

The Location and Layout of Lay-bys

September 2008

Summary :

This Advice Note provides guidance on the location and layout of lay-bys on all-purpose dual carriageway roads and Motorways, and of garda enforcement areas on motorways.

VOLUME 6 ROAD GEOMETRY

**SECTION 3 HIGHWAY
FEATURES**

PART 3

NRA TA 69/03

**THE LOCATION AND LAYOUT
OF LAY-BYS**

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1. INTRODUCTION

General

1.1 This Advice Note gives the general principles to be followed for the siting and layout of lay-bys on national roads.

1.2 The lay-bys described in this Advice Note should be provided on rural all-purpose dual carriageway roads and Motorways. They are not intended for use on single carriageway roads. A special type of lay-by, known as a 'garda enforcement area', for use on motorways is also described.

1.3 The purpose of a lay-by is to provide a convenient area for short period stops so the road user can undertake tasks which would otherwise be considered unsafe whilst driving or pulled up on the side of the road. These would include tasks such as answering a mobile phone, changing driver, brief rest, attending to a distressed child passenger, changing a flat tire or some other form of emergency stop etc. The lay-by provides separation from the carriageway so that a passenger or driver getting out of an offside door would not encroach onto the carriageway.

1.5 It is not intended that lay-bys be furnished with facilities such as refreshments or toilets. For these and for longer duration stops, drivers should be encouraged to leave the national road and use facilities in adjacent towns or villages or at Motorway Service Areas near the road. However, if emergency telephones are installed along the route, it is preferable to position them at lay-bys.

1.6 An essential feature of a motorway is that it is intended for fast moving traffic only, with freedom, as far as possible, from stationary vehicles and pedestrians. Regulations under the Roads Act 1993, therefore, prohibit vehicles from stopping on the motorway hard shoulder, except in special circumstances such as an emergency or when instructed by the gardaí. Pedestrians are also prohibited.

Scope

1.6 This Advice Note sets out siting options and a recommended layout for lay-bys on rural all-purpose dual carriageway roads and Motorways. It also gives recommendations for the layout of a special 'garda enforcement area' for use on motorways.

Implementation

1.7 This Advice Note should be used as appropriate for the design of all new or improved rural all-purpose dual carriageway roads and motorways. The advice should be applied to the design of schemes already being prepared unless, in the opinion of the National Roads Authority, application would result in significant additional expense or delay progress. In such cases, design organisations should confirm the application of this Advice Note to particular schemes with the National Roads Authority.

2. SITING OF LAY-BYS

2.1 There are a number of factors that should be taken into account when considering the siting of a lay-by on a dual carriageway road. Table 2/1 gives guidance. Siting affects the safety and operation of the lay-by and the land-take requirements for the scheme; consequently it is best considered at an early stage in the design process to reach a balanced solution.

2.2 Siting of lay-bys should particularly be avoided on the inside of curves and at locations near junctions and signing.

2.3 Accident statistics from the United Kingdom in the 1980s suggest that accidents at lay-bys represented 0.8% of all injury accidents on rural roads. This included vehicles hitting pedestrians at lay-bys. The figures emphasise the need for lay-bys to be sited in carefully selected locations with appropriate design and choice of layout.

2.4 For the purposes of considering Relaxations in the geometric standards of NRA TD 9 on the immediate approach to a lay-by, the lay-by shall be regarded as a 'junction'. Thus, the scope for Relaxations is severely restricted, in accordance with NRA TD 9, from a distance of 1.5 times the Desirable Minimum stopping sight distance upstream of the start of the diverge taper to the end of the merge taper. This requirement does not apply to garda enforcement areas (see Paragraph 4.5).

