

Chapter 20

Roadside Amenities

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Chapter 20 Amendments - March 2002

Revision Register

Issue/ Rev No.	Reference Section	Description of Revision	Authorised by	Date
1		First Issue.	Steering Committee	Sept 2000
2	Figure 20.5	"Optional" changed to "Desirable".	Steering Committee	19 Sept 2000
	20.2	"access-limited" changed to "limited access".		
	20.3.3	"typical of those operating on the road" added to first paragraph.		
	20.3.10	Addition of three paragraphs.		
	20.4.2	Modifications to the first paragraph and Figure 20.2.		
	20.4.3	Modifications to the first paragraph and Figure 20.3.		
	20.4.7	Addition of a third paragraph.		
	20.4.9	Modifications to the first paragraph.		
	20.5.1	Deletion of the third paragraph.		
	References	Reference 7 deleted. References 8 to 21 renumbered.		
Appendix 2A	Added.			
3	20.4.2	Remove reference to motorways.	Steering Committee	10 Oct 2000
4	20.4.8	Change to agree with Figures 20.2 and 20.3.	Steering Committee	13 Oct 2000
5	20.1	Help Phones added to dot points.	Steering Committee	Mar 2002
	20.2.3	Truck facilities - Additional requirements for separation of truck facilities.		
	20.2.5	Editing.		
	20.2.5	Paragraph added to provide guidance on turn-in rates.		
	20.3.1	Environmental values - New paragraph added on environmental values.		
	20.3.2	Added description of the function of rest areas.		
	20.3.3	Added description of truck rest areas.		
	20.3.4	Misspelling - "Quiet" replaces "quite". Access - Second paragraph reworded.		
	20.3.7	Spacing of Service Centres - 5th dot point amended.		
	20.4	Location; commuter buses - New paragraphs added - location of stopping places on opposite sides of the road; location and design of commuter bus stops.		
	Figs 20.2 & 3	Modified to provide a better approximation of the scale.		
	20.4.7	Added paragraph re sites for heavy vehicles.		
20.4.8	Figure 20.3 - Change to "edge of seal".			

Issue/ Rev No.	Reference Section	Description of Revision	Authorised by	Date
	20.5.1	Editing.	Steering Committee	Mar 2002
	20.5.2	First paragraph amended to add by-pass routes; paragraph (a) amended to include road trains.		
	20.5.4	Editing. Environmental considerations - new section to alert designers to the need to consider environmental issues.		
	20.5.5	Lighting - New section to highlight the need to light interception sites where they are to be used at night.		
	20.6.2	Amendments to "Parking Facilities" and "Travel Paths for Pedestrians".		
	20.6.3	New section "Bus Terminus"; minor editing.		
	Figure 20.5	Changed to align with the Departmental Guide for the Management of Rural School Bus Stops.		
	Figure 20.7	Corrections - Ditto.		
	20.7.2	New section on lighting bus stops in urban areas added.		
	20.8	Section removed except for the first two paragraphs. New sentence on design details added at end.		
	References	Format of referencing changed as per the other chapters.		
	New section	Relationship with other chapters added.		

Chapter 20

Roadside Amenities

20.1 General Introduction

The Department of Main Roads (Main Roads) is responsible for the management of 34,000 kilometres of State-controlled roads in Queensland with the aim of achieving an improved quality of life for all Queenslanders.

This responsibility extends to include the management of roadside amenities to improve road safety - a key issue. In addition roadside amenities improve the quality of road travel.

Roadside amenities are established primarily to meet the needs of the long distance traveller and are aimed at reducing fatigue related crashes whilst enhancing the total travel experience. Roadside amenities can reduce fatigue-related crashes in two ways. Firstly, stopping and resting at regular intervals while driving has been shown to reduce driver fatigue, with a subsequent reduction of single vehicle and fatigue related crashes. Secondly, by providing facilities for travelers to stop clear of traffic, collisions with stopped vehicles can be minimized.

Roadside amenities can also contribute to regional economic development, as the provision of information to travellers about the region they are passing through and the location of attractions can alter travel behaviour. Increased tourism can occur as a result of altered travel routes, with additional stops in the area and increased expenditure in the region.

Roadside amenities may be divided into the following broad categories:

- commercial service centres;
- rest areas with amenities to enable drivers of light and heavy vehicles to rest and recuperate;
- stopping places where stops will be short such as at points of interest (e.g. lookouts) and pull off areas;

- interception (inspection) sites for weighing and inspecting heavy vehicles, random breath testing etc.;
- bus stops;
- help phones (refer Chapter 8, Section 8.4.7); and
- roadside vending sites.

Currently in Queensland, the total number of rest areas, heavy vehicle stopping places and points of interest is approximately 530 of which Main Roads controls 27% and maintains 15%.

Local Governments, Service Clubs and other Government Authorities (e.g. National Parks and Wild Life Service and Department of Natural Resources) control the remaining sites.

This Chapter describes the various types of roadside amenities and addresses their location, access requirements and the carriageway related elements of the facilities. It does not give detailed design parameters, and the references at the end of the Chapter should be consulted for further advice.

20.1.1 Strategic Framework

The intent (Main Roads, 1999a) is to provide a network of appropriately located and developed roadside amenities to meet the needs of all road users in Queensland.

To achieve this, the following key principles are to be employed:

- Where appropriate, Main Roads will provide roadside amenities, including motorist and heavy vehicle rest areas and stopping places.
- Local governments or civic organizations should be encouraged to provide motorist and/or heavy vehicle rest areas to the standard required by Main Roads.

- Where Main Roads expects that providing motorist and heavy vehicle rest areas would reduce fatigue related crashes, and no suitable roadside amenities are provided by other organizations, then Main Roads will act as the provider of these facilities.
- Providing roadside amenities is based on the intrinsic value and non-quantifiable benefits of assisting the management of driver fatigue, therefore assisting in reducing the incidence of fatigue-related accidents.
- In determining priority for providing new roadside amenities, the locations of fatigue “black spots” and other road safety issues should receive primary consideration.
- Facilities, access and signing should be consistent along routes and across Main Roads’ Regional and District boundaries to assist in meeting the expectations of road users.
- Main Roads’ provision of rest areas, where camping may be permissible, should not conflict with commercial accommodation facilities, in particular, caravan parks.
- Commercial facilities may not offer the same capacity for rest as Main Roads, Local Government, or civic roadside amenities, since they may not offer the road user an area to use without obligation to purchase a good or service.
- Main Roads’ Districts may consider “partnering” arrangements with local government, civic organisations, or commercial organizations to develop, or upgrade, appropriate roadside amenities.

20.2 Service Centres

20.2.1 Introduction

“**Service Centre**” means a roadside development providing essential services for the safety, comfort and convenience of all users of an limited access road, adjacent to or in close proximity to, and with direct or indirect access to the limited access road. Service centres are privately operated facilities.

It is important for safety reasons to provide facilities that encourage drivers to break their journey to avoid driver fatigue and to minimize the risk of vehicles running out of fuel.

“**Means of access**” means a physical means of entry or exit between land and a road.

“**Direct access**” refers to a direct connection of a service centre's means of access to the through carriageway of the access-limited road.

“**Indirect access**” is where a service centre's means of access is from interchange ramps or from other roads adjacent to or connecting with the through carriageway of the access-limited road.

“**Limited access**” road means a road that has been gazetted as such under Section 51 of the Transport Infrastructure Act 1994.

20.2.2 Service Centre Strategy

The Service Centre Policy (Main Roads, 1998a) requires Service Centre Strategies to identify zones in which the Director-General will permit the development of major roadside service centres. The Service Centre Strategy will also identify those existing service stations that contribute to the overall strategy, provided they meet, or can be upgraded to meet the minimum standard of facility.

To preserve the high standard of traffic operational performance and safety on the roads covered by the policy, it is inevitable that the opportunities to develop service centres will be restricted.

The Service Centre Strategy will define, amongst other things:

- zones in which roadside service centres will be permitted in either or both direction(s) of travel on the road concerned;
- the number of roadside service centres which will be permitted in any zone;
- the nature, type and extent of facilities and services to be provided at each service centre including:

- minimum standard or extent of facilities and services to be provided;
- additional facilities or services that would be acceptable;
- any provision that should be made for co-location of Government roadway-related services;
- the type of access (e.g. direct or indirect) to be provided, if necessary;
- any specific facilities or services that are prohibited by the policy; and
- whether staged provision of facilities and services is acceptable.

20.2.3 General Requirements for Service Centres

Service centres are required to:

- comply with the Government's requirements for environmental protection, efficient traffic operations and safety;
- operate 24 hours per day, 7 days per week;
- provide appropriate areas for rest unless deemed inappropriate in a particular circumstance by the relevant service centre strategy; and
- be designed to be attractive to all road users, with convenient and easy access from the through carriageway in accordance with the Access Policy for Roadside Service Centre Facilities on Limited Access Roads and the relevant Service Centre Strategy for that road.
- provide distinctly separate area for trucks and other users. Facilities for truck drivers, including fuelling facilities, dining and ablutions must be separate from those for other motorists.

Service Centres must not:

- contain facilities which would have the effect of generating significant additional traffic and which are not essential for meeting the needs of motorists for service, safety, comfort or

convenience;

- sell or supply alcoholic beverages; and
- have drive-through food service outlets, because of the intent to encourage rest and provide fatigue relief.

Longer stay or multi-purpose developments, including taverns, motels and hotels are specifically excluded under this policy. Unless in a remote area, and identified as part of the strategy, all forms of overnight accommodation, other than for heavy vehicle drivers, are also excluded under this policy.

