



An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

ROADS Services Training Group

LOCAL AUTHORITY ROADS CONFERENCE and EXHIBITION - 2019

Lyrath Estate Hotel, Kilkenny, May 2019.

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Design Manual for Urban Roads and Streets (Updates)

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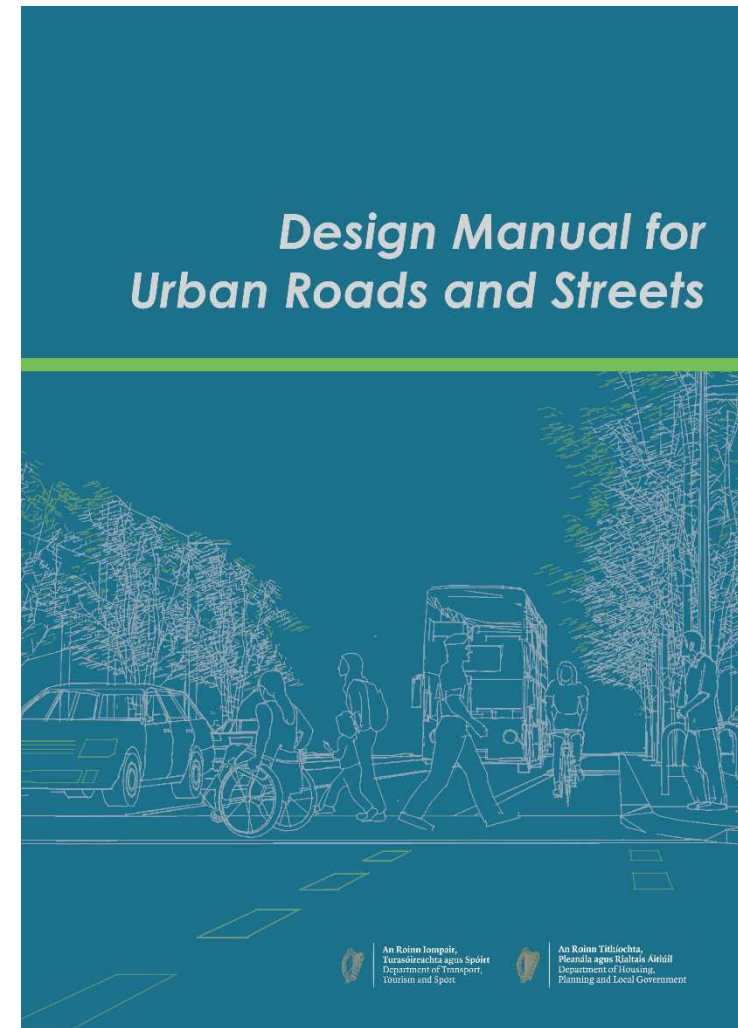
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DMURS Updates

- Document Updates
- Website
- Advice Notes
 - Transition Zones and Gateways
 - Quality Audits
 - Geometric Standards
 - Materials and Specifications



Document Updates

- Housekeeping and minor updates
 - Updated references (inc. NRA/TII, withdrawn/updated documents)
 - Discussions with other agencies (NTA - carriageway widths, Bus Connects, NDA - Universal Access.
 - References to Advice Notes
- Replacement pages to be issued (19 pages – double sided)
- Full document to also be reissued – Version 1.1

Website

- New dedicated website

- www.dmurs.ie

- Fully updated document (May 2019), Advice Notes and all replacement pages available for download.

- Website designed to be a resource tool that is continuously updated.



Advice Notes

4 x Advice Notes

- Transition Zones and Gateways
- Quality Audits
- Geometric Standards
- Materials and Specifications

- DMURS Street Design Audit also available to compliment Quality Audit process

ADVICE NOTE 4 - Quality Audits

1.0 Introduction

Auditing provides a system of design checks that can be carried out to promote 'best practice' design solutions. They can demonstrate that the appropriate consideration has been given to the relevant aspects of the design. Auditing processes in Ireland generally focus on particular aspects of a design, such as safety¹ or a particular user experience, such as mobility impaired users.² For large scale/complex projects several audits may be undertaken. However as these audits primarily focus on a particular issue they may not fully engage with the complexity of issues that need to be considered when designing streets and street networks. The Quality Audit process seeks to integrate existing auditing processes and expand their scope to fully embrace a multi-disciplinary approach to street design (See Figure 1).

