

DMRB Briefing note

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CHANGES TO THE ROAD LAYOUT PART OF THE DMRB

This briefing note provides an overview of the key changes introduced to the DMRB road layout documents.

Overview

The road layout discipline covered what was:

- All of Volume 6: road geometry
- All of Volume 8, section 2: Traffic Signs and Road Markings¹
- Volume 9, section 1: part 1 Traffic Control & Communications (CD 146 Positioning of signalling and advance direction signs)
- Plus three assessment documents in Volume 5: Assessment of Road Schemes:
 - GG 119: Road safety audit
 - GG 142: Walking, cycling and horse-riding assessment and review
 - CA 185: Vehicle speed measurement

Through consolidation, rationalisation and the archive of outdated content, the road layout discipline suite of documents has gone from 49 to 18 documents. These 18 documents and their places within the new DMRB structure are:

General Principles and Scheme Governance, General Information

- GG 119: Road safety audit (*supersedes HD 19/15*)
- GG 142: Walking, cycling and horse-riding assessment and review (*supersedes HD 42/17*)

Road Layout, Appraisal

- CA 185: Vehicle speed measurement (*supersedes TA 22/81*)

Road Layout, Design

- CD 109: Highway link design (*supersedes TD 9/93 and those parts of TD 70/08, IAN 198/17, IAN 149/17 and IAN 161/15 relating to highway link design*)

¹ with the exception of TD 26/17 Inspection and Maintenance of Road Markings and Road Studs on Motorways and All-Purpose Trunk Roads

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

- CD 116: Geometric design of roundabouts (*supersedes TD 16/07, TD 50/04, TD 51/17, TD 54/07, TA 78/97 and those part of TA 23/81, TA 86/03 and TD 70/08 relating to roundabouts*)
- CD 122: Geometric design of grade separated junctions (*supersedes TD 22/06, TD 39/94, those parts of TD 40/94 relating to compact connector roads and those parts of IAN 198/17, IAN 149/17 and IAN 161/15 relating to grade separated junctions*)
- CD 123: Geometric design of at-grade priority and signal-controlled junctions (*supersedes TD 41/95, TD 42/95, and those parts of TD 40/94, TD 50/04, TD 70/08, TA 23/81 and TA 86/03 relating to priority and signal-controlled junctions*)
- CD 127: Cross sections and headrooms (*supersedes TD 27/05, those parts of TD 70/08, IAN 149/17, IAN 161/15 and IAN 198/17 relating to cross sections, and those parts of TA 57/87 relating to kerbs*)
- CD 143: Designing for walking, cycling and horse-riding (*supersedes TA 90/05, TA 91/05, TA 68/96, TD 36/93*)
- CD 146: Positioning of signalling and advance direction signs (*supersedes TD 46/05, TD 18/85, and those parts of TA 60/90, TA 74/05, TA 83/05, TD 33/05, IAN 109/08, IAN 149/17, IAN 161/15 relating to sign/signal/VMS gantry positioning*)
- CD 169: The design of lay-bys, maintenance hard standings, rest areas, service areas and observation platforms (*supersedes TD 69/07, TA 66/95, those parts of TD 22/06 relating to service areas and those parts of TD 70 relating to lay-bys*)
- CD 193: Driver location signs (*supersedes IAN 93/10*)
- CD 195: Designing for cycle traffic (*supersedes IAN 195/16*)

Road Layout, General Information

- CG 152: Traffic signs to tourist destinations and leisure facilities (*supersedes TD 52/17*)
- CG: 153: Traffic signs to retail destinations and exhibition centres (*supersedes TD 53/05*)

Road Layout, Inspection and Assessment

- CS 125: Inspection of traffic signs (*supersedes those parts of TD 25/15 relating to traffic sign inspection and assessment*)

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

Road Layout, Maintenance and Operation

- CM 125: Maintenance of traffic signs (*supersedes those parts of TD 25/15 relating to traffic sign maintenance*)

Road Layout, Disposal

- CZ 125: Disposal of traffic signs (*supersedes those parts of TD 25/15 relating to traffic sign disposal*)

The content of TA 57 relating to cattle grids has been updated and moved over to section 13 of CD 377: Requirements for road restraint systems; however, the responsibility for the cattle grid content remains with road layout. Apart from cattle grids and kerbs (see CD 127 above), all other content within TA 57 has previously been superseded and therefore this document has been withdrawn.

In addition, three other documents within the road layout discipline have been withdrawn and not replaced. These are TA 85: Guidance on minor improvements to existing roads, TA 87: traffic calming on trunk roads - a practical guide, and TA 98: The layout of toll plazas. TA 85 and TA 87 were both withdrawn because the content of them is dealt with by other, more contemporary publications, including those that sit outside of Highways England. TA 98 was withdrawn because Highways England's expectation is that any new toll road scheme would be free-flow and not include toll plazas. All withdrawn documents are still available online if needed however.

