Technical Note 115

Signing and linemarking for heavy vehicle interception sites

April 2015
1 Background

Government compliance staff use designated ‘interception sites’ to check vehicles and their drivers for compliance with the various statutory requirements. The agencies using these sites include the Department of Transport and Main Roads, Queensland Police Service and other statutory agencies.

Transport and Main Roads provides and maintains these sites as a designated work place and, as such, has a duty of care to ensure they are built and maintained in such a manner as to provide a safe work environment. These sites should conform to the appropriate legislation and relevant codes of practice.

There is currently no specific national or state code of practice for the provision, maintenance and operation of interception sites. This guide relies on the requirements outlined in the Manual of Uniform Traffic Control Devices (MUTCD) for the protection of employees undertaking activities within the road reserve.

The guide must also provide guidance on meeting the department’s duty of care to provide a safe environment for traffic that is entering or exiting the site, as well as any other traffic that may be impacted by this activity.

2 Superseded documents

This document supersedes the following documents:

- TRUM Technical Note 1.18 – Heavy Vehicle Interception Site Signing Arrangements
- TRUM Technical Note 1.31 – Pavement Marking for Interception Sites.

These documents have now been withdrawn.

3 Purpose

The purpose of this guideline is to provide guidance on the installation of signs and linemarking, including symbolising, required to provide a safe environment for the interaction between passing vehicles, transport inspectors and the occupants of any vehicles entering, parking on or leaving the interception site.

4 Scope

4.1 In scope

The signing and linemarking of officially designated permanent interception sites used by transport inspectors.

4.2 Out of scope

Out of scope are processes for developing and maintaining such support activities as:

- random locations/activity of intercepting vehicles
- programmed inspection sites
- development and implementation of site-specific operating instructions
- methodology associated with road safety audits.
5 References

The following documents and pieces of legislation are referenced:

- Transport Regulation Branch policy – TRB is developing a policy on interception and inspection of vehicles. When this has been finalised, it will be referenced and any relevant requirements will be incorporated into this document
- Manual of Uniform Traffic Control Devices (MUTCD)
- Traffic Control Signs Database
- Road Planning and Design Manual
- Traffic and Road Use Management Manual
- TRUM Notes 1.31 and 1.18 have been replaced by this document

6 Terms and definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>AADT</td>
<td>Average annual daily traffic. It is given as vehicles per day and is an indication of the number of vehicles travelling over the road (in both directions) at that location.</td>
</tr>
<tr>
<td>Government compliance staff</td>
<td>Enforcement staff employed by government departments and agencies to enforce relevant legislation.</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transport System. The use of electrical, electronic or mechanical systems to control or regulate a traffic function.</td>
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<tr>
<td>M994</td>
<td>Departmental form for the Installation and/or Removal of Regulatory Traffic Signs/Devices.</td>
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<tr>
<td>merge</td>
<td>The action of combining traffic from a lane external to the existing road with traffic on existing through lanes.</td>
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<tr>
<td>multilane road</td>
<td>Dual carriageway with median or four or more lanes of traffic with no physical separation. Refer MUTCD Part 3 Clause 1.4.7.</td>
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<tr>
<td>MUTCD</td>
<td>Manual of Uniform Traffic Control Devices</td>
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<tr>
<td>OHS</td>
<td>Occupational health and safety</td>
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<tr>
<td>operational separation</td>
<td>A physical separation, such as grass verge, concrete median or a barrier system (concrete, guardrail or wire rope), that separates the main work site of the interception site from the adjacent traffic lane</td>
</tr>
<tr>
<td>physical separation</td>
<td>The term is used to describe a site that has the work area on the site separated from the through traffic lane by either a barrier system, concrete median or a grassed verge. The 1.2 m flush painted median is not considered as physical separation.</td>
</tr>
<tr>
<td>QPS</td>
<td>Queensland Police Service</td>
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<tr>
<td>RP&amp;D</td>
<td>Road Planning and Design Manual</td>
</tr>
<tr>
<td>State-Controlled Road (SCR)</td>
<td>Road or land, or part of a road or land, declared under Section 24 of the Transport Infrastructure Act to be a SCR, and the stewardship of which resides with the Department of Transport and Main Roads</td>
</tr>
<tr>
<td>TI Act</td>
<td>Transport Infrastructure Act</td>
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<tr>
<td>TC sign</td>
<td>A sign used for the purpose of traffic control that has been formally authorised for use as an official traffic sign</td>
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### Term Definition

<table>
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<tr>
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</tr>
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<tbody>
<tr>
<td>TMC</td>
<td>Traffic Management Centre. Control centre for co-ordinating traffic lights and ITS.</td>
</tr>
<tr>
<td>traffic controller</td>
<td>A person authorised to control traffic on a declared road</td>
</tr>
<tr>
<td>transport inspectors</td>
<td>Staff of the Department of Transport and Main Roads who are authorised to undertake compliance (enforcement) activities.</td>
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<tr>
<td>TRB</td>
<td>Transport Regulation Branch, Department of Transport and Main Roads</td>
</tr>
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<td>TRUM</td>
<td>Traffic and Road Use Management</td>
</tr>
<tr>
<td>TSR</td>
<td>Transport Services Division, Department of Transport and Main Roads</td>
</tr>
<tr>
<td>Two-way road</td>
<td>Single carriageway. Ref MUTCD Part 3 Clause 1.4.22</td>
</tr>
<tr>
<td>vpd</td>
<td>Vehicles per day</td>
</tr>
<tr>
<td>weave</td>
<td>The movement of a vehicle from one through lane to another. It is sometimes referred to as changing lanes (see definition of merge above)</td>
</tr>
</tbody>
</table>

### 7 Assumptions

The sign layouts have been developed based on the following assumptions:

- there is no national or industry code of practice for the signing of interception sites
- transport inspectors will develop site-specific operating instructions that incorporate the layouts and operational recommendations in this report
- an interception site that is located on only one side of the road, is not used for traffic approaching in the opposite lane – that is, vehicles do not have to cross the dividing (centre) line to enter the site
- Form M994 will be completed and lodged for each site.

### 8 Signing

A basic minimum sign layout has been developed for four major groups of layouts:

- mobile interception of single vehicle on a permanent site
- two-way roads
- divided multi-lane road
- motorway.

#### 8.1 The philosophy

The signing is driven by two obligations. The first is worker safety and the second deals with traffic safety – for example, weaving between lanes, merging or exiting the traffic lane or the safe interaction of traffic within the one lane (as the intercepted vehicle is slowing).

The signing requirements are drawn from Part 2 of the MUTCD to cover the safe operation of vehicles and from Part 3 of the MUTCD to cover the safety of the Inspectors.

