Manual

Traffic and Road Use Management
Volume 3 –Signing and Pavement Marking

Part 2: Pavement Marking Usage
Chapter 4: Treatment at intersections / roundabouts / interchanges

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4 Treatment at intersections / roundabouts / interchanges

4.1 General use of pavement markings

Refer to MUTCD Part 2 Section 5.3.9.

5.3.9 Longitudinal lines at intersections and roundabouts

Use of longitudinal lines at, and on the approaches to intersections and roundabouts shall be as follows:

a) Dividing, barrier and lane lines

These lines shall be used as follows:

i. At minor side roads with or without STOP or GIVE WAY sign control, these lines, where existing on the major road approach, shall be carried through the intersection, except that a gap shall be left in a double barrier line for turning or crossing traffic see Clause 5.3.3.2.

ii. At signalised intersections, the lines shall be discontinued at the stop line on each approach.

iii. Where lane changing just in advance of the intersection is a problem and needs to be prohibited, the last 10 m to 12 m of lane line on the approach shall be continuous.

iv. On an intersection approach controlled by STOP or GIVE WAY signs or across which is marked a give-way line, a dividing line terminating at the stop or give-way line comprising either:

- a single continuous dividing line 10 m to 12 m in length, or
- a special purpose broken dividing line (see Figure 5.1) up to 30 m in length unless a single continuous line is required for another purpose, e.g. to control overtaking, shall be marked wherever the sealed pavement width or width between kerbs is at least 6 m over the length of the line. It shall also be provided at lesser widths if the rest of the approach road is dividing line marked, or if there is a crest or curve on the immediate approach. The marking may need to be extended in the latter case.

v. Exit lines shall be marked at multi-lane roundabouts, except where geometric restrictions prohibit their safe use or where combinations of single lane exits and high turning traffic volumes can lead to operational difficulties. A typical example is shown in Figure 2.7.

Exit lines shall:

- comprise a special purpose lane line (see Figure 5.1)
- have a minimum of three segments marked per exit line
- commence from a line drawn tangentially from the central island to the splitter island exit edge line at the previous exit, and
- extend far enough into the roundabout exit to provide satisfactory guidance for exiting vehicles.
b) Edge lines

Where edge lines are used they shall be discontinued through a major intersection or past intersecting roads or streets which have STOP or GIVE WAY signs. If the intersection is wide, a continuity line should be used.

4.1.1 Introduction

The various line types and their use at intersections are described briefly below. Detailed layouts for different types of intersection are given in Section 4.2.

In some situations, the strict application of the line types described below (particularly lane, edge and continuity lines) will result in a variety of line types in a single alignment over a short distance (see Figure 4.2.2(F) in Section 4.2.2 of this guide). Here a relaxing of the criteria may be desirable, for the sake of simplicity in both driver understanding and line marking operations. Figures 4.2.2(G) and 4.2.2(I) in Section 4.2.2 of this guide illustrate a way of doing this.

4.1.2 Dividing lines

At major / minor road intersections, with or without ‘STOP’ or ‘GIVE WAY’ control, broken lines on the major road are continued through the intersection, and lines on the minor road are terminated at the stop line or give way line, or at the major road edge line or edge of pavement.

A side road dividing line is not normally provided if the seal width, measured 10 metres back from the give way line or stop line, is less than 6 metres, unless either the side road is already marked with a dividing line, or there is a curve or crest on the immediate approach. The marking may be extended on curved approaches.

For general use of dividing lines, see Section 2.2.1 of this guide.

4.1.3 Barrier lines

The use of a barrier line on the side road is, in addition to any sight line requirements, subject to the same provisions as for dividing lines (see the preceding Section 4.1.2 in this guide).

Barrier lines may be supplemented by RRPMs if delineation of the intersection is likely to be a problem at night.

For general use of barrier lines, see Section 2.2.2 in this guide.

4.1.4 Lane lines

At major / minor road intersections, lane lines are continued through the intersection. A continuity line is used to show the continuation of a bicycle lane along the major road through major / minor unsignalised intersections.

Where lane lines are used to separate lanes for different turn types and lane discipline needs to be legally enforced, the line is continuous for some distance up to the stop line or give way line.

For general use of lane lines, see Section 2.2.3 in this guide.
4.1.5 Edge lines

Edge lines are discontinued through intersections, the termination point being the tangent point of the turn arc. The edge line may be continued around the turn to give a better indication of the course for turning vehicles to follow, especially where it can join up with an edge line on the intersecting road.