As noted in Section 5.4.2 of the *Design Manual for Urban Roads and Streets (2013)*, Quality Audits have not been widely prepared in Ireland, however they are more commonly sought/provided in the United Kingdom. An Advisory Leaflet issued by the UK Department for Transport in 2011³ notes the benefits of a Quality Audits as:

- ¹ Auditing processes are familiar to the engineering profession, such as in the form of Road Safety Audits (RSA).
- ² Guidelines for Access Auditing of the Built Environment have been issued by the National Disability Association.
- ³ Refer to UK Department for Transport Traffic Advisory Leaflet SJ11- Quality Audits (2011).

- A transparent process that demonstrates that the needs of all user groups have been considered alongside the design objectives.
- A checking procedure that facilitates the projects objectives to be delivered.
- A documentation process that clearly demonstrates the breadth of issues that have been considered and how decisions were arrived at.
- A cost saving exercise that reduces the likelihood of problems at completion.
- A process that encourages greater engagement with stakeholders.

DMURS Advice Note No. 4 provides designers with guidance in relation to the preparation and content of Quality Audits in Ireland. This includes guidance in relation to a DMURS Street Design Audit, that can be submitted as a component of a Quality Audit (for larger projects) or as a stand-alone audit process for smaller projects.

It should be noted that it is not the intention of these guidelines to create a further layer of documentation in relation to the development process. In this regard Quality Audits/DMURS Street Design Audit may be used to complement or supplement the existing range of reports submitted in support of development.



Figure 1: Street design is a complex process that must consider the many issues related to movement (users) and place (experience).

Advice Note 1: Transition Zones and Gateways

- ❑ Transition Areas or Transition Zones referred to in DMURS Section 3.2.2 – Place Context.
 - ‘transition from those roads built to NRA DMRB led standards to those roads and streets described by this Manual’

- ❑ Transition Zones and Gateway referred to in DMURS Section 3.3.4 - Wayfinding of DMURS.
 - ‘area that may be needed for slowing vehicles when entering an urban area from a faster moving road

 - ‘*Gateways* are used to demarcate a point of arrival from one place to another’

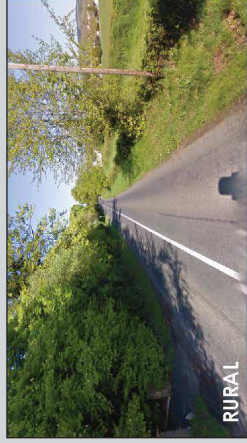


Advice Note 1: Transition Zones and Gateways

- ❑ Noted as a key issue during National Workshops.
- ❑ Advice Note prepared by Transport Infrastructure Ireland.
- ❑ Applies to:
 - 'the zone between the rural environment and more urbanised development. It is an area where speed reductions must occur when entering an urban area from a higher speed road'
- ❑ Also refines the definition of Gateway to:
 - 'features are easily identifiable elements along the route which signal a change of context. These gateways can be used to influence driver behaviour, wayfinding, and signal an entrance to an urban area'

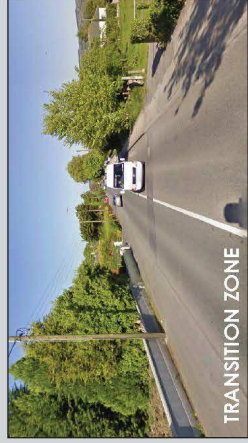


Figure 3: As individual elements of the streetscape change, the context of the street alters from rural to town.