Factor	Avoid	Preferred	Reason
Vertical and horizontal alignment of carriageway in vicinity of lay-by	<ul style="list-style-type: none"> • Inside of curves. • Sharp crests. • Bridges and other structures. 	<ul style="list-style-type: none"> • Carriageway visibility standards are contained in NRA TD 9. • Visibility at entry and exit should conform to TD 42. 	To ensure adequate visibility for vehicles entering and leaving the lay-by and for traffic on the mainline if the lay-by is in the line of visibility.
Proximity of junctions	Location after any Advance Direction Signing or within countdown signs for exits off the main carriageway or near an entry from another road.	Location clear of junctions and signing.	To avoid confusion of the lay-by with a junction exit or entry, particularly at night.
Environment	Houses, woods and adjacent ground cover.	Open aspect.	<ul style="list-style-type: none"> • For security and to avoid nuisance to households. • To avoid noise intrusion. • To avoid visual intrusion. • To discourage pollution and soiling.
Earthworks	<ul style="list-style-type: none"> • Locations which require extensive earthworks. • High embankments. 	<ul style="list-style-type: none"> • Locations requiring minimal changes to the earthworks. • Locations which are not visually prominent. 	<ul style="list-style-type: none"> • To minimise cost (although the widening needed for lay-bys may help improve the earthworks balance). • To minimise visual intrusion
On-line improvement	Use of redundant carriageway as a lay-by without reference to design standards.	Use of standard layout.	<ul style="list-style-type: none"> • To ensure basic safety requirements of lay-bys. • To avoid misuse.
Facilities provided in a lay-by	<ul style="list-style-type: none"> • Provision of infrequently used services. • Under provision of services. 	Careful determination of needs.	<ul style="list-style-type: none"> • Under use can encourage vandalism. • Under provision can lead to soiling, litter or unwanted trading.
Misuse of lay-by	<ul style="list-style-type: none"> • Location near a train or bus interchange. • Use as a lorry park. • Long duration or overnight stops. 	Consider other needs for parking facilities.	<ul style="list-style-type: none"> • Location may encourage long stay parking and use as a park-and-ride facility. • Long term parking may prevent or discourage short duration stops.

Table 2/1: Siting Considerations

3. LAY-BYS FOR DUAL CARRIAGEWAY ROADS

Frequency

3.1 On rural all-purpose dual carriageway roads, the desirable frequency is for lay-bys to be provided at intervals of about 10km for each carriageway. There is no need for lay-bys on the two carriageways to be close to or opposite each other: indeed it is better to separate them, so as to reduce the likelihood of pedestrians crossing the road.

3.2 Where practicable, at least one lay-by should be located on each carriageway between each pair of junctions. When considering the spacing of lay-bys, each 'full' junction (i.e. one with both an exit and an entry slip road in the direction under consideration) may be regarded as providing equivalent facilities for short duration stops and may, therefore, count as a lay-by.

3.3 There should be a Type 2 lay-by (see Figure 3/2) at about 20 to 25km intervals in either direction. All other lay-bys should be Type 1 (see Figure 3/1).

3.4 Since stopping on a motorway is only permitted in an emergency, lay-bys for public use should be provided on motorways in accordance with Chapter 4 of this advice note.

Layout

3.5 The recommended layout for a Type 1 lay-by on a rural all-purpose dual carriageway road is given in Figure 3/1 and that for a Type 2 lay-by is given in Figure 3/2. A Type 1 lay-by is the standard layout. A Type 2 lay-by is one which can also be used as a garda enforcement area; when not required by the gardaí, it will function as a normal lay-by. A Type 2 lay-by includes a covered slot in the road pavement for a temporary weighbridge.

3.6 The lay-by is separated from the carriageway by a segregation island. A 3.5m wide through lane and a 3.0m wide parking lane (3.5m for Type 2) are provided.

3.7 An auxiliary deceleration lane should be provided at the entry to the lay-by, to enable vehicles to decelerate clear of the main carriageway. Similarly, a merging taper should be

provided at the exit from the lay-by to allow for acceleration. The layouts of the entry and exit should be as indicated in Figure 3/1, with the lane and taper lengths in accordance with Table 3/1; these requirements are similar to those of TD 42 for a major/minor priority junction.

3.8 The segregation island is a safety feature that separates main line traffic from parked vehicles, restricts access to and egress from the parking area and, by restricting through width, encourages drivers to slow down on entering the lay-by. However, accidents can occur when the island is not sufficiently conspicuous to vehicles either on the main carriageway or entering the lay-by. For this reason, standard delineator posts should be placed along the island at about 10m intervals.

3.9 The segregation island should be raised and preferably hard surfaced for ease of maintenance. Consideration may be given to the use of a different surface colour to emphasise the island. The island should be separated from the main carriageway by a 600mm wide hard strip.