The road layout discipline has also recently taken over responsibility for CS 126: Inspection and assessment of road markings and road studs (*supersedes TD 26/17*).

Key changes by document

The update of the road layout suite of documents was predominantly editorial in nature to align with the new DMRB format and drafting rules; however, changes have been introduced across the documents where it has been necessary to resolve a contradiction or ambiguity that existed in the superseded documents. There have also been a number of more changes introduced as a result of previous research/studies. The following pages list the key changes that we think you should be aware of for each road layout document. This is not an exhaustive list however and users of the DMRB are encouraged to read the documents in full. DMRB users should also read GG 101: Introduction to the Design Manual for Roads and Bridges, which provides an overview of the new DMRB and its application.

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

Feedback

Comments, suggestions and queries on the new documents may be addressed to Standards_Enquiries@highwaysengland.co.uk.

GG 119: Road safety audit

- Separate Stage 1 and 2 Road Safety Audits are now required for all schemes unless preliminary design is not undertaken. A combined Stage 1 and 2 Road Safety Audit is permitted in this situation.
- 36 month Stage 4 Road Safety Audits are no longer a requirement.
- Temporary Traffic Management and Temporary changes to the highway only require road safety audits where,
 - They last longer than 6 months, and
 - The Temporary Traffic Management layout is not associated with construction works i.e. to manage a long-term incident such as a landslip or collapse of a sewer.
- Road safety audits no longer need to be submitted to the overseeing organisation in draft.
- Site visits are limited to a maximum of 6 people to ensure the number of people on site and involved in the road safety audit is manageable.
- Exception reports no longer exist. Designers and the overseeing organisation collaboratively come to a solution which is documented in the Road Safety Audit Response Report.

GG 142: Walking, cycling and horse-riding assessment and review

- The key requirements for undertaking the WCHAR process remain the same. Only minor improvements have been made. These include:
 - Clarification added that site visits should not be undertaken alone. This clarification has been added as concerns were raised that the previous wording may have encouraged solo site visits;

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

- Scheme exemption applicability has been clarified to state that any schemes where no walkers, cyclists and horse-riders are permitted are exempt from the WCHAR process.

CA 185: Vehicle speed measurement

- The concept of 'wet weather journey speeds' has been removed in CA 185. CA 185 now requires that all speed measurements are taken in dry weather; however, the formula for converting between wet and dry weather has been retained but reversed as we acknowledge that it is not always practicable to ensure speeds are taken in dry weather conditions.

There were a number of reasons for the removal of the concept of 'wet weather journey speeds'. Firstly, Wet weather was only mentioned within paragraph 3.4 of TA 22 in relation to improving alignments and junctions. It wasn't mentioned anywhere else in TA 22 and contradicted the general principle that speeds should be recorded in free flow conditions and not during bad weather (rain or 'wet weather' could be considered bad weather).

Wet weather speeds are also not used within any other DMRB document. There used to be a reference to wet weather within Figure 1 of TD 9 but this too has been removed (as part of its update to CD 109) as it was considered to serve no meaningful purpose. But the key reason for the change was safety orientated. Taking 85th percentile speeds in 'wet weather' or reducing dry weather speeds to wet weather speeds is counterproductive (bearing in mind that safety is Highways England's number one imperative), as measurements in wet weather will result in an arbitrary low value that is not representative of what the actual worst case 85th percentile speed would be at a given location.

- Alignment improvements for existing roads has been removed from the scope of TA 22. TA 22 and TD 9 contradicted each other when it came to determine the basis of design for new alignments of existing roads. The TA 22 method was to use measured vehicles speeds whereas the TD 9 method was to use design speed principles based on road bendiness etc.

TD 9 is a more robust document (noting that a TD takes precedence over a TA). TD 9 is also a more recent document (1993 as opposed to 1981) and is

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

based on more recent research, experience and operational data. Furthermore, basing realignment works on the design speed of the existing road (as per TD 9) is the more widely adopted method. This is because the vehicle speeds on a new alignment would not necessarily be representative of what they were on the old alignment.

CD 109: Highway link design

- CD109 incorporates the majority of the requirements and advice relating to WS2+1 roads that were previously in TD 70 (requirements and advice relating to WS2+1 interfaces with junctions, laybys and differential acceleration lanes have moved to CD 123, CD 169 and CD 116 respectively).
- The cross-sectional dimensions for single carriageway climbing lanes have been moved to CD 127 as this is a more suitable location for this content; however, as a result of research undertaken into vehicle widths, the climbing lane dimensions have been changed to provide a safer cross section. The new cross section comprises a 3.5m wide climbing lane, a 3.5m wide overtaking lane, a 3.5m wide opposing lane and 1.0m hard strips.

