



THE HIGHWAYS AGENCY

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THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT



**THE WELSH OFFICE
Y SWYDDFA GYMREIG**



**THE DEPARTMENT OF
THE ENVIRONMENT FOR NORTHERN IRELAND**

Traffic Signs and Road Markings for Lane Gains and Lane Drops on All-Purpose Dual Carriageway and Motorway Trunk Roads

Summary:

This Advice Note recommends the type of traffic signs and road markings to be used at locations where traffic lanes are gained or dropped in either permanent or temporary situations.

This Advice Note provides advice on specification requirements for use in public purchasing contracts. It does not lay down legislative requirements for products and material used in highway construction in the United Kingdom.

REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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VOLUME 8	TRAFFIC SIGNS AND LIGHTING
SECTION 2	TRAFFIC SIGNS AND ROAD MARKINGS

PART 1

TA 58/92

TRAFFIC SIGNS AND ROAD MARKINGS FOR LANE GAINS AND LANE DROPS ON ALL-PURPOSE DUAL CARRIAGEWAYS AND MOTORWAY TRUNK ROADS

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1. INTRODUCTION

General

- 1.1 There are two main types of situation where traffic lanes are gained or dropped:
- i. at junctions where traffic streams come together or separate with an associated gain or loss of one or more traffic lanes;
 - ii. on lengths of carriageway where a widening or narrowing occurs involving the addition or loss of one or more full width traffic lanes. (In general, this will apply to temporary situations only - see 3.5.)
- 1.2 The variation of the number of carriageway lanes over specific sections of route to meet particular traffic management demands brings with it different signing needs beyond those covered in existing advice.
- 1.3 Chapter 4 of the Traffic Signs Manual (1986) [paragraphs 4.13 and 4.14] (Ref 1) deals with Warning Signs for use at junctions where the joining stream of traffic may be required to concede priority to the "through" traffic stream.
- 1.4 The situation where lanes are gained or dropped is not as straightforward. A need has been identified for additional new traffic signs to be provided at these locations to ensure that drivers understand the road layout, to prepare them for the traffic movements they are likely to encounter and manoeuvres they will have to make.
- 1.5 Where drawings and specifications for signs described in this Advice Note require that materials or products shall comply with a British Standard, these requirements shall be satisfied by compliance with a relevant national or governmental standard of any member state of the European Community, provided that the standard in question offers guarantees of safety, suitability and fitness for purpose equivalent to those offered by the British Standard specified.
- 1.6 The advice given in this document will eventually be incorporated into the revised Traffic Signs Manual.

Scope

- 1.7 This Advice Note recommends the type of traffic signs and road markings to be used on all purpose dual carriageway and motorway trunk roads at locations where there are lane gains and lane drops.
- 1.8 The document does not cover the justification of the construction of a lane gain/drop provision. For policy guidance on such matters reference should be made to TD 22 (DMRB 6.2) (Ref 2) and TA 48 (DMRB 6.2) (Ref 3). TD 22 and TA 48 are due to be revised mid 1992.
- 1.9 Siting distances quoted in this document should be regarded as applicable in ideal situations. They may need to be varied to suit particular circumstances, for example, the location of other signs.

Implementation

- 1.10 This Advice Note should be used forthwith on all schemes for the construction, improvement and maintenance of trunk roads, including motorways, currently being prepared provided that, in the opinion of the Overseeing Department, this would not result in significant additional expense or delay progress. Design organisations should confirm its application to particular schemes with the Overseeing Department.

2. PERMANENT LANE GAIN

At Junctions

2.1 When a lane is gained at a junction there are two major objectives in providing signs:

- i. to ensure that joining traffic proceeds ahead in the additional lane without impeding the flow of traffic on the main carriageway;
- ii. to alert drivers on the main carriageway to the effect that fast moving traffic will suddenly appear on their left-hand side in a parallel and additional traffic lane.

2.2 To meet these demands new sign designs have been developed. These are shown in Appendix 1 Figures 1 to 8.

2.3 Guidance on the detailed deployment of these new traffic signs, existing traffic signs and road markings for various lane gain junction configurations is given below.

2.4 Where the number of lanes gained equals the number of entry slip lanes (Appendix 4, Diags 1 and 2), signs to Figure 1 or Figure 2, as appropriate, should be placed on the main carriageway and sited on the left hand side to indicate to through traffic that one or two lanes will be added to the through carriageway on the left hand side. These signs should be sited 50 metres and 295-355 metres in advance of the back of the merge nose.

