	@ 50mph

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)

3.5m (3m)	@ National Speed Limit
2m (1.5m)	@ 50mph

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1.2m minimum Cover to pipes under carriageway
- 0.9m minimum Cover to pipes under footway, cycleway and verge

P2/M2: Residential Distributor Roads

Multifunctional inner urban/suburban roads, A, B, C or U roads and have bus routes, connecting different parts of an urban settlement and non-residential access road including to and within industrial estates.

P2 /M2 also connect to P1/M3 and P2/M3 road category types within an urban setting.

Classifications

- Main Distributor
- Secondary Distributor
- L1 Local Distributor
- L2 Local Access

Characteristics

Speed limit

Main & Secondary Distributor	40mph
L1 (Local Distributor)	30mph
L2 (Local Access)	20mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle track
- Shared Use but segregated from carriageway
- Footways & Stepped Cycle Track

Acceptable Standard

- Footways & Light segregation or cycle lanes for existing highways with constrained widths.
- Footways & On-street cycling designed for 85th percentile speeds of 22mph or lower if parking controlled for L2.

Active Travel Provision

- Signal controlled crossings
- Zebra & Parallel Crossings for L1(Local Distributor) & L2 (Local Access)
- Bus stop bypasses or bus stop boarders
- Direction signage
- Priority at side roads.

Provision for Passenger Transport

- Bus lanes
- Bus Priority at Junctions
- Bus stops & RTPI
- Potentially laybys on Main / Secondary Distributors for safety or timetabling purposes only
- At least passive provision for shelters, seating & cycle parking.

Frontage access: Not Normally

Gateway: None

Junction Forms

Main & Secondary Distributor

- Continental / Compact Roundabouts
- Signal junctions
- Priority junctions
- Ghost Islands

L1 Local Distributor L2 Local Access

- Continental / Compact Roundabouts
- Signal junctions
- Priority junctions

Street Lighting: Part Night Lighting

Pavement Materials: Bituminous

Planting

- Standard specification trees, no need for enhancement
- No planting in SUDs features with slopes steeper than 1:5
- Shrubs used in edge planting not to be planted within 0.6m (40mph) or 0.5m (30mph and below) from the edge of the carriageway

- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Car Parking: Restricted / Controlled on-street parking

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1.2m minimum cover to pipes under carriageway
- 0.9m minimum cover to pipes under footway, cycleway and verge

Design Codes

- DMRB for Main & Secondary Distributor
- Manual for Streets for L1 Local Distributor and L2 Local Access Road

Road Hierarchy Designation

Main & Secondary Distributor

Min forward visibility 120m

Junction spacing CD123

Carriageway width 7.3m

Design Review Panel to consider proposals if separated cycle facilities are not included

Minimum Recommended Footway width

Total 2.6m Effective 2.6m

Minimum Acceptable Footway width

Total 2m Effective 2m

L1 Local Distributor (30mph)

Min forward visibility 43m

Junction spacing

30m opposite

43m adjacent

Carriageway width 6.5m

Minimum Recommended Footway width

Total 3.1m Effective 2.6m

Minimum Acceptable Footway width

Total 2m Effective 1.5m

L2 Local Access Road (20mph)

Min forward visibility 25m

Junction spacing

20m opposite

45m adjacent

Carriageway width 6.2m

Minimum Recommended Footway width

Total 3.1m Effective 2.6m

Minimum Acceptable Footway width

Total 2m Effective 1.5m

Minimum Footway widths including cycle parking

Recommended Perpendicular: 5.2m Parallel: 4m

Acceptable Perpendicular: 4m Parallel: 3.6m

Minimum Footway widths at Bus stops

Recommended: 5m

Acceptable: 3.8m

Minimum Cycleway width

see P2/M1 Active Travel Links Design Menu Card below

Minimum Cycle lane width

Recommended: 2m

Acceptable: 1.5m

Minimum horizontal curve (radius)

DMRB standard 44m 16m

Reverse curves (min separation)

DMRB standard 20m 14m

Transition Curves

DMRB standard Not applicable Not applicable

Maximum distance between speed restraints

Not applicable 100m 80m

Min K value

DMRB standard 6.5 2

Longfall - Carriageway 1% to 5%

Longfall - Active Travel provision:
see P2/M1 Active Travel Links Design Menu Card below

Access type

DMRB standard Bell-mouth Bell-mouth

Minimum Verge Width (with utilities)

DMRB 1.5m (2m) 1.5m (2m)

Minimum horizontal clearance to street lighting column
1m 0.8m 0.8m

Minimum horizontal clearance to other obstructions

0.6m 0.5m 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)
1m (0.5m) 0.5m (0m) N/A

P2/M2: Industrial, Commercial or Service Roads

Non-residential access road including to and within industrial estates.

Classifications

L1 Local Distributor

Characteristics

Speed limit: 30mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle track
- Shared Use but segregated from carriageway
- Stepped Cycle Track

Acceptable Standard

- Footways & light segregation or cycle lanes for existing highways with constrained widths

Active Travel Provision

- Signal Controlled crossings
- Zebra & Parallel Crossings
- Bus stop bypasses or bus stop boarders
- Direction Signage
- Priority at side roads.

Provision for Passenger Transport

- Bus lanes
- Bus priority at junctions
- Bus stops & RTPI
- At least passive provision for shelters, seating & cycle parking.

Frontage access: Yes - with appropriate planning conditions

Other Access Forms: Bell-mouths

Gateway: Normally signing

Junction Forms

- Continental / Compact Roundabouts
- Signal junctions
- Priority junctions

Street Lighting: Part Night Lighting

Pavement Materials: Bituminous

Planting Requirements

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 500mm from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Design Codes

- Manual for Streets

Geometric Design Standards

Min forward visibility (Enhanced for HGVs): 51m

Junction spacing

30m	opposite
50m	adjacent

Junction type

- Compact or Continental Roundabouts
- Signal Junctions
- Priority Junctions

Carriageway width: 6.5m

Minimum Footway width

Recommended	Total 3.1m	Effective 2.6m
Acceptable	Total 2m	Effective 1.5m

Minimum Footway widths including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum Footway width at Bus stops

Recommended 5m

Acceptable 3.8m

Minimum Cycleway width: see P2/M1 Active Travel Links Design Menu Card below

Minimum cycle lane width

Recommended 2m

Acceptable 1.5m

Minimum exclusive bus lane width

Recommended 4.5m

Minimum horizontal curve (radius): 44m

Reverse curves (min separation): 20m

Transition Curves: Not applicable

Maximum distance between speed restraints: Not applicable

Min K value2: 6.5

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Minimum Verge Width (with utilities): 1.5m (2m)

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable): 0.5m (0)

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

P3/M2

Inner urban road with a predominance of retail (3 premises within 15m) and other commercial land uses, e.g. high street, local shopping parades, retail parks.

Classifications

- Main Distributor
- Secondary Distributor
- L1 Local Distributor
- L2 Local Access

Characteristics

- Serving an economic hub or district shopping area in large towns. A place for people to meet and shop.
- Typical street scene includes street trees, licensed tables & chairs, advertisements, bus shelters, taxi ranks, places for shade, shelter & rest

Speed Limit: 20mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle tracks
- Shared Use but separated from carriageway
- Footways & Stepped cycle track
- Footways & on-street cycling designed for 85th percentile speeds of 22mph or lower if parking controlled

Acceptable Standard

- Footways & light segregation or cycle lanes for existing highways with constrained widths
- Footways & contraflow cycle lanes

Active Travel Provision

- Preferably Zebra or Parallel (raised) crossing for pedestrians
- Priority at side roads.
- Bus stop bypasses or bus stop boarders
- Way finding signage
- Cycle parking
- Bike hire

Provision for Passenger Transport

- Bus priority at junctions
- Bus stops, shelters, seating, cycle parking, RTPI
- Taxi rank and/or waiting area and drop-off

Frontage access: Only for Access Road

Maximum Dwellings: 300 per km for Access Road

Access Forms

- Vehicle crossover for up to 2,000 PCU per day on the entry arm
- 4m radius bell mouth

Gateway: Desirable

Junction Forms

- Priority Junctions
- Signalled Junctions

Street Lighting: Full Night Lighting

Pavement Materials

- Bituminous
- Bituminous with block paved features
- Standard block paving

Planting Requirements

- Compact crown, in keeping with local character/townscape, tolerant to urban pollution
- Specimen tree, compact crown, in keeping with local character/townscape, tolerant to urban pollution
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Provision for Commercial Vehicles: Loading Areas for premises if not off-street

Car Parking: Regulated parking required (time limited) to enable turnover

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum Cover to pipes under carriageway
- 900mm minimum Cover to pipes under footway, cycleway and verge

Design Codes

- Manual for Streets

Geometric Design Standards

Design Speed: 20mph

Min forward visibility: 33m

Junction spacing

20m	opposite
33m	adjacent

Carriageway width

6.2m - 6.7m determined by provision for safe cycling and buses

Traffic lane width for on-street cycling

Cars Only

	Recommended 3m	Acceptable 2.75m

Notes: 2.5m only at offside queuing lanes where there is an adjacent flared lane

Bus Route or >8% HGVs

	Recommended 3.2m	Acceptable 3m

Notes: Lane widths of between 3.2m and 3.9m are not acceptable for cycling in mixed traffic.

Minimum Footway width

Recommended	Total 4m	Effective 3.5m
Acceptable	Total 3.5m	Effective 3m

Minimum Footway including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: see P2/M1 Active Travel Links Design Menu Card below

Minimum cycle lane width

Recommended	2m
Acceptable	1.5m

Vehicle Parking

- Powered two-wheeler parking bays 2.5m x 1.5m
- Standard car parking space 6m x 2.5m
- Disabled parking bays 6.5m x 2.9m (plus 1m clearance)
- Recommended minimum separation between parking bay and cycle track is 1m (Acceptable Minimum of 0.5m)

Minimum horizontal curve (radius): 16m

Reverse curves (min separation): 14m

Transition Curves: N/A

Maximum distance between speed restraints: 80m

Min K value: 2

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable): 0.5m (0)

Drainage SuDS features shall have slopes no steeper than 1 in 3

- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

P1/M1

Minor road within rural setting (within countryside, hamlet or small village). Typically narrow roads, with widths under 5.5 metres

Classification:

- Rural Local Distributor

Characteristics

- Recognises local character, the surrounding environment and usage of the local highway network.
- Low numbers of vehicle trips with pedestrians and cyclists sharing carriageway
- Design speed no greater than 40mph (70kph)
- Local considerations for farm access and agricultural vehicles may require a wider carriageway
- Historic or sympathetic signage. No yellow back boards
- Road marking limited to junctions or edge lines
- Passing Place provision in single lane situations
- Verges accommodate places of shade, shelter and rest as appropriate.
- Consideration given to how verge overruns can be avoided

Speed Limit: National Speed Limit

Walking Provision: On-road. Give consideration of whether walkers should be able to walk on the verge.

Cycling Provision: On-road

Provision for Passenger Transport: Not expected to be on bus route

Frontage access: Yes

Maximum Dwellings: 40 per km

Other Access Forms: Simple bell-mouth

Gateway: Desirable

Junction Forms: Simple Junctions

Street Lighting: Unlit, except at roundabouts

Pavement Materials: Bituminous

Planting

- Standard specification trees, no need for enhancement.
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Provision for Commercial Vehicles: HGV through trips discouraged. Area wide HGV restrictions may be appropriate

Car Parking: No provision or controls

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

Design Codes

DMRB and the Manual for Streets unsuitable for designing new, extended or diverted rural lanes and could give rise to unwelcome consequences such as an increase in motor vehicle dominance.

- Recognise local character, the surrounding environment and usage of the local highway network considering the two standards and:
- Environmental Guidelines for the Management of Highways in the Chilterns, Chilterns Conservation Board (2009)
- Traffic in Villages: Safety and Civility for Rural Roads; A toolkit for communities. (2011) Dorset AONB Hamilton-Baillie Associates

Design concepts for Zonal 40mph (e.g. New Forest)

A Design Review should be sought, if in doubt

Design speed: 70kph (40mph)

Min forward visibility: 120m @ 70kph

Junction spacing: CD123

Carriageway width: 5.5m or 3.7m with passing places

Minimum horizontal curve (radius): Not specified

Reverse curves (min separation): Not specified

Super elevation: Only as a remedial measure

Max distance between speed restraints: 150m

Min K Value: DMRB (70kph)

P2/M1 Streets

Inner urban/suburban/rural residential street identified using address base premium residential properties and other land use datasets where the presence of dwellings has been identified on at least one side of the carriageway.

Designated Quiet Lanes and lanes within the Chilterns Area of Outstanding Natural Beauty (AONB).

Active and Sustainable Travel Links (ATL & STL)

Classifications

- L2 Local Access

Characteristics

- Existing streets typically 30mph speed limit and street lit.
- New streets to be 20mph areas with road markings at junctions only - no centre lines

Speed Limit: 20mph

Active Travel Provision

Recommended Standard

- Footways & on-street cycling for new highways by street design
- Segregated provision for ATLs & STLs
- Segregation from busway within STLs

Acceptable Standard

- Footways & parking controls and traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Shared facilities for ATLs & STLs. Unless the ATL is on a main route on the local cycle network in which case it should be fully segregated.
- Footways & contraflow cycle lanes

Active Travel Provision

- Cycle Streets in urban areas
- Wayfinding signage
- Cycle parking
- Places to stop and rest

Provision for Passenger Transport: Not expected to be on bus route

Street Lighting: Part Night Lighting

Maximum dwellings: 300 per km

Frontage Access: Yes

Access Forms

- 4m radius bell-mouths
- Vehicle crossover for up to 2,000 PCU per day on the entry arm.

Junction Forms: Simple Priority

Gateway: No

Pavement Materials: Bituminous

Planting

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Provision for Commercial Vehicles: Allow for safe pick up and drop off

Car Parking: No footway parking

Design Codes

- Manual for Streets

Geometric Design Parameters

Design speed: 20mph

Design Vehicle: Max 11m refuse vehicle. Allow to swing out over centreline when turning.

Min forward visibility: 33m

Junction spacing

20m	opposite
33m	adjacent

Minimum Footway width

Recommended	Total 3.1m	Effective 2.6m
Acceptable	Total 2m	Effective 1.5m

Minimum Footway widths including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum Cycleway width: see P2/M1 Active Travel Links Design Menu Card below

Minimum Footway width

Recommended	2m
Acceptable	1.5m

Carriageway width: 5.5m

Minimum horizontal curve (radius): 40m

Reverse curves (min separation): 17m

Super elevation: N/A

Max distance between speed restraints: 70m

Min K Value: 2

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: see P2/M1 Active Travel Links Design Menu Card below

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable):

- 0.5m (0)
- 2m adjacent to a Blue Badge parking bay

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

P2/M1 Active Travel Links

Non-motorised links within urban, semi-urban, semi-rural and rural settings for walking, cycling and potentially horse riding as non-motorised routes away from the County's main road system

Classifications

- Public Bridleway
- Public Restricted Byway

Characteristics

Active Travel Links (ATL) provide clean, pleasant and quiet routes providing connection with nature including places of shade, shelter and rest.

Street Lighting

- Part Night Lighting

Junction Forms

- Simple
- Simple Priority

Gateway

- Required to filter access
- Consider whether access for emergency vehicles is required

Surfacing

Urban	Bituminous
Semi-Urban	Mix of bituminous and unbound material
Rural	

- Mix of bituminous and unbound material
- unbound material

Planting

- Standard specification trees, no need for enhancement
- Native meadow seed mix either through direct seeding (from the Emorsgate meadow and grassland range or equivalent

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum Cover to pipes under carriageway
- 900mm minimum Cover to pipes under footway, cycleway and verge

Geometric Design Parameters

ATLs shall be of minimum 6 metres width made up from a permutation of the modules listed below depending on the setting and proposed usage:

Hedge - 1m, wildlife margin - 1m, amenity margin - 1m, unsealed surface - 2m, sealed surface - 2m, amenity margin - 1m, wildlife margin - 1m, hedge - 1m.

Additional 0.5m increments can be added to, or removed from, the module widths providing the following minimum 6m overall width is achieved.

Minimum widths for Walking

Recommended 3m

Acceptable 2m

Minimum widths for cycling

Direction	Peak hour cycle flow	Recommended width	Acceptable limit width at constraints	Absolute limit
1 way	<200	2m	1.5m	N/A
	200-800	2.2m	2m	N/A
	>800	2.5m	2m	N/A
2 way	<300	3m	2m	N/A
	300-1,000	3m	2.5m	N/A
	>1,000	4m	3m	N/A

Minimum widths for Cycling

- One-way flow for one-way cycle route. Two-way flow for two-way cycle route.
- Based on a saturation flow of 1 cyclist per second per metre of space. For user comfort a lower density is generally desirable.
- Provision narrower than the Recommended width should be the exception, minimised and only used on sections up to 100m long.

Minimum widths for Unsegregated Shared Use

≤ 300 Cycles per hour 3m

> 300 Cycles per hour 5m

Provision for Horses: 3m width of amenity margin

Provision for Utilities: Public Utilities shall not be laid longitudinally underneath unsealed or sealed surfacing and the ATL shall be wide enough to accommodate future access for safe utilities maintenance without closure of the ATL

Planning for Temporary Works: A minimum clear width of 3m shall be required for walking and cycling during periods of maintenance of any form

Minimum forward visibilty

Recommended	Gradient ≤ 3% 31	Gradient >3% 47
Acceptable	Gradient ≤ 3% 17	Gradient >3% 31

Visibility splay x-distance

Recommended	4.5m
Acceptable	2.4m

Minimum link radius

Recommended	Gradient ≤ 3% 25m	Gradient >3% 40m
Acceptable	Gradient ≤ 3% 15m	Gradient >3% 25m

Minimum longitudinal gradient length

Gradient exceeding	Acceptable Limit	Absolute Limit: Departure from Standards
2%	150m	250m
2.5%	100m	160m
3%	80m	110m
3.5%	60m	80m
4%	50m	65m
4.5%	40m	50m
5%	N/A	5m
6%	N/A	5m
7%	N/A	5m
7.5%	N/A	5m

Minimum sag K value

Recommended	Gradient ≤ 3% 3.5	Gradient >3% 7.5
Acceptable	Gradient ≤ 3% 2.5	Gradient >3% 5

Minimum Crest K Value: 6

Vertical clearances

Maintenance vehicle access	Minimum 4m	Obstruction 4m
Equestrian	Minimum 3.4m	Obstruction 2.8m
Walking & Cycling	Minimum 3.4m	Obstruction 2.4m

P2/M1 Sustainable Travel Links

Sustainable Travel Links provide connections within urban, semi-urban, semi-rural and rural settings, as appropriate, for:

- Passenger Transport
- Active Travel modes
- Emergency services
- Limited local access for motor vehicles by design
- Limited local access for motor vehicles by regulation

Sustainable Travel Links providing limited local access for motor vehicles include:

- Designated Quiet Lanes and lanes within the Chilterns Area of Outstanding Natural Beauty (AONB)
- Cycle streets in urban areas

Classifications

- Public Bridleway
- Public Restricted Byway
- All-purpose Unclassified road

Characteristics

- Short links providing direct, comfortable and convenient access between zones in urban and semi-urban areas for sustainable transport modes.
- Other vehicles (if permitted) are considered as a guest.
- Cycle streets provide high quality walking and cycling connections in urban areas whilst providing limited access to motor vehicles.
- Quiet Lanes provide clean, pleasant and quiet routes for walking and cycling providing connection with nature including places of shade, shelter and rest.

Busways

- STLs accommodating a busway and limited access for other motor vehicles may be designed for one-way shuttle working up to a length of 80m providing that access is signal controlled, access restrictions are enforced and provision is made for a safe waiting area at each end.

Speed Limit

- 30mph for inter urban busways
- 20mph for urban and semi-urban busways

Active Travel Provision

- Geometric parameters as per Active Travel Links
- ATL parameters dictate the STL design standards for horizontal radii, vertical curves, Stopping Sight Distances, visibility splays and longitudinal gradients if adjacent to busway.

Busway Provision

Busway (30mph)	Busway (20mph)

Frontage access

Busway (30mph) No	Busway (20mph) No

Access control (restricted to authorised users)

Busway (30mph) Yes	Busway (20mph) Yes

Min forward visibility

Busway (30mph) 51m	Busway (20mph) 25m

Carriageway width (Single Way)

Busway (30mph) N/A	Busway (20mph) 3.7m

Carriageway width (Two Way)

Busway (30mph) 6.5m	Busway (20mph) 6.2m

Minimum horizontal curve (radius)

Busway (30mph) 44m	Busway (20mph) 16m

Reverse curves (min separation)

Busway (30mph) 20m	Busway (20mph) 14m

Maximum distance between speed restraints

Busway (30mph) 100m	Busway (20mph) 80m

Min K value

Busway (30mph) 6.5	Busway (20mph) 2

Longfall - Carriageway: 1% to 5%

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Minimum horizontal separation between carriageway and cycle track: 0.5m

Planting

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

Provision for other motor vehicles

The parameters set out in P1/M1: Rural Lanes will be of consideration in designing a STL which has limited motor vehicle access, but with greater emphasis on the provision for active travel and on recognising the sense of ‘place,’ including reinforcing local character and bio-diversity and providing for shade, shelter and rest.

A Design Review shall be sought prior to the submission of any Planning Application to establish feasibility and design parameters.

P3/M1

Inner urban road or square at the core of a settlement (predominantly retail), Shared space and often block paving, with no roadside kerb. High people movement but little to no motorised vehicle movement. Some Town Centres will not be fully identified on the P&M network as they may not include adopted Highway.

Shared Space Residential Street initiatives.

Classifications

- L2 Local Access

Characteristics

Typical street scene includes street trees, licensed tables & chairs, advertisements, places for shade, shelter & rest.

P3/M1 Street Initiatives are aimed at promoting a high sense of place, where health and social wellbeing are as important factors as active travel. Such initiatives have been introduced nationally and internationally, captured as:

- Home Zones
- Low Traffic Neighbourhoods
- Vehicle Restricted Areas
- Pedestrian prioritised streets
- Informal streets
- Enhanced streets
- Stellplatzfrei streets (‘free from parking space streets’)
- ‘Mews Courts’ and ‘Housing Squares’ for higher density developments grouped around a Shared Surface road
- School Streets

Mews cul-de-sacs for motorised traffic serving up to 25 dwellings, a Mews Street of 50 dwellings served by a Local Access road at either end and Informal Streets serving up to 5 dwellings are exempt from the current pause on the use of shared space.

All other P3/M1 streets shall use kerbing a minimum of 50-60mm to define areas used by motor vehicles

Speed Limit: 20mph

Active Travel provision

Recommended Standard

- Footways & on-street cycling for new highways by street design
- Shared space for exempt Mews & Informal Streets

Acceptable Standard

- Footways & traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Footways & contraflow cycle lanes

Active Travel Provision

- Places for shade, shelter & rest
- Way finding signage
- Cycle Parking
- Bike Hire
- Depot space for cargo bikes

Provision for Passenger Transport

- Not expected to be on bus route
- Direction signage to bus stops
- Taxi rank and/or waiting area and drop-off at town squares

Street Lighting: Full Night Lighting

Maximum dwellings

- Mews - 50
- Informal Street - 5

Frontage access: Yes

Access Forms

- 4m radius bell-mouth
- Vehicle crossover for up to 2,000 PCU per day on the entry arm.

Junction Forms: Simple Priority

Gateway: Yes

Pavement Materials

- Bituminous
- Bituminous with block paved features
- Standard block paving
- Local enhancement to reflect local character and heritage articulated within guidance prepared by the LPA

Planting

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the running lane
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m to the carriageway
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m of the carriageway unless otherwise agreed by HCC

Provision for Commercial Vehicles: Controls for safe pick up and drop off. Rear access for commercial properties preferred

Car Parking

- Strictly controlled
- No parking on walking space

Design Codes

Relevant design advice and ideas can be found in

- Street Design for All (2014) DfT,
- Streetscapes: How to design and deliver great streets by Colin J Davis
- CIHT guidance,
- Civic Voice
- Public Realm Information & Advice Network

Geometric Design Parameters

Design speed

Mews	20mph
Informal Street	10mph

Design Vehicle: Allow refuse vehicle to swing out over centreline when turning.

Min forward visibility

Mews	25m
Informal Street	11m

Junction spacing: N/A

Carriageway width

Mews	5m
Informal Street	Tracked

Minimum unobstructed width: 3.7m

Minimum footway width

Recommended	Total 4m	Effective 3.5m
Acceptable	Total 3.5m	Effective 3m

Minimum footway width including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum cycle lane width

Recommended	2m
Acceptable	1.5m

Minimum horizontal curve (radius): 16m

Reverse curves (min separation): 14m

Super elevation: N/A

Max distance between speed restraints

Mews	80m
Informal Street	40m

Min K Value: 2

Longfall: See Active Travel Links

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

Chapter 2
Planning Public Realm

Contents

Introduction

1.1 This chapter provides guidance on how high-level principles established at the master planning stage can be translated into the design of public realm suitable for the emerging planning application or the general arrangement for permitted development schemes.

1.2 Part 2 of this guidance shows how due consideration of transport requirements during master planning can help deliver environments of local character that provide a sense of place, encourage active travel and contribute positively to public health and social wellbeing.

1.3 At the master planning stage scheme promotors should have proposed public realm that limits the access of motor vehicles, and where access is provided, the volume and speed of vehicles is controlled through car parking controls and traffic management measures such as filtered permeability.

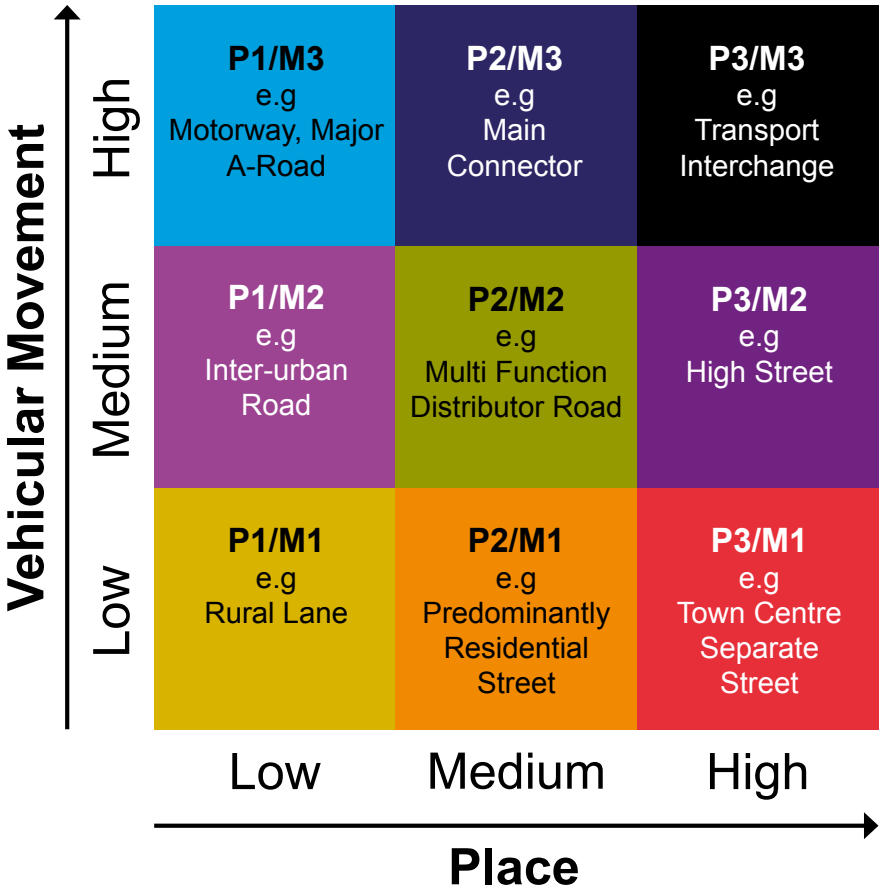
1.4 In considering the relationship between the trafficked highway, local landscape, the public and built realm, master planning should have created a proposed environment in which vehicle speeds will be managed naturally within the resulting development or scheme and, in doing so, the need for supplementary traffic calming features in new highways will have been avoided.

1.5 The term ‘master planning’ used within this guidance refers to the activity of scoping the form and nature of a scheme or development, regardless of its size.

1.6 More detailed, supporting technical guidance for final design is set out in Part 4 of this guidance and Hertfordshire’s Speed Management Strategy.

Designing for Place & Movement

2.1 As described in Part 2; Chapter 5, HCC has developed a 'Place and Movement' matrix to reflect the different functionalities a highway may have.



2.2 All categories involve public realm of varying natures. The Design Menu Cards in the appendix to Part 3 Chapter 1 provide guidance on the design of shape and form for all categories.

2.3 This Chapter provides additional context for the design of public realm in the P2/M1 and all P3 categories.

2.4 There is a clear distinction between streets and roads. Roads are highways whose main function is accommodating the movement of motor traffic. Streets are typically lined with buildings and public spaces, and while movement is still a key function, there are several others, of which the place function is the most important. Even small changes in design can have a major impact on the quality of an area.

2.5 The design of any improvement to the highway network needs to take into account a series of sometimes conflicting elements. The interaction between different modes including pedestrians, cyclists, cars and others' needs to be carefully considered to ensure it is safe for all. **Access to and within any development must be available to all sections of the community.**

Source: Lucy Saunders

2.6 Highway engineering requirements should not be taken as the starting point for layout design. The local context should have been appraised by the master planning stage through the LTP4 Compliance Test process as described in Part 1 Chapter 3. This will have identified the way in which an area has developed, in terms of the arrangement of buildings, their functions and the spaces between them and identified the needs for movement. The highway engineering requirements should then be based on this context.

2.7 A good sense of 'Place' is exemplified by the components considered as success factors within the 'Healthy Streets' initiative that also complements the Place & Movement concept.

2.8 **Every effort should be made to prevent motor vehicles from dominating the visual and physical aspects of the surrounding landscape and the provision for motor vehicles should never be to the detriment of the access requirements of those walking or cycling, including those with limited mobility.**

2.9 Careful design can prevent the need for movement of motor vehicles from being detrimental to the creation of sustainable and responsible developments in most situations.

2.10 It is also important to provide Green Infrastructure within developments to influence the design, layout and management of roads and adjacent verges, the control of parking and to reduce any 'dead space' that may be created.

Local Character

3.1 A primary aim during the master planning of a new development should have been to create a sense of 'place' by considering the strategic elements that influence character, such as local heritage and function, building height, density and topography.

3.2 The elements contributing to local character that should be considered collectively in more detail when translating the master plan into an emerging planning application or the general arrangement for permitted development include:

- the local topography and boundaries;
- the shape of existing development;
- architectural style
- the use of landscaping in integrating old and new development;
- materials
- soft landscaping
- ecological issues.

3.3 The Local Character & Heritage Plan (LCHP) should be developed to set out the proposed measures to minimise risk and maximise opportunities in the proposals, demonstrating how collaboration with historic environment specialists has contributed to the preferred solution.

3.4 In setting out the location of heritage assets, the LCHP should identify listed building curtilage structures as these can influence the siting of the proposed highway boundary and/ or constrain its usage.

3.5 Entrances to new developments can result in bland amenity spaces of little or no significance in terms of local distinctiveness, and more related to highway engineering requirements such as location, visibility splays, etc. Appropriate landscaping could contribute hugely to the impact and contribution of new developments.

3.6 Planting, particularly street trees, helps to soften the street scene while creating visual interest, improving microclimate and providing valuable habitats for wildlife. Care needs to be taken to preserve existing trees, particularly when changes to a street are planned. Maintenance arrangements for all planted

areas need to be established at an early stage, as they affect the design, including the choice of species and their locations.

3.7 Careful design of the roads, walking and cycling routes can contribute to the way in which a development responds to the local character as much as the design of the buildings themselves. The choice of street furniture and materials play a key part in this. Particular consideration should be given to existing routes and movement patterns in an area when designing layouts for new developments.

3.8 The way a new development connects with, and contributes to, existing routes and patterns is a significant factor in successful design. Layouts for proposed development should be designed to take into account future development, which could adjoin it, as well as linking well to any existing development.

3.9 New development can have a significant impact on the existing local character of an area. The LPA should be contacted for preapplication advice on local policies or published guidance on local landscape character, local heritage and conservation area requirements.

Designing for Safety, Health, Security, Place and Movement

4.1 When designing or modifying highway infrastructure it is important to understand the needs of the end user.

4.2 Provision at the minimum requirements will often deter certain users from using the facility. If walking facilities on a route to school are provided at minimum standard, for example, then they are unlikely to be used thereby failing to deliver the intended objectives and becoming a waste of expenditure.

4.3 **Something is not better than nothing if it cannot be used safely, or users do not feel safe using them.**

4.4 Road safety is a key issue to be addressed in layout design. Personal injury collisions often occur at junctions and interfaces between adjoining highway links of different status (e.g. at the start of a residential area on a rural road) and at points of conflict between different users. For this reason, it is important that proposals are set out within a planning application (or general arrangement for those schemes promoted under permitted development) in sufficient detail to demonstrate that a safe, final design can be achieved without compromise.

4.5 It has been found that fewer collisions occur in cul-de-sacs and short loop roads functioning only as residential access roads, where traffic flows and speeds are usually low. The aim must therefore be to design residential road layouts so as to exclude, or at least discourage non-access motorised traffic, to reduce traffic flows generally and in particular to restrain vehicle speeds.

4.6 The master planning principles set out in Part 2 for access points and permeability of a development align with these highway safety conclusions and, therefore should provide a good platform for a safe highway design.

4.7 It is also a requirement for local authorities, the police, and other partners to take account of community safety under the Crime and Disorder Act 1998 Section 17 and the risks raised by the national police initiative Secured by Design (SBD) should be addressed.

4.8 In Hertfordshire's context, such risk mitigations could include ensuring that:

- The inter-connecting corridors for walking and cycling between cul-de-sacs are lit, overlooked and sufficiently wide to provide clear end to end sightlines, without blind spots or hiding places.
- Parking provision at the edge of development is monitored and managed
- Street furniture is designed to be robust and features such as seating are designed to provide resting facilities for those that need them, whilst not encouraging congregation and vandalism.
- Opportunities for graffiti are minimised by avoiding blank elevations and hard boundary treatments abutting footpaths through the use of landscaping, soft boundary treatments, green walls, and orientating buildings to provide actives edges to paths.

4.9 Consideration of Counter Terrorism measures should be given when developing the planning application as these can sympathetically form an integral part of the public realm proposals and without them appearing to be obtrusive or incurring a significant extra cost if they are incorporated as additional features during final design.

4.10 Advice on providing for Counter Terrorism can be found in the Secured by Design guidance at: https://www.securedbydesign.com/images/downloads/resilient-design-tool-for-counter-terrorism.pdf.

Further advice can be from Hertfordshire's Counter Terrorism Security Advisors by via https://www.herts.police.uk/advice/advice-and-information/t/terrorism-in-the-uk/ctsa/protecting-your-business-from-terrorism/

4.11 Those laden with shopping; pushing prams or buggies; the elderly; people with physical disabilities may have Limited Mobility. Whilst the cause of their limited mobility may differ, their challenges are common, viz: - long walking distances without rest or shelter, inappropriate gradients, surfaces and the differentiation of surfaces, obstructions including cluttered street furniture.

4.12 Blind and partially sighted people will be particularly affected by obstructions, inappropriate surfaces and poor differentiation of surface types.

4.13 The geometric design standards detailed in the Design Menu Cards within this guidance are aimed at providing suitable conditions for those with limited mobility for typical P1 & P2 Category roads.

4.14 Departures from these standards may create an adverse impact on those with limited mobility and compromise HCC's compliance with the Public Sector Equality Duty under Section 149 of the Equality Act 2010.

4.15 The general layout to be shown in the planning application (or general arrangement for those schemes promoted under permitted development) for P2/M1 and all P3 categories streets shall enable environments suitable for those with limited mobility and, in particular, demonstrate that there will be enough public realm space to accommodate all the proposed street furniture without creating obstruction.

4.16 This overall guidance has been prepared to support health and wellbeing intrinsically.

4.17 The production of Health & Wellbeing Impact Assessments, where required should have been started during the master planning stage and need to be completed alongside the Planning Application.

4.18 Consideration of winter maintenance should be made as this can affect the safety and utility of the public realm, noting HCC's winter service approach set out in Part 2, Chapter 6: Maintenance & Operation.

Speed Management

5.1 Local Transport Note 1/07 and the HCC Speed Management Strategy (SMS) form the basis for the selection of speed management measures including home zones, 20mph Areas, speed limits, shared surfaces, traffic calming measures (vertical and horizontal) as well as additional supportive measures such as roundels, safety cameras and rumble devices.

5.2 The aim of the SMS is **to ensure the speed limit for any road is in keeping with its environment.**

5.3 The SMS contains five core principles which are:

- We will encourage speed limit changes that support active travel
- In some cases (where appropriate) we will lower speed limits
- In some cases (where appropriate) we will need to change the design of a road to change behaviour
- We won't put up a speed limit signs alone and expect a significant behaviour change
- In some cases (where we establish that speed limits are too low for the environment) we may need to raise speed limits.

5.4 The default speed restriction for the provision of new residential streets (P2/M1) and all P3 categories within the P&M matrix is 20mph, but it may be appropriate to design for a lower speed residential street.

5.5 As previously stated, master planning should have created an environment in which vehicle speeds will be managed naturally within the resulting development or scheme so as to avoid the need for supplementary traffic calming features in new highways.

5.6 Scheme Promoters should not provide wide carriageways and then install measures to reduce speeds. Providing wider carriageway to accommodate loading or parking is acceptable, but the areas should be clearly defined so that when not occupied by vehicles they continue to serve their speed management purposes. This could be achieved by provided buildouts at the end of bays as shown or providing an overly wide footway and then insetting the bays parallel to the road.

5.7 Measures to reduce or restrain speed should be in keeping with the local character. In an urban situation, shorter, straight lengths of road with features such as junction treatments may be in keeping with the existing road layouts in the vicinity. In villages elements such as sharper bends, increased use of planting or verge areas, etc. may be more appropriate.

5.8 The road layout should suggest to the vehicle driver that low speeds are appropriate, and that to travel at higher speeds would be both dangerous and anti-social.

5.9 The avoidance of open aspects and long, wide straight or slightly curving roads will assist in reducing vehicle speeds. Visually enclosing the highway and keeping visibility to the minimum requirements by building close to the road and soft landscaping can make the road appear ‘narrower’ and give drivers the impression that they are in a low-speed area.

5.10 Care should be given not to compromise footway widths, particularly through maturing vegetation. Visibility shall not be restricted below the agreed minimum standards.

5.11 Formalised on-street parking with build-outs at each end can assist in some situations, as can different road surface finishes.

5.12 Restricted visibility at junctions cannot be considered a safe means of reducing vehicle speeds at junctions without the provision of other precautions. Visibility distances must therefore be adequate for expected vehicle speeds.

5.13 Scheme Promoters need to consult the SMS and note that there are key criteria (KC) in Appendix K that determine the suitability of the following features:

- Speed limit buffer zones KC20, KC21
- Speed limit countdown markers KC 22
- Home zones KC23-KC25
- Quiet Lanes KC26
- Gateways KC27 & KC28
- Chicanes KC29, KC30
- Pinch Points KC31, KC32
- Central islands KC33

- Road humps KC34 - KC37
- Rumble Strips KC38 - KC41
- Mini Roundabouts KC42

5.14 There are historic examples of road humps on the A road network, but in general humps should be limited to roads with High Place functions or where the intention is to change the roads focus from Movement to Place.

5.15 Hertfordshire's Speed Management Strategy also includes HCC's approach to the implementation of speed management traffic calming measures on the existing highway network.

5.16 Guidance on the design of traffic calming features is contained in Part 4, Chapter 8: Designing Speed Management Features.

Shared Spaces and Surfaces

6.1 Shared surface arrangements can allow more flexible use of public space, potentially giving the benefit in reductions in overall highway space and/ or enable wider 'living' areas where pedestrians and cyclists have freedom to use the whole street space in safety.

6.2 Shared spaces may be inappropriate where it is anticipated that there will be a significant presence of the elderly, mobility or visually impaired.

6.3 The use of shared space was paused during 2018 and therefore Public Realm schemes shall use kerbing a minimum of 60mm to define areas used by motor vehiclesin accordance with the Government's Inclusive Transport Strategy.

6.4 All raised elements shall be defined by tactile paving or kerbs in accordance with the DfT's Inclusive mobility: using tactile paving surfaces.

6.5 The following destinct areas are more likely to achieve technical approval with low boundary features and special materials, than long sections of road:

- Raised junctions, speed tables, etc;

- Raised pedestrian, cycle or equestrian crossings;
- Cul-de-sacs for motorised traffic serving less than 25 dwellings. (Mews or Informal Street)

6.6 A loop road of 50 dwellings linking to a single access would not satisfy the exemption. A Mews Street (of 50 dwellings) served by a Local Access road at either end would.

6.7 Scheme promoters should have set clear visions and objectives for their developments or schemes, such that the master planning exercise can identify appropriate street environments to meet those objectives.

6.8 The resulting master plan, which should be based on the latest national guidance on shared surfaces, local context, their intended use and their intended users could variously include:

- Home Zones
- Low Traffic Neighbourhoods
- Vehicle Restricted Areas
- Pedestrian prioritised streets;
- Informal streets
- Enhanced streets.
- Stellplatzfrei streets (‘free from parking space streets’)
- ‘Mews Courts’ and ‘Housing Squares’ for higher density developments grouped around a Shared Surface road.
- School Streets
- Quiet Lanes

Residential Accesses

7.1 Access roads shall be provided for developments of over 50 units.

7.2 Shared Private Drives or Access ways shall be provided for developments up to 50 dwellings. These will be low-speed unadopted paved areas.

7.3 Pedestrian priority, at suitable footway levels shall be maintained along the public highway at the connection between the private drive or access way and the public highway.

7.4 Detailed design guidance for accesses is contained within Part 3; Chapter 9.

Routes to School

8.1 HCC aims to increase opportunities for children and young people to travel to, from and between schools and colleges by walking, cycling, travelling by bus or train and, in some cases, car-sharing.

8.2 In most cases school communities start and finish at the same time so there is intense concentrated use of the footway during peak times. Adequate footway width shall be provided to reduce the possibility of pupils or other users spilling out onto the carriageway.

8.3 Consideration should be given to the installation of railings directly outside pedestrian entrances into schools where pupils have the potential to access directly to the carriageway. The provision of railings should not compromise the effective width. The type of railing installed should not reduce the inter-visibility of vehicles to pedestrians and should be limited to 2-4 panels depending on the width of the pedestrian exit.

8.4 Additional pedestrian and cycle entrances into larger school sites should be provided if the main entrance route creates a significantly longer journey, which would encourage more car use.

8.5 Adequate waiting space for bus and coaches shall be provided, either within or just outside the school site. This will allow a safe location for the picking up and dropping-off of pupils. Areas for bus and coach drop off should be separated from the main pedestrian access into the school.

8.6 Where new or extended schools are to be served by the existing highway networks it may not be possible to enable all journeys to be made by sustainable means and journeys will need to be made by car, schools can encourage the use of park and stride facilities. This can be an agreed informal use of parking facilities a short walk from the school so that fewer vehicles are dropping off or picking up children at the school gate. Park and stride measures can also encourage and promote independent travel for older primary school children who cannot walk all the way to school.

8.7 With the support of the school, parents can set up and run a walking bus, where trained volunteer adults walk to school picking children up at pre-determined points along the route. This initiative reduces the number of low occupancy cars making identical journeys and provides a safer and more enjoyable walk to school. Children can also benefit from absorbing pedestrian skills whilst being supervised when crossing roads.

8.8 The design of the streetscape in new developments serving new schools should inherently enable safe routes for walking buses.

8.9 Walking bus routes to schools served by the existing highway network can be improved with the use of additional measures that make them more attractive and safer to use. These measures may include waiting restrictions to improve visibility, kerb build-outs to reduce carriageway width and vehicle speeds.

8.10 School Crossing Patrols allow safe pedestrian movements across busy roads and therefore bridge significant severance in pedestrian networks. Each potential school crossing location will need to be assessed by the HCC's Active and Safer Travel Team.

8.11 No new development, or highway improvement should necessitate the provision of a new school crossing patrol and proposals should consider opportunities to remove the need for existing school crossing patrols.

Preparing a Planning Application

9.1 P3 category areas promote a high sense of place that intrinsically promote active and sustainable travel, whilst in doing so promote health and social wellbeing which are as important factors in their own right.

9.2 Part 1, Chapter 3: The Scheme Promotion and Development Management Process sets out the range of design elements and proposed strategies to be submitted at the planning application stage.

9.3 Schemes with P3 public realm proposals particularly require plans and a narrative that present a clear and cohesive picture by drawing together:

- Proposed Adoption Strategy and stewardship models in a draft Whole Life Management Plan indicating who is going to own the various highways and transport assets, who is going to maintain and manage them and how they are going to be funded
- Loading and servicing strategy
- Winter maintenance
- Street furniture - seating, planters, cycle parking etc
- Street cleaning strategy
- The use of enhanced materials; including stockpiles, future maintenance and/or commuted sums
- Maintenance of planting or landscaping
- Consultation/engagement strategy (for the design stage and during construction)
- Counter Terrorism considerations
- Licencing requirements - cafés, street trading, markets
- Lighting strategy- highway, amenity and festive (as appropriate)
- Event uses - along with metered services (water, electricity)
- Vehicle enforcement strategy - to encourage turnover in shopping areas
- Additional Vehicle access strategy:
  - Bus stops and layover stands.
  - Taxi ranking
  - Disabled parking
  - Motorcycle parking

Chapter 3
Planning Walking Infrastructure

Contents

Introduction

1.1 Part 2 of this guide highlights that providing for people walking is the first and primary consideration in master planning proposals. Hertfordshire's Local Transport Plan (LTP4) notes that walking is the principal form of travel for trips under 1 mile at 76%.

1.2 At the master planning stage Scheme Promoters should have carefully positioned walking routes to provide easy access for all. Links with the wider pedestrian network, both existing and planned should have been incorporated. Particular consideration should have been given to connecting pedestrian routes with local centres, transport hubs, healthcare facilities and schools. Opportunities to link to upgrade and improvethe existing Public Rights of Way network for Active Travel and recreational use should be proposed.

1.3 This chapter provides guidance enabling the emerging planning application or the general arrangement for permitted development schemes to include well aligned footways and footpaths that follow a direct route from point to point, having reasonable and practicable gradients and be sufficiently wide and free of obstruction to enable different users (pedestrians, prams, wheelchairs, etc.) to pass each other freely.

1.4 More detailed, supporting technical guidance for final design is set out in Part 4 Chapter 2.

General Principles

2.1 Footways are those parts of a road intended for walking. They generally run parallel to the adjacent carriageway and may be separated from it by kerbs and a verge.

2.2 Footpaths are walking routes generally located away from the carriageway and not associated with routes for motor vehicles.

2.3 Carriageway design should not dictate, compromise or conflict with the needs of pedestrians and footway or footpath design.

2.4 Footways and footpaths should be continuous and, where possible, follow pedestrian desire lines.

2.5 Walking routes should be carefully positioned and provide easy access for all, regardless of physical ability so as to maximise their use.

2.6 If routes are segregated from passing traffic they will need to be well-connected and overlooked by dwellings or other buildings, because people generally prefer to walk along streets where for their personal security they can be seen by drivers, residents and other pedestrians.

2.7 Designers should avoid using existing paths and Rights of Way as the alignment for new vehicular access roads and should design their developments to accommodate these safely alongside new roads or through landscaped areas.

2.8 When considering width and alignment of footpath and footway facilities, consideration must be given to the need for ramped crossings to garage drives or parking spaces, and to providing for utilities and other underground plant (see also Part 4; Chapter 19 Designing for Utilities).

2.9 The approach to a dwelling from the point where a disabled person would get out of a car should be level or ramped. The approach should be at least 1.2m wide.

2.10 Designers should understand HCC's requirements for designs that minimise and facilitate future maintenance as set out in their Maintenance for Active Travel Strategy which is part of the Highway Infrastructure Asset Management Plan (HIAMP).

Application of Design Standards

3.1 The standards referred to in this Chapter are defined in three levels as outlined below.

Recommended

Designers should aim to adopt these standards as the first choice wherever possible.

Acceptable Limits

Whilst it is acceptable for designers to use these standards, their use should be limited, and they shall carefully consider the impact on Non-Motorised Users. The use of this category should be documented through the Technical Review process.

Absolute Limits - Departure from Standards

- Provision of new facilities below Acceptable Limits will result in a poor standard of provision. As such the scheme promoter should submit the scheme proposal to a Design Review Panel so that the overall objectives of the scheme can be reviewed and potential alternative solutions can be discussed.
- Absolute Limits are sometimes referred to as absolute minimum in various national standards, but they constitute a Departure from Standard within Hertfordshire.
- If there is no alternative solution but to adopt a standard below the Acceptable Limits then a Departure from Standard shall be sought from HCC.
- Departures below the Absolute Limit will not be accepted.

Footway widths

4.1 The standards for footway widths are based on Place & Movement Categories (See Part 2; Chapter 5 Place & Movement) and consideration of speed limits.