CD 116: Geometric design of roundabouts

- A new requirement has been added to clarify that no roundabout shall be located on motorways. This aligns with the superseded TD 9 text that stated that motorways must be free-flowing.
- It is now clear that signalised roundabouts are designed to the same geometric parameters as normal roundabouts to remove the ambiguities within TD 16.
- Signal controlled roundabout visibility on the circulatory carriageway should now be the same as non-signal controlled roundabouts; TD 16 was silent on circulatory visibility at signal controlled roundabouts.
- The design vehicle for signalised roundabouts has been updated to the more relevant maximum legal 16.5m articulated vehicle (from a 15.5m vehicle). This

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

now aligns with other DMRB documents and provides clarity for tracking assessments.

- Differential Acceleration Lane (DALs) from TD 70 are now incorporated into CD 116.
- A reference to the *Stockdale Method* has now been included in relation to designing the crown line as an option.
- Clarification provided on SSD requirements for Segregated Left Turn Lanes (SLTLS) to make it clear where the transition point between the SSD requirements in Table 6.27 (of CD 116) are CD 109 SSD applies.

CD 122: Geometric design of grade separated junctions

- The referencing of merge layouts has been updated to better reflect the progression in capacity provision through the layout types. For example, merge layout D in TD 22/06 is now Layout A Option 2 in CD 122.
- It is no longer a departure to provide a layout with a greater level of capacity than that which aligns with the design year. This is to better accommodate future proofing and provide efficiencies through the removal of unnecessary departure processing.
- The 3 lane diverge and merge layouts from TD 39 have been included in CD 122; however, they have been rationalised and amended where appropriate to ensure that they reflect the safe design ethos of the more contemporary TD 22/06 i.e. the separation of multi-lane diverge/merge movements via ghost islands.
- The curve widening requirements for compact connector roads have been rationalised as it was acknowledged that the pre-existing advice was ambiguous and complex. The requirements/advice has been simplified by alignment with the curve widening requirements and advice in TD 42 (now CD 123) for the same radii curves.

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

CD 123: Geometric design of at-grade priority and signal-controlled junctions

- New advice on permitted movements at single lane dualling and dual carriageway priority junctions has been included. This is in acknowledgement of the greater level of risk associated with right turns (and in particular the right turns out of the minor road) at these junction types. The new advice includes details of what would constitute an acceptable diversion if the ability to turn right was removed. This was based on work undertaken by Ireland.
- In order to remove duplication across the various types of priority junctions defined by TD 41 and TD 42, priority junctions are now formed of two key elements. These two elements are the priority junction (the layout of the minor road arm) and the major road central treatment (the layout of the major road aspect of the junction e.g. a ghost island arrangement). This approach allows for flexibility of varying the form of the layout of the minor road and/or major road while removing the repetition and ambiguity resulting from the entire junction being treated as a single component in the previous documents.
- To rationalise and remove duplication between direct access layouts the definition of a direct access is now only used for a single dwelling or field. A priority junction is now the definition for anything greater.
- TD 42 included the concept of a passing bay but did not include robust advice relating to its use or suitable dimensions. There was also uncertainty over its potential use as a substitute for a ghost island layout. CD 123 includes expanded and clearer advice on the use of nearside passing bays, including recommended dimensions.
- Visibility splays now represent an area of visibility rather than a line of visibility from the minor road set back point to the target. In addition, where a priority junction is located on the outside of a bend, and the visibility splay crosses the offside verge, that section of verge is accounted for in the splay. These changes have been made to ensure that the requirements/advice for this key safety feature are as robust as possible.
- The advice on curve widening for compact connector roads was complex and ambiguous. This has been simplified in CD 123 through alignment with the

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

curve widening requirement/advice that existed in TD 42 (now CD 123) for the same radii curves.

CD 127: Cross sections and headrooms

- The cross-sectional dimensions for single carriageway climbing lanes have been moved from TD 9 to CD 127. As a result of research undertaken into vehicle widths, the climbing lane dimensions have been changed to provide a safer cross section. The new cross section comprises a 3.5m wide climbing lane, a 3.5m wide overtaking lane, a 3.5m wide opposing lane and 1.0m hard strips.
- Requirements and advice relating to kerbs have been included in CD 127. These were transferred (and upgraded to requirements where appropriate).
- The cross sectional dimensions for wide single 2+1 carriageways from TD 70 have been included in CD 127.