Edge lines are continued across the mouths of minor roads at intersections, where the T-intersection rule is relied upon.

Private property accesses do not count as intersections, and edge lines are continued across them.

For general use of edge lines, see Section 2.2.4 in this guide.

4.1.6 Continuity lines

A continuity line may be used through an intersection, where the line will be crossed by vehicles turning at the intersection, to indicate the edge of the roadway assigned to through traffic. It may also be used at the start or finish of an added lane where vehicles change lanes when entering or leaving the lane.

The continuous lane line is used when the lane has achieved full width and the continuity line is at least the minimum taper lengths ‘M’ or ‘D’ as shown in Figure 4.2.2(F) in Section 4.2.2 of this guide. Other applications of continuity line are shown in figures 4.2.2(G), 4.2.2(H) and 4.2.2(I) in Section 4.2.2 of this guide.

For general use of continuity lines, see sections 2.2.5 and 4.1.4 of this guide.

For continuity lines for bicycle lanes see Section 3.8.2 of this guide.

4.1.7 Turn lines

Refer to MUTCD Part 14 Section 6.2.4.

<table>
<thead>
<tr>
<th>6.2.4 Turn lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn lines may be used within major or complex intersections to indicate the proper course to be followed by turning vehicles. They should be used within an intersection to assist separation of traffic in the case of multiple turning lanes for the one turn. They are not required when the path to be followed is obvious to drivers under all conditions (see also Clause 6.3). Turn lines should not be carried through crossings.</td>
</tr>
<tr>
<td>Turn lines comprise a broken line 100 mm wide, with 600 mm stripes and 600 mm gaps.</td>
</tr>
</tbody>
</table>

For general information on turn lines, see Section 2.2.6 of this guide.

4.1.8 Stop lines

At intersections which are controlled by ‘STOP’ signs, the stop line must be used in conjunction with the ‘STOP’ sign. It is normally placed in prolongation of the kerb line or edge line.

Where there is a problem with vehicles overrunning the line or to hold vehicles back from the intersection, the stop line can be set back from the kerb or edge line (refer to MUTCD Part 2 Figure 5.3 reproduced at Section 2.3.1 of this guide).
Stop lines at intersections should be located adjacent to, or not more than, 3 m in advance of a primary signal post and 1.0 m minimum from parallel pedestrian crosswalks at intersections (measured from the outside edge of the crosswalk to the outside edge of the stop line).

Stop lines at mid-block crossings should be located 3.0 m minimum (6.0 m maximum) from signalised mid-block crossings (measured from the outside edge of the crosswalk to the outside edge of the stop line).

If the intersection is wide, a continuity line should be used across the right-hand side of the approach.

For general information on stop lines, see Section 2.3.1 in this guide.

Advanced stop lines for bicycles should be placed 2 metres ahead of other vehicular stop lines at intersections controlled by signals so that drivers of other vehicles, particularly bus and truck drivers, will be aware of bicycles waiting at the stop line prior to the start of the green period. An advanced stop line for bicycles is shown at (a) in AS1742.9 Figure 2.9 reproduced at Section 3.8.5 of this guide.

4.1.9 Give way lines

A give way line must be used in conjunction with a ‘GIVE WAY’ sign at intersections. It is normally placed in prolongation of the kerb line or edge line.

Where there is a problem with vehicles overrunning the line or to hold vehicles back from the intersection, the give way line can be set back from the kerb or edge line (refer to MUTCD Part 2 Figure 5.3 reproduced at Section 2.3.1 in this guide).

If the intersection is wide, a continuity line should be used across the right-hand side of the approach.

See also Section 2.3.1 in this guide.

4.1.10 Pavement messages and symbols

Pavement messages are not generally used to supplement stop and give way signs.

4.1.11 Pedestrian crosswalk lines

Where crosswalk lines are marked at traffic signals they should be located up to 0.5 metres from the primary signal post. The stop line should then be located at least a further 2 to 3 metres in advance of the same primary signal post and not less than a clear 1 m distance from the crosswalk lines.

The standard width between crosswalk lines is 3.5 metres, but this may be increased where pedestrian flows are high or reduced to 2 metres if pedestrian flows are low and/or required by other site considerations.

4.1.12 Marked islands

If traffic encroachment on marked islands becomes a problem, pavement bars may be installed (see Section 2.5.5 in this guide).

See also Section 2.4.1 in this guide.