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20.2.4 Specific Facility Requirements

Although not required at all sites, the following facilities (References 5 and 6) are commonly required:

- service station facilities;
- restaurant/fast food for motorists and heavy vehicle drivers;
- picnic area with tables, chairs and shelters;
- toilets and showers capable of servicing motorists, coach and heavy vehicle drivers and passengers;
- information services;
- enhanced landscaping;
- segmented and clearly defined parking zones including spaces for cars, buses, truck/semi-trailers, car/trailers and car/caravans; and
- space provision for Government regulatory services and emergency services.

20.2.5 Access

Accesses must be located and designed so as to operate safely, and not compromise the efficiency of existing and future traffic operations on the access-limited road. Where service centre access is provided across the limited access boundary,

traffic associated with other forms of development or using other roads will not be permitted to gain access to or from the limited access road through the service centre site. For service centre sites with direct access to both an interchange ramp and a side road, side road access is to be used for service centre traffic only.

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Access to service centre sites should be designed and constructed to operate efficiently under traffic volumes predicted to occur not less than 10 years after opening. Upgrading to meet traffic growth through the period of the Service Centre Agreement must be provided. Staged development of the access(es) may be permitted, with upgrading from stage to stage as required to meet increasing traffic demands.

The volumes of traffic expected to use a Service Centre access may be estimated using the “turn-in rate”. This rate will vary depending on the services available and the spacing of facilities along the road. Some Service Centres in NSW have achieved turn-in rates of 10-15%. Individual service stations on the Bruce Highway (SE Region) have shown rates of 4-6%. Up to 10% has been measured.

For initial design purposes a rate of 8-10% could be assumed, if better information is not available.

To reduce the risk of drivers or passengers making risky manoeuvres to gain access to roadside service centre facilities, it is preferred that service centres are located approximately in pairs. Desirably, service centres should be located on opposite sides of the road such that the driver sees the near side service centre first. Should this not be possible, the proponent of a single service centre on one side of the road must demonstrate what strategies will be implemented so that motorists and pedestrians do not undertake unsafe crossing actions.

Direct access is preferred over indirect access due to the potential heavy traffic flows on interchange ramps. 1500 m spacing between the noses of adjacent ramps (on followed by off) on that carriageway is sought. This distance is measured from the point at which the width between the ramp and adjacent through carriageway outer edge line reduces to 3 metres. Because of existing

interchange spacing, it may be difficult to achieve this distance between noses of adjacent ramps. For an otherwise high class proposal, consideration may be given to a reduction in this distance provided expert Traffic Engineering analysis can demonstrate adequate safety and operational performance (Main Roads, 1997b). (See also Chapter 16, Section 16.8.9.)

Indirect accesses at interchanges may be permitted, but will require expert Traffic Engineering analysis of the impact on the operation and safety of the ramps and intersections involved. Such access is not preferred because it is not as easy for drivers to stop. Indirect access will be considered where alternatives are not available, or the site and development proposal clearly offers the best solution in all other respects (Main Roads, 1997b).

20.3 Rest Areas

20.3.1 Introduction

Rest areas are provided to allow drivers to rest and overcome fatigue. To allow the maximum number of motorists to use the facilities provided, long stays are not encouraged and camping is either prohibited or limited to short stays as indicated in Section 20.3.6.

There are two basic types of rest areas:

- rest areas for motorists; and
- heavy vehicle rest areas.

However, combined rest areas and towns as rest areas should be considered in meeting the demands.

It should be noted that roadside rest areas often contain environmental values that should be pointed out to users by means of signs. Further, landscaping and retention of environmental features are essential in retaining and enhancing social and amenity values. (Refer also Main Roads, 1994).

20.3.2 Rest Area for Motorists

A rest area for motorists is an attractive park-like area separated from, but within general sight of, the through pavement. It should have a parking area suitable for cars towing caravans or trailers.

Motorist rest areas also provide opportunities to promote local tourism facilities. Tourist information boards sited by local tourism authorities provide information to facilitate drive tourism through the provision of information on local business, accommodation and points of interest that is useful in both enhancing the driving experience and assisting the development of regional economies. These facilities should not deprive local hospitality industries (such as caravan parks) of business by allowing camping in close proximity. Where these sites are located within (say) 25 km of commercial accommodation facilities this conflict needs to be managed by Main Roads (see Section 20.3.6).

Motorist rest areas should incorporate as a minimum:

- rubbish bins;
- toilets;
- sheltered tables and seats; and
- water.

Water provided at motorist rest areas should be potable where practicable. Whether the water is potable or not should be clearly notified at the tap.

Toilets for impaired road users should be provided whenever practicable (see Chapter 5 for access details).

Motorist rest areas, when located on State Strategic Roads and National Highways should have sealed access and gravel parking. In Coastal and South East Queensland sealed car parking should be provided.

Provision for tourist display boards should be made at motorist rest areas. Local tourist organizations should be encouraged to install and maintain these tourist display boards.

The extent of facilities provided will depend on

local conditions, the quality of maintenance able to be secured and the amount of use.

Maintenance and servicing of rest areas are essential to ensure their use by motorists despite the problems in remote or isolated areas. However, in remote areas, it may be impractical to provide and maintain some facilities such as a water based toilet, and alternative facilities such as self composting toilets should be considered.

20.3.3 Heavy Vehicle Rest Area

A heavy vehicle rest area is a sealed or paved area with safe entrance and exit for heavy vehicles. It should have adequate space to accommodate at least 2 heavy vehicles typical of those operating on the road with sufficient separation from the through pavement to provide a reasonably quiet and restful environment.

Research has shown that many heavy vehicle drivers stop to take a meal break, then move to a rest area location to rest or sleep. To facilitate rest, the area should allow sufficient separation from the roadway to provide a reasonably quiet and restful environment. Developing heavy vehicle rest areas in this manner will make them attractive to heavy vehicle operators to use for rest or sleep. Importantly, these facilities also reduce the incidence of crashes involving stationary vehicles parked on the road shoulder.

Research has also demonstrated that heavy vehicle drivers are unlikely to stop at rest areas frequented by tourists. Providing a reasonable level of facilities will also attract tourist traffic. Therefore, signing and public education will play an important role in informing motorists of the specific intention of a site to be utilised by heavy vehicles for the purpose of resting fatigued heavy vehicle drivers, and in particular, the location of and facilities provided by the nearest motorist rest area.

The parking area should be screened from headlights of vehicles on the through pavement.

Minimum facilities required in a heavy vehicle rest area are:

- shade (artificial or natural);
- a table;
- benches; and
- rubbish bins.

In addition, drinking water should be provided where practicable. These amenities when located on Intrastate Roads (including National Highways) should have sealed access and gravel parking areas. Heavy vehicle rest areas on these roads in Coastal and South East Queensland should provide sealed truck parking areas, particularly in areas subject to high rainfall.

Toilets and showers may be required at some heavy vehicle rest areas. The actual facilities to be provided at any particular rest area will depend on the expected use and the particular circumstances of the site.

20.3.4 Combined Rest Areas

In some locations it may be possible to combine a motorist rest area with a heavy vehicle rest area.

For a combined rest area to operate effectively there need to be distinctly separate areas for heavy vehicles and motorists. Each of these distinct areas should be accessible to its customers without their needing to pass through the other area.

Facilities such as toilets and water can be shared, but it is advisable to provide separate recreation areas with tables, seats and shelter. Heavy vehicle driver's needs are different from those of motorists. They need quiet shady areas where they can rest relatively undisturbed during the day as well as at night.

20.3.5 Towns as Rest Areas

Facilities provided at rest areas are often available in towns, some of which are listed in "Guide to Queensland Roads".

In determining the need for roadside amenities along a route, the ability of towns along that route

to serve as rest areas and provide the facilities required should be considered.

However, it should be remembered that rest areas are primarily to provide the driver with the opportunity to rest. If a town is to be considered a rest area, it should have a quiet area adjacent to the through route where drivers can do that. Ideally such an area should have natural shade and be sufficiently removed from the through traffic to provide a restful environment.

At the same time the adverse impacts of nominating a town as a rest area must be considered. Adverse impacts can include:

- congestion of urban streets caused by the parking of heavy vehicles, campervans, or a large number of vehicles using the rest area;
- noise and air pollution, particularly from heavy vehicle movements; and
- extended stays at areas by motorists wanting to use the rest area as a camping area.

20.3.6 Camping at Rest Areas

Rest areas are not intended to be camping grounds. Obviously, campers will take up space and a crowded area may discourage the entry of drivers looking for a quiet, peaceful area to rest.

Where nearby camping grounds exist within 25 kilometres of a rest area, the District should consider prohibiting camping or restricting the duration of a stay in the rest area to a maximum of 20 hours. In other rest areas the maximum length of stay permitted is 48 hours during a continuous 4-week period.

Conspicuous signage should be erected outlining the length of stay permitted and the penalty for non-compliance. It is important that the duration of camping be enforced to minimize misuse of the facilities. Section 4 of the Transport Infrastructure (State-controlled Roads) Regulation 1994 allows enforcement once the conspicuous sign has been erected.

20.3.7 Distance Between Rest Areas

The benchmark spacing for rest areas (Main Roads, 1999a) is:

- Motorist rest areas - 110 km
- Heavy vehicle rest areas - 100 km
- Motorist stopping places - 15 km
- Heavy vehicle stopping places - 45 km
- Commercial service centres - < 400 km (subject to commercially viable traffic volumes; actual locations determined by the strategy).

These spacings may need to be varied to suit the particular circumstances of a route (e.g. available sites) and the location of centres generating significant traffic. Assessing travel times from these centres may provide guidance on suitable locations.