4.2 For speed limits up to 30mph the total footway width generally allows 0.5m for separation features from the carriageway such as kerbing.

Widths for P1 & P2 Categories up to 30mph limit

Recommended	Total Width 3.1m	Effective Width 2.6m
Acceptable Limits	Total Width 2m	Effective Width 1.5m
Absolute Limits - Departure from Standards		
	Total Width N/A	Effective Width N/A

Where there is a safety benefit or a high number of pedestrians, the footway and footpath width should be increased. This will be appropriate outside schools, shops and other community facilities.

A clear width of at least 1.2m shall be provided between street furniture and other obstacles, to allow for people with mobility impairments and for passage of a double-buggy.

Widths for P3 Categories up to 30mph limit

Recommended	Total Width 4m	Effective Width 3.5m
Acceptable Limits	Total Width 3.5m	Effective Width 3 3m
Absolute Limits - Departure from Standards		
	Total Width 2m	Effective Width 1.5m

Widths for P1 & P2 Categories with 40mph limit or above

Recommended	Total Width 2.6 m	Effective Width 2.6 m
Acceptable Limits	Total Width 2 m	Effective Width 2 m
Absolute Limits - Departure from Standards		
	Total Width 2m	Effective Width 1.5m

Footways on roads with a speed limit of 40mph or more should be separated from the carriageway by the widths shown below. This buffer strip width is measured from the edge of the running carriageway and may therefore include the adjacent hard strip (if any).

Speed limit (mph)	Recommended	Acceptable Limits
40	1.5m	0.5m
50	2m	1.5m
60	2.5m	2m
70	3.5m	3m

4.3 Where footpaths extend up to 50m beyond a vehicular access point, they should lie in an unobstructed corridor 2.5m wide to allow for access of maintenance vehicles.

4.4 The width of a footway will need to be locally increased around features, such as bus shelters, to maintain adequate footway width and to avoid conflict between pedestrians and passengers.

4.5 The Recommended width of footway at bus stops is 5m for P1, P2 & P3 categories up to 30mph speed limits with Acceptable Minimum of 3.8m. The Recommended width of footway at bus stops is 3.8 m for P1& P2 categories over 30mph speed limits is 3.8m with an Acceptable Minimum of 3.1m.

Clearances

Boundary Clearances

The boundary clearance is the required distance between each edge of the footway and any continuous fixed vertical obstruction such as walls or fences, for example. These are required in addition to the Total Width dimensions quoted above.

Recommended	up to 1.2m high 0.25m	above 1.2m high 0.5m
Acceptable Limits	up to 1.2m high 0m	above 1.2m high 0m
Absolute Limits - Departure from Standards		
	up to 1.2m high N/A	above 1.2m high N/A

A minimum 0.5m clearance to the ‘normal’ extent of a hedge is required in all instances.

Horizontal clearance to obstructions

In exceptional circumstances the footway or footpath width may be reduced around obstacles, over a short distance (up to 6m).

Minimum Footway Width over a maximum of 6m

Recommended	1.25m
Acceptable Limits	1.25m
Absolute Limits - Departure from Standards	1m

Wherever possible street furniture should be located at back of footway or footpath to minimise the impact of obstruction.

Gradients

Crossfall

Recommended	Maximum 2% (1:50)	Minimum 1%(1:100)
Acceptable Limits	Maximum 2.5% (1:40)	Minimum 1% (1:100)
Absolute Limits - Departure from Standards		
	Maximum 8% locally up to 5 m (1:12.5)	
	Minimum Drainage solution may be required to prevent ponding	

Absolute Limits will only be considered where existing ground levels make it impractical to achieve the Acceptable Limits specified.

The crossfall of footways and footpaths will increase locally around a crossing point. This shall be an absolute maximum of 8% (1:12.5). Where a crossfall steeper than Acceptable Limits is necessary, a strip at least 0.9m wide with crossfall no greater than 2% (1:50) must be provided. This will help ensure that the footway or footpath is accessible for all pedestrians, including those using wheeled mobility aids.

Level strip at back of footway

Where possible a level strip should be retained along the back of the footway. This detail is also used on vehicle crossovers as well as for footways with steep crossfalls.

Level[1] strip at back of footway

Recommended	0.9 m
Acceptable Limits	0 m - (only if existing footway is too narrow, and there is no space available within highway to widen)
Absolute Limits - Departure from Standards	N/A

1. The notionally level strip must drain adequately to prevent ponding. In some locations the longitudinal fall or gradient will achieve this, but elsewhere it will need a crossfall of typically 1% to 2%.

Pedestrian route longitudinal gradient

Recommended **Gradients and resting platforms as per Cycling Chapter**

Maximum	Refer to Part 3 Cycling Table 691
Minimum	1 % (1:100)

Acceptable Limits **As per Part M**

Maximum	5%[2]
Minimum	1 % (1:100)

Absolute Limits - Departure from Standards

Maximum	Departure Required
Minimum	Departure Required

1. Up to 1 in 60 (1.67%) is considered level.

2. Ramps with resting platforms can be used for gradients of 5% or more. Refer to Diagram 2.1 in Part M Volume 1 or Diagram 3 in Part M Volume 2.

The gradient recommendations in Inclusive Mobility (DfT, December 2021) should be implemented.

The gradient of a footway is often the same as the adjacent road.

The gradient of a footpath should not exceed 5%. In exceptional circumstances this may be increased to 8% over short distances less than 5m.

Where it is unavoidable to have a footpath with a gradient greater than 8%, steps shall be provided with a bypass ramp for wheelchairs and pushchairs.

Chapter 4
Planning Cycling Infrastructure

Contents

Introduction

1.1 This chapter provides guidance on the planning of cycling provision in readiness for a planning application (or the approval of outline design in the case of permitted development schemes) with the aim of ensuring that cycling will be safe and accessible to all and meets the five core design principles of:

- Safety (including perception of safety)
- Directness
- Coherence
- Comfort
- Attractiveness

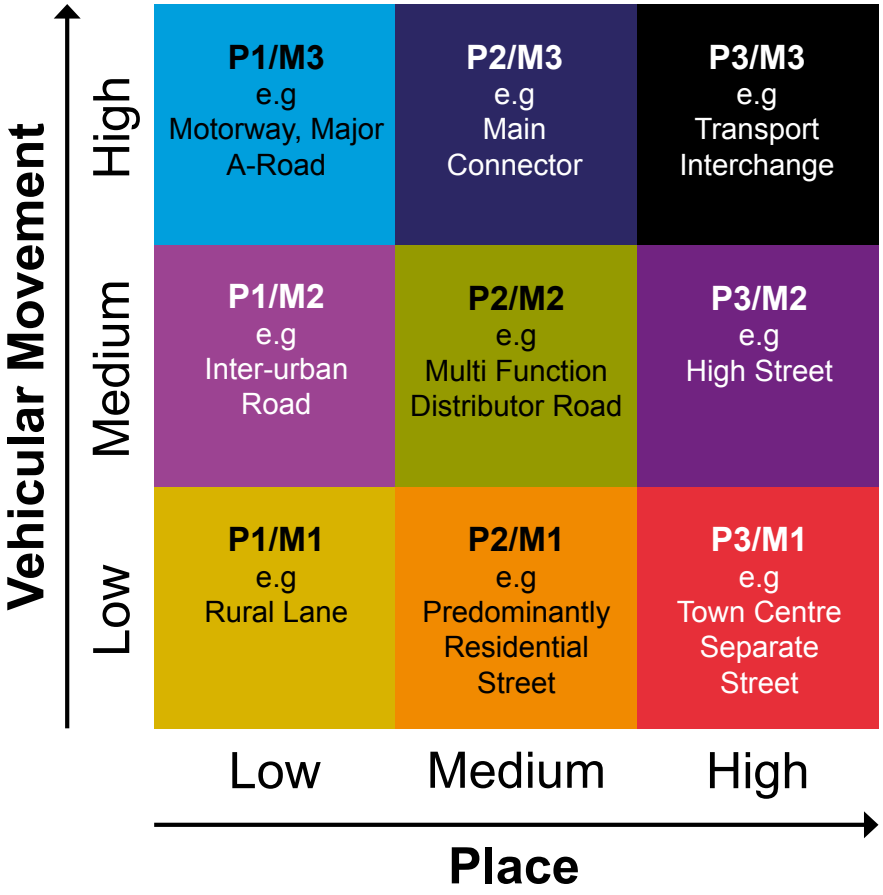
1.2 At the master planning stage Scheme Promoters shall have considered the provision of holistic area-wide schemes for cyclists, or how their proposals connect into the existing networks to reduce traffic levels and make cycling attractive to all reinforcing LTP4 Policy 1: Transport User Hierarchy that gives precedence over motor vehicles to the needs of those walking and wheeling.

1.3 In accordance with the principles set out in Part 2, Chapter 4: Validation & Master Planning, all Scheme Promoters shall provide specific, coherent, safe measures to assist cyclists, and cycle routes designed such that anyone aged 12 to 80 could be expected to cycle along them independently and safely.

1.4 To aid the practical application of the LTP4 policies, Hertfordshire has developed a 'Place and Movement,' (P&M) matrix, which recognises the different functionalities that streets will need to have. P&M provides a basis for deciding which activities should be prioritised and where the balance of provision should lie.

1.5 Each proposed new or improved highway should have been assigned a P&M category at the master planning stage. This chapter provides guidance on the appropriate cycling provision for each P&M category.

1.6 The master plan will have also developed strategies for providing high quality, secure cycle storage for the development including local facilities, employment locations and within homes.



1.7 The emerging planning application or the general arrangement for a permitted development scheme, and particularly its cycling and walking provision, must be consistent with the guidance in LTN 1/20 Cycle Infrastructure Design except where stated otherwise in this Chapter.

1.8 A key aim of this Place & Movement Planning and Design Guidance is to promote integrated thinking and design and therefore advice relevant to planning and providing for cycling is integrated across the chapters.

1.9 This chapter contains the simple, derivative cycling infrastructure guidance based on three defining parameters:

- Design speed for links ≤ 3% and >3% vertical gradient
- Widths based on predicted usage
- P&M category and speed limit for associated road / street

1.10 This chapter also provides advice on the appropriate legal processes required to create the various types of cycling facilities.

1.11 More detailed supporting technical guidance for final design is set out in Part 4, Chapter 3: Designing for Cycling.

Definitions

2.1 For the purposes of this chapter, terms and abbreviations used are as defined below:

Term or Abbreviation and Definitions

Cycle
One of the full range of human-powered vehicles described in LTN 1/20, including those shown in LTN 1/20 Figure 5.2.

A pedal cycle is defined as 'a bicycle, a tricycle, or a cycle having four or more wheels, not being in any case a motor vehicle' (Section 192(1) of the Road Traffic Act 1988 (c.52)).

In this Chapter, the term Cycle includes Electrically assisted pedal cycles, often known as e-bikes, which are defined in the Electrically Assisted Pedal Cycle Regulations 1983 (as amended). They can legally be ridden where pedal cycles are allowed, but only by someone aged 14 years or more. They are not classed as motor vehicles for the purposes of road traffic legislation.

Protected facilities
Cycling or shared use space along roads that is physically separated from motor traffic, including by fully kerbed cycle track, stepped cycle track, light segregation.

People walking
Equivalent to the legal meaning of pedestrian/pedestrians.

Primary position
Cycling in the centre of a traffic lane.

This makes the person cycling more visible to motorists approaching from behind. It enables the motorist to appreciate that it will be necessary either to cross the centre line to overtake or wait behind until there is sufficient space.

Secondary position
Cycling around 0.5m from the nearside kerb.

Segregated
Cycle and pedestrian paths separated from each other (as opposed to being shared).

Shared use
A route or surface which is available for use by both pedestrians and cyclists. It provides for pedestrians and cycle users to be either unsegregated or segregated. It is not normally for use by mopeds.

Note this does not mean Shared Space, which normally refers to motor vehicles, cycles and pedestrians all sharing the same space.

AADT
Annual Average Daily traffic

CLoS
Cycling Level of Service Tool (LTN 1/20 Appendix A)

DfT
Department for Transport

DMRB
Design Manual for Roads and Bridges, published online by National Highways primarily for the Trunk Road and Motorway network

HCC
Hertfordshire County Council

JAT
Junction Assessment Tool (LTN 1/20 Appendix B)

kph
kilometres per hour

LCWIP
Local Cycling and Walking Infrastructure Plan

LTN
Low Traffic Neighbourhood

LTN 1/20
Local Transport Note 1/20 Cycle Infrastructure Design, DfT, 2020 available online

LTP4
Hertfordshire Local Transport Plan (LTP4 2018-2031), available online

PCU
Passenger Car Unit

PSED
Public Sector Equality Duty (Section 149 of the Equality Act 2010)

RST
Route Selection Tool (available as part of the DfT LCWIP technical guidance)

TSRGD
Traffic Signs Regulations and General Directions 2016 as amended

vpd
Vehicles per day

vph
Vehicles per hour

Cycle Mapping & Network Planning

3.1 Existing cycle network maps and an understanding of new route aspirations shall be used when planning new routes at the Validation Stage so that they have an origin and destination and connect to existing or will connect to future cycling facilities. The connecting facility shall be a continuous link for cycling.

3.2 Information on cycling and existing cycle routes in Hertfordshire can be found on the Hertfordshire Cycling page on HCC's website.

3.3 Cyclestreets.net makes use of open source mapping for route planning and recording issues on the network. Consider making use of this data when planning any new facility.

3.4 The guidance in LTN 1/20 Chapter 3 Planning for cycling should be followed in network planning.

3.5 In line with LTP4, the cycling network should facilitate journeys by cycle in preference to public transport and car, particularly for day-to-day short journeys but also for journeys up to around 20km.

3.6 Planning for cycling should be based around providing a network of all-weather on-carriageway and/or off-carriageway routes that are suitable for all abilities. The cycling network should be safe, convenient, comfortable, attractive and direct.

3.7 Subject to topographical constraints, the aim is to create a densely spaced network (typically 250m to 1km spacing between routes, depending on location) so that all people can easily travel by cycle for trips within and between neighbourhoods. In addition to this, longer distance routes within the local network should serve leisure, tourism and utility cycling.

3.8 Highway schemes and developments should contribute to creating this coherent countywide network, both within and between settlements. This network may already have been identified in a LCWIP and/or in HCC's countywide cycle network planning.

3.9 The outputs will be identified origins, destinations and cycle flows. These should inform how a development's internal cycling (and walking) networks and routes will connect into its surroundings and to the actual and/or intended wider cycle network.

3.10 Continuity is important for successful cycle routes and scheme promoters should strive to provide both high quality links and high quality junctions. Stop-start at every side road or low priority at junctions will result in the route being used less than it could be. With off carriageway routes this could result in cyclists using the main carriageway to avoid delaying their journeys.

3.11 Scheme Promoters should design routes that are continuous and maintain the standard to each node (junction) and depending on complexity of the junction and its strategic position on the network be afforded a similar or higher level of priority as the other vehicle users at the junction. Pedestrians shall not be disadvantaged by such prioritising and should be considered in line with the LTP4 Policy 1 user hierarchy.

3.12 An important element of cycle network planning is the ends of potentially cyclable journeys.

3.13 A cycle journey will typically start away from the formal cycle network (e.g. at home or at work), which means that the environment between the start and the cycle network needs to be as safe, convenient, comfortable, attractive and direct as the cycle network itself.

3.14 A Low Traffic Neighbourhood (LTN) and/or network of Cycle Streets may be the most effective way of achieving that environment, as well as yielding benefits such as better air quality, and a better and safer living environment for everyone. This concept could be applied to existing neighbourhoods and to new developments

3.15 A cycle journey may end at shops, work, leisure or other destinations. They may well not be on the cycle network itself, so good (particularly safe, direct, comfortable and attractive) cycling routes to them from the cycle network are necessary.

3.16 At the destination (and at / for home) cycle storage is needed. This can take many forms, as outlined in the Part 3, Chapter 7: Planning for Parking, and can be indoor or outdoor, but it needs to be sufficiently secure for its location. If well designed and managed it should enhance its environment.

Forecasting

4.1 For developments and highway schemes alike, the scenario planning function of the Propensity to Cycle Tool (PCT) should be used to identify potential commuting and school-related cycle trips and therefore daily trips. Both 'between zones' and 'within zone' flows should be included.

4.2 As the PCT is only based on 2011 census journey to work data, comparable analyses should be made to take account of developments since 2011 and developments planned. These may, for example, use the outputs of Transport Assessments prepared for those developments, the results of traffic surveys, and transport models. HCC holds and maintains a range of traffic data. Normally the PCT 'Go Dutch' scenario should be used.

4.3 Cycle routes should achieve a Cycling Level of Service (CLoS) score of at least 70% and no critical fails. Junctions should feature no cycle turning movements that are red-scored under the Junction Assessment Tool (JAT). These criteria, which are in line with government funding requirements, apply to cycling infrastructure schemes and to highway and other schemes that include cycle infrastructure or part of an existing or intended cycle route.

4.4 The JAT criterion need not be applied to cycle routes in Place and Movement category M1. It is likely that little if any dedicated cycle infrastructure will be provided in P&M category M1, although it may well be integrated into other infrastructure such as cycle streets.

4.5 A cycle route should provide a consistent CLoS of not less than 5% below the average % score along its whole length.

4.6 The CLoS tool and JAT are provided as Appendices in LTN 1/20. A working Excel copy of the CLoS is available to HCC staff. The JAT uses a graphical representation of the junction(s) being considered.

4.7 Local people can provide valuable knowledge: scheme promoters should consult and engage proactively with them when proposing new or amending existing cycle facilities even if not obliged to through statutory processes. They include local residents and businesses, HCC and borough or district officers, and local cycling and walking campaign groups. For example, Cycle Herts is a collaboration of cycle organisations and should be consulted where possible. Hertfordshire's Sustainable Mobility team should also be consulted in case they already have knowledge of the neighbourhood via Travel Plan monitoring.

Application of Design Standards

5.1 Guidance for provision for cycling is predominantly derived from LTN 1/20 Cycling Design Infrastructure.

5.2 HCC also makes selected use of the following design guides. Scheme promoters who wish to make use of these guides should consult HCC as not all of the design guides are applicable in all locations in Hertfordshire.

- London Cycling Design Standards, TfL
- CD 195 - Designing for cycle traffic, Highways England (now National Highways) 2020.
- Making Space for Cycling

5.3 Note that LTN 1/20 supersedes LTN 2/08 (Cycle Infrastructure Design) and that LTN 1/12 (Shared Space) has been withdrawn: these are not to be used.

5.4 National Highways standards apply to the Trunk Road network and are used by HCC on a discretionary basis.

5.5 Designers should understand HCC's requirements for designs that minimise and facilitate future maintenance as set out in their Maintenance for Active Travel Strategy which is part of the Highway Infrastructure Asset Management Plan (HIAMP).

5.6 As indicated in Part 1, Chapter 8: Standards & Departures, the requirements set out in this guide take precedence in situations where this guide differs from other standards.

5.7 Scheme Promoters shall adopt Recommended Standards wherever feasible, particularly for the provision of new facilities, as their use is most likely to contribute positively to the objectives of LTP4 and good development.

5.8 Acceptable Standards may be necessary where improvements are required within existing highway boundaries.

5.9 Designing facilities below Acceptable Limits will result in a poor standard of provision and constitutes a 'Departure from Standards'. As such the scheme promoter should submit the scheme proposal to a Design Review Panel so that the overall objectives of the scheme can be reviewed and potential alternative solutions can be discussed.

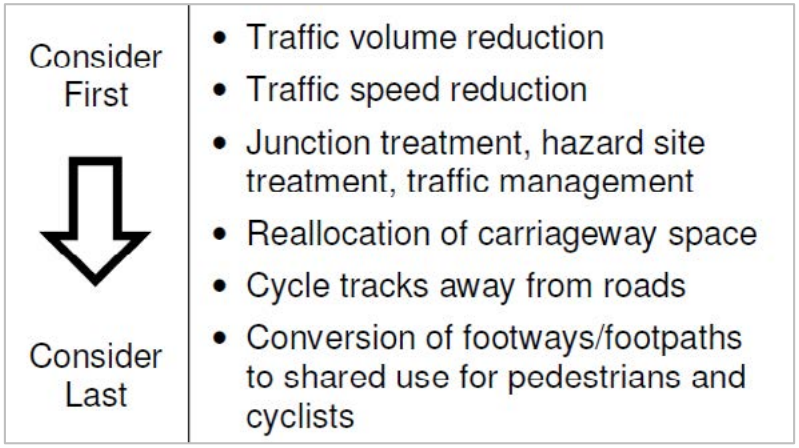
5.10 Scheme promoters and their advisors are expected to keep up to date with cycle design standards.

5.11 Cycling experience when preparing cycle infrastructure design gives better insight of the needs of people cycling. We recommend that designers undertake road cycle training so they can experience cycle facilities at first hand.

5.12 HCC provides cycle training and sends staff on this course where they will cycle at work.

General Principles for the Provision of Highway Links for Cycling

6.1 Scheme promoters should consider all appropriate ways to encourage cycling, not simply resort to building new infrastructure, in doing so they should apply the hierarchy of techniques as follows:



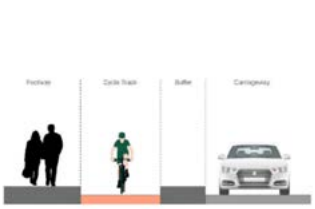
6.2 High volume and high speed carriageways create barriers for cyclists, whether as part of a cycle route or as features to cross.

6.3 Creating a slow speed, low traffic environment will benefit all users, including cyclists, and should be a key feature of developments, particularly residential developments.

6.4 The needs of cyclists shall be considered and factored into the design of all highway schemes, not just those with the objective of increasing cycling trips.

6.5 Appropriate protection should be provided from motor traffic on highways for people cycling as shown in LTN 1/20 Figure 4.1, noting its requirements regarding actual 85th percentile traffic speed.

6.6 Along roads this normally means segregated cycling space as follows:



Fully Kerbed Cycle Track

Stepped Cycle Track

Light Segregation

6.7 Stepped cycle tracks and light segregation are generally unsuitable for urban highways with speed limits above 30mph. They are normally in the same direction as the adjacent traffic lane, although Contraflow cycling and two-way stepped tracks may be appropriate in certain circumstances to line up other components of a cycle network but should be considered as a Departure from Standards.

6.8 If there is risk of vehicles parking on a proposed stepped cycle track then it may be better to create a fully kerbed track, because it may have a lesser spatial requirement than the stepped track plus the necessaryprotective bollards or the like.

6.9 Cycle lanes or cycling in mixed traffic will only be suitable in situations with low traffic speeds and volumes.

6.10 In slow speed environments, such as a 20mph areas or traffic calmed carriageways it may be feasible to plan for on-street cycling.

6.11 If space is required for cycling facilities within an existing, constrained highway, the first priority should be to take that space from motor vehicular traffic rather than from space provided for other vulnerable users.

6.12 Therefore, narrowing the carriageway in order to provide adequate cycle lanes will generally be preferable to the alternatives of narrowing footways or creating shared paths of inadequate width.

6.13 Heavy Goods Vehicles (HGVs) pose a particular hazard for cyclists, so segregated facilities should be provided in industrial areas or other places that carry a high volume of HGVs. A high volume of HGVs is defined as total buses and HGVs exceeding 500 per day (highest flow, whether weekdays or weekends).

6.14 Cycle lanes are part of the carriageway and provide no physical protection for people cycling. They should only be used in exceptional circumstances. They should not be provided where the carriageway is less than 9m unless the carriageway is widened, or the centre line is omitted/removed.

6.15 In hilly areas where the carriageway width does not permit cycle lanes in both directions consider providing a cycle lane only on the uphill side to provide additional width for people wobbling more as they cycle uphill. Cyclists travelling downhill will tend to be moving faster and the speed differential between them and passing vehicles will be less.

6.16 Cycle lanes narrower than 1.5m on existing carriageways should be removed when part of improvement or maintenance projects.

6.17 Cycle lanes without segregation should not be used except in low speed, low traffic flow situations. They do not provide any physical protection from moving motor vehicles and most people will perceive them to be unacceptable for safe cycling on busy or fast roads.

6.18 The introduction of advisory cycle lanes is deemed a Departure from Standards for consideration through the Design Review Panel process as in many situations Advisory cycle lanes can increase risk to people cycling compared to no cycle infrastructure because they are prone to encroachment by motor traffic and obstruction by parked vehicles.

6.19 The Design Review Panel shall also be consulted when any roadworks (including maintenance) are planned on roads with existing advisory lanes in order for it to consider whether they should be replaced by Stepped cycle tracks or Fully kerbed cycle tracks, mandatory cycle lanes, or be removed.

6.20 However, there are certain circumstances in which advisory cycle lanes can have a safety benefit. In areas subject to a 30mph speed limit and where traffic volumes are less than 3,000vpd or 300vph, there are no significant heavy goods vehicle traffic flows and on-street parking is strictly managed, consideration may be given to the removal of the road centre line and the introduction of advisory cycle lanes.

6.21 Providing a cycle track and buffer between parked vehicles and the footway provides a much higher level of service in terms of safety and comfort than having a cycle lane and buffer strip on the offside of parking/loading areas; and requires no additional width. The buffer between a cycle track (or cycle lane) and parked vehicles should be a minimum of 1m wide to provide enough room so that cycle users can avoid being hit if a car door is opened. Adjacent to disabled parking bays the buffer strip shall be at least 2m wide.

6.22 One-way traffic systems can be a significant inconvenience for cyclists. There should be a general presumption in favour of cycling in both directions in one way streets, unless there are safety, operational or cost reasons why it is not feasible.

6.23 It is essential to ensure that cyclists are provided with permeability through the road network, therefore, contraflow lanes should always be provided on new one-way streets or at "No Entry" plugs.

6.24 Pinch points that could cause cyclists to be 'squeezed' by motor traffic should be avoided or removed.

6.25 New developments will need to be highly permeable for sustainable modes, with the number of access points and internal routing for the private car highly limited.

6.26 Active Travel Links (ATLs) are provided within urban, semi-urban, semi-rural and rural settings for walking, cycling and potentially horse riding as non-motorised routes away from the County's main road system.

6.27 Sustainable Travel Links provide connections within urban, semi-urban, semi-rural and rural settings, as appropriate, for:

- Passenger Transport
- Active Travel modes
- Emergency services
- Limited local access for motor vehicles by design
- Limited local access for motor vehicles by regulation

6.28 Cycles are faster than walkers and slower than motor vehicles. Care should be taken to minimise the conflict that might arise if cycling is mixed with other modes.

6.29 Cycle routes and sections of unsegregated shared use should be designed to meet both the needs for walking and cycling equally, including their width, alignment and treatment at side roads and other junctions. Such designation should only be applied in limited situations as follows:

- Alongside interurban and arterial roads where there are few pedestrians;
- At and around junctions where cyclists are generally moving at a slow speed, including in association with Toucan facilities, where it is not possible to segregate pedestrians and cyclists;
- Where a length of shared use is acceptable to achieve continuity of a cycle route; and
- In situations where high cycle and high pedestrian flows occur at different times.

6.30 A Toucan Crossing may only be used where options which do not involve sharing space between pedestrians and cyclists (such as a parallel or signalised parallel crossing) have been thoroughly examined and found to be undeliverable in a specific location.

6.31 Conversion of existing footways to shared use should only be considered when options that reallocate carriageway or other space (e.g. verge) have been investigated and rejected as unworkable.

6.32 When the provision for active travel modes is immediately adjacent to the trafficked carriageway the geometrical design parameters for Active Travel will act as limits (e.g. minimum radii, visibility splays), but where the highway parameters are more generous they should be used.

6.33 Parallel or more direct routes for walking and cycling shall be provided where the carriageway design cannot meet the standards for Active Travel Links. This is to avoid the carriageway dictating the gradients for walking and cycling.

General Requirements for Place & Movement

7.1 The following table shows typical options for the appropriate provision for cyclists for new highways and within the new and existing highway network for each of the P&M categories.

7.2 These are derived from consideration of the hierarchy of provision, from likely traffic flows and speeds.

7.3 Selection of provisions outside of those shown within each category are likely to lead to compromises requiring departures from standards and, as such the Scheme Promoter should request a review from a Design Review Panel.

P1/M3

Major A road or Primary Road connecting two large urban settlements

Typical Cycling Provision

Recommended Standard

- Protected segregated cycle track
- Protected Shared Use

Acceptable Standard

Protected Shared Use (Urban where pedestrian flows will be low)

- Direction Signage
- Cycle priority at side roads (main road speed limit no more than 30mph)
- Unlit except at junctions

P2/M3

Main Connector linking a strategic road to a settlement (predominantly A roads)

Typical Cycling Provision

Recommended Standard

- Protected segregated cycle track
- Protected Shared Use

Acceptable Standard

Protected Shared Use (where pedestrian flows will be low)

- Cycle priority at side roads (up to 40mph main road speed limit)
- Direction Signage
- Bus stop bypasses or bus stop boarders
- Part Night Lighting

P3/M3

An urban interchange between two or more modes of transport

Typical Cycling Provision

- On-highway cycling
- Highway, cycleway and crossing facilities
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, docking station location etc.)
- Direction Signage
- Mobile device charging
- Secure storage / parking sufficient for both interchange users and those needing parking for other local facilities.
- Depot space for cargo bikes
- Full Night Lighting

P1/M2

Inter-urban road excluding the SRN and MRN network connecting two settlements within a rural setting

Typical Cycling Provision

Recommended Standard

- Protected segregated cycle track
- Protected Shared Use

Acceptable Standard

- Protected Shared Use
- Cycle priority at side roads (up to 40mph main road speed limit)
- Direction Signage
- Unlit

P2/M2

Multifunctional inner urban/suburban roads with bus routes, connecting different parts of an urban settlement and non-residential access road including to and within industrial estates.

Typical Cycling Provision

Recommended Standard

- Protected segregated cycle track
- Protected segregated Shared Use
- Stepped Cycle Track

Acceptable Standard

- Light segregation (or cycle lanes only within bus lanes) for existing highways with constrained widths
- On-street cycling for all purpose highways designed to achieve 85th percentile speeds of 22mph or lower and if parking is controlled
- Bus stop bypasses or bus stop boarders
- Direction Signage
- Cycle priority at side roads (up to 40mph main road speed limit)
- Part Night Lighting, except Full Night Lighting for stepped cycle tracks

P3/M2

Inner urban road e.g. high street, local shopping parades

Typical Cycling Provision

Recommended Standard

- Protected segregated cycle track
- Stepped Cycle Track
- On-street cycling for all purpose highways designed to achieve 85th percentile speeds of 22mph or lower and if parking is controlled

Acceptable Standard

- Light segregation (or cycle lanes only within bus lanes) for existing highways with constrained widths
- Contraflow cycle lanes
- Cycle priority at side roads.
- Bus stop bypasses or bus stop boarders
- Wayfinding signage
- Cycle Parking
- Bike Hire
- Full Night Lighting

P1/M1

Minor road within rural setting

Typical Cycling Provision

- On-Road cycling
- Unlit

P2/M1

Residential streets identified as Active and Sustainable Travel Links (ATLs & STLs)

Typical Cycling Provision

Recommended Standard

- On-street cycling for new highways by street design
- Segregated provision for ATLs & STLs
- Protected from busway within STLs

Acceptable Standard

- Traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Shared facilities for ATLs & STLs
- Contraflow cycle lanes
- Part night lighting
- Wayfinding signage
- Cycle parking
- Places to stop and rest

P3/M1

Inner urban road or square at the core of a settlement Shared Space Residential Street initiatives

Typical Cycling Provision

Recommended Standard

- On-street cycling for new highways by street design

Acceptable Standard

- Traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Contraflow cycle lanes
- Wayfinding signage
- Cycle Parking
- Places to stop & rest
- Bike Hire
- Depot space for cargo bikes

Geometric Design Requirements for Cycling

8.1 The following table summarises the geometric parameters for the provision of cycling facilities, which are predominantly derived from LTN 1/20, which includes the detailed supporting rationale.

8.2 The geometric parameters for cycling shall (except where minimum values of the corresponding highway parameters for the carriageway are more generous) dictate the carriageway design standards for horizontal radii, vertical curves, Stopping Sight Distances, visibility splays and longitudinal gradients where cycling is expected to be accommodated on carriageway or where the cycling facilities are contiguous with the carriageway.

8.3 The design parameters for Active Travel Links shall be applied to facilities shared with pedestrians.

Geometric Design Parameters

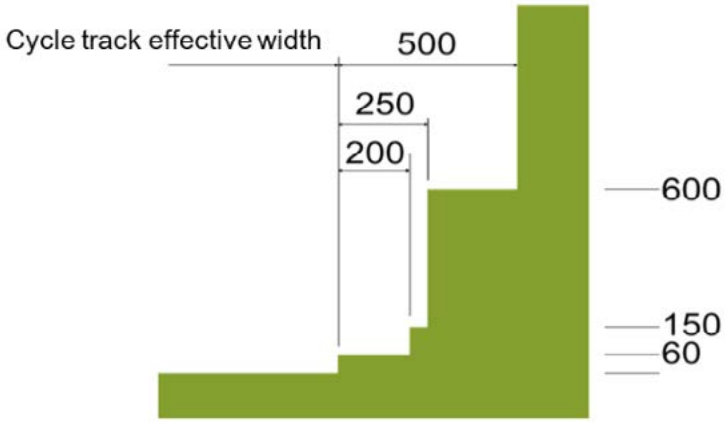
Minimum effective widths for Cycling

Direction [2]	Peak hour cycle flow [3]	width [1]	Acceptable limit width at constraints [4]	Absolute limit
1 way	<200	2m	1.5m	N/A
1 way	200-800	2.2m	2m	N/A
1 way	>800	2.5m	2m	N/A
2 way	<300	3m	2m	N/A
2 way	300-1,000	3m	2.5m	N/A
2 way	>1,000	4m	3m	N/A

Notes:

1. The presence of gullies, kerbs, walls and street furniture prevent the use of the full width of a cycle lane or track. The full width of the cycle lane or track shall therefore equate to 'the effective width + any additional compensatory width' as set out below.
2. One-way flow for one-way cycle route. Two-way flow for two-way cycle route.
3. Based on a saturation flow of 1 cyclist per second per metre of space. For user comfort a lower density is generally desirable.
4. Provision narrower than the Recommended width should be the exception, minimised and only used on sections up to 100m long.

Additional compensatory widths at fixed objects



Provision for Utilities

Buried utilities shall not be laid longitudinally underneath unsealed or sealed surfacing and the ATL shall be wide enough to accommodate access for safe utility maintenance without closure of the ATL.

Planning for Temporary Works

A minimum clear width of 3m shall be required for walking and cycling during periods of maintenance of any form.

Minimum margin width between the cycle lane and the carriageway for light segregation features

0.4m

Minimum Separation between carriageway and cycle track (excluding allowance for any street furniture or tree planting)

Speed Limit

30mph

Recommended	0.5m
Acceptable	0m

40mph

Recommended	1m
Acceptable	0.5m

50mph

Recommended	2m
Acceptable	1.5m

60mph

Recommended	2.5m
Acceptable	2m

70mph

Recommended	3.5m
Acceptable	3m

Buffer strip width alongside parked vehicles

General

Recommended	1m
Acceptable	0.5m

Cycle Track and Blue Badge Parking

Recommended	2m
Acceptable	2m

Cycle Lane and Blue Badge Parking

Recommended	1m
Acceptable	0.5m

Taper

Recommended	1:10
Acceptable	Approach 1:10
	Exit 1:5

Min forward visibility

Gradient ≤3%

Recommended	47m
Acceptable	31m

Gradient >3% uphill

Recommended	31m
Acceptable	17m

Visibility Splay X-Distance

Recommended	4.5m
Acceptable	2.4m

Minimum Link Radii

Gradient ≤3%

Recommended	25m
Acceptable	15m

Gradient >3% downhill

Recommended	40m
Acceptable	25m

Minimum Radius at Junctions

4m

Recommended Longitudinal Gradients

1% to 2%

Maximum Longitudinal Gradient

Gradient: 2%

Maximum Length Acceptable Limit: 150m

Maximum Length Absolute Limit:
Departure from Standards: 250m

Gradient: 2.5%

Maximum Length Acceptable Limit: 100m

Maximum Length Absolute Limit:
Departure from Standards: 160m

Gradient: 3%

Maximum Length Acceptable Limit: 80m

Maximum Length Absolute Limit:
Departure from Standard: 110m

Gradient: 3.5%

Maximum Length Acceptable Limit: 60m

Maximum Length Absolute Limit:
Departure from Standards: 80m

Gradient: 4%

Maximum Length Acceptable Limit: 50m

Maximum Length Absolute Limit:
Departure from Standards: 65m

Gradient: 4.5%

Maximum Length Acceptable Limit: 40m

Maximum Length Absolute Limit:
Departure from Standards: 50m

Gradient: 5%

Maximum Length Acceptable Limit: N/A

Maximum Length Absolute Limit:
Departure from Standards: 40m

Gradient: 6%

Maximum Length Acceptable Limit: N/A

Maximum Length Absolute Limit:
Departure from Standards: 25m

Gradient:7%

Maximum Length Acceptable Limit: N/A

Maximum Length Absolute Limit:
Departure from Standards: 20m

Gradient: 7.5%

Maximum Length Acceptable Limit: N/A

Maximum Length Absolute Limit:
Departure from Standards: 18m

Crossfall Gradients

Recommended

Maximum	2% (1:50)
Minimum	1% (1:100)

Acceptable

Maximum	2.5% (1:40)
Minimum	1% (1:100)

Absolute Limits: Departure from Standards

Steeper gradients will only be considered where existing ground levels make it impractical to achieve the acceptable limits specified. If shallower gradients are used drainage must be considered

Minimum Sag K Value

Gradient ≤3%

Recommended	5%
Acceptable	3.5%

Gradient >3% downhill

Recommended	7.5%
Acceptable	5%

Minimum Crest K Value

6

Vertical Clearances

Minimum: 2.7m

At obstruction up to 23m long: 2.4 m

Absolute Limits: Departure from Standards: 2.3m

Use warning sign to Diagram 530 and yellow / black chevron to Diagram 530.2 across top of subway entrance

Lane widths for on-carriageway cycling

9.1 The prescribed widths of P&M category P3/M2, P1/M1, P2/M1, P3/M1 and P2/M2 L2 carriageways have been selected for their suitability for on-street cycling.

9.2 The following traffic lane widths are applicable when improving conditions for cycling on existing roads and streets.

Traffic lane (cars only, speed limit 20/30mph)

Recommended 3m
Acceptable Limit 2.75m

2.5m only at offside queuing lanes where there is an adjacent flared lane

Traffic lane (bus route or >8% HGVs, or speed limit 40mph)

Recommended 3.25m
Acceptable Limit 3m

Lane widths of between 3.2m and 3.9m are not acceptable for cycling in mixed traffic.

2-way traffic lane (no centre line) between advisory cycle lanes - subject to Design Review Panel

Recommended 5.5m
Acceptable Limit 4m

4m width only where AADT flow <4000 vehicles** and/or peak hour <500 vehicles with minimal HGV/Bus traffic.

LTP4 Compliance

10.1 The suitability of cycling and the concept of cycling provision should already have been LTP4 Compliance tested at the Site Validation and Master Plan stages.

10.2 Cycling provision shall also be LTP4 Compliance tested at the outline planning application stage, if appropriate and at the full planning application stage.

Cycling Proposals

LTP4 Compliance Test: Outline Planning Application

The proposed network strategy and accompanying narrative demonstrates that the strategy will support LTP4 Policy 1: Transport User Hierarchy giving precedence to the needs of those walking and cycling over motor vehicles and that it can be developed into a proposed network that will be safe and accessible to all.

The proposals at 1:2500 scale show that key destinations are close to where people live with an effective network for active travel.

Cycle routes within the site will be able to achieve a Cycling Level of Service (CLoS) score of at least 70% and no critical fails.

Cycling Proposals

LTP4 Compliance Test: Full Planning Application

The proposed network supports LTP4 Policy 1: Transport User Hierarchy giving precedence to the needs of those walking and cycling over motor vehicles.

The proposed provision for cycling will be safe and accessible to all and meets the five core design principles of:

- Safety (including perception of safety)
- Directness
- Coherence
- Comfort
- Attractiveness

The plans and accompanying narrative demonstrate compliance with this guidance and as assessed by the first Healthy Herts test.

Cycle routes within the site achieve a Cycling Level of Service (CLoS) score of at least 70% and no critical fails.

Cycle routes provide a consistent CLoS (i.e. not less than 5% below the average % score) along their whole length.

Junctions feature no cycle turning movements that are red scored under the Junction Assessment Tool (JAT).

Cycling Proposals

LTP4 Compliance Test: Approvals

The detailed proposals deliver the strategy agreed at the Full Planning Stage Gateway.

The design is compliant with this guidance and any departures from Standards have been agreed.

The design passes the second Healthy Herts test.

Legal processes

11.1 LTN 1/20 Appendix C provides guidance on legal issues and definitions, and on processes to create cycle tracks in new developments.

11.2 Traffic Regulation Orders (TROs) or other legal processes may be needed as part of the provision of cycling facilities.

11.3 For on-carriageway facilities:

- **Advisory Lanes** - no legal processes are required to create an advisory cycle lane. However, parking restrictions to keep the lane clear of parked vehicles should be considered.
- **Mandatory Lanes** - a TRO is required to restrict use to pedal cycles. Traffic Signs Regulation and General Directions 2016 (TSRGD) removes the requirement for a TRO with 24hr Mandatory Lane. The TRO would not restrict loading and in locations where this may be a problem, segregation or a loading ban should be considered. It may be necessary to provide alternative loading arrangements.
- **Contraflow** - A TRO is required to create a one-way carriageway. The TRO will need to exempt cyclists travelling on the carriageway or be applicable only to motor vehicles. This may mean an existing TRO would need to be modified.

11.4 For off carriageway, but set alongside:

- Section 65 of the Highways Act 1980 provides HCC with powers to create new cycle tracks in the highway verge without any special legal procedures, but a conversion report shall be provided for the signature of a HCC authorised officer. The conversion report should document the consultation process undertaken along with consideration of Equality Impacts and make it clear that the cycle track includes a right-of-way on foot so that pedestrians are able to use the track.
- Where an existing footway needs to be modified to accommodate the cycle track the process becomes more complex, the table below outlines the requirements for various scenarios.

Powers used from Highway Act 1980

Location of new Cycle Track & Type of facility

Section 66	Create / Remove Footway
Section 65	Create / Remove Cycle Track

Verge (shared)

Section 65	Create Cycle Track

Verge (segregated shared)

Section 66	Create Footway
Section 65	Create Cycle Track

Existing Footway (shared)

Section 66	Remove Footway
Section 65	Create Cycle Track

Existing Footway (segregated shared)

Section 66	Remove Footway and create in new location as appropriate
Section 65	Create Cycle Track

11.5 Creating a cycle track away from a road corridor can be a complex process sometimes requiring agreement from third party landowners. The table below outlines some of the possible options:

Bridleways, BOATs and Restricted Byways

Can be used by cyclists, pedestrians and equestrians, so widths and appropriate surfacing for each mode should be considered.

Footpaths

Cycle Tracks Act 1984 Section 3 - Cycle Tracks Order to convert footpath (only up to 95% of width to retain Public Right of Way status on the definitive map).

This option can be difficult and costly to pursue as it will require approval from the Secretary of State, and any objections would need to be resolved at a Public Inquiry.

Private Land

- Landowner dedicates as highway
- Permissive agreement with landowner
- Purchase land

11.6 The Equalities Act places a number of duties on public authorities. Among these duties is the requirement to assess whether changes will adversely affect those with Protected Characteristics under the Act.

11.7 Consequently existing footway conversion could be seen as adversely affecting groups with protected characteristics and therefore an Equality Impact Assessment is an important process in recording the consultation and decision-making process.

Chapter 5
Planning Passenger Transport Infrastructure including Transport Hubs

Contents

Introduction

1.1 This Chapter provides guidance on planning for the seamless use of passenger transport between new development and other major settlements through the provision of infrastructure, building on key principles established at the Master Planning stage as set out in Part 2 Chapter 4 and summarised in the following table.

Passenger Transport Key Principles

Enhancement of stations to include secure, covered cycle parking and integration with local bus services.

A high-quality, high-frequency bus network to offer a 'turn up and go' service on key routes.

Key destinations must be served rapidly and directly.

Accessible services and facilities

Bus network potentially connecting to existing or proposed Rapid Transit routes

Journey time for PT1 passenger transport must give an advantage over the private car. Where buses share road space with cars, segregation/priority for buses on main roads should be considered.

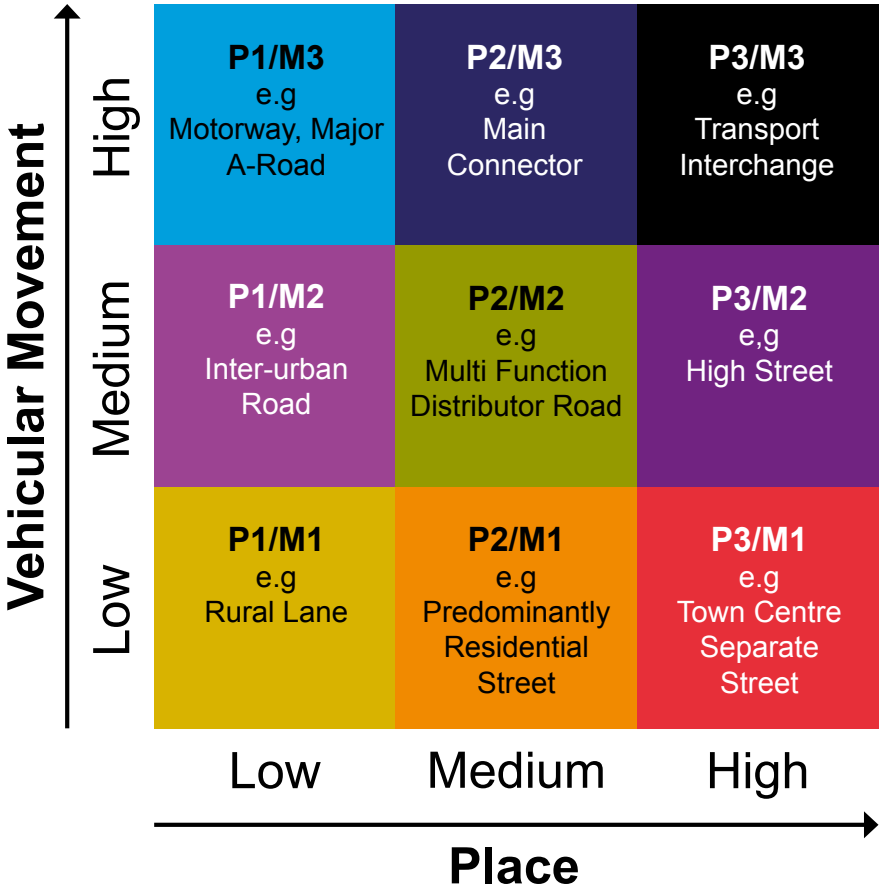
Integrated ticketing across operators in a multi-operator scenario, or otherwise the use of simple fare structures using contactless technology.

Sustainable Transport Hubs that provide Interchange for passenger transport and active travel modes information and tickets, cycle hire docking stations and cycle parking, drop off points for on-demand services and car club parking. Co-located or combined with other activities and a mix of uses such as residential, employment, leisure, health, community and retail

Common branding of local passenger transport services to be considered and explored with operators

1.2 For the purpose of this Place & Movement Planning and Design Guide PT1 passenger transport modes include trains, Mass Rapid Transit (MRT) and buses with more than 8 passenger seats operated as time tabled public services, works buses, school buses or Demand Responsive Transport (DRT) services.

1.3 PT1 buses are not expected to be used or designed for within the M1 categories of the Place & Movement matrix.



1.4 PT2 passenger transport modes include mini-buses, Hackney Carriages, private hire taxis and Demand Responsive Transport vehicles with 8 or less passenger seats.

1.5 The guidance also supports the published Intalink Bus Strategy, which sets out how HCC will:

- Support a network of cost effective and efficient bus services to promote accessibility and respond to the changing bus network
- Deliver bus infrastructure improvements including bus priority measures, focused primarily on a core network of routes
- Work with bus operators through the Intalink Enhanced Partnership to promote bus services and other network improvements
- Consider how smarter use of data and information can be made

1.6 HCC was the first local authority to introduce a statutory Enhanced Partnership in 2020, ensuring greater collaboration with local bus operators and the subsequent Bus Service Improvement Plan (BSIP) sets out how it will deliver the Bus Back Better strategy across Hertfordshire.

1.7 HCC leads the Hertfordshire Intalink Enhanced Partnership, which is a well-established group of public transport operators and local authorities working together to improve the passenger experience of services in the county. In recognition of the importance of many stakeholders in the Hertfordshire public transport network, membership includes the county, 10 district and borough councils, bus operators and train operating companies. A statutory document has been adopted (Plan and Scheme) with all parties. This links into the Bus Services Improvement Plan (BSIP)

1.8 Hertfordshire's Rail Strategy sets the strategic framework against which decisions regarding future franchises and investment in key elements of infrastructure can be identified and prioritised.