Treatment of islands other than painted islands is detailed in Section 3.4 of this guide.

4.1.13 Pavement arrows

Traffic lane arrows are discussed in Section 2.4.2.1 of this guide.
4.2 **Typical arrangements**

4.2.1 **General**

The signing and marking treatments for the various intersection types illustrated in MUTCD Part 2 figures 2.1 to 2.8 reproduced at Section 4.2.2 of this guide are typical only, and the layout of a particular intersection may require reference to two or more figures to obtain a suitable guide for a composite treatment.

The precise layout of pavement markings should be adjusted to suit the design of the intersection, and positioning of signs and the need for additional signs or delineating devices may be affected by variations in the layouts, particularly where there are curves or crests on any approach. Some relaxation of line-type application criteria may also be appropriate (see Section 4.1.1 of this guide).

Bicycle arrangements at intersections are covered in Section 3.8 of this guide. Bicycle lane treatments at unsignalised intersections are shown in AS1742.9 Figure 2.8 reproduced in this guide at Section 3.8.5, bicycle provision on the approach to traffic signals are shown in AS1742.9 Figure 2.9 reproduced in this guide at Section 3.8.5 and arrangements for retrofitting bicycle lanes in left-turn lanes are shown in Traffic Control (TC) Signs TC1769_1 to TC11769_4 shown at Section 3.8.5 of this guide.

4.2.2 **Typical arrangements at interchanges**

Signing and marking treatments for the interchanges are illustrated in MUTCD Part 2 figures 3.3 to 3.5 reproduced in this guide at Section 4.2.2. Provision for cyclists to cross a freeway ramp are discussed in Section 3.8.5 and AS1742.9 Figure 4.1 reproduced at that section in this guide.
Notes

1. Any dividing lines or lane lines on the main road, except double barrier lines, shall be carried through the intersection.

2. No marking should be painted across uncontrolled side roads. Edge or continuity lines should be discontinued across such intersections.

3. For dimensions of line marking, refer to MUTCD Part 2 Figure 5.1 reproduced at Section 2.2.7 in this guide.
Figure 4.2.2(A) – Intersection treatment along rural (unkerbed) roads

Notes

1. Sealed side road.
2. Unsealed side road.
3. Property entrance.
4. ‘T’ intersection rule applies.
5. For a four-lane road, use separation and lane lines as per MUTCD Part 2 Figure 5.1 reproduced at Section 2.2.7 in this guide.
6. If side road is not pavement marked, no turn lines to be used.
Figure 4.2.2(B) – Intersection treatment along urban (kerbed) roads

Notes
1. Sealed side road.
2. Unsealed side road.
3. Property entrance.
4. ‘T’ intersection rule applies.
5. For a four-lane road, use separation and lane lines as per MUTCD Part 2 Figure 5.1 reproduced at Section 2.2.7 in this guide.
6. If side road is not pavement marked, no turn lines to be used.
Figure 4.2.2(C) – Intersection treatment along roads with wide reserves

(a) With edge lines

(b) Without edge lines

Notes

1. Sealed side road.
2. Unsealed side road.
3. Property entrance.
4. ‘T’ intersection rule applies.
5. For a four-lane road, use separation and lane lines as per MUTCD Part 2 Figure 5.1 reproduced at Section 2.2.7 in this guide.
6. If side road is not pavement marked, no turn lines to be used.
Figure 4.2.2(D) – Intersection treatment along roads with medians

(a) Median width > 10 m

(b) Median width 3 m - 10 m
Notes

1. Barrier lines and island outline markings may be augmented with retroreflective raised pavement markers (RRPMs). See Clause 5.6.5.2 in the MUTCD Part 2 extract in Section 2.5 of this guide for location and spacing. Barrier lines are extended if sight conditions on any approach so require.

2. Where the route is not edge lined continuously and edge lines are provided through the intersection, they should be continued to the end of the approach barrier line.

3. The GIVE WAY sign may be repeated on the median island if visibility to the left-hand sign is inadequate and may be provided on the slip lane.

4. The sight board is located for best long-distance visibility from the side road approach, that is, it may need to be offset if the approach is curved or raised if there is a crest in the side road approach.

5. A part of the parallel portion of the turning lane may be bounded by a single unbroken line if required for control of traffic using the turning lane or for better delineation of the adjacent through lane.
Figure 4.2.2(E) – Minor rural intersection straight approach

Note

1. Dividing line marked in accordance with MUTCD Part 2 Clause 5.3.9(a)(iv).
**Notes**

1. The W2-14(L) sign is not required if intersection visibility is satisfactory at the distance given in MUTCD Part 2 Table 2.3.

