

# Guidelines for Choosing Informal Bus Stop Locations

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## Guidelines for Choosing Informal Bus Stop Locations

### Document details

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1.0	July 2019	Public Transport	Initial Version

### Acronyms

The following acronyms appear in this document.

<b>Acronyms</b>	<b>Full form</b>
DIPL	Department of Infrastructure, Planning and Logistics
NT	Northern Territory

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# 1 About the guidelines

*Informal bus stops* are used every day across the Northern Territory (NT) to pick up and drop off passengers on school and public bus services operating in rural areas. An informal bus stop is not an official sign-posted bus stop, rather it is a location identified as a suitable place for a bus to stop.

Safety around buses operating on rural bus routes is a complex issue involving road and roadside conditions, pedestrian and passenger behaviour, motorist behaviour and travel speed.

Further safety issues arise for school bus services as young children lack the capacity to make informed and safe choices when crossing the road, increasing their likelihood of being involved in pedestrian accidents.<sup>1</sup> Children under 16 years of age are three times likely to be involved in a fatal accident.<sup>2</sup> Parents/carers play an important role in ensuring the safety of students getting to and from, and waiting at school bus stops.

Passengers, parents/carers of passengers and bus operators can help to reduce risks by deciding on safer locations.

## 1.1 Scope

This set of guidelines assists bus operators, drivers, passengers and parents/carers in deciding on the location of an informal bus stop with particular focus on the safety of:

- passengers approaching, departing or waiting at bus stops;
- bus operators and on-board passengers;
- other road users such as passing traffic.

It is recognised that ideal road and roadside conditions often cannot be met in rural environments. Accordingly, safety factors may need to be weighed against others when considering bus stop locations.

The guidelines set out important road safety factors that should be considered by operators, drivers, passengers and parents/carers when deciding on an informal bus stop location. The guidelines also outline a process for estimating sight lines to oncoming traffic which is not a formal standard or requirement, however it is considered a significantly important safety factor.

These guidelines compliment the [Code of Conduct for School Bus Travel](#), which provides a set of behavioural guidelines for parents/carers and students for travel on school buses and relevant procedures for bus operators, drivers and schools, as well as the [Rules of Travel](#) for the public bus network.

In the event that a suitable location cannot be identified and there are continuing safety concerns, alternatives may need to be considered. Concerned parties are encouraged to contact Public Transport for assistance on 08 8924 7666 or email [passenger.transport@nt.gov.au](mailto:passenger.transport@nt.gov.au).

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<sup>1</sup> *'Child Pedestrians: Factors Associated with Ability to Cross Roads Safely and Development of a Training Package'* Monash University Accident Research Centre (November 2008)

<sup>2</sup> [Transport for New South Wales 'Advice for choosing locations of informal school bus stops' \(December 2016\)](#)

### 1.2 Acknowledgement

These guidelines have been prepared with reference to guidance available in other jurisdictions. Particular acknowledgement to the Transport for New South Wales Centre for Road Safety for their December 2016 publication “*Advice for choosing locations of informal school bus stops.*”

## 2 Responsibilities

### 2.1 Bus Driver Responsibilities

Bus drivers need to be vigilant when passengers, particularly school students, are boarding and disembarking the bus.

**Drivers should:**

- Pull over in an area where it is safe and there is sufficient space for the passenger to get on or off the bus and is not obstructing other traffic.
- Not make a stop on a stretch of road with unbroken centre lines or nearby to any turns, bends, crests or other sections of road that have limited visibility for the bus or other traffic.
- Make sure they stop a sufficient distance from any nearby intersection.
- Wait until the bus is completely stationary before opening the doors and wait until passengers are safely seated before driving off.
- Ensure that there is adequate distance to indicate and decelerate on approach to the stop (refer to sight distances in Annexures A and B).