- i. Signs to Figure 3 or Figure 4, as appropriate, should also be placed on the joining carriageway to indicate to joining traffic that one or two extra lanes will be available for that traffic when it reaches the main carriageway. Signs to Figure 3 should be sited on the left hand side only but signs to Figure 4 should be sited on each side of the joining carriageway. These signs should be sited 50 metres and 160-230 metres in advance of the back of the merge nose.
- ii. To reinforce the lane gain message conveyed by the signs shown in Figures 1 to 4, all road markings to Diagram 1005 of the Traffic Signs Regulations and General Directions "TSRGD" (Ref 4) and to the Traffic Signs Regulations (Northern Ireland) "TSR" (Ref 6) should be replaced by markings to

Diagram 1004 for a distance commencing at least 200 metres prior to the merge nose tip and continuing for at least 200 metres beyond the tip.

2.5 Where a two lane entry slip road joins the main carriageway but there is only one additional main carriageway lane available (Appendix 4 Diags 3 and 4), there are three methods available to allow this merging movement onto the additional lane.

- i. The two lane slip road is subjected to a preliminary merge in advance of the back of the merge nose. In this case, signs to Figures 5 or 6, as appropriate, should be used to indicate to joining traffic that one slip lane is discontinued. These signs should be sited at each side of the joining carriageway 100 metres and 210-280 metres in advance of the back of the merge nose.

Signs to Figure 3 should be placed on the left hand side of the joining slip lane 50 metres in advance of the merge nose tip. Signs to Figure 1 should be sited on the left hand side of the main carriageway 50 metres and 295-355 metres in advance of the back of the merge nose to indicate to through traffic that one lane will be added.

- ii. To reinforce the message conveyed by the signs, all road markings to Diagram 1005 of TSRGD should be replaced by markings to Diagram 1004. These markings should commence at the first sign to Figure 5 or 6 on the slip road and at least 200 metres prior to the merge nose tip on the main carriageway. The markings should be continued for at least 200 metres beyond the merge nose tip or to the termination of the merge taper, whichever is the greater.

- iii. The preliminary merge shall be effected by the use of cross hatch road markings to Diagram 1040 of TSRGD. These markings should commence 50 metres in advance of the back of the merge nose and be continued as far as the merge nose tip.

- iv. Additionally, at least two arrows to Diagram 1014 of TSRGD should be used on the slip lane which is to be discontinued. The

final arrow should have its tip 30 metres in advance of the commencement of the preliminary merge taper. Other arrows should be placed so that the arrow tips are at 30 metre intervals.

v. An alternative to the arrangement described in i. above is where the right hand slip lane merges with the through carriageway before the left hand slip lane is added to the main carriageway (Appendix 4 Diag 5).

vi. In this case, signs to Figure 7 should be used to indicate to joining traffic that the left hand slip lane is continuous and the right hand slip lane concedes priority to the main carriageway. Signs to Figure 7 shall be sited on both sides of the joining carriageway 160-233 metres in advance of the back of the merge nose. A sign to Figure 3 should be sited on the left hand side of the position of the merge nose tip.

Additionally, signs to Figure 8 should be sited on the left hand side of the main carriageway 50 metres and 295-355 metres in advance of the back of the merge nose.

vii. To reinforce the message conveyed by the signs, all road markings to Diagram 1005 of TSRGD should be replaced by markings to Diagram 1004. These markings should commence at the first sign of Figure 7 on the slip road and at least 200 metres prior to the merge nose tip on the main carriageway. The markings should be continued for at least 50m beyond the termination of the merge taper (for the left hand slip lane). Also, road markings to Diagram 1010 should extend from the tip of the merge nose to the termination of the furthest merge taper.

viii. Straight Ahead arrows to Diagram 1038 of TSRGD should be placed on the joining (additional) lane and on the original left lane of the main carriageway adjacent to the merge nose tip and immediately beyond the termination of the furthest merge taper to indicate straight ahead movement.

ix. A further alternative to the arrangement described in i. above is where the left hand slip lane merges with the additional main carriageway lane after the right hand slip lane has been added to the through carriageway.

Any proposal to use this arrangement should be referred to the Overseeing Department at the address in Chapter 7.

Between Junctions

2.6 Where a carriageway is increased in width between junctions by the addition of a full width traffic lane, signs to Figure 9 or Figure 10, as appropriate, should be used. These signs should normally be sited at each side of the carriageway 180-200 metres and 360-400 metres in advance of the commencement of the taper. Where this is not practicable, consideration should be given to mounting the signs on gantries.

2.7 Straight ahead arrow markings to Diagram 1038 of the TSRGD should be placed in each lane at the commencement of the parallel section, as shown in Appendix 4 Diagrams 6 and 7 of this Advice Note.

3. PERMANENT LANE DROP

At Junctions

3.1 Where a lane drop occurs at a junction, it is important that drivers should be given information in good time to enable them to select the correct lane according to their destination.

3.2 In all lane drop situations at junctions, direction signs to Diagrams 703.1, 703.3, 718.1, 718.3, 906.1 and 908.2 of TSRGD, as appropriate, should be used. Policy guidance and criteria for the use of gantries for signs is contained in TD 18 (DMRB 9.1) (Ref 5).