2. For use of the side road separation line, see Clause 5.3.9(a)(iv) in the MUTCD Part 2 extract in Section 4.1 of this guide.

3. Barrier lines may be supplemented with RRPMs if night-time delineation of the intersection is likely to be a problem and the remainder of the route is not treated continuously with RRPMs.

4. If the curve is substandard, Chevron Alignment markers (CAMs) (D4-6), are placed as shown in accordance with MUTCD Part 2 Clause 3.4.9. If the curve is not substandard, CAMs are not used but two D4-1-1 Hazard markers may be placed one each side of the intersection in the CAM positions.

5. This sign is provided in accordance with MUTCD Part 2 Table 2.4.

6. Similar signs may be required for the opposite approach.
Figure 4.2.2(F) – Auxiliary lanes and tapers – Controlled side road (full treatment)

Notes

1. These markings are omitted if auxiliary lane length (including taper) is less than or equal to ‘M’ or ‘D’ respectively.
2. ‘M’ or ‘D’ should be at least the length shown in the table. Longer lengths may be required on flat tapers and shorter lengths are sometimes necessary due to construction limitations.

<table>
<thead>
<tr>
<th>Design speed of Through Road km/hr</th>
<th>D m</th>
<th>M m</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>60</td>
<td>55</td>
<td>85</td>
</tr>
<tr>
<td>80</td>
<td>75</td>
<td>115</td>
</tr>
<tr>
<td>100</td>
<td>90</td>
<td>135</td>
</tr>
</tbody>
</table>
Figure 4.2.2(G) – Auxiliary lanes and tapers – controlled side road (simplified treatment)
**Figure 4.2.2(H) – Auxiliary lanes and tapers – uncontrolled side road (full treatment)**

Notes

1. These markings are omitted if auxiliary lane length (incl. taper) is less than or equal to ‘M’ or ‘D’ respectively.
2. ‘M’ or ‘D’ should be at least the length shown in the table. Longer lengths may be required on flat tapers and shorter lengths are sometimes necessary due to construction limitations.
Figure 4.2.2(I) – Auxiliary lanes and tapers – uncontrolled side road (simplified treatment)
Figure 4.2.2(J) – Urban three-way intersection – unsignalised

Notes

1. If side road not controlled, its centre line is broken and no stop or holding bar is to be used.
2. If side road not pavement marked, no turn lines are to be used.
Figure 4.2.2(K) – Urban four-way intersection – unsignalised

Note

1. If side road not pavement marked, no turn lines are to be used.
**Figure 4.2.2(L) – Minor urban four-way intersection – unsignalised**

Notes

1. Unbroken lines may be used where lane discipline on the approach is a problem (see Section 2.2.3 of this guide).
**Figure 4.2.2(M) – Minor urban three-way intersections – signalised T-junction**

Notes

1. Barrier lines and island outline markings may be augmented with RRPMs.
2. Unbroken lines may be used where lane discipline on the approach is a problem (see Section 2.2.3 of this guide).
Notes

1. For further details on pavement arrow spacing see Section 2.4.2.1 of this guide.
2. Where loop detectors are installed on any particular approach, double barrier lines should be used on the separation line extending to the position of the loops.
3. The distance between the stop line and the kerb line projection in the intersecting road should not be less than 1 m. At rural intersections or intersections without kerbing on high-speed approaches, this distance should be 3–5 m clear of the nearest point of conflict with cross traffic.
4. The stop line should be placed not less than 1 m advance of the pedestrian crosswalk markings.
5. Where pedestrian volumes are large, this width may be increased.
6. No stopping signs to be located 3 m in advance of detector positions on approaches to intersection.
7. Turn lines can be omitted where the path to be followed is simple.
Notes

1. For further details on pavement arrow spacing, see Section 2.4.2.1 of this guide.
2. Where loop detectors are installed on any particular approach, two-way barrier lines should be used on the separation line extending to the position of the loops.
3. Zebra crossing signs and pavement markings to be installed only if warranted.
4. The stop line should be placed not less than 1 m advance of the pedestrian crosswalk markings.
5. Where pedestrian volumes are large, this width may be increased.
6. The distance between the stop line and the kerb line projection in the intersecting road should not be less than 1 m. At rural intersections or intersections without kerbing on high-speed approaches, this distance should be 3–5 m clear of the nearest point of conflict with cross traffic.
7. No stopping signs to be located 3 m in advance of detector positions on approaches to intersection.
8. Adopt minimum of 11 m for one-lane right-turn in each direction. If two lanes right-turn, then clearance must be maintained (see Section 4.1.7 of this guide).
Notes