RURAL

- Boundary:** hedgerow and trees
- Footpath:** none
- Kerb:** none
- Access:** infrequent or limited to farmland
- Road width:** carriageway only
- Street lighting:** none
- Built form:** infrequent
- Speed limit:** should be greater than 60kph



TRANSITION ZONE

- Boundary:** hedgerow and garden hedges with occasional boundary walls and gates
- Footpath:** commencing to one side
- Kerb:** occasional to one side
- Access:** increased individual access
- Road width:** carriageway, including setback/layby
- Street lighting:** occasional or none
- Built form:** occasional one off buildings offset from road
- Speed limit:** should be 50-60kph



URBAN AREA (CITY, TOWN, VILLAGE)

- Boundary:** garden hedges, walls, railings, buildings
- Footpath:** both sides
- Kerb:** continuous dropped at crossings
- Access:** individual, school and housing access
- Road width:** carriageway only, no setback or parking
- Street lighting:** one or two sides
- Built form:** closer to road with established building lines
- Speed limit:** 50kph or less

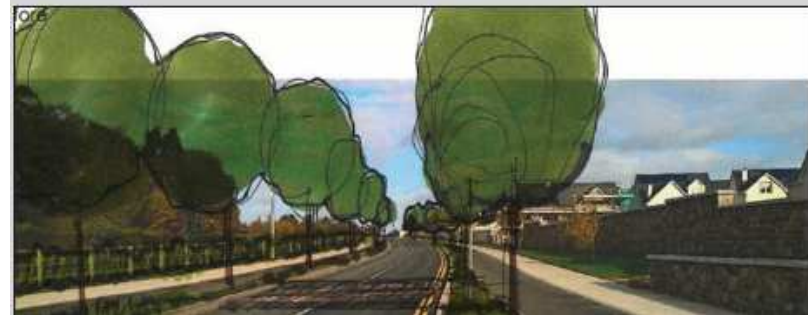
* The Transition Zone will include elements of development similar to the Rural Fringe (as defined within DMURS), or also commonly referred to as Peri-Urban areas.

Images: Google Street View

Advice Note 1: Transition Zones and Gateways

- ❑ Provides guidance on, and preference for, 'place' based measures
 - Buildings
 - Landscaping/Tree Canopies
 - Sculptures/public art
 - Identification Signs

- ❑ Provides further guidance in relation to the application of more conventional measures
 - Carriageway widths
 - Roundabouts
 - Signage/line making (reduction)
 - Materials