### 2.2 Passenger Responsibilities

Passengers should ensure that they:

- Wait in an area where there is sufficient space on the side of the road for the bus to stop safely and is in clear view of other traffic.
- Take care when crossing the road around the bus, and if disembarking, wait until the bus has driven off safely.
- Understand and comply with the Rules of Travel.

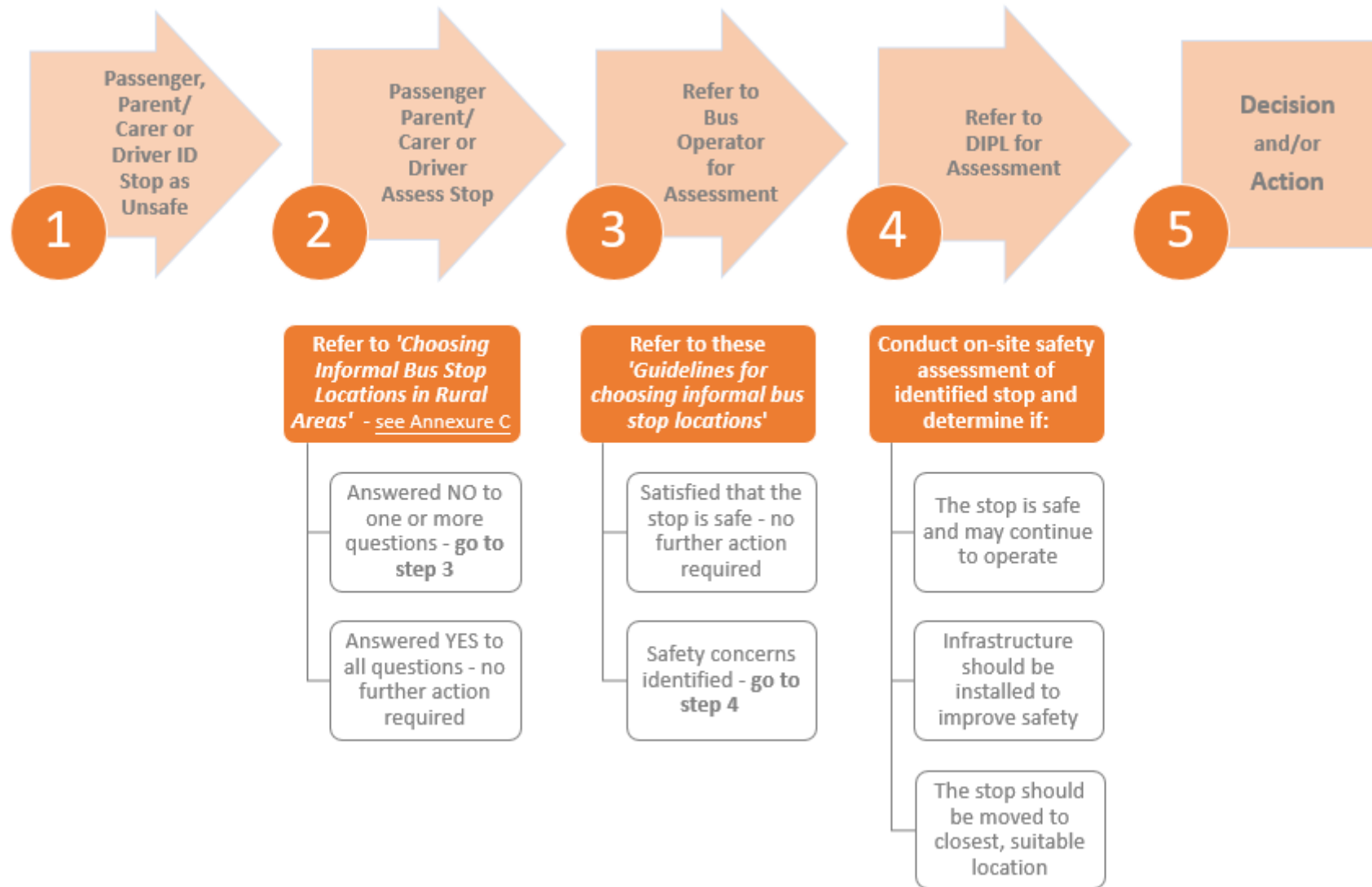
### 2.3 Parent/Carer Responsibilities

Parents/carers should ensure that:

- If they are meeting their child at the stop, they wait in an area where there is sufficient space on the side of the road for the bus to stop safely and is in clear view of other traffic.
- The student understands and complies with the Code of Conduct for School Bus Travel.
- They supervise students while waiting to meet, or after they have gotten off the bus.

They meet the child on the side of the road where the bus stops and take care when crossing the road.

### 3 Procedure for Assessment



## 4 Key Safety Considerations

Bus Operators should refer to and complete column four of this table ‘Observed Site Conditions’ when making an assessment of any bus stop referred to then by a passenger, parent / carer or driver.

Issue	Considerations	Guidance	Observed Site Conditions
Sight line for vehicles approaching from behind the bus	<ul style="list-style-type: none"> <li>All bus stops should be sited so that they are clearly visible to motorists.</li> <li>The better the sight line, the greater chance of motorists slowing in the vicinity of a bus with its lights flashing and taking action if pedestrians are on the road.</li> <li>Higher speed zones need a longer sight line for motorists to make judgements, take action and stop when necessary.</li> <li>Curves and crests, and roadside vegetation can all reduce sight lines.</li> <li>The stopping distance is greater, and requires a longer sight line:                             <ul style="list-style-type: none"> <li>on a down grade</li> <li>on unsealed roads</li> <li>where there are frequent trucks, on curves with close roadside vegetation or other sight line obstructions.</li> </ul> </li> <li>Estimating sight lines by <b>timing</b> approaching vehicles is a simple task that can be safely undertaken from the roadside. It involves using a stop watch to time how long vehicles are visible on the approaches to a bus stop. A suggested process is provided as Attachment A.</li> <li>Estimating or measuring sight lines in metres is more complex, and requires careful Work Health and Safety planning by the organisation and people involved. Sight distances in metres are provided in Attachment B.</li> </ul>	<p><b>Minimum</b> seconds that a vehicle approaching at the speed limit needs to be visible from beside the roadway:</p> <p><b>100 km/h speed zones</b></p> <ul style="list-style-type: none"> <li>Estimate 250 metres</li> <li>9 seconds on flat roads</li> <li>add 1-3 seconds on a down grade</li> <li>add 2 seconds on curves with frequent trucks</li> <li>add 1 second on unsealed roads</li> </ul> <p><b>80 km/h speed zones</b></p> <ul style="list-style-type: none"> <li>Estimate 180 metres</li> <li>8 seconds on flat roads</li> <li>add 1-2 seconds on a down grade</li> <li>add 1 second on curves with frequent trucks</li> <li>add 1 second on unsealed roads</li> </ul> <p><b>60 km/h speed zones</b></p> <ul style="list-style-type: none"> <li>Estimate 125 metres</li> <li>7 seconds on flat roads</li> <li>add 1-2 seconds on a down grade</li> <li>add 1 second on curves with frequent trucks</li> <li>add 1 second on unsealed roads</li> </ul>	
Sight line for vehicles approaching from in front of the bus	<ul style="list-style-type: none"> <li>As above.</li> <li>For traffic approaching from in front of the bus, the bus itself may block the line of sight to school students at the roadside.</li> </ul>		