3.10 The crossfall of the lay-by should normally be arranged to drain away from the main carriageway.

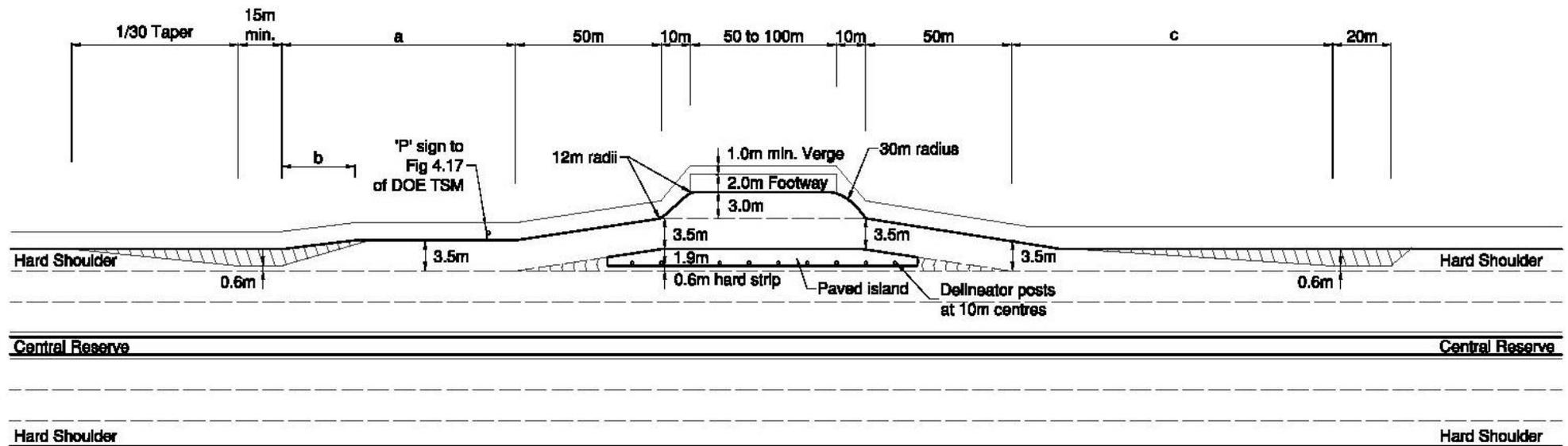
Capacity

3.11 The parking bay length should be based on an estimation of demand, within the limits indicated. Demand will be affected by factors such as traffic flow, lay-by spacing, proximity to junctions and proximity to other facilities.

3.12 If the number of vehicles wishing to use the lay-by frequently exceeds the capacity of the lay-by, there may be operational problems and increased accident risk. Common problems caused by lack of capacity are: parking on tapers or outside the lay-by, collisions within the lay-by and over-running of the verges or footway.

3.13 At a Type 1 lay-by, a minimum parking length of 50m should be provided. Where, on a typical rural dual carriageway road, the two-way Annual Average Daily Traffic is forecast to be between 20,000 and 30,000, the minimum parking

length should be 75m, while above this flow level the minimum parking length should be 100m.



Note: a = Deceleration Length
b = Direct Taper Length
c = Merging Length
Not to scale

Figure 3/1: Geometric Layout of Type 1 Lay-by on Dual Carriageway

Design Speed (km/h)	a Deceleration Length (m)				b Direct Taper Length (m)	c Merging Length (m)
	Up Gradient		Down Gradient			
	Above 4%	0 – 4%	0 – 4%	Above 4%		
120	80	110	110	150	30	130
100	55	80	80	110	25	110
85	40	55	55	80	15	90