1.9 The master planning exercise should have identified a general layout which ensures that all occupied parts of development will be within 400m walking distance of a bus stop or transport hub by public walking route. For town centre locations, educational establishments, areas with a significant proportion of elderly residents and commercial and industrial developments the maximum walking distance this will be 200m.

1.10 The highway design requirements to support passenger transport are set out in:

- Part 3 Chapter 8 - Planning Highway Links
- Part 3 Chapter 9 - Planning Highway Junctions
- CIHT Guidelines for 'Buses in Urban Developments'

1.11 The subsequent detailed design requirements are set out within the Part 4 chapters and within the CIHT Guidelines.

Transport Hubs

2.1 A Transport Hub should be designed to be a recognisable and easily accessible place which integrates different transport modes and supplements them with enhanced facilities, services and information aimed at encouraging more sustainable travel, creating sense of place and improving journeys and travel choices.

2.2 A review of UK and international best practice suggests the following key success factors for hubs:

Key Success Factors

General

- Hubs can be for more than mobility: consideration should be given to the role hubs can play in economic and community development
- Hubs are a spatial concept within their surroundings with the hub site working with surrounding networks and activities
- There is no one-size-fits-all approach and it is important that each hub is designed to meet local needs through a bespoke approach, with local characteristics and needs leading the specification

Design & Operation

- Hubs need to be developed with community involvement, expert knowledge, technical operation support and suitable funding

- The chosen location for a hub will be an important element of success. They should ideally be located in areas of locally high demand (whether for travel or other community/commercial services) or where demand can be aggregated
- Hubs can be developed in purpose-built facilities or in underused facilities which can be repurposed. The opportunity should also be taken to enhance the quality of the surrounding public realm to anchor the facility
- The location and layout of hubs should be designed to relate well to existing pedestrian desire lines and any new pedestrian desire lines created as a result of the hub or other nearby planned development
- A strong financial plan is needed for the operation, upkeep and maintenance of hubs with identified sources of funding and revenue
- Key staff should have the right expertise and local knowledge
- The digital foundations are as important as the physical integration of hub components including digital integration of transport services and modes through smart ticketing or Mobility as a Service solutions. Consideration could also be given to how digital isolation of users can be reduced through hubs
- Hubs should have a recognisable brand (either a new one, or linked to an existing brand), supported with signage, wayfinding and consistent and marketing. Marketing should be cross-channel, across all age groups, to reach a wide audience.
- Hub developers should work closely with potential service providers for hubs to consider operational needs/challenges including for space, utilities and digital communications.

Stakeholder and Community Engagement

- A community led approach is essential for success, particularly for smaller hubs, in both designing and implementing and a hub. In some cases, the delivery of hubs could be via a local volunteer base
- Building strong partnerships is important for a collaborative approach. This includes working with local stakeholders (e.g. local businesses), local government, NGOs, charities, transport operators and other organisations. A strong engagement plan should be developed early
- Hubs can be developed through both a top-down policy approach and a bottom-up community-led approach and both can provide direction

- Working with multiple partners on a complex multi-service pioneering development may not happen fast or easily. Hub developers need to have robust plans and realistic programmes
- A customer-centric approach should be used to develop hubs and in specifying locally appropriate components

Commercial

- Hubs should operate like a business, with a clear business model and plan. Whilst external funding may be required to set up a hub, being financially self-sustainable through hub-generated revenue could help ensure long term viability
- A diversified offer in the hub could help strengthen the resource viability of the hub, as it could attract a range of different users to different functions/services over time and create diversified income stream

2.3 Having established the strategic context and types of hubs at the Master Planning Stage the next step is to identify a long list of features from across mobility modes and infrastructure, traveller facilities, placemaking, community functions, commercial functions and supporting principles.

2.4 Each hub should have its own business case with each neighbourhood having its own appropriate type of hub and selected features to suit its local needs.

2.5 An important check is to assess whether there may be displacement impacts on the existing community and commercial functions if the hub is delivered in each location. Equally it is important to assess which, if any, of the features are already being provided at the hub site or in the immediate surroundings

REGIOtim mobility hub in rural Austria

2.6 The demand for the features should be established through an assessment of

- Hub catchment including residential population and local trip origins and destinations
- The propensity of the local population to use the features

2.7 Taking on board the key success factors, displacement impacts, existing provisions and demand, the features can be sorted to identify high, medium and low priorities.

2.8 The following table sets out the features that should be considered in themes associated with:

- Traveller facilities for the different transport modes
- Placemaking
- Community functions
- Commercial functions
- Supporting Principles

Traveller Facilities

Mode RangeCustomer requirements

Walking

Less than 3km

- Footway and crossing facilities,
- Lighting
- Seating
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, etc)
- Wayfinding
- Mobile device charging

Cycling by a bicycle / tricycle that is:

- Self-powered (i.e. pedalled) and is owned by the user
- Electrically power-assisted and is owned by the user
- Self-powered (i.e. pedalled) using a shared docked or dockless bicycle service
- Electrically power-assisted using a shared docked or dockless bicycle service

Less than 10km

- Highway, cycleway and crossing facilities
- Lighting
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, docking station location etc)
- Wayfinding
- Mobile device charging
- Secure and covered storage / parking sufficient for both hub users and those needing parking for other local facilities.
- Docking station (where cycle share schemes are to be used
- Charging facilities

E-Scooters and other personal mobility devices such as balanced wheels, hoverboards, powered skateboard (Note: these are currently not permitted in public spaces in the UK but the DfT is currently considering legislation)

Less than 3km

- Highway, cycleway and crossing facilities
- Lighting
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, docking station location etc)
- Wayfinding
- Mobile device charging
- Secure storage / parking sufficient for both hub users and those needing parking for other local facilities.
- Docking station (where cycle share schemes are to be used
- Charging facilities

Powered and shared mobility devices for mobility impaired users

Less than 3km

- Highway, cycleway, footway and crossing facilities
- Lighting
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, etc)
- Wayfinding
- Mobile device charging

Powered Two-Wheeler moped, scooter or motorbike that is owned by the user or shared

Less than 15km

- Highway
- Lighting
- Shelter
- Changing facilities, showers, lockers
- Traveller information (routing, weather, etc)
- Wayfinding
- Mobile device charging
- Parking

Powered Two-Wheeler Taxi Service by scooter or motorbike for pillion passengers

Less than 15km

- Highway
- Lighting
- Shelter
- Waiting area and drop-off
- Wayfinding (for 'last mile' walking)

Private Car

No limit

- Highway
- Lighting
- Traveller information (parking locations)
- Wayfinding (for 'last mile' walking)
- Parking including potentially designated car-pooling spaces

Traditional Bus

Less than 30km

- Highway, busway, bus priority
- Lighting
- Shelter
- Stop
- Real-time passenger information
- Traveller information (routes, time tables, stop locations)
- Wayfinding (for 'last mile' walking)

Traditional & Emerging Taxi

Less than 20km

- Highway
- Lighting
- Shelter
- Taxi rank and/or waiting area and drop-off
- Wayfinding (for 'last mile' walking)

Ride-hailing / Mobility as a Service) (shared or sole use) schemes match customers with available rides using a smartphone app. Users can register their desired trips and pay on account via pre-approved payment methods with prices set according to supply and demand.

Less than 30km

- Highway
- Lighting
- Shelter
- Pick-up/drop area
- Wayfinding (for 'last mile' walking)

Drones/ Pavement Delivery Devices

Deliveries by low level automated air technologies (commonly referred to as drones) or wheeled devices operating on pavements (sometimes called droids or robots) as a way of eliminating or reducing trips

Less than 10km

- Depot and maintenance space
- Footway
- Landing pad

E-cargo bike

Deliveries by electrified cargo bike

Less than 10km

- Highway, cycleway and crossing facilities
- Lighting
- Shelter
- Changing facilities, showers, lockers
- Traveller information (docking station location, routing, weather, etc)
- Wayfinding

- Mobile device charging
- Docking station (where applicable)
- Depot space

Digital as a Mode
The use of digital connectivity to reduce / remove the need to travel. Digital access to work, education and healthcare provides for similar opportunities without physical movement.

No Limit

- Fixed or mobile connectivity
- Service provider software/apps and/or sound/video conferencing software/apps

Place Making Features

- Hub signage & pillar
- Public realm improvements including public art
- Green and blue infrastructure including park / parklet
- Community garden

Community Features

- Community hall / space
- Library
- Place of worship
- Community café
- Healthcare provision
- Space for mobile community facilities e.g. library, healthcare
- Recycling facilities
- Public defibrillator
- CCTV
- Emergency help point
- Emergency planning and response role

Commercial Features

- Convenience retail
- Co-working space
- Office space
- Childcare
- Banking including cash machine
- Postal services
- Parcel locker / freight consolidation
- Space for mobile commerce
- Discretionary retail
- Leisure

Supporting Principles

- Consistent branding
- Local electrical generation and storage
- Digital connectivity
- Flexible space to enable innovation

2.9 Consideration should also be given to hubs being flexible spaces where some features can change over time and allowance can be made for new features and innovation to be built in over time. Furthermore, some features may not perform well in some locations, therefore, having designed-in flexibility may lessen the impacts if features fail.

2.10 In some locations, features could change by time of day, by day of the week or even season as demand from users change temporally. Some examples of this flexibility could include:

- Space could be used for co-working during core office hours and used for community functions in evenings or at weekends.
- Components that support the tourism market could be in place during school holidays but converted to pop-up retail or services in non-holiday periods.
- Spaces for drop-off/pick-up in peak hours could be used for expanded taxi waiting in evenings.

2.11 At their simplest a Transport Hub could entail a pillar, space for rest and shelter with secure covered cycle parking and provision for PT1 and PT2 passenger transport services to pick up and drop off.

Bus Stops

3.1 Bus stops shall be designed to serve PT1 buses. Additional, separate provision should be made for PT2 passenger transport pick up and drop off, if required in that vicinity and, in that case, the provision of a basic Transport Hub may wish to be considered.

3.2 The supporting facilities required at each proposed bus stop shall be agreed with HCC prior to the submission of a planning application including the provision for:

- Shelter
- Seating
- Cycle parking
- Real Time Passenger Information
- Monitoring infrastructure

3.3 The need for provision of shelter, seating and cycle parking and their scale should be considered within the context of the wider public realm and other local facilities. In doing so, they may usefully serve dual purposes.

3.4 Bus journeys are currently made predominantly between home and key retail, leisure, employment and public service destinations and the likely required scale and scope of the supporting facilities along a route are predictable.

3.5 However, travel patterns are expected to change over time with the application of demand management measures for the private car and the priority provision for multi modal sustainable travel

3.6 Hence, whilst there may not be the immediate requirement for shelter, seating or cycle parking provision at a bus stop, passive provision should be made within the geometric layout for all proposed bus stops on new, or improved highways, such that the facilities can be introduced readily, at a later date. The geometric design parameters for bus stops are set out in Part 4, Chapter 4.

Bus Laybys

4.1 New highway design should negate the requirement for the provision of bus laybys in most circumstances. They should only be required where it is expected that buses will lay-over for timetabling purposes, or for highways are designed for 40mph speed limits and above. In certain circumstances, proximity to pedestrian crossings and/or junctions may mean a lay-by is retained to aid visibility.

4.2 The provision of bus laybys should only be considered necessary within the P1/M2, P1/M3, P2/M3 and the higher speed P2/M2 categories.

Bus Priority Measures

5.1 Bus priority measures including Sustainable Travel Links, segregated bus lanes, junction priority, bus gates shall be restricted to PT1 passenger transport, emergency vehicle and, as appropriate, cycle use.

5.2 Bus detection for activating priority measures is currently via induction loop and enforcement by Automatic Number Plate Recognition (ANPR) technology.

Real Time Passenger Information (RTPI)

6.1 RTPI includes both the collection of passenger data for monitoring and transport planning purposes and the provision of travel information to passengers.

6.2 HCC's strategy for the provision of RTPI is that:

- RTPI should be collectable at all new bus stops and Transport Hubs
- RTPI for passengers should be available by mobile app at all bus stops and Transport Hubs
- RTPI for passengers should be available on static screens at all Transport Hubs and at major public buildings and employment buildings within close walking distance of Transport Hubs, as appropriate
- There may be a requirement for screens at significant bus stops, by exception.

6.3 Detailed requirements for RTPI are set out in Part 4, Chapter 4: Designing for Passenger Transport.

Intelligent Transport Systems (ITS)

7.1 HCC's ITS strategies set out in Part 3, Chapter 19 - Planning for Intelligent Transport Systems (ITS) are key to:

- Improving passenger transport by enabling more reliable, safer and more efficient services through the active management and controls of Sustainable Travel Links, segregated bus lanes, junction priority, bus gates.
- Collecting passenger and passenger transport data. HCC is introducing Smart City sensor networks and anticipates expansion in the network and its usage will be key for monitoring and planning passenger transport.
- Providing better travel and traveler information, helping to match supply and demand by providing better information, so that travelers can make informed choices on when and how to travel.
- Enabling digital integration of transport services and modes through smart ticketing or Mobility as a Service solutions.

7.2 Scheme Promoters should discuss potential ITS proposals with HCC prior to formulating any planning application or scheme proposal.

Chapter 6
Planning for Public Rights of Way

Contents

Introduction

1.1 This chapter provides guidance on how high-level principles for any affected Public Rights of Way (PRoW), established at the master planning stage, can be translated into proposals for PRoW suitable for inclusion within the emerging planning application or the general arrangement for permitted development schemes.

1.2 At the master planning stage scheme promotors should have undertaken informal consultation with HCC and the Local Planning Authority (LPA) to explore, where possible, how the PRoW network may be improved and to ensure that any potential disadvantages to the public in alternative arrangements for a PRoW can be minimised or mitigated.

Management of the Public Rights of Way Network

2.1 HCC's Countryside & Rights of Way Service deals with the maintenance and improvement of the PRoW network.

2.2 The Public Rights of Way (PRoW) network consists of:

- Byways Open to All Traffic (BOAT) - used by all modes of traffic but mainly used by walkers, horse, cycle riders and carriage drivers;
- Restricted Byway (RB) - for all non-motorised users below, including horse & carriage drivers;
- Bridleway (BW) - for horse riders, cycle and pedestrian use only;
- Footpath (FP) - for pedestrian use only.

2.3 HCC has produced a Rights of Way Improvement Plan (RoWIP), which sets out detailed proposals for the improvement of the network. This is a statutory document integrated with the Local Transport Plan and sets out that the 3200+km of PRoW should be improved through development where it will better serve the needs of walkers, cyclists and other forms of active travel as well as providing for health and wellbeing.

2.4 HCC has a duty to "assert and protect" the right of the public to unimpeded access to Rights of Way. These routes are now widely used throughout Hertfordshire, particularly for leisure but also for many commuting and utility journeys, for example to and from schools and workplaces or as part of the National Cycle Network.

The Public Rights of Way Network and Development

3.1 Development or road improvement which is undertaken without regard to its effect on the PRoW network can cause serious problems.

3.2 Early informal consultation between scheme designers and promoters, HCC and the LPA to explore, where possible, how the PRoW network may be improved and to ensure that any potential disadvantages to the public in alternative arrangements for a PRoW can be minimised.

3.3 It may be appropriate for improvements to PRoW both within the development site and on the adjacent PRoW network. Opportunities provided by new developments to bridge missing links and provide new or improved connections to the network will be encouraged.

3.4 These improvements may be associated with increased usage of the PRoW as a result of the development, or to provide safe road crossing points for PRoW users, for example.

3.5 Department for Environment, Food and Rural Affairs (Defra) document Rights of Way Circular 1/09 sets out useful information relating to Public Rights of Way and development.

3.6 Where a PRoW passes through or is within a site and either remains unaltered or is diverted as a result of a development, the amenity value of the PRoW must, as a minimum, remain unchanged in terms of width, perceived safety, attractiveness and surfacing.

3.7 The surface finishes required for the different typology of route should be informed by Part 3 Chapters 3, 6 and 20. This detail will be attributed to all individual routes or parts thereof and informed through engagement with the CRoW service. This to be submitted to and approved in writing by the Local Planning Authority in consultation with Hertfordshire County Council as Highway Authority.

Statutory Processes

4.1 Scheme Promoters should be aware that PRoW are protected by the same legislation as all other highways and as such should be treated in the same way as existing highway.

4.2 Statutory procedures must be followed where development requires the diversion or extinguishment of a PRoW.

4.3 Temporary Traffic Regulation Orders to close and divert the PRoW may be required during the construction of a development.

4.4 The effect of development on a PRoW is a material consideration in the determination of applications for planning permission. Local Planning Authorities must ensure that the effect on any PRoW is considered whenever such applications are considered.

4.5 Planning applications shall include information about PRoW on the site.

4.6 Where a development affects a PRoW, the LPA is required to make this clear, both by posting a notice on the site and in advertisements in a local newspaper.

4.7 The formal consultation and statutory procedures associated with making and confirming the necessary orders can be lengthy and need to be started without delay, once the details have been approved, to improve the chances of success. Only if successful may the development or scheme then proceed on the line of the path. Advice can be sought on appropriate procedures from the county council's Countryside & Rights of Way service for which a fee may be payable.

4.8 The granting of planning permission does not entitle scheme promoters to obstruct, divert or extinguish a PRoW. Separate procedures must be successfully completed before this can be confirmed, under either Section 247 / 257 of the Town and Country Planning Act (TCPA) or Section 118 / 119 of the Highways Act. The developer or scheme promoter is advised to contact the HCC Countryside & Rights of Way team via 0300 123 4047 or row@hertfordshire.gov.uk for advice.

Chapter 7
Planning for Parking

Contents

Introduction

1.1 Part 1 of this guidance highlights the importance of car parking control as a demand management tool within an overall transport strategy and that parking provision will be assessed as part of the Transport Assessment, Transport Statement or School Transport Statement process as appropriate. These are described in Part 1; Chapter 5.

1.2 At the master planning stage Scheme Promoters should have considered the appropriate number and location of car parking spaces to avoid over provision of parking resulting in car dominated development. This principle applies to new developments as well as extensions and changes in use.

1.3 The scale and nature of parking provision and their relationship to the built environment should also have been considered at that stage as it can have a determining influence on the success of the development.

1.4 Consideration should have been given to more innovative measures to reduce the demand for individual parking spaces and to emerging technologies such as the provision for on-demand services, Mobility as a Service (MaaS) solutions and potential for shared autonomous vehicle provision as set out in Chapter 4 of Part 2.

1.5 The needs of pedestrians shall be taken into account when designing the layout of parking for all modes. This includes both those who have parked and those accessing the development on foot.

1.6 Pedestrian access to the development should be considered and pedestrian desire lines identified. Pedestrian access, segregated or shared surface, should then be provided along these routes rather than simply relying on the vehicular route.

1.7 Provision of safe and accessible pick-up and drop-off points for on-demand services and MaaS should also be considered.

1.8 Careful design should also ensure that provision for pedestrians, parking, bin storage and waste management complement each other sympathetically to foster an attractive space, rather than competing and conflicting with each other, which makes the space uninviting.

1.9 In Hertfordshire the ten borough and district council Local Planning Authorities are responsible for setting parking standards.

Cycle Parking

2.1 Active travel such as cycling is a high priority, as identified in the Local Transport Plan Policy 1 user hierarchy. In order to encourage cycling it is critical that safe, secure and convenient cycle parking facilities are provided as an integral part of new developments.

2.2 Cycle parking standards are applied by Local Planning Authorities (LPAs) to all applications for new or extended development. They are expressed as minimum standards to reflect the sustainable nature of this mode of travel. The scheme promotor shall design cycle parking into a development at an early stage and should consider the requirements of additional needs such as lockers, changing and shower facilities, prior to the granting of planning permission.

2.3 Where possible cycle parking should be provided on site as an integral part of transport provision. If this is not deemed appropriate by the Scheme Promotors, they should justify the exceptional circumstances and provide a financial contribution towards public provision of such facilities.

2.4 Key principles in relation to the provision of cycle parking are as follows:

- Cycle parking provision must consider all types of cycle vehicle and all types of cycle user.
- Cycle parking should be secure
- Cycle parking should be provided at all residential units, local facilities and employment sites.
- Cycle parking, and routes to and from it, should be clearly marked, overlooked, well-maintained, well-lit and integrated into the built environment.
- If the proposed cycle parking provision is to be within a garage, the garage should be large enough to accommodate a large family car together with general storage, whilst providing sufficient clearance to enable the cycles to be wheeled in and out of the garage without moving the car.
- All flatted development should have secure communal cycle parking areas including visitor cycle parking areas on site.
- Communal cycle parking areas should be accessible and well lit.
- Communal cycle parking areas should be sheltered and secure.

- Consideration should be given to provision of secure storage for different types of cycle (e.g. cargo cycles, Electrically Assisted Pedal Cycles (EAPCs or e-cycles) and trailers).
- Provision for charging for e-cycles should be considered.
- Cycle parking should be reviewed as part of Travel Plan monitoring to ensure there are adequate spaces to meet the demand. Arrangements should be incorporated into a new layout to allow for extension / additional parking facilities.
- The site management arrangements should include a protocol for dealing with abandoned cycles.
- Co-ordination with local cycle hire schemes should also be considered for larger developments.

2.5 Long stay cycle parking for employees should be located conveniently for the cycle user in a secured, indoor or covered area to reduce the chance of theft or tampering. Facilities should be present such as showers, changing rooms and lockers, preferably with facilities to dry clothing.

2.6 Short term cycle parking for shoppers or visitors should be secure and ideally covered and situated as close to the main entrance as possible. The location should be highly visible to people, to reduce the chance of theft or tampering.

2.7 Detailed design requirements for cycle parking are contained in Part 4, Chapter 6: Designing for Parking.

Powered Two-Wheeler Parking

3.1 Powered Two-Wheeler (PTW) vehicles come above private cars in the LTP4 policy hierarchy and their use for short regular journeys can create significant benefits, most notably in the form of reduced congestion and reduced land used for parking.

3.2 Key principles are as follows:

- Scheme promoters shall provide sufficient provision of secure parking for powered two wheelers in line with LPA standards and should demonstrate that they have considered additional needs for PTW users.
- For long stay parking, such as workplaces, lockers to allow storage of clothing and equipment including helmet and changing facilities should be provided.
- PTW parking can be vulnerable locations, particularly long stay parking. Ideally there should only be access for PTWs, not vehicles, which can be done by using a causeway or pinch point. The parking area should be in an open location, not in an isolated, secluded place.
- PTW parking should be reviewed as part of travel plan monitoring to ensure there are adequate spaces to meet the demand. Arrangements should be incorporated into a new layout to allow for extension / additional parking facilities.

- Electric charging points for electrically powered scooters and motorbikes should be considered.

Car Parking

4.1 General Principles

- Parking should not be considered in isolation from other design considerations. It is part of the palette that makes for a high quality environment and sense of place. It has to be considered along with other factors such as location, context of public realm and environment. Road widths, verges, and cycleways may also dictate the location and type of parking for a given area.
- Where housing densities are low, space for car parking can be provided “on plot”, within the curtilage of the dwelling in the form of a garage, car port, cart lodge garage, parking bay or private drive. Ideally dwellings/ premises should be accessed from the front, although side and rear access can be appropriate in some circumstances (e.g. compact terraces).
- Good quality urban design dictates that care should be taken that this does not result in streets dominated by parking spaces in front of dwellings, or by building facades with large expanses of garage doors.
- For developments of high dwelling density, it is unlikely that sufficient space for car parking can be provided by in-curtilage and garage provision (without a detrimental effect on the quality of the development).
- Parking areas should be designed with adequate lighting and other features so that people feel comfortable using them, especially after dark.
- Within any car park area, provision should be made so that pedestrians can walk through it easily and safely. Their routes should be direct and ensure maximum safe permeability. The provision of raised footways through the car park and crossing points across main vehicle routes will help to reduce conflict between pedestrians and vehicles. See Part 4 Chapter 2: Designing for Walking.
- Parking provision for individual dwellings will not be adopted and therefore the developer must make arrangements for their future management and maintenance. On-street parking spaces which are not allocated to particular dwellings may be considered for adoption by the Highway Authority subject to appropriate design. Areas of parked vehicles can be arranged to provide vehicle speed management through horizontal deflection.

- Bus routes within residential developments will require a minimum clear passage of 6.5 m (reduced to 6.2m at 20mph) which must be available at all times where on-street parking is proposed.
- Where garages, gated and driveways (all gates to open inwards) are placed directly adjacent to the highway the setback should be 6m from the highway boundary to allow for parking in front of the garage/gates.

4.2 Parking Structures

- Locating car parking under buildings, either above or below ground level, can significantly improve the quality of a development, as can edge of development multi-storey car parks or parking barns.
- Planning Authorities will need to be assured that multi-storey, barn, underground, underdeck and under-croft parking is safe, secure and retained for parking.
- Garages shall only be considered as a viable car parking provision if they are large enough to accommodate a large family car and general storage. If they are also to be the designated provision for cycle storage, they should also provide sufficient clearance to enable the bikes to be wheeled in and out of the garage without moving the car.

4.3 Tandem Parking

- This the parking of one vehicle behind another, including one within a garage or car port, rather than space for double length bicycles.
- Provision for tandem parking is acceptable on-plot, within the curtilage of a dwelling, providing there is also alternative space provided for bin storage.
- Tandem parking should not be designed for areas which offer general access, such as parking courts, because it reduces the uptake of spaces and leads to on-street parking, whilst the space often becomes used for bin storage.

4.4 Shared Use Parking

- The potential for shared use of parking areas should be considered in urban areas where nearby uses have different operational times or the development is considered ancillary to other activities (i.e. food and drink within a retail area). The car parking provision should be for the use that requires the greater number of car spaces. Shared use may help reduce the number of parking spaces that a scheme promoter is required to provide.

4.5 Shared Surfaces

- Careful consideration should be given to ensuring that the use of shared surfacing is appropriate for the location, because shared surfaces can lead to indiscriminate parking, blocking of footway and the narrowing of the road which hampers access by service and emergency vehicles as well as being dangerous for visually impaired.
- Parking Squares are pedestrian/vehicle shared surfaces, often consisting of a junction of routes. Parking squares should be directly fronted by buildings and provide a good opportunity for hard landscaped shared spaces. The siting of trees and street furniture can be used to informally manage the parking.

4.6 Parking Courts

- Careful consideration needs to be given to the location and design of parking courts. A balance needs to be struck between on-street and on-plot parking. They must be high quality in design terms and have a sense of place and feel secure, to encourage ownership. They should not be located in remote areas at the extremity of the development, as they are unmanaged.
- Rear parking courts can reduce the visual intrusion of cars, but there are disadvantages including inefficient use of land, reduced garden sizes and loss of security and privacy to the rear of the home. As a result the development can be blighted by cars parked in front of the house where there is no space designed to accommodate them. Rear parking courts should ideally serve no more than six dwellings.
- More detailed information is given in Part 4 Chapter 6

4.7 Extensions or Change of Use

- Prior to any extension or change of use, the developer must demonstrate that adequate parking will be provided. It is especially important to ensure that there is adequate parking provision should the change of use be from a garage into a habitable room for a residential dwelling.

4.8 Electric Vehicle Charging

- The development of new residential and non-residential buildings presents an opportunity to increase the provision of EV charging infrastructure and future proofing associated car parks with electric vehicle charging infrastructure. Ultimately this is a decision for the LPAs)but HCC will work closely with them to ensure EV charging infrastructure is an integral part of development design.

- Every new residential building and buildings undergoing a material change of use to create a dwelling with an associated car parking space should have a charge point.
- Every residential building undergoing major renovation with more than 10 car parking spaces should have cable routes for electric vehicle charge points in every car parking space.
- Every new non-residential building and every non-residential building undergoing a major renovation with more than 10 car parking spaces should have one charge point and cable routes for an electric vehicle charge point for one in five spaces.
- Consideration should be given to the additional weight of electric vehicles

4.9 Planning Applications

- Planning applications should show the scale, shape and form of parking areas on the general arrangement plans, based on the recommended dimensions for parking bays and garages set out in in Part 4 Chapter 6: Designing for Parking.

4.10 Parking at Schools

- Except in very sustainable areas, such as Watford's Core Development Area, Hertfordshire CC Highways supports the following parking policy for education establishments:
- 1 space per full-time member of staff; plus 1 space per 100 pupils; plus 1 space per 8 pupils over 17 years old; plus 1 space per 20 pupils under 17 years old.
- Motorcycle/moped spaces = 4% of standard spaces.
- Cycle spaces = 1 long term space per 5 staff plus 1 space per 3 students.

Provision for Disabled Parking

5.1 Under the Disability Discrimination Act (DDA) 2005 it is the responsibility of site occupiers to ensure that adequate provision is made for the needs of people with disabilities. Parking for people with disabilities will be required for their exclusive use at all sites. Use of these spaces will usually require a Blue Badge to be displayed.

5.2 General principles in Hertfordshire are as follows:

- The number of spaces required for people with disabilities varies between use classes and shall in the first instance be based on the standards in the Department for Transport's (DfT) Traffic Advisory Leaflet 5/95: 'Parking for Disabled People'.
- It should be noted that a larger number of spaces may be required by the LPA at facilities where a higher proportion of users/visitors with disabilities will be expected, for example medical, health and care facilities. Whether this applies should be agreed with the LPA at an early stage.
- Spaces for people with disabilities should be located adjacent to entrances, where possible, should be convenient to use and the dimension conform to Part 4, Chapter 6: Designing for Parking
- Meeting the requirements of the Equality Act (2010) is the responsibility of the building occupier or service provider.

Warden controlled/ retirement developments

6.1 Many residents are car owners and parking should be provided for each unit unless there is the evidence base to support a reduction in the standard.

6.2 Consideration should be given to safe storage and charging point locations for mobility scooters when designing Retirement/Warden Controlled Developments.

Provision of parking for commercial vehicles and coaches

7.1 Commercial vehicles are those which move goods to or from premises. The scheme promoter shall analyse the requirements of their development in terms of the numbers and types of commercial vehicles visiting their premises and should demonstrate to the LPA that any development includes sufficient provision to meet normal requirements for loading, unloading and turning.

7.2 Such commercial provision should be clearly signed and marked to avoid being utilised as overflow parking area for cars.

7.3 Standard dimensions for commercial vehicle parking spaces can be found in Part 4, Chapter 6: designing for Parking

7.4 Developments likely to generate coach traffic should provide appropriate off-street parking facilities for the stopping, setting down and picking up of passengers as well as appropriate turning facilities that allow coaches to turn without the need to reverse.

Flood avoidance

8.1 Resilience to climate change shall be considered, particularly as flood risk is becoming an important consideration when planning development.

8.2 Underground parking is not advised in areas at risk of flooding.

8.3 Sustainable Drainage Systems (SuDS) and pollutant filters shall be designed into parking areas to address flooding and water quality issues. In light of the Flood and Water Management Act, consideration should be given to permeable surfacing materials.

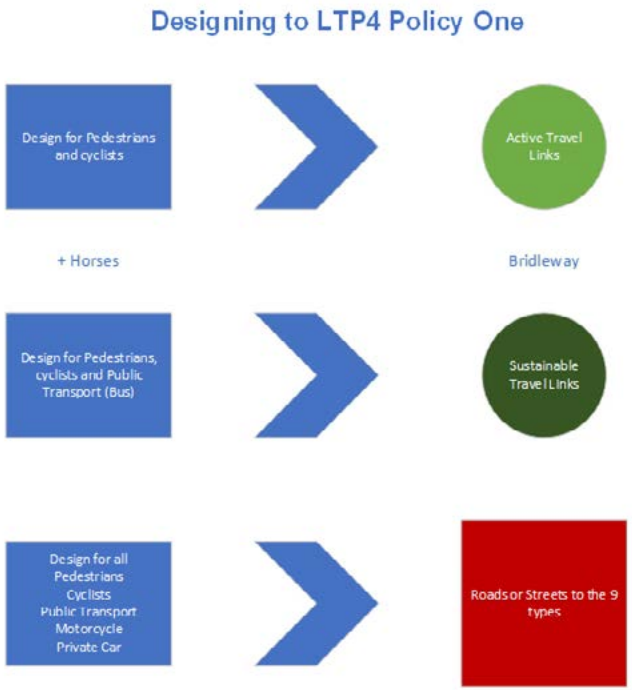
Chapter 8
Planning Highway Links

Contents

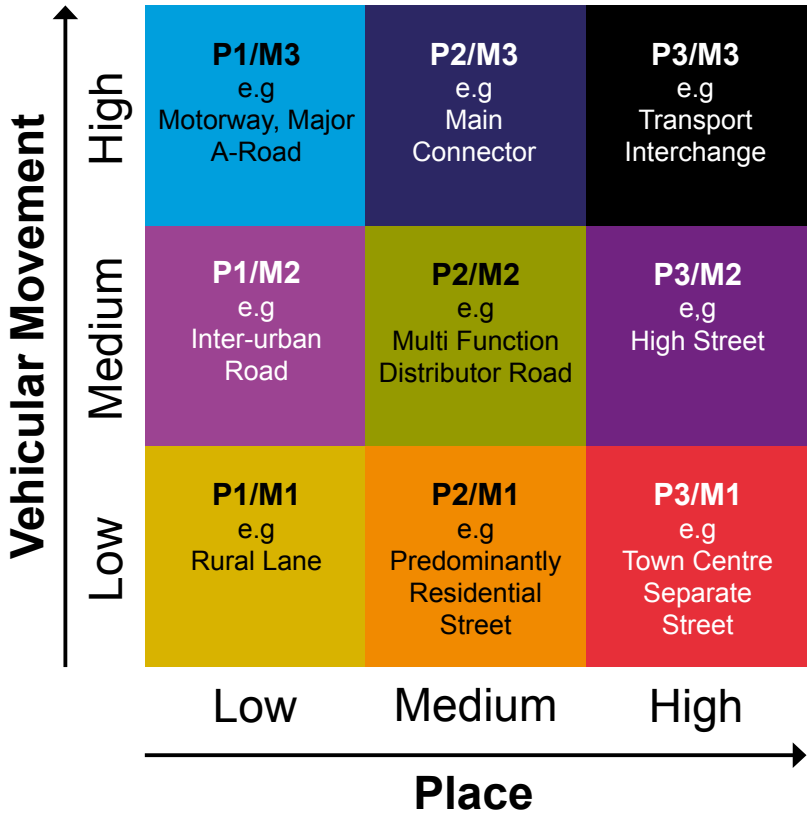
Introduction

1.1 This chapter sets out the principles of highway layout primarily focusing on geometric design of highway links for motorised and non-motorised users.

1.2 LTP4 is the primary influence in applying design standards within Hertfordshire. In particular Policy One; Transport User Hierarchy and Policy 13: New Roads and Junctions.



1.3 The types of highway links within Hertfordshire are discussed in Part 2, Chapter 5: Providing for Place & Movement both in terms of their 'Place & Movement' function and their status within the Road Hierarchy.



1.4 All new or improved highways will be assigned an appropriate character selected from Hertfordshire's 'Place and Movement' matrix and agreed by HCC through the Planning Application process.

1.5 The performance of a highway link is interrelated with its junctions. Therefore, the two functions (link and junctions) should be considered together to avoid highway links and junctions becoming motor vehicle dominated or the provision of Active Travel measures becoming disjointed.

1.6 As indicated in Part 1, Chapter 8: Standards & Departures, the requirements set out in this guide take precedence in situations where this guide differs from other standards.

1.7 Scheme Promoters shall adopt Recommended standards, wherever feasible, particularly for the provision of new facilities, as their use is most likely to contribute positively to the objectives of LTP4 and sustainable and responsible development.

1.8 Acceptable Standards may be necessary where improvements are required within existing highway boundaries.

1.9 Designing facilities below Acceptable Limits will result in a poor standard of provision and constitutes a 'Departure from Standards'. The scheme promoter should submit the scheme proposal to a Design Review Panel so that the overall objectives of the scheme can be reviewed and potential alternative solutions can be discussed.

General Geometrical Design Requirements for Place & Movement

2.1 HCC's highway geometrical design standards for highway links with provision for motorised vehicles have been primarily derived from Manual for Streets (MfS) and Design Manual for Roads and Bridges (DMRB) and applied to the different Place & Movement Categories as appropriate.

2.2 Roads and streets shall be designed to the standards set out for each P&M category. Where the carriageway is contiguous to the provision for active travel modes then the more onerous design parameters will be used.

2.3 The scale and configuration of the provisions for walking and cycling shall be determined in accordance with Part 3, Chapter 3: Planning for Walking and Part 3, Chapter 4: Planning for Cycling.

2.4 Appropriate speed management should be achieved by designing to this guidance document.

- Master planning should have created a proposed environment in which vehicle speeds will be managed naturally within the resulting development or scheme so as to avoid the need for supplementary traffic calming features in new highways.
- On new streets speed can be managed by using curving alignments, carriageways of appropriates widths, landscape and/or different materials.
- Minimum horizontal radii are specified to aid speed management and carriageway widths are specified as narrow as possible to aid speed management and to give higher priority to the provision for active travel within the highway.

2.5 Carriageway widths are set out in the design parameters tables below:

- The widths will still need to allow for the passage of refuse vehicles, emergency vehicles and buses in appropriate locations and the routing should be agreed at the Master planning Stage.
- Scheme promoters should not provide wide carriageways and then install measures to reduce speeds. Providing wider carriageway to accommodate loading or parking is acceptable but the areas should be clearly defined so that when not occupied by vehicles they continue to serve their speed management purposes (see Part 4: Chapter 8: Speed Management features).
- Where necessary, allowance shall be made for the additional space required for the swept path of turning vehicles. Widening of the carriageway on small radius curves may be required to allow easy access for larger vehicles and shall be confirmed by vehicle tracking.
- Additional carriageway width may be required in a side road at a junction with a higher category road with a higher speed limit. This is to allow for the safe entry and exit of traffic from the side road, without causing an unnecessary obstruction or hazard on the major road but bearing in mind that too large an access will encourage high entry and exit speeds. Further advice on this is provided in Part 3, Chapter 9: Planning for Highway Junctions.

2.6 Visibility requirements as set out in the design parameters tables follow the principles set out in MfS and CD109 as appropriate.

- On tighter curves the preference is to create splays by securing additional land rather than adopting shallower curves.
- If a new development or scheme is being developed in hilly or undulating environment vertical visibility shall be checked and confirmed pre-application. Forward vertical visibility is the primary consideration and then road user comfort.
- Allowance shall be made for the growth of trees and shrubs.
- The juxtaposition of signage, street lighting and planting and their impact on visibility shall be considered.

2.7 The application of superelevation may be required for roads designed to 70kph or greater on tight radii to avoid adverse camber, where this might lead to loss of control incidents, particularly in wet or icy conditions.

- On small radius curves, the application of superelevation may be required to avoid severe adverse camber that may be hazardous for cyclists and cause discomfort, particularly to users of passenger transport vehicles.
- However, the use of superelevation in urban environments should be avoided if it is likely to encourage inappropriate speeds around a bend.
- Guidance on the application of superelevation is given in the DMRB and CD109 - Highway Link Design as appropriate.

2.8 The crossfall of a carriageway is governed by the need to remove water from the running surface of the road to the drainage channels and should be 2.5%. The carriageway cross section should generally be cambered, with the high point at the centreline. The recommended crossfall for Active Travel Links is between 1% and 2%.

2.9 The minimum longitudinal gradient is governed by the need to provide adequate drainage of the surface and shall be greater than 1%.

2.10 The maximum longitudinal gradient for motorised vehicles is reliant on factors such as increased braking distances downhill, problems for HGV's or buses travelling uphill and shall not exceed 5%.

2.11 Parallel or more direct routes for walking and cycling shall be provided where the carriageway design cannot meet the standards for Active Travel Links. This is to avoid the carriageway dictating the gradients for walking and cycling.

2.12 Horizontal clearances set out in the design parameters tables for each P&M category below are measured from the nearest edge of the running lane to the particular obstacle in question.

- If security, garage or gate facilities are provided on residential premises, they shall be sited at least 6m from the highway boundary or back of footway as appropriate. This is to avoid waiting vehicles obstructing traffic, cycles and footway users passing the site. This may be reduced to 5.5m if the gates or doors do not open outwards.
- The minimum clearances to trees and shrubs shall be the greater of the minimum clearances to obstructions set out in the tables below and the following dimensions:
    - o Shrubs used in edge planting not to be planted within 500mm from the edge of the carriageway
    - o Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
    - o Larger, un-pollarded trees (tree girth greater than 600mm) no closer than 2m unless otherwise agreed by HCC
- Lamp columns should be located at the back, but within the footway wherever possible, or positioned in the service strip where no footway exists.

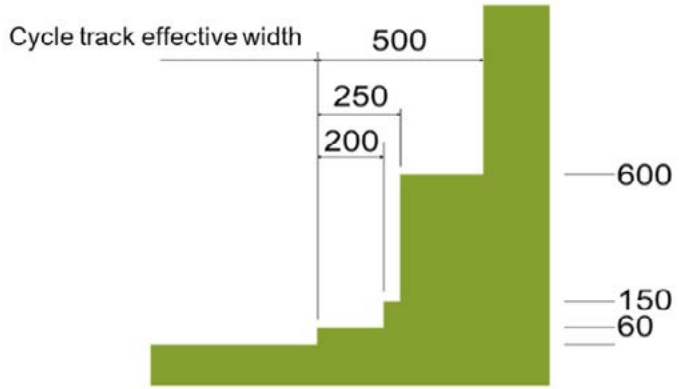


Diagram showing additional width at fixed objects based on LTN 1/20 table 5-3

- Additional widths are required to maintain effective widths along cycle tracks at fixed objects as follows, in accordance Part 3, Chapter 4: Planning for cycling:

Footway Boundary Clearances

Up to 1.2m high	0.25m
Above 1.2m high	0.5m

- The boundary clearance for a footway is the required distance between each edge of the footway and any continuous fixed vertical obstruction such as a wall, fence and vegetation. These clearances are required **in addition** to the total widths in the Active Travel Links table at para 4.30, below.

2.13 Vertical clearances are taken from the highest point on the running lane to the lowest point on the overhanging obstacle. The lowest point on the obstacle shall be measured at any point that is over the carriageway or within a horizontal distance of 500mm of the carriageway.

- The headroom to structures over the highway (such as bridges, lamp columns or archways) where there will be motorised traffic should be at least 5.3m.
- Structures over access roads to car parks or shared areas may be lower. Assessment should be made on a case-by-case basis.

2.14 Geometric design parameters from drainage requirements include:

- Footways, cycleways, shared-use paths and verges should generally drain onto the adjacent carriageway
- SuDS features shall have slopes no steeper than 1 in 3 to ensure they are self-supporting under most geological and weather eventualities
- Trees and shrubs shall not be planted within highway SuDS features that have slopes steeper than 1 in 5
- Note that SuDS are an additional spatial requirement and should be provided in addition to minimum verge requirements
- A berm, or grass filter strip of 1m minimum width is required between any hardscape and the slope of a SuDS feature.

2.15 Verges should not generally be provided between the back of a footway and the highway boundary where there will be motorised traffic.

2.16 Geometric design parameters from bus requirements include:

- New highway design should negate the requirement for the provision of bus laybys in most circumstances. They should only be required where it is expected that buses will lay over for timetabling purposes, or for highways designed for 40mph speed limits and above. The provision of bus laybys should only be considered necessary within the P1/M2, P1/M3, P2/M3 and the higher speed P2/M2 categories.

- Passive provision should be made for future installation of bus shelters at all bus stops on new highways. The Recommended width of footway at bus stops is 5m for P1, P2 & P3 categories up to 30mph speed limits, and the Acceptable Minimum is 3.8m. The Recommended width of footway at bus stops is 3.8 m for P1 & P2 categories over 30mph speed limits is 3.8m and the Acceptable Minimum is 3.1m.
- Accommodating the supporting facilities required at bus stops which may include: shelter; seating; cycle parking; Real Time Passenger Information
- The Recommended minimum width for exclusive Bus lanes and contraflow bus lanes is 3.5m with an Acceptable minimum width of 3.1m in 20mph areas only
- The Recommended minimum width for bus lanes and contraflow bus lanes accommodating cyclists is 4.5m with an acceptable width of 4m
- Dedicated space for cycling should continue past bus and tram stops but it is essential that the needs of pedestrians are taken into account, particularly disabled people. Bus stop boarder and bus stop bypass arrangements may be used and should be designed in accordance with the guidance in LTN 1/20 Cycle Infrastructure Design. Particular attention should be paid to the needs of people with disabilities and impairments and to the interactions between bus passengers and people cycling.

2.17 Geometric design parameters from parking requirements are described in detail within Part 4, Chapter 6: Designing for Parking. In summary:

- Recommended minimum footway width required for perpendicular cycle parking is 5.2m. (Acceptable Minimum of 4m)
- Minimum footway width required for parallel cycle parking is 3.6m
- Powered two-wheeler parking bays should be 2.5m x 1.5m
- Standard car parking space should be 6m x 2.5m
- Disabled parking bays should be 6.5m x 2.9m (plus 1m clearance)
- Recommended minimum separation between parking bay and cycle track is 1m (Acceptable Minimum of 0.5m)

P1/M1: Rural Lane

3.1 The vast majority of Hertfordshire's rural lanes are historical and do not conform to currently recognised standards.

3.2 The direct use of DMRB and the MfS is not suitable for designing new, extended or diverted rural lanes and could give rise to unwelcome consequences such as an increase in motor vehicle dominance.

3.3 Scheme Promoters should look to take a risk-based approach recognising local character, the surrounding environment and usage of the local Highway Network considering the two standards and:

- Environmental Guidelines for the Management of Highways in the Chilterns, Chilterns Conservation Board (2009)
- Traffic in Villages: Safety and Civility for Rural Roads; A toolkit for communities. (2011) Dorset AONB Hamilton-Baillie Associates
- Design concepts for Zonal 40mph (e.g. New Forest)

3.4 In the absence of an obvious, appropriate design approach a Design Review should be sought in accordance with Part 1, Chapter 8: Standards & Departures.

3.5 The following Table sets out the geometric design parameters that will influence the design of P1/M1 rural lanes.

P1/M1

Minor road within rural setting (within countryside or in a hamlet or small village). Typically narrow roads, with widths under 5.5 m

Classification

- Rural Local Distributor

Characteristics affecting Geometric Design

- Recognises and maintains local character, the surrounding environment and usage of the local highway network.
- Low numbers of vehicle trips with pedestrians and cyclists sharing carriageway
- Design speed no greater than 40mph (70kph)
- Local considerations for farm access/vehicles may require a wider carriageway
- Passing bay provision in single lane situations
- Verges accommodate places of shade, shelter and rest as appropriate.
- Consideration given to how verge overruns can be avoided

Speed Limit: National Speed Limit

Walking Provision: On-road. Give consideration of whether walkers should be able to walk on the verge.