For example:

- Vicroads Rest Area Guidelines maintain the existing network of rest areas and provide for additional areas when driving times between rest opportunities (which includes towns and commercial service centres) exceed approximately 1 hour for major highways and 1.5 hours for lesser roads (Cockshutt, 1997).
- RTA of NSW (RTA, 1999) calls for major rest areas at a general spacing of about 3.5 to 4 hours of travel, based on Sydney as the starting point. A major rest area provides 10 or more spaces for light vehicles and 5 or more separate spaces for heavy vehicles.

20.3.8 Siting Rest Areas

Apart from the distance to the next rest area, detailed siting should also take into consideration:

- sight distance at the intended location, to maximise safe access and egress (see Chapter 13 for sight distance requirements);
- placing heavy vehicle sites at or near a crest so

that vehicles entering the roadway take less time to reach cruising speed thus reducing a potential traffic hazard;

- maximising the opportunity to co-locate with existing points of interest, or scenic locations;
- minimising the impact on the environment in site location, clearing operations, drainage, construction and operation - the usual processes to assess environmental impact must be undertaken (see Chapter 3);
- the location of the nearest commercial accommodation facility must be more than 25 kilometres from the rest site if camping is to be allowed; and
- the proximity to services, such as water and power supplies that may be used to enhance facilities at the amenity.

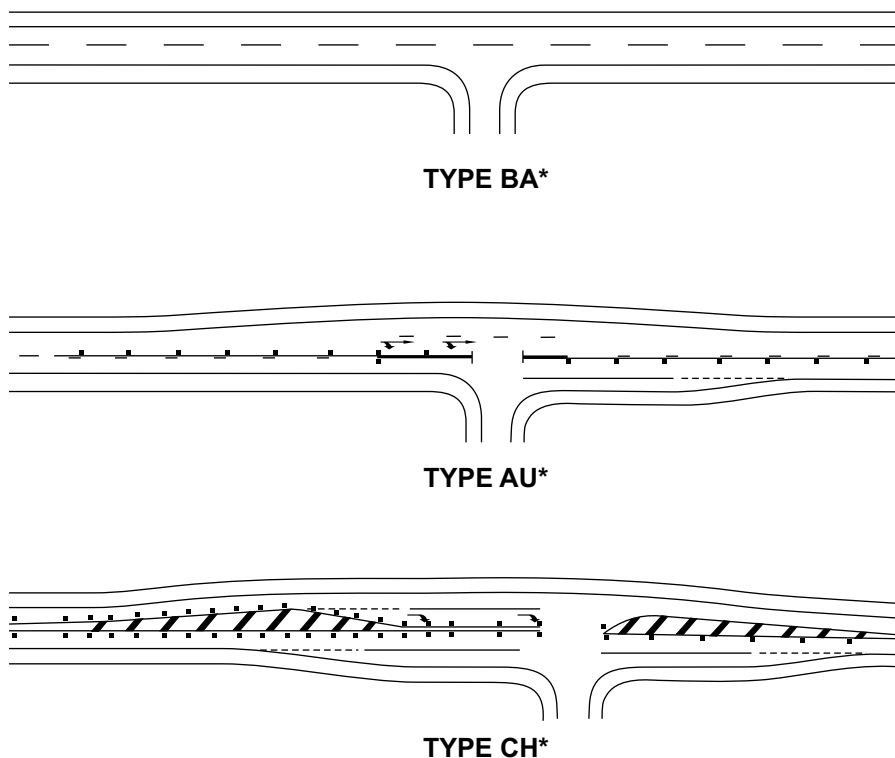
20.3.9 Access

To encourage entry, access to rest areas should be seen to be safe and easy to effect.

The usual considerations of the standard safety elements of sight distance, stopping distance, auxiliary lanes, and provision for turning at intersections, must be applied to the design of the access to the rest area (see Chapter 13). Depending on traffic volumes, one of the three types shown in Figure 20.1 will be suitable (see Figure 13.21, Chapter 13 for warrants).

To encourage the use of the roadside amenities, a uniform standard of access configuration may be appropriate for the entire set of amenities along a particular route, even though a lower standard might be indicated at some locations on the route.

Where the cost of providing the required level of access is high, consideration should be given to duplicating the rest area on both sides of the road. However, if a rest area is duplicated, deceleration and acceleration lanes will still be required. The entrance to the two rest areas must be within obvious sight of each other, so that drivers do not try to turn right because they are not aware of the rest area on their own side of the road. It is



* See Chapter 13, Figure 13.21 Warrants for Rural Turn Lanes

Figure 20.1 Access to Rest Areas

Source: *Main Roads (1999a)*

preferable that the left side rest area appears first to the approaching driver.

Details of the design of the access must be in accordance with the requirements set out in Chapter 13.

20.3.10 Rest Area Signing

Advance signing should provide the driver with adequate time to decide to use a particular amenity, given the amenity's location and the level of facility provided.

The MUTCD (Main Roads, 1999d) gives appropriate advance signs 300 or 200m before a rest area (depending on the speed environment) and at the turn-off to the facility in accordance with current Australian standards.

In addition, advance warning signs are required at:

- 10km - indicate type of rest area and facilities provided;
- 2km - indicate type of rest area and the distance to the next rest area.

A “Fasten Seat Belts” sign should be placed adjacent to the exit points of all rest areas.

Note that on the advance warning signs, no more than three symbols should be used to cover the facilities required. It is intended that a standard sign G7-1-1 (MUTCD) should indicate a rest area providing the minimum facilities described in Section 20.3.2. Other symbols may be used where services in addition to these minima are provided.

Signs for heavy vehicle rest areas should not show the facilities available to minimise use by motorists and tourist traffic. These additional users may restrict the space available for trucks and create unnecessary disturbance to resting truck drivers.

20.4 Stopping Places

20.4.1 Introduction

Stopping places are areas made available to enable drivers to undertake short stops for a variety of reasons, such as checking loads, attending to a vehicle breakdown or enjoying a scenic view.

They serve the purpose of providing a relatively safe location for immediate stopping needs at a safe distance from through traffic. Specific stopping places are required on sections of road which do not provide adequate shoulder width to allow vehicles to stop clear of the carriageway with sufficient frequency to meet unexpected stopping needs. There should be sufficient clearance from the through pavement to allow drivers to inspect their vehicles safely.

Stopping places are designed to meet the specific needs of both motorists and heavy vehicle operators and can be co-located with a point of interest to tourists.

Stopping places for each direction should be located in approximately the same place, but separated to avoid having stopped vehicles on both sides of the road at the same time. Traffic from each direction should arrive at its own stopping place first. A spacing of 25 - 100m between adjacent tapers should be satisfactory.

Stopping places for commuter buses should be designed to the same standard as a heavy vehicle Stopping Place when located in rural areas. In urban areas, the stops should be designed according to the procedures described in Section 20.7.

20.4.2 Motorist Stopping Places

Motorist stopping places are sealed or paved areas clear of the through pavement, allowing adequate space for a car towing a caravan or trailer, with safe access and egress, and sufficient width to allow safe inspection of the vehicle. Figure 20.2 shows details of a typical stopping place for motorists (see Appendix 20A for signing arrangements).

Except, perhaps, for lookouts where a scenic view is obtainable on only one side of the road, roadside stopping places should consist of stopping bays on both sides of the road.

In all cases, safe intersection sight distance (SISD) must be provided to the start of the approach taper of the stopping place (refer Chapter 13).

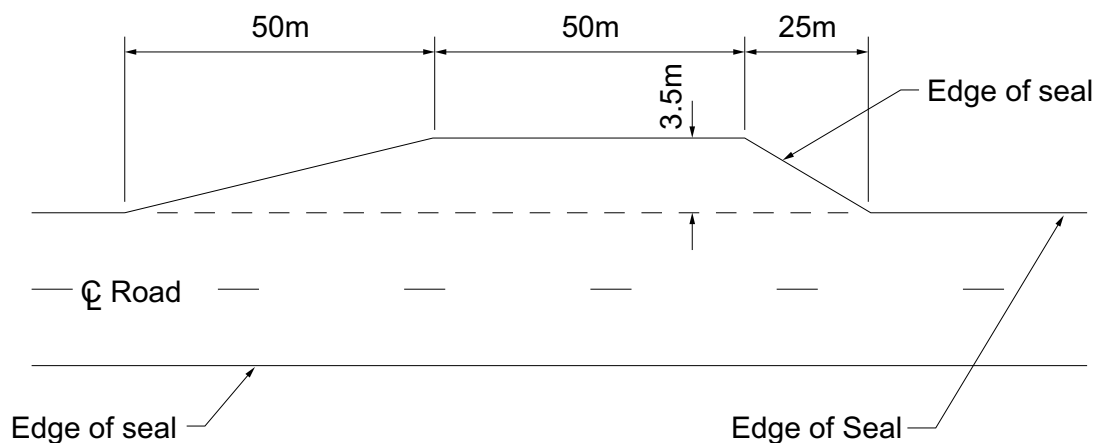


Figure 20.2 Typical Stopping Place for Passenger Vehicles

20.4.3 Heavy Vehicle Stopping Places

Heavy vehicle stopping places are sealed or paved areas with safe entrances and exits for heavy vehicles and with sufficient clearance from the through pavement to allow loads to be inspected and adjusted safely. Figure 20.3 illustrates typical details for these stopping places (see Appendix 20A for signing arrangements). Safe Intersection Sight Distance (SISD) must be provided to the start of the approach taper of the stopping place (refer Chapter 13).

Brake check and brake rest areas are particular types of stopping places for heavy vehicles. A detailed discussion of these is included in Section 15.7.5, Chapter 15.

20.4.4 Points of Interest

Points of interest are stopping places provided to allow travellers to view and enjoy scenic areas and be informed about, or have interpreted, interesting local features.