It is imperative the department’s duty of care for the employees does not compromise the safety of the travelling public and vice versa.
8.1.1 General

The following points were considered in the development of this guide:

- The signs should not be open when the site is not being used.
- The sign layouts provide the minimum requirements; however, designers should be open to the need for an OHS or road safety audit as a means of identifying any possible additional signing.
- Drivers must be given sufficient warning of any activity currently being conducted at an interception site ahead. Drivers need to be able to identify what is required (reduce speed, change lanes, etc.), justify what is required (see the activity ahead) and respond to the traffic control requirements in place.
- There is a general understanding, with reduced speed limits, that if the driver is restricted for too long a distance without perceiving there is activity or a reason to reduce speed, then the driver will start to increase speed again. For this reason, any speed reduction needs to be as close to the site as possible. Speed reductions need to comply with sound traffic engineering practices and Parts 2 and 3 of the MUTCD.
- Form M994 must be completed and lodged for each site. The one M994 form will remain current while the sign layout is unchanged. Any changes to the layout or sign faces will require a new M994.

Each time the signs are opened or closed, will be recorded in an appropriate place. This is necessary for QPS enforcement, as well as any future legal action against the department. It is the responsibility of the transport inspectors to ensure the records are discoverable.

8.1.2 Signing

The following points were considered in the development of this guide:

- The transport inspector directs vehicles onto the site from anywhere along the site and not from a fixed point as would be the ‘pure’ activity of a traffic controller. This is because the transport inspector could be engaged with another vehicle while observing an approaching vehicle of interest. The transport inspector may, at that point in time, temporarily cease the current activity and move closer to the traffic lane and give the directive to the driver of the approaching vehicle to enter the site. The transport inspector would then continue on with the original activity. For this reason, all dimensions for the location of signs on the approach to the site are taken from the start of the taper used to enter the site.
- The region is to make a decision on whether the blank side of the sign is used to provide an appropriate road safety message. The site can be used as a stopping place when not being used for compliance activities. It is preferred to not have signing with blank faces – therefore, where it is appropriate, a road safety message should be used when the interception site is not being used for compliance activity. The standard layouts in Appendix A show a fatigue/rest-related message as the default safety message, but this may be varied as required. The region should look at the level of signing in the area and if it is too busy, then the road safety signing may be more counterproductive as it will add to the level of clutter.
- The interception site needs to be considered as a stopping place rather than a rest area. The provision of toilets and the higher level of amenities associated with a rest area would mean
the site would not be available for compliance activities. Transport inspectors do not intercept at major rest areas due to the danger of their activity conflicting with travelling public and their primary use as a rest area.

- Each of these sites is to have a sign TC9677 that informs the public they may be asked to vacate the site when it is being used for compliance activities.

![Vehicle Inspection Site Sign](image)

TC9677

- The TC9677 sign should be located outside the edge of the seal, towards the middle of the site, clear of the transport inspectors’ vehicle. The sign face being parallel to the centreline of the adjacent traffic lane.

- The 100 km/h sign that delimits the temporary work area speed zone should be located as close to the end of the exit lane as practical, but it must also be in line with the 60 speed sign. The location is determined by Clause 4.1.4[c] MUTCD Part 3 and is 30 m from the end of the interception site. Offset speeds in a speed zone are not allowed, except as per the MUTCD Part 3 Clause 4.9.9:

4.9.9 Offset speed zones

Temporary speed zoning which results in speed limits which are different for each direction of travel at a particular location shall be permitted under the following conditions:

a) On a divided road where works affect traffic conditions on one side of the median only.

b) On a divided or undivided road where a buffer zone in accordance with Clause 4.9.5 has been provided. The buffer zone speed limit is not required for traffic leaving the lower speed limit merely because the limit applies to the opposite direction of travel.

This allows offset speed in the buffer zone (see Figure 8.1.2). The purpose of the buffer zone is to slow the drivers to 60 km/h through the worksite zone. There is no specific purpose for vehicles to be travelling at 80 km/h in the buffer zone other than to reduce speed. This is the reason why the use of a ‘60 AHEAD’ sign is generally more appropriate than posting a speed limit as a buffer. If there was a warrant for the 80 zone, for example, a side entrance or similar hazard, then the 100 sign would need to be opposite the 80, and an 80 km/h speed sign would need to be installed opposite the 60, because the 80 km/h limit is no longer a buffer but an actual speed zone.
Some sites have a problem with trailers being parked on the site. Sometimes the trailer is located in a position that does not allow for the site to be used for interceptions. If this is the case, then sign TC1387 can be erected in appropriate locations.

**8.1.3 Worker safety**

The following points were considered in relation to worker safety:

- Sites that do not have physical separation from the traffic lane must have, as a minimum, a 1.2 m wide painted flush median. This median is used as an operational separation zone by the transport inspectors. They are instructed not to work or enter inside this zone. The adjacent traffic lanes must have a temporary speed limit of 60 km/h applied while transport inspectors are present. Reference MUTCD Part 3 Clause 4.4.2 (ii).

- The guide is based on the premise the transport inspector performs two different functions:
  a) The transport inspector has statutory power to direct vehicles onto the interception site. There is currently no national or state code of practice for directing vehicles onto an interception site. Where the interception site does not have a barrier system or physical separation, such as a median or grassed verge that is 1.2 m to 3 m wide, then this guide has adopted the safety process relating to the function of a traffic controller at a roadworks site. This permits the use of a 60 km/h speed zone rather than a 40 km/h zone (ref. MUTCD Part 3 Clause 4.2(d)). If the work site is more than 3 m from the traffic lane, that is, there is physical separation as defined in Section 5, then this criteria is no longer
applicable. The reasoning is when the transport inspector is more than 3 m from the traffic lane, the level of interaction and proximity to the traffic changes the primary activity to enacting the legislated power to direct a vehicle from the traffic lane rather than the type of interaction performed by a traffic controller.

b) The second is as a worker performing the function of checking vehicles for compliance with statutory requirements. The statutory power the transport inspector has to perform certain activities does not mitigate the requirement for the transport inspector or Transport and Main Roads from undertaking these activities in a safe manner.

- The location of a sign needs to be flexible to accommodate the OHS issues associated with the opening and closing of a sign. Typical issues are:
  - parking of inspector’s vehicle when opening and closing the signs
  - crossing the road to open or close signs, or to access signs located in the median strip
  - work environment around the sign as the sites are used at night – for example, signs have been located adjacent to a pipe headwall
  - height of the lock and the type of hinge mechanism to allow for ease of activation.

- The signing requirements do not vary between night work and day work. The issues include sign visibility and reflectivity, as well as the OHS issues of opening and closing signs in the dark.

8.1.4 Traffic safety

The following points were considered in relation to traffic safety:

- If there is a merge or an exit ramp that is not associated with the interception site, but is close to, or within, the extent of the signing layout, then a road safety audit is to be undertaken by a road safety auditor to ensure the safety of the travelling public is not compromised by the site signing.

- The road safety auditor should be a Transport and Main Roads registered road safety auditor.

- Signing must consider the interaction of the through traffic with the vehicles that are either entering or exiting the site, as well as the deceleration and acceleration characteristics of these vehicles.

- Signing must take into consideration the deceleration and weaving of heavy vehicles into the left lane on dual carriageways.

- The location of the signing must take into consideration the sight distance and the amount of clutter of signs and similar distractions in the area.