## Guidelines for Choosing Informal Bus Stop Locations

Issue	Considerations	Guidance	Observed Site Conditions
Road shoulder width for a bus to stop clear of traffic	<ul style="list-style-type: none"> <li>• The Northern Territory Road Rules require that, outside a built up area, heavy vehicles (including buses) must not stop on or partly on the road, and may only stop on a road shoulder. An exemption is in place which excludes buses from complying with this road rule.</li> <li>• Outside a built up area, the Road Rules prohibit stopping by any vehicles near curves or crests, on a road or road shoulder, where an approaching motorist cannot see them for at least 100 metres.</li> <li>• When a bus stops in a traffic lane or on a narrow unmarked road, the sight line from oncoming vehicles to school students approaching or crossing a road from behind the bus can be <u>very much reduced</u>.</li> <li>• If a bus stops close to a double barrier line or on a curved road with no centre-line, it may force passing traffic onto the wrong side of the road in a dangerous situation.</li> <li>• The width, shape and condition of the shoulder must be suitable for safe pull-off and re-entering traffic.</li> </ul>	<p>Buses should stop clear of traffic lanes, on the road shoulder or verge.</p> <p>Buses should not stop near crests or curves, where an approaching motorist cannot see them for 100 metres.</p> <p>The condition of the shoulder must be considered, both for safe pull-off and re-entering traffic.</p> <p>It is not appropriate to stop within 3 metres of a double barrier centre-line.</p> <p>It is not appropriate to stop on curves or curve approaches, on a narrow unmarked road.</p>	
Waiting area for school children	<ul style="list-style-type: none"> <li>• Passengers must be able to wait in an area well clear of passing traffic.</li> <li>• The most hazardous roadside area on rural roads is on the outside of curves, where there is greatest likelihood of a vehicle leaving the roadway.</li> <li>• The end of an overtaking lane is another hazardous roadside area.</li> <li>• Roadside hazards can include steep drains, poor draining ground, trip hazards, encroaching vegetation, snakes and other dangers.</li> </ul>	<p>A cleared, firm, preferably 8 metres from the edge of travel lanes, is desirable. A minimum of 4 metres is essential.</p> <p>Bus stops that involve waiting areas on the outside of curves and at the ends of overtaking lanes, should be avoided.</p>	
Potential wet weather issues	<ul style="list-style-type: none"> <li>• Wet weather can affect the usability of:               <ul style="list-style-type: none"> <li>• pedestrian access to a stop</li> <li>• the waiting area</li> <li>• the parking area</li> </ul> </li> </ul>	<p>It is desirable that bus stops be located in areas where wet weather will not affect:</p> <ul style="list-style-type: none"> <li>• pedestrian access</li> </ul>	



## Guidelines for Choosing Informal Bus Stop Locations

Issue	Considerations	Guidance	Observed Site Conditions
	<ul style="list-style-type: none"> <li>the bus pull-off area.</li> <li>If any of these areas are adversely affected by wet weather, there may be an increased risk of pedestrian or vehicular conflict with passing traffic, especially when factors such as poor visibility, distraction and masking of sound can also affect a person's ability to be safe in wet weather.</li> </ul>	<ul style="list-style-type: none"> <li>waiting areas</li> <li>parking areas, and</li> <li>bus pull-off areas.</li> </ul>	
Location relative to intersections	<ul style="list-style-type: none"> <li>The consensus from road safety experts is that bus stops should be located on the departure from intersections, rather than on approaches, preferably 50 metres from the intersection.</li> <li>A bus stopped on the approach to an intersection might obstruct sight lines between turning and oncoming traffic.</li> <li>The closer a bus stops to an intersection, the greater the likelihood of blocking sight lines.</li> </ul>	<p>Bus stops should be located on the departure from intersections, rather than on approaches, preferably 50 metres from the intersection.</p> <p>A shorter distance (20-30 metres) is feasible if the bus stop area is 5 metres from the edge of the roadway.</p>	
Location relative to other bus stops	<ul style="list-style-type: none"> <li>Where there are bus stops on both sides of a road, they should be staggered so that there is a clear crossing area for pedestrians between the backs of buses that may stop around the same time.</li> <li>Where there are bus stops close to one another on the same side of the road, they should be consolidated to the safer site, if access and other conditions are adequate.</li> </ul>	<p>Opposing bus stops should be off-set to allow for pedestrians from either side of the road to cross behind stopped buses.</p> <p>Opposing bus stops should be set as far back from travel lanes as possible, to maximise visibility for, and of, pedestrians.</p>	

*NOTE: Table adapted from the [Transport for New South Wales 'Advice for choosing locations of informal school bus stops' \(December 2016\)](#)*

## 5 Resources

Austrroads Guide to Road Design “*Safe Intersection Sight Distance*” [Part 3](#) and [Part 4a](#).