Cycling Provision: On-road

Provision for Passenger Transport: Not expected to be on bus route

Frontage access: Yes

Maximum Dwellings: 40 per km

Other Access Forms: Simple bell-mouth

Gateway: Desirable

Junction Forms: Simple junctions

Street Lighting: Unlit except at roundabouts

Provision for Commercial Vehicles: HGV through trips discouraged. Area wide HGV restrictions may be appropriate

Car Parking: No provision or controls

Geometric Design Parameters

Design speed: 70kph (40mph)

Min forward visibility: 120m @ 70kph

Junction spacing: CD123 - Geometric Design of At-Grade Priority and Signal-Controlled Junctions

Carriageway width: 5.5m or 3.7m with passing places

Minimum horizontal curve (radius): Not specified

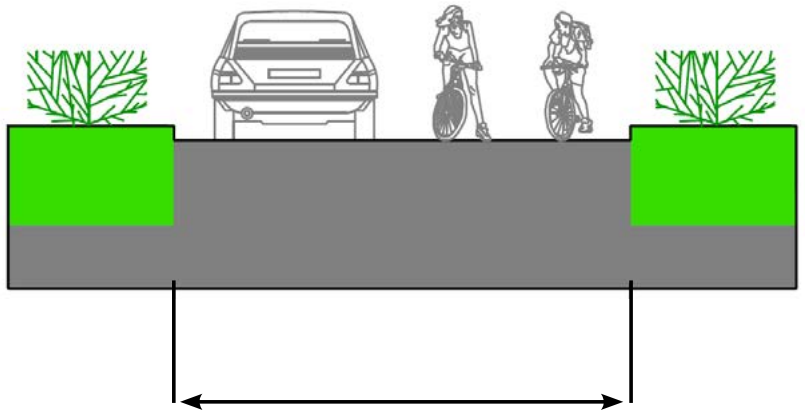
Reverse curves (min separation): Not specified

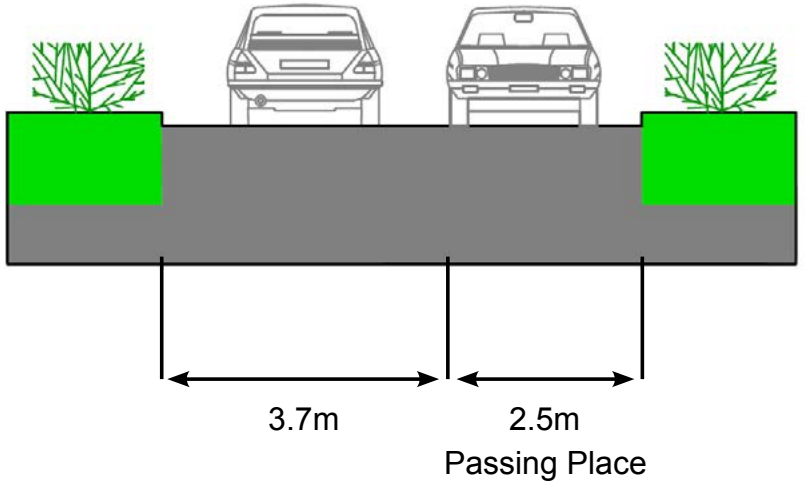
Superelevation: Only as a remedial measure

Max distance between speed restraints: 150m

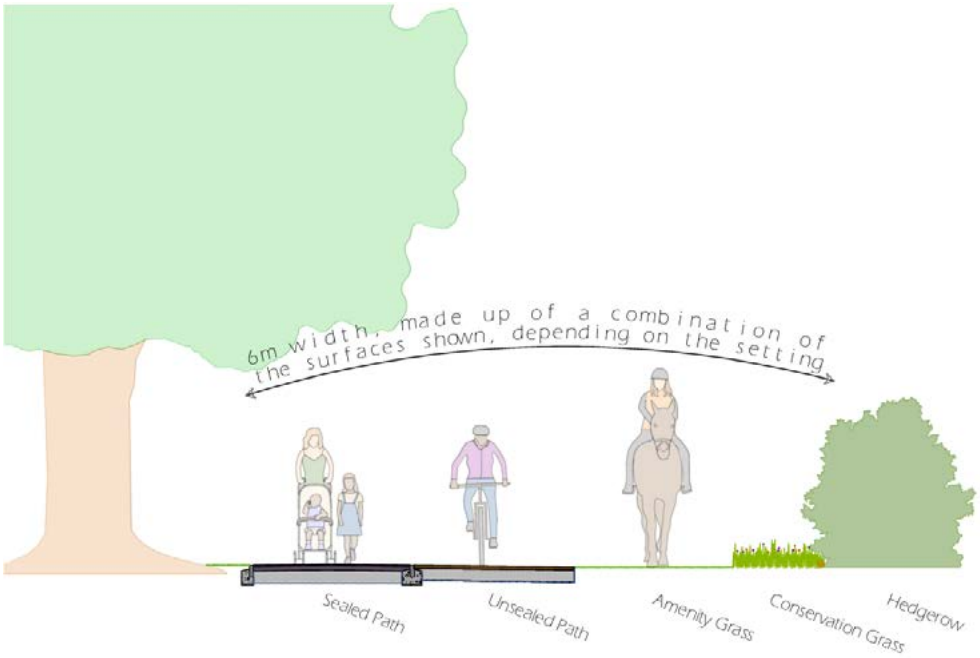
Min K Value: DMRB (70kph)

3.6 The following illustrations show typical cross-sections for rural lanes:





P2/M1 Active Travel Links



4.1 Active Travel Links (ATLs) are provided within urban, semi-urban, semi-rural and rural settings for walking, cycling and potentially horse riding as non-motorised routes away from the County's road system.

4.2 Part 2 Chapter 5: Providing for Place & Movement sets out the formal status an Active Travel Link could have.

4.3 Scheme Promoters should have agreed with HCC the proposed formal status of the ATL at the Master Planning stage to understand the long-term maintenance responsibilities.

4.4 Whilst the landscape character may vary, the required design geometry for the links is consistent for all settings and for whatever their legal status is.

4.5 ATLs shall be of minimum 6m width made up from a permutation of the modules shown below depending on the setting and proposed usage.

Hedge	1m
Wildlife margin	1m
Amenity Margin	1m
Unsealed Surface	2m
Sealed Surface	2m

4.6 Additional 0.5m increments can be added to, or removed from, the module widths providing the following minimum 6m overall width is met.

4.7 As ATLs may be connecting locations traditionally served directly by all-purpose roads, it is possible that public utilities plant may need to be accommodated within ATLs. Buried utilities shall not be laid longitudinally underneath unsealed or sealed surfacing and the ATL shall be wide enough to accommodate future access for safe utilities maintenance without closure of the ATL.

4.8 The provision for hedges shall be 2m width but could be 1m within the ATL width and 1m over the boundary, subject to the agreed maintenance regime.

4.9 An Amenity Margin shall be 0.5m minimum width and include scalloped edges where possible. The minimum width for equestrian usage shall be 3m.

4.10 A Wildlife Margin shall be 1m minimum width and include scalloped edges where possible.

4.11 Sealed and unsealed surfaces shall each be minimum 3m width.

4.12 The requirements for cycling shall generally dictate the ATL design standards for:

- The modular widths for segregated and unsegregated cycle tracks
- Horizontal radii & vertical curves
- Stopping sight distances and visibility splays

4.13 ATLs can be constructed with either a crossfall across the whole paved width or a central camber to help surface water to clear.

4.14 The Recommended limits for crossfall or camber are 1% minimum and 2% maximum, with an Acceptable Limit maximum of 2.5%. A steeper crossfall will constitute a Departure from Standards because it could cause wheels to slide in icy conditions and will only be considered where existing ground levels make it impractical to achieve the acceptable limits specified. Adequate drainage must be ensured, and particularly where shallower gradients are used.

4.15 People can cycle steep gradients that are fairly short but cannot maintain high levels of effort for longer distances.

4.16 The Recommended longitudinal gradients are 1% to 2%. Acceptable Limits and Absolute Limits (which constitute a

Departure from Standards) summarised in the table at the end of this section are derived from the strictest needs of those walking or cycling.

4.17 Sections of minimum 5m length at a maximum incline of 1.67% (1:60) shall be required between sections with gradients steeper than 2%.

4.18 A landscape-led approach should be taken and absolute limits will only be considered where existing ground levels make it impractical to achieve the specified acceptable limits.

4.19 Adequate drainage must be ensured, and particularly where gradients less than 1% are proposed.

4.20 Where ramps in a zig-zag arrangement are required, horizontal curves should be provided at the ends of the ramp sections with a minimum outer radius of 5m, so that cyclists can maintain some momentum. Where this cannot be achieved, the ramp must be laid out so that it can be used by the Cycle Design Vehicle (see LTN 1/20).

4.21 Where a ramp may be used by both cyclists and pedestrians, gradients should be suitable for wheelchair users and other people with disabilities. It is preferable that ramps consist of a separate footway and cycle track.

4.22 Shallower gradients should be used where possible and the approach to the structure should be on the desire line, such as where a cycle track alongside a road is gently raised to bridge level.

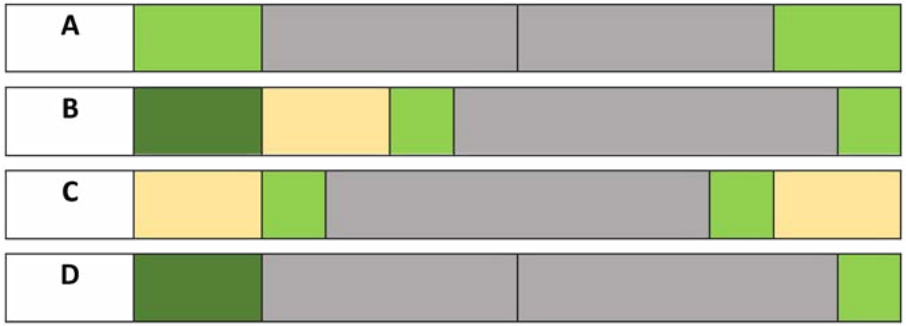
4.23 Ramps of 5% gradient and above should be divided into sections no longer than is shown in the table below, with intermediate resting places at least 2m long.

4.24 Stepped ramps should not be provided because they are inaccessible for cyclists and mobility impaired people. Wheeling ramps are only usable by some bicycles: they are not inclusive and should therefore only be used where an alternative route is provided that will cater for all users.

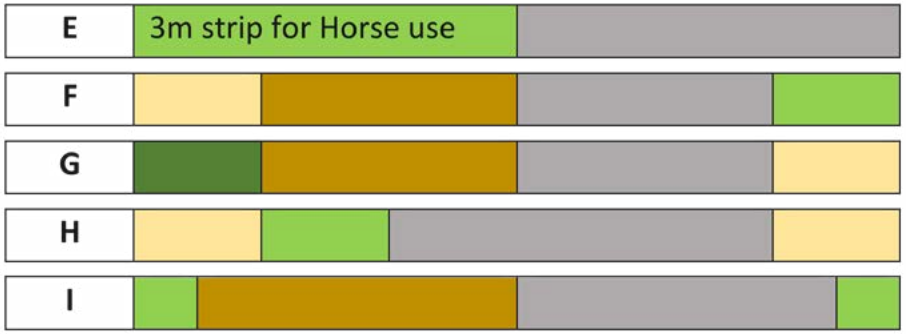
4.25 The ATL geometric design should also accommodate places of shade, shelter and rest as appropriate.

4.26 Urban ATLs are likely to require a sealed surface due to high level and type of everyday use, routes to employment, education, retail and public transport. Walking and cycling may be segregated depending on the expected level of use.

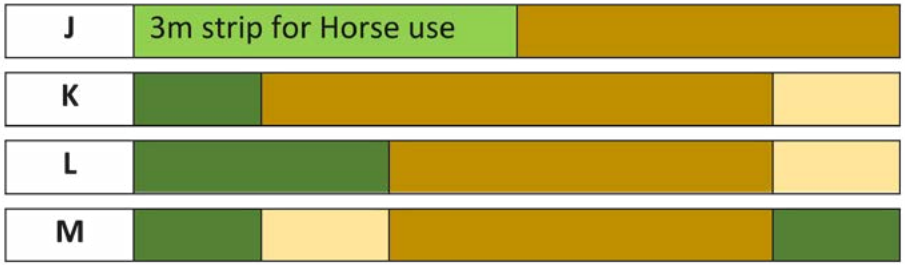
4.27 An ATL in an urban area may typically be composed of the modules as set out in examples A to D below:



4.28 An ATL in a semi-urban area may typically be composed of the modules set out in examples E to I below potentially involving a mix of sealed and unsealed surfacing. These can also apply to ATLs in semi-rural and rural areas.



4.29 An ATL in semi-rural and rural areas may typically be composed of the modules set out in examples J to M below involving unsealed surfacing.



P2/M1 Active Travel Links

Non-motorised links within urban, semi-urban, semi-rural and rural settings for walking, cycling and potentially horse riding as non-motorised routes away from the County's main road system.

Classifications

- Public Bridleway
- Public Restricted Byway

Street Lighting

- Part Night Lighting

Junction Forms

- Simple
- Simple Priority

Gateway

- Required to filter access
- Consider whether access for emergency vehicles is required

Minimum width for Walking

Recommended	3m
Acceptable	2m

Minimum widths for cycling

Direction	Peak hour cycle flow	Recommended width	Acceptable limit width at constraints	Absolute limit
1 way	<200	2m	1.5m	N/A
	200-800	2.2m	2m	N/A
	>800	2.5m	2m	N/A
2 way	<300	3m	2m	N/A
	300-1,000	3m	2.5m	N/A
	>1,000	4m	3m	N/A

- One-way flow for one-way cycle route. Two-way flow for twoway cycle route.
- Based on a saturation flow of 1 cyclist per second per metre width. For user comfort a lower density is generally desirable.
- Provision narrower than the Recommended width should be the exception, minimised and only used on sections up to 100m long.

- Additional width is required adjacent to obstructions, including cycle track kerbs, adjacent to the cycle track in accordance Part 3, Chapter 4: Planning for cycling (see illustration at 2.12 above).

Minimum widths for Unsegregated Shared Use

≤ 300 Cycles per hour	3m
> 300 Cycles per hour	4.5m

Provision for Horses: 3m width of amenity margin

Provision for Utilities: Public Utilities shall not be laid longitudinally underneath unsealed or sealed surfacing and the ATL shall be wide enough to accommodate future access for safe utilities maintenance without closure of the ATL

Planning for Temporary Works: A minimum clear width of 3m shall be required for walking and cycling during periods of maintenance of any form

Design speed

Gradient	General off-carriageway cycle tracks
Recommended	30 kph
Acceptable Limits	20 kph
Gradient	Downhill >3%
Recommended	40 kph
Acceptable Limits	N/A

Minimum forward visibility

Design speed	40 kph
Recommended	47 m
Acceptable Limits	N/A
Design speed	30 kph
Recommended	31 m
Acceptable Limits	N/A
Design speed	20 kph
Recommended	17 m
Acceptable Limits	N/A

Visibility Splay X-Distance

Recommended	4.5m
Acceptable	2.4m

Minimum link radii

Design speed	40 kph
Minimum horizontal radius	40 m
Acceptable Limits	N/A

Design speed	30 kph
Minimum horizontal radius	25 m
Acceptable Limits	N/A

Design speed	20 kph
Minimum horizontal radius	15 m
Acceptable Limits	N/A

Design speed	10 kph
Minimum horizontal radius	4 m
Acceptable Limits	N/A

Design speed	Acceptable
Minimum horizontal radius	2.4m

Minimum Radii at Junctions: 4m

Recommended Longitudinal Gradients: 1% to 2%

Maximum Longitudinal Gradient

Gradient	2%
Acceptable Limits	150m
Absolute Limits: Departure from Standards	250m

Gradient	2.5%
Acceptable Limits	100m
Absolute Limits: Departure from Standards	160m

Gradient	3%
Acceptable Limits	80m
Absolute Limits: Departure from Standards	110m

Gradient	3.5%
Acceptable Limits	60m
Absolute Limits: Departure from Standards	80m

Gradient	4%
Acceptable Limits	50m
Absolute Limits: Departure from Standards	65m

Gradient	4.5%
Acceptable Limits	40m
Absolute Limits: Departure from Standards	50m

Gradient	5%
Acceptable Limits	N/A
Absolute Limits: Departure from Standards	6m

Gradient	6%
Acceptable Limits	N/A
Absolute Limits: Departure from Standards	5m

Gradient	7%
Acceptable Limits	N/A
Absolute Limits: Departure from Standards	4m

Gradient	7.5%
Acceptable Limits	N/A
Absolute Limits: Departure from Standards	4m

Minimum Sag K Value

Gradient ≤ 3%	
Recommended	5.0
Acceptable	3.5

Gradient >3%	
Recommended	7.5
Acceptable	5.0

Minimum Crest K Value: 6.0

Vertical Clearances

Maintenance Vehicle Access	
Minimum	3.5m
Minimum at Obstruction	3.5m

Equestrian	
Minimum	3.4m
Minimum at Obstruction	2.8m

Walking & Cycling	
Minimum	2.7m
Minimum at Obstruction	2.7m

P2/M1: Sustainable Travel Links (STLs)

5.1 Sustainable Travel Links provide connections within urban, semi-urban, semi-rural and rural settings, as appropriate, for:

- Passenger Transport
- Active Travel modes
- Emergency services
- Limited local access for motor vehicles by design
- Limited local access for motor vehicles by regulation

5.2 The setting and proposed function of STLs are the key determinants in their geometrical design and, particularly any provision for buses.

5.3 STLs accommodating a busway and limited access for other motor vehicles may be designed for one-way shuttle working up to a length of 80m providing that access is signal controlled, access is enforced and a safe waiting area is provided at each end.

5.4 The Busway element of a STL shall be designed to the standards set out in the table at the end of this section, except where the provision of a busway is adjacent to the provision for active travel modes when the geometric design parameters for Active Travel Links shall where more onerous dictate the STL design standards for horizontal radii, vertical curves, Stopping Sight Distances, visibility splays and longitudinal gradients.

5.5 Busways shall have a minimum 0.5m separation from the provisions for walking and cycling.

5.6 The scale and configuration of the provisions for walking and cycling shall be determined in accordance with the geometric parameters for Active Travel Links.

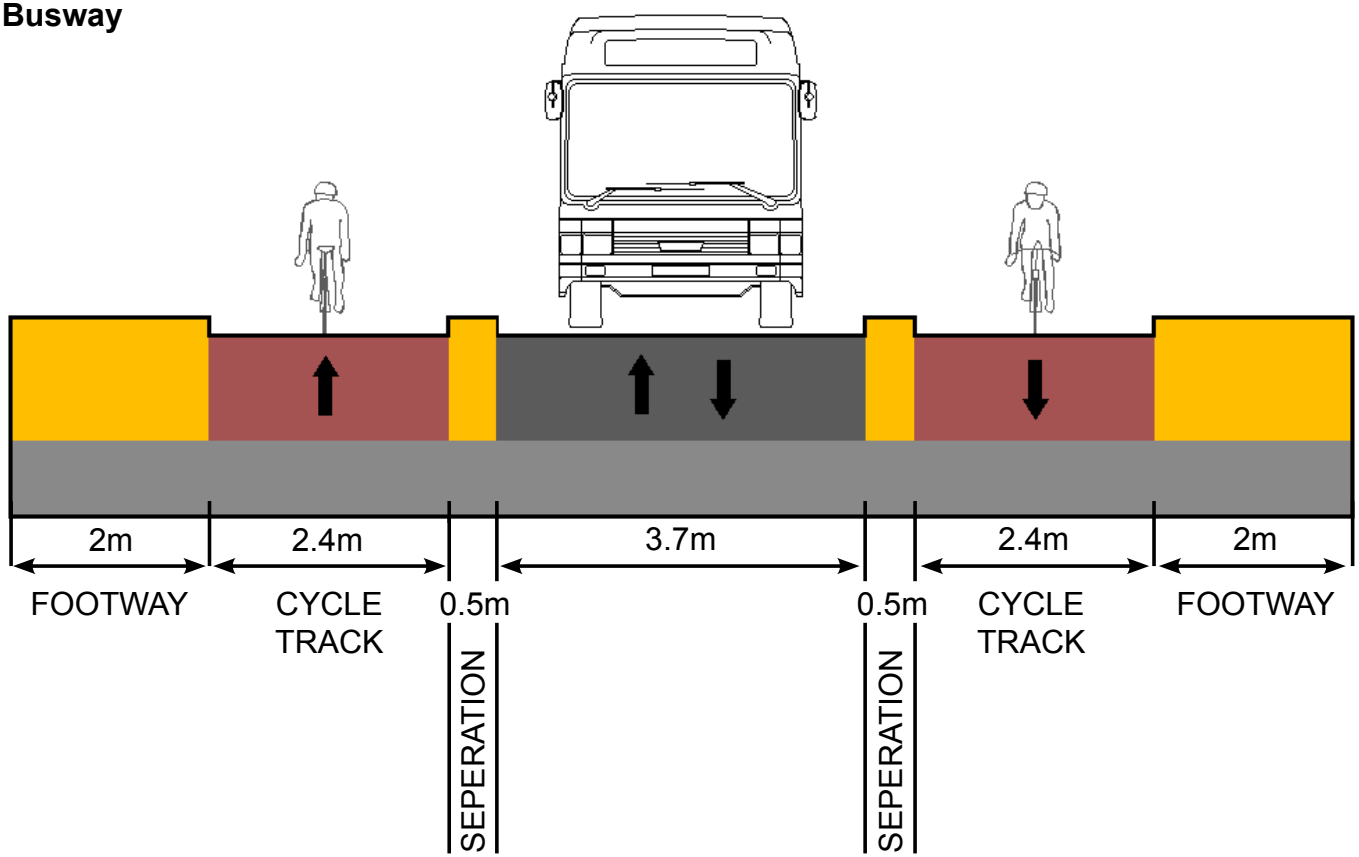
5.7 As STLs may be connecting locations traditionally served directly by all-purpose roads, it is possible that utilities' plant may need to be accommodated within STLs.

5.8 Underground utilities shall not be laid longitudinally underneath unsealed or sealed surfacing and the STL shall be wide enough to accommodate future access for safe utilities maintenance without closure of the STL.

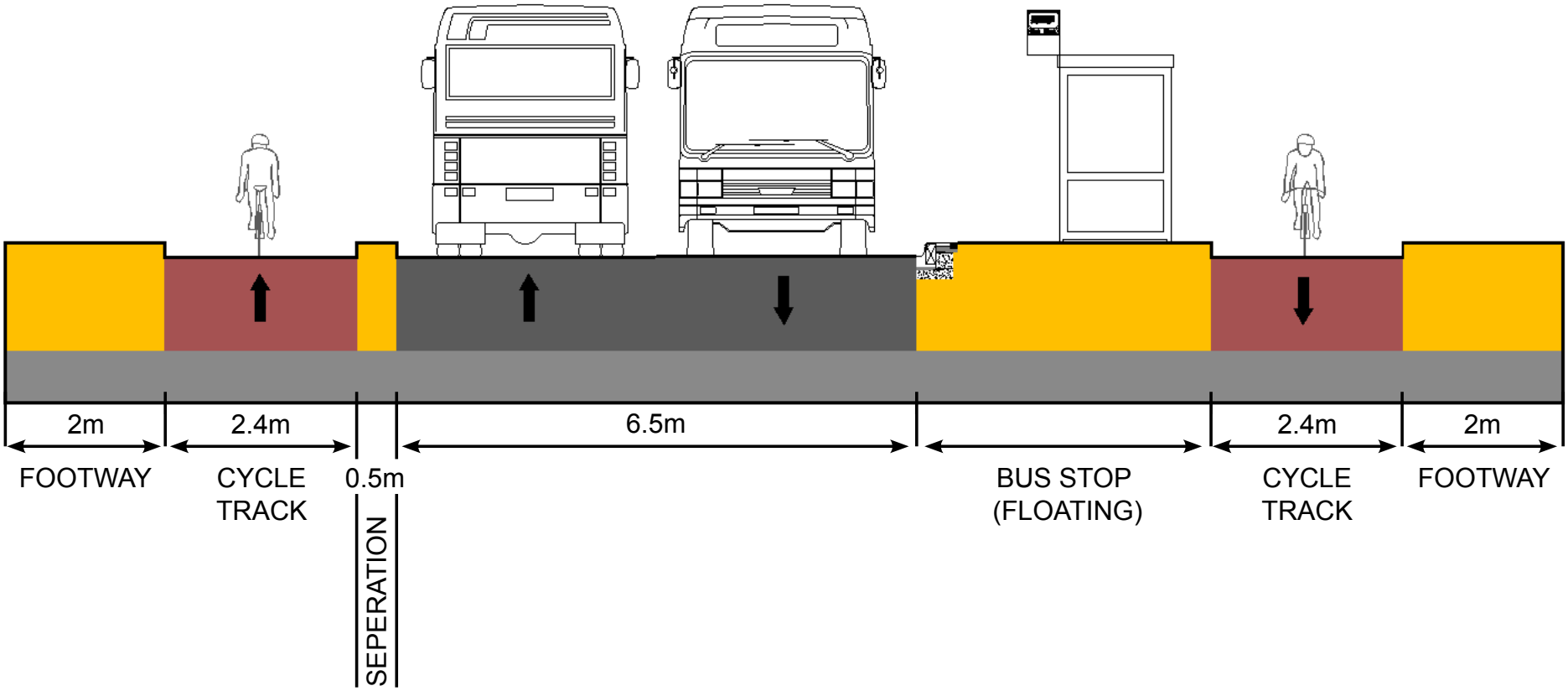
5.9 STLs shall be designed such that a minimum clear width of 3m will remain available for walking and cycling during periods of maintenance of any form.

5.10 The following illustrations show typical cross-sections for 30mph STLs providing a busway (and potentially limited access for other motor vehicles) with contiguous provision for walking and cycling.

STL - Single Way Busway



STL - Two Way Busway



5.11 Cycle streets provide high quality walking and cycling connections in urban areas whilst providing limited access to motor vehicles.

Figure 1 Cycle street in Cardiff (photo by Catriona Swanson)

5.12 These are streets designed so that cycles are the vehicles that dominate visually and motorised traffic is tolerated as a guest.

5.13 As such:

- The street design should encourage cyclists to assume priority with drivers of motor vehicles behaving as 'guests': road signs alone are inadequate.
- They should carry at least 1,000 cyclists per day including forecast traffic cycle growth, motor traffic flows should not exceed 500 vehicles per day and through traffic is typically not permitted (e.g. by using filtered permeability).
- The design should provide cyclists with a level of service comparable to that provided by an Active Travel Link.
- Sections over which a motor vehicle has to follow a cyclist should be limited to 400m.
- The design requires more than just traffic signs to show clearly that cycle traffic has priority over motor traffic. It can be helpful to construct the buffer between parking and carriageway in a different material, such as block paving, contrasting surfacing or imprint as agreed with HCC.
- Traffic signals should detect cycles and give them priority and quick phase change.

5.14 There are limited UK examples and design guidance for cycle streets to draw from, but the following European guidance will form a good starting point in a Design Review that should be held for such proposals in accordance with Part 1, Chapter 8: Standards & Departures prior to the submission of any planning application to establish feasibility and design parameters.

- 1.8 Cycle streets (europa.eu)
- https://transport.ec.europa.eu/document/download/d59fad69-c693-40dc-accc-d5fa082050fd_pl
- CROW, Design Manual for Bicycle Traffic V12, V13 & V14

5.15 A Quiet Street can be designated or created where a cycle route uses a low speed quiet street (e.g. a residential road, a town centre back street or a road through a park). It should typically:

- Provide a convenient and direct route between key destinations
- Give cyclists priority on the road itself and right of way at junctions
- Carry no more than 2,500 motor vehicles per day

5.16 Quiet Street features may include:

- 20mph speed limits
- Point closures with cycle gaps (modal filters, e.g. for removing rat-running traffic)
- Psychological and physical traffic calming
- Banned turns with exemption for cyclists
- Changed priorities
- Cycle priority at road crossings
- One way with contraflow cycling
- Surface markings

5.17 Creation and design of Quiet Streets should be made in collaboration with the local community, including residents and businesses, as part of a planned programme of engagement.

5.18 Master Planning may identify the rare requirement for a new STL or to repurpose existing rural lanes that do not need a busway but need to accommodate limited access for motor vehicles.

5.19 In such a case a Design Review shall be sought prior to the submission of any Planning Application to establish feasibility and design parameters.

5.20 The parameters set out in P1/M1: Rural Lanes will be of consideration in designing a STL for limited motor vehicle access, but with greater emphasis on the provision for active travel and on recognising the sense of ‘place,’ including reinforcing local character and biodiversity and providing for shade, shelter and rest.

5.21 The following table sets out the geometric design parameters for Sustainable Travel Links.

P2/M1 Sustainable Travel Links

Classifications

- Public Bridleway
- Public Restricted Byway
- All-purpose Unclassified road

Characteristics

- Short links providing direct, comfortable and convenient access between zones in urban and semi-urban areas for sustainable transport modes.
- Other vehicles (if permitted) are considered as a guest.
- Cycle streets provide high quality walking and cycling connections in urban areas whilst providing limited access to motor vehicles.
- Quiet Lanes provide clean, pleasant and quiet routes for walking and cycling providing connection with nature including places of shade, shelter and rest.

Busways

- STLs accommodating a busway and limited access for other motor vehicles may be designed for one-way shuttle working up to a length of 80m providing that access is signal controlled, access restrictions are enforced and provision is made for a safe waiting area at each end.

Speed Limit

- 30mph for interurban busways
- 20mph for urban and semi-urban busways

Geometric Design Parameters

Active Travel Provision

- Geometric parameters as per Active Travel Links
- ATL parameters dictate the STL design standards for horizontal radii, vertical curves, Stopping Sight Distances, visibility splays and longitudinal gradients if adjacent to busway.

Busway Provision

Busway (30mph)	Busway (20mph)

Frontage access

No	No

Access control (restricted to authorised users)

Yes	Yes

Min forward visibility

51m	25m

Carriageway width (Single Way)

N/A	3.7m

Carriageway width (Two Way)

6.5m	6.2m

Minimum horizontal curve (radius)

44m	16m

Reverse curves (min separation)

20m	14m

Maximum distance between speed restraints

100m	80m

Min K value

6.5	2

Longfall - Carriageway: 1% to 5%

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Minimum horizontal separation between carriageway and cycle track. 0.5m

P2/M1: Predominantly Residential Street

6.1 The default is that residential P2/M1 streets are designed in accordance with Manual for Streets as 20mph Areas with cycling on street and tight radii (4m max) at junctions

6.2 The street environment should engender 85th percentile speeds of 22mph or lower, if on-street cycling is proposed.

6.3 Further relevant advice and ideas can be found in Street Design for All (2014) DfT, CIHT guidance, Civic Voice and the Public Realm Information & Advice Network.

6.4 The following Table sets out the design parameters that will influence the design of P2/M1 residential streets.

P2/M1 Streets

Classifications

- L2 Local Access

Characteristics

- Footways & on-street cycling for new highways by street design
- Segregated provision for ATLs & STLs
- Segregation from busway within STLs

Speed Limit: 20mph

Active Travel Provision

Recommended Standard

- Footways & on-street cycling for new highways by street design
- Segregated provision for ATLs & STLs
- Segregation from busway within STLs

Acceptable Standard

- Footways & parking controls and traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Shared facilities for ATLs & STLs. Unless the ATL is on a main route on the local cycle network in which case it should be fully segregated.
- Footways & contraflow cycle lanes
- Cycle Streets in urban areas
- Wayfinding signage
- Cycle parking
- Places to stop and rest

Provision for Passenger Transport: Not expected to be on bus route

Street Lighting: Part night lighting

Maximum dwellings: 300 per km

Frontage Access: Yes

Access Forms

- 4m radius bell-mouths
- Vehicle crossover for up to 2,000 PCU per day on the entry arm

Junction Forms: Simple Priority

Gateway: No

Pavement Materials: Bituminous

Planting: Standard specification trees, no need for enhancement

Provision for Commercial Vehicles: Consider how home deliveries and house moves are to be

Car Parking: No footway parking

Geometric Design Parameters

Design speed: 20mph

Design Vehicle: Max 11m refuse vehicle. Allow to swing out over centreline when turning.

Min forward visibility: 33m

Junction spacing:

20m opposite

33m adjacent

Minimum Footway width

Recommended	Total 3.1 m	Effective 2.6 m
Acceptable	Total 2 m	Effective 1.5 m

Minimum Footway widths including cycle parking

Perpendicular

Recommended	5.2m	Acceptable 4m

Parallel

Recommended	4m	Acceptable 3.6m

Minimum Cycleway width See Active Travel Links

Minimum Cycle lane width: Recommended 2m

Carriageway width: 5.5m

Minimum horizontal curve (radius): 40m

Reverse curves (min separation): 17m

Super elevation: N/A

Max distance between speed restraints: 70m

Min K Value: 2

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Table for Active Travel Links

Minimum horizontal clearance to street lighting column: 0.8m

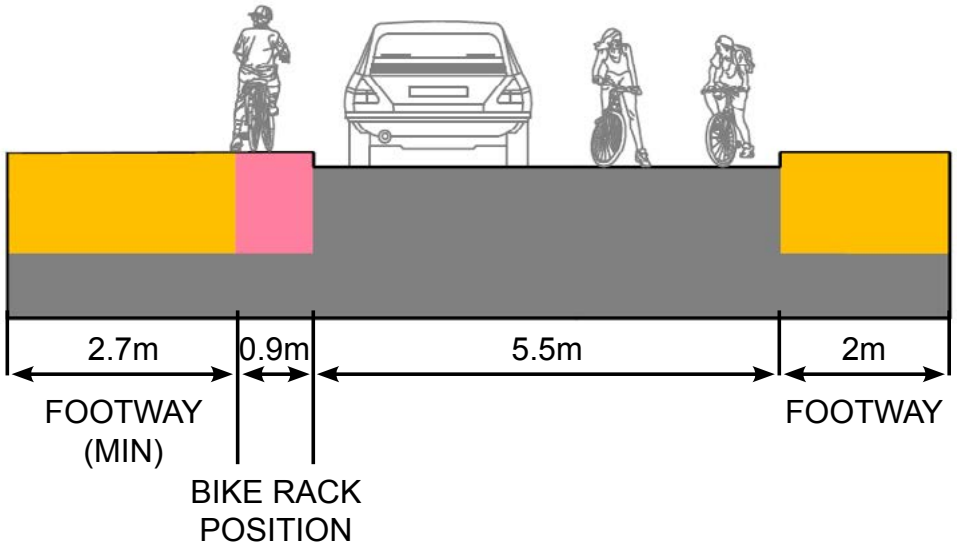
Minimum horizontal clearance to other obstruction: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)

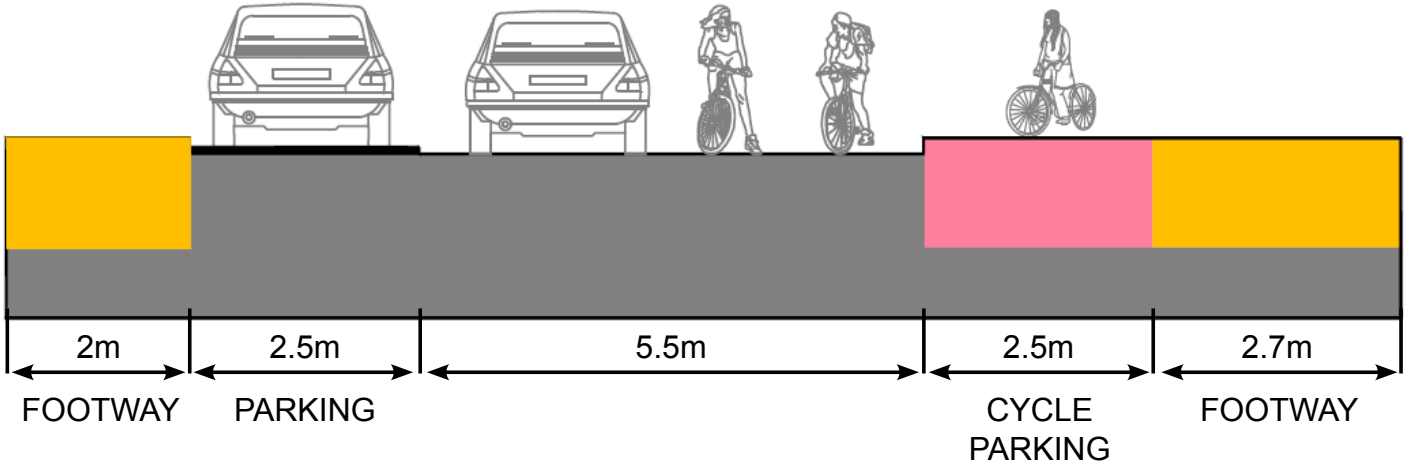
- 0.5m (0)
- 2m adjacent to a Blue Badge parking bay

6.5 The following illustrations show typical cross-sections for residential streets

Residential Street (with space for cycle parking) - Cycle parking parallel to kerb



Residential Street (Local access) (with space for car and cycle parking)



6.6 The following illustration from Manual for Streets shows the relationship between the minimum trafficked carriageway width and the actual carriageway width which is dedicated (or repurposed) for other uses, such as parking.

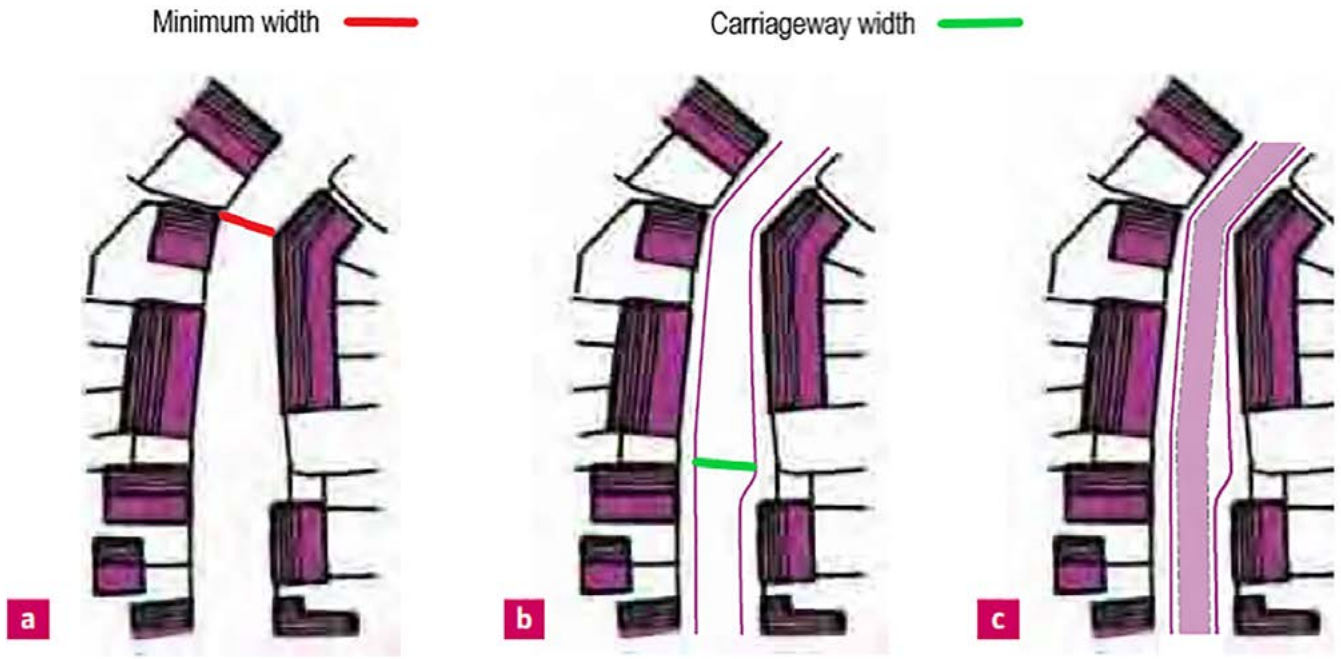


Figure 7.4 Left to right: (a) the buildings and urban edge of a street help to form the place; (b) the kerb line can be used to reinforce this; and (c) the remaining carriageway space is tracked for movement and for the provision of places where people may park their vehicles.

P2/M2: Residential Distributor Roads

7.1 Design codes for P2/M2: Residential Distributor Roads are:

- DMRB for Main & Secondary Distributor
- MfS for L1 Local Distributor and L2 Local Access

7.2 P2/M2 is the minimum standard for scheduled bus services in new developments and these roads should not be cul-de-sac to motor vehicles.

7.3 The following Table sets out the design parameters that will influence the design of for P2/M2: Residential Distributor Roads.

P2/M2: Residential Distributor Roads

Classifications

- Main Distributor
- Secondary Distributor
- L1 Local Distributor
- L2 Local Access

Characteristics

Multifunctional inner urban/suburban roads, typically A, B or C roads often on bus routes, connecting different parts of an urban settlement and non-residential access road including to and within industrial estates.

P2 /M2 also connect to P1/M3 and P2/M3 road category types within an urban setting.

Speed limit

- Main & Secondary Distributor 40mph
- L1 (Local Distributor) 30mph
- L2 (Local Access) 20mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle track
- Segregated Shared Use
- Footways & Stepped Cycle Track

Acceptable Standard

- Footways and Light segregation or cycle lanes for existing highways with constrained widths.
- Footways and on-street cycling where motor traffic 85th percentile speeds of 22mph or lower are achieved and if parking controlled for L2.

- Signal controlled crossings
- Zebra & parallel crossings for L1(Local Distributor) & L2 (Local Access)
- Bus stop bypasses or bus stop boarders
- Direction signage
- Priority at side roads

Provision for Passenger Transport

- Bus lanes
- Bus priority at junctions
- Bus stops & RTPI
- Potentially laybys on Main / Secondary Distributors for safety purposes
- At least passive provision for shelters, seating & cycle parking.

Frontage access: Not normally

Maximum Dwellings: •

Other Access Forms: •

Gateway: None

Junction Forms

Main & Secondary Distributor

- Continental / Compact roundabouts
- Signal junctions
- Priority junctions
- Ghost islands

L1 Local Distributor L2 Local Access

- Continental / Compact roundabouts
- Signal junctions
- Priority junctions

Street Lighting: Part Night Lighting

Pavement Materials: Bituminous

Planting

- Standard specification trees, no need for enhancement
- No planting in SUDs features with slopes steeper than 1:5
- Shrubs used in edge planting not to be planted within 0.6m (40mph) or 0.5m (30mph and below) from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

Provision for Commercial Vehicles: •

Car Parking: Restricted/ controlled on-street parking

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1.2m minimum cover to pipes under carriageway
- 0.9m minimum cover to pipes under footway, cycleway and verge

Geometric Design Standards

Road Hierarchy Designation

- Main & Secondary Distributor
- L1 Local Distributor (30mph)
- L2 Local Access Road (20mph)

Min forward visibility

120m 43m 25m

Junction spacing

- CD123
- 30m opposite 43m adjacent
- 20m opposite 45m adjacent

Carriageway width

7.3m 6.5m 6.2m

Minimum Recommended Footway width (Total / Effective)

2.6m / 2.6m 3.1m / 2.6m 3.1m / 2.6m

Minimum Acceptable Footway width (Total / Effective)

2m / 2m 2m / 1.5m 2m / 1.5m

Minimum Footway widths including cycle parking

Perpendicular

Recommended: 5.2m

Acceptable: 4m

Parallel

Recommended: 4m

Acceptable: 3.6m

Minimum Footway widths at Bus stops

Recommended: 5m

Acceptable: 3.8m

Minimum Cycleway width: See Active Travel Links

Minimum Cycle lane width

Recommended: 2m

Acceptable: 1.5m

Minimum horizontal curve (radius)

DMRB standard	44m	16m

Reverse curves (min separation)

DMRB standard	20m	14m

Transition Curves

DMRB standard	Not applicable	Not applicable

Maximum distance between speed restraints

Not applicable	100m	80m

Min K value

DMRB standard	6.5	2

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Table for Active Travel Links

Access type

DMRB standard	Bell-mouth	Bell-mouth

Minimum Verge Width (with utilities)

DRMB	1.5m (2m)	1.5m (2m)

Minimum horizontal clearance to street lighting column

1m	0.8m	0.8m

Minimum horizontal clearance to other obstructions

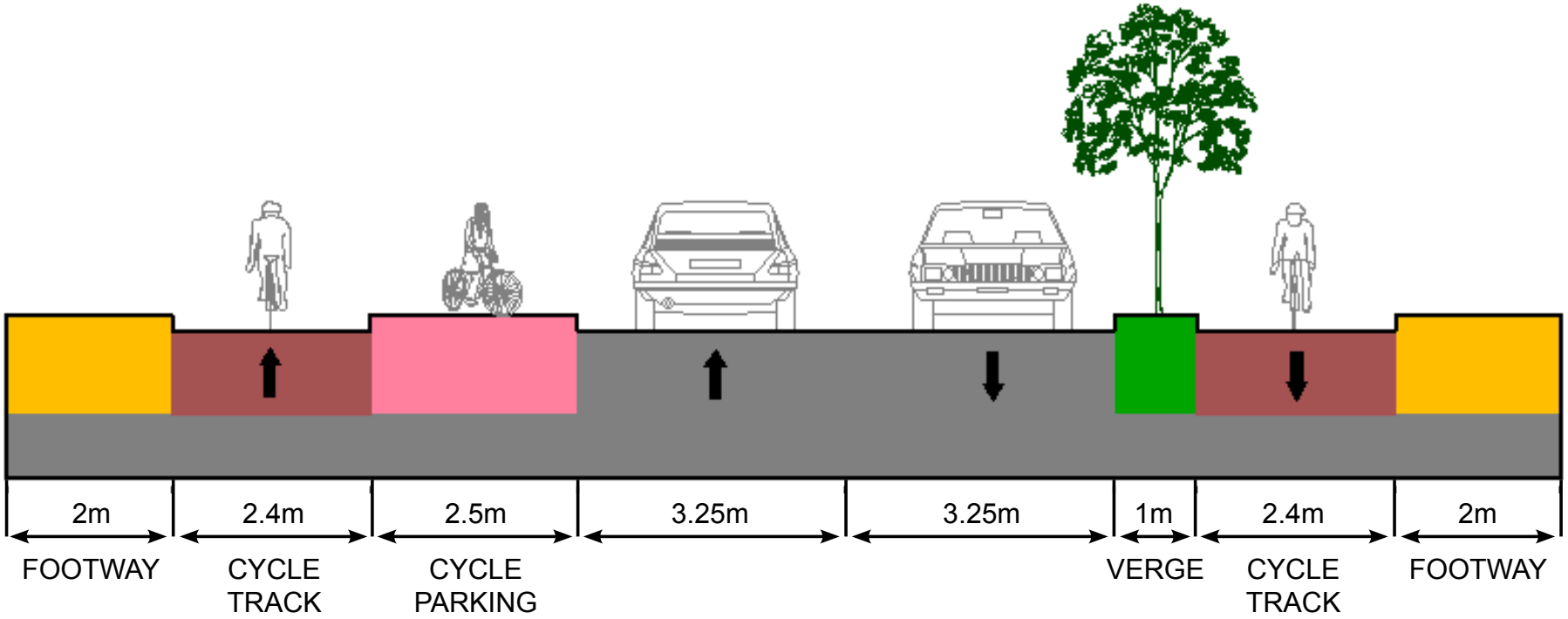
0.6m	0.5m	0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)

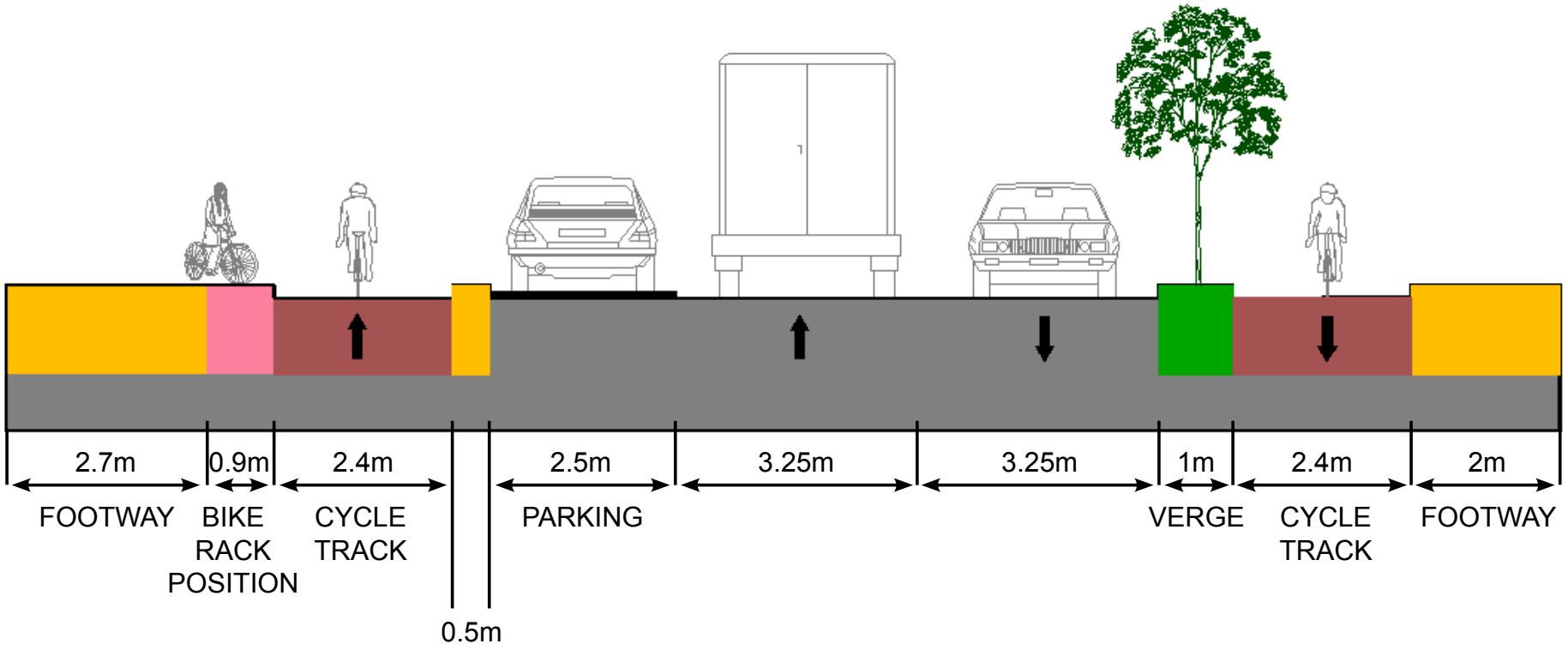
1m (0.5m)	0.5m (0m)	N/A

7.4 The following illustrations show a range of typical cross-sections for Residential Distributor Roads

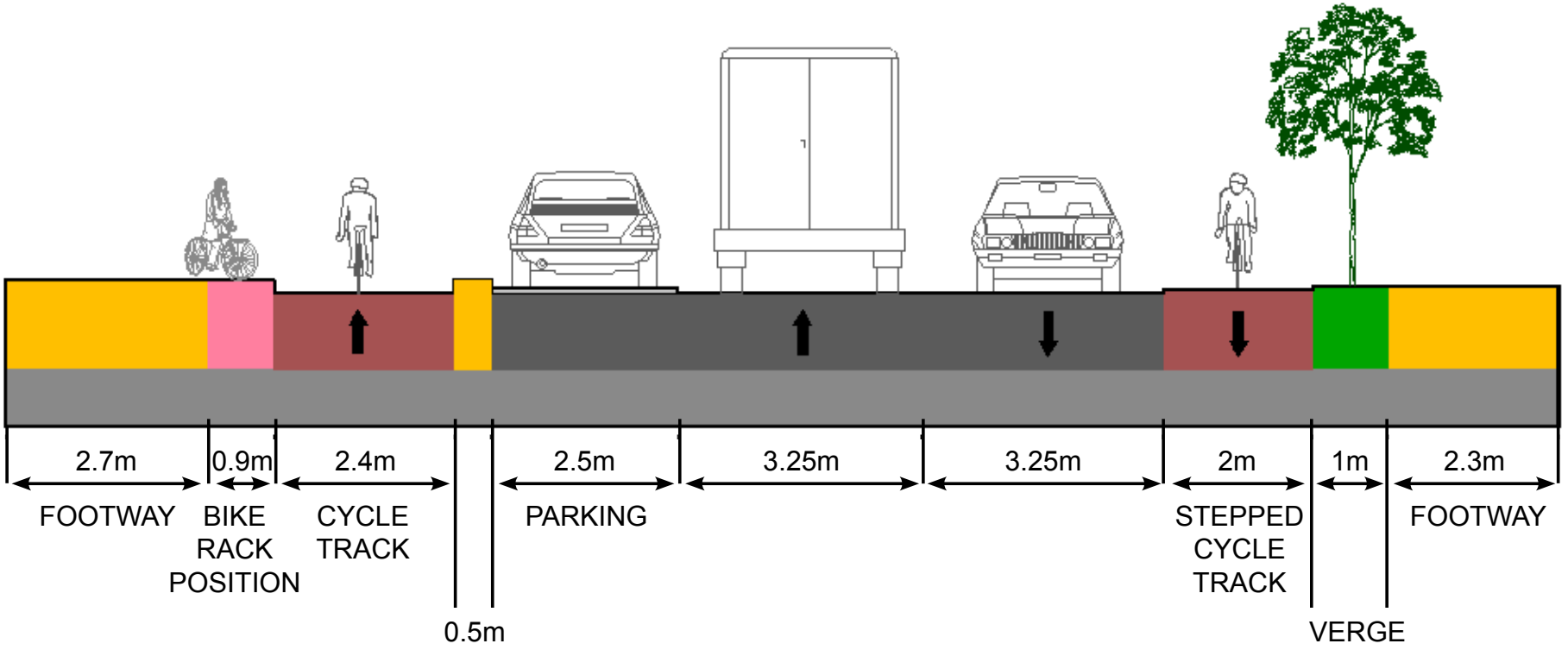
Distributor Road (with small median and verge)



Distributor Road with vehicle parking



Distributor road with vehicle parking and stepped cycle track



P2/M2: Industrial, Commercial or Service Roads

8.1 Any road likely to be used by large vehicles shall be designed to accommodate such vehicles. This might include roads serving industrial estates, offices, retail outlets or leisure facilities.