8.2 Mobile interception at permanent sites

There are times when the transport inspectors are involved in what is referred to as ‘mobile interception’. This is when they are travelling and see a vehicle of interest. The transport inspectors will follow the vehicle until they are able to instruct the driver to pull into a permanent site. The driver and vehicle will be assessed and the appropriate action taken. The transport inspectors will then continue on. This activity has specific site operating instructions and does not require the signs to be opened.
Extract from MUTCD Part 3:

4.3  Short-term low impact works – open road areas

4.3.1  General

The treatments in this Clause (4.3) are permitted in recognition of the need to allow certain short-term low impact works to be carried out without the use of fully protected static work sites or mobile works convoys. It is vital that a risk assessment (see Clause 2.2.3) be made of the proposed adoption of these treatments in particular environments taking particular account of factors such as traffic volume and speed, road geometry and width, and the general behaviour of road users. If the risk cannot be tolerated, a fully protected static work site (Clause 4.2) or mobile works convoy (Clause 4.6) will be required. These treatments shall not be applied on expressway type roads.

The relevant clause for this activity is

4.3.7  Work off-roadway

For activities involving a vehicle or item of plant running off the road such as mowing and sign/road edge guide post maintenance where the machine is running on the shoulder or work vehicle is parked clear of the road so that traffic does not have to deviate from the normal travelled path, the work may proceed without the use of advance signs under the following conditions. Sight distance to the vehicle mounted warning device for approaching drivers shall be:

a)  greater than 150 m in a 60 km/h or lower speed zone; or

b)  greater than 250 m elsewhere; and

c)  the vehicle-mounted device is displayed and not be obscured.

This does not apply to any mobile interceptions that occur at random locations (that is, not a permanent site) as this activity is out of scope of this guide.

8.3 Two-way road

8.3.1  Without physical separation

The layout for a single sided interception site located on a two-way road is shown in Figure A-1 in Appendix A.

The layout for a location that has a site on both sides of the road is a variation of this layout and is shown in Figure A-2 in Appendix A.

The logic behind the layouts is detailed in Table 8.3.1 below.
Table 8.3.1 – Layout for single-sided site on a two-way road, no physical separation

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="REduce SPEED 60 AHEAD VEHICLE INSPECTION AHEAD" /></td>
<td>MUTCD Part 3 Clause 4.9.5 – Advanced warning of temporary speed zones (buffer zones) and</td>
</tr>
<tr>
<td></td>
<td>• Table 4.7 – Guide to the selection of roadwork speed limits requires the use of a buffer zone. The length should be 300 m, but can be up to 500 m if conditions require.</td>
</tr>
<tr>
<td></td>
<td>• Table 4.2 Value of Dimension D, for speed limits greater than 60 km/h, ‘D’ is 60 to 80 m. The ‘60 AHEAD’ sign is to be located 2D in advance of a lower speed zone, i.e., the sign should be located 120 to 160 m ahead of the 60 km/h speed zone. However, for the reasons stated below, the distance was increased to 300 m.</td>
</tr>
<tr>
<td></td>
<td>The decision to use 300 m is based on:</td>
</tr>
<tr>
<td></td>
<td>• The signs are permanent signs that are displayed at various times and do not have advanced worker signs or any indications of there being activity ahead as would be the case with temporary work sites.</td>
</tr>
<tr>
<td></td>
<td>• Heavy vehicles will take time to slow down as they approach the interception site.</td>
</tr>
<tr>
<td></td>
<td>The ‘60 AHEAD’ sign is the preferred option for the provision of advanced warning of a temporary speed zone ahead.</td>
</tr>
<tr>
<td></td>
<td>Note: Experience and research has shown that if the distance is too long and the driver does not see an obvious need or there is no evidence of workers, then the driver will begin to accelerate to a higher speed. The length should be on the lower end of the scale when conditions allow.</td>
</tr>
</tbody>
</table>

TC1937_1 (LHS)

Sign to be located 460 m from the start of the site (300 m before 60 km/h speed sign).

Duplicated on RHS of the road.

TC1937_3 (RHS)

TC1938_1 (LHS)

Located 160 m from the start of the site.

Duplicated on the other side of the road.

TC1938_3 (RHS)

TC1938_1 (LHS)

MUTCD Part 3 Clause 4.2[c](ii) requires a 60 zone when working 1.2 m to 3 m from the adjacent traffic lane. There is also a requirement to have a symbolic worker sign. The distance from the TC1938 sign to where the transport inspector could stand is based on the roadwork layout distance of 2D where ‘D’ is 60 to 80 m (the maximum value of ‘D’ is to be used because of the traffic controller function, i.e., 160 m).

Note: The symbolic transport inspector sign is preferred to the road worker. The approaching driver would be looking for some road worker and when the only workers are the transport inspectors they will most likely sense a false alarm and start to accelerate as the identification of the hazard was not verified. If, on the other hand, the driver is advised they may be asked to enter the site by a transport inspector (light vehicles can also be checked) then the hazard is verified and the driver will hopefully maintain 60 km/h speed.
### TN115 Signing and linemarking for heavy vehicle interception sites

#### Sign Justification

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erect on site</td>
<td>Consideration should be given to adding additional length at high AADT sites or at sites that have a history of being used as a stopping place. The space is to be located away from the main activity area, and signed as a stopping place. TC9677 is used to advise drivers they may be required to move on if the interception site is to be used for compliance activity.</td>
</tr>
</tbody>
</table>

- **TC9677**
  - See Section 7.1.2 for installation.

- **R4-1**
  - Located 30 m past the end of the site. Duplicated on the other side of the road.

- **TC1911_3**
  - The ‘100’ sign must be in line with the ‘60’ sign (reference MUTCD Part 3 Clause 4.9.9).
  - The ‘100’ sign is permanent and the ‘60’ is temporary and is mounted with a target board as highlight on the reverse side of the ‘100’ sign.
  - MUTCD Part 3, Clause 4.1.4c. The 30 m is determined by Clause 4.1.4[c] for vehicles approaching the work zone from the other direction.

- **TC1936_1** (LHS)
  - Sign to be located 330 m past the end of the site (300 m before 60 km/h speed sign).
  - Duplicated on the other side of the road.

- **TC1936_3** (RHS)
  - This sign is set to face traffic entering the site area from the reverse direction.

#### 8.3.2 With physical separation

This layout is for a site where there is a physical separation, such as grass verge, concrete median or a barrier system (concrete, guardrail or wire rope). The verge or median must be greater than 3 m (see Figure A-3 in Appendix A).

The transport inspector is no longer standing in close proximity to the traffic as would be the case where there was no physical separation (only a 1.2 m flush painted median). In this scenario, the transport inspector is treated as performing a function similar to that of a traffic controller and, therefore, the safety protocol used to protect the traffic controller was used to provide a safe work...
environment for the transport inspector. Because they are now more than 3 m from the traffic lane or protected by an appropriate barrier system, the function is considered as being a transport inspector giving an official instruction to the driver of a vehicle to enter an interception site. This means the requirement for the use of a 60 km/h speed zone (based on the general rule that a traffic controller must not work in a speed zone greater than 60 km/h) is no longer applicable in this situation.