3.3 Where there is a difficult road alignment (eg. a tight left hand horizontal curve) or other visual interference the lane drop message of the direction sign may not be clearly conveyed to all the approaching drivers. In these circumstances signs to Figure 11 or Figure 12, as appropriate, may be used to reinforce the message. The applicable sign should be sited on the left hand side of the main carriageway 180-200 metres in advance of the half-mile advance direction sign. To assist in these circumstances, destination lane markings to Diagram 1035 of TSRGD may also be used to supplement the directional signing indicating dedicated lanes.

3.4 Road markings to Diagram 1005 of TSRGD, between the lanes to be dropped and the lanes continuing on the main carriageway, should be replaced by markings to Diagram 1010. This marking should normally commence at the half-mile advance direction sign and continue to the diverge nose tip. A one mile advance direction sign should also normally be provided.

Between Junctions

3.5 The provision of a permanent lane drop between junctions is not recommended. Any proposal to depart from this recommendation should be referred to the Overseeing Department at an early stage.

4. TEMPORARY LANE GAIN/LANE DROP

4.1 Roadworks that create new but temporary lane gain or lane drop situations or modify existing permanent lane gain or lane drop layouts require temporary signs to indicate to drivers the changed circumstances.

4.2 Signs for this purpose are illustrated in Appendix 2 Figures 14-30. These should be used in association with the normal Road Work and Traffic Management signing layouts.

4.3 In permanent lane gain/drop locations the existing permanent signs should be temporarily replaced with the appropriate temporary signs to suit the roadwork situation in accordance with Appendix 3 Table 1.

4.4 Where new but temporary lane gain/drop situations are created by the roadworks, temporary signs should be erected. These should be sited in accordance with the advice given for the equivalent permanent signs (see Appendix 3 Table 2)

4.5 Road markings should be provided in accordance with the corresponding permanent situation.

4.6 Where the hard shoulder is utilised as a gained lane a supplementary plate (WBM(R)950 "Use Hard Shoulder") to signs to Figures 15 and 17 should be used. Additionally a supplementary plate (WBM351 "No Hard Shoulder for x miles) to signs to Figures 14 and 16 may be appropriate.

4.7 A lane drop between junctions is not recommended as a permanent condition. It is however the common result of road works and requires the use of temporary lane drop signs. Signs to Figs 27 and 28 should be used for this. These should be sited at each side of the carriageway 180-200 metres and 360-400 metres in advance of the commencement of the taper. Additionally, three arrow markings to Diagram 1014 of TSRGD should be placed on the lane to be discontinued, in advance of the lane reduction. The tips of the arrow should be 206 metres, 250 metres and 316 metres in advance of the commencement of the taper.

4.8 Near junctions the position of a lane drop needs very careful consideration to ensure that it can be signed properly and that the resulting traffic manoeuvring does not produce unacceptable conflict particularly in the area of the merge. Wherever possible this situation should be avoided.

4.9 The colours for temporary signs are constant irrespective of the status of the road. They should have black symbols and borders and red blocks (to indicate closed lanes) on a yellow background.

4.10 At the completion of the Road Works the original traffic signs and road marking should be reinstated.

4.11 For advice on the signing and road marking requirements for cases not covered in Appendix 3 Table 1 or Table 2 reference should be made to the Overseeing Department at the address in Chapter 7.

5. GENERAL REQUIREMENTS

Variants to Signs Diagrams

5.1 It may be appropriate to include a distance plate on the signs. This should be incorporated into the design as shown at Appendix 1 Figure 13 or Appendix 2 Figure 26.

5.2 Not all possible sign variants are illustrated in this Advice Note. The number of arrows shown on the signs should be varied to correctly indicate the number of lanes which exist.

5.3 With the exception of temporary signs the sign colours should be varied to accord with the status of the main road on which they are placed. For motorways they should be white on blue and for primary routes they should be white on green. On non-primary routes, the symbols, legend and border should be black and the background white. For each of the three main road categories, the signs on the joining carriageway should have the same colour arrangement as those on the main carriageway.

Working Drawings and Authorisation

5.4 Working drawings for the signs shown in Figures 1 to 30 will be included in the Department of Transport WBM and the Welsh Office WO/WBM series of drawings. Eventually, they are to be incorporated into the TSRGD.

5.5 All signs to WBM or WO/WBM drawings are required to be authorised by the Department of Transport or Welsh Office, as appropriate, before installation.

Junction Layouts and Standards

5.6 The diagrammatic road layouts, with signs and roadmarkings shown symbolically in Appendix 4 Diagrams 1 to 10, are intended for illustrative and guidance purposes only. They do not supersede any other Departmental Standard or Advice Note. They do not show all possible variations of layout.