8.2 Separate, segregated facilities for walking and cycling shall be designed from inception. Shared facilities for pedestrians and cyclists should be avoided.

8.3 Access roads may be cul-de-sacs or loop roads, however in general loop roads providing connected networks are preferred over the use of cul-de-sac layouts.

8.4 Active Travel Links should be provided to connect cul-de-sacs and to connect to the wider highway network, as appropriate.

8.5 Where a cul-de-sac is used it should not normally exceed 200m in length. If it does exceed this length, a full turning facility for motor vehicles should be provided every 200m.

8.6 If security or gate facilities are provided at accesses where long vehicles are expected, they shall be sited at least 20m from the highway boundary. This is to avoid waiting vehicles obstructing traffic on the road passing the site.

8.7 The following Table sets out the design parameters that will influence the design of for P2/M2: Industrial, Commercial or Service Roads

P2/M2: Industrial, Commercial or Service Roads

Classifications

- L1 Local Distributor

Characteristics

Non-residential access road including to and within industrial estates.

Speed limit: 30mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle track
- Segregated Shared Use
- Stepped Cycle Track

Acceptable Standard

- Footways & light segregation or cycle lanes for existing highways with constrained widths
- Signal controlled crossings
- Zebra & Parallel Crossings
- Bus stop bypasses or bus stop boarders
- Direction signages
- Priority at side roads

Provision for Passenger Transport

- Bus lanes
- Bus priority at junctions
- Bus stops & RTPI
- At least passive provision for shelters, seating & cycle parking.

Frontage access: No

Other Access Forms: Bell-mouths

Gateway: Normally signing

Junction Forms

- Compact or Continental Roundabouts
- Signal junctions
- Priority junctions

Street Lighting: Part night lighting

Provision for Commercial Vehicles: Specifically for their use

Car Parking: Restricted/ controlled on-street parking

Design Codes

- Manual for Streets

Geometric Design Standards

Min forward visibility (Enhanced for HGVs): 51m

Junction spacing

- 30m opposite
- 50m adjacent

Junction Type

- Compact or Continental Roundabouts
- Signal junctions
- Priority junctions

Carriageway width: 6.5m

Minimum Footway width (Total/Effective)

Recommended	3.1m	2.6m
Acceptable	2m	1.5m

Minimum Footway widths including cycle parking

Perpendicular

Recommended:5.2m

Acceptable:4m

Parallel

Recommended:4m

Acceptable: 3.6m

Minimum Footway widths at Bus stops

Recommended:5m

Acceptable: 3.8m

Minimum Cycleway width: See Active Travel Links

Cycle lanes: Not Acceptable

Minimum exclusive Bus lane width: 3.5m

Minimum Bus Lane width including cycling

Recommended: 4.5m

Acceptable: 4m

Minimum horizontal curve (radius): 44m

Reverse curves (min separation): 20m

Transition Curves: Not applicable

Maximum distance between speed restraints: Not applicable

Min K value: 6.5

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Table for Active Travel Links

Minimum Verge Width (with utilities): 1.5m (2m)

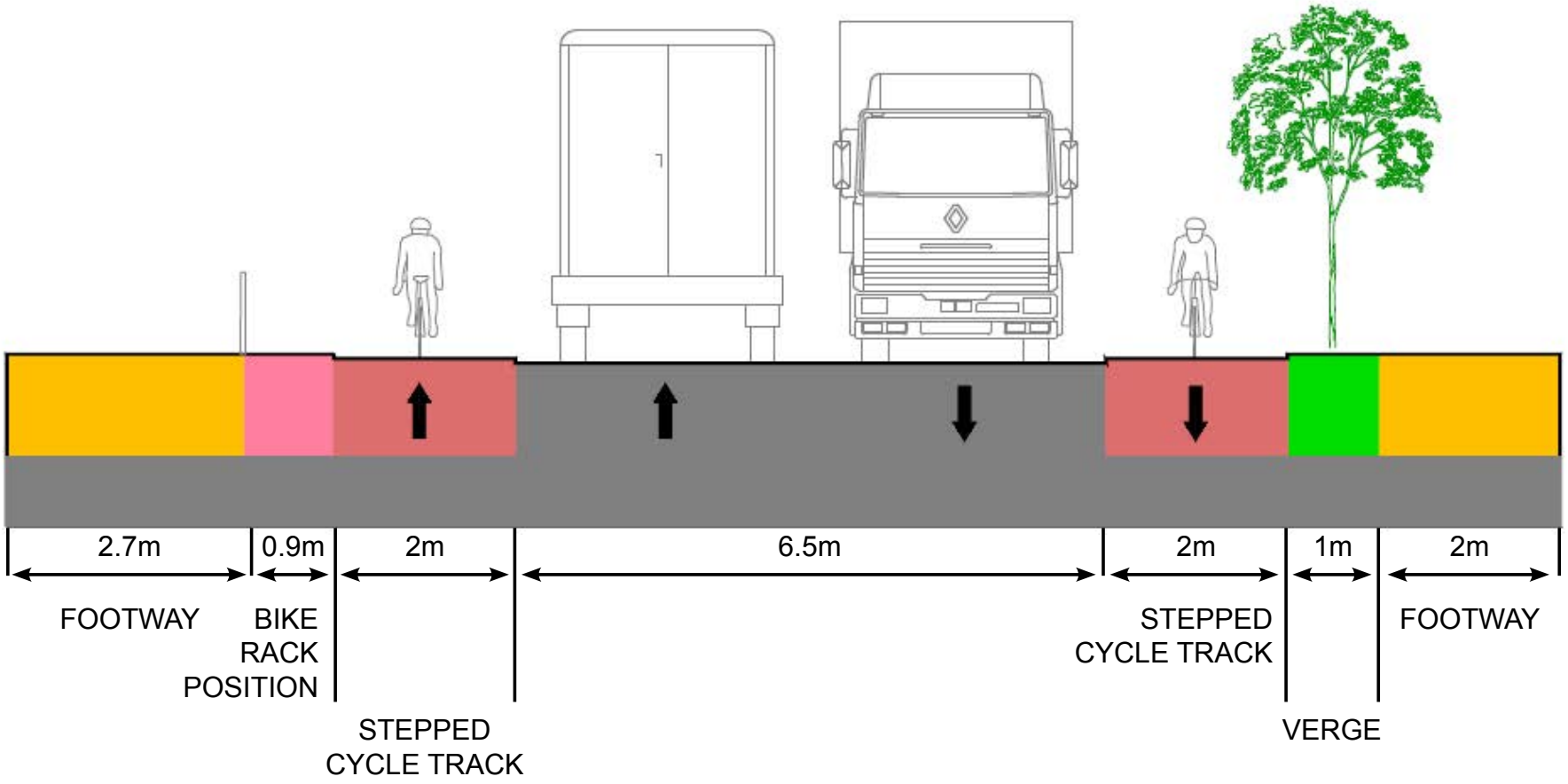
Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable): 0.5m (0)

8.8 The following illustrations show a typical cross-section for an Industrial estate road.

Industrial Estate (with stepped cycle tracks)



P2/M3: Main Connector

P2/M3

Main Connector linking a strategic road (P1/M3) usually to a settlement. The roads should be over 5.5 m wide and are predominantly A roads.

Classifications

- Rural Main Distributor
- Rural Secondary Distributor

Characteristics

- Speed Limit 50

Active Travel Provision

Recommended Standard

- Segregated footways & cycle tracks
- Segregated Shared Use

Acceptable Standard

- Unsegregated Shared Use

Active Travel Provision

- Signal Controlled Crossings
- Priority at side roads
- Direction Signage
- Bus stop bypasses or bus stop boarders

Provision for Passenger Transport

- Bus Priority at Junctions
- Bus stops & RTPI
- Potentially laybys for safety purposes
- At least passive provision for shelters, seating & cycle parking

Frontage access: Not normally

Other Access Forms: Not generally

Junction Forms

- Roundabouts (conventional or signalised)
- Signal junctions
- Ghost islands

Street Lighting

- Part Night Lighting

Car Parking: Parking is not normally permitted

Design Codes

DMRB

Geometric Design Parameters

Design Speed: 40mph

Min forward visibility: 120m

Junction spacing

40m	opposite
66m	adjacent

Minimum Footway width

Recommended	Total: 2.6m	Effective: 2.6m
Acceptable	Total: 2m	Effective: 2m

Minimum Footway widths including cycle parking

Recommended	Perpendicular: 5.2m	Parallel: 4m
Acceptable	Perpendicular: 4m	Parallel: 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: See Active Travel Links

Carriageway width: 7.3m

Minimum horizontal curve (radius): DMRB standard

Reverse curves (min separation): DMRB standard

Transition Curves: DMRB standard

Maximum distance between speed restraints: N/A

Min K value: DMRB standard

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Table for Active Travel Links

Minimum Verge Width (with utilities): 2m

Minimum horizontal clearance to street lighting column: 1m

Minimum horizontal clearance to other obstructions: 0.6m

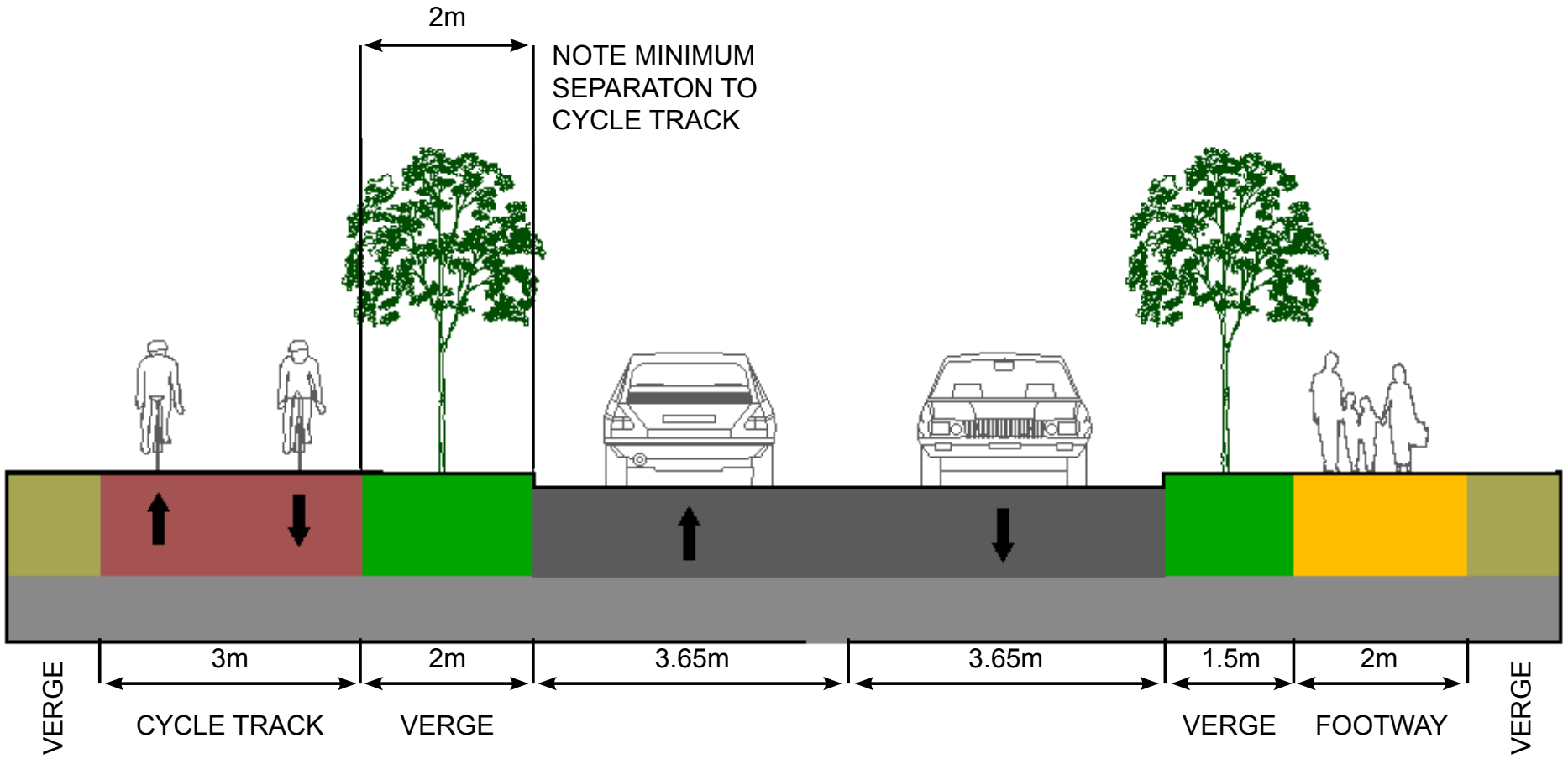
Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable)

- 2m (1.5m) 50 mph
- 1m (0.5m) 40 mph

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1.2m minimum Cover to pipes under carriageway
- 0.9m minimum Cover to pipes under footway, cycleway and verge

Main connector/ Interurban road (50mph)



P1/M3: Major A-road

10.1 Some existing P1/M3 roads pass through the centre of urban areas and while the category is aimed at mass movement the inclusion of a P1/M3 will create severance for Active Travel modes.

10.2 In new developments this classification shall be routed away (to bypass) urban settlements with connections from lower movement classes as appropriate.

P1/M3

Major A road or Motorway or Primary Road connecting two large urban settlements and carrying more strategic traffic. Identified using the Strategic Road Network, Primary Road Network and Major Road Networks.

Classifications

- Primary Distributor
- Urban Main Distributor

Characteristics

Speed limit

- Rural: National Speed Limit
- Semi-Urban: 50mph
- Urban: 40mph

Active Travel Provision

Recommended Standard

- Segregated footway & cycle track
- Segregated Shared Use

Acceptable Standard

- Unsegregated Shared Use (Urban)

Up to and including 40mph Active Travel Provision

- Signal Controlled crossing points or grade separation at junctions or desire lines
- Direction Signage
- Cycle priority at side roads up to 40mph limit only

Active Travel Provision

- Signal Controlled crossing points or grade separation at junctions or desire lines
- Direction Signage
- Cycle priority at side roads

Provision for Passenger Transport

- Bus priority at junctions
- Potentially laybys for safety purposes
- Bus lanes
- Bus stops & RTPI
- At least passive provision for shelters, seating & cycle parking

Frontage access

- No

Other Access Forms

- Not generally.

Gateway

- No

Junction Forms

- Grade separation (Rural)
- Conventional Roundabouts
- Signalled junctions
- Ghost islands

Street Lighting

- Unlit except at safety features

Frontage access

- No

Gateway

- No

Provision for Commercial Vehicles

- Laybys for short stops only

Car Parking

- Laybys for short stops only

Restraint Systems

- Road restaint systems and passive posts.

Design Codes

DMRB

Geometric Design Parameters

Design Speed

Speed Limit	Design Speed
40mph	70kph
50mph	85kph
60mph	100kph
70mph	120kph

Min forward visibility:

Junction spacing:

Minimum Footway width

Recommended	Total: 2.6m	Effective: 2.6m
Acceptable	Total: 2m	Effective: 2m

Minimum Footway widths including cycle parking

Recommended	Perpendicular: 5.2m	Parallel: 4m
Acceptable	Perpendicular: 4m	Parallel: 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: See Active Travel Links

Carriageway width:

- National Speed Limit: 7.3m plus 1m hard strips
- 50mph and below: 7.3m
- Design Review Panel to consider proposals if separated cycle facilities are not included

Minimum horizontal curve (radius): DMRB

Reverse curves (min separation): DMRB

Transition Curves: DMRB

Maximum distance between speed restraints: DMRB

Min K value: DMRB

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Active Travel Links

Access: DMRB

Minimum Verge Width (with utilities): 2.5m

Minimum horizontal clearance to street lighting column

1.5m	@ National Speed Limit
1m	@ 50mph

Minimum horizontal clearance to other obstructions

1.2m	@ National Speed Limit
0.6m	@ 50mph

Minimum horizontal separation between carriageway and cycle track. (Acceptable)

3.5m (3m) @ National Speed Limit - dual

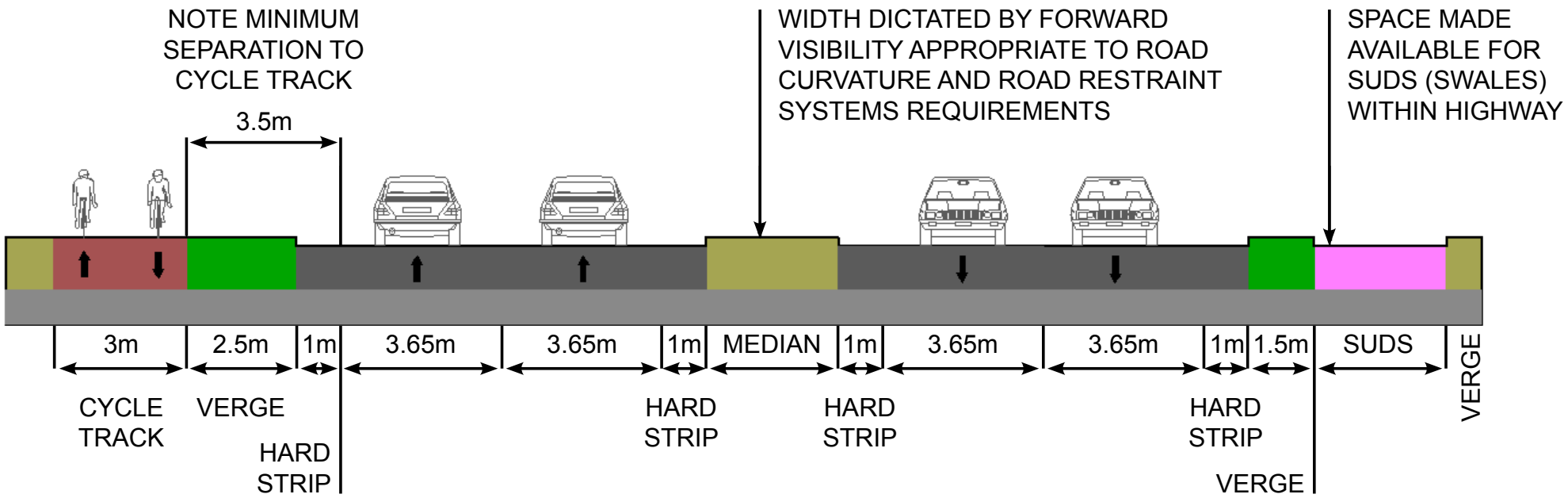
2.5m (2m) @ National Speed Limit - single

2m (1.5m) @50mph

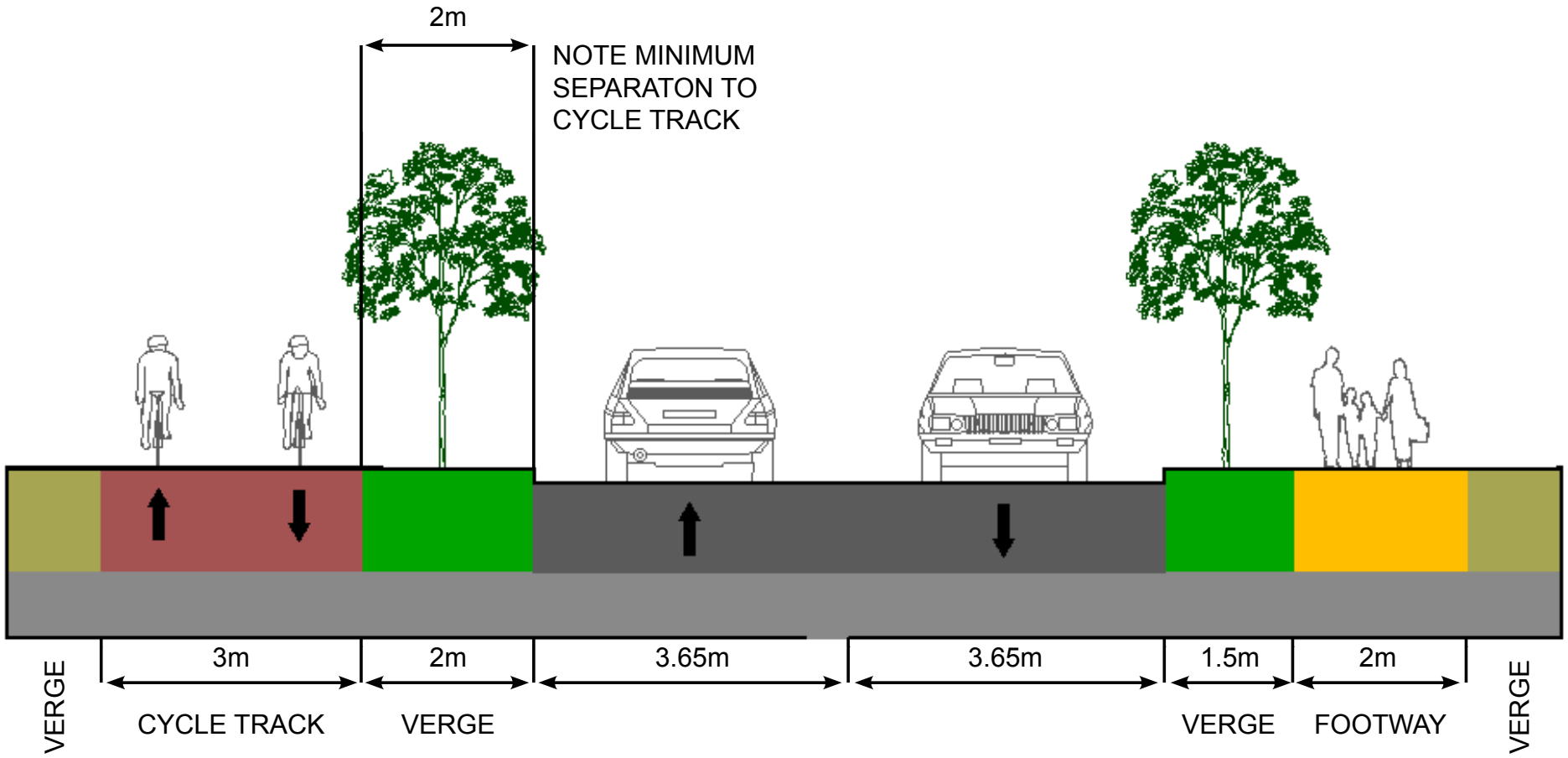
Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No planting in SuDS features with slopes steeper than 1:5

Figure 2: P1/M3 dual carriageway (with space for SUDS and National Speed Limit)



P1/M3 with footway (50mph)



P3/M1 Residential Streets

11.1 The parameters to be considered in designing P3/M1 residential streets are discussed within Part 3, Chapter 2: Planning Public Realm

11.2 Relevant design advice and ideas can be found in

- Street Design for All (2014) DfT,
- Streetscapes: How to design and deliver great streets by Colin J Davis
- CIHT guidance,
- Civic Voice
- Public Realm Information & Advice Network

11.3 Mews cul-de-sacs for motorised traffic serving up to 25 dwellings, Mews Streets of 50 dwellings served by a Local Access road at either end and Informal Streets serving up to 5 dwellings are exempt from the current pause on the use of shared space.

11.4 All other P3/M1 streets shall use kerbing a minimum of 50-60mm to define areas used by motor vehicles

11.5 P3/M1 Street initiatives are aimed at promoting a high sense of place, where health and social wellbeing are as important factors as active travel.

11.6 Such initiatives have been introduced nationally and internationally, captured as:

- Home Zones
- Low Traffic Neighbourhoods
- Vehicle Restricted Areas
- Pedestrian prioritised streets
- Informal streets
- Enhanced streets
- Stellplatzfrei streets (‘free from parking space streets’)
- ‘Mews Courts’ and ‘Housing Squares’ for higher density developments grouped around a Shared Surface road
- School Streets

11.7 The following Table sets out the design parameters that will influence the design of P3/M1 residential streets.

P3/M1

Inner urban road or square at the core of a settlement (predominantly retail), Shared space and often block paving, with no roadside kerb. High people movement but little to no motorised vehicle movement. Some Town Centres will not be fully identified on the P&M network as they may not include adopted Highway.

Shared Space Residential Street initiatives.

Classifications

- L2 Local Access

Characteristics

Typical street scene includes street trees, licensed tables & chairs, advertisements, places for shade, shelter & rest.

Mews cul-de-sacs for motorised traffic serving up to 25 dwellings, a Mews Street of 50 dwellings served by a Local Access road at either end and Informal Streets serving up to 5 dwellings are exempt from the current pause on the use of shared space.

All other P3/M1 streets shall use kerbing a minimum of 50-60mm to define areas used by motor vehicles

P3/M1 Street Initiatives are aimed at promoting a high sense of place, where health and social wellbeing are as important factors as active travel. Such initiatives have been introduced nationally and internationally, captured as:

- Home Zones
- Low Traffic Neighbourhoods
- Vehicle Restricted Areas
- Pedestrian prioritised streets
- Informal streets
- Enhanced streets
- Stellplatzfrei streets (‘free from parking space streets’)
- ‘Mews Courts’ and ‘Housing Squares’ for higher density developments grouped around a Shared Surface road
- School Streets

Speed Limit: 20mph

Active Travel provision

Recommended Standard

- Footways & on-street cycling for new highways by street design
- Shared space for exempt Mews & Informal Streets

Acceptable Standard

- Footways & traffic calming to achieve 85th percentile speeds of 22mph or lower to enable on-street cycling
- Footways & contraflow cycle lanes

Active Travel Provision

- Places for shade, shelter & rest
- Wayfinding signage
- Cycle Parking
- Bike hire
- Covered and secure depot space for cargo bikes

Provision for Passenger Transport

- Not expected to be on bus route
- Direction signage to bus stops
- Taxi rank and/or waiting area and drop-off at town squares

Street Lighting: All night lighting

Maximum dwellings

- Mews - 50
- Informal Street - 5

Frontage access: Yes

Access Forms

- 4m radius bell-mouth
- Vehicle crossover for up to 2,000 PCU per day on the entry arm

Junction Forms: Simple Priority

Gateway: Yes

Pavement Materials

- Bituminous
- Bituminous with block paved features
- Standard block paving
- Local enhancement to reflect local character and heritage articulated within guidance prepared by the LPA

Planting

- Standard specification trees, no need for enhancement
- Shrubs used in edge planting not to be planted within 0.5m from the edge of the running lane
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m to the carriageway
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m of the carriageway unless otherwise agreed by HCC

Design Codes

Relevant design advice and ideas can be found in

- Street Design for All (2014) DfT,
- Streetscapes: How to design and deliver great streets by Colin J Davis
- CIHT guidance,
- Civic Voice
- Public Realm Information & Advice Network

Geometric Design Parameters

Design speed

Mews	20mph
Informal Street	10mph

Design Vehicle: Allow refuse vehicle to swing out over centreline when turning.

Min forward visibility

Mews	25m
Informal Street	11m

Junction spacing: N/A

Carriageway width

Mews	5m
Informal Street	tracked

Minimum unobstructed width: 3.7m

Minimum footway width

Recommended	Total 4m	Effective 3.5m
Acceptable	Total 3.5m	Effective 3m

Minimum footway width including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum cycle lane width

Recommended	2m
Acceptable	1.5m

Minimum horizontal curve (radius): 16m

Reverse curves (min separation): 14m

Super elevation: N/A

Max distance between speed restraints

Mews	80m
Informal Street	40m

Min K Value: 2

Longfall: See Active Travel Links

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum cover to pipes under carriageway
- 900mm minimum cover to pipes under footway, cycleway and verge

11.8 In Mews and Informal Streets the trafficked carriageway width shall be provided at intervals along the street to allow users to pass and be long enough to permit the agreed design vehicle to pass another user.

11.9 The minimum unobstructed width is to permit passage of emergency fire vehicles (from Part B: Building Regulations)

11.10 Effective and good quality engagement with local residents, businesses, disabled groups, emergency services and refuse collection services, as a minimum, is essential in preparing any P3/M1 scheme.

11.11 Trials of proposed traffic management measures and layouts are recommended. They help people understand what the proposals are and how they will affect them, enable adjustments prior to making these permanent, and if implemented effectively as part of the engagement programme they can give people a genuine say in the design of measures that will affect their local area.

11.12 Monitoring of pedestrian, cycle and motor traffic flows and behaviour should be carried out on schemes, before and after implementation and during any trials.

P3/M2 Inner Urban Street

12.1 Inner urban street with a predominance of retail (3 premises within 15m) and other commercial land uses, e.g. high street, local shopping parades, retail parks.

12.2 The parameters to be considered in designing P3/M2 inner urban streets are discussed within Part 3, Chapter 2: Planning Public Realm.

P3/M2

Classifications

- Main Distributor
- Secondary Distributor
- L1 Local Distributor
- L2 Local Access

Characteristics

- Serving an economic hub or district shopping area in large towns. A place for people to meet and shop.
- Typical street scene includes street trees, licensed tables & chairs, advertisements, bus shelters, taxi ranks, places for shade, shelter & rest

Speed Limit: 20mph

Active Travel Provision

Recommended Standard

- Segregated footways & cycle tracks
- Segregated Shared Use
- Footways & Stepped cycle track
- Footways & on-street cycling designed for 85th percentile speeds of 22mph or lower and traffic flows are below about 2,500 vehicles per day if parking managed

Acceptable Standard

- Footways & light segregation or cycle lanes for existing highways with constrained widths
- Footways & contraflow

Active Travel Provision

- Preferably Zebra or Parallel (raised) crossings
- Priority at side roads.
- Bus stop bypasses or bus stop boarders
- Wayfinding signage
- Cycle parking
- Bike hire

Provision for Passenger Transport

- Bus priority at junctions
- Bus stops, shelters, seating, cycle parking, RTPI
- Taxi rank and/or waiting area and drop-off

Frontage access: Only for Access Road

Maximum Dwellings: 300 per km for Access Road

Access Forms

- Vehicle crossover for up to 2,000 PCU per day on the entry arm
- 4m radius bell mouth

Gateway: Desirable

Junction Forms

- Priority Junctions
- Signalled Junctions

Street Lighting: All night lighting

Pavement Materials

- Bituminous
- Bituminous with block paved features
- Standard block paving

Planting Requirements

- Compact crown, in keeping with local character/townscape, tolerant to urban pollution
- Specimen tree, compact crown, in keeping with local character/townscape, tolerant to urban pollution

Provision for Commercial Vehicles

- Loading Areas for premises if not off-street

Car Parking

- Regulated parking required (time limited) to enable turnover

Design Codes

- Manual for Streets

Geometric Design Standards

Design Speed: 20mph

Min forward visibility: 33m

Junction spacing

20m	opposite
33m	adjacent

Carriageway width
6.2m - 6.7m determined by provision for safe cycling and buses

Traffic lane width for on-street cycling

Cars Only

Recommended 3m Acceptable 2.75m

Notes: 2.5m only at offside queuing lanes where there is an adjacent flared lane

Bus Route or >8% HGVs

Recommended 3.2m Acceptable 3m

Notes: Lane widths of between 3.2m and 3.9m are not acceptable for cycling in mixed traffic.

Minimum Footway width

Recommended	Total 4m	Effective 3.5m
Acceptable	Total 3.5m	Effective 3m

Minimum Footway widths including cycle parking

Recommended	Perpendicular 5.2m	Parallel 4m
Acceptable	Perpendicular 4m	Parallel 3.6m

Minimum Footway widths at Bus stops

Recommended	5m
Acceptable	3.8m

Minimum Cycleway width: See Active Travel Links

Minimum Cycle lane width

Recommended	2m
Acceptable	1.5m

Vehicle Parking

- Powered two-wheeler parking bays 2.5m x 1.5m
- Standard car parking space 6m x 2.5m
- Disabled parking bays 6.5m x 2.9m (plus 1m clearance)
- Recommended minimum separation between parking bay and cycle track is 1m (Acceptable Minimum of 0.5m)

Minimum horizontal curve (radius): 25m

Reverse curves (min separation): 14m

Transition Curves: N/A

Maximum distance between speed restraints: 80m

Min K value: 2

Longfall - Carriageway: 1% to 5%

Longfall - Active Travel provision: See Active Travel Links

Minimum horizontal clearance to street lighting column: 0.8m

Minimum horizontal clearance to other obstructions: 0.5m

Recommended minimum horizontal separation between carriageway and cycle track. (Acceptable): 0.5m (0)

Drainage

- SuDS features shall have slopes no steeper than 1 in 3
- A berm, or grass filter strip of 1m minimum width required between any hardscape and the slope of a SuDS feature
- No filtration materials to be laid over utilities plant or under areas that are expected to have vehicular overrun
- 1200mm minimum Cover to pipes under carriageway
- 900mm minimum Cover to pipes under footway, cycleway and verge

Preparing a Planning Application

13.1 Part 1, Chapter 3: The Scheme Promotion and Development Management Process sets out the range of design elements and proposed strategies to be submitted at the planning application stage.

13.2 The geometrical design proposals should particularly show clearly how the following elements integrate spatially without conflict providing appropriate horizontal and vertical alignments, effective widths, clearances and sightlines for the appropriate P&M category:

- Highway boundary
- Kerb lines
- Footway provision
- Cycling provision
- Equestrian provision
- Utilities
- Restraint systems
- Signpost locations
- Passenger transport facilities
- Lamp column locations
- Landscape planting
- Verge provision
- Structures
- Street furniture
- Drainage features
- Parking for cycles, scooters and motor vehicles

Chapter 9
Planning Highway Junctions & Crossings

Contents

Planning Highway Junctions & Crossings

1 Introduction

1.1 This chapter sets out the principles for the selection and design of highway junctions and crossings for motorised and non-motorised modes.

1.2 HCCs Local Transport Plan (LTP4) is the primary influence in applying design standards in Hertfordshire. Policy 1: Transport User Hierarchy, Policy 5: Development Management and Policy 13: New Roads and Junctions.

1.3 The types of highway links within Hertfordshire are discussed in Part 2 Chapter 5: Providing for Place & Movement both in terms of their 'Place & Movement' function and their status within the Road Hierarchy. Guidance relating to their geometric design is set out in Part 3, Chapter 8: Planning Highway Links.

1.4 The performance of a highway link is interrelated with its junctions. Therefore, the two features (links and junctions) should be considered together to avoid them becoming motor vehicle dominated or the provision of active travel measures becoming disjointed.

1.5 Scheme Promoters should consider the wider context for their proposals at the master planning stage alongside the nature and design of any new junctions and crossings that are likely to be required in accordance with the appropriate P&M category.

1.6 As indicated in Part 1, Chapter 8: Standards & Departures, the requirements set out in this guide take precedence in situations where this guide differs from other standards.

1.7 Scheme Promoters should ensure that their proposals comply with recommended standards, wherever feasible, and contribute positively to the objectives of LTP4 and create good development.

1.8 Acceptable Standards may be necessary where improvements are required within existing highway boundaries.

1.9 Designing facilities below Acceptable Limits will result in a poor standard of provision and constitutes a 'Departure from Standards'. In these circumstances the scheme promoter should submit the scheme proposal to a Design Review Panel so that the overall objectives of the scheme can be reviewed, and potential alternative solutions can be discussed.

General Principles

2.1 Junctions and crossings are required where highways of any P&M class or category meet. The form and operation of junction or crossing have a significant impact on the degree to which people choose to undertake active travel.

2.2 In general, simple forms of junction or crossing are best located in areas with a high place value. With increasing vehicle speed and volume more complex forms of junction and crossing are likely to be needed with the highest complexity being grade separation.

2.3 Grade separation may appear to be the safest option, but poor design can create barriers for Active Travel and could lead to the facility being less used by those it was intended to protect.

2.4 Junctions are where people cycling tend to be at most risk and therefore improvements at junctions can bring the biggest benefits to them. Junction layouts and treatments should be designed to remove conflict as far as reasonable without compromising the core design principles.

2.5 One of the key considerations in the provision of safe, convenient and continuous cycling routes is how people cycling will negotiate junctions. The guidance in LTN 1/20 Cycle Infrastructure Design should be followed.

2.6 For highways with a movement category of M2 and above, the Junction Assessment Tool (JAT) in LTN 1/20 shall be used to assess cyclability.

2.7 The adjacent figure illustrates that when designing a new junction to the principles of LTP4 Policy 13, routes through the junction should be set out for active travel modes first.

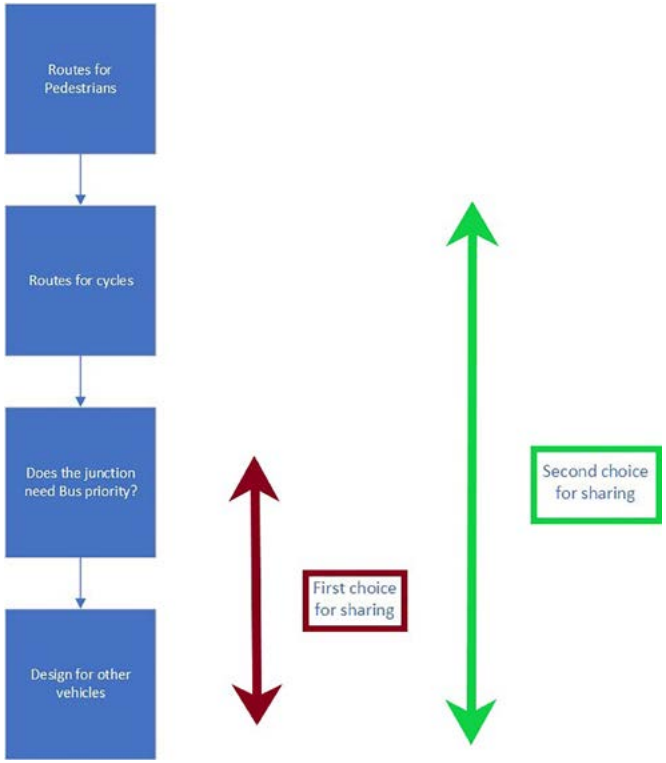


Figure 1
New junction design considerations to LTP4 Policy 13 principles

2.8 If the junction is spatially constrained, then it should follow this hierarchy in the allocation of space.

2.9 Certain modes such as cyclists, buses and other traffic can share space. Motor vehicles should be mixed in the first instance, with cycling only added as a last resort. Cycles and pedestrians can be mixed, but only in certain circumstances. A key feature is that the pedestrian flows are low when there are cycle flows, so that the frequency of potential movement conflict is also low.

2.10 The common types of junction likely to be encountered are roundabouts, priority junctions and junctions under traffic signal control. Manual for Streets (MfS) points out that uncontrolled crossroads can have a role to play in the creation of connected network in residential and town centre areas.

2.11 Whilst junction design standards are contained in Design Manual for Roads and Bridges (DMRB), this does not necessarily mean that designing to this standard will deliver the best product for the location.

2.12 Proposed junction types, including an analysis of the users that need to be provided for, and their relative priorities, shall be agreed with HCC at the pre-application stage (or preliminary design stage) together with the proposed design standards to be used.

Vehicle Crossovers

3.1 A vehicle crossover (VXO) is method of providing access between the edge of the highway carriageway and a site, where the footway is reinforced to take the weight of a vehicle and the kerb is dropped to form a ramp. Through their design and use, walking and/ or cycling priority is maintained with a continuous footway and/ or cycle track extending across the vehicular access.

3.2 A vehicle crossover is suitable on P&M category P2/M1, P3/M1 and P3/M2 streets for up to 2,000 Passenger Car Units (PCU) per day on the entry arm.

3.3 In general, the number of crossovers should be kept to a minimum to reduce conflict with and discomfort for footway and cycle track users.

3.4 The widths of drives and the length of dropped kerbs at a vehicle crossover shall be sufficient to allow vehicles to safely manoeuvre into and out of the property. In certain situations, it may be necessary for a scheme proposal to be accompanied by a swept path analysis. Unnecessarily long crossovers should be avoided to minimise inconvenience and danger to footway users. As cars are increasing in size, HCC no longer accepts the tracking paths of a 'Medium Sized Car' (Volvo 440) from AutoTRACK's 'European pre-2006 Library' and considers that an 'Estate Car' (Volvo V70) from the 'European post-2006 Library' is now appropriate

3.5 Where practicable, at entrances to driveways a flat area with a width of 900mm carried through at footway level should be provided to enable pedestrians and wheelchair users to avoid the steep ramp to dropped kerbs, as a minimum 800mm may be provided in some circumstances.

3.6 The process for applying for a vehicle crossover (also known as a dropped kerb) for 1 or 2 dwellings on existing highways can be found through the following link. https://www.hertfordshire.gov.uk/services/highways-roads-and-pavements/changes-to-your-road/dropped-kerbs/dropped-kerbs.aspx

Priority Junctions

4.1 A simple T-junction is an at-grade junction of two roads, at which the minor road joins the major road approximately at a right angle.

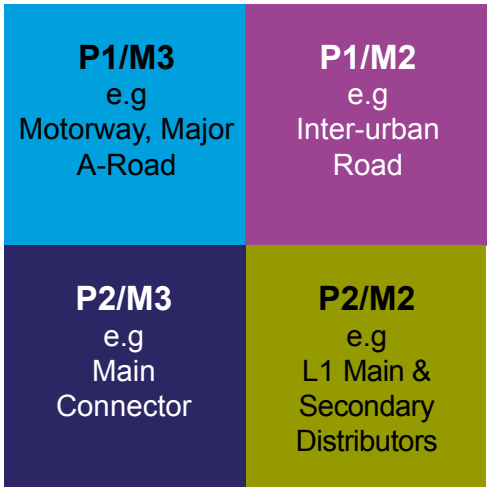
4.2 A ghost island junction is a T-junction that has an area marked on the carriageway of the major road for traffic turning right into the minor road.

4.3 T-junctions and ghost island junctions shall be designed to the requirements of CD123 - Geometric design of at-grade priority and signal-controlled junctions and MfS.

4.4 For the majority of situations encountered on P&M category P2/M1, P3/M1 and P3/M2, a simple T-junction will suffice with a bell-mouth kerb radius of 4m (6m maximum) if a crossover is considered to be unsuitable.

4.5 Simple T-junctions may also be suitable for P&M category P1/M1, P2/M2 (L2 and industrial roads).

4.6 Ghost Islands may be required for higher movement, higher speed classes as follows:



4.7 The spacing of junctions should be determined by the type and size of urban blocks appropriate for the development. Block size should be based on the need for permeability, and generally tends to become smaller as density and pedestrian activity increases.

4.8 In movement terms, the minimum spacing of junctions, on the same side of the road, is related to the stopping sight distance for the speed of the road. The spacing of junctions, on opposite sides of the road, is intended to keep turning movements at each junction separated by sufficient distance to avoid confusion or conflict.

4.9 Minimum junction spacings for the various P&M categories are set out in Part 3, Chapter 8: Planning Highway Links

4.10 For staggered junctions, when progressing from one side road to the other a right-left stagger is preferred to a left-right stagger.

4.11 Advice on the issues at priority junctions for cycling in mixed traffic is provided in LTN 1/20 Section 10.5 with design methods available to address the safety, comfort and directness for people cycling. Every effort should be made to allow cycles through junctions that are one-way to motorised vehicles.

4.12 Designers should use the Junction Assessment Tool to identify and assess the issues to address at priority junctions to facilitate all cycle movements and make them safe, direct and convenient. The junction must be designed so that no cycle movements are colour-coded red.

4.13 Cyclists should be given priority across the entrance to a side road where feasible and should not need to give way. The cycle track and adjacent footway should continue across the side road without significantly changing their heights above the carriageway: they should not ramp down at the junction kerbline.

4.14 Where access to the side road is restricted or where cyclists are turning into an off-carriageway facility, the provision of a right turn pocket should be considered.

Figure 2
Right turn pocket (Birmingham Cycle Campaign)

4.15 The photograph above shows an example of this facility. Where oncoming vehicle flows are high an island should be placed beyond the pocket to provide protection to the waiting cyclists from overtaking vehicles.

4.16 Right turn pockets can be used for cyclists turning into a cycle only facility, either cycle track or cycle only road.

General Principles for Roundabouts

5.1 Roundabouts (including mini roundabouts) shall be designed to conform to CD116 - Geometric design of roundabouts.

5.2 Designing to this standard will be capacity focused and vehicle orientated junctions and Scheme Promoters will be required to demonstrate how the needs of pedestrians and cyclists have been considered and prioritised in accordance with LTP4 Policy 1.

5.3 Roundabouts are one of the most hazardous types of junction for cyclists, particularly roundabouts designed to standard UK geometry. The guidance in LTN 1/20 Section 10.7 should be followed.

5.4 Roundabouts should be designed for all cycle movements, taking account of the long term cycle network plans where these are available. Where such a plan is not available the Scheme Promoter should first consult with HCC.

5.5 There are two ways to accommodate cyclists more safely at roundabouts depending on traffic conditions:

- Roundabouts with protected space for cycling for where traffic volumes are high, and at roundabouts with high-

speed geometry. Protected space for cycling away from the carriageway should be made, preferably with cycle priority or signal-controlled crossings of the roundabout entries and exits (or grade separation)

- Roundabouts for cycling in mixed traffic conditions for where traffic volumes and speeds are (or will be made) low, and the lane widths are narrow so that with other traffic cyclists can safely share the single lane entries, exits and the circulatory carriageway in primary position.

Conventional Roundabouts

6.1 A conventional (normal) roundabout has a one-way circulatory carriageway around a kerbed central island 4m or more in diameter and usually with flared approaches to allow multiple vehicle entry.

6.2 Conventional roundabouts are not generally appropriate for use in residential areas, because:

- Their capacity advantages are not usually relevant
- They have a negative impact on vulnerable road users as they encourage high vehicle throughputs and therefore speed
- They often do little for the street scene as they require large land take.

6.3 They may be suitable for the following P&M categories:

P1/M3	P1/M2	P2/M3
e.g Motorway, Major A-Road	e.g Inter-urban Road	e.g Main Connector

Mini Roundabouts

7.1 In Hertfordshire mini roundabouts have been used for extensively for traffic calming. These were largely installed before published standards were available.

7.2 Mini-roundabouts shall not be used for new accesses or junctions. When existing roads are being redesigned, opportunities to consider whether an existing mini-roundabout is appropriate or should be removed should be taken.

Compact or Continental Roundabouts

8.1 The use of Compact Roundabouts or Continental roundabouts which are described in the Department for Transport's Traffic Advisory leaflet TAL 9/97, 7.3.16 in MfS and in LTN 1/20, will be supported by Hertfordshire County Council, subject to Road Safety Audit.

8.2 They sit between conventional roundabouts and mini roundabouts in terms of size. They have single lane entries and exits on each arm and their geometry is effective in reducing entry, circulatory and exit speeds.