The layout for a single-sided interception site is shown in Figure A-3 and the two-sided site is in Figure A-4. Both of these figures are shown in Appendix A. Neither of these layouts can be used if the transport inspector is within 3 m of the traffic lane.

Since the transport inspector is more than 3 m from the traffic lane, the use of ITS may be required to direct vehicles onto the site. Refer to Section 7.5 for an explanation of the use of ITS in this application.

The transport inspector has the power to intercept and direct traffic, but must do so in a manner that is safe to themselves, others on site and the travelling public. Each site needs to have a site-specific operating instruction as to how the vehicles are to be intercepted.

The logic behind the layout is detailed in Table 8.3.2 below.

**Table 8.3.2 – Layout for single sided site on a two-way road, with physical separation.**

(Figure A-3)

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC1937_1 (LHS)</td>
<td>Sign to be located 300 m prior to the 80 km/h speed sign. Duplicated on the other side of the road.</td>
</tr>
</tbody>
</table>
| TC1937_3 (RHS) | Reference is made to MUTCD Part 3 Clause 4.9.5 - Advanced warning of temporary speed zones (buffer zones) and:  
  - Table 4.7 – Guide to the selection of roadwork speed limits requires the use of a buffer zone. The length should be 300 m, but can be up to 500 m if conditions require.  
  - Table 4.2 – Value of Dimension D  
    For speed limits greater than 60 km/h, ‘D’ is 60 to 80 m. The ‘80 AHEAD’ sign is to be located 2D in advance of a lower speed zone, i.e., the sign should be located 120 to 160 m ahead of the 80 km/h speed zone. However, for the reasons stated below, the distance was increased to 300 m.  
  The decision to use 300 m is based on:  
  - The signs are permanent signs that are displayed at various times and do not have advanced worker signs or any indications of there being activity ahead as would be the case with temporary work sites.  
  - Because heavy vehicles take time to slow down as they approach the interception site.  
  The ‘80 AHEAD’ sign is the preferred option for the provision of advanced warning of a temporary speed zone ahead.  
  Note: Experience and research has shown that if the distance is too long and the driver does not see an obvious need, or there is no evidence of workers, then the driver will begin to accelerate to a higher speed. The length should be on the lower end of the scale when conditions allow. |
The distance from the TC1938 sign to where the transport inspector would stand is based on the road layout distance of 2D where ‘D’ is 60 to 80 m (the maximum value of ‘D’ is to be used because of the traffic controller function, i.e., 160 m).

MUTCD Part 3 Clause 4.2[b](iii) – Static Work Site does not require a speed zone reduction to 80 km/h when working between 3 m and 6 m from the adjacent traffic lane and where the AADT is less than 10,000 vpd; however, from a traffic management perspective, the traffic lanes within the work zone will be reduced to 80 km/h. There will be few two-way roads with an AADT greater than 10,000 vpd as the warrant for duplication is normally triggered at this figure. The 80 km/h speed zone will also apply to roads with less than 10,000 vpd.

It is a requirement that a symbolic transport inspector sign is used.

Ref Clause 4.2(b) iii. – Static Work Sites – Work Area 3 m to 6 m clear of traffic and Table 4.7 – Guide to the selection of roadwork speed limits.

Table 4.7 recommends this limit not be imposed on traffic safety grounds if unrestricted speeds through the work site can be tolerated at the prevailing level of driver behaviour.

The slowing of vehicles to enter and then accelerate as they leave the site necessitates an 80 km/h speed zone.

Table 4.7 recommends a minimum 80 km/h speed zone length of 500 m.

Note: The symbolic transport inspector sign is preferred to the road worker. The approaching driver would be looking for some road worker and when the only workers are the transport inspectors they will most likely sense a false alarm and start to accelerate as the identification of the hazard was not verified. If, on the other hand, the driver is advised they may be asked to enter the site by a transport inspector (light vehicles can also be checked), then the hazard is verified and the driver will hopefully maintain 80 km/h speed.

Consideration should be given to adding additional length at high AADT sites or at sites that have a history of being used as a stopping place. The space is to be located away from the main activity area and signed as a stopping place. TC9677 is used to advise drivers they may be required to move on if the interception site is to be used for compliance activity.

The ‘100’ sign must be in line with the ‘80’ sign (reference MUTCD Part 3 Clause 4.9.9).

The ‘100’ sign is permanent and the ‘80’ is temporary and is mounted with a target board as highlight on the reverse side of the ‘100’ sign.

MUTCD Part 3 Clause 4.1.4 [c]. The 30 m is determined by Clause 4.1.4 [c] for vehicles approaching the work zone from the other direction.
8.4 Divided multilane road

8.4.1 Without physical separation

The work site is separated from the traffic lane by the use of a 1.2 m wide painted flush median, reference Figure A-5 in Appendix A.

Because of the high AADT associated with this type of road, the use of ITS may be required to safely control the entry and exit of vehicles from this site. Refer to Section 7.5 for an explanation of the use of ITS in this application.

Table 8.4.1 – Layout for single sided site on a divided multilane road, without separation

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="TRUCKS MUST USE LEFT LANE NEXT 3 km" /> TC9737</td>
<td>On multi-lane roads, appropriate warning must be given to move trucks into the left lane so that any vehicle given the direction to enter the interception site can do so in a manner that does not affect the safety of other road users or the transport inspectors. Ref: MUTCD Part 2 Clause 3.15.6. The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane. TC1655 should be used if the site is connected to the local traffic management network, i.e., the signs can be remotely activated by a transport inspector. The TC1655 sign has twin flashing magenta lights that flash in an alternating pattern. The locations of these signs needs to be determined after a road safety audit by staff experienced in traffic management. Some existing sites have the complication of exit and merge ramps being located within 3 km of the site. This is causing problems during peak traffic flows. The location of the first sign should be approximately 3 km prior to the site. The minimum distance as per the RP&amp;D Manual is 200 m, but this is not to be adopted as the actual distance, since experience at Burpengary has shown that 3 km is a good operational compromise between too long a distance for pushing all trucks into the slow lane and too short a distance for them to respond.</td>
</tr>
<tr>
<td><img src="image" alt="TRUCKS MUST USE LEFT LANE" /> TC1655_1</td>
<td>Located approximately 3 km prior to the start of the site. Duplicated in the centre median.</td>
</tr>
<tr>
<td><img src="image" alt="TRUCKS MUST USE LEFT LANE NEXT 3 km" /> TC9728</td>
<td>The instruction to move into the left lane is reinforced prior to the reduced speed zones. This sign is duplicated in the median.</td>
</tr>
<tr>
<td>Sign</td>
<td>Justification</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
| Alternative using ITS. **MAGENTA Colour**  
![Image](image1.png)  
**TC1655_2**  
Note: * Flashing magenta lights  
Located approximately 1 km prior to site. | This sign is not duplicated in the median. |
| **TC1937_1 (LHS)**  
Sign to be located 460 m from the start of the site (300 m from the 60 km/h speed sign).  
Duplicated in the centre median. | MUTCD Part 3 Clause 4.9.5 and:  
- Table 4.7 – Guide to the selection of roadwork speed limits requires the use of a buffer zone. The length should be 300 m, but can be up to 500 m if conditions require.  
- Table 4.2 – Value of Dimension D  
For speed limits greater than 60 km/h, ‘D’ is 60 to 80 m. The ‘60 AHEAD’ sign is to be located 2D in advance of a lower speed zone, i.e., the sign should be located 120 to 160 m ahead of the 60 km/h speed zone. However, for the reasons stated below, the distance was increased to 300 m.  
The decision to use 300 m is based on:  
- The signs are permanent signs that are displayed at various times and do not have advanced worker signs or any indications of there being activity ahead as would be the case with temporary work sites.  
- Heavy vehicles will take time to slow down as they approach the interception site.  
The ‘60 AHEAD’ sign is the preferred option for the provision of advanced warning of a temporary speed zone ahead.  
Note: Experience and research has shown that if the distance is too long and the driver does not see an obvious need or there is no evidence of workers, then the driver will begin to accelerate to a higher speed. The length should be on the lower end of the scale when conditions allow. |
<p>| <strong>TC1937_3 (RHS)</strong> | |</p>
<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Sign" /></td>
<td>MUTCD Part 3 Clause 4.2(c)(ii) requires a [60] zone when working 1.2 m to 3 m from the adjacent traffic lane. It is a requirement that a symbolic transport inspector sign is used. Note: The symbolic transport inspector sign is preferred to the road worker. The approaching driver would be looking for some road worker and when the only workers are the transport inspectors they will most likely sense a false alarm and start to accelerate as the identification of the hazard was not verified. If, on the other hand, the driver is advised they may be asked to enter the site by a transport inspector (light vehicles can also be checked) then the hazard is verified and the driver will hopefully maintain 60 km/h speed.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Sign" /></td>
<td>Consideration should be given to adding additional length at high AADT sites or at sites that have a history of being used as a stopping place. The space is to be located away from the main activity area, and signed as a stopping place. TC9677 is used to advise drivers they may be required to move on if the interception site is to be used for compliance activity.</td>
</tr>
</tbody>
</table>