1. The GIVE WAY sign may be provided if indicated in MUTCD Part 2 Clause 2.5.4.
2. The sign is mounted on the signal post where practicable and angled towards right-turning traffic.
3. Dividing lines and island outline markings may be augmented with RRPMs. For layout and spacing, see Clause 5.6.5.2 in the MUTCD Part 2 extract in Section 2.5 of this guide.
4. The need for a Hazard marker should be considered if R2-3 is not sufficient to delineate the median end (see MUTCD Part 2 Clause 3.6.7).
5. 10 m to 12 m-long unbroken lines may be used where lane discipline on the approach is a problem and adequate length remains for turning traffic to enter the right lane (see Section 2.2.3 of this guide).
Notes

1. 10 m to 12 m-long unbroken lines may be used where lane discipline on the approach is a problem and adequate length remains for turning traffic to enter the right lane (see Section 2.2.3 of this guide).

2. Island outline markings may be augmented with RRPMs. For layout and spacing, see Clause 5.6.5.2 in the MUTCD Part 2 extract in Section 2.5 of this guide.

3. A Hazard marker may be required if the sign alone is not sufficient to delineate the median end (see MUTCD Part 2 Clause 3.6.7).

4. Turn lines may be omitted where the path to be followed is obvious to drivers under all conditions (see Section 4.1.7 of this guide).
Figure 4.2.2(P) – Major urban intersection – divided road – double right-turn lanes
Notes

1. For arrow spacing in the trap lane, see Clause 5.5.2.3 in the MUTCD Part 2 extract in Section 2.4.2 of this guide. The length of the trap lane will depend on the queue length to be accommodated.

2. The panel at the bottom of the G9-43-4 sign is required if there is an intermediate intersection along the trap lane. Alternative legends, such as AT HIGH ST, 300 m may be more appropriate.

3. The R2-9(R) signs are provided at spacings not exceeding 100 m along the length of the continuity line.

4. An extra R2-9(R) sign may be required in advance of this point if earlier advice of the start of the trap lane is required. It may have either a location plate, R9-8, or a distance plate, G9-78 (see MUTCD Part 2 Clause 2.8.10(c)).
Figure 4.2.2(Q) – Roundabout pavement markings – four two-lane entry/exits

Notes

1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Figure 4.2.2(R) – Roundabout pavement markings – two two-lane and two one-lane entry / exits

Notes
1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Figure 4.2.2(S) – Roundabout pavement markings – four two-lane entry / exits with one exclusive left turn lane

Notes
1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Figure 4.2.2(T) – Roundabout pavement markings – three two-lane entry / exits and one one-lane entry / exit with one exclusive right turn lane

Notes

1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Figure 4.2.2(U) – Roundabout pavement markings – T-junction with two two-lane entry / exits and one one-lane entry / exit

Notes
1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. Right-turn arrow marked to legally permit U-turn.
4. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Figure 4.2.2(V) – Roundabout pavement markings – T-junction with three two-lane entry/exits with optional marking for dual right turn

Notes

1. Exit lines are marked as 9 m line, 3 m gap.
2. Line marking not to leave an excessively large internal lane.
3. Right-turn arrow marked to legally permit U-turn.
4. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
5. A painted chevron may be installed, in conjunction with the exclusive left-turn lane (see Figure 4.2.2(S) in Section 4.2.2 of this guide).
Figure 4.2.2(W) – Roundabout with spiral markings

Notes

1. Careful consideration needs to be given prior to the installation of ‘spiral’ markings and advice should be sought from the department’s Traffic Engineering Practice Unit, email TrafficEngineering.Support@tmr.qld.gov.au. The provision of such markings should be the exception rather than the rule.

2. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
Notes

1. Careful consideration needs to be given prior to the installation of ‘spiral’ markings and advice should be sought from the department’s Traffic Engineering Practice Unit, email TrafficEngineering.Support@tmr.qld.gov.au.

   The provision of such markings should be the exception rather than the rule.

2. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
**Figure 4.2.2(Y) – Roundabout with spiral markings – five approaches**

Notes

1. Careful consideration needs to be given prior to the installation of ‘spiral’ markings and advice should be sought from the department’s Traffic Engineering Practice Unit, email TrafficEngineering.Support@tmr.qld.gov.au.
   The provision of such markings should be the exception rather than the rule.

2. The first pavement arrow shall be spaced at a distance of 15–30 m from the give way line.
MUTCD Part 2 Figure 2.7 – Large roundabout

Notes

1. Where geometry permits, exit lines are marked as shown and as described in Clause 5.3.9(a)(v) in the MUTCD Part 2 extract in Section 4.1 of this guide.

2. Pavement arrows are not normally marked on single-lane entries to roundabouts. Where a roundabout has two or more lanes on an entry, pavement arrows shall be marked to show movements permitted from each entry lane (see Clause 5.5.2.3 in the MUTCD Part 2 extract in Section 2.4.2 of this guide).

3. Sign R1-3 is required on both sides of each approach at a multi-lane approach, see MUTCD Part 2 Clause 2.6.2(a).

4. Island outline markings may be augmented by RRPMs. For layout, see MUTCD Part 2 Figure 5.24 in Section 2.5 of this guide.

5. The need for a Hazard marker should be considered if R2-3 is not sufficient to delineate the median end (see MUTCD Part 2 Clause 3.6.7).

6. Bidirectional Hazard markers may be required on splitter islands if additional night-time delineation is needed.

7. Hazard markers on the curve are required only if the curve cannot readily be seen by approaching drivers.
**MUTCD Part 2 Figure 2.8 – Local street roundabout**

**Notes**

1. Signs W2-7A and D4-1-2 may not be required in local streets but should be used where there is poor visibility to the roundabout from one or more approaches.
2. Sign R1-3 should be placed on the side of the approach that will make it as conspicuous as possible to approaching drivers.
3. Sign R2-3A may not be necessary where traffic is clearly required to pass to the left of the island or where a Roundabout (R1-3) sign is located in the island.
4. Landscaping in the central island should not be high enough to restrict visibility across the island.
Notes

1. For detail, see MUTCD Part 2 Figure 5.28 reproduced in Section 2.4.2.1.2 of this guide.
2. Lane line markings on expressways and ramps are shown in MUTCD Part 2 Figure 5.15 reproduced in Section 5.2.5 of this guide.
3. Alternative ‘step-out’ line for use at exit ramps where indicated in Clause 5.7.5 in the MUTCD Part 2 extract in Section 2.4.2.5 of this guide.
4. Alternative pavement marking when the entrance ramp leads directly into an added freeway lane, and direct merging is not required. The length of unbroken lane line may vary depending on traffic operation requirements. Generally, a length of 150–200 m is considered appropriate.
5. Lane change signing should be provided where length of full width acceleration lane exceeds 300 m.
**MUTCD Part 2 Figure 3.4 – Two-lane exits and entrances**

Notes

1. Edge line and nose marking details as shown in MUTCD Part 2 Figure 5.28 reproduced at Section 2.4.2.1.2 of this guide.

2. Retroreflective raised pavement markers (RRPMs) at 12 m spacing.

3. Pavement arrows in trap lane and adjacent lane are spaced at 50 m. Minimum of seven sets of arrows normally provided. They may be supplemented or replaced by a minimum of three LEFT LANE MUST EXIT signs (R2-19). For detailed design and positioning of these arrows, see Clause 5.7.3 in the MUTCD Part 2 extract in Section 2.4.2.5 of this guide.

4. Merge is signed as a lane change, general case, see Clause 4.7.2(b) in the MUTCD Part 2 extract in Section 3.5 of this guide.

5. Special purpose broken line, see MUTCD Part 2 Figure 5.1 reproduced at Section 2.2.7 in this guide (9 m line, 3 m gap).
MUTCD Part 2 Figure 3.5 – Trap lanes at expressway exits

(a) Mid-block left lane becomes trap lane

(b) Entry ramp continues as trap lane to next exit

Notes
1. LEFT LANE MUST EXIT R2-19 signs are placed at 100 m maximum spacing.
2. Continuity line delineates the trap lane for 800 m minimum.
3. Pavement arrows in the trap lane and adjacent lane are spaced at 50 m. For detailed design and positioning, see Clause 5.7.3 in the MUTCD Part 2 extract in Section 2.4.2.5 of this guide.
4. Special purpose broken line, see Figure 5.1.5(A) in Section 5.1.5 of this guide (9 m line, 3 m gap).