8.3 They retain a conventional kerbed central island, but differ in other respects:

- There is minimal flare at entry and exit
- They have a single-lane circulatory carriageway
- The circulatory carriageway has negative camber, so water drains away from the centre, which simplifies drainage arrangements
- The central island may need an overrun strip around it where the island is relatively small in diameter.

8.4 Parallel crossings are required where protected cycle facilities intersect with a compact roundabout.

8.5 Compact or continental roundabouts will be considered for P&M Category P2/M2.

P2/M2
e.g
Multi Function
Distributor Road

Dutch Style Roundabouts

9.1 A Dutch-style roundabout has parallel crossings on each arm which enables pedestrians and cyclists to have priority over motorists.

9.2 Currently UK design standards do not cover Dutch style roundabouts and while there is a UK example in Cambridge and a trial at the Transport Research Laboratory (TRL RPN751) this is still an area for development.

9.3 The benefit of a Dutch style design vs standard UK design is that cyclists are separated from general traffic into a circular cycle track that has parallel crossings providing priority over the roundabout entries and exits.

9.4 HCC is developing its first Dutch style roundabout in Hemel Hempstead, It will need to pass through post evaluation before it is included in this guide.

9.5 In the interim Scheme Promoters wishing to propose such a design will need to go through the Departure from Standards Process (outlined in Part 1, Chapter 8)

Figure 3
Concept for Breakspear Way Roundabout, Hemel Hempstead

Traffic Signal Junctions

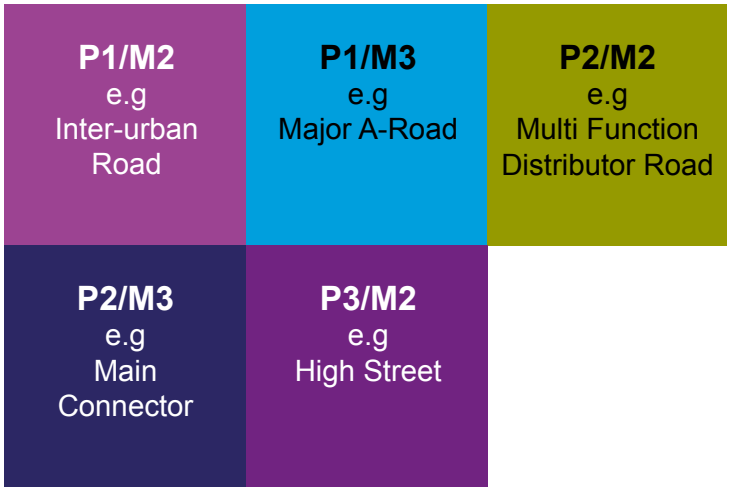
10.1 The addition of signals to an existing junction should be considered, in order to provide controlled crossing points for pedestrians and/or cycles (where cycle facilities are off carriageway); provide bus priority and only then to resolve movement issues for existing vehicles.

10.2 Policy 13 of LTP4 sets out that junction capacity can be provided to service planned development, but it must not be provided beyond this to avoid inducing traffic demand.

10.3 Traditionally, the primary reason to signalise a junction was to increase traffic capacity and mitigate dominant movements in a controlled manner and, on occasions pedestrian crossing facilities were omitted in preference to increase vehicular throughput.

10.4 The adoption of LTP4 Policy 1 and the obligations under Section 149 of the Equality Act 2010 has the effect of reversing the priorities afforded under that previous approach.

10.5 Signal Junctions may be appropriate for the following P&M Categories:



10.6 The safety, comfort, directness and coherence of cycle routes can be improved through remodelling or introducing signal control at junctions, particularly where signal timings can be changed to reallocate time from motor traffic to generate time savings for cyclists.

10.7 Scheme promoters should use the Junction Assessment Tool (JAT) in LTN 1/20 to identify and assess the issues to address at signalised junctions to facilitate all cycle movements and make them safe, direct and convenient. The junction must be designed so that no cycle movements are colour coded red.

10.8 New traffic signal junctions shall provide controlled facilities for pedestrians where they are able to link to existing or proposed footways. The controlled facilities shall be provided across all arms to minimise walking distance for users.

10.9 New traffic signal junctions should provide facilities for cyclists. Under LTP4 Policy 1 footway users and cyclists should take precedence over motor traffic (see para 1.2 above). Providing control for cyclists is complex and can be spatially challenging. The JAT shall be used to evaluate the proposals.

10.10 Types of cycle facilities at traffic signals, generally in descending order of protection for cyclists, include:

- Cycle bypasses;
- Separate cycle phases;
- Cycle and pedestrian-only stage;
- Hold the left;
- Two stage right turns;
- Cycle gate;
- Early release; and
- Advanced stop lines.

10.11 Advanced Stop Lines (ASLs) have been used traditionally to enable cyclists to take up a position in a waiting area between the two stop lines, for their intended manoeuvre ahead of general traffic, before the signals change to green. Their use is now been discouraged except in specific circumstances, because:

- They are unlikely to be adequate by themselves to encourage most people to cycle through major junctions.
- Other measures are available and should be used to protect people cycling through signalised junctions.
- ASLs do not remove conflict with motor vehicles.
- They only benefit people cycling on a signal approach when the signals are on red.
- They have little value on approaches that are free flowing for much of the cycle and/or have multiple lanes.

10.12 Guidance on the design of ASLs for use at quieter signalised junctions is given in LTN 2/08 Cycle Infrastructure Design.

10.13 The CYCLOPS traffic signal junction developed by Transport for Greater Manchester has separate facilities for cyclists and pedestrians linking to protected cycle facilities.

10.14 HCC supports the concepts as it meets the principles of LTP4 and will include the design in future revisions of this guidance once in situ evaluation has been undertaken of the concept in Hertfordshire.

Figure 4
CYCLOPS junction typical layout

10.15 The geometric design of signalled junctions shall provide for safe maintenance including adequate widths of splitter islands that enable safe access and areas of hardstanding for the parking of maintenance vehicles.

10.16 Traffic signal control mechanisms and detailed design requirements are set out in Part 4, Chapter 18: Traffic Signals.

10.17 All traffic signal poles shall be positioned to ensure there is a minimum footway width as required by Part 3, Chapter 3: Planning Walking Infrastructure and all equipment has minimum clearances to the carriageway as set out in Part 3, Chapter 8: Planning Highway Links. Clearances and layouts on cycle tracks should be as Part 4, Chapter 3: Planning Cycling Infrastructure.

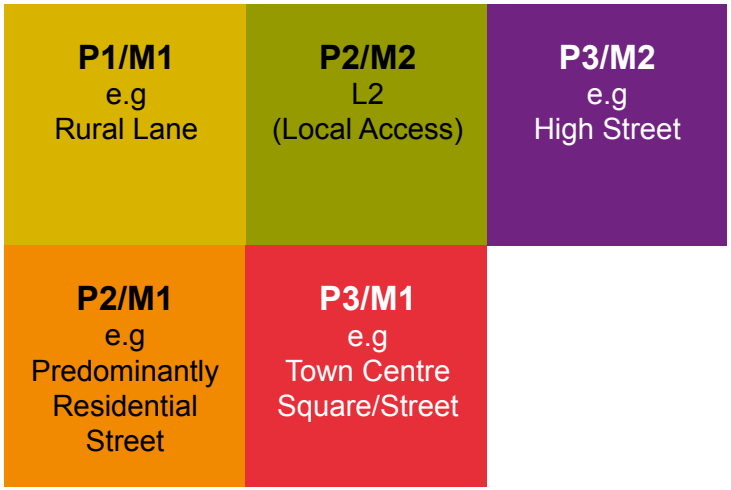
Junction Radii and Tracking

11.1 The appropriate design vehicle shall be tracked for all junctions.

11.2 The dimensions and layout of a junction shall cater for the swept path of all vehicles likely to be encountered, which will include those used for emergency services and refuse collection.

11.3 Freight Transport Association (FTA) vehicles (2016) shall be tracked for the following P&M categories. These will be the FTA Design Articulated vehicle (2016) and the FTA Design Rigid vehicle (2016).

11.4 The following P&M categories shall use the 11m refuse vehicle as the standard design vehicle to be used, which is more onerous than the FTA Design Rigid vehicle.



11.5 This vehicle must be able to pass a car (without one or the other bumping up on the footway or verge) so in general the minimum carriageway width will be 5.5m.

11.6 Developers and designers shall submit designs and track using design software such as Vehicle Tracking by Autodesk. Scheme Promoters shall use up to date vehicles in the traffic

assessments and shall not use vehicles prefixed DB32. As cars are increasing in size on average, HCC no longer accepts the tracking paths of a 'Medium Sized Car' (Volvo 440) from AutoTRACK's 'European pre-2006 Library' and considers that an 'Estate Car' (Volvo V70) from the 'European post-2006 Library' is now appropriate.

11.7 Residential developments shall be tracked using the principles in Manual for Streets however designers are expected to smooth out kerb lines so as not to create kinks or bulges in the final kerb alignment.

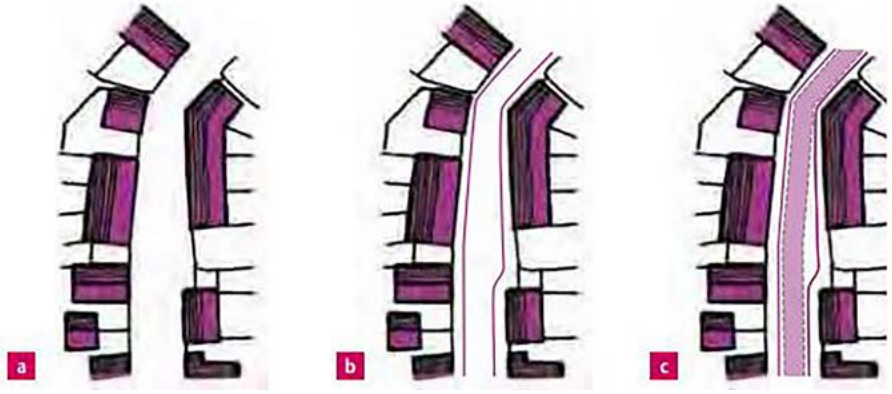
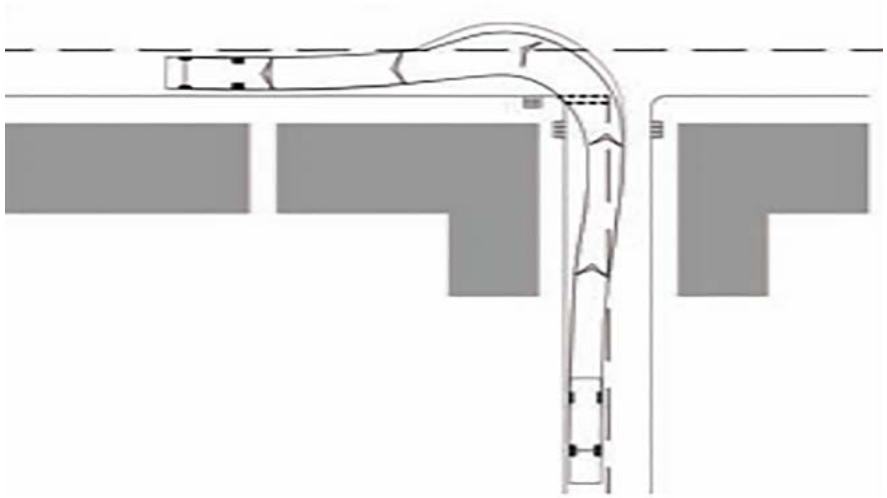


Figure 5
Building placement and tracking for movement showing: (a) the buildings and urban edge of a street help to form the place; (b) the kerb line can be used to reinforce this; and (c) the remaining carriageway space is tracked for movement and for the provision of places where people may park their vehicles. (MfS 2007)

11.8 In all cases the design vehicle shall not run over or collide with any central island kerbing.

11.9 Large radii (6m or more) at junctions make it easy for large vehicles to turn into side- roads but are problematic for pedestrians to cross and increase the risk of cyclists being hit from the side as they pass because they encourage high vehicle turning speeds.

11.10 Manual for Streets 2 (9.4.1.1) shows how to accommodate larger vehicles at junctions with tighter radii. This can be achieved by locally widening the junction rather than providing a large radius.



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

Figure 6
Extract from MfS2. Accommodating large vehicles with tight radii

11.11 A tighter radius is more in tune with HCC's policy aims as it favours footway users by shortening the distance they have to cross and reduces vehicle turning speed.

11.12 A standard radius of 4m shall be used for the following P&M categories:

P2/M1 e.g Predominantly Residential Street	**P3/M1** e.g Town Centre Square/Street

11.13 This provides an ample balance between reduced crossing points and large swept paths required by refuse vehicles.

11.14 This assumes that that the large vehicle would swing out beyond the centre line as shown above.

11.15 Where radii are 6m and below the pedestrian crossing point should be provided at the pedestrian desire line and be classed as an inline crossing.

11.16 Where large kerb radii (6m or more) are required the pedestrian crossing point should be set back into the side road to keep the crossing distance short.

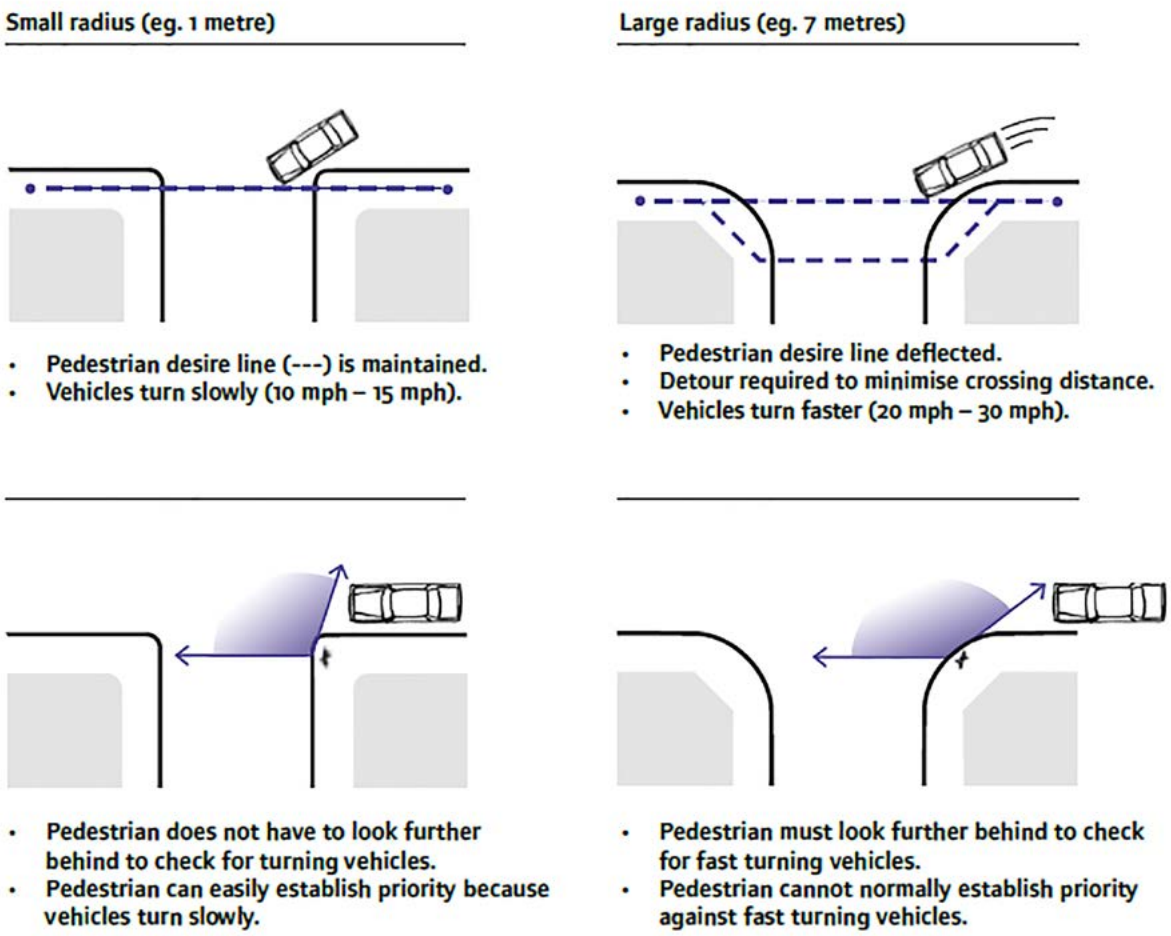


Figure 7
The effects of different corner radii on pedestrians (MfS 2007)

Junction Visibility

12.1 The visibility requirements for roundabouts are laid down in DMRB CD116 - Geometric design of roundabouts.

12.2 The visibility requirements for major/minor priority junctions are laid out in MfS and DMRB CD109 - Highway link design and CD123 - Geometric design of at-grade priority and signal-controlled junctions.

12.3 The visibility splay is measured from a distance X on the minor road for a distance Y along the major road. The distance X is measured back from the edge of the major road along the centre line of the minor road. The distance Y is measured from the centre line of the minor road along the nearside kerb line of the major road. This is summarised below.

P&M classification	Major Road [Road Hierarchy]	Major Road Speed Limit	X	Y (excluding bonnet allowance)	Y (including bonnet allowance) P2/M2
P2/M2	Secondary Distributor	40mph	4.5m	N/A	120m
P2/M2	Local Distributor	30mph	4.5m	43m	43m
P2/M1	Major Access Road	20mph	2.4m	31m	33m
P2/M1	Minor Access Road	20mph	2.4m	31m	33m
P2/M1	Shared Surface Road	20mph (10mph)	2.4m	9m	11m
P2/M2	Industrial Estate Road	30mph	4.5m	51m	51m [2]

Table Notes

The P2/M1 road should be designed for 10mph but signed as 20mph (the minimum UK limit)

The Y distances for industrial estate roads have been lengthened for significant HGV use following calculations in MfS2.

12.4 The X distances given above are for 'give way' junctions. They may be reduced at junctions with stop lines, with the agreement of HCC. This might be appropriate for situations on existing roads where the visibility is constrained by existing features.

12.5 The visibility requirements outlined above also apply to private drives, but the X distance can be reduced to 2.4m from the edge of the footway or carriageway.

12.6 Visibility splays for cycle tracks may exceed those for roads designed to MfS. Two-way cycle tracks have inter-visibility issues as highlighted in the following figure and should be considered and risks reduced as part of the design process.

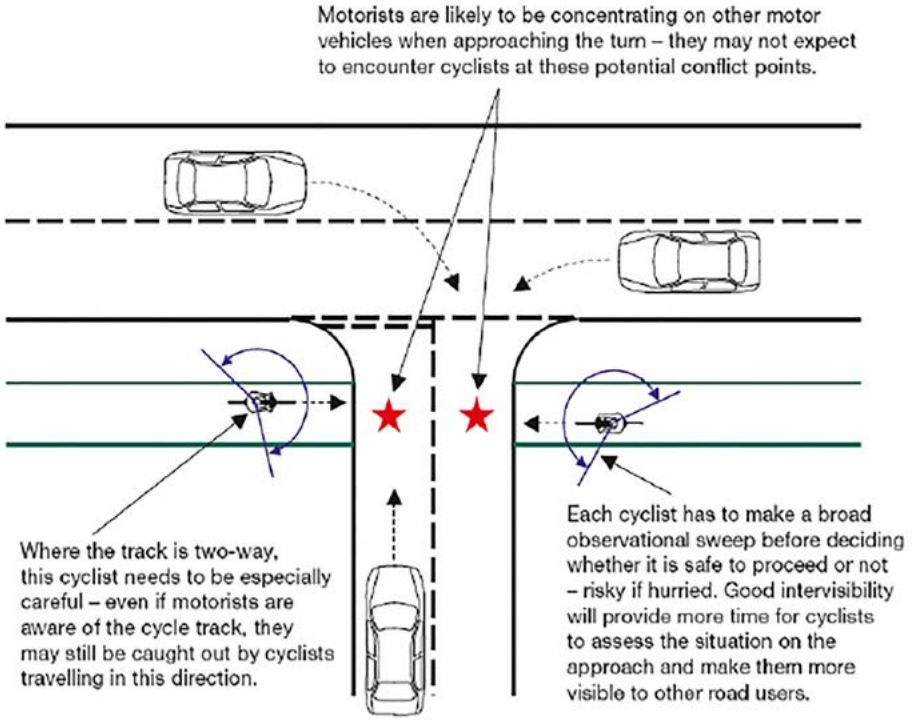


Figure 8
Intervisibility issues for 2-way cycle tracks at road junctions
(Source: Superseded Local Transport Note 1/12 Shared use routes for pedestrians and cyclists)

Junction Spacing

13.1 The minimum spacings (in metres) between opposite and adjacent junctions for the P&M categories are as follows:

P1/M2	Opp: 40	Adj: 66
P1/M3	Opp: To CD123	Adj: To CD123
P2/M1	Opp: 20	Adj: 33
P2/M2 Industrial	Opp: 30	Adj: 50
P2/M2 Main & Secondary	Opp: To CD123	Adj: To CD123
P2/M2 L1	Opp: 30	Adj: 43
P2/M2 L2	Opp: 20	Adj: 44
P2/M2	Opp: 40	Adj: 66
P3/M2	Opp: 20	Adj: 33

Cycle crossings

14.1 Cycle crossings are mid-link standalone facilities to enable cyclists to cross a carriageway that would otherwise form a hazardous or impenetrable barrier within the cycle route network.

14.2 Cyclists crossing carriageways, for example where an off-highway route crosses the road, must give way to motor traffic unless a controlled crossing is provided.

14.3 Cyclists should be able to cross a two-way carriageway via an uncontrolled crossing in lightly trafficked conditions, but at higher speeds and traffic volumes uncontrolled crossings are unlikely to meet the needs of all users.

14.4 The following table from LTN 1/20 gives an indication of the suitability of each type of crossing, depending on the speed and volume of traffic and the number of lanes to be crossed in one movement.

LTN 1/20 Table 10-2: crossing design suitability

Speed Limit	Total traffic flow to be crossed (pcu)	Maximum number of lanes to be crossed in one movement	Un-controlled	Cycle Priority	Parallel	Signal	Grade separated
≥ 60mph		Any	R	R	R	R	G
40mph and 50mph	> 10000	Any	R	R	R	G	G
	6000 to 10000	2 or more	R	R	R	G	G
	0-6000	2	R	R	R	G	G
	0-10000	1	A	R	R	G	G
≤ 30mph	> 8000	> 2	R	R	R	G	G
	> 8000	2	R	R	A	G	G
	4000-8000	2	A	A	G	G	G
	0-4000	2	A	G	G	G	G
	0-4000	1	G	G	G	G	G

G	Provision suitable for most people
A	Provision not suitable for all people and will exclude some potential users and/or have safety concerns
R	Provision suitable for few people and will exclude most potential users and/or have safety concerns

Notes:

1. If the actual 85th percentile speed is more than 10% above the speed limit the next highest speed limit should be applied.
2. The recommended provision assumes that the peak hour motor traffic flow is no more than 10% of the 24 hour flow.

Figure 9
Cycle crossing design suitability (LTN 1/20)

14.5 Individual locations should be assessed on a case-by-case basis. In some situations, reducing the speed of motor traffic using the carriageway will enable additional options for the crossing design to be considered.

14.6 Crossing facilities should allow cyclists to approach the crossing at right angles to the carriageway or aligned with the crossing where it is not square to the kerb.

14.7 Where a cycle route runs parallel to the carriageway a 'jug-handle' turn (see LTN 1/20 Section 9.3) should be used where possible to ensure that cyclists can cross at right angles to the carriageway. Any facility provided needs to have a radius that allows the Cycle Design Vehicle to turn safely.

14.8 Overly small radii can lead to cyclists losing control or slipping.

14.9 The following figure shows the preferred layout for a cycle crossing.

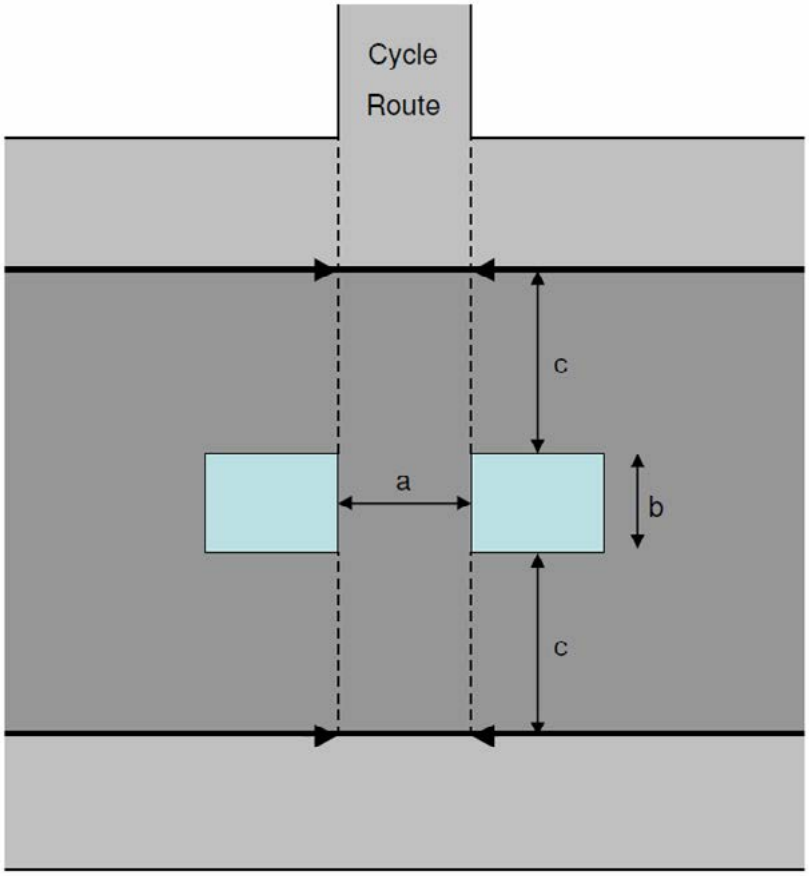


Figure 10
Cycle crossing preferred layout

14.10 Dimension '**a**' should match the effective width of the cycle lane or track, including any widening for the island kerb height. Noting that the cycle design vehicle is 2.8m long, for dimension '**b**', the Recommended/Acceptable Limit is 3m. On strategic cycle routes wider islands (providing '**b**' of 4m) may be needed to cater for larger cycles and those with trailers.

14.11 The traffic lane widths (dimension '**c**') shall be wide enough to allow vehicles to safely overtake cyclists or narrow enough to discourage overtaking. Therefore dimension '**c**' should be less than 3.2m or greater than 3.9m, but not between the two.

14.12 Staggered traffic islands should not be used on cycle routes. However, if this type of facility is required for pedestrians as part of a shared cycle/pedestrian facility then the minimum distance between the barriers or guardrail should be 4m and the layout should ensure that it can be used by the cycle design vehicle.

Figure 11
Staggered traffic island without guardrails.
Source: National Archives, CABE David Cowlard

14.13 Pedestrian guardrail should only be used on staggered traffic islands in high risk locations (i.e. high vehicle speeds or volume).

14.14 Consideration should be given to using kerbing to define a staggered crossing where guardrail is not needed as shown below.

14.15 Note the width would need to be increased for cyclists and tactile paving denoting a signal controlled crossing should be of an acceptable contrasting colour. Less contrast is allowable in Conservation Areas.

Pedestrian Crossing Points

15.1 Pedestrian crossing points should be provided at junctions, adjacent to bus stops, near to amenities such as at post boxes, shops, schools and any other location where pedestrians are likely to cross the road.

15.2 Scheme Promoters shall be mindful of LTP4 Policy One: User Hierarchy and there shall be a presumption to provide pedestrian facilities as standard at signal controlled junctions. Liaison with HCC will be required to assess the need and any impact on capacity. Guidance is given in Traffic Signs Manual (TSM) Chapter 6 and CD123 - Geometric design of at-grade priority and signal-controlled junctions.

15.3 The recommended frequency of crossing points in urban areas is maximum every 100 metres.

15.4 In certain circumstances, such as where the carriageway is wide or traffic volumes are high, there may be a need to provide refuge islands at crossing points.

Figure 12
Uncontrolled pedestrian crossing point

15.5 For planning purposes, the carriageway width should be suitable to accommodate a recommended width for a refuge island of 2m (1.5m acceptable width), whilst traffic lane widths between 3.2m and 3.9m should be avoided such that the lane is either wide enough to allow vehicles to safely overtake cyclists or narrow enough to discourage overtaking.

15.6 The full dimensions for the design of crossings are detailed in Part 4, Chapter 2: Designing for Walking.

15.7 Less able-bodied users will have difficulty crossing urban roads with flows greater than 300-360 vehicles per hour when speeds are 30mph or below, without any form of traffic control. Most pedestrians will have difficulty crossing a two-lane carriageway when traffic exceeds 900 vehicles per hour.

Figure 13
Crossing at junction of Station Road, Station Place and Leys Avenue in Letchworth Conservation Area

15.8 For existing highways, Scheme Promoters should assess current numbers and types of usage and make an assessment of any suppressed demand.

15.9 Higher speeds will make it harder to cross and increase the likelihood that measures will be required.

15.10 Guidance on providing controlled crossings is given in Traffic Signs Manual Chapter 6 Traffic Control.

15.11 At roundabouts the proximity of controlled crossings is governed by CD116. Signal controlled crossings should be situated at 20m from the exit or greater than 60m. Zebra crossings may be placed between 5 and 20m from the exit.

15.12 Further guidance on this standard is provided in CD116 - Geometric design of Roundabouts. Note CD116 has specific requirements regarding the provision of pedestrian facilities at roundabouts where there is demand or a desire line and these are now mandatory requirements.

Uncontrolled Pedestrian Crossings

16.1 The geometric and street scape design should enable the safe, uncontrolled crossing of the carriageway by pedestrians in the following P&M Categories:

P2/M1 e.g Predominantly Residential Street	**P3/M1** e.g Town Centre Square/Street

16.2 In kerbed areas the kerbs should be dropped at key desire lines to provide access for all, particularly the partially sighted and those with wheelchairs and prams.

16.3 On longer side roads and residential roads, safe and convenient dropped kerbs should be provided at least every 100 metres, where possible, to avoid the need for pedestrians, particularly wheelchair users, to make lengthy detours to cross the road, giving due consideration to pedestrian desire lines. This is encouraged in Para.4.11 of the DfT's Inclusive Mobility Guide.

Zebra Crossings

17.1 Zebra crossings are easily recognisable by the black and white stripes on the road and flashing amber beacons on either side of the road.

17.2 The crossings are less visually intrusive than Puffin, Toucan and Sparrow crossings and users do not need to wait for traffic signals to change.

17.3 The crossings can be located closer to junctions than signalled crossings and can be installed on a road hump.

17.4 They will include a parking ban on zigzag lines on approach to the crossing.

17.5 It should also be noted that they are not easily used by partially sighted and blind users and are for pedestrian use only.

17.6 They should not be introduced on roads with an 85th percentile speed of 35mph or above and as such their use is limited to the following P&M Categories:

P2/M2 e.g L1 (Local Distributor), & L2 (Local Access)	**P3/M2** e.g High Street

17.7 Zebra crossings should not be required in new-build P2/M1 streets, but in limited situations they may be needed as a retro-fitted feature on existing streets, where the geometric design and street environment is not conducive to safe, uncontrolled crossing.

Parallel Cycle and Zebra Crossings

18.1 Parallel Cycle and Zebra crossings are very effective in providing priority to pedestrians and cyclists, allowing cyclists to cross legally, within the controlled area of the crossing.

18.2 Parallel crossings may be considered for the following P&M categories:

P2/M2 e.g L1 (Local Distributor), & L2 (Local Access)	**P3/M2** e.g High Street

18.3 Further guidance can be found in LTN 1/20 Section 10.4.

Puffin Crossings

19.1 Puffin Crossings are traffic signal controlled crossings for pedestrians.

19.2 They are generally suitable where there is a high level pedestrians wanting to cross a busy road as they provide clear signals to drivers and pedestrians and they are an effective means of encouraging walking where the road otherwise acts as a barrier to reaching local services by foot.

19.3 Puffin Crossings may be considered for the following P&M categories:

P1/M2 e.g Inter-urban Road	**P1/M3** e.g Major A-Road
P2/M2 e.g Multi Function Distributor Road	**P2/M3** e.g Main Connector

Toucan Crossings

20.1 Toucan Crossings are signal-controlled crossings shared between pedestrians and cyclists with no separation between the two types of user.

20.2 A Toucan Crossing should only be used where options which do not involve sharing space between pedestrians and cyclists (such as a parallel or signalised parallel crossing) have been thoroughly examined and found to be undeliverable in a specific location.

20.3 A Toucan crossing is suitable for connecting Shared unsegregated areas on either side of a busy road at a location where pedestrians and cyclists wish to cross.

20.4 Further guidance on Toucan Crossings can be found in LTN 1/20 Section 10.4.

20.5 Toucan Crossings may be considered for the following P&M categories:

P1/M2 e.g Inter-urban Road	**P1/M3** e.g Major A-Road
P2/M2 e.g Multi Function Distributor Road	**P2/M3** e.g Main Connector

20.6 In some circumstances HCC will consider the use of a wide single-stage Toucan crossing as an alternative to providing two-stage crossing. Guidance is provided by Sustrans.

20.7 The width requirements for Toucan Crossings are as follows:

Minimum Width	
Recommended	4m
Acceptable limits*	3.2m
Absolute limits	3m

The 3.2m acceptable limit avoids the need to cut a slab (when using 400mm wide tactile slabs)

Sparrow Crossings

21.1 Sparrow Crossings are signal controlled parallel crossings for use by pedestrians and cyclists

Sparrow crossing showing parallel crossing routes

21.2 They are generally suitable where there is a high level of both pedestrian and cyclists. A sparrow crossing avoids the need for shared space between pedestrians and cyclists.

21.3 Sparrow crossings may be considered for the following categories of road:

P1/M2 e.g Inter-urban Road	**P1/M3** e.g Major A-Road
P2/M2 e.g Multi Function Distributor Road	**P2/M3** e.g Main Connector

Pegasus Equestrian Crossings

22.1 Pegasus crossings are signal controlled parallel crossings used by cyclists and equestrians. Pegasus crossings are designed for horses and riders. They are not suitable for horse-drawn vehicles.

Fenced corral and Pegasus crossing waiting areas

22.2 Pegasus crossings are generally suitable where a bridleway crosses a major route where volumes and/or speed would make an uncontrolled crossing inappropriate.

22.3 Pegasus crossings may be considered for the following categories of road:

P1/M2 e.g Inter-urban Road	**P1/M3** e.g Major A-Road
P2/M2 e.g Multi Function Distributor Road	**P2/M3** e.g Main Connector

22.4 Further guidance on equestrian crossings can be found in Part 22 of the Traffic Signs Manual - Chapter 6. Designers are also encouraged to read the British Horse Society's Advice on Road Crossings for Equestrians in England and Wales.

Local Widening at Junctions

23.1 When introducing a new junction or improving an existing junction that requires local widening of the existing carriageway, the crossfall should be extended to the new kerb line and the drainage assets, such as gullies, should be relocated.

23.2 Widening a carriageway such that the new section falls towards the old channel position, with gullies remaining in their existing position meaning that the water runs down the middle of the new running lane creates a poor alignment and poor drainage, which is detrimental to cyclists.

Chapter 10
Planning Landscape

Contents

Introduction

1.1 Landscape is important to providing a sense of place and local character. A well-designed landscape that reinforces local character and provides interest will help to encourage walking and cycling, whilst protecting and potentially enhancing local wildlife habitats. Therefore, the landscape within and adjacent to the highway is of key interest to the county council in its role as highway and transport authority achieving LTP4 modal targets, whilst also maintaining its highway assets.

1.2 For the purpose of this guidance hard landscape includes paved areas and street furniture, albeit more detailed guidance on signposts and lamp columns are contained in Part 3, Chapters 17 & 18.

1.3 This chapter provides guidance on:

- How the outline 'Ecology & Landscape Strategy' and 'Local Character & Heritage Plan' initiated at the Site Validation stage, can be translated into landscape proposals suitable for inclusion within the emerging planning application (or the general arrangement for permitted development schemes)
- The preparation of a draft long-term 'Ecology & Landscape' section for inclusion in the 'Whole Life Management Plan' that sets out the proposed responsibilities for maintaining the landscape and habitats for agreement in principle.

1.4 Hard and soft landscape is encouraged as a key element in maintaining and/or improving local character. This may reflect historic features of ecolog-ical value, such as trees, banks, hedges, verges, built structures, etc. which if they cannot be retained, should be compensated or mitigated for.

1.5 The National Planning Policy Framework (NPPF) requires that planning policies and decisions should ensure that new streets are tree-lined unless, in specific cases, there are clear, justifiable and compelling reasons why this would be inappropriate.

1.6 The vision for landscape at the Master Planning stage should have been based on the appreciation of the existing landscape and on the evaluation of site constraints and risks for the blue and green infrastructure, as captured in the outline Ecology & Landscape Strategy. The Ecology & Landscape Strat-egy can encompass the Green Infrastructure Plan Green as required by the Infrastructure Strategy Standard.

1.7 The vision for landscape, which should respond to the existing topography, green, blue and built landscape assets. The vision should also indicate how it is intended that smaller supporting elements such as gardens, driveways, paths, fences, gates, verges, open space, paving materials, street furniture, trees and shrubs will combine to deliver the desired outcomes of sustainable travel and benefits to physical and mental health.

1.8 In considering the relationship between the trafficked highway, local landscape, the public and built realm, master planning should have also created a proposed environment in which vehicle speeds will be managed naturally within the resulting development or scheme and, in doing so, the need for supplementary traffic calming features in new highways will have been avoided.

1.9 The vision should have included any specific requirements when working within the Chilterns Area of Outstanding Natural Beauty or affecting 'Heritage Verges' as discussed in Part 2, Chapter 4.

1.10 Most of the critical success factors for a healthy street can be directly related to soft and hard landscape, viz.

- People choose to walk or cycle
- Shade & shelter
- Places to stop and rest
- People feel safe
- Things to see and do
- People feel relaxed
- Everyone feels welcome

1.11 HCC is committing to establishing at least 10km of new hedgerows and 10 Ha of linear woodlands on the county council's existing highway estate and establishing at least 100 new trees on the county council's highway estate in each urban borough or district ward which has a tree canopy cover of below 15% (of the total ward area). Trees improve our air through removing pollutants, protect watercourses, reduce the urban heat island effect, save energy, improve physical and mental wellbeing, and provide biodiversity and habitat. The climate crisis will have a significant negative impact on Hertfordshire's green infrastructure through increased heat, drought, and introduction of new tree pests and diseases.

1.12 A tree canopy cover of minimum 20% at maturity shall be planned for all new highways in urban areas unless this scale of tree canopy cover is ecologically inappropriate.

LTP4 Compliance

2.1 The Landscape Strategy shall be LTP4 Compliance tested at the outline planning application stage, if applicable and at the full planning application stage. More detail on LTP4 Compliance testing is given in Part 1, Chapter 4.

Ecology & Landscape Strategy
LTP4 Compliance Test: Outline Planning Application

The location of proposals encourage movement by active travel modes and reduced travel demand.

The outline 'Ecology & Landscape Strategy' and 'Local Character & Heritage Plan' set a vision for the landscape responding to the existing topography, green, blue and built landscape assets and indicating conceptually how gardens, driveways, paths, fences, gates, verges, open space, SuDS features, paving materials, street furniture, trees and shrubs will combine to help achieve the desired outcomes of sustainable travel and benefits to physical and mental health.

Ecology & Landscape Strategy
LTP4 Compliance Test: Full Planning Application

The landscape proposals set out in the 'Ecology & Landscape Strategy,' the 'Local Character & Heritage Plan' and the submitted plans set out to conserve and enhance the functionality and sense of place, to improve and create enhanced connectivity for all users and habitats, ensuring the inter-relationships between related sustainability themes are addressed and promoted.

The design of proposals reflect the LTP Transport User Hierarchy and encourage movement by active travel modes and reduced travel demand.

In accordance with the Hertfordshire Pollinator Strategy, the proposals demonstrably contribute to the target of a 20% increase in green and blue habitats and spaces, across Hertfordshire, by 2030

The proposals preserve and enhance the understanding and enjoyment of both the tangible and intangible aspects of Hertfordshire's heritage and archaeology

General Requirements

3.1 The Scheme Promoter should consult with HCC and the relevant Local Planning Authority (LPA) - the district and borough councils within Hertfordshire - at an early stage to discuss details of their landscape proposals where they will affect the adoptable highway.

3.2 In particular, Scheme Promoters should engage with the relevant LPAs and HCC regarding large scale tree planting and other established biodiversity schemes, to identify opportunities to integrate habitat and wildlife corridors across the county and thereby encourage biodiversity net gain.

3.3 Hard and Soft Landscape proposals, that form part of the adoptable highway or that may affect it should be clearly identified within the 'Ecology & Landscape Strategy and Plan' as they will require the approval of HCC.

3.4 The 'Local Character & Heritage Plan' (LCHP) should be developed to set out the proposed measures to minimise risk and maximise opportunities in the proposals, demonstrating how collaboration with historic environment specia-lists has contributed to the preferred solution.

3.5 The LCHP should establish the need for and timing of any site-based inves-tigation, whether this is required pre-planning or pre-construction, and demonstrate that sufficient time has been incorporated into the planning pro-gramme.

3.6 Blue infrastructure should be included within the overall landscape design including spatial provision to accommodate flash flooding from cloudbursts, whilst noting HCC will only adopt the highway drainage systems that only manage surface water that falls onto the adoptable area.

3.7 Regular resting places for active travel modes should be well integrated throughout the landscaping plans, with generous space for meeting and gathering at key locations with adequate shading.

3.8 Adequate space for cycle parking provision to promote active travel choices should be integrated into the landscape plans to work in coordination with local cycle accessibility and provision.

3.9 Landscape can be used to constrain vehicle speeds, but care shall be taken not to restrict visibility to below the agreed minimum standards set out in Part 3, Chapter 9: Planning Highway Junctions.

3.10 Whilst the importance that soft and hard landscape contributes to encouraging active travel should not be underestimated, proposals need to adhere to the needs to minimise lifecycle costs in accordance with Part 2, Chapter 6: Maintenance & Operation and a feasible strategy for long-term stewardship needs to be identified.

Soft Landscape Requirements

4.1 Scheme Promoters shall use an appropriate mix of native and non-native species that are:

- Aimed at achieving Biodiversity Net Gain (BNG)
- Resilient to future climate change
- Covered by a biosecurity scheme as set out in part 3 of the section Guiding principles for Hertfordshire's treescape resilience in the HCC Tree and Woodland Strategy
- Are low maintenance
- Create a mix providing year-round visual interest

4.2 Scheme Promoters shall calculate the (baseline) value of biodiversity within the proposed planning red line boundary, using Defra's Biodiversity Metric and use the landscape proposals to forecast the expected biodiversity value of the final scheme, including any off-site planting planned as part of offsetting.

4.3 The green infrastructure network should be laid out to make best use of topography, existing trees, water and vegetation. Care needs to be taken to preserve and protect existing trees, particularly when changes to a street are planned.

Trees with protected status e.g. a Tree Preservation Order (TPO) or situated within a Conservation Area (CA), and/or have historical, scientific, wildlife or designated arboricultural significance i.e. ancient or veteran trees, will need to be considered as part of this.

4.4 When designing for tree planting it is essential that the location is appropri-ate as trees are not readily moved once established. Additionally, planting trees in unsustainable locations can result in them having drastically shorter lifespans, which can increase rather than reduce atmospheric carbon and pollution.

4.5 Planting in soft verges is usually easier than in paved areas as excavation and reinstatement can be more straightforward. This is the preferred option for planting locations. Nevertheless there are many benefits to planting trees within paved areas and this should not be totally excluded It should be not-ed that underground utilities can prevent the planting of trees in what other-wise appear to be good locations. For the safety of those planting trees, and to reduce the risk of tree damage in the future, utility searches should be car-ried out when planning tree and shrub planting.

4.6 Planting design should take account of longer-term maintenance, manage-ment, nature of the road corridor that this is intended for, including opera-tional as well as safety requirements with:

- Shrubs used in edge planting not to be planted within 0.5m from the edge of the carriageway
- Medium size trees (tree girth less than 450mm) and pollards (such as Platanus, Tilia etc.) no closer than 1m
- Larger, un-pollarded trees (tree girth greater than 600mm) not within 2m unless otherwise agreed by HCC

4.7 The provision of tree cover is a key component in ensuring the provision of shade and shelter, but care needs to be taken to avoid obstruction to street lighting, signage and to the passage of highway users.

4.8 Landscape design should be considered in conjunction with lighting design to ensure that they complement each other, rather than conflict. Vegetation, in particular, should be selected and sited so as not to impair the lighting ef-fectiveness when it reaches maturity.

4.9 The minimum clearance to tree branches that overhang any pedestrian or cycle facility shall be 2.4m. Therefore, where possible trees should be crown lifted to 3m to minimise the need for excessive routine maintenance due to re-growth of branches, or any sag from the weight of the foliage.

4.10 The clearance distance to tree branches that overhang the trafficked carriageway shall 5.6m minimum, with the crown lifted to 6m

4.11 Hedges planted on private property should be at least 500mm clear of the highway boundary.

4.12 Climbing shrubs should not be used within the highway or adjacent to high-way structures unless agreed by HCC as they can develop very quickly and potentially restrict visibility.

4.13 SuDS features shall have slopes no steeper than 1 in 3 to ensure they are self-supporting under most geological and weather eventualities

4.14 Trees and shrubs shall not be planted within highway SuDS features that have slopes steeper than 1 in 5 in order to enable safe maintenance.

4.15 Rain gardens will be considered where a satisfactory maintenance regime is planned.

4.16 A berm, or grass filter strip of 1m minimum width is required between any hardscape and the slope of a SuDS feature. The width of the strip and type of planting will need to be based on consideration of:

- Safety of all highway users
- Ground conditions and the need to keep sub-grades to paved areas free of saturation
- The location of proposed street furniture
- Provision for the accommodation of buried utilities
- Safe and practical access for maintenance operations

Alternatively, in urban areas where the SuDS feature is planted throughout, minimum 1m width of planting between areas of hardscape.

4.17 Improving a highway within the confines of the existing highway boundary presents a greater challenge than planning for new highways and, therefore, departures from standards may be a more common requirement.

4.18 Whilst the geometric design proposals for highway improvements need to reflect the allocated Place & Movement category and the LTP4 user hierarchy, providing for their overall spatial requirements should not be made at the unacceptable expense of landscape.

4.19 For example, it is unlikely to be acceptable in environmental terms, to make spatial provision for all modes to the acceptable limits defined within the Design Menu Cards (in Part 3, Chapter 1) if that dictates that valuable landscape, biodiversity or sustainable flood management facility will be lost without opportunity for compensation. These factors, which are important in their own right, also contribute to the sense of place and encourage active travel.

Hard Landscape Requirements

5.1 Hard landscape is a key component within the public realm as discussed in Part 3, Chapter 2: Planning for Public Realm and in particular, it should be noted that:

- Blind and partially sighted people will be particularly affected by obstructions, inappropriate surfaces and poor differentiation of surface types.
- Consideration of integrating Counter Terrorism measures into landscaping design should be given.
- The safety of public spaces, ensuring passive surveillance, illumination where appropriate and overlooking should be integral to all proposals

5.2 Consideration of winter maintenance should be made, noting HCC's winter service approach set out in Part 2, Chapter 6: Maintenance & Operation.

5.3 The materials strategy to be employed in areas of hard landscape in adopted highways shall be in accordance with Part 3, Chapter 13: Planning Carriageway, Footway and Cycleway Construction and approved by HCC. It should also accord with any requirements set out by the Local Planning Authority (LPA).

5.4 The principles of street art, sculptures, water features and advertising that will be within, or impact on the highway should be discussed and agreed with HCC and the relevant LPA prior to submission of the Planning Application.

'Ecology & Landscape Strategy' at Outline Planning Stage

6.1 The submitted outline 'Ecology & Landscape Strategy' should evolve the vision set out in the masterplan for the landscape which responds to the existing topography, green, blue and built landscape assets. The submission should include conceptual plans and supporting narrative for the landscape, indicating how gardens, driveways, paths, fences, gates, verges, open space, SuDs features, paving materials, street furniture, trees and shrubs can combine to help achieve the desired outcomes of sustainable travel and benefits to physical and mental health, whilst protecting local character, considering the points discussed in Part 2, Chapter 4: Validation & Master Planning.

6.2 In particular the submission should identify the intended purpose and function of planting near to the highway. These might include wind shelter or shade for pedestrians and cyclists, providing BNG for another part of the site, increasing areas of species of local, county or national importance, creating or reinforcing a wildlife corridor, providing amenity space, flood mitigation, or other purposes.

6.3 The baseline value of biodiversity within the proposed planning red line boundary, using Defra's Biodiversity Metric should be included, together with a proposed target for the scheme based on County and local policy at the point of application.