20.4.5 Facilities

As stops at these places are expected to be of much shorter duration than at rest areas, the

minimum facility required in a stopping place is a rubbish bin. Additional facilities should be considered, particularly at points of interest.

20.4.6 Distance Between Stopping Places

The benchmark distance between motorist stopping places is 15 kilometres (refer Section 20.3.7).

As the bench mark distance between heavy vehicle stopping places is 45 kilometres, consideration should be given to making every third stopping place for motorists suitable for both heavy vehicles and motorists.

20.4.7 Siting Stopping Places

The first three considerations for siting rest areas in Section 20.3.8 are also relevant for stopping places.

In brief, they are:

- sight distance for safe access and egress;
- placing heavy vehicle sites at or near a crest;
- locating at points of interest and minimizing the impact on the environment.

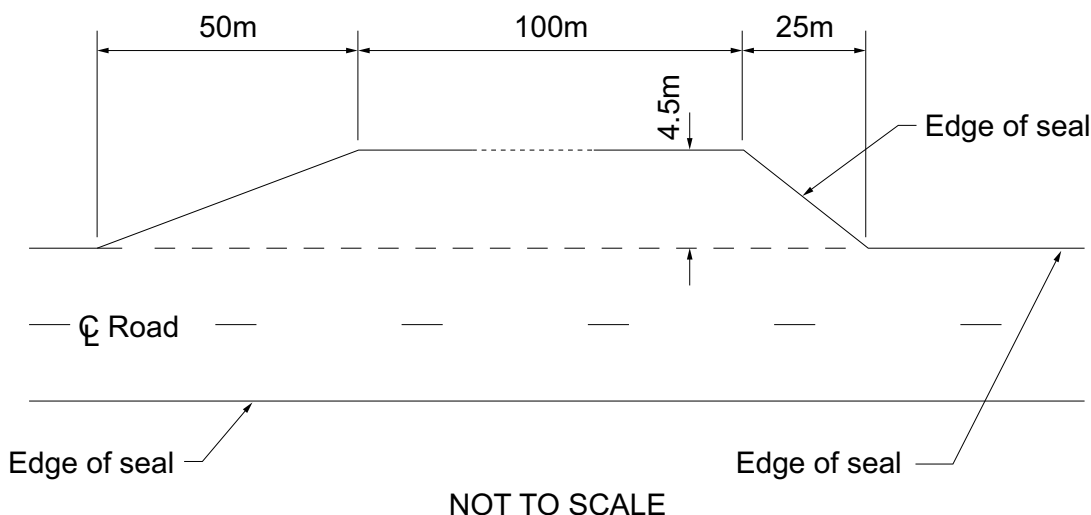


Figure 20.3 Typical Stopping Place for Heavy Vehicles

When assessing a length of road for appropriate location of stopping bays, suitable sites for heavy vehicles (especially on crests) should be determined first. The other locations can then be determined to provide the required spacing.

Further, stopping places must be located so that nearby residences are not inconvenienced. Preferably, they should not be visible from residences.

20.4.8 Geometry

For economy and practical reasons, stopping places are located just off the roadway, but with sufficient offset to allow tapers for safe entry and exit and inspection of the vehicles.

Figure 20.2 shows a typical sealed motorist stopping place. The parking area is a minimum of 3.5m wide and 50m long, to accommodate vehicles with suitable tapers from the edge of the sealed road shoulder for entry and exit.

Figure 20.3 shows a typical sealed heavy vehicle stopping place. The parking area is a minimum of 4.5m wide and 100m long with suitable tapers for entry and exit from the edge of the sealed road shoulder.

For both types of access, sight distance for safety is essential and additional rainfall runoff from the sealed areas needs to be considered in the design.

20.4.9 Signs for Stopping Places

Advance and other road signs should be in accordance with the MUTCD (Main Roads, 1999d) and Drawing TC1112 (see Appendix 20A).

20.5 Interception Sites

20.5.1 Introduction

Interception sites are safe areas outside the road carriageway provided for:

- weighing and inspecting heavy and commercial vehicles;
- inspecting other vehicles; and
- other enforcement (e.g. random breath testing) by appropriate officials.

Motorists may use them for short stops to inspect their own vehicles provided the site is not being used for official purposes. Emergency vehicles may also use them.

They may function in conjunction with WIM (Weigh-In-Motion) sites on the roadway to optimise the selection of vehicles to be weighed. These sites have piezo-electric detectors (weighing devices) to allow over-weight vehicles to be detected and be directed to an interception site for more accurate weighing

The concrete slab used for more accurate weighing devices at the interception site may sometimes also have one of these detectors, which allows inspectors to limit the weighing to those vehicles that are overloaded.

20.5.2 Site Selection for Interception Sites

The location of interception sites is influenced by the design requirements of the access and weighing areas and the needs of the transport inspection officers. The routes taken by heavy vehicles (including alternative by-pass routes) are also considered.

Sites have been selected at intersections of major corridors and on sections of a very long link where there is reasonable access to accommodation and facilities for enforcement officers. In addition, consideration has been given to adopting enforcement sites that provide maximum flexibility and minimum inconvenience to both inspectors and heavy vehicle operators (e.g. avoiding road trains crossing centre lines or doing U-turns.).

Given the required sight distance and other safety needs, space is required for:

- deceleration and acceleration tapers and access roads;
- storage for a number of vehicles on the approach side of the weigh site for vehicles waiting to be weighed;
- the actual process of weighing (see grade and crossfall requirements below);
- a holding bay on the departure side of the weighing device for vehicles detected overloaded (Ideally, this area should allow for any necessary offloading to be undertaken, in addition to the area needed for safe access to both sides of the vehicle by inspectors to complete their records.); and
- sufficient width to permit safe passing of stationary vehicles and Inspecting Officers where a vehicle is allowed to proceed.

General requirements are:

- (a) Maximum longitudinal grade over the weighing area is 2.0% and maximum crossfall is 3.0%. Desirable limits are level grade and 2.0% crossfall.
In addition the grade should be uniform over the site. Changes in grade can be tolerated provided areas of uniform grade sufficient to accommodate the longest vehicle, including B Doubles (Road Trains in some areas), can be clearly identified.
- (b) Visibility to the start of the exit taper and the end of the entrance taper should be not less than the heavy vehicle stopping distance, and should be carefully considered in the context of the ruling traffic volume and speed.
- (c) Where weighing sites are required for both sides of the road to cover each travel direction, they need not be located directly opposite each other, although this is desirable due to the logistics of providing personnel for both directions.

20.5.3 Geometry

Given the need for a heavily loaded vehicle to decelerate and enter an interception site where there may already be other heavy vehicles, the design of access to and from the area is critical for safety reasons.

Figure 20.4 shows a typical major interception site suitable for 1000 commercial vehicles per day with semitrailers being 20% of the commercial vehicles. This design is suitable for sites providing for the brake/suspension tester.

The entry taper is longer than those for rest areas and stopping places as in those cases, the drivers are expecting to stop and would be slowing down earlier. At interception sites, approach speeds would be higher depending on when the drivers are asked to pull over by inspectors.

The overall dimensions of the site depend on the expected number of commercial vehicles and the extent of the holding areas required.

Concrete pads with nominal dimensions of 40m long x 5.0m wide are required for effective weighing of multi-combination vehicles.

20.5.4 Environmental Considerations

It may be necessary to collect run-off from the site and process it in the appropriate way to avoid contamination of waterways (see Chapter 3 and Road Drainage Design Manual). Further, it may be necessary to provide for the containment of spillage that may occur on the site. Traps and retention basins should be designed into the scheme if appropriate.

20.5.5 Lighting

Where interception sites are to be used at night, they should be lit to provide safe working conditions for inspectors and to ensure the safety of motorists. The lighting is to be designed to the standard defined in Chapter 17 of this Manual.