Glossary of Terms

5.7 Throughout the document reference has been made to the terms: "back of the merge nose", "the merge nose tip" and "diverge nose tip". These points of reference for the siting of signs should be taken to be as shown in Diagram 10.

6. REFERENCES

1. The Traffic Signs Manual Chapter 4 - Warning Signs - HMSO.
2. Standard TD 22 (DMRB 6.2) - Layout of Grade Separated Junctions.
3. Advice Note TA 48 (DMRB 6.2) - Layout of Grade Separated Junctions.
4. "TSRGD" - The Traffic Signs Regulations and General Directions 1981 (SI 1981 No 859) as amended.
5. Standard TD 18 (DMRB 6.2) - Criteria for the use of Gantries for Traffic Signs and Matrix Traffic Signals on Trunk Roads and Trunk Road Motorways.
6. "TSR" - The Traffic Signs Regulations (Northern Ireland) 1979 (SRO 1979 No. 386) as amended.

7. ENQUIRIES

All technical enquiries or comments on this Advice Note (incorporating Amendment No 1 dated April 1994) should be sent in writing as appropriate to:

Head of Network General and Maintenance
Division
The Highways Agency
St. Christopher House
Southwark Street
London
SE1 OTE

C DIXON
Head of Network General and
Maintenance Division

The Deputy Chief Engineer
The Scottish Office Industry Department
Roads Directorate
New St Andrew's House
Edinburgh EH1 3TG

J INNES
Deputy Chief Engineer

Head of Roads Engineering (Construction) Division
Welsh Office
Y Swyddfa Gymreig
Government Buildings
Ty Glas Road
Llanishen
Cardiff CF4 5PL

B H HAWKER
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10-18 Adelaide Street
Belfast BT2 8GB

D O'HAGAN
Assistant Chief Engineer (Works)

PERMANENT SIGNS

PERMANENT SIGNS



Fig. 1 Single Lane Gain on Left of Main Carriageway

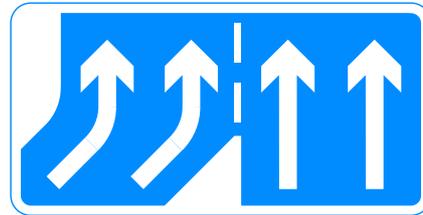


Fig. 2 Two Lane Gain on Left of Main Carriageway

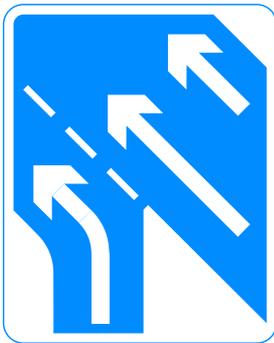


Fig. 3 Single Lane Joining Main Carriageway

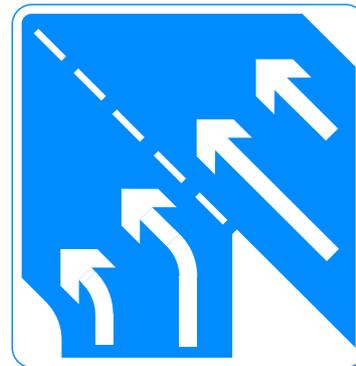


Fig. 4 Two Lanes Joining Main Carriageway

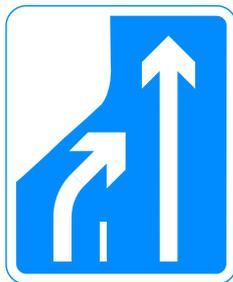


Fig. 5 Carriageway Narrows on Left at Junctions

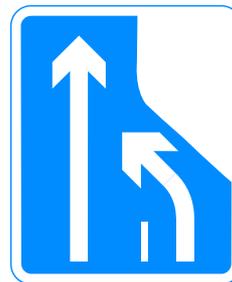


Fig. 6 Carriageway Narrows on Right at Junctions

Note: Figs. 1-6 may be supplemented by a distance incorporated into the design and the distance varied as appropriate - See Fig. 13.

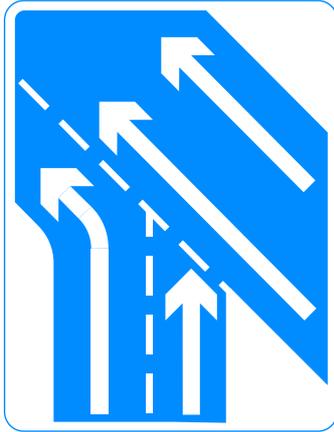


Fig. 7 Single Lane Joining Main Carriageway From Two Lane Slip Road. Lane Gain for Left Hand Slip Lane