| TC1938_1 (LHS) | Located 160 m from the start of the site. Duplicated in the centre median. |
| TC1938_3 (RHS) | Located 30 m past the end of the site. Duplicated on the other side of the road. |

<table>
<thead>
<tr>
<th>Erect on site</th>
<th>TC9677</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3.png" alt="Sign" /></td>
<td>See Section 7.1.2 for installation.</td>
</tr>
</tbody>
</table>
### Sign Justification

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>R6-28</td>
<td>The R7-4 and R6-28 should be located as close to the site as practical.</td>
</tr>
<tr>
<td>R7-4</td>
<td>Ref: MUTCD Part 2 Clause 3.15.6. The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane. If it is necessary to terminate this requirement prior to the end of the lane, the END (R7-4) sign shall be used in conjunction with this sign to mark the termination.</td>
</tr>
</tbody>
</table>

### 8.4.2 With 3 metres or more of physical separation

The basic assumption is the separation distance between the inner edge of the interception site and the outer edge of the through traffic lane is greater than 3 m wide or the physical barrier system meets the requirements of MUTCD Part 3 Clause 4.2 (c)(i). Reference should be made to the layout shown in Figure A-6 of Appendix A.

The use of ITS-based signing is recommended on divided roads with AADT greater than 10,000 vpd, but this needs to be discussed with the relevant stakeholders. See Section 7.5 for details.

### Table 8.4.2 – Layout for single sided site on a divided multilane road with separation

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC9737</td>
<td>On multi-lane roads, appropriate warning must be given to move trucks into the left lane so that any vehicle given the direction to enter the interception site can do so in a manner that does not affect the safety of other road users or the transport inspectors.</td>
</tr>
<tr>
<td>TC1655</td>
<td>Ref: MUTCD Part 2 Clause 3.15.6. The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane.</td>
</tr>
<tr>
<td>TC1655-1</td>
<td>TC1655 should be used if the site is connected to the local traffic management network, i.e., the signs can be remotely activated by a transport inspector. The TC1655 sign has twin flashing magenta lights that flash in an alternating pattern. The location of these signs needs to be determined after a road safety audit by staff experienced in traffic management. Some existing sites have the complication of exit and merge ramps being located within 3 km of the site. This is causing problems during peak traffic flows.</td>
</tr>
<tr>
<td>TC1655-1</td>
<td>The location of the first sign should be approximately 3 km prior to the site. The minimum distance as per the RP&amp;D Manual is 200 m, but this is not to be adopted as the actual distance, since experience at Burpengary has shown that 3 km is a good operational compromise between too long a distance for pushing all trucks into the slow lane and too short a distance for them to respond.</td>
</tr>
<tr>
<td>Sign</td>
<td>Justification</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td><img src="image1.png" alt="Trucks Must Use Left Lane" /> TC9728</td>
<td>The instruction to move into the left lane is reinforced prior to the reduced speed zone. The sign is duplicated in the centre median. TC1655_3 can be duplicated in the centre median if warranted by the number of lanes, volume of traffic, ease of communication connectivity and the nature of the traffic.</td>
</tr>
<tr>
<td><img src="image2.png" alt="Trucks Exit If Directed 1km On Left" /> TC1655_2</td>
<td>Alternative using ITS. Not: * Flashing magenta lights Located approximately 1 km prior to the site.</td>
</tr>
<tr>
<td><img src="image3.png" alt="Reduce Speed 80 Vehicle Inspection Ahead" /> TC1937_1 (LHS)</td>
<td>Sign to be located 460 m from the start of the site (300 m from the 80 km/h sign). Duplicated in the centre median – TC1937_3 (RHS). Clause 4.9.5 Advance warning of temporary speed zones (buffer zones) and Table 4.2 Value of Dimension D for speed limits greater than 60 km/h, ‘D’ is 60 to 80 m. The ‘80 AHEAD’ sign is to be located 2D in advance of a lower speed zone, i.e., the sign should be located 120 to 160 m ahead of the 80 km/h speed zone. However, for the reasons stated below, the distance was increase to 300 m. The decision to use 300 m is based on: The signs are permanent signs that are displayed at various times and do not have advanced worker signs or any indications of there being activity ahead as would be the case with temporary work sites. Heavy vehicles will take time to slow down as they approach the interception site. The ‘80 AHEAD’ sign is the preferred option for the provision of advanced warning of a temporary speed zone ahead.</td>
</tr>
<tr>
<td><img src="image4.png" alt="Enter If Directed 80" /> TC1938_1 (LHS)</td>
<td>MUTCD Part 3 Clause 4.2<a href="ii">b</a> – Static Work Site does not require a speed zone reduction to 80 km/h when working between 3 m and 6 m from the adjacent traffic lane and the AADT is less than 10,000 vpd; however, from a traffic management perspective, the traffic lanes within the work zone will be reduced to 80 km/h. It is a requirement that a symbolic transport inspector sign is used. Ref Clause 4.2[b] iii – Static Work Sites – Work Area 3 m to 6 m clear of traffic and Table 4.7 – Guide to the selection of roadwork speed limits. Table 4.7 recommends this limit not be imposed on traffic safety grounds if unrestricted speeds through the work site can be tolerated at the prevailing level of driver</td>
</tr>
</tbody>
</table>
Sign | Justification
--- | ---

**Sign Justification**

The slowing of vehicles to enter and then accelerate as they leave the site necessitates an 80 km/h speed zone.