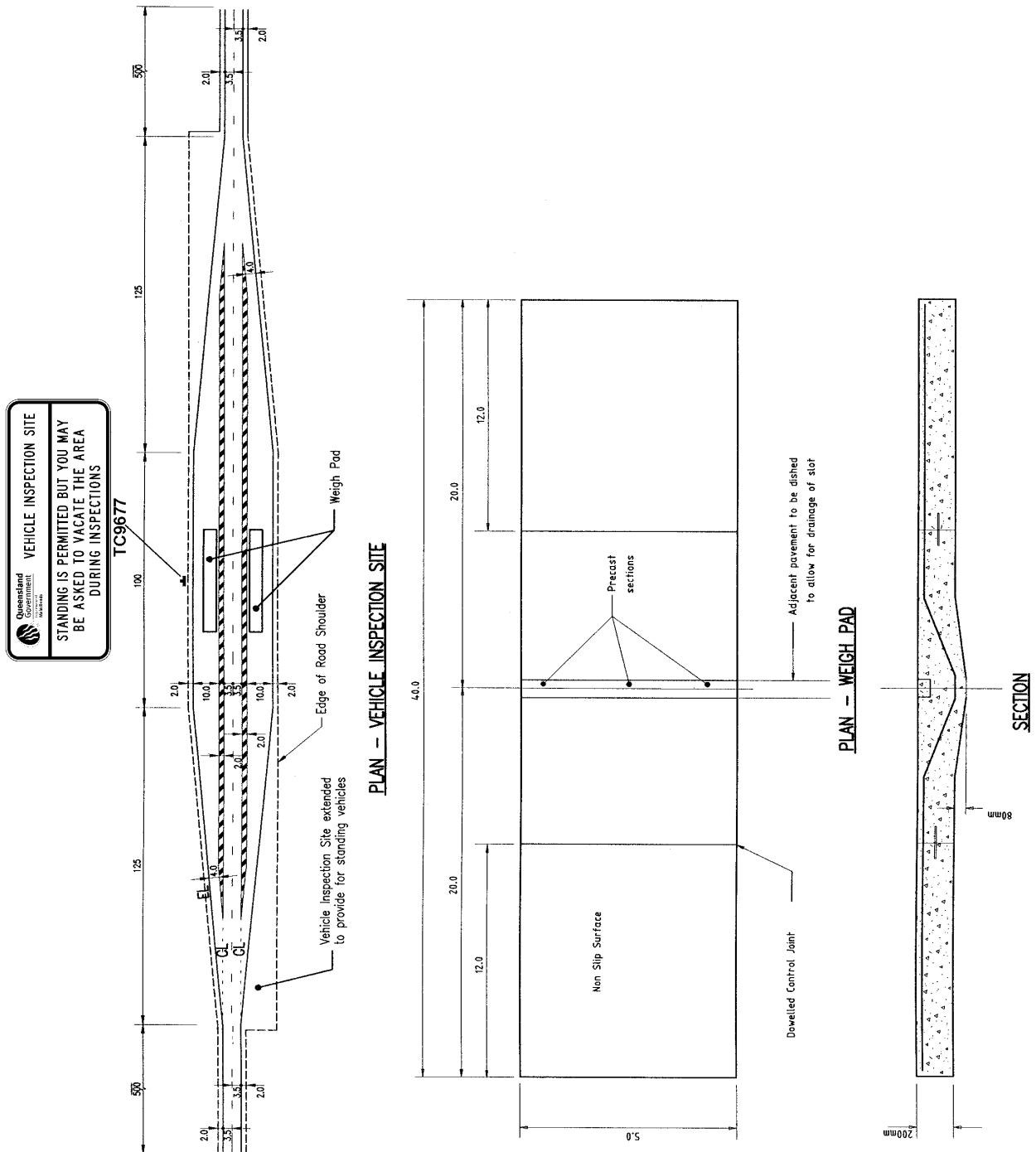


Figure 20.4 Typical Vehicle Interception Site

20.6 Rural School Bus Stops

20.6.1 Introduction

A rural bus stop is any school bus passenger pickup or set down area in a rural environment.

A school bus is any omnibus whilst it is being used exclusively for the carriage of school children to or from a school.

To ensure the safety of school transport, the following issues must be considered:

- (a) selection and standard of school bus routes;
- (b) provision of appropriate safe school bus stops;
- (c) signing of school bus routes and stops; and
- (d) in-vehicle safety e.g. standees, seat belts and padding.

This section of the Manual considers the siting, facilities and access requirements for (b) with some reference to (c). QT and Main Roads 2000a is the chief source of information for this Section of the Manual.

20.6.2 Facilities

Depending mainly on the number of school children using a bus stop, consideration should be given to providing the following facilities. (For safety, all facilities for children should be on the side of the bus stop furthest from the road.)

Waiting Areas

Where needed, waiting areas should be provided at school bus stops for school children to assemble and disperse.

These areas should be level, well drained and free from tripping hazards and may be gravelled and sealed. It is desirable to provide shade.

Bus Shelters

Passenger shelters should be provided where justified. The need should be determined from

factors such as:

- passenger demand;
- stop permanency;
- passenger waiting duration; and
- passenger convenience (e.g. protection from heat, rain etc.).

The shelter should be located such that the bus driver is able to see the waiting children in time to stop the school bus. Speed environment and physical features should be considered in the location of the shelter in relation to the traffic lanes. Desirably, the shelter should be located beyond the clear zone so as not to become a hazard to road users. (Refer to Chapter 7 - Cross Section for further discussion on clear zones.)

Parking Facilities

Providing safe parking facilities should be considered at school bus stops where parents with vehicles assemble to drop-off/collect children.

Adequate area should be available to permit parents to park their vehicle, drop-off the children and collect them safely with minimum disruption to the children and traffic. If a separate area is to be provided, Section 20.4, Stopping Places may be used as a guide.

Pedestrian Crossings and Refuges

Where necessary, safe pedestrian crossings should be provided at the school bus stop in accordance with the warrants set out in the MUTCD (Main Roads, 1999d).

Travel Paths for Pedestrians

Safe travel paths should be available for children to walk to and from the school bus stop (e.g. from a separate parking area).

The need for children to walk along the edge of a vehicle carriageway should be avoided where possible, especially on roads where the traffic speed, volume and proportion of heavy vehicles are high. Preferably, paths at the maximum distance from the traffic lanes should be provided for children to use. In some cases, facilities for

bicycles on off-road paths and storage for bicycles should be considered.

20.6.3 Siting School Bus Stops

School bus stops should be located and designed to:

- (a) maximize the safety of school children and other road users; and
- (b) minimise interference to traffic flow on the road system.

Good practice in relation to school bus stop location, design and safety includes considering the following:

- crash history in the vicinity of the school bus stop;
- visibility to/from the school bus stop facilities;
- providing for passing a stationary bus at the school bus stop;
- roadway characteristics in the vicinity of the school bus stop;
- traffic characteristics in the vicinity of the school bus stop;
- providing bus stop facilities at intersections or mid-block;
- signing specifically for school bus stops and crossing areas;
- providing passenger waiting facilities; and
- providing pedestrian facilities.

Requirements for school bus stops should be resolved with the appropriate Queensland Transport officers.

Crash History

School bus stops should be avoided in areas with a history of particular types of crashes (e.g. run-off the road crashes) which may place the bus stop users (e.g. children waiting at stop, bus stopping) at risk.

Visibility Issues

The optimum locations for school bus stops are on sections of road with a straight alignment with a uniform gradient. School bus stops should not be located in unexpected situations and/or at locations with limited visibility, such as just around sharp horizontal curves, or just over crests.

The visibility of the school bus stop should be sufficient to allow:

- following vehicles to stop or slow down safely behind the school bus while the bus is entering or leaving the bus stop; and/or
- vehicles to safely pass the school bus while it is engaged in pick up/set down activities.

It is desirable that at least safe intersection sight distance be provided to the bus stop (see Chapter 13). Where this cannot be achieved, a full pull off area is required with at least stopping sight distance to the start of the pull off area. If children have to cross the road to reach the stop, the visibility to the crossing point must satisfy both of the criteria:

- Approach Sight Distance
- Crossing Sight Distance

in accordance with the procedures set out in Austroads (1999) Guide to Traffic Engineering Practice - Part 13 Pedestrians (see also Chapters 5 and 13).

Where these conditions cannot be met, the bus stop should be relocated to a site that does.

Stopping distances for passenger vehicles, buses and trucks are given in Austroads (1988) Guide to Traffic Engineering Practice, Part 5 - Intersections at Grade. See also Chapter 8 - Sight Distance for further discussion.

Passing Zones

Safe and effective passing zones at bus stops on two lane roads require both adequate sight distance to opposing vehicles and adequate passing zone length. If these cannot be provided, a pull off area will be required in accordance with Figure 20.5.

To allow for safe passing of vehicles at bus stops, it may be necessary to provide pull-off areas for buses to stop. It should be noted that in accordance with the Traffic Act, where there is no continuous dividing line or dividing strip, there must be at least 3 metres of the road alongside the vehicle that is clear for other vehicles to pass. Where there is a continuous dividing line or dividing strip, the driver must position the vehicle at least 3 metres from any dividing line or dividing strip. However, for added safety, a clear distance of 4.0m between the dividing line and the offside of the parked bus is required.

Roadway Grades

The school bus stop should be appropriately located in relation to the roadway grade and any auxiliary lanes.

Where visibility is not an issue and where grades are very steep, school bus stops should be avoided in sag curves or on the grade incline due to the difficulty and hazard of decelerating and/or accelerating amid general traffic.

School bus stops must not be located within the tapering sections of auxiliary lanes (e.g. overtaking lanes, climbing lanes, descending lanes, turning lanes, passing bays). Stops must not be located on grades where runaway vehicle facilities are required.

Lanes and Shoulders

Adequate shoulders should be provided to improve safety at school bus stops. (See also “Passing Zones” above.)

Widening road shoulders to allow the bus to stand clear of the traffic lanes provides improved traffic flow and safety. In addition, improved warning of the approaching stop with appropriate signs is desirable.

At areas where the school bus must remain stationary for some period of time (e.g. route terminal etc.), the stopped bus must be located clear of through traffic lanes. It should be noted that in accordance with the Traffic Act, vehicles 7.5 metres long or longer, may only park on the road shoulder in a non-built up area.

Road Surface Condition

The road surface at the school bus stop should be suitable under wet weather conditions for bus performance.

If necessary, placing selected gravel or sealing the bus stop area and its access should be carried out to make the area safe for the bus and waiting school children.

Bus Terminals

Suitable allowance for a bus to turn around safely must be provided at the terminus of a school bus route. This may take the form of shoulder widening, off road facility or cul-de-sac depending on the circumstances of the site.

Side Roads and Property Accesses

As stopped/stopping buses cause conflict in traffic, locating bus stops at intersections minimizes the conflict area. Property accesses to a lesser degree are also places where slower vehicles would expect to be encountered by through traffic.