6.4 The submission should explain how the Scheme Promoter will follow the mit-igation hierarchy in designing the infrastructure and planting scheme, name-ly:

- Avoid loss and harm (choice of route)
- Minimise net loss and harm (design choices)
- Mitigate loss and harm caused through ecological measures elsewhere on site
- Mitigate loss and harm caused through ecological mitigation measures off site

Ecology & Landscape Strategy at Full Planning Stage

7.1 The submitted the draft 'Ecology & Landscape Strategy' should be an evolution of the outline strategy demonstrating how it will help achieve the desired outcomes of sustainable travel and benefits to physical and mental health, whilst protecting local character.

7.2 The submission should include plans and supporting narrative showing:

- Overall landscape design concept as it affects movement networks, identi-fying any echoes in planting design from species in the surrounding area.
- The (baseline) value of biodiversity within the proposed planning red line boundary, using Defra's Biodiversity Metric and forecasted biodiversity value of the final scheme.
- Status of routes (permissive, statutory), constraints of visibility/sight lines, and needs of disabled persons
- Clear identification of the hard and soft landscape proposals that form part of the proposed adoptable highway, or which may affect it.

- Soft landscape elements (areas of: woodland, shelterbelts, specimen plants, shrubs, ground cover, grass; native/ ornamental; existing condition and treatment of retained vegetation)
- Area and type of hard surfaces including access and site circulation (ur-ban plazas, playing surfaces, street furniture, roads, footpaths, cycleways, bridleways, including links to adjoining land)
- The relationship of buildings to the highway (statements regarding pro-posals for doors and ground floor windows fronting public realm, roof heights above ground level; compatibility of building foundations with planting may be required if they are adjacent to highway, or other move-ment networks)
- Use/function of different areas of public realm (for example play provision, private amenity and public open space)
- Contours and levels in accordance with the Earthworks Strategy (See Part 3, Chapter 12: Planning Earthworks)
- Major existing and proposed services (above and below ground)
- Land drainage/blue infrastructure (existing, proposed; streams, ponds, ditches, water features)
- Intentions for any street art, sculptures, water features or advertising.
- Boundary treatment (See Part 3, Chapter 11: Highway Boundaries)
- Details of how the land designated for ecological benefit (existing or new) is to be protected during street or utility repairs, maintenance or salting.

Whole Life Management Plan

8.1 The ongoing maintenance and management of any landscape scheme is essential to ensure its long-term contribution to the environment.

8.2 Scheme Promoters shall prepare a 'Ecology & Landscape' section for inclusion within the 'Whole Life Management Plan' that sets out the proposed responsibilities for creating, owning, maintaining and funding the landscape and habitats within, or adjacent to the adoptable highway.

8.3 An indicative Whole Life Management Plan shall be submitted with any Outline Planning Application setting out broad principles.

8.4 A draft Whole Life Management Plan shall be submitted at the Full Planning Application stage setting out proposals for each feature type. The draft section for 'Ecology & Landscape' should set out:

- The overall functional and aesthetic objectives and design concepts of the landscape scheme;
- Clear identification of the hard and soft landscape proposals that form part of the proposed adoptable highway, or which may affect it; &
- Proposals for the long-term stewardship of landscape along both adopted and non-adopted highways.

Compensation for Reduction in Tree Amenity

9.1 In the event that any highway trees either need to be removed or pruned to enable Scheme Promoters to undertake their activities HCC shall recover costs and compensation for the loss of tree canopy. The method of tree valuation used by HCC is Capital Asset Value for Amenity Trees (CAVAT) which provides a value for each tree. The full CAVAT will be used to calculate value of trees removed and where trees are pruned the difference between the original CAVAT value and the lower value will be regarded as the loss in value.

9.2 The planting of a single new tree to replace a removed mature tree is not comparable so the CAVAT value allows for planting of more trees to offset the immediate loss of tree canopy. Compensation secured from Scheme Promoters will be used to invest in the planting of new trees and for the ongoing crown management of those trees retained but pruned.

Chapter 11
Planning Highway Boundaries

Contents

Introduction

1.1 This chapter highlights the requirements for a strategy for boundaries and fencing suitable for the local landscape at the planning application stage.

Seamless Public Realm

2.1 A successful street scene from a place making perspective, would not have obvious edges between the public highway and the rest of the public (and potentially private) realm. However, the highway boundary shall always be marked for future reference.

2.2 In urban areas or at the entrance to a private road, the boundary shall be marked using a feature, such as contrasting paving or brass studs laid into the surfacing.

2.3 Elsewhere, the boundary of private property will normally be marked using a fence, wall, hedge, trees or other planting.

2.4 The character of the place being created should be a key consideration. Hard boundary treatments like acoustic fences can have a negative impact on placemaking. Space should be left during the layout phase for suitable tree planting and landscaping to avoid an over-engineered feel to the public realm and its boundary treatments.

Permanent Fencing

3.1 Various types of fencing or other boundary treatments may be required for different situations:

- Recognising the character of the area. For example in Hertfordshire's Garden Cities, hedges might be more appropriate whereas in a historic market town, walls using appropriate materials might be better;
- Denoting property boundaries;
- Accommodating the needs of adjacent landowners;
- Protecting or delineating landscape areas;
- Protecting or delineating public areas;
- Highway fencing.

3.2 In general, such fencing will be erected on adjacent private property and will not be adopted by HCC.

3.3 Whilst considering highway boundary fencing needs, scheme promoters should also consider whether there are needs for controlling movements of wildlife, such as deer and badgers and also whether there are requirements for noise barriers in order to develop a co-ordinated boundaries and fencing strategy.

3.4 Deer fencing, which should be 1.8m high, is most successful where it is installed in combination with the construction of 'green bridges' and under / over passes, whereby the fencing channels the animals to the safe crossing points.

3.5 For fencing of this type to be successful, it must create a closed circuit, with particular attention paid at its ends, which must be secure. There are many disadvantages to fencing including cost, and impact on biodiversity and landscape. Moreover, if it is breached by deer, the deer become trapped on the highway, assuming both sides of the highway are fenced.

3.6 Deer fencing is seldom a suitable solution for retro-fitting along existing highways as the highway.

3.7 The provision of permanent fencing shall be in accordance with DMRB.

Chapter 12
Planning Earthworks

Contents

Introduction

1.1 Earthworks are those works required to shape the formation below the pavement layers forming carriageways and footways, below verges and to create associated highway landscape areas.

1.2 This chapter provides guidance on the requirements to develop an earthworks strategy at an early stage to demonstrate to both the Local Planning Authority and the Highway Authority that safe, durable and sustainable design and construction, compatible with SuDS provision, is achievable and, whilst reducing the risk of needing to design more expensive, less sustainable solutions after lines and levels have been set.

Earthworks Strategy

2.1 The sustainable balance of cut, fill, import and export of earthworks materials has a direct relationship with the line and level of the proposed highway and the local landscape, which therefore requires due consideration at the planning application stage.

2.2 Scheme promoters shall prepare and submit an Earthworks Strategy to accompany the planning application to demonstrate to both the Local Planning Authority (LPA) and the Highway Authority that a safe, durable and sustainable design and construction is achievable.

2.3 The aim of the strategy shall be to demonstrate that sustainable resource management action will be taken to eliminate or practicably reduce waste, to keep materials in high value applications, and (where appropriate) encourage the 'sharing' of materials between projects and organisations locally.

2.4 Where materials are not to be shared, the strategy shall maximise the quantity of excavated material retained within the site and the importing and exporting of material kept to a minimum, whilst maintaining, or creating a sympathetic local landscape.

2.5 As a minimum, the strategy should also include:

- Evidence of a desktop study identifying the existing geology, groundwater levels and quality and the potential presence of contaminated land
- The likely nature, volume and purpose of proposed earthworks materials
- Consideration of any contamination remediation, materials recycling and needs for stabilisation
- Confirmation of compatibility with SuDs provision
- Consideration of slope gradients and any need for stabilisation (potentially for slopes steeper than 26.5° (1:2))
- Confirmation that acceptable gradients for the intended provision for walking, wheeling and equestrians can be achieved
- The use of CD 622 Managing Geotechnical Risk, to provide a clear and consistent record of the management of geotechnical risks to the highway asset at all stages in a project (options, development, construction and removal).

2.6 Sand and gravel deposits are found in most parts of the county although they are concentrated in that part south of a line between Bishop's Stortford in the east and Hemel Hempstead in the west (often referred to as the sand and gravel belt). Within this belt and to the north of it the upper geology is generally chalk and south of the belt is generally London Clay.

2.7 The chalk areas of Hertfordshire are of varying chalk quality and all suffer significant occurrences of sink holes and crown holes from mining activities. Similarly, there are failures resulting from collapses within abandoned brick claypits. Many historical gravel extraction pits were refilled with waste.

2.8 Whilst there are records of previous extraction activities within the chalk, gravels and clay, they are far from complete.

2.9 Scheme promoters should consider the advantages of undertaking on-site investigations and testing which can inform the early planning and design of their scheme and, in doing so reduce the risk of needing to design more expensive, less sustainable solutions after lines and levels have been set.

2.10 Further detailed site investigation undertaken to support final design or, indeed excavation during construction may reveal variances from the anticipated geology and archaeology.

2.11 To avoid additional import or export of material and the associated vehicle movements required to conform to the lines and levels set within the planning permission, scheme promoters should consider undertaking sensitivity calculations on earthworks volumes and seeking agreement to some limits of deviation within the planning process. Landscaping in particular may be an area where some flexibility on line and level could be agreed.

2.12 Excavated material that is to be incorporated into highway permanent works shall comply with the Specification for Highway Works (SHW).

2.13 The LPA may have specific conditions for development that takes place on previously occupied sites and may require certain investigations and remedial treatments to be undertaken prior to development. Indeed, Section 57 of the Environment Act requires construction professionals, including scheme promoters, landowners and local authorities, to investigate and assess the risks of potentially contaminated sites.

2.14 HCC would wish to be involved in discussions regarding remediation, such that they can be assured that the sub-soil of publicly maintainable highway will not pose a significant hazard to health, safety or welfare when maintenance or any other works are undertaken on the highway in the future.

2.15 Non standard earthworks such as reinforced earth, ground anchors, dynamic compaction, piles, geotextiles etc. will require additional information in an Earthworks Strategy to support reasons for their use.

LTP4 Compliance

3.1 The Earthworks Strategy shall be LTP4 Compliance tested at the outline planning application stage, if appropriate and at the full planning application stage. See Part 1, Chapter 4: LTP Compliance.

Earthworks Strategy
LTP4 Compliance Test: Outline Planning Application

The outline Earthworks Strategy demonstrates an understanding of the existing geology, groundwater levels and quality and the potential presence of contaminated land and sets out proposed strategies for resource management optimisation, contamination remediation, materials recycling and any stabilisation.

Confirmation that the resulting terrain for the proposed movement corridors will be suitable for walking, wheeling and equestrians.

Earthworks Strategy
LTP4 Compliance Test: Full Planning Application

The proposed Earthworks Strategy supporting the full planning application demonstrates that sustainable resource management action has been taken to eliminate or practicably reduce waste, to keep materials in high value applications, and (where appropriate) has encouraged the ‘sharing’ of materials between projects and organisations. Where materials are not to be shared, the strategy maximises the quantity of excavated material retained within the site and the importing and exporting of material kept to a minimum, whilst maintaining, or creating a sympathetic local landscape.

Acceptable gradients for the intended provision for walking, wheeling and equestrians can be achieved.

Chapter 13
Planning Surfacing Materials

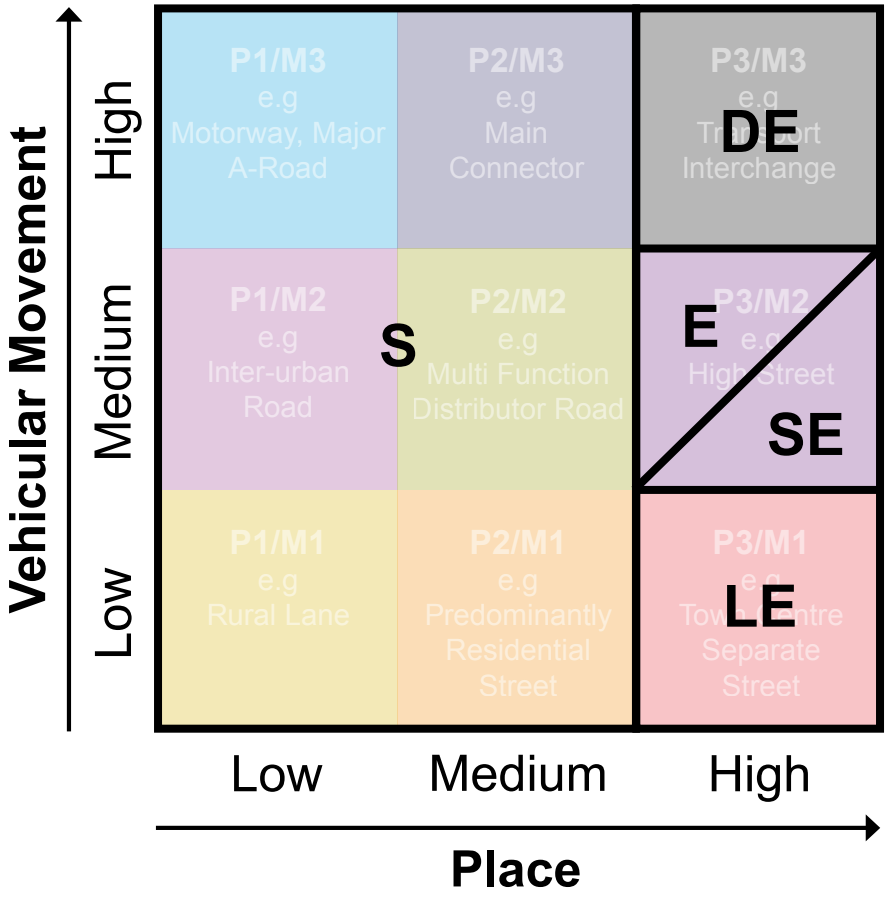
Contents

Introduction

1.1 This Chapter provides guidance on the key principles that will determine the detailed design and specification for the surfacing and supporting construction for of all types and parts of the highway

1.2 The choice of surfacing for all highway types influences their character, utility and lifecycle cost and therefore surfacing type should be considered at the planning stage in the context of their Place & Movement category as discussed in Part 2, Chapter 5: Providing for Place & Movement and Part 3, Chapter 8: Planning Highway Links

Material Specification based on Place & Movement



Palettes

S	Standard	**LE**	Local Enhanced
SE	Semi Enhanced	**E**	Enhanced
DE	Durable Enhanced		

2.1 A primary objective of Hertfordshire's Highways Infrastructure Asset Management Plan (HIAMP) is to ensure highway assets reach their full, service potential for as long as possible, whilst minimising their lifecycle costs.

2.2 Given the continued pressure on public sector revenue spending, HCC has adopted a risk-based approach to highway maintenance.

2.3 This approach controls the selection of features and materials that HCC is prepared to adopt and maintain.

2.4 P3 Category highways have been designated as Areas of High Place Importance which may have more attractive features and finishes (albeit still restricted and controlled) and, subject to suitable funding arrangements, may be maintained to a higher serviceability level.

Road Pavement Construction

3.1 All new roads in the P1 & P2 categories shall be of standard flexible bituminous construction, with the recommended bituminous material for the surface course being Hot Rolled Asphalt (HRA). More detail on this is provided in Part 4, Chapter 12: Designing Carriageway, Footway & Cycleway Construction.

3.2 The use of recycled components within standard road construction materials is encouraged.

3.3 An additional option of enhancing to block paving surfacing will be considered for P3 categories as follows:

- Local Enhancement within P3/M1 to reflect local character and heritage articulated within guidance prepared by the Local Planning Authorities;
- Enhancement using standard block paving or semi-enhancement using a mix of bituminous surfacing with features in block paving for P3/M2.

3.4 Scheme Promoters are also encouraged to investigate and consider the use of innovative products using additional, alternative recycled materials but these shall be considered as a departure from standards in order to ensure that HCC can fully satisfy itself as to their suitability and a controlled application agreed.

Active Travel Link Construction

4.1 Active Travel Links (ATLs) are provided within urban, semi-urban, semi-rural and rural settings for walking, cycling and potentially horse riding as non-motorised routes away from the county's road system. As such they may be made up of permutations of sealed paths, unsealed paths and amenity grass areas suitable for horse riding.

4.2 Standard sealed surfacing shall be bituminous for all categories With AC6 Dense being the preferred surfacing material.

4.3 Additional options for enhancement will be considered for P3 categories as follows:

- Local Enhancement to block paving or flag paving within P3/M1 to reflect local character and heritage articulated within guidance prepared by the Local Planning Authorities (LPA) for conservation areas and the Chilterns Area of Outstanding Natural Beauty (AONB)
- Enhancement using standard block paving or flag paving and semi- enhancement using a mix of bituminous surfacing with features in block paving for P3/M2 categories.
- Durable enhancement to block paving, recognising the high potential for wear and tear, including from service vehicles.

4.4 Concrete surfacing shall be considered as a departure from standards.

4.5 In certain locations other types of paving units or materials may be used. This may be the case where an existing character is continued within the scheme or for aesthetic purposes; in all cases advice from the LPA should be sought and, in the case of development, agreement reached with HCC over commuted sums to cover future maintenance.

4.6 Scheme Promoters are also encouraged to investigate and consider the use of innovative products using additional, alternative recycled materials but these shall be considered as a departure from standards in order to ensure that HCC can fully satisfy itself as to their suitability and a controlled application agreed.

4.7 Detailed requirements and specifications are provided in Part 4, Chapter 12: Designing Carriageway, Footway & Cycleway Construction.

Chapter 14
Planning Structures

Contents

Introduction

1.1 This chapter sets out the general requirements for structures to support planning applications and HCC scheme development.

1.2 The process for gaining approvals through the lifecycle of the scheme preparation, including Approvals in Principle (AiP) are described in Part 1, Chapter 10: Technical Approval for Structures.

1.3 Detailed design, specification and construction requirements are set out in Part 4, Chapter 13: Structures.

General Requirements

2.1 Structures are inherently expensive to provide and maintain and HCC charges commuted sums for their long-term maintenance as per Part 1, Chapter 15: Charges & Fees.

2.2 Scheme Promoters should establish whether the need for structures can be avoided during master planning, before the planning permission's 'red-line' is set and they then become a necessity.

2.3 Scheme Promoters are advised to contact the relevant Technical Approval Authority to establish the acceptability of providing structures that will affect a highway, railway or waterway before applying for any Outline Planning Approval.

2.4 Full Approval in Principle (AiP) is not required to accompany a Detailed Planning Application, but the application should demonstrate LTP4 Policy Compliance as a minimum.

Structures

LTP4 Compliance Test: Full Planning Application

- Line, level and widths are conducive for accommodating the needs of those walking and wheeling
- Safe sight lines can be achieved
- Suitable drainage can be achieved
- Consideration has been made for accommodation of utilities, and appropriate provision for future utilities
- Strategies for minimising carbon impact and for sustainable resource management have been formulated
- The structures will complement the local historic and built environment and / or the green landscape.

2.5 When designing highway structures it is important to consider the impact on the ease, frequency and cost of future inspection and maintenance that the design would have.

2.6 However, this does not necessarily mean that architectural merit nor innovation needs to be stifled, particularly as structures make an important contribution to the local landscape.

2.7 Scheme Promoters are encouraged to engage with HCC before submitting a detailed planning application to discuss any proposals for innovation, atypical designs and any potential futureproofing such as additional width to accommodate future active travel requirements or change of use.

Chapter 15
Planning Road Restraint Systems

Contents

Introduction

1.1 Road Restraint Systems (RRS) is a generic term for vehicle restraint systems and pedestrian restraint systems used on the highway to reduce safety risks by controlling errant movements.

1.2 RRS include permanent and temporary safety barriers, vehicle parapets, terminals, transitions, crash cushions, pedestrian parapets, pedestrian guardrails and pedestrian restraint and protection, vehicle arrester beds, anti-glare systems and cattle grids.

1.3 Pedestrian Restraint Systems, provided to reduce the risk to non-motorised users, fall into two main categories:

- Guardrail to prevent those walking or wheeling moving dangerously into the paths of other modes.
- Parapets to prevent those walking, wheeling or where appropriate riding a horse falling from height.

1.4 It is important that RRS provision and requirements are assessed at an early stage in the scheme's development and design processes to:

- Ensure all factors such as land take, road or bridleway horizontal, vertical and and cross-section geometry, location of hazards, the safety of construction and maintenance workers, route users, those that work on the route, and other parties, are taken account of in determining the overall optimum solution
- Avoid the unnecessary provision of pedestrian guard railing by the inherent design of safe environments for active travel modes
- Minimise the need for departures from standards
- Avoid later abortive work
- Account for maintenance and repair costs.

1.5 Given the potential needs for RRS can impact on the setting of the optimum planning approval's 'red line' it is important that RRS are considered as part of the planning application preparation. The nature and type of any RRS shall be proposed for approval at the Planning Application Stage.

Vehicle Restraint Systems (VRS)

2.1 Vehicle Restraint Systems (VRS) are systems installed on a corridor to provide a level of containment for errant vehicles.

2.2 The consideration and provision of VRS shall be in accordance with DMRB's CD 377: Requirements for road restraint systems and SHW Series 400.

2.3 CD 377 sets out the different approaches for how risks are to be assessed for local roads up to 50mph and for roads of 50mph or higher.

2.4 Whilst they will not normally be required on single carriageway routes with speed restrictions less than 50mph there may be circumstances where protection is required to prevent large vehicles from colliding with structures or to provide protection where hazards such as rivers.

2.5 Where a VRS (excluding a parapet) is necessary for the road it should, where possible, be positioned between the carriageway and the cycle track, and so that under the design impacts it will not deflect across the cycle track.

Pedestrian Restraint Systems (PRS) - Guard Rails

3.1 Scheme Promoters should have considered and proposed highway environments at the Master Planning stage that reflect the LTP4 hierarchy of highway users, which gives highest priorities to active travel modes. As such the need for pedestrian guardrails should be minimised and only be required as a last resort after all other means of providing safe walking and cycling environments have been considered and found to be unfeasible.

3.2 Pedestrian guard rails can be used to prevent pedestrians crossing at dangerous places (for example where filtering traffic may be moving at times or in directions unexpected by footway users) however this should only be done as a last resort where the potential conflict cannot be mitigated by other means.

3.3 Pedestrian guard rails should not be provided as a deterrent to kerbside vehicle parking.

3.4 It is important to consider the potential need for PRS in the preparation of a Planning Application to ensure that the minimum effective width of footway or cycle track will to be provided for.

3.5 At the bottom of steep gradients where cycle tracks meet the carriageway or another hazard, some method of stopping an out-of-control cyclist should be considered on a case-by-case basis. It is better to design out sharp bends and steep gradients where possible. LTN 1/20 Section 5.11 provides further guidance.

Pedestrian Restraint Systems (PRS) - Pedestrian Parapets

4.1 All footbridges and bridleway bridges must be provided with pedestrian parapets to the following minimum heights.

Parapets for drops over 1.2 m

Walking

Not over railway	1.15m
Over railway	1.8m

Cycling

Not over railway	1.4m
Over railway	1.8m

Equestrian

Not over railway	1.8m
Over railway	1.8m

4.2 Subject to a risk assessment considered by a Design Review Panel the absolute minimum parapet height for cyclists use on existing non-railway structures is 1.2m. The assessment should consider the likelihood of high crosswinds and the overall proposed alignment of the cycle track relative to the parapet.

Pedestrian Restraint and Protection at Head Walls, Wing Walls and Retaining Walls

5.1 Where any pedestrian movement may occur within the highway from use or maintenance of the highway and there is a risk to health and safety from a fall from a height of 1.5m or more, suitable protective measures must be provided.

5.2 The type of pedestrian protective measure to be used will need to be determined locally and be in keeping with any structural, drainage, environmental and aesthetic considerations. The protective measures could include pedestrian guard railing, pedestrian parapet or appropriate types of boundary fencing.

Chapter 16
Planning for Drainage and Flood Prevention

Contents

Introduction

1.1 This Chapter sets out Hertfordshire County Council's (HCC's) requirements for a Drainage & Flood Management Strategy needed to support a planning application that conforms to the technical approval process set out in Part 1, Chapter 11: Drainage & Flood Management Compliance Testing & Approvals Process.

1.2 Part 2 of this guide highlighted that an understanding of the approach including the life cycle of assets, the selection of features and materials that HCC is prepared to adopt and maintain will influence master planning and planning application preparation.

1.3 Through this guide and the application of the staged technical approval process HCC seeks the planning, design and construction of effective and sustainable highway drainage solutions that provide both manageable and maintainable highway assets with low lifecycle costs and whole replacement costs, whilst delivering benefits for active travel, the local landscape and biodiversity.

1.4 The primary objective of highway drainage systems is managing surface and groundwater to the level of service required to ensure the continual and safe operation of the network in accordance with the LTP4 policies. Highway drainage systems shall also collect, transport and dispose of surface and groundwater in a safe and controlled manner that is acceptable to the consent/ approval bodies and other stakeholders.

1.5 In doing so, the highway drainage system shall:

- Remove surface water from the carriageway, footway and cycleway surface
- Control rising groundwater to be below the pavement construction
- Remove moisture from the unbound pavement construction
- Control surface water discharge rates
- Manage water quality to minimise impact of run-off on the receiving environment

1.6 Hertfordshire seeks solutions that not only will prevent floods, but also support the wider policy objectives of LTP4 and HCC's Local Flood Risk Management Strategy 2 (2019-'29).

1.7 In particular, drainage solutions need to demonstrate that:

- Flood and groundwater will be managed to protect highway assets and to minimise nuisance, damage or health and safety hazards.
- Pollution & contamination will be controlled and mitigated.
- The quality of public space and local landscape will be protected and enhanced, thereby encouraging active travel.
- Environmental mitigation or net gains for biodiversity, habitats and natural landscape will be achieved, contributing to the target of a 20% increase in green and blue habitats and spaces, across Hertfordshire.
- Future maintenance costs are kept to a minimum and are fundable.

1.8 The use of vegetated SuDS measures can achieve multiple environmental benefits including increased amenity and shade, increased habitat and biodiversity and improved water quality by reducing heavy metal and silt loads within highway run-off. Sustainable and nature-based solutions (NBS) shall be prioritised and designed in collaboration with ecological expertise to help ensure:

- The design of drainage systems avoids impacting on existing environmental features (such as trees, green spaces or existing SuDS)
- Adequate spatial provision is made for vegetated SuDS measures
- Feasible opportunities to provide vegetated SuDS measures such as ponds, rain gardens and swales are taken.
- Ease of future maintenance is not compromised.

1.9 As the adopting authority HCC needs to be satisfied that the following aspects of highway drainage and the resultant surface water management from all schemes and developments have been considered and adequately provided for:

- Impacts on points of surface water discharge including:
  - Water quality (routine runoff and spillage)
  - Hydro-morphology
- Impacts on groundwater including:
  - Water quality (routine runoff and spillage)
  - Groundwater levels and flows
  - Groundwater dependent terrestrial ecosystems
- Flood impacts

1.10 'DMRB LA113 Volume 11: Road Drainage & the Water Environment' sets out a structured approach to assessment and management of these impacts.

1.11 Major highway projects (greaterthan a value of £5 million) shall follow the DMRB approach in full, whilst a proportionate approach should be followed for more modest schemes.

1.12 Part 2 identified that Scheme Promoters shall prioritise flood management solutions as follows:

1. Infiltration
2. To a surface water body
3. To a surface water sewer or drainage system
4. To a combined sewer.

1.13 The adoptable highway drainage system shall be designed to receive highway run-off only. Water from areas that are not adoptable highway shall not be allowed to run onto areas of adopted highway and water from the highway shall not be allowed to run onto non-highway areas.

1.14 HCC will not adopt any highway until all necessary consents and approvals from regulatory bodies have been granted and evidenced to HCC.

1.15 If consents and approvals have not been granted by the time of the planning application submission, scheme promoters shall submit evidence of agreements in principle from the relevant regulatory bodies.

1.16 It should be noted that a range of drainage assets attract the levy of commuted sums in accordance with the scheme set out in Part 1, Chapter 15: Charges & Fees.

HCC's Regulatory Functions

2.1 HCC has a key interest in drainage and flood prevention given its role as the local Highways Authority responsible for keeping its network safe and operational, and as the Lead Local Flood Authority (LLFA).

2.2 As the Lead Local Flood Authority (LLFA) HCC is the regulatory body for construction in, and maintenance of flow in all ordinary watercourses in Hertfordshire, except for the small area of the county north of Hitchin (Ickleford & Pirton), which is covered by the Bedfordshire and River Ivel Internal Drainage Board (IDB).

2.3 HCC is also the regulatory body under Section 23 of the Land Drainage Act (LDA) 1991. It has powers under sections 23, 24 and 25 of the LDA 1991.

2.4 Ordinary watercourses are deemed to be all rivers, streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers vested with utilities) and passages, through which water flows that are not classified as Main River by the Environment Agency.

2.5 To view all currently recorded ordinary watercourses in Hertfordshire, please refer to HCC's online Ordinary Watercourse Map.

2.6 The purpose of ordinary watercourse regulation (consenting and enforcement) is to control certain activities and works that might disrupt the ability of the watercourse to drain areas or transfer water.

2.7 Scheme promoters planning to carry out work that may affect the flow or storage of water in an ordinary watercourse shall seek consent from the LLFA and it is strongly recommended that HCC's Flood Risk Management Team are contacted directly prior to submitting a planning application.

2.8 Consideration and granting of consent for works to ordinary water courses sits outside of the planning process.

2.9 Prior written consent should be secured from the LLFA prior to submission of the planning application to avoid unnecessary delays or issues with implementation of the planning permission.

2.10 Further details can be requested through email to ordinarywatercourses@hertfordshire.gov.uk

or send by post to:

Flood Risk Management Team
Growth & Environment
Hertfordshire County Council, Post point CHN215
County Hall, Hertford, SG13 8DN

HCC's Role in the Planning Process

3.1 Under Section 23 of the Land Drainage Act 1991 HCC, as LLFA, is the regulatory authority for surface water management and is a statutory consultee for all major development planning applications in relation to the management of surface water.

3.2 A "major development" is a development involving any one or more of the following:

(a) the winning and working of minerals or the use of land for mineral-working deposits;

(b) waste development;

(c) the provision of dwelling houses where —

(i) the number of dwelling houses to be provided is 10 or more; or

(ii) the development is to be carried out on a site having an area of 0.5 hectares or more and it is not known whether the development falls within sub-paragraph (c)(i);

(d) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more;

(e) development carried out on a site having an area of 1 hectare or more

3.3 As such the LLFA will be advising the relevant Local Planning Authority (LPA) on whether the proposed drainage scheme complies with the relevant technical standards and policies.

3.4 HCC is also consulted in its role as the Highway Authority.

3.5 The LPA will provide the applicant with HCC's responses once received. HCC will not be able to accept new information or other communication direct from the applicant in the period between submission and determination. Communications shall be made via the relevant LPA during this period

3.6 The decision as to whether the planning application is acceptable rests with the relevant LPA.

3.7 However, HCC will not adopt any highways whose design fails to conform to this guidance.

3.8 Compliance shall be demonstrated through the development and approval at key stages of a Drainage & Flood Management Strategy followed by the approval of the detailed design within the section Agreements and by final Adoption as described in Part 1, Chapter 11: Drainage & Flood Management: Compliance Testing & Approvals Process.

3.9 Scheme promoters shall seek pre-application advice for projects with significant drainage or flood prevention challenges and / or requiring non-standard solutions. Details of the pre-application advice can be found in Part 1, Chapter 3: The Scheme Promotion and Development Management Process.

General Principles for Surface Water Management

4.1 Scheme promoters should familiarise themselves with the National Planning Policy Framework, which sets out government policy on development and flood risk and take into account any Strategic Flood Management Plans that have been carried out by HCC and build upon these proposals for sustainable developments.

4.2 Climate Change shall be accounted for through the precautionary principles recommended in National Planning Policy Framework. An additional allowance of 40% is required to account for climate change, Environment Agency (EA) guidelines

4.3 HCC will only adopt the highway drainage systems that only manage surface water that falls onto the adoptable area. Water from areas that are not adoptable highway shall not be allowed to run onto areas of adopted highway and water from the highway shall not be allowed to run onto non-highway areas.

4.4 The developers should use the Flood Estimation Handbook, with all new developments hydraulically modelled using suitable software as hand calculations will not be acceptable.

4.5 Where systems take water from adoptable areas and other sources, such as roof water from dwellings, they may be eligible for adoption as a public surface water sewer. This would be undertaken as an agreement between the developer and the Regional Water Company: Anglian or Thames Water.

4.6 The drainage system should be contained within the adoptable highway boundary. When this is not possible the scheme promoter shall arrange an easement. These should be a minimum of 3m around the outside of a soakaway and 3m either side of the centre of any pipe. Additional area for vehicular access may be required.

4.7 Water from areas that are not adoptable highway shall not be allowed to run onto areas of adopted highway and water from the highway shall not be allowed to run onto non-highway areas. Where required, a separate perimeter drainage system should be provided to intercept significant flows from the highway onto adjacent land and/or collect surface water run-off from adjacent land to prevent the runoff from entering the highway drainage system (e.g. where highway is in cutting).

4.8 Highway flooding is defined as applying to all paved areas including the carriageway, footway, cycleway or public realm. For combined surface and sub□surface water drains (filter drains) flooding should be defined as surcharging into the pavement construction.

4.9 Pipelines taking existing or proposed land drainage runoff, flows from watercourses or groundwater will not be considered for adoption as Highway drainage.

4.10 For P1/M3 category highways, drainage systems should be designed in accordance with the DMRB Drainage standards, however the Annual Exceedance Probability (AEP) should be taken from this guide.

4.11 For all other highways, drainage systems are to be designed in accordance with this design guide unless otherwise agreed with HCC. Where this design guide does not provide appropriate guidance, the DMRB drainage standards should be consulted with the acceptance of HCC.

4.12 Surface water flows in excess of those arising from the existing unpaved surface, usually referred to as the 'greenfield' runoff rate, shall be attenuated to the 1 in 100 year rainfall event (including climate change allowance).

4.13 Perimeter drainage shall be designed to a 1 in 100 year rainfall event (including climate change allowance) in accordance with DMRB CD 522 Drainage of Runoff from Natural Catchments using a method appropriate for the catchment size as described in The SuDS Manual Chapter 24.

4.14 Highway flooding is defined as applying to all paved areas include the carriageway, footway, cycleway or public realm. For combined surface and sub□surface water drains (filter drains) flooding should be defined as surcharging into the pavement construction.

P1/M3

No Surcharge
100% AEP (1:1) + climate change

No Flooding
3% AEP (1:30) + climate change where AEP = Annual Exceedance Probability

P1/M2, P2/M3

No Surcharge
100% AEP (1:1) + climate change

No Flooding
10% AEP (1:10) + climate change
Flow width limited to allow a minimum unflooded corridor of 6m.

P2/M2

No Surcharge
100% AEP (1:1) + climate change1.1.1.

No Flooding
50% AEP (1:2) + climate change.
Flow width limited to allow a minimum unflooded corridor of 6m.
Flow width limited to 0.5m on a shared use carriageway

P1/M1

No Surcharge
100% AEP (1:1) + climate change

No Flooding
50% AEP (1:2) + climate change.
Flow width limited to allow a minimum unflooded corridor of 3m.
(1 in 2 year)

P2/M1, P3/M1, P3/M2, P3/M3

No Surcharge
100% AEP (1:1) + climate change

No Flooding
10% AEP (1:10) + climate change.
Flow width limited to 0.5m on a shared use carriageway on any classification of road.

Climate Change

A 40% uplift in peak rainfall intensity should be allowed for in accordance with the Upper end of total potential change for the '2080s' from EA climate change allowance guidance. The climate change allowance should be updated in accordance with latest EA guidance. Flooding is to be contained on site and not cause any detriment to property.

4.15 All flooding up to the 1% AEP (1:100) event + climate change shall be kept within the highway boundary, in an area designated to accommodate the exceedance flows. The carriageway should not be used for attenuation. All surface water shall be drained from the road within an hour of the end of the critical 1% AEP (1:100) + climate change.

Sustainable Drainage Systems (SuDS)

5.1 Traditionally, surface water has been rapidly removed from the highway via a network of pipes, which tends to concentrate water flows causing potential flooding and pollution at, or beyond, the point of outfall.

5.2 HCC now follows a more sustainable approach to the design of drainage systems to provide more comprehensive management of flood risk as described in HCC's SuDS Policies (Addendum to the Local Flood Risk Management Strategy for Hertfordshire)

5.3 The aim of this approach is to retain as much of the surface water on, or near, the site. This can be achieved by using a combination of methods, including:

- Swales - An open grass lined channel that carries water but also allows water to be dispersed into the ground;
- Filter drains - A linear trench filled with permeable material. Often contains a permeable pipe in the base of the trench to remove storm water;
- Perforated pipes - Using perforated pipes, surrounded by permeable material, as carrier drains can help disperse water into the ground. Permeable pipes should not be used under carriageways, cycleways or footways;
- Soakaways - Traditional soakaways may be installed as part of a pipe network system, with an inlet and overflow pipe. During light rain, water would be dispersed into the ground. In conditions of heavy rainfall water would fill the soakaway and run along the overflow pipe to an outfall or interconnecting soakaway network;
- Drainage basins/ponds - These store water during heavy precipitation, allowing a more gradual dispersal once the risk of flooding has passed;
- Permeable surfaces will not be permitted on the public highway due to future maintenance liability. However permeable paving, such as block paving or concrete grass paving, can be used to reduce runoff from private driveways or parking areas. A geotextile may be necessary to prevent the loss of bedding material.

5.4 The use of these drainage techniques will depend on a number of factors, including: -

- land availability;
- the permeability of the ground;
- the level of the water table;
- the quality of the ground water;
- exceedance
- nature of existing soils
- local habitats and biodiversity
- the implications on landscape character & treatment
- the risk of pollution

5.5 It may not be possible to dispose of all surface water using the above techniques. However, they may be incorporated into a pipe network system to reduce the impact of high water flows and disperse pollutants.

5.6 The scheme promoter or designer should investigate the possibility of incorporating on-site disposal techniques into the drainage design. They should be able to demonstrate to HCC that this process has been carried out.

5.7 Trees and shrubs shall not be planted within highway SuDS features that have slopes steeper than 1 in 5 in order to enable safe maintenance.

5.8 A berm, or grass or low level vegetation filter strip of 1m minimum width should be provided between any hardscape and the slope of a SuDS feature. The width of the strip and type of planting will need to be based on consideration of:

- Safety of all highway users
- Ground conditions and the need to keep sub-grades to paved areas free of saturation
- The location of proposed street furniture
- Provision for the accommodation of buried utilities
- Safe and practical access for maintenance operations.

Pollution Risk Assessment

6.1 New outfalls into existing surface or ground water systems carry an increased risk of pollution from spillage or other discharge. The amount of acceptable risk is related to the probability of a pollution incident occurring and the sensitivity of the water environment into which the new system discharges.

6.2 In small residential developments, with minimal goods vehicle movements, the likely discharge will be uncontaminated surface water run-off. Where this type of discharge is fed into the existing highway drainage or sewer network, there is unlikely to be an appreciable increase in the risk of pollution.

6.3 For large developments, industrial areas and routes that will carry high numbers of Heavy Goods Vehicles, there may be a significant risk of pollution occurring.

6.4 In such cases, the scheme promoter or designer shall carry out a risk assessment of the likelihood and severity of a pollution event occurring.

6.5 Guidance is given in Volume 11 of the DMRB and may also be obtained from the relevant authority responsible for the type of discharge proposed.

6.6 The scheme promoter or designer shall provide HCC with a pollution risk assessment as part of the Technical Approval Process to satisfy HCC that the reasoning used to produce the assessment is acceptable.

6.7 The assessment shall include evidence of mitigation and proposals for managing the remaining risk.

Discharge of Surface Water

7.1 Outfalls to ditches, streams or other watercourses require the written consent of the Lead Local Flood Authority (LLFA), the Environment Agency and the Canals & Rivers Trust as appropriate. The scheme promoter or designer shall provide HCC with proof that such approval has been given as part of the Technical Approval Process.

7.2 The scheme promoter or designer shall comply with any requirements for headwalls, catchpits, oil interceptors, non-return valves, flow control devices and safety grills required by the Lead Local Flood Authority or Environment Agency.

7.3 The scheme promoter or designer shall satisfy themselves and demonstrate to at the planning application stage that the LLFA and Environment Agency are satisfied that the capacity of the watercourse is sufficient for the output of the drainage system.

7.4 Where a piped system discharges into an existing ditch or watercourse the pipe invert shall not be lower than the level of the average flow in the ditch or watercourse and under no circumstances less than 150mm above the ditch or watercourse invert.

Discharge to Ground Water

8.1 The use of discharge to groundwater shall have the written consent of the Environment Agency. The scheme promoter or designer shall provide HCC with proof that such consent has been given at the planning application stage.

8.2 The scheme promoter or designer shall carry out sufficient site investigations and calculations to determine that the ground conditions are suitable for soakaways or other groundwater disposal methods.

8.3 The scheme promoter or designer shall provide HCC with the results of site investigations and calculations.

8.4 Soakaways shall be located so as to minimise their impact on the new roads and surrounding property.

8.5 They should be positioned outside of the carriageway or footway or any verge that contains trees or utility companies' equipment, and a minimum 5m away from the foundations for a structure or building. The bottom of the soakaway should not extend below a line at 45 degrees from the edge of the carriageway

8.6 Ideal locations for soakaway are within public open space areas with appropriate easements and /or wide areas of highway verge.

8.7 Although not ideal, adoptable soakaways may be located within private property. In such a situation the scheme promoter shall provide HCC with the necessary easements to allow future access.

8.8 In certain circumstances a deep bored soakaway may be required to reach a sufficiently permeable layer. The detail of the design and construction of the soakaway will need to be agreed with HCC and Environment Agency (EA).

8.9 Guidance on the design of soakaways is given in BRE Digest 365 'Soakaway Design' and The SuDS Manual.

8.10 As mentioned above the use of other groundwater dispersal methods will be encouraged particularly at surface rather than buried structures. Such solutions should be developed in consultation with the EA, HCC and Water Companies.

8.11 If at any time prior to formal adoption the system is found to be inadequate, HCC reserves the right to acquire modifications to the design and construction to overcome the problem.

Discharge to Existing Highway Drainage

9.1 Where the scheme promoter or designer proposes to connect a new highway drainage system into an existing network, the approval of HCC shall be obtained.

9.2 The scheme promoter shall carry out sufficient site investigations and calculations to determine that the existing drainage system can accommodate the outfall from the new network. The principles for assessing the capacity of the existing system are the same as those outlined for the new system.

9.3 The scheme promoter shall provide HCC with the results of their site investigations and calculations for the capacity of the existing network, including its condition, current discharge rate, upstream catchment area, any spare capacity. The discharge rate into existing drainage system will be Green field run-off or less.

9.4 If there is no capacity in the existing highway drainage system the developer will provide proposals how they will manage the surface water within their development.

Discharge to Regional Water Company Sewers

10.1 Where the developer proposes to connect a new highway drainage system into an existing public sewer, the consent of the Regional Water Company (Anglian or Thames Water) or those under the responsibility of Internal Drainage Boards shall be obtained. The developer shall provide HCC with proof that such consent has been given and demonstrate that capacity and integrity of connecting infrastructure has been made.

Pumped Discharge

11.1 Pumped discharges should only be considered where the highway precludes a gravity connection to a suitable outfall and the geology prevents a discharge to ground. An adequate exceedance flood route shall be available provided in the event of pump failure.

11.2 This solution is likely to be confined to drainage of tunnels or underpasses but flows will ultimately discharge to one of the surface water disposal methods above

11.3 Vehicular access shall be provided for inspection and maintenance, including for a tanker to empty the wet well and any storage in the event of failure and associated parking requirements.

11.4 For surface water pumping facilities, 125 cubic metres of storage should be provided per hectare of impermeable surface draining to the pumping station (i.e. 15 minutes of rainfall at 50mm per hour).

Attenuation or Balancing Ponds

12.1 Where the receiving highway drainage system is likely to become overloaded by additional run-of, or where regulation of discharge is required, the use of attenuation features such as a balancing container, storage system or pond may be necessary.

Providing for Exceedance

13.1 Flood flow paths shall be examined as part of the design of the adoptable highway drainage, as outlined in CIRIA C 365: Designing for Exceedance in Urban Drainage - Good Practice.

13.2 Safe and appropriate flow routes as a result of blockages and exceedance of the drainage system shall be evaluated and the potential effects of flooding to property and land addressed.

13.3 Exceedance area and overland flood routes are to be clearly indicated on the relevant drawings and these shall be secured by the works promoter/designer to prevent them being blocked in the future. Where exceedance flows run or land into waterways belonging to third parties then evidence of consultation with and approval from, third party landowner and any other stakeholder shall be included.

13.4 Where exceedance flows go off site the Environment Agency (EA) may be a Statutory Consultee requiring consultation and their approval.

13.5 If flood paths are proposed through residential properties or businesses then this information should be included on any deeds associated with these properties. This ensures owners and future owners are aware of the risks in time of severe storm conditions greater than 1 in 100 years (plus 40%) that surface water flows have been designed through specified land. Covenants shall be required to ensure land is not to be built on or obstructed where this could lead to interior flooding.

13.6 This will ensure property owners are aware of the design considerations of exceedance flows before they move in.

Reducing Carbon Through Design

14.1 Evidence of design decisions relating to the following questions can be used to demonstrate how carbon reduction principles have been applied:

- What strategic decisions have been made to reduce carbon?
  - o Can drainage input to the vertical alignment allow for 'over-the-edge' (build nothing) solutions?
  - o Can drainage input to the highway layout contribute to build less, such as decreasing impermeable area and/or allowing increased space for source control, attenuation and/or exceedance routes?
- Is this the right design?
  - o Has a SuDS management train been prioritised over traditional 'hard' drainage?

Providing for Future Maintenance

15.1 Future low-cost maintenance of the drainage asset should be a principal factor of the design, utilising simple solutions which do not rely on difficult to maintain infrastructure.

15.2 Cleansing is essential for ensuring the systems are working efficiently so the designer should look at how assets will be maintained, looking at various issues like location, traffic management difficulties, and access of plant and heavy machinery, including associated easements.

15.3 The Scheme Promoter should also consider how assets like soakaways and off-highway crates storage areas will be replaced in the future and ensure there is enough area and easements to replace them easily and safely.

Survey Requirements

16.1 Where records of the existing highway drainage are not available, a drainage survey should be undertaken to determine the connectivity, line, level and outfall.

16.2 Guidance on selection of the appropriate drainage survey methodology is given in DRMB CD 535 Drainage Asset Data and Risk Management. Guidance on the specification of drainage surveys can be found in DMRB CS 551 Drainage Surveys.

16.3 The survey plans should be provided in both PDF and appropriate CAD format (typically .shp or .dwg) and photos and/or video evidence should be provided of chamber and pipe condition. A copy of the drainage survey data should be issued to HCC for their records.

16.4 Other surveys which may be required by HCC include topographic surveys, GPR utility surveys, ground investigation surveys, infiltration testing, and seasonally high groundwater levels.

Chapter 17
Planning Street Lighting & Illuminated Signs

Contents

Introduction

1.1 This chapter summarises Hertfordshire County Council's approach to street lighting, which is aimed at reducing energy consumption and carbon impact, light pollution, street clutter and operational costs, whilst continuing to support the local economy, maintaining safety and accessibility and assisting with the prevention of crime and disorder.

1.2 HCC achieves its aims through the application of a 'safe and operational' strategy for the management of its assets, the use of LED lighting and flexible lighting control through a Central Management System (CMS).

1.3 Due consideration should have been given to Hertfordshire's street lighting policy at the master planning stage as it is a potential influencer on the shape and form of the proposed development and streetscape.

1.4 Scheme Promoters shall identify the proposed illumination strategy for their development or scheme together with any intentions to use Special Design Apparatus (and may include solar and or wind powered lighting where appropriate) within their proposed Lighting Strategy accompanying the full planning application ready for LTP4 Compliance testing.

1.5 The location of street lighting apparatus within the verge, footway or urban realm can impact on the proposed Place & Movement functionality of the highway, so must be considered at the planning application stage to ensure that there will be adequate clearances to accommodate the intended uses.

1.6 Exceptions to the general lighting policy are summarised in Paragraph 12 below: Lighting within Areas of Special Importance.