Note: The symbolic transport Inspector sign is preferred to the road worker. The approaching driver would be looking for some road worker and when the only workers are the transport inspectors they will most likely sense a false alarm and start to accelerate as the identification of the hazard was not verified. If, on the other hand, the driver is advised they may be asked to enter the site by a transport inspector (light vehicles can also be checked) then the hazard is verified and the driver will hopefully maintain 80 km/h speed.

**Erect on site**

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC9677</td>
<td>Consideration should be given to adding additional length at high AADT sites or at sites that have a history of being used as a stopping place. The space is to be located away from the main activity area, and signed as a stopping place. TC9677 is used to advise drivers they may be required to move on if the interception site is to be used for compliance activity.</td>
</tr>
<tr>
<td>R6-28</td>
<td>The R7-4 and R6-28 should be located as close to the site as practical. It is preferable to have the signs located prior to the exit lane from the site so that trucks that are passing the site are able to move into the fast lane to allow the slower trucks that are exiting the site to merge and accelerate up to speed. The sign must also be located adjacent to the merge lane so that trucks exiting the site have seen a [END] [TRUCKS USE LEFT LANE] sign.</td>
</tr>
<tr>
<td>R7-4</td>
<td>Ref: MUTCD Part 2 Clause 3.15.6. The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane. If it is necessary to terminate this requirement prior to the end of the lane, the ‘END’ (R7-4) sign shall be used in conjunction with this sign to mark the termination.</td>
</tr>
<tr>
<td>R4-1</td>
<td>Located 30 m after the site and duplicated in the median.</td>
</tr>
</tbody>
</table>
The sign can be replicated at 60 m after the ‘100’ sign and duplicated in centre median.

If the signing environment is cluttered and the designer believes there is a possibility that the first R7-4 and R6-28 signs (located within the site) may not be easily discernible, then the signs should be replicated at this location.

### 8.5 Motorway standard

The motorway standard is to be used when there are two or more traffic lanes in the one direction and the AADT of the slow lane is more than 10,000 vpd or the lane peak hourly flow is more than 1,000 vehicles.

Interception sites located adjacent to motorways will have more than 6 m of separation from the adjacent traffic lane or will have an appropriate physical barrier system. The speed zone adjacent to the site will remain unchanged unless the road safety audit reveals there is a traffic safety issue.

The signs can be either one of or a combination of a VMS, CMS or a fixed sign with magenta flashing lights that are remotely activated. The sign layout will need to be tailored to each site and the stakeholders engaged at an early stage to resolve operational issues. The existing communication protocols between Transport Services Regulations and the various Traffic Management Centres may need to be altered to reflect the requirements of the particular site. See Section 9 for more details on the installation and use of ITS.

It is recommended the Intelligent Transport Systems and Electrical Technology Unit in Transport and Main Roads is consulted on the technical and operation issues for a given sign layout.

The traffic audit will recommend whether the ‘TRUCKS USE LEFT LANE’ signs are permanent or the sign face displayed only during enforcement operations.

Some sites may require the installation of CCTV facilities.

### Table 8.5 – Layout for single sided site on a motorway (Refer Figure A-7)

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="TC9726.png" alt="Image" /></td>
<td>Located 4 km prior to site and duplicated in the centre median.</td>
</tr>
<tr>
<td>Sign</td>
<td>Justification</td>
</tr>
<tr>
<td>------</td>
<td>---------------</td>
</tr>
</tbody>
</table>
| **TC1655_1**<br>Note: * Flashing magenta lights<br>Located approximately 3 km prior to the start of the site and duplicated in the centre median. | On multi-lane roads, appropriate warning must be given to move trucks into the left lane so that any vehicle given the direction to enter the interception site can do so in a manner that does not affect the safety of other road users or the transport inspectors.  
*Ref: MUTCD Part 2 Clause 3.15.6.*  
The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane.  
TC1655 should be used if the site is connected to the local traffic management network, i.e., the signs can be remotely activated by compliance staff. The TC1655 sign has twin flashing magenta lights that flash in an alternating pattern.  
The location of these signs needs to be determined after a road safety audit by staff experienced in traffic management. Some existing sites have the complication of exit and merge ramps being located within 3 kms of the site. This causes problems during peak traffic flows.  
The location of the first sign should be approximately 3 km prior to the site. The minimum distance as per the RP&D Manual is 200 m, but this is not to be adopted as the actual distance, since experience at Burpengary has shown that 3 km is a good operational compromise between too long a distance for pushing all trucks into the slow lane and too short a distance for them to respond. |
| **TC9728**<br>Located approximately 2 km prior to site and duplicated in median. | The instruction to move into the left lane is reinforced prior to the reduced speed zones. |
| **TC9727**<br>Located approximately 1 km prior to site. | This sign provides advanced warning. |
### Sign Justification

<table>
<thead>
<tr>
<th>Sign</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRUCKS EXIT IF DIRECTED 500m ON LEFT</strong>&lt;br&gt;TC9738&lt;br&gt;The sign should be located approximately 500 m prior to site.&lt;br&gt;The transport inspectors will use an ITS to give the official directive to enter the site.</td>
<td>This sign provides advanced warning. The design of the ITS layout and components is site-specific and may vary from simple CMS to a combination of multiple VMS, light gating, component activated networking. The designer needs to reference the guidance given in Section 8.</td>
</tr>
<tr>
<td><strong>VEHICLE INSPECTION SITE&lt;br&gt;STANDING IS PERMITTED BUT YOU MAY BE ASKED TO VACATE THE AREA DURING INSPECTIONS</strong>&lt;br&gt;TC9677&lt;br&gt;See Section 7.1.2 for installation.</td>
<td>TC9677 is used to advise drivers they may be required to move on if the interception site is to be used for compliance activity. This sign may not be required at a motorway standard site.</td>
</tr>
<tr>
<td><strong>R6-28&lt;br&gt;TRUCKS USE LEFT LANE&lt;br&gt;END</strong>&lt;br&gt;R7-4&lt;br&gt;The signs are replicated at these locations:&lt;br&gt;- Within the work zone&lt;br&gt;- 30 m after the site&lt;br&gt;Duplicated in the centre median.</td>
<td>The R7-4 and R6-28 should be located as close to the site as practical. It is preferable to have the signs located prior to the exit lane from the site so that trucks that are passing the site are able to move into the fast lane to allow the slower trucks that are exiting the site to merge and accelerate up to speed.&lt;br&gt;The sign must also be located after the merge lane so that trucks exiting the site have seen an [END] [TRUCKS USE LEFT LANE] sign.&lt;br&gt;Ref: MUTCD Part 2 Clause 3.15.6.&lt;br&gt;The ‘TRUCKS USE LEFT LANE’ sign (R6-28) shall be used to indicate a mandatory requirement for trucks to use a slow vehicle lane. If it is necessary to terminate this requirement prior to the end of the lane, the ‘END’ (R7-4) sign shall be used in conjunction with this sign to mark the termination.</td>
</tr>
</tbody>
</table>

### 8.6 Offset sites

There are occasions when an existing sealed area is used as an interception site. These have been referred to as ‘offset’ sites as a simplified method of describing them. They are constructed well clear of the through traffic lane or have been bypassed as a result of an upgrade.
Figure 8.6 – Typical offset site

The tapers are often not to the same standard as purpose built interception sites. The speed zone on the through traffic lanes will be determined by the existing traffic management guidelines in the Road Planning and Design Manual and the MUTCD. Regions would have signed such locations in the same manner as rest areas and pull over sites.