Table 3/1: Entry and Exit Lane Lengths at Lay-bys

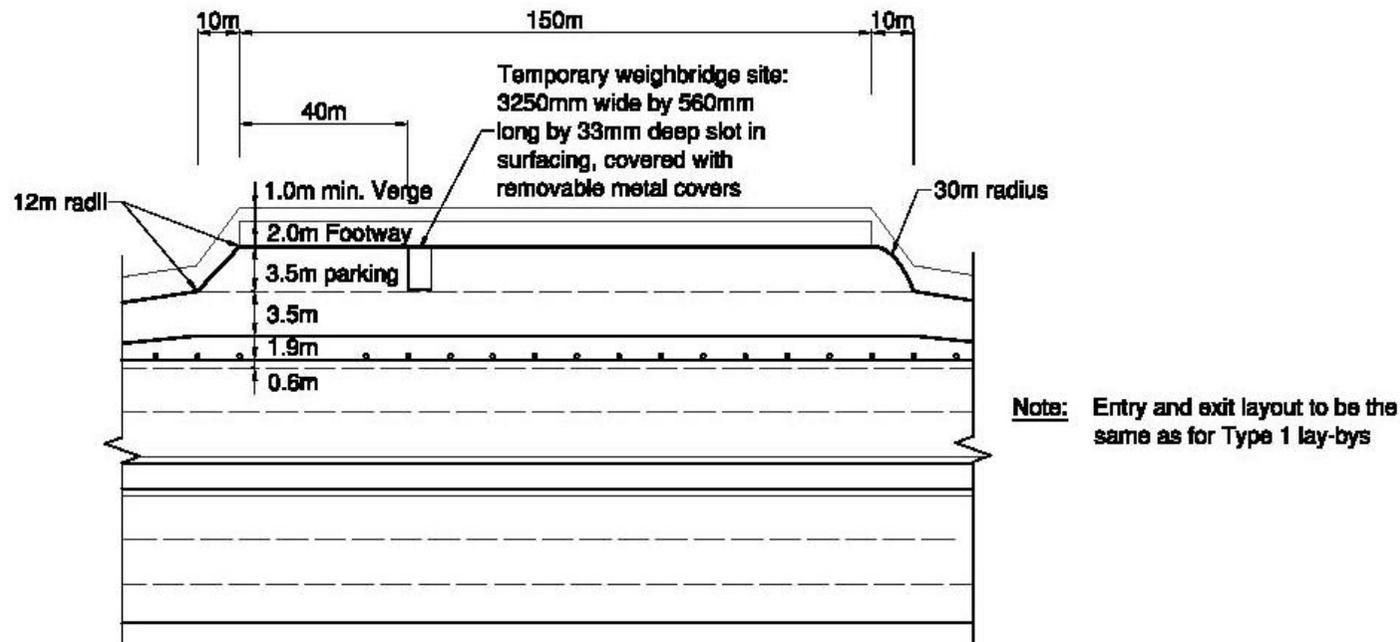


Figure 3/2: Geometric Layout of Type 2 Lay-by on Dual Carriageway

3.14 At a Type 2 lay-by, the minimum parking length should be 150m as this length is required for a garda enforcement area. This length will also be adequate in most circumstances for its use as a public lay-by.

Signs and Road Markings

3.15 With lay-bys located at regular intervals, drivers will have a choice whether or not to stop at a specific lay-by. Good advance signing assists in this decision and helps avoid sudden deceleration on the approach to the lay-by and attempts to enter the lay-by at too high a speed. Advance 'P' signs to Figure 4.16 of the Traffic Signs Manual (TSM), with the distance indicated, are advised. A sign to Figure 4.17 of the TSM should also be positioned on the verge alongside the start of the entry nose. If the lay-by contains an emergency telephone, a telephone symbol should be added to the signs.

3.16 Chevron hatching to Figure 7.33 of the TSM (Sign No RRM 021 of the Road Traffic (Signs) Regulations) should be provided at each end of the segregation island. Hatching should also be used in the hard shoulder to delineate the ends of the diverge and merge tapers. This hatching should terminate 600mm from the edge of the traffic lane, to enable cyclists to remain within the hard shoulder without entering the hatched area. Carriageway markings should have reflectorised studs in accordance with the Traffic Signs Manual.

Footway and Kerbing

3.17 A footway 2m wide should be provided adjacent to the lay-by to encourage parking close to the kerb edge and to provide a surfaced area to walk on. The footway should be separated from the vehicle parking area by a raised kerb to improve safety for those on foot.

3.18 Raised kerbing should normally be provided along the whole length of the widening at the lay-by and along the segregation island, to facilitate drainage, to define the edge of the surfacing more clearly, and to dissuade parking on the grass verge adjacent to the tapers. 75mm splayed kerbs will normally be appropriate, except alongside the footway, where 125mm high kerbs would normally be used.

Lighting

3.19 Where the road has street lighting, the lay-by should be illuminated to the same standard as the carriageway. Where no lighting exists, a road marking strip 100mm wide may be laid at the back of the parking bay to facilitate identification.