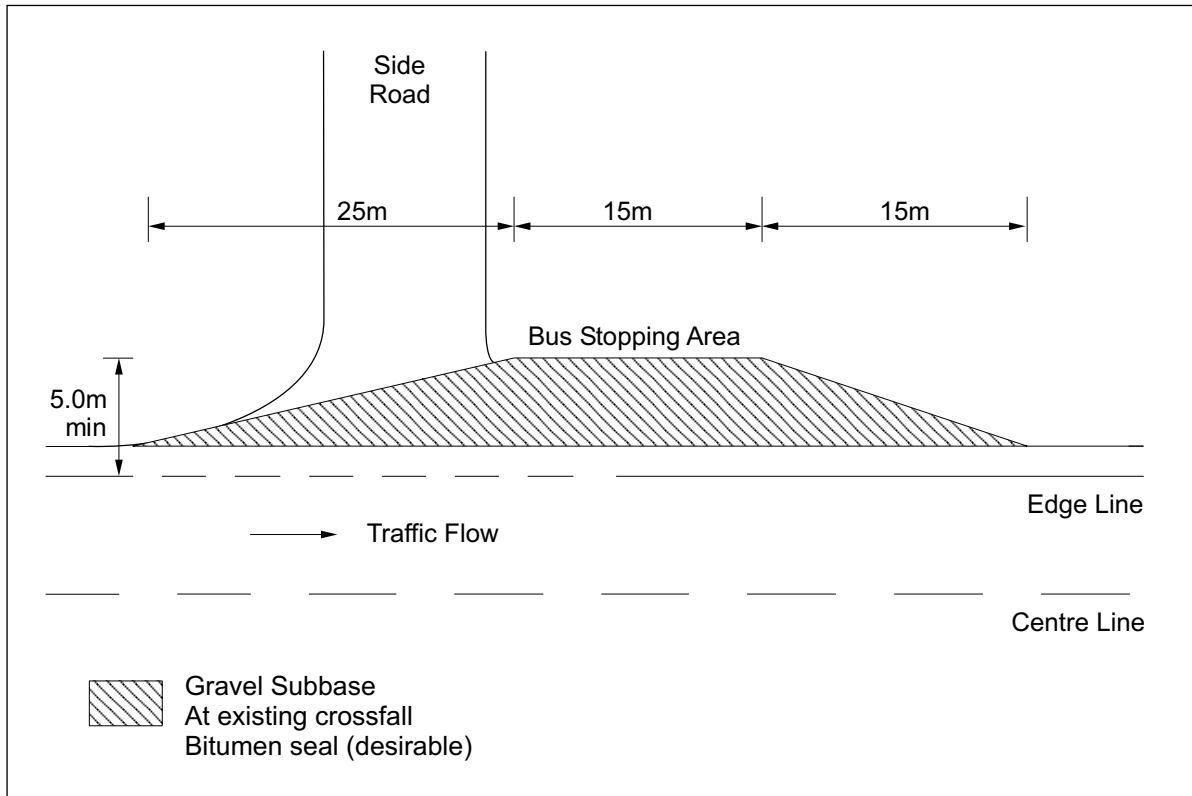
Intersections and property accesses may also be logical places for picking up school children that live on the side road or on the property itself. As some of the paved or sealed area required for a bus stop may already be in place for the intersection or property access, there may be a saving in cost in providing a bus stop at one of these locations.

20.6.4 Access

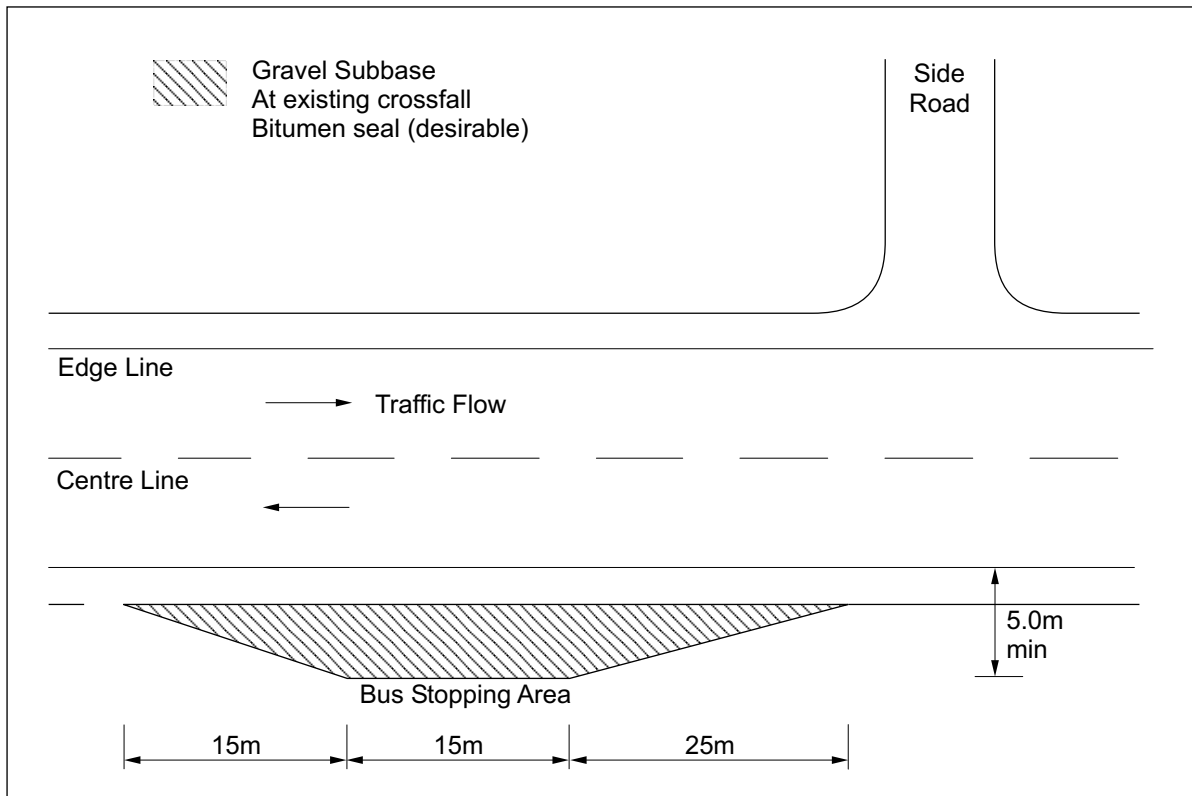
At Intersections

A school bus stop should be located on the departure side of intersections, children's crossing locations, and property accesses, where possible.

A bus stop located on the departure side of an intersection is generally safer than one located on the approach side as children cross behind the bus where they can be seen. In this position, the bus does not block the view of traffic controls and other intersection traffic.



(a) School bus stopping area on same side as side road



(b) School bus stopping area on opposite side to side road

Figure 20.5 Typical Intersection Rural Bus Stop Layouts

Source: Main Roads (2000a)

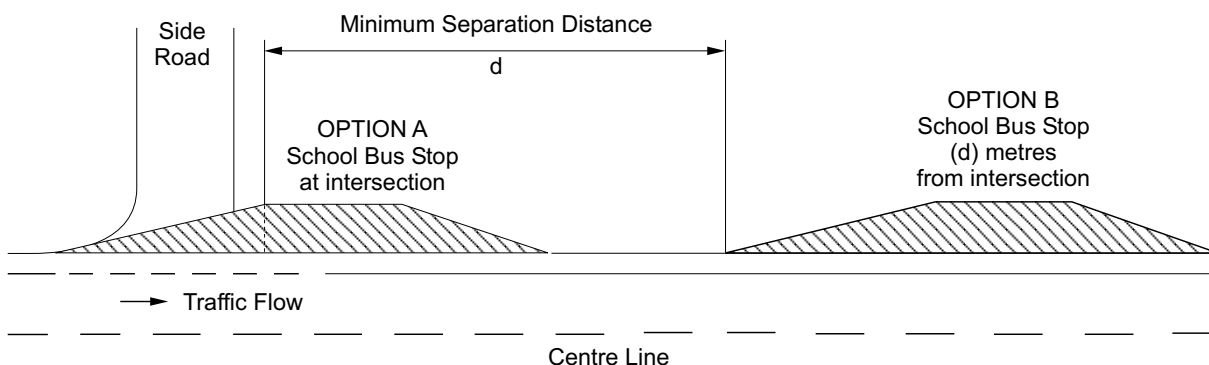


Figure 20.6 School Bus Stop Options at/near Intersections

Source: Main Roads (2000a)

Other advantages of the departure side bus stop include:

- reduced bus conflict with left turning vehicles;
- increased intersection capacity by freeing the kerb lane for through movement;
- improved sight distances at intersections;
- shorter kerb length requirements for bus stop approaches; and
- easier bus re-entry into traffic after passenger loading/unloading.

School bus stops should not be located opposite the terminating leg of a T-junction for safety and efficiency reasons. Typical intersection bus stop layouts are detailed in Figure 20.5.

Where a bus stop cannot be located at an intersection, it should be located at an appropriate distance from the intersection to sufficiently separate the points of conflict (i.e. intersection and bus stop), so the drivers are faced with only one decision at a time. Refer to Figure 20.6 and Table 20.1 for the minimum separation distances for school bus stops from an intersection or points of conflict.