The operational signing for each offset site will need to be determined by a site inspection, and be included in the site-specific operating procedure developed by the transport inspectors.

The safety audit will need to take into account the potential hazards created through:

- vehicles entering the site through drivers own volition, without understanding of the compliance function underway, and/or
- vehicles entering the site without the knowledge of the transport inspectors.

9 ITS

Some sites will require the use of ITS to achieve the required level of worker and traffic safety. As a general rule, any road with an AADT greater than 5,000 vpd will need to be investigated. The need for and the type of ITS can only be determined in conjunction with the users of the site (transport inspectors, QPS) and the availability of the support network. It is recommended the specialists within Transport and Main Roads (for example, the Intelligent Transport Systems and Electrical Technology Unit) are involved in the deliberations along with the local regional Traffic Operations Unit and the relevant MTCs. Some sites may require the installation of CCTV.

The signs can be a simple sign, such as a VMS, CMS or fixed signs with magenta flashing lights or a combination of two or more different types. The signs are all remotely activated. The sign layout will need to be tailored to each site and the stakeholders engaged at an early stage to resolve operational issues. The existing communication protocols between Transport Services Regulations and the various Traffic Management Centres may need to be altered to reflect the requirements of the particular site.

Points that need to be considered when looking at an ITS solution are:

- availability of ADSL network
- availability of laptop computers with the appropriate software and modems
- cost/source of power (solar or cabled 240V mains)
- cost of cable ITS connection versus the reliability of wireless coms
• cabling under the road
• the maintenance requirements for CMS and VMS
• cost of software and ITS hardware
• the compatibility of software and hardware manufactured by second party organisations with the existing ITS platforms. This needs to be included in the product specification
• possible priority conflicts with TMCs and streams and the use of the signs by the transport inspectors
• risk management, for example, should some or all of the LEDs or the sign malfunction
• the need for redundancy of electronic signing, for example, if sign is blank, then Transport and Main Roads needs to be assured a sign is visible for safety reasons
• use of remotely activated flashing magenta lights
• use of the streams activity log as evidence of the signing log
• tri-vision CMS to be used. Safety message/enforcement message/BLANK face. Consideration of ITS redundancy – for example, mechanical CMSs are being replaced by LED CMSs or VMSs due to the maintenance costs associated with the mechanical units. This has a big impact on whole of life costs.

The cost of ITS signing can be more than five times the cost of fixed signing – for example $15,000 compared to $75,000 (2011 costs). The actual costs will vary with the complexity of the signing layout and the particular road environment. The whole-of-life costs for the ITS layout is greater than for fixed signs. The actual quantum was not known at the time of publication. The statement is based on the maintenance requirements and the redundancy of ITS technology that are much greater than for fixed physical signs.

10 Linemarking and symbolising

10.1 Philosophy

It is important that the road user should see consistency in the pavement marking and not be confronted with a surprise that induces indecision. Therefore, a concerted effort has been made to ensure the motorist does not consider the site as an entrance to a passing lane.

10.2 Layout options

There are five options for pavement marking of sites:

• Option 1: Site has edge lining on adjacent pavement and has an additional lane for clearing vehicles
• Option 2: Site has edge lining on adjacent pavement
• Option 3: Site has no edge lining on adjacent pavement
• Option 4: Site has no edge lining or dividing line on adjacent pavement
• Option 5: Site is separated by a median – the linemarking will be in accordance with Chapter 13 of the Road Planning and Design Manual and with Part 2 MUTCD.

Layouts for Options 1, 2, 3 and 4 are shown in Figure 10.2.1.
10.2.1 Linemarking

**Dividing line** – sites would generally be located where the dividing line is marked as a broken line (3 m line with 9 m gap). If there is no dividing line, the continuity and edge of the operational separation is positioned as described in the section titled Operational Separation.

**Edge line** – If the approaches have edge line marking, the edge line is continued to delineate the outer edge of the interception site. The edge line is used to define the work area (especially during night time operation). Vehicles moving off the sealed area and onto softer ground could cause damage to the vehicle or to the pavement in the interception site – that is, deep depressions can lead to water ponding adjacent to the pavement. There is also the issue of possible vehicle instability if the vehicle moves off the edge of the site that has a steep batter slope. If the approaches do not have edge lines (refer Option 3), then the site will be marked:

- Entrance and exit portion of the site will not have an ‘edge line’ (this could cause uncertainty with motorists if the rest of the road has no edge lines).
- The straight portion of the site will have an edge line to define the work area.

**Continuity line** – This line is used to indicate the edge of the roadway at the start and finish of the interception site. Where there is no edge line on the approach, the continuity line commences at the start of the taper. This line is positioned not less than 3 m from the separation line. If there is no separation line, this line is positioned to line up with the edge of the seal on the approach. Part 1 Chapter 4.3.6 of the MUTCD refers to continuity lines as being used to indicate where traffic is entering or leaving an auxiliary lane. There was concern that these areas were not traffic lanes, nor were they parking areas (where an edge line is used). The use of a new type of line was rejected as it introduces another symbol that the public would not be familiar with and would not be exposed to on a regular basis. The continuity line was chosen over the edge line for the following reasons.

- The public understand the continuity line directs them in the direction of the default path of travel. In this case, the normal traffic lane.
- The entry into the site needs to be controlled. Vehicles have to enter at the location indicated by the continuity line otherwise operational efficiency will be adversely affected. Vehicles entering further along the site will need to be reversed to align with the screening pad. Parking areas do not require such vehicle control.
- The site more closely conforms to the characteristic of an auxiliary lane than it does a parking lane. The vehicles are controlled and moving through the site rather than entering as a matter of choice and stopping in an independent and uncontrolled manner.

**Operational separation** – A combination of edge lines and diagonal markings is considered suitable marking. This combination is similar to the diagonal markings in shoulders (MUTCD Part 2 Clause 4.5.1.3) and uses 1 m wide bars. The operational separation does not have a nose taper so as to try and differentiate it from a median. The spacing of bars is 5 metres apart. This combination should be referred to as an operational separation. The individual components should not be considered alone. It should not be considered a painted island with outline markings. The operational separation is to provide clearance between the work area and the through traffic. The dimensions shown are the minimum to achieve the safe workplace clearance to traffic of 1.2 m. The site-specific operation guidelines will require transport inspectors to work outside of this separation. The width of the outline markings should be 100 or 150 mm wide to match the adjacent edge lines. This is for
efficiency when re-marking. The linemarking crew does not have to stop and adjust the height of the
guns on the marker.