Facilities for Users

3.20 Consideration should be given to inviting telephone companies to install public telephone kiosks in lay-bys on the approaches to by-passed towns and villages and in remote locations where no alternative facilities exist. In view of the minimal cost of ducts, they should be laid at the time of construction of the lay-by where there is a reasonable possibility of a telephone being installed at a later date. Where telephones are provided, they should be installed in lay-bys on both sides of the road so that drivers do not need to cross the road to reach them.

3.21 Emergency telephones connected to a garda control centre may be considered in certain locations: advice may be obtained by consulting the National Roads Authority. Alternatively, motoring organisations or telephone companies may be invited to install emergency telephones.

3.22 Lay-bys are not intended to accommodate roadside trading. The presence of roadside trading can cause congestion, parking outside the lay-by, unsafe manoeuvres and environmental damage. However, where mobile traders, snack bars, flower stalls, etc. are safely located and are not a nuisance, they are sometimes tolerated by road authorities, although where such facilities cause a safety hazard various powers exist to remove them.

4. LAY-BYS FOR MOTORWAYS

Frequency

4.1 On Motorways, the desirable frequency is for lay-bys to be provided at intervals of about 25km for each carriageway. There is no need for lay-bys on the two carriageways to be close to or opposite each other: indeed it is better to separate them, so as to reduce the likelihood of pedestrians crossing the road.

4.2 When considering the spacing of lay-bys, each 'full' junction (i.e. one with both an exit and an entry slip road in the direction under consideration) may be regarded as providing equivalent facilities for short duration stops and may, therefore, count as a lay-by. The location of Motorway Service Areas should also be taken into account when considering the spacing of the lay-bys.

4.3 There should be a lay-by (see Figure 4/1 and 4/2) at about 20 to 25km intervals in either direction. Type M1 Lay-by shall be used on Motorways. Type M2 lay-bys may only be installed on motorways with the agreement of the Head of Engineering, National Roads Authority..

4.4 Since stopping on a motorway is only permitted in an emergency, lay-bys for public use should be provided on motorways in accordance with this Chapter.

Layout

4.5 The recommended layout for a Type M1 lay-by on a Motorway is given in Figure 4/1 and that for a Type M2 lay-by is given in Figure 4/2. A Type M1 lay-by is the standard Motorway layout. A Type M1 lay-by is one which can also be used as a garda enforcement area; when not required by the gardaí, it will function as a normal lay-by. A Type M1 lay-by includes a covered slot in the road pavement for a temporary weighbridge.

4.6 The Type M1 lay-by is separated from the carriageway by a hard shoulder and a segregation island. A 3.5m wide through lane and a minimum 3.0m wide parking lane are provided.

4.7 An auxiliary deceleration lane with a dashed yellow line, as per the Traffic Signs

Manual, should be provided at the entry to the lay-by, to enable vehicles to decelerate clear of the main carriageway. Similarly, a merging taper should be provided at the exit from the lay-by to allow for acceleration. The layouts of the entry and exit should be as indicated in Figure 4/1 and 4/2, with the lane and taper lengths in as indicated; these requirements are similar to those of TD 42 for a major/minor priority junction.

4.8 The segregation island is a safety feature that separates main line traffic from parked vehicles, restricts access to and egress from the parking area and, by restricting through width, encourages drivers to slow down on entering the lay-by. However, accidents can occur when the island is not sufficiently conspicuous to vehicles either on the main carriageway or entering the lay-by. For this reason, standard delineator posts should be placed along the island at about 10m intervals. The delineators used shall be reboundable.

4.9 The segregation island should be raised and preferably hard surfaced for ease of maintenance. Consideration may be given to the use of a different surface colour to emphasise the island. The island should be separated from the main carriageway by a 2.5m wide hard shoulder and a solid yellow line as per the Traffic Signs Manual.

4.10 The crossfall of the lay-by should normally be arranged to drain away from the main carriageway.

Capacity

4.11 The parking bay length should be based on an estimation of demand, within the limits indicated. Demand will be affected by factors such as traffic flow, lay-by spacing, proximity to junctions and proximity to other facilities.

4.12 If the number of vehicles wishing to use the lay-by frequently exceeds the capacity of the lay-by, there may be operational problems and increased accident risk. Common problems caused by lack of capacity are: parking on tapers or outside the lay-by, collisions within the lay-by and over-running of the verges or footway.