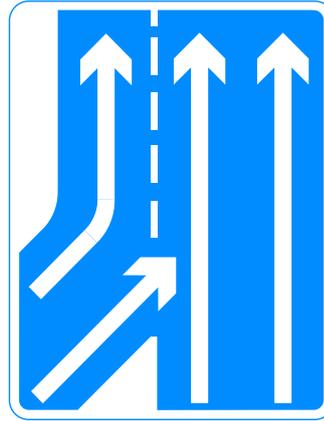


Fig. 8 Slip Lane Merging with Main Carriageway before Lane Gain



Fig. 9 Carriageway widens on Left (Lane addition other than at Junctions)

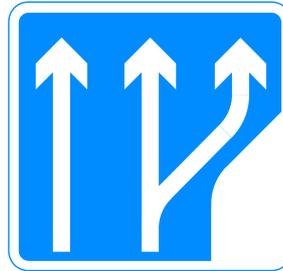


Fig. 10 Carriageway widens on Right (Lane addition other than at Junctions)

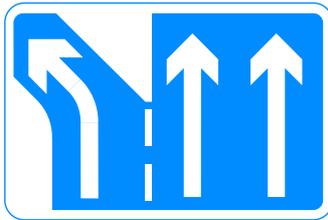


Fig. 11 Single Lane Drop on Left at Junctions

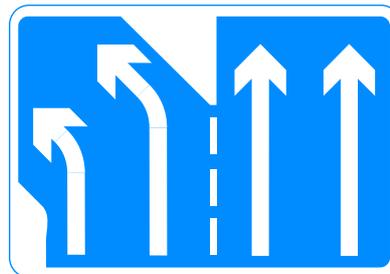


Fig. 12 Two Lane Drop on Left at Junctions

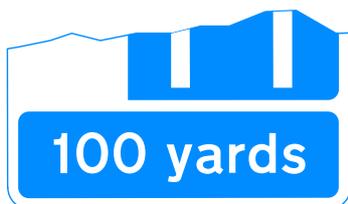


Fig. 13 Refer to Note

Note: Figs. 7-12 may be supplemented by a distance incorporated into the design and the distance varied as appropriate - See Fig. 13.

TEMPORARY SIGNS FOR ROADWORKS



Fig. 14

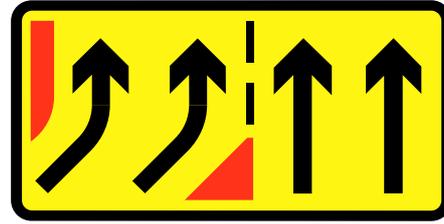


Fig. 15

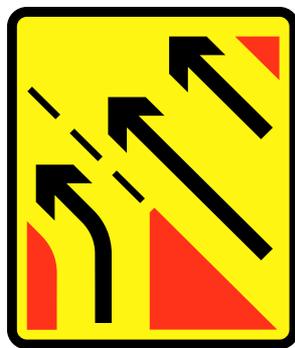


Fig. 16

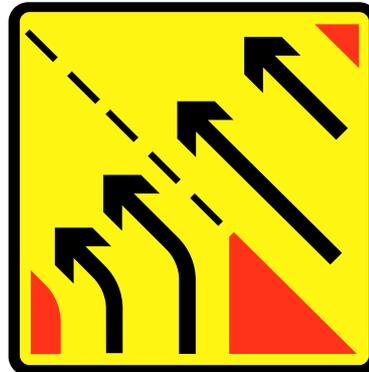


Fig. 17



Fig. 18



Fig. 19

Note: Figs. 14-19 may be supplemented by a distance incorporated into the design and the distance varied as appropriate - See Fig. 26.



Fig. 20

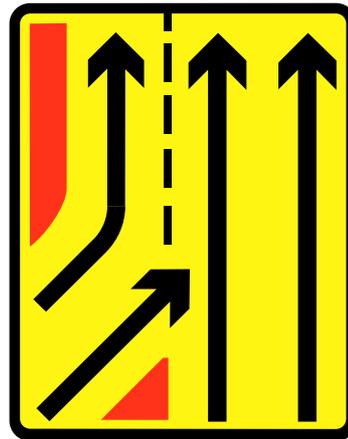


Fig. 21



Fig. 22



Fig. 23



Fig. 24



Fig. 25



Fig. 26 Refer to Note

Note: Figs. 20-25 may be supplemented by a distance incorporated into the design and the distance varied as appropriate - See Fig. 26.



Fig. 27



Fig. 28



Fig. 29



Fig. 30

Note: Figs. 27-30 may be supplemented by a distance incorporated into the design and the distance varied as appropriate - See Fig. 26.