Illumination Policy

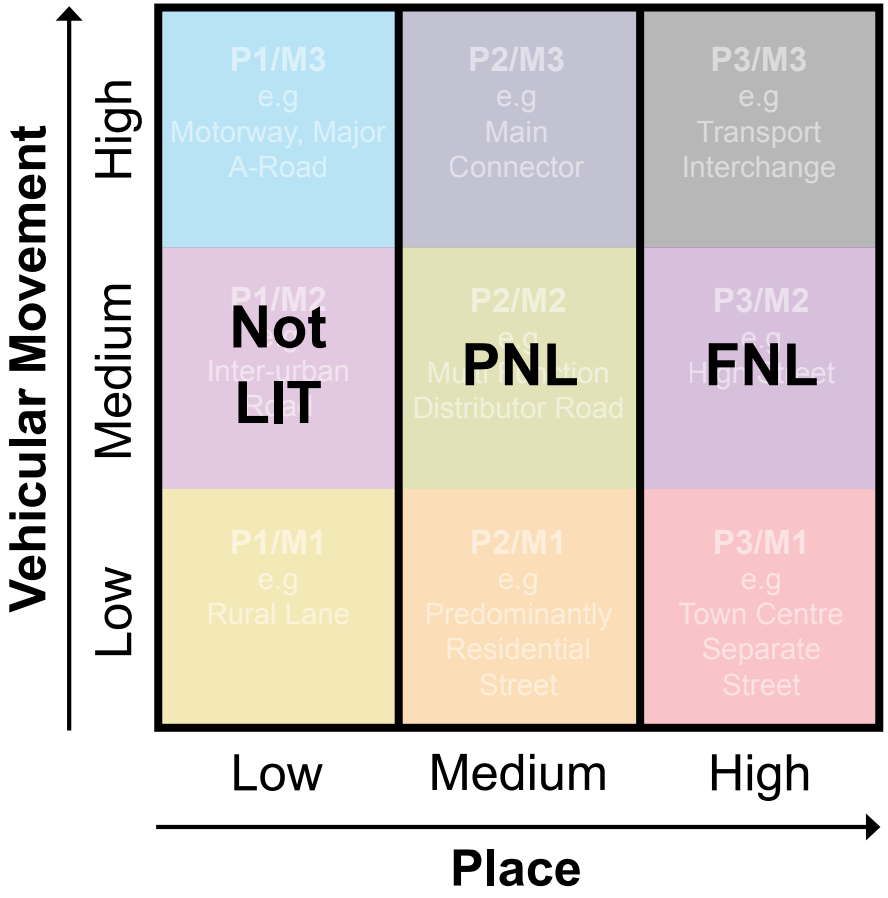
2.1 The highway is not to be illuminated unless in doing so it meets one or more of the criteria of maintaining safety and accessibility, supporting the local economy, or assisting with the prevention of crime and disorder. The illumination policy is subject to periodic review.

2.2 For safety purposes, major junctions, roundabouts, traffic calming, centre islands, pedestrian crossings, splitter islands, CCTV areas transport hubs and remote footpaths are likely to require full night lighting (FNL).

2.3 Requests for lighting to support crime prevention and to address disorder must be sanctioned by the local Chief Inspector from Hertfordshire Constabulary.

2.4 Highways in towns and villages are subject to Part Night Lighting (PNL) with staged dimming, unless they meet the exception criteria, in which case they are subject to full night lighting. Details and refinement of the Part Night Lighting (PNL) exception criteria are included in the reports to the HCC Highways and Transport Cabinet Panel meetings on 11 January 2011 and 15 March 2011. Copies available on the HCC website.

2.5 Subject to the exception criteria, the illumination strategy applies to the Place & Movement Categories as follows:



2.6 PNL is generally applied to new lighting schemes as follows:

- Switch on at dusk until 21.00
- Dim by 50% until 23.00
- Dim a further 30% from 23.00 until 01.00
- Switch off until 05.00
- Switch on at 05.00 and run until dawn, when required
- Must be designed to the requirements set out in BS5489

2.7 Full night lighting is lit to the requirements set out in BS5489 but dimmed by 25% between the hours of 23.00 and 06.00.

2.8 The lighting strategy for major improvements to the inter-urban network shall be considered as an influencing factor during the process of selecting the preferred route and agreed by HCC. Whilst the provision of street lighting and illuminated signs can be a small proportion of the overall capital cost of a major highway scheme, it is likely to be a significant proportion of the overall life cost of the highway scheme. Therefore, due consideration should be given to the interdependence between highway illumination, highway alignment, landscape design, maintainability, and materials specifications at that early stage, with the aim of minimising the whole life costs of the overall highway scheme.

2.9 There may be occasions where a proposed cycleway/ footway runs alongside the main carriageway, in this instance one source of lighting shall provide illumination for both the carriageway and cycleway/footway, with the lighting/dimming levels and operating periods dictated by the relevant hierarchy.

2.10 Where the cycleway/footway is remote from the carriageway, there may be more than one source of lighting which can be operated independently to satisfy the required lighting/dimming levels and operating periods.

2.11 If a cycleway or footway is sufficiently remote from a main carriageway the main carriageway may be unlit, but the cycleway or footway may be lit.

2.12 The illumination strategy shall be LTP4 Compliance tested at the full planning application stage

Illumination Strategy

LTP4 Compliance Test: Full Planning Application

The proposed illumination strategy supporting the full planning application demonstrates minimised energy consumption and carbon impact, light pollution, street clutter and operational costs, whilst continuing to maintain highway safety and accessibility, support the local economy and support the prevention of crime and disorder.

Third Party Lighting Systems

3.1 HCC is prepared to maintain and operate third party owned lighting on the highway on a rechargeable basis providing that the lighting assets comply with the requirements of this guidance and HCC's street lighting policy.

3.2 No additional street lighting installations are to be introduced to the existing highway network unless it becomes a statutory requirement, such as when a traffic calming scheme or junction improvement is introduced, or a safety requirement (i.e., as part of a specific casualty or crime reduction measure/scheme/ initiative) for example.

3.3 Hertfordshire County Councillors have the flexibility to use their Highway Locality Budget (HLB) to fund additional street lighting (including commuted maintenance sum for 25 years) on remote footpaths (defined as 5 metres or more from an adjacent carriageway) and may include solar and or wind powered lighting where appropriate.

3.4 HCC will consider converting part night lighting to full night lighting subject to the local chief police inspector confirming in writing it is necessary where there was an evidence-based nighttime crime issue.

3.5 Hertfordshire County Councillors have the discretion to extend the lighting hours from 01.00 to 02.00 and to dim the lighting by 50% between 05.00 and 06.00 within the PNL Regime, where there is a local justification for doing so for a particular street, route, or area within an urban or rural area.

3.6 "Local justification" would be based on destinations which operate until at least 02.00. Members would need to identify and evidence connections (that can be changed from 01.00 to 02.00 and to dim (suggested as by 50%) the lighting between 05.00 and 06.00) to and from such destinations.

3.7 The criteria where there is a local justification for doing so will be street(s), route(s), or area(s) (from A, B and C roads that are in Full Night Lighting) that provide connections to and from the following destinations which operate until at least 02.00:

- Transport Hubs - i.e., major railway stations and bus stations (there are currently 22 railway stations and 4 bus stations / coach interchanges within Hertfordshire which operate until 02.00).

- Hospitals and Emergency Services Headquarters - i.e., which operate a 24-hour 7 day a week emergency facility (there are currently 3 hospitals within Hertfordshire which operate on this basis).
- Places of Key Employment, Amenity, Entertainment and Leisure - i.e., significant organisations/ businesses and town centres within Hertfordshire which operate throughout the hours of darkness (i.e., night-time economy).

Street Lighting & Landscape Design

4.1 Landscape design should be considered in conjunction with lighting design to ensure that they complement each other, rather than conflict.

4.2 Vegetation (e.g. trees and hedges), in particular, should be selected and sited so as not to impair access to the apparatus door or the lighting effectiveness at ground level when it reaches maturity.

Column Design

5.1 Unless in an Area of Special Importance columns should be of tubular, galvanised steel construction and uncoated except at the root.

5.2 Columns should be designed and positioned to be capable of carrying a sign, rectangular in elevation, with a surface area of 0.3sq m for columns up to 5m in height and 0.6sq m for columns greater than 5m in height.

5.3 Columns located on remote footway or where there is no vehicular access shall be designed with a raise and lowering facility.

5.4 Columns should be located at the rear of the maintained highway within the footway wherever possible or positioned in the easement strip where no footway exists.

5.5 The clearance from edge of carriageway shall not be less than the minimum defined in the Table below.

Minimum horizontal clearance

20 mph	0.8m
30 mph	0.8m
40 mph	1m
50 mph	1m
60 mph	1.5m
70 mph	1.5m

5.6 Greater clearances may be required due to other factors such as passive safety risk assessments and the needs of the Place & Movement designation for accommodating the needs for pedestrians, cycling and other street furniture.

5.7 Columns should be arranged to avoid potential obstructions to those with a mobility impairment and to partially sighted users and be lined up with other existing street furniture unless detailed within a specific streetscape design.

5.8 Scheme promoters must consult property owners who will be affected by the siting of lighting columns next to their buildings prior to submitting their planning application.

Column Peripherals

6.1 Highway lighting columns may be designed or positioned to provide charging points for electric vehicles.

6.2 Lighting columns may need to be designed to support and power attachments such as festive lighting in towns and villages centres designated as Conservation Areas.

6.3 Similarly, some columns may be required to accommodate CCTV, ANPR, communications infrastructure, Banners, hanging baskets and the like.

6.4 Scheme promoters shall consult HCC regarding any requirement for such facilities and HCC shall co-ordinate the potential partners involved.

6.5 All non-HCC promoted peripherals shall be subject to a licence or legal agreement with HCC or a 'shared column' legal agreement.

Mounting Street Lighting on Buildings or Structures

7.1 Consideration should be given by designers to mounting streetlights on buildings or structures to overcome engineering difficulties or to maintain horizontal clearances on narrow footways.

7.2 Written consent for the mounting of lighting on their buildings or structures must be sought from the relevant property owners by the scheme promotor and presented to HCC at the time of planning application

7.3 Subsequently, formal wayleaves must be secured by the scheme promoter and passed onto HCC as a condition of the adoption of the works.

Lanterns

8.1 All lanterns shall be LED with electronic dimmable control gear and a suitable node to work with the HCC Telensa Central Management System (CMS) system must be fitted.

8.2 Lanterns should be coloured grey and fitted with the manufacturers' internal or external shields where appropriate

Brackets

9.1 All lanterns are to be fitted post top to columns with suitable reducers where required unless the designed location of the column requires a bracket.

9.2 The following Table indicates the maximum bracket projection by lantern mounting height.

Lantern mounting height	**Maximum bracket projection**
15m	2.5m
12m	2m
10m	1.5m
8m	1m
6m	Post top (no bracket)
5m	Post top (no bracket)

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Cabling

10.1 Street lights shall be fed through Distribution Network Operators (DNOs) where possible.

10.2 Supplies to illuminated signs and bollards should be obtained from the nearest lighting columns or feeder pillar via cables laid in 50mm diameter orange ducts

10.3 Earth rods should be installed at the end of each circuit of three or more columns/signs, and at the feeder pillar or column.

Illuminated Bollards & Signs

11.1 Careful highway scheme design shall first aim to avoid the need to install signs and bollards, where it is safe to do so and it does not compromise the overall feasibility of the scheme.

11.2 If this is not feasible, then non-illuminated signs and bollards shall be the second aim. See Part 3 Chapter 18 and Part 4 Chapter 17 for more information on non-illuminated signs and bollards.

11.3 Illuminated signs and bollards shall only be installed if necessary and the highway scheme shall be designed in such a manner that they are not prone to collision damage and be self-righting or rebound design where appropriate and may be solar powered where appropriate.

11.4 All illuminated signs and bollards are to use LED technology and be fitted with a Telensa node to control switching them on and off.

Lighting in Areas of High Place Importance

12.1 Exceptions to the general lighting strategy are considered within Areas of High Place Importance, which generally include the P3 Categories of the Place & Movement matrix, but also the Chilterns AONB, conservation areas, heritage towns and villages centres designated as Conservation Areas.

12.2 The lighting design to be used close to sites of wildlife conservation value or near known populations of rare species shall be determined through early consultation with HCC.

12.3 Replacement lighting or additional lighting necessitated by local highway changes within heritage towns or village centres will need to be sympathetic to the ambient lighting regime and may require a deviation from the general requirements set out in the rest of this guidance. In such circumstances early consultation with HCC is required.

12.4 Proposed columns and lanterns and their colour should be supplied in the specific colour during the design briefing with HCC.

12.5 HCC's 'Safe & Operational' strategy does not allow for the funding of painting and repainting of columns out of its core maintenance budgets other than for columns in Conservation Areas.

12.6 Scheme promotors will be required to fund the ongoing re-painting requirements through a funding agreement, which may be in the form of a commuted sum payment.

12.7 HCC has a palette of 'off the shelf' heritage style columns and lanterns which it uses within Conservation Areas and heritage towns and villages centres designated as Conservation Areas, which already have a heritage lighting regime.

12.8 HCC will adopt and maintain such matching Special Design Apparatus (including shields where applicable) within this palette subject to the payment of a commuted sum.

12.9 HCC is also prepared to consider innovative arrangements (e.g. may include solar and or wind powered lighting where appropriate) for the provision, maintenance and operation of bespoke street lighting regimes in P3 Category Areas, the creation of strategic settlements or the regeneration of strategic sites providing that they are at no net extra cost to HCC over the whole life of the assets when compared to the costs of a scheme conforming to the requirements set out in PMPDG and they create no extra carbon impact.

12.10 The contribution to Local Character and Heritage shall be LTP4 Compliance tested at the full planning application stage.

Lighting in Areas of High Importance
LTP4 Compliance test: Full Planning Application

The lighting policy proposes a lighting design and use of Special Design Apparatus that protects, preserves and enhances the understanding and enjoyment of both the tangible and intangible aspects of Hertfordshire's heritage and archaeology in areas of High Place Importance.

Whole Life Management Plan

13.1 The first draft of the Whole Life Management Plan will be required at the Planning Application stage setting out broad proposals as to who is going to own the proposed street lighting assets, who is going to maintain and manage them and how they are going to be funded.

Adoption Requirements

14.1 Scheme Promoters should ensure that their street lighting advisors and contractors are good ‘completer finishers’ and will readily comply with the requirements to provide all the documentation and certificates detailed in Part 4 in a timely manner.

14.2 Scheme Promoters should note that design approvals and adoption shall not take place without full compliance.

14.3 The Scheme Promoter should note that they shall be responsible for all energy and maintenance charges until the date of adoption.

14.4 The scheme promoter shall obtain connection, unmetered and meter supply agreements for energy supplies.

Chapter 18
Planning Signs, Road Markings and Studs

Contents

Introduction

1.1 This Chapter provides guidance on the planning for road signs and markings through the development of a Signage Strategy Plan. It should be read in conjunction with HCC's Highway Signing Guidance as at Highway Signing Guidance WCS-N-068 - HCC (hertfordshire.gov.uk)

1.2 This guidance aims to:

- Promote the efficient working and enforcement of traffic regulations.
- Aid traffic control.
- Aid road safety.
- Reduce visual intrusion by choosing sign location and method of erection appropriate to the context and setting.
- Avoid unnecessary sign clutter.

1.3 Traffic signs must give highway users relevant information clearly and at the right time.

1.4 Any signage erected on a new road needs to be consistent and needs to consider the local context.

1.5 Limiting the number of types of sign available assists in their quick recognition as does consistency of shape, colour, and lettering. Consistency of design alone however is not enough; there must be consistency in their use, location, and illumination.

1.6 The types of signs and carriageway markings available for use are governed by the Department for Transport (DfT) and specific legislation (Traffic Signs Regulations and General Directions (TSRGD)).

1.7 Signing on the Strategic Road Network (SRN) (previously known as the Motorways and Trunk Roads Network) is the responsibility of National Highways (NH).

1.8 HCC is responsible for signing on the non-Strategic Roads within the public highway network.

1.9 Street naming, house numbering, supplying, and maintaining nameplates are the general responsibility of Hertfordshire's district and borough councils.

1.10 The general provision and maintenance of on-street parking signposts and plates are also the responsibility of Hertfordshire's district and borough councils

1.11 The Scheme Promoter shall obtain the approval of HCC for the signing and lining regime proposed.

1.12 The Scheme Promoter shall be responsible for the cost of introducing new signage and changing any of the existing signs and road markings that are required by HCC or the district and borough councils resulting from their scheme.

1.13 Detailed guidance for the selection, design and implementation of signs and road markings is contained in Part 4 Chapter 17.

Signing Strategy Plan (SSP)

2.1 Scheme Promoters should complete a SSP and gain agreement from HCC before starting the detailed design of any signage or road marking scheme. The scope and detail of the SSP should be proportionate to the impact of the proposals on the network. Details of what an SSP should contain are given in 2.9 below and in Part 4 Chapter 17.

2.2 Clear and effective signing is essential for all network users, vehicle users, equestrians, cyclists, and pedestrians alike. Signing is important for the economy, especially tourism, but ill-considered use of signs can result in unacceptable street clutter to the detriment of users and the local environment.

2.3 The SSP should aim to encourage active travel modes in support of LTP4 Policy 1: Transport User Hierarchy, Policy 6: Accessibility, Policy 7: Active Travel - Walking and Policy 8: Active Travel - Cycling by ensuring that local routes and destinations for them are appropriately way-marked.

2.4 In accordance with LTP Policy 21: Environment, the SSP should aim to:

- Minimise the visual intrusion of highway signage and number of signs to avoid clutter and reduce existing clutter, which will also minimise future maintenance costs.

- Minimise light pollution, energy consumption and maintenance costs from signage illumination by ensuring that signs shall be illuminated only if required in accordance with the current TSRGD.
- Preserve the local character and, where appropriate enhance the built environment

2.5 Signage should be provided to encourage HGVs to use the Primary Route Network in accordance with Policy 16: Freight and Logistics, where relevant.

2.6 The need to highlight hazards with signage, road markings (and coloured surfacing) shall be considered as the last resort when designing new or improved highways. The aim shall always be to avoid or design out the hazard at the outset.

2.7 To support the LTP4 Policy objectives:

- All inter urban routes for active travel modes that contribute to the overall transport network shall be signed.
- A leisure route will not normally be signed unless assurance is needed to be given to the users on that route, because routes often overlap and a proliferation of signs would result. These routes will normally be promoted through leaflets/ guides.
- It is important that Rights of Way are signposted and accurately waymarked as this gives users and landowners/ occupiers increased confidence in the network and its use.
- Wherever possible signs will be erected on existing poles, suitable street furniture, on walls, or on structures with the owners' permission and legal wayleave.
- Signposts and sign backs will need to be an agreed 'conservation' colour when erected in conservation/ environmentally sensitive areas.
- The district or borough council (specifically conservation officers) shall be consulted on proposals to place signs near listed or historic buildings.
- When locating signs, account shall be taken of the likely growth in vegetation to ensure that signs will always be visible without the need to carry out regular trimming.
- The needs of those footway and footpath users with disabilities shall be considered when designing and locating all types of signing.
- Mounting heights, orientation, location, type of post, post spacing will all need consideration in deciding on the best option for any sign installation.

- Signs shall only be illuminated if required by the Traffic Signs Regulations and General Directions (TSRGD)
- Flat, self-righting, and other retro reflective and other non-illuminated bollards, complying with the appropriate British Standards, may be erected under general powers, so long as they do not incorporate a traffic sign.
- Road markings are required to be of high durability given HCC's operations & maintenance policies
- Full stud provision is required where new roads will not be in full night lighting.

2.8 The development of the SSP should be undertaken in conjunction with the development of the landscaping strategy and geometrical cross-section. All should complement, rather than compete against each other. For example, the highway verge should be sufficiently wide enough locally to provide adequate sightlines, vegetation planting, features such as swales (if appropriate) and the provision of an Advance Direction Sign (ADS) ahead of a junction, without compromise.

2.9 The final SSP should contain the following:

- **Existing signing and road layout** - Following a full survey of the existing road and signing layout which should be carried out prior to design, at any location where existing signing may be affected by the highway improvements. This should include the location of existing signs, type and location of power supply and sign measurements where appropriate.
- **Types of signs to be used** - The Scheme Promoter should propose the appropriate type and approximate sizing of sign for each circumstance, for HCC's approval. This should include a written explanation as to why the sign/marking is proposed to be installed considering all the points in the two chapters in the PMDG.
- **Route destination planning** - Having consulted HCC when determining the destinations to be signed and any abbreviations used.
- **Continuity of signing** - Maintaining continuity of routes and consistent messaging style between new and existing signing in an area affected by a new signing scheme. This may involve consultation with neighbouring authorities
- **Proposals for the reduction of environmental impact and sign clutter/proliferation** - Minimising any physical and visual obstructions to motorists, pedestrians, and cyclists, and ensuring that maintenance issues are kept to a minimum. The best use of existing posts and signs and a minimum number of new posts and signs should be proposed. This may involve the combination of signs onto one sign face (where permitted under TSRGD). Too many

signs can lead to sign blindness where users are unable to process all the information that is intended to be delivered to them.

- **Consideration of HCC's illumination policy** - which will influence road stud design, the requirements for illuminated vs non-illuminated signs and requirements for power supplies
- **Hazard mitigation** - Proposals for how hazards are to be mitigated with signs, road markings or coloured surfacing, demonstrating that it is not feasible to avoid or design out those hazards by other means.

2.10 The Scheme Promoter will have laid the foundations for a SSP during the Master Planning stage by virtue of considering the proposed Place & Movement functions within the development, connectivity to the local network and any proposed changes to the functions of the local highways network

2.11 By the time a planning application is submitted the SSP should have been developed sufficiently to demonstrate:

- Routes and destinations for all modes reflecting those proposed Place & Movement functions within the development, connectivity to the local network and any proposed changes to the functions of the local highways network.
- Proposals for approximate signage and signpost sizes and positions within the development can be accommodated within the planning 'red line' and proposed amendments to signage on the existing highway are feasible.
- Consideration of environmental impacts such as illumination, use of materials, clutter avoidance and maintainability (e.g. large signposts may require periodic structural testing and use of post retention sockets)
- Consideration of hazards and evidence of hazard mitigation
- Maintainability and Sustainability.

Route and Destination Planning

3.1 The Scheme Promoter shall consult HCC when determining the destinations to be signed and any abbreviations used as continuity must be maintained between new and existing signing.

3.2 Hertfordshire currently has 456 settlements comprising of ten or more households (represented by Ordnance Survey Address-Point Data filtered to give only residential records). Depending on specific factors these settlements can be categorised into Primary Destinations, Main Towns, and Important Rural Settlements.

3.3 DfT provides a national list of Primary Destinations which are linked by the Primary Route Network (PRN).

3.4 HCC uses population data to determine whether a settlement is a Main Town or Important Rural Settlement. The current population figures are based on Office for National Statistics (ONS) 2007 Mid-Year Population Estimates, on a pro-rata basis using data at Census Ward level. Boundaries are semi-arbitrary, but follow logical, rule-based guidelines relating to land-use, and have no official status.

3.5 Therefore, destinations can be categorised as follows:

- Primary destinations: designated in Traffic Signs Manual - Chapter 2.
- Non-Primary destinations: cities not designated as primary destinations, Main Towns, Important Rural Settlements, other rural settlements, and local destinations (i.e., industrial estates, hospitals, schools etc.)
- Tourist destinations

3.6 Primary destinations accessed via the PRN A roads are generally indicated on the road by signs with a green background. Motorways, which form part of the SRN, a subsection of the PRN, are indicated by signs with a blue background.

3.7 Non-Primary destinations accessed via the local roads network are generally indicated on the road by signs with white backgrounds.

3.8 The network of Main Towns and their associated routes, in conjunction with the PRN provide a suitable navigational network for visitors.

3.9 The following types of directional signs are available for use:

- Advance Direction Signs (ADS) - A sign placed in advance of the junction giving road users information about the route ahead.
- Local Advance Direction Sign (LADS) - A sign placed in advance of a junction (or in addition to the ADS) giving a driver information relating to local destinations. This can take the form of a map type or stack type sign.
- Flag Direction Signs (FDS) - This is a sign placed at (not before) a junction for the benefit of turning traffic.
- Route Confirmatory Signs (RCS) - This is a sign placed after (usually a major) junction which gives confirmation and often additional information about the route ahead.
- Tourist Signs (TS) - These are signs that provide route information for tourists to approved destinations. Tourist signs can take the form of any of the above or can be included on any of the above as a brown patch.
- Variable Message Sign (VMS) - These are signs capable of displaying alternative legends including pictograms appropriate to changing circumstances.
- Finger-Post Sign (FPS) - These are small flag or wooden square end signs erected on one post at a road junction. (Usually in rural locations or conservation areas).

3.10 Consideration should be given to the signing of area names where it is felt that many small destinations can be signed to one area before being signed separately.

3.11 HCC shall be consulted as to the naming of any such area where a name does not already exist.

3.12 In general, smaller destinations located within larger areas that are individually signed, should only have signing provided when the larger area has been reached or when the route to the smaller destination deviates from the focal point of the larger destination.

3.13 HCC receives many applications for directional signing to individual locations at the same time as the number of traffic signs required by legislation or for safety or route direction has been increasing.

3.14 To limit the proliferation of signs within the highway boundary, HCC no longer approves signs to individual locations except in very exceptional circumstances.

Primary Destinations

4.1 The Primary Destinations in Hertfordshire are set out in the HCC Network Management Strategy 2023. Until it is made available on the HCC website the version endorsed by councillors is at Highways & Transport Cabinet Panel (hertfordshire.gov.uk).

4.2 HCC provides directional signage for several Primary Destinations in counties bordering Hertfordshire to aid navigation as set out in the HCC Network Management Strategy 2023. Until it is made available on the HCC website the version endorsed by councillors is at Highways & Transport Cabinet Panel (hertfordshire.gov.uk).

4.3 If a destination happens to lose or gain Primary Destination status, then the signing will be reviewed in conjunction with these changes.

4.4 Regional and Special Destinations may also be used, examples are set out in the HCC Network Management Strategy 2023. Until it is made available on the HCC website the version endorsed by councillors is at Highways & Transport Cabinet Panel (hertfordshire.gov.uk).

Main Towns

5.1 Main Towns, as identified by HCC, are important locations on A or Broads (HCC Urban/Rural Main and Secondary Distributors).

5.2 HCC defines a Main Town as any settlement with approximately 10,000 or more residents that is not already a DfT stipulated Primary Destination.

5.3 Hertfordshire's Main Towns are set out in the HCC Network Management Strategy 2023. Until it is made available on the HCC website the version endorsed by councillors is at Highways & Transport Cabinet Panel (hertfordshire.gov.uk).

Important Rural Settlements

6.1 HCC defines Important Rural Settlements as any settlement with between approximately 4,000 and 10,000 residents.

6.2 These destinations tend to be located on B, Classified unnumbered (sometimes referred to as C roads) or Unclassified roads (HCC Urban/Rural Secondary and Local Distributors and Access Roads).

6.3 Hertfordshire's Important Rural Settlements are set out in the HCC Network Management Strategy 2023. Until it is made available on the HCC website the version endorsed by councillors is at Highways & Transport Cabinet Panel (hertfordshire.gov.uk).

6.4 The list in the Network Management Strategy will be kept under review as an Important Rural Settlement may be elevated to Main Town status because of planned growth. Signage will need to be adjusted accordingly.

Other Rural Settlements

7.1 Other Rural Settlements are any settlements with approximately 4,000 residents or less and because of their size or location, may generate a reasonable level of traffic requiring direction.

7.2 Other Rural Settlements tend to be located on B, Classified unnumbered (sometimes referred to as C roads) or Unclassified roads (HCC Urban/Rural Secondary and Local Distributors and Access Roads).

7.3 Other Rural Settlements will not be signed as forward destinations but may be signed as destinations from the junction with the nearest B road or, where there is no B road in the vicinity, or where the most appropriate traffic route is clearly from an A road, they may be signed from the A road.

Signing Local Facilities for Active Travel Modes

8.1 The following local facilities should be signed for active travel modes within town centres:

- Transport hubs (including bus and rail stations)
- Hospitals, specifically Accident & Emergency centres, local general hospitals, General Practitioners (GPs), Urgent Care Centres and clinics (but not private hospitals, nursing homes)
- Visitor attractions and facilities (e.g., parking facilities, tourist information centres and information boards, walks)
- Public leisure and sport facilities (e.g., concert halls, museums, and sports centres, public parks).
- Concentrated areas of single land use (e.g., industrial estates, science parks, town centres, neighbourhood shopping areas, retail parks, standalone out-of-town superstores greater than 10,000 m2
- Public buildings such as toilets, libraries, council offices etc.
- Police and fire stations.

8.2 Such facilities shall be signed from the boundary of the built-up area in which they are situated if they are not within the town centre.

8.3 Sufficient directions and way points should be provided to enable users to find their way back.

8.4 Shared pedestrian and cyclist routes should share signs when the destination is within walking distance (one mile) by adding the pedestrian symbol to the cycling sign to minimise street clutter.

8.5 Direction signs for active travel modes should include distances.

Signing Local Facilities for Non-Active Travel Modes

9.1 With the exception of transport hubs, the destinations listed above shall only be signed for non-active travel modes if they have car-parking facilities and are open to the public without prior membership, pre-booking or other entry restrictions.

9.2 If parking facilities are not available, the nearest car park should be signed, and pedestrian signing provided from the car park.

9.3 Local direction signs will not be provided for non-active travel modes where an establishment qualifies for brown on white tourist attraction signing.

9.4 Equal consideration should be given to clearly signing exit routes from town centres and their local facilities.

Special Signage

10.1 Guidance for the following special signage can be found in Part 4, Chapter 17:

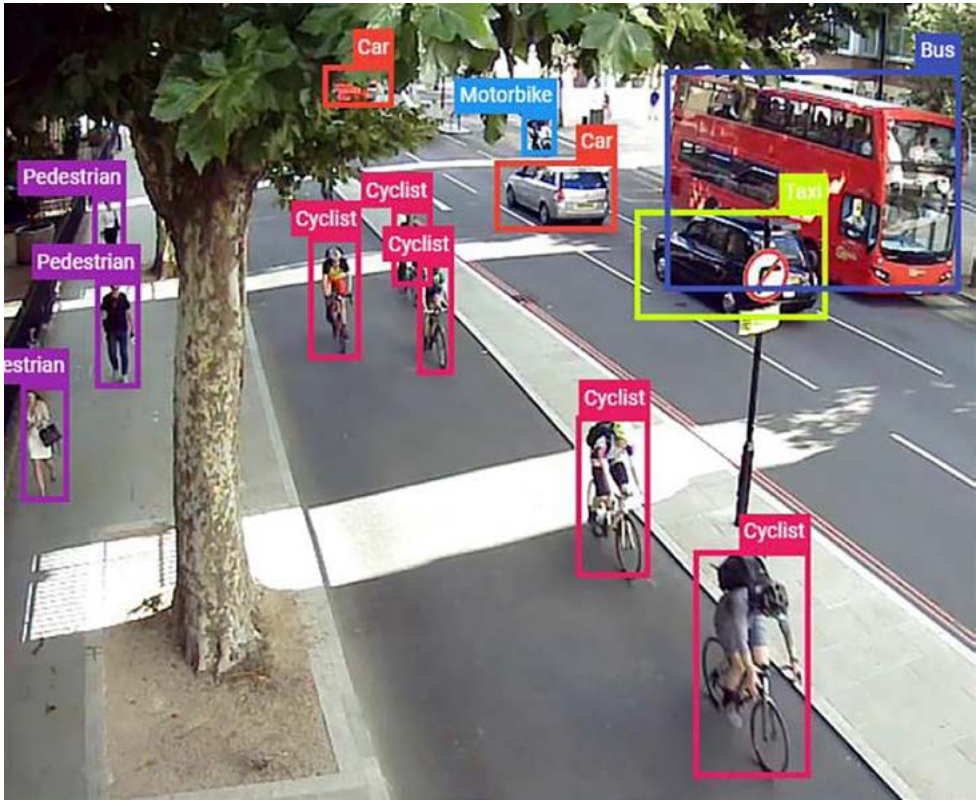
- Tourist Signs
- Town & Village Signage
- Advertising & Permitted Posters
- Electric Vehicle (EV) charging points
- Heritage Signage
- Memorials & Shrine
- Mirrors
- Temporary Signs

Chapter 19
Planning Intelligent Transport Systems

Contents

Introduction

1.1 This Chapter sets out HCC's approach to the planning for Intelligent Transport Systems (ITS) guided by its LTP4 policies and the need to be future ready.



1.2 HCC's vision for travel is that 'SMaRT Journeys' will be made by Informed Travellers - Online, On Street and On the move.

1.3 The term 'SMaRT' means that journeys will be:

- **S**afe
- **M**anaged &
- **R**esponsive through effective use of
- **T**echnology

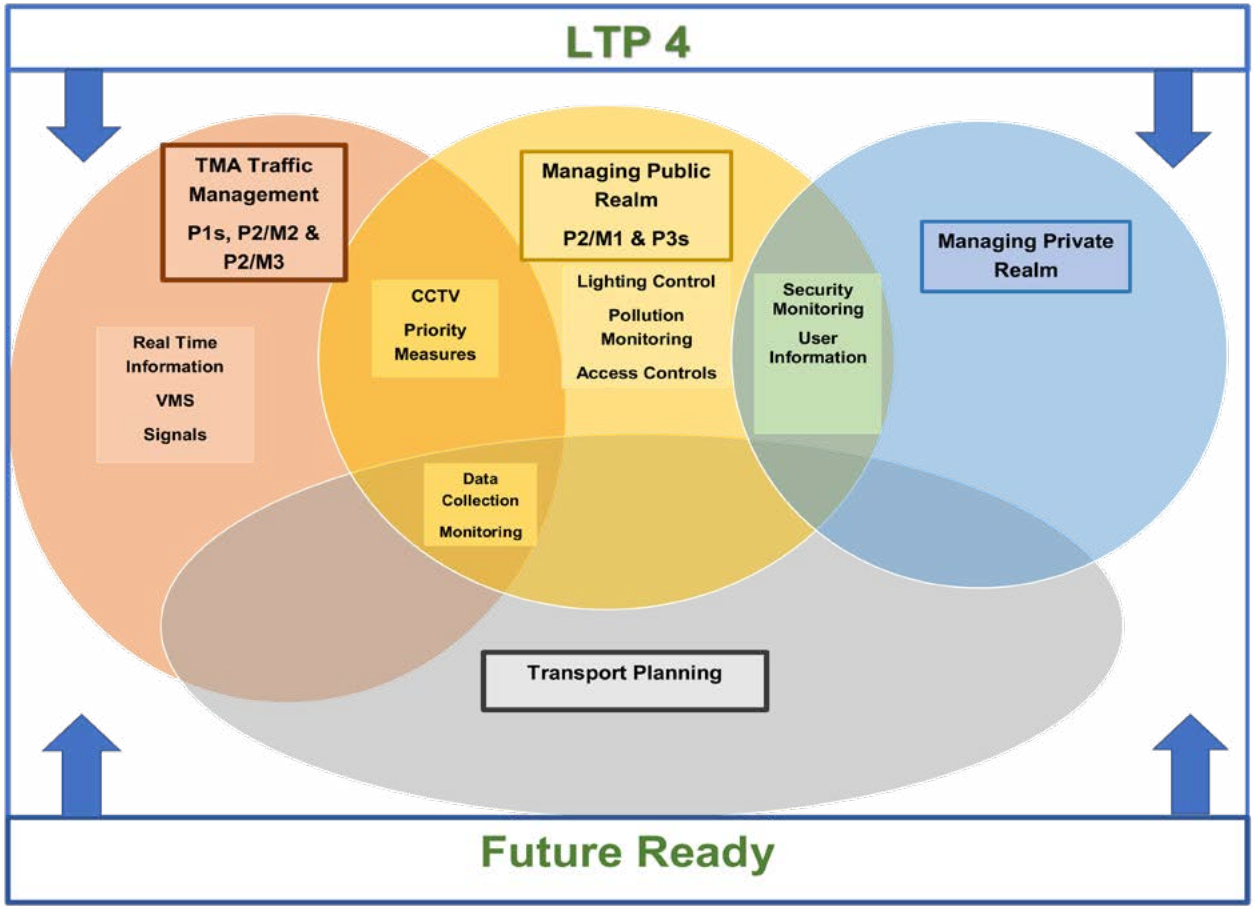
ITS Objectives

2.1 The use of Intelligent Transport System (ITS) technology will meet the needs and requirements of the widest range of travellers, optimising the quality of their single mode and multimodal journeys in a safe and efficient way by:

- Improving highway network management for all users through dynamic, responsive traffic management, including managing, controlling, and enforcing access to Active Travel Links and Sustainable Travel Links.
- Assisting in the rapid and effective response to incidents, thereby minimising disruption to the transport network.
- Improving road safety, by reducing collisions, casualties, and deaths through the provision of speed and traffic management information and controls.
- Providing better travel and traveller information, helping to match supply and demand by providing better information, so that travelers can make informed choices on when and how to travel.
- Improving passenger transport by enabling more reliable, more accessible, safer, and more efficient services.
- Supporting the efficiency of the road freight industry through dynamic routing information and by investigating innovative solutions to the movement of goods.
- Improving air quality locally by managing movement networks that keeps traffic moving, incentivises the use of passenger transport, alongside systems that facilitate the use of low emission vehicles.
- Reducing energy use and the impacts of carbon through the dynamic management of street lighting and enabling the use of low emission vehicles.
- Supporting security, crime reduction and emergency planning measures for the public realm and for those accessing to and from the private realm.
- Collecting multi-modal transport data in real-time to assist in transport planning and scheme design.
- Monitoring effectiveness of transport measures that were introduced to mitigate the impact of a development and assisting in the identification of any further mitigation measures required.

- Supporting the undertaking of Climate Change Adaptation and Resilience risk assessments to influence the location, scale, and specifications of interventions on the movement network.
- Helping protect and preserve transport assets enabling them to retain serviceability.
- Monitoring asset performance to optimise their operation and their lifecycle.

2.2 The collection and analysis of data from ITS is fundamental to planning for transport and travel and for improving ongoing operations.



2.3 ITS will support HCC's Network Management Duty under the Traffic Management Act 2004 for the safe expeditious movement of traffic along high movement, low place P&M corridors, whilst providing priority measures for passenger transport and safe crossings for active travel modes in accordance with HCC's Network Management Strategy.

2.4 Consideration should be given to the introduction of Green Person Authority and 'vehicle platooning' to assist active travel modes.

2.5 Within the public realm of high place importance, ITS will enable safe and convenient active travel with cleaner air and less noise through controlling access for motor vehicles.

2.6 At Transport Hubs ITS will be key to providing real time passenger information and enabling digital integration of transport services and modes through smart ticketing or Mobility as a Service solutions.

Integrated Transport Control Centre (ITCC)

3.1 Hertfordshire County Council's ITCC provides a state-of-the-art facility, co-ordinating responses during major travel incidents and severe weather as well as monitoring the daily operation of HCC's highway network and, in doing so, keeps road users well informed and traffic moving.

3.2 The ITCC manages defined strategic diversion routes with National Highways and other stakeholders and consider implementing specific plans and communication methods such as VMS (mobile included) at decision-making nodes to control traffic by means of pre-programmed 'emergency' message sets. Pre-planned diversion routes and event signing plans will be made available so the ITCC can implement control interventions based on agreed protocols.

Current Systems

4.1 HCC has a range of proprietary systems in current, or recent usage as follows:

- SCOOT
- MOVA
- Automatic Traffic Counters (ATC)
- Automatic Number Plate Recognition Cameras (ANPR)
- Closed Circuit Television Cameras (CCTV)
- Vehicle Activated Signs (VAS)
- Variable Message Signs (VMS)
- Parking Guidance System - variable message signs that indicate car park space availability and direct to alternatives when full (PGS)
- Real Time Passenger Information (RTPI) systems
- Electronic Passenger Information Systems (ePIPS)
- Select Vehicle Detection (SVD)
- Rising Bollards
- Signal Control Access
- Automatic Vehicle Location (AVL)
- Over-height Vehicle Signs
- Bluetooth/Wifi Journey Time systems
- VivaCity sensor networks, which provide real-time data including speeds, travel times and vehicle counts across zones, whilst distinguishing different travel modes.

4.2 Some of these systems will be phased out as their technologies become superseded, or their function becomes redundant.

4.3 Many of the current systems use bespoke data formats, platforms and communications.

4.4 The LTP4 and ITS Strategy drivers for the current systems are set out in Appendix A below.

Camera Enforcement

5.1 To meet the needs of road users in accordance with the priorities set by the LTP and the appropriate place and movement functions of the network, some parts need to be reserved for certain road users at the exclusion of others and elsewhere traffic may need to be managed pro-actively to ensure it moves safely and efficiently. Pro-active enforcement through unattended camera is necessary at some locations to ensure that the local traffic management objectives are achieved. Details can be found in the following guides:

- Hertfordshire County Council's Approach to Bus Lane and Bus Gate Unattended Camera Enforcement
- Hertfordshire County Council's Approach to Enforcement of Moving Traffic Contraventions

5.2 All designs of bus lanes and gates and sites which are eligible for camera enforcement of moving traffic contraventions shall make passive provision for enforcement apparatus. The degree of provision shall be based on the probability of need for immediate enforcement as agreed with HCC.

5.3 Monitoring apparatus shall be provided as part of the implementation of developments where it is envisaged that enforcement will be required from the near outset.

Planning for ITS

6.1 HCC plans to adopt systems that use open data, compatible platforms and common communication systems.

6.2 For the immediate term, HCC may require some proposed ITS infrastructure to be wholly compatible with those proprietary systems currently in use.

6.3 Given the rapid revolution in transport technology and transport systems technology, this guidance does not set out any detailed requirements, or specifications, but the following key principles shall be followed.

6.4 ITS proposed for mainstream use shall be:

- Discussed with HCC at its inception
- Remotely accessible, preferably using non-propriety systems, and communicate in real time with already established HCC systems or at minimum with systems being used by the equipment operator if this is not HCC
- Capable of generating data that can be made accessible in an open, machine readable format to HCC, using non-propriety systems, and preferably in real-time.

- Interconnected, or be interoperable, with HCC's other Intelligent Transport Systems to enable the benefits from integration to be enjoyed.
- Follow current national standards, specifications and guidelines and it is the responsibility of the scheme promoter to check that this is the case.
- Subject to a formal Road Safety Audit (as per Part 1, Chapter 9 of this guidance).

6.5 Network sensors with the functionality to provide real-time data including speeds, travel times and vehicle counts across zones, whilst distinguishing different travel modes are likely to be required to monitor the effectiveness of the transport measures that were proposed to mitigate the impact of a development. The operation, maintenance and provision of data will be the responsibility of the Scheme Promoter until highway adoption.

ITS and Innovation

7.1 HCC is keen to work with industry partners or Scheme Promoters to innovate.

7.2 Innovative data collection and ITS technologies should be piloted on a small scale before being mainstreamed across the county.

- Piloting innovative technologies on a small scale can help to develop the evidence and learnings to minimise future maintenance liabilities (as far as possible) when scaled up across the county.
- Sharing the outputs from these innovative experiments can support a wider group of stakeholders across Hertfordshire to benefit from HCCs experience deploying innovative solutions in a real-world environment.
- Successful elements of tests and experiments can provide benefits to many other stakeholders who are seeking to achieve similar objectives. Collaboration between HCC and these stakeholders can create a route to scale solutions and services.

7.3 The introduction of innovative data collection and ITS technology on HCC highway infrastructure and assets should be supported by HCC if the uses for the data are clearly established and demonstrated to align with LTP4 policies including those associated with air quality, social trends and community feedback.

- Innovations in the field of transport and mobility data collection are providing various tools which can capture more granular, representative and real-time data which has previously inaccessible to Local Authorities.
- Sensors (including smart phones) and IoT devices are primary sources of mobility data which is used to support designers, planners and network managers deliver services across Hertfordshire. In some cases, these technologies need to be installed on Highway infrastructure.
- The financial liability, engineering and legal issues associated with the deployment of sensors onto HCC infrastructure and assets by third parties (e.g. street lighting columns) need to be addressed through Memoranda of Understanding (MoUs) and contracts.
- Establishing business cases before deploying sensors can demonstrate how the outputs from the technology will be used to deliver real value to avoid investment in assets which do not deliver value for money.

7.4 Innovative data science skills and tools (including machine learning, spatial analysis, visualisation) will be used by HCC to develop new tools, insights and evidence from new and existing data to support LTP4 objectives and the sustainable movement of people and goods.

- Emerging data science skills can support network planners, designers and operators to capture more value from our data by enabling a deeper understanding of interactions between people, transport and the environment, including:
- Monitoring, predicting and evaluating interactions between all road users - pedestrian, cyclist, public transport and vehicle (passenger and freight).
- Travel movements and behaviours in response to live incidents, congestion, weather and other variables.
- Where to locate new mobility services e.g. shared bikes, mobility hubs, digital wayfinding and navigation infrastructure.
- More efficient and safer traffic control systems.

7.5 HCC encourages its providers, passenger transport operators and other stakeholders to use and promote the provision of open data.

- The provision of open data can enable greater levels of cross organisational collaboration to solve strategic urban and rural challenges across the county.
- Providing open data to students and other third parties through hackathons (meetings to engage in collaborative IT problem solving) can leverage additional support to innovate.

7.6 To support cross organisational collaboration on Future Mobility projects, HCC must be able to effectively share anonymised data between project partners.

- A Data Trust or MoU can enable data provide data owners with reassurance regarding ownership of data and IP outputs from its use.
- A Data Trust can protect personal data by using a hierarchical permissions structure for the original data owner to control access.

7.7 Users of the network in Hertfordshire should have access to real-time travel data, information and tools to reliably predict and plan travel times across all modes of transport, both prior and during trips.

- Tools to communicate this data should include a mixture of smart phone devices (Elgin, Citizen Lab, Travel A.I), wayfinding/navigation infrastructure, (real-time) digital signage and other tools.
- The provision of reliable and real-time data to people travelling on the network can improve journey reliability, attractiveness and accessibility. It can also enable a shift to more sustainable modes of transport:
- By providing this data and information to passenger transport and active travel users, HCC can enable a modal shift to more sustainable modes of transport by enabling quicker and more informed decisions to be made before and during trips on the network.
- As new mobility services come online, these tools can ensure the full value of services such as Mobility as a Service and shared bike and e-scooter schemes are captured by communities across Hertfordshire.

Appendix A
Current ITS Systems & Functionality and their relationship to LTP4 and ITS Strategy

Place

ITS Strategy Objectives	LTP4 Policy Drivers	Current Systems
Improve air quality locally by managing movement networks that keeps traffic moving, incentivises the use of passenger transport, alongside systems that facilitate the use of low emission vehicles.	19: Emissions 20: Air Quality	• Telensa air quality monitoring technology proven, but not yet pursued
Reduce energy use and the impacts of carbon through the dynamic management of street lighting and enabling the use of low emission vehicles.	19: Emissions	• Part night street lighting, dimming & trimming via Central Management System • Telensa adaptive lighting technology proven, but not yet pursued
Support security, crime reduction and emergency planning measures for the public realm and for those accessing to and from the private realm.	18: Transport Safety & Security	• Closed Circuit Television Cameras (CCTV) • Rising Bollards

Movement

ITS Strategy Objectives	LTP4 Policy Drivers	Current Systems
Improve highway network management for all users through dynamic, responsive traffic management, reflecting the LTP 4 User Hierarchy, including managing and controlling access to Active Travel Links and Sustainable Travel Links.	1: User Hierarchy 12: Network Management 15: Speed Management	• SCOOT • MOVA • Automatic Number Plate Recognition Cameras (ANPR) • Parking Guidance System (PGS) • Rising Bollards • Signal Control Access • Select Vehicle Detection (SVD)
Assist in the rapid and effective response to incidents, thereby minimising disruption to the transport network.	12: Network Management	• Variable Message Signs (VMS) • Integrated Traffic Control Centre (ITCC)
Improve road safety, by reducing collisions, casualties and deaths through the provision of speed and traffic management information and controls.	15: Speed Management 17: Road Safety	• Vehicle Activated Signs (VAS) • Variable Message Signs (VMS)
Provide better travel and traveller information, helping to match supply and demand by providing better information, so that travelers can make informed choices on when and how to travel.	6: Accessibility 9: Buses	• Real Time Passenger Information (RTPI) systems • Electronic Passenger Information Systems (ePIPS)

ITS Strategy Objectives	LTP4 Policy Drivers	Current Systems
Improve passenger transport by enabling more reliable, more accessible, safer and more efficient services.	9: Buses	• Automatic Vehicle Location (AVL) • Rising Bollards • Signal Control Access • Select Vehicle Detection (SVD)
Support the efficiency of the road freight industry through dynamic routing information.	16: Freight and Logistics	
Collect multi-modal transport data in real-time to assist in transport planning and scheme design.	2: Influencing Land Use Planning 5: Development Management 23: Growth & Transport Plans	• Automatic Traffic Counters (ATC) • Bluetooth/Wifi Journey Time systems • Vivacity sensor networks
Monitor effectiveness of transport measures that were introduced to mitigate the impact of a development and assist in the identification of any further mitigation measures required (potentially funded through a secured Monitor & Manage fund).	5: Development Management	• Vivacity sensor networks
Support the undertaking of Climate Change Adaptation and Resilience risk assessments to influence the location, scale and specifications of interventions on the movement network. Factors to include: • Precipitation • Temperature (both seasonal average and extremes) • Wind • Lightning • Soil conditions	14: Climate Change Network Resilience	• Icelert for winter service

Asset

ITS Strategy Objectives	LTP4 Policy Drivers	Current Systems
Help protect and preserve transport assets enabling them to retain serviceability.	22: Asset Management	• Over-height Vehicle Signs • Vehicle Activated Signs (VAS)
Monitor asset performance to optimise their operation and their lifecycle.	22: Asset Management	• Telensa gully silt monitoring technology proven, but not yet pursued