4.13 At a Type M1 lay-by, the minimum parking length should be 150m as this length is required for a garda enforcement area. This length will also be adequate in most circumstances for its use as a public lay-by.

4.14 At a Type M2 lay-by, a minimum parking length of 50m should be provided. Where the two-way Annual Average Daily Traffic is forecast to be between 20,000 and 30,000, the minimum parking length should be 75m, while above this flow level the minimum parking length should be 100m.

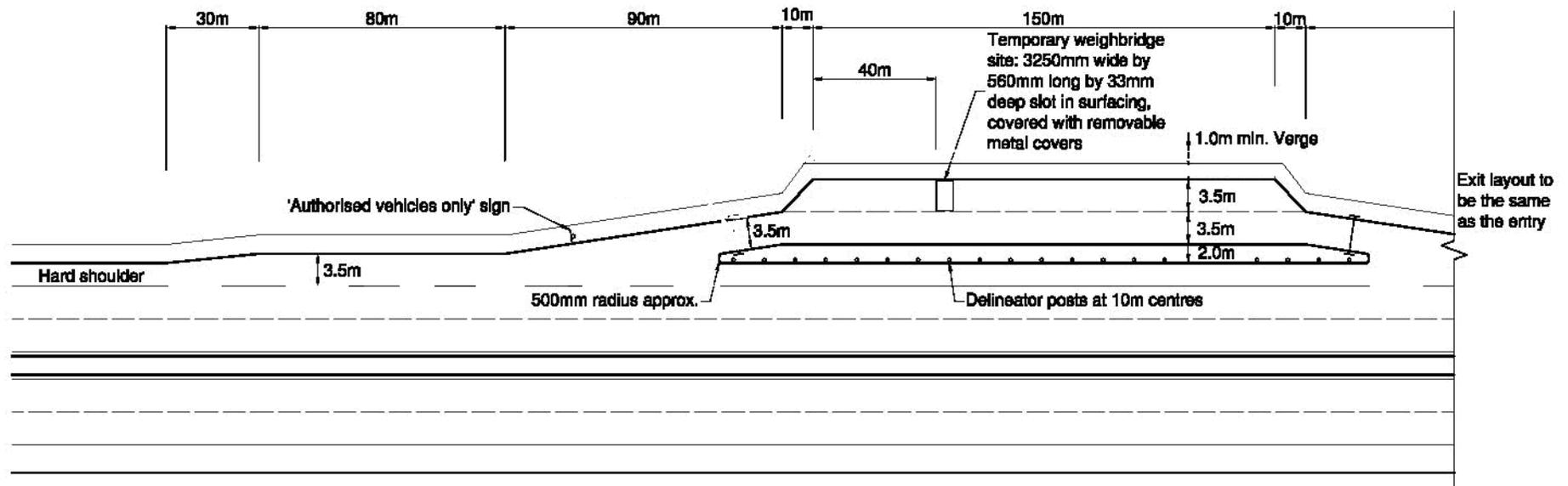
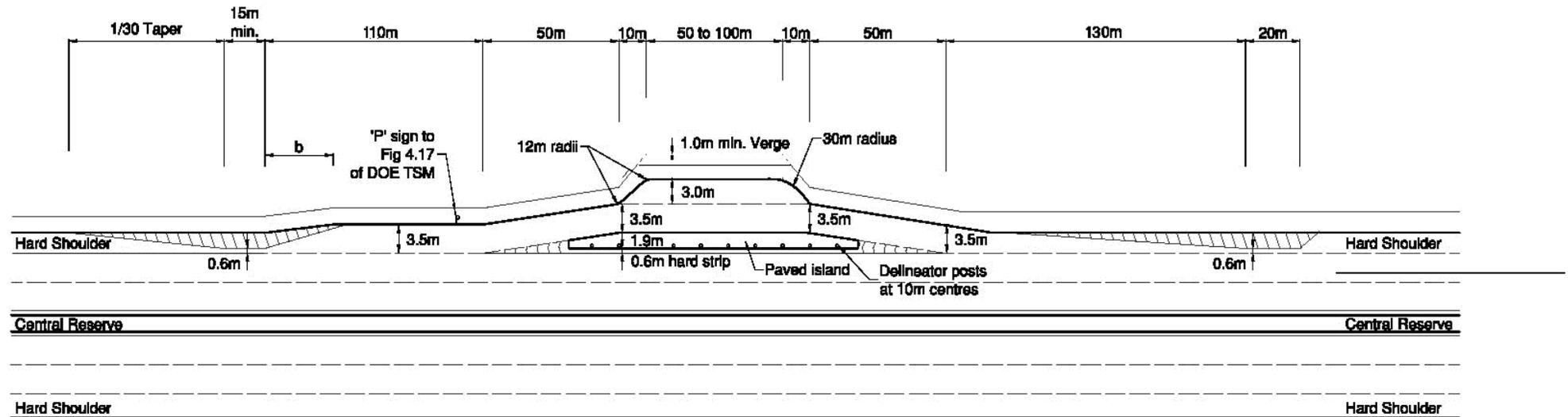