**Lane line** – This line is used only where width is available and clearing of vehicles is necessary (see
Figure 10.2.1-B – Option 1).

**Work site edge definition line** – The line is only used to define the outer edge of the work site on
roads that have no edge lines. The work site edge definition line is not marked if the site is less than
7.0 m wide. This requires the transport inspectors to walk on an unsealed shoulder that could have an
irregular surface profile. Such conditions constitute an occupational health and safety hazard (that is,
tripping or twisting an ankle). If a site does not have an edge line (as shown in Figure 10.2.1-B –
Options 1 and 2) or a worksite edge definition line (as shown in Option 3), then the site-specific OHS
instructions require the transport inspector to examine the conditions of the unsealed shoulder to
determine if a hazard exists.

*Figure 10.2.1-A – Work site edge definition line*
Figure 10.2.1-B – Options for pavement marking (no physical barrier or median)
10.2.2 Retroreflective raised pavement markers

Retroreflective raised pavement markers are not recommended at interception sites for the following reasons:

- the RRPM may create a workplace safety issue, such as as a trip hazard, and
- the RRPM may cause confusion with motorists if the rest of the road has no RRPMs.

If the designer believes there is a need (refer Section 2 Clauses 4.6.5.3(d) of the MUTCD) because the environment surrounding the site constitutes a special hazard, then red unidirectional retroreflective raised pavement markers can be used. Designers are to ensure the layout does not have RRPM in the middle third of the length of the operational separation. It would be preferable to only have the RRPMs in the first 20 m of the operational separation. The transport inspectors may move into the operational separation in this area to direct traffic onto the interception site. Because the inspectors are looking up at approaching heavy vehicles, they could trip over one of the RRPMs. This is a particular concern at night.

11 Road safety audit

A road safety audit is to be undertaken by a qualified road safety auditor where:

- there is concern about the interaction of traffic streams
- there is a merge or exit lane within two kilometres of the site
- there is sight distance of less than one kilometre to the start of the site
- the site is located on a four-lane (divided or undivided) carriageway or where vehicles are required to weave into the left lane to enter the site.

The audit team needs to be made up of both a departmental-accredited road safety auditor and a senior transport inspector who is familiar with the site. The respective requirements of vehicle safety, worker safety and operational effectiveness can sometimes be in conflict and so need to be resolved on site with input from both parties.

12 Audit program

The sign layout for each site should be audited on a regular basis for compliance with these guidelines, MUTCD and TC Manual. This should occur every two years or sooner if there is a change in AADT, functionality or any changes to the infrastructure – for example, the actual site itself, addition of lanes or widening of lanes or shoulders or the construction of an exit or entrance to private properties or other roads.

13 Operational recommendations

It is recommended the following operational procedures are incorporated into the site-specific operating procedures for interception sites that are signed using these guidelines:

- Inspectors must not work in the operating separation zone, that is the 1.2 m wide flush, painted median unless to signal an approaching vehicle to enter the site
- Use cones with a reflective band to define the extent of the operational separation so that the transport inspectors are aware of where the edges of the zone are. This should be done if intercepting more than a single vehicle.
- Where there is a 3 m physical separation, such as grass verge or a barrier system (concrete, guardrail or wire rope) and the work zone is in an 80 kph speed zone, then the site needs to have a site-specific operating instruction as to how a vehicle is to be intercepted. The general rule is a traffic controller must not work in an 80 kph zone. Transport inspectors have the power to intercept and direct traffic, but they must do this in a manner that is safe.

- Each opening and closing of the signs is to be recorded in an appropriate place. This is necessary for QPS enforcement, as well as any future legal action against the department.
Appendix A: Typical layouts

Figure A-1 – Layout for one-sided site on two-way road with no physical separation
Figure A-2 – Layout for two-sided site on two-way road with no physical separation
Figure A-3 – Layout for one-sided site on two-way road with > 3 m separation or barrier system
Figure A-4 – Layout for two-sided site on two-way road with > 3 m separation or barrier system
Figure A-5 – Layout for divided multi-lane road with no physical separation
Figure A-6 – Layout for divided multilane road with > 3 m separation or barrier system
Figure A-7 – Layout for motorway with ITS capability and 6 m separation and barrier system

Note:
This layout is indicative as the ITS signing may influence location and signing; however, the basic principles remain a valid basis.
Appendix B: Suggested sign configuration

The signs have a flap hinge mounted to the centre line of the sign.

*Figure B-1 – Sign mechanism*

[Safety message when site is closed](#)  [Sign when site operating](#)

The road safety message should be used where there is a history of fatigue crashes. The signing can be used to encourage drivers to use the site as a stopping place. Refer to Section 7.1.2 of this guide for information on the use of these signs.
Appendix C: Philosophy behind the operational separation

The work area is made up of the vehicle, the inspectors normal work area and an operational separation for safety.

The minimum width for an interception site is 7 m, made up of:

- 1.2 m minimum clearance as per Clauses 4.3(b)(ii), 4.8.1 and 4.8.5 of Part 3 of the MUTCD
- 1.5 m to weigh the RHS (the inspector needs 1.5 m to locate and operate the weighing devices)
- 2.5 m for the vehicle
- 0.3 m additional clearance for the RHS to allow for lateral vehicle movement (driver will not park exactly where instructed or expected)
- 1.5 m to weigh the LHS
- 2.0 m is sometimes allowed for the Inspectors to park their vehicle near the middle of the site.

Figure C-1 – Minimum site width

The standard drawings show the minimum width as being 10.5 m from the centre lines of the road. This allows for the lower volume roads that may have a lane width less than 3.5 m and so maintain the total work environment of separation of transport inspectors and passing traffic.

Operational separation width of 1.2 m

Section 4.2c – Work area closer than 3 m to traffic, of Part 3 of the Manual of Uniform Traffic Control Devices is the basis for the use of the 1.2 m width. This section deals with separation of 1.2 m to 3 m. The transport inspectors are instructed to not work within 1.2 m of the traffic lane. The painted median is used as a physical reminder of this safety requirement.
Linemarking of operational separation

There are two major issues:

1. The separation has to be obvious to the inspector, both at night and during the day. For this reason, the width of the separation is defined by white linemarking paint with an application of glass beads. Diagonals are used to make the separation more conspicuous and increase the transport inspector's awareness of the proximity of the separation. The transport inspector works mostly in the middle third of the interception site and it is from this area that the transport inspector will move to the edge of the operational separation to signal a vehicle to move onto the interception site. If a transport inspector was to move within the separation zone, then he/she would be looking at the approaching traffic and not at the ground under their feet. Therefore, it is important there are no irregularities (for example, RRPMs) that could become a tripping hazard.

2. There is no nose on the ends of the operational separation. The ends are open to stop any possibility of an approaching driver thinking they are approaching a median and will need to veer onto the interception site. It may appear obvious it is an interception site; however, the concern is fatigue in rural areas and its effect on driver perception. The driver needs to see continuity in the definition of the left edge of the traffic lane as indicated in the photographs below.

*Figure C-2 – Linemarking of operational separation*