Table 20.1 Minimum Separation Distances (d) for School Bus Stops (refer Figure 20.6)

Speed Environment (km/h)	Minimum Separation Distance d (m)
<60	50
61-80	70
81-100	85
>100	110

Source: Main Roads (2000a)

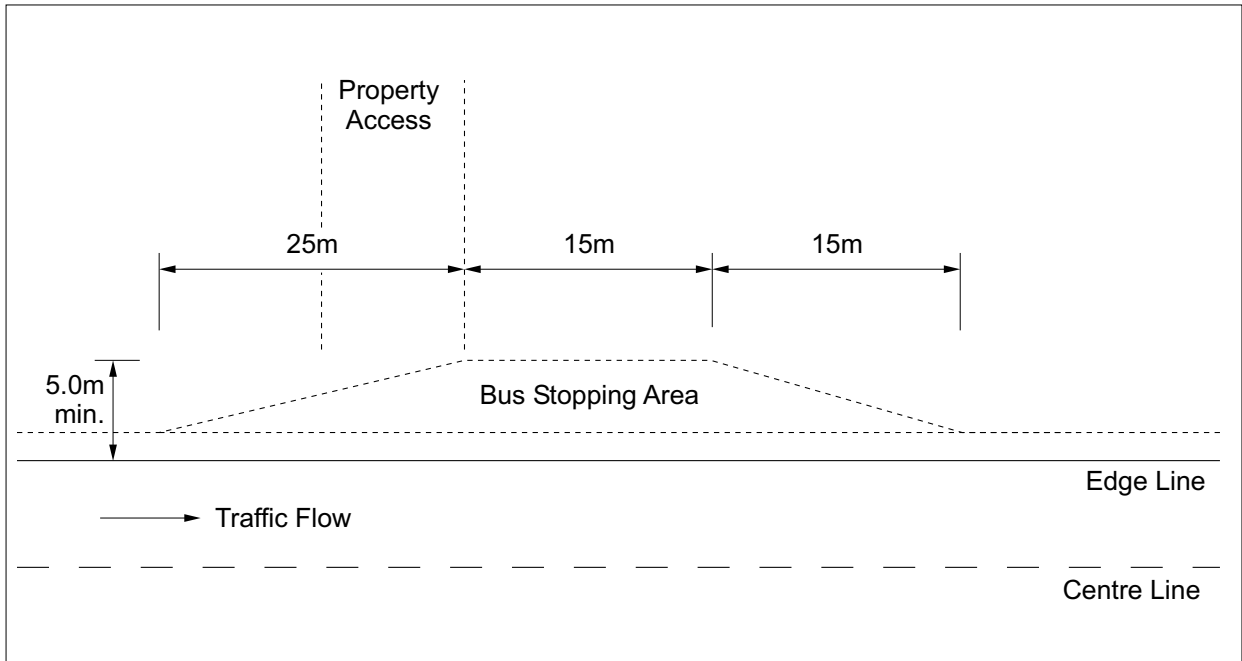
At Mid-Block

Mid-block school bus stops should be located either across property accesses or downstream of property accesses to minimize conflicts. Typical bus stop pull-off layouts are detailed in Figure 20.7.

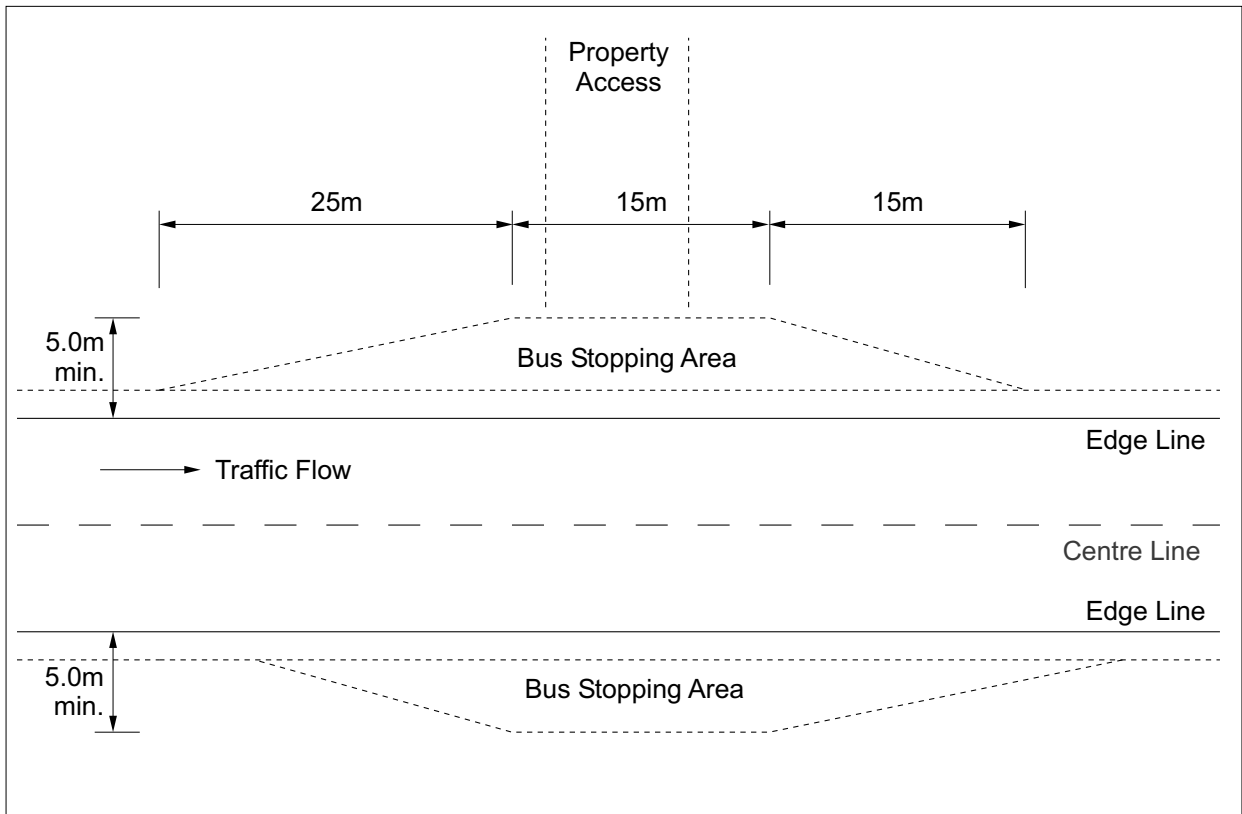
20.6.5 School Bus Stop Signing

A school bus stopping location should only be signed as a school bus stop where sight distance is restricted and cannot be sufficiently improved.

In accordance with the Manual of Uniform Traffic Control Devices (Main Roads, 1999d), the Children sign (W6-3) with supplementary plate BUS STOP (W8-Q03) or Bus and Student sign (TC9944) should only be used in advance of school bus stops in rural areas where visibility for



(a) School bus stopping area adjacent to property access



(b) School bus stopping area across property access and/or opposite property access

Figure 20.7 Typical Mid-Block School Bus Stop Layouts

Source: Main Roads (2000a)

approaching drivers to any children waiting at the bus stop is less than 200 metres.

It is not intended that these signs should be generally used at school bus stops. To improve safety, consideration should be given to relocating the bus stop to a location with adequate visibility.

Children's crossing areas should only be signed where for safety reasons it is necessary to warn motorists of the possible presence of school children on the road.

The Children sign (W6-3) alone should only be used where:

- (a) pedestrian volumes are significant but insufficient to justify a pedestrian crossing (zebra) or traffic signals;
- (b) the presence of pedestrians may not be expected; or
- (c) the pedestrian demand extends over a length of road.

To maintain the credibility of these signs it is important that they be removed as soon as the situation ceases to warrant such signing.

20.7 Urban Bus Stops

20.7.1 Introduction

Although considerations for urban bus stops have much in common with those for rural school bus stops, there are also major differences. Some of these differences are:

- a lower speed environment (50-60 km/h speed limits in urban areas and 100 km/h common on rural bus routes);
- much more frequent stop visits by buses in urban areas, compared with only 2 per day at rural bus stops (1 trip to and from school);
- intersections and property accesses are much more common in urban areas and these must be kept completely clear, unlike those at rural bus stops; and

- choice of bus stop location is more limited in urban areas, with routes defined and shorter distance between stops.

However, the key considerations of minimising the interference to traffic flow on the road system and safety for the buses and their passengers remain the same.

20.7.2 Facilities

For the facilities mentioned below, the basic considerations are similar to those for rural bus stops and reference should be made to Section 20.6.2 for further details.

Bus Shelters and Waiting Areas

Because of the greater demand, bus shelters at regular intervals are expected in urban areas.

Parking Facilities

Apart from Park and Ride areas which may be quite large (e.g. providing parking bays for 50-250 cars), parking facilities are not required for the sole reason of servicing passengers for buses.

Pedestrian Crossings and Refuges and Travel Paths (Footpaths)

These will be more common in urban areas, but exist for reasons other than use by bus passengers.

Lighting

Bus stops in urban areas should be lit to:

- provide a deterrent to crime against people waiting for a bus;
- improve the visibility of the stop, thereby increasing the safety of people waiting.

20.7.3 Siting Urban Bus Stops

Considerations for the placement of urban bus stops include:

- minimising interference to traffic flow (indented bus bays if necessary);

- spacing of stops as a trade off between impact on traffic and passenger demand (e.g. QT and Main Roads (2000a) gives distances between stops as 150 - 365 m in urban areas and 180 - 760 m in suburban areas in the USA).
- volume and turning movements of traffic;
- safety of buses (visibility, passing zones, roadway grades etc, as in Section 20.6.3);
- safety of people waiting for and exiting buses (including the proximity of pedestrian crossings and intersections);
- access for people with impairments;
- the proximity of footpaths and kerb ramps;
- the possibility of having a stop for travel in the opposite direction in near proximity;
- street lighting;
- adequate space for the number of buses expected at the one time;
- impact of the bus stop on nearby properties;
- on-street parking of passenger and commercial vehicles;
- traffic control signs and signals (lights, stop, yield signs);
- width of footpaths; and
- property accesses.

20.7.4 Access

Access requirements are discussed in the “kerbside bus stops” and “indented bus bays” sections below.

Considerations are similar to those for rural bus stops with the added complication of the presence of close intersections, bus queues and the increased probability of buses arriving at opposite sides of the road at the same time.

There should be sufficient length of road for buses to leave stops, move to the centre lane and turn right at the next intersection where applicable.

Mid-block stops remove the run-in and run-out manoeuvres from the vicinity of intersections and may cause less interference with traffic.