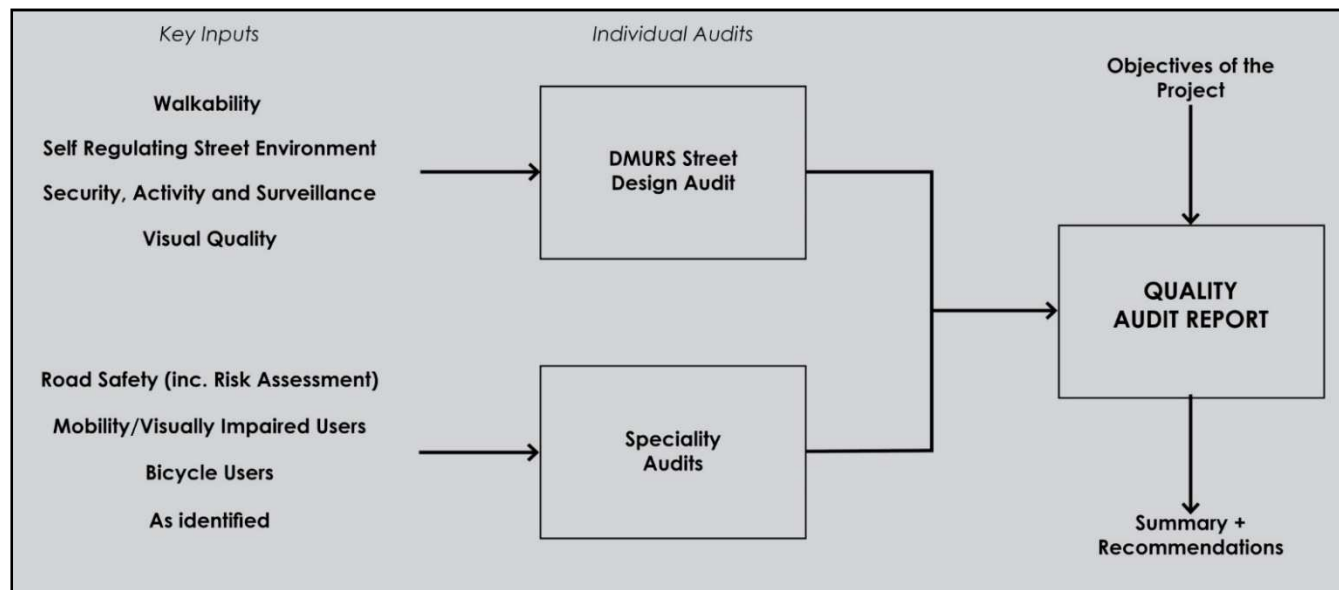
Advice Note 4: Quality Audits

- Quality Audits referred to in Section 5.4.2 of DMURS
 - 'should be undertaken to demonstrate that appropriate consideration has been given to all of the relevant aspects of the design'.
- UK Guidance is available
 - Collection of Individual Audits
 - Cross evaluation?
 - Conflict Resolution?



Advice Note 4: Quality Audits

- Quality Audits should consist of:
 - Background information (i.e. context for, reason for works).
 - Main objectives project.
 - Summarise the issues raised within Individual Audits and identify any potential **conflicts** (if any).
 - Propose solutions/make recommendations (consistent with objectives of the project).



Advice Note 4: Quality Audits

- DMURS Street Design Audit. Subset (i.e. Individual Audit) that forms part of a QA.

- The DMURS Street Design Audit is concerned with four major aspects of street design:
 - Connectivity
 - Self-Regulating Street Environment
 - Pedestrian and Cycling Environment
 - Visual Quality

- Template available consisting tables that can be used to demonstrate how the requirements of DMURS has been applied/addressed.

Pedestrian and Cycling Environment		
Key Issues	Key DMURS Reference	Design Response
The built environment contributes to the creation of a safe and comfortable pedestrian environment.	4.2.1 - Building Height and Street Width 4.2.3 - Active Street Edges 4.2.5 - Street Furniture 4.4.7 - On-Street Parking	
Junctions have been designed to ensure the needs of pedestrians and cyclists are prioritised.	4.3.2 - Pedestrian Crossings 4.3.3 - Corner Radii 4.4.3 - Junction Design 4.4.7 - Horizontal and Vertical Deflections	
Footpaths are continuous and wide enough to cater for the anticipated number of pedestrian movements.	3.0.1 - Movement Function 3.2.3 - Place Context 4.2.5 - Street Furniture 4.3.1 - Footways, Verges and Strips 4.3.2 - Pedestrian Crossings	

Refer also to the National Cycle Manual (2017)

Visual Quality		
Key Issues	Key Considerations and DMURS Ref.	Design Response
The landscape plan responds to the street hierarchy and the value of the place.	3.0.1 - Movement Function 3.2.3 - Place Context 4.2.2 - Street Trees 4.0.7 - Planning Advice Note 1 - Transitions and Gateways	
Street furniture is orderly placed.	3.2.1 - Movement Function 3.2.3 - Place Context 4.2.5 - Street Furniture 4.3.1 - Footways, Verges and Strips	
The use of signage and line marking has been minimised.	3.2.1 - Movement Function 3.2.3 - Place Context 4.0.4 - Signage and Line Marking	
Materials and finishes used throughout the scheme have been selected from a limited palette and respond to the value of the place.	3.2.1 - Movement Function 3.2.3 - Place Context 4.2.6 - Materials and Finishes 4.2.8 - Historic Contexts 4.3.2 - Pedestrian Crossings 4.4.2 - Carriageway Surfaces Advice Note 2 - Materials and Specifications	

Advice Note 4: Quality Audits

- Quality Audits should be submitted for major projects and in support of:
 - Applications for planning permission and development consents to planning authorities and An Bord Pleanála,
or
 - Development proposals prepared under Part 8 of the Planning and Develop

- Major Project?
 - the creation of new streets/street networks
 - significant changes to existing streets
 - be of a complexity that the need for multiple audits arises, thus requiring cross evaluation via a *Quality Audit Report*

Advice Note 4: Quality Audits

- ❑ DMURS Street Design Audit may suffice for smaller projects smaller/less complex projects (e.g. where a Road Safety Audit is not required).
- ❑ Quality Audit Report may be carried out by Design Team or 3rd party
 - Individual audits as required (i.e. suitably qualified or certified persons)