TABLES

TABLE 1: REPLACEMENT TEMPORARY SIGNS IN PERMANENT LANE GAIN/DROP LOCATIONS

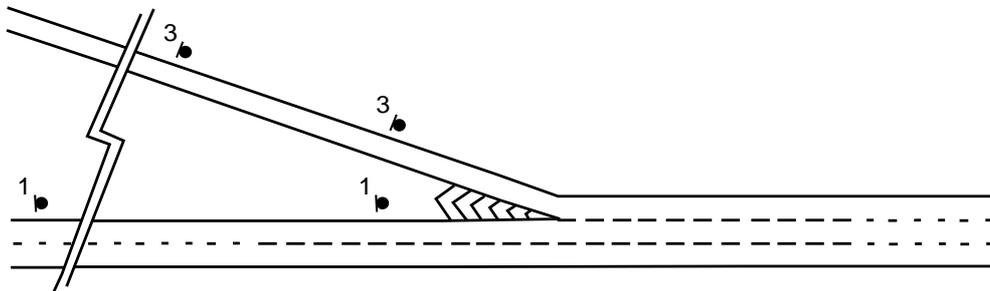
PERMANENT SIGN (Fig. No.)	TEMPORARY SIGN (Fig. No.)	SITUATION	REMARKS
1 2 3 4 5 6 7	29(++) 14(++) 30(*) 18 & 16 (**) 18(*) 19(*) 18 or 19 & 30(**) (*)	Additional "gained" lane, or nearside "gained" lane of a two "gained" lane layout, closed at or within 750 metres of the merge entry point.	(*) Road markings to Diag 1010 across merge taper required. (**) Temporarily cover the permanent signs and site temporary signs as for permanent signs to Figs 5 or 6, and 3. Include arrows and ghost markings to sections 2.5 iii - iv. (++) See below.
1 2 3 4 5 6	(((No change (((Additional "gained" lane(s) closed beyond 750 metres from merge entry point.	These cases are considered to be sufficiently outside the influence of the Road Works to be left as permanent signs. Install temporary signs on the main carriageway to Fig 27 plated with distance (see section 4.7)
11 12	cover sign	Lane to be dropped is closed to traffic up to the junction.	
1 2 3 4 5 6 7 11 12	14(++) 15(++) 16(++) 17(++) 18(++) 19(++) 20(++) 24(++) 25(++)	Loss of outside (fast) lane and any number of adjacent lanes up to and including lane 2.	(++) The number of lane arrows should be varied to indicate those available on the main carriageway.
2 4	29 30	Additional two "gained" lanes closed at or within 750 metres of the merge entry point.	Markings to Diag 1010 across merge taper required.
9 10	WBM(R) 858.3 WBM(R) 858.3	"Gained" lane closed.	It may be more appropriate to temporarily blank signs to Figs 9 or 10.

TABLE 2: PERMANENT SIGNS AND THEIR TEMPORARY EQUIVALENT

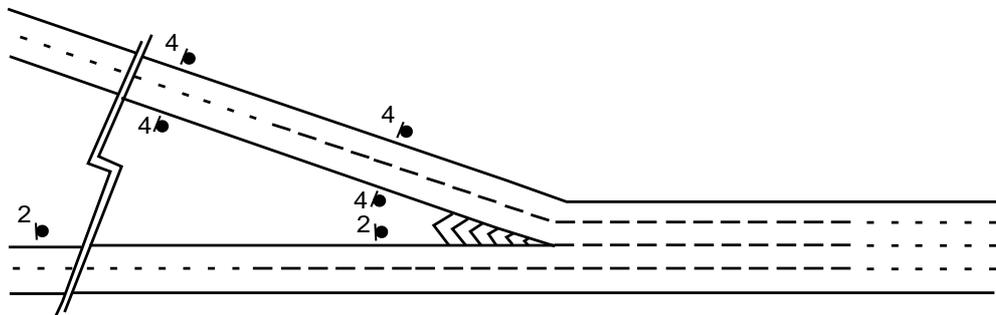
PERMANENT SIGN (Fig. No.)	TEMPORARY SIGN (Fig. No.)
1	14
2	15
3	16
4	17
5	18
6	19
7	20
8	21
9	22
10	23
11	24
12	25
13	26
No equivalent	27
No equivalent	28
No equivalent	29
No equivalent	30