Figure 4/1: Geometric Layout of a Type M1 Lay-by on Motorways



Note: a = Deceleration Length
 b = Direct Taper Length
 c = Merging Length
 Not to scale

Figure 4/2: Geometric Layout of Type M2 Lay-by on Motorways (Type M2 lay-bys may only be used on motorways with the agreement of the Head of Engineering of the National Roads Authority.)

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Signs and Road Markings

4.15 With lay-bys located at regular intervals, drivers will have a choice whether or not to stop at a specific lay-by. Good advance signing assists in this decision and helps avoid sudden deceleration on the approach to the lay-by and attempts to enter the lay-by at too high a speed. Advance 'P' signs to Figure 4.16 of the Traffic Signs Manual (TSM), with the distance indicated, are advised. A sign to Figure 4.17 of the TSM should also be positioned on the verge alongside the start of the entry nose. If the lay-by contains an emergency telephone, a telephone symbol should be added to the signs.

4.16 Chevron hatching to Figure 7.33 of the TSM (Sign No RRM 021 of the Road Traffic (Signs) Regulations) should be provided at each end of the segregation island for the Type M2 Lay-bys. Hatching should also be used in the hard shoulder to delineate the ends of the diverge and merge tapers. This hatching should terminate 600mm from the edge of the traffic lane, to enable cyclists to remain within the hard shoulder without entering the hatched area. Carriageway markings should have reflectorised studs in accordance with the Traffic Signs Manual.

Footway and Kerbing

4.17 Footways should not be provided adjacent to Motorway Lay-bys.

4.18 Raised kerbing should normally be provided along the whole length of the widening at the lay-by and along the segregation island, to facilitate drainage, to define the edge of the surfacing more clearly, and to dissuade parking on the grass verge adjacent to the tapers. 75mm splayed kerbs will normally be appropriate.

Lighting

4.19 Where the road has street lighting, the lay-by should be illuminated to the same standard as the carriageway. Where no lighting exists, a road marking strip 100mm wide may be laid at the back of the parking bay to facilitate identification.

Facilities for Users

4.20 Emergency telephones connected to a garda control centre may be considered in certain locations: advice may be obtained by consulting the National Roads Authority. Alternatively, motoring organisations or telephone companies may be invited to install emergency telephones.

4.21 Lay-bys are not intended to accommodate roadside trading. The presence of roadside trading can cause congestion, parking outside the lay-by, unsafe manoeuvres and environmental damage.

5. GARDA ENFORCEMENT AREAS FOR MOTORWAYS

5.1 An Garda Síochána and other bodies need temporary areas alongside the carriageways of major roads for enforcement purposes such as checking vehicle loads. On all-purpose dual carriageway roads and Motorways, Type 2 and Type M1 lay-bys may be used. However, it may still be necessary to provide additional areas on motorways for enforcement purposes.

5.2 The locations of garda enforcement areas should be agreed with an Garda Síochána and the National Roads Authority; they will generally be required at intervals of about 25km along rural motorways. The general principles given in Chapter 2 and 3 concerning the siting of lay-bys also apply to garda enforcement areas on motorways.

5.3 Figure 5/1 shows a recommended layout for a garda enforcement area on a motorway. The layout is similar to that for a Type M1 lay-by, however the entry and entry and exit tapers are lined with a solid yellow line to prevent unauthorised parking.