Departure side stops are preferred at school crossings, pedestrian activated signals and marked pedestrian crossings as buses are less likely to obscure pedestrians at such crossings.

Where buses are required on both sides of busy roads, they should be staggered or fully indented into the verge or reservation to avoid the creation of a bottleneck when buses from opposite directions arrive concurrently.

Kerbside Bus Stops

The length of kerb line needed to be free of parking to provide for a bus (stop) zone may be determined as shown in Figure 20.8.

Where angle parking is involved, the run-in and run-out areas generally need to be lengthened at the taper rates given in Figure 20.8(a). Where the angle parking is a relatively permanent arrangement, extending the footpath area as illustrated in Figure 20.8(b) shortens the required bus (stop) zone, minimizes the required deviation of the bus and allows more footpath area for passengers to wait or for a bus shelter to be erected.

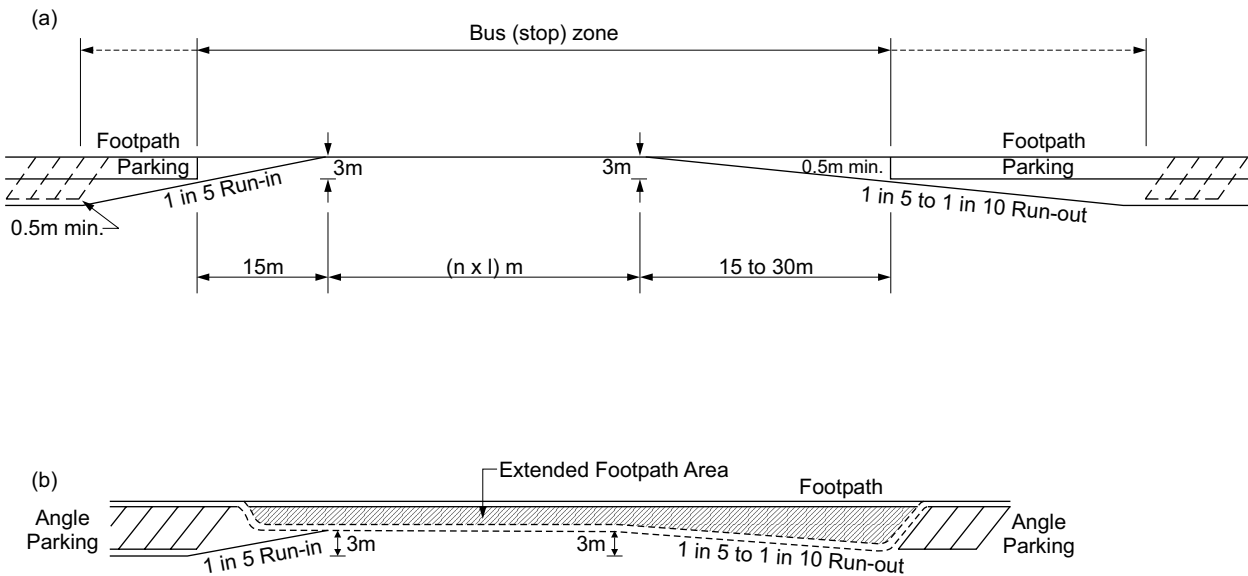
Run-in and run-out tapers should always be provided to ease entry to and exit from the through traffic lanes. Entry may be further assisted by regulations giving priority to the bus for this manoeuvre in Queensland.

Bus route terminal stands or areas where buses must remain for some time should be located clear of through traffic lanes or at sites where the disruption to traffic flow and parking is minimised.

Indented Bus Bays

Bus bays may be partially or fully indented into the adjacent footpath or reservation so that the bus is clear of traffic while it is setting down or taking up passengers.

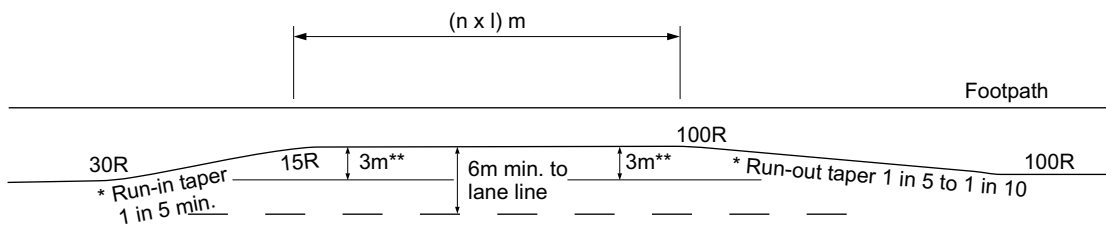
A typical bus bay layout is shown in Figure 20.9. With kerbside parking there is generally little



n = Number of buses using stop simultaneously
 l = Length of bus (including clearances if desired)
 Use 12m for single unit rigid bus, 18m for Articulated bus

Figure 20.8 Urban Bus (Stop) Zone Length

Source: Main Roads (1997a)



* Run-in and Run-out tapers may need to be varied according to site conditions, traffic speed and volume etc. Run-in tapers should not be less than 1 in 5. Run-out tapers should be as long as practicable.
 ** Width (including clearances) may need to be increased where large/wide buses are involved.

n = Number of buses using stop simultaneously
 l = Length of bus (including clearances if desired)
 Use 12m for single unit rigid bus, 18m for Articulated bus

Figure 20.9 Typical Urban Bus Bay Layout

Source: Main Roads (1997a)

advantage in providing an indented bus bay except where “clearway” conditions may be implemented in peak periods. Where this is the case, off-peak parking needs to be prohibited over the length of the bus bay plus run-in and run-out tapers (across the parking width) as shown in Figure 20.8(a).

20.7.5 Urban Bus Stop Signing

All traffic signs are to be in accordance with the MUTCD (Main Roads, 1999d).

20.8 Roadside Vending Sites

Roadside vending involves the selling of articles either directly or from a stall or standing vehicle on a road. The selling of goods and services in this way is potentially dangerous, as vehicles may suddenly swerve or stop, creating unsafe situations with moving traffic.

Stalls on private land adjacent to the road will potentially attract the same approval conditions as roadside vending sites within the road reserve, because of the possible impact on traffic safety.

Main Roads, 2000b gives the Policy for Main Roads on roadside vending.

Design details should be similar to those for Truck Stopping Places.

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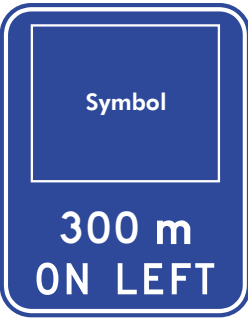
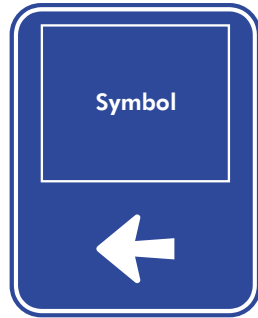


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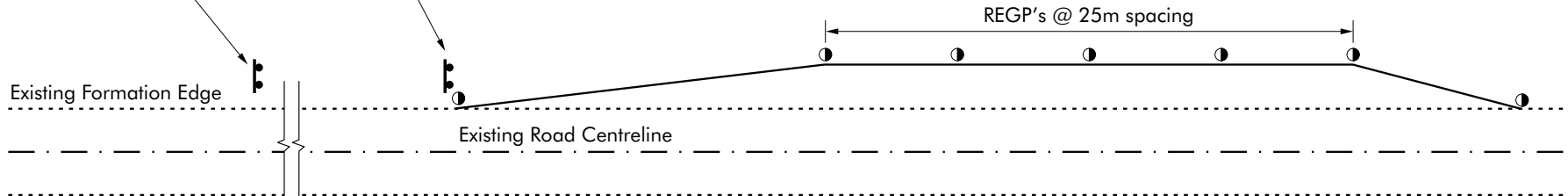
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Relationship to Other Chapters

- Relies on Chapters 13 and 15 for details of access requirements;
- Chapter 16 deals with spacing of ramps and this affects location of Service Centres;
- Sight distance requirements are provided in Chapter 9;
- Chapter 4 discusses urban bus stops in the context of arterial road design;
- Chapter 5 provides details of pedestrian characteristics and design vehicles.


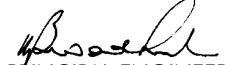
Symbol	Symbol		Motorist Stopping Place	Heavy Vehicle Stopping Place
 <p>G7-1-4</p>	 <p>G7-3-4(L)</p>	Symbol	 <p>TC1108</p>	 <p>TC1109</p>



PLAN VIEW

Notes:

1. For 'STOPPING BAY' symbol use grid module size as follows - 140 mm for G7-1-4A/G7-3-4A and 210 mm for G7-1-4B/G7-3-4B.
2. No signing is to be provided which encourages vehicles to turn right into Stopping Places.
3. Installation of R10-Q01 (FASTEN SEAT BELTS) not required.

 <p>Queensland Government Department of Main Roads</p>		<p>Traffic & Road Use Management Division Traffic Engineering Section</p>	<p>APPROVED AS OFFICIAL TRAFFIC SIGN</p>  <p>PRINCIPAL ENGINEER (Traffic Engineering)</p>	<p>11/09/01 Date</p>	<p>SIGNING ARRANGEMENTS FOR MOTORIST AND HEAVY VEHICLE ROADSIDE STOPPING PLACES</p>	<p>TC1112</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">A</td> <td style="width: 25%;">B</td> <td style="width: 25%;">C</td> <td style="width: 25%;"></td> </tr> </table>	A	B	C	
A	B	C								
<p>Designed RH 3/99</p>	<p>Checked KB 9/01</p>	<p>Scale Not to Scale</p>								