Advice Note 3 Geometric Standards

- Aim is self-regulating streets
- Choice of design speeds
 - Relate to function and context
 - Do NOT over design

		PEDESTRIAN PRIORITY		VEHICLE PRIORITY		
FUNCTION	ARTERIAL	30-40 KM/H	40-50 KM/H	40-50 KM/H	50-60 KM/H	60-80 KM/H
	LINK	30 KM/H	30-50 KM/H	30-50 KM/H	50-60 KM/H	60-80 KM/H
	LOCAL	10-30 KM/H	10-30 KM/H	10-30 KM/H	30-50 KM/H	60 KM/H
		CENTRE	N'HOOD	SUBURBAN	BUSINESS/ INDUSTRIAL	RURAL FRINGE
		CONTEXT				

Figure 1: Design Speed Selection Matrix

Advice Note 3 Geometric Standards

□ Visibility

- Sight Stopping Distance (SSD)
- Same laws of physics but different inputs

	TII DMRB DN-GEO-03031	DMURS
Reaction time	2s	1.5s
Deceleration rate	0.25g	0.45g
Deceleration rate m/s ²	2.45m/s ²	4.41m/s ²
Bonnet length	0	2.4
SSD at 30 kph	(30)	23
SSD at 40 kph	(47)	33
SSD at 50 kph	(67)	45
SSD at 60 kph	90	59

Advice Note 3 Geometric Standards

- Horizontal alignment and minimum radii
 - Urban areas
 - Generally no superelevation
 - Rely on side friction

Horizontal Curves						
Design Speed (km/h)	10	20	30	40	50	60
Side Friction Factor (F)	0.300	0.300	0.300	0.25	0.214	0.184
Min. radius with adverse camber of 2.5%	3	11	26	56	104	178
Min. radius with superelevation of 2.5%	3	11	22	46	82	136

Table 2: Recommended Minimum Curve Radii

Advice Note 3 Geometric Standards

- Vertical alignment
 - Urban areas
 - lower design speed
 - few severe crest and sag curves
 - Simplifies to using K values

VERTICAL CURVATURE						
Design Speed (km/h)	10	20	30	40	50	60
Crest Curve K Value	N/A	N/A	N/A	2.6	4.7	8.2
Sag Curve K Value	N/A	N/A	2.3	4.1	6.4	9.2

Table 3: Vertical Curve K-Values

Advice Note 2 Materials and Specs

- Introduction
- Materials can:
 - define an urban street
 - improve legibility
 - calm traffic
 - look good
- Clay, natural stone and concrete pavers
 - Not just concrete and blacktop
- Footpaths and carriageways

Advice Note 2 Materials and Specs

- Designers need to consider:
- Highest specs at
 - focal points
 - town and village centres
 - gateways and transition zones
- Selection of material
 - colour, tone, texture, pattern
 - strength

Advice Note 2 Materials and Specs

- Traffic loading (BS 7533)
- Categories based on number of heavy vehicles per day
- Horizontal loading factors
 - Radius <100m
 - Gradient >10%
 - Narrow lane width (channelisation)

Advice Note 2 Materials and Specs

- Material performance
- Slip and skid resistance
- Break load
 - Flexural strength, paver dimensions
- Standards
 - BS EN 1338, 1339, 1341

Advice Note 2 Materials and Specs

- Pavement Design and Construction
- Flexible pavement (BS 7533 parts 2 and 3)
 - Subbase, bedding, pavers
 - For lightly trafficked areas
- Rigid pavement (BS 7533 parts 1, 7, 8, 10 and 12)
 - Subgrade, subbase, roadbase, bedding, pavers
 - For heavily trafficked areas

Advice Note 2 Materials and Specs

- Workmanship is critical
 - Setting out, tolerances, compaction, patterns



Figure 7: Ridgid Paving using granite setts bedded in mortar on concrete roadbase

Advice Note 2 Materials and Specs



Figure 1. Well considered schemes enhance place, prioritise sustainable movement, calm traffic and provide longer term durability.

Advice Note 2 Materials and Specs



Figure 14: Completed raised table.

Advice Note 2 Materials and Specs



Figure 2. Self-regulating junction using contrasting surface materials

DMURS Updates

Thank You

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