5.4 A covered slot should be provided in the parking lane, as indicated on Figure 5/1, to allow for the installation of a temporary weighbridge. The slot should be covered with metal covers when not in use. Lifting barriers or gates should be provided at either end of the enforcement area, to deter its use as an unauthorised lay-by. There should be no road markings or signs to indicate the presence of the enforcement area, other than signs stating 'Authorised vehicles only' at either end. The enforcement area will normally be relatively inconspicuous; when it is to be used, the gardaí will set up temporary traffic signs and cones as necessary to direct traffic.

5.5 Garda enforcement areas will only be used occasionally and will, when in use, be controlled by the gardaí. Therefore, for the purposes of considering Relaxations in the geometric standards of NRA TD 9 on the immediate approach to a garda enforcement area, the enforcement area need not be regarded as a 'junction'.

5.6 In accordance with NRA TA 70, Motorway Service Areas shall also include Garda Enforcement Areas.

5.7 Type M1 Lay-bys may be converted into Garda enforcement areas if required.

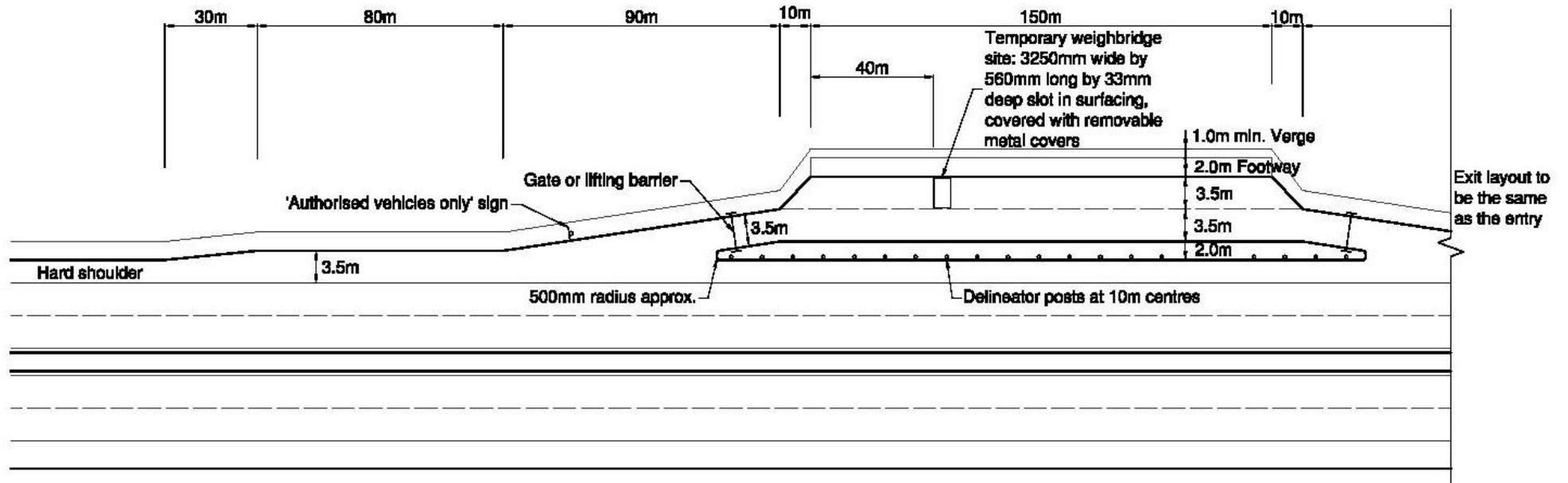


Figure 4/1: Geometric Layout of Garda Enforcement Area on Motorway

6. REFERENCES

Design Manual for Roads and Bridges (DMRB),
Volume 6: Road Geometry:

NRA TD 9, Road Link Design (NRA
DMRB 6.1.1).

TD 42, Geometric Design of Major/Minor
Priority Junctions (DMRB 6.2.6).

Roads Act, 1993.

Road Traffic (Signs) Regulations, 1997 (SI No.
181 of 1997).

Traffic Signs Manual, Department of the
Environment and Local Government.

7. ENQUIRIES

7.1 All technical enquiries or comments on these guidelines should be sent in writing to:

Head of Project Management and Engineering
National Roads Authority
St Martin's House
Waterloo Road
Dublin 4



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E O'CONNOR
Head Engineering Operations