CD 143 Designing for walking, cycling and horse-riding

- Combines requirements and advice from ,
 - TA 90/05 'The Geometric Design of Pedestrian, Cycle and Equestrian Route'
 - TA91/05 'Provision for Non-Motorised Users
 - TA 68/96 ' The Assessment and Design of Pedestrian Crossings'
 - TD 36/93 'Subways for Pedestrians and Pedal Cyclists – Layout and Dimensions' into one single standard.
- Where previous advisory clauses were unclear these have been removed to aid designers in understanding what are the core requirements when designing facilities.
- The fundamental requirements themselves have not been updated, but are currently being reviewed and challenged as part of research work targeting improved provision for walking, cycling and horse-riding.

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

CD 146: Positioning of signalling and advance direction signs

- Combines requirements and advice from,
 - TD 46/05 'Motorway signalling', and
 - TD 18/85 'Criteria for the use of gantries for traffic signs and matrix traffic signals on trunk roads and trunk road motorways'
 - IAN 109/08 'Advice regarding the motorway signal mark 4 (MS4)'
 - IAN 149/17 'Existing motorways: Additional requirements and relaxations'
 - IAN 161/15 'Smart motorways'
 - TA 60/90 'The use of variable message signs on all-purpose and motorway trunk roads'
 - TA 74/05 'Motorway signalling'
 - TA 83/05 'Guide to the use of variable message signs for strategic traffic management on trunk roads and trunk road motorways', and
 - TD 33/05 'The Use of Variable Message Signs on All-Purpose and Motorway Trunk Roads'.
- CD 146 is applicable to motorways only.
- The requirements relating specifically to smart motorways are contained in the England NAA.

CD 169: The design of lay-bys, maintenance hard standings, rest areas, service areas and observation platforms

- CD 169 introduces the term non-emergency stopping provision and how stopping provision on a route should be considered holistically rather than as individual elements e.g. considering the combined provision of lay-bys and rest areas along a route rather than just the provision of lay-bys or just the provision of rest areas;
- It is now a requirement to not provide lay-bys on the outside of right hand bends where radii is less than the minimum value permitted; and

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

- The requirements for visibility approaching, entering and exiting a lay-by have been made more robust in acknowledgement that they were open to interpretation in the superseded document.

CD 193: Driver location signs

- As driver location signs are now a prescribed sign, the previous content relating to the non-prescribed signs authorisation has been removed.

CD 195: Designing for cycle traffic

- Advice associated with the development and planning of cycle routes and construction and maintenance have been removed so that this document concentrates on requirements and advice on the design aspects of a cycle route. This advice will be provided in emerging policy documents.
- The structure and content of the document were amended to provide less ambiguous requirements and advice.

CG 152: Traffic signs to tourist destinations and leisure facilities

- Added clarity to the existing criteria for the signing of national parks and geographical areas in England. Applications for tourist signs to national parks and geographical areas may be made where they include a settlement with a permanently established tourist information centre. An example is provided in the England NAA for the signing of 'Swaledale and Richmond', where Swaledale is the geographical area and Richmond contains a tourist information centre.
- 'Tourist boundary signs' are now referred to as 'boundary signs with images' to better align with the description in the Traffic Signs Regulations and General Directions 2016.

DMRB Briefing note

DATE: 29 July 2020

CONFIDENTIALITY: Public

CG 153: Traffic signs to retail destinations and exhibition centres

- Previously TD 53/05.
- A figure has been added to provide clarity to the requirement that signs to retail destinations and exhibition centres are not provided where they can be reached by following existing direction signs.
- Information on the type and design of traffic signs has been removed as this information is provided elsewhere, such as the Traffic Signs Manual.
- Information on the financial arrangements for traffic signs to retail destinations and leisure facilities has been removed as this is process information that is not permitted to be included in a new DMRB document.
- A requirement linked to the safe accommodation of traffic signs has been introduced that aligns to a similar requirement that was previously introduced in TD 52/17 (Traffic signs to tourist destinations and leisure facilities in England – Signing for motorways and all-purpose trunk roads).

CS 125: Inspection of traffic signs, CM 125: Maintenance of traffic signs and CZ 125: Disposal of traffic signs

- TD 25/15 has been split into three separate documents to reflect the new asset lifecycle structure of the DMRB.
- The term “safety inspection” has been replaced with “inspection” to avoid conflict with the types of inspection described in a highway authority’ inspection regimes.
- The requirement over the process of measuring the coefficient of reflection has been relaxed to allow for emerging mobile technologies to be used.
- Performance Class R3C-UK has been included within the RAD to align with BS EN 12899-1.