DIAGRAMMATIC ROAD LAYOUTS

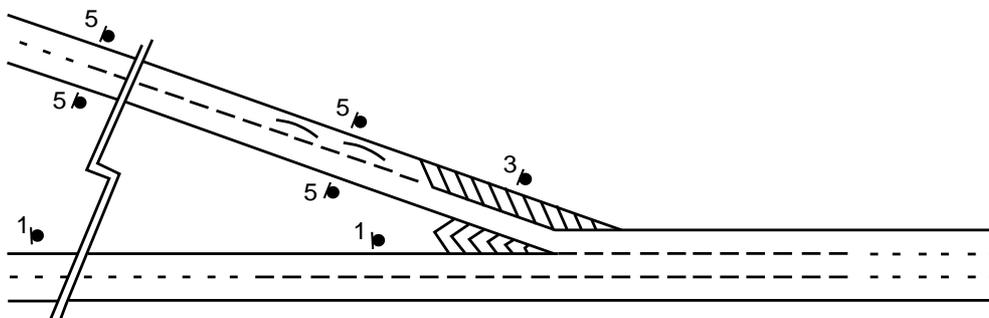
DIAGRAMMATIC ROAD LAYOUTS



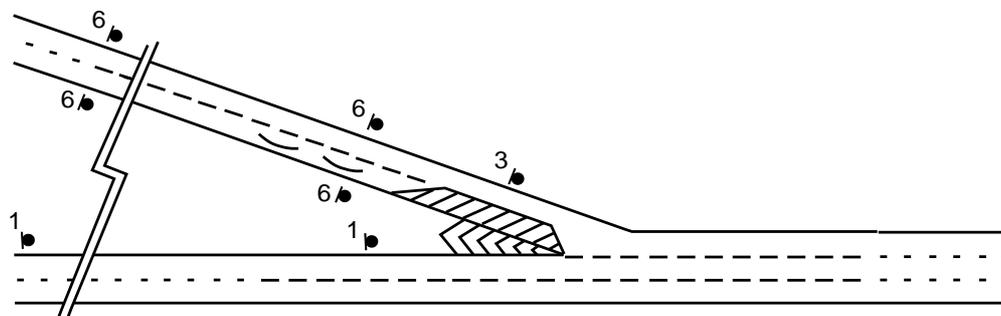
Dia.1 Single lane slip road to single lane gain at a junction



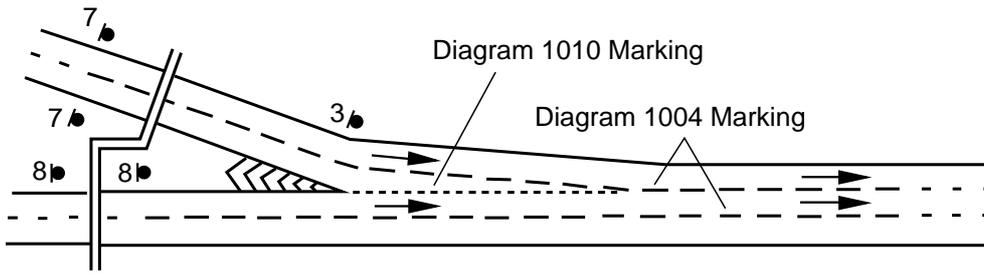
Dia. 2 Two lane slip road to two lane gain at a junction



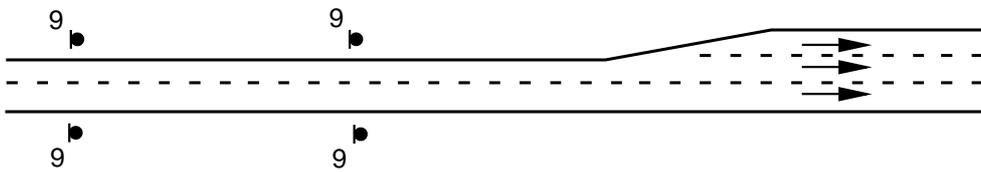
Dia. 3 Two lane slip road to single lane gain at a junction



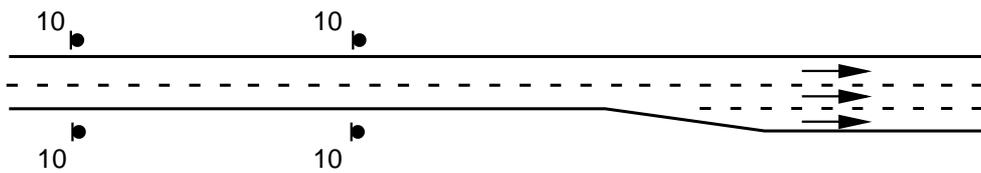
Dia. 4 Two lane slip road to single lane gain at a junction (variant 1)



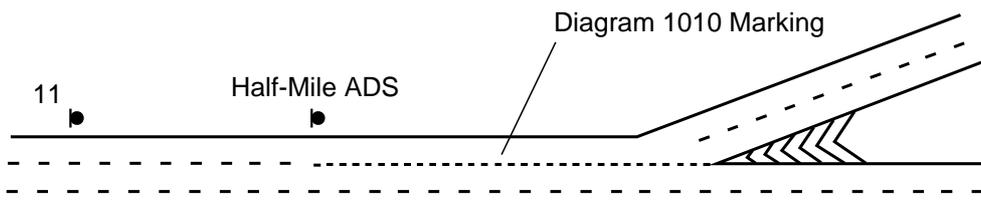
Dia. 5 Two lane slip road to a single lane gain at a junction (variant 2)



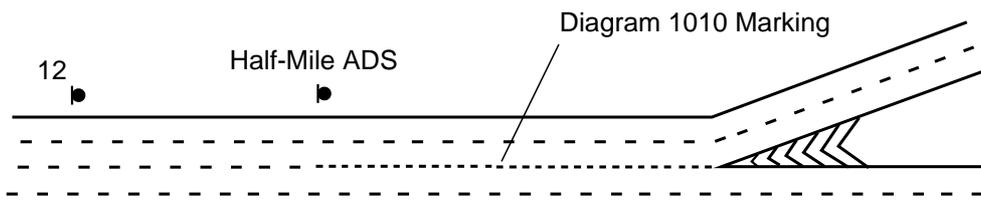
Dia. 6 Single lane gain between junctions



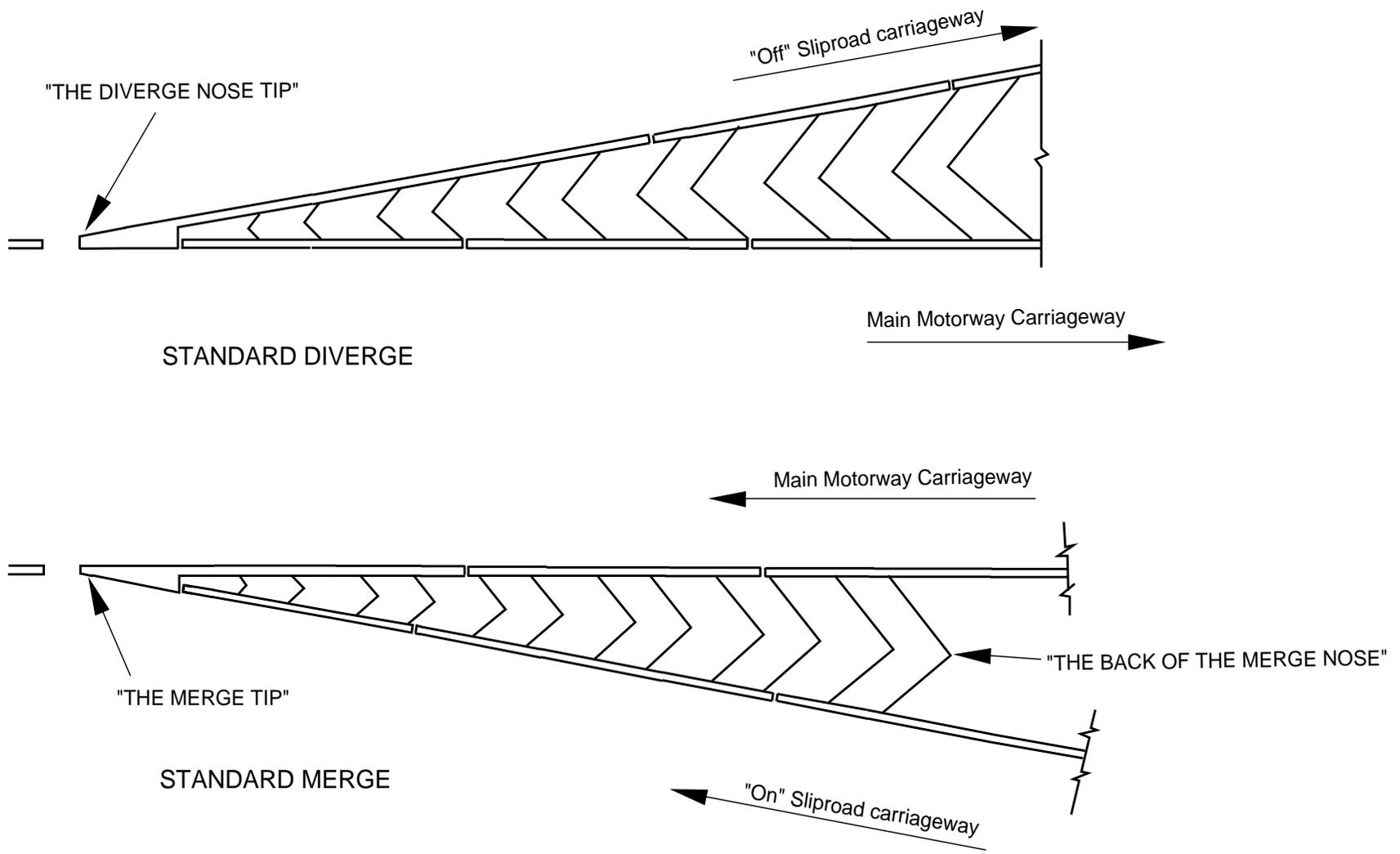
Dia. 7 Single lane gain between junctions (variant)



Dia. 8 Single lane drop at a junction



Dia. 9 Two lane drop at a junction



Dia. 10 Points of reference for siting traffic signs