Department of Infrastructure Planning and Logistics: Road Safety and Buses

Code of Conduct for School Bus Travel

Rules of Behaviour on Public Buses

Department of Education: Getting to and from school for remote students

Monash University Accident Research Centre ‘*Child Pedestrians: Factors Associated with Ability to Cross Roads Safely and Development of a Training Package*’ (November 2008)

Transport for New South Wales ‘*Advice for choosing locations of informal school bus stops*’ (December 2016)

## Annexure A: Estimating Sight Distance

\*From the Transport for New South Wales 'Advice for choosing locations of informal school bus stops' (December 2016)

Motorists need a clear sight line to observe hazards (including pedestrians or stopped vehicles) on the road ahead, in order to decelerate and stop if it is necessary.

On flat straight roads required sight lines are:

- 250 metres in a 100 km/h zone
- 180 metres in an 80 km/h zone
- 125 metres in a 60 km/h zone

Whilst sight distance is the primary metric it is acknowledged that it can be difficult to measure or estimate in metres. Where this is the case it can be estimated by standing at the roadside and timing approaching vehicles with a stop watch. Sight time is the number of seconds from when an oncoming vehicle becomes visible from the measurement point, to when it passes the measurement point. To be a valid measurement, the oncoming vehicle must be travelling at the set speed limit.

Required sight times for different speed limits are:

- 10 seconds, for 110 km/h
- 9 seconds, for 90 km/h or 100 km/h
- 8 seconds, for 70 km/h or 80 km/h
- 7 seconds, for 60 km/h

So, on a flat straight road, if an approaching vehicle is travelling at 100 km/h and you can see it for 9 seconds (or more), you have the required sight line for 100 km/h. If you can't, the sight line is not sufficient.

Sight time can be measured as either a two person or one person task. Even when working at a road side, it is recommended that a high visibility vest is worn.

### A two person task:

- When the road is clear of traffic, person 1 steps to the edge of the travel lane (not into the travel lane) where a child pedestrian would wait to cross the road;
- Person 2 approaches the bus stop in a vehicle, travelling at the speed limit (or curve advisory speed);
- Person 1 starts a stop watch when they first see the vehicle being driven by person 2;
- Person 1 steps into the bus stop waiting area, well clear of traffic;
- Person 1 stops the watch when the vehicle passes, and records the time in seconds in the checklist;
- Repeat the process for the other side of the road;
- Compare your times with the required times in the checklist, for the road conditions.

The required times are listed by speed zone, and seconds need to be added to the required time for a specific bus stop, if any of the listed road conditions are present.

**A one person task:**

- Measure times as above, but with live traffic.
- Time five vehicles to allow for speed variations (multiple measurements are required because traffic must be travelling at the speed limit, or curve advisory speed, to achieve a valid test).
- Use the lowest time (which will be the fastest vehicle) as your recorded time.
- Repeat the process for the other side of the road.
- Compare your times with required times in the checklist, for the road conditions.

The required times are listed by speed zone, and seconds need to be added to the required time for a specific bus stop, if any of the listed road conditions are present.

**Note that for the one person task:**

- The test will not be valid if vehicles slow on the approach to the proposed bus stop, owing to parked vehicles close to the roadway. (Regardless, a high visibility vest is essential for anyone working on a roadway).
- The test will not be valid with a bus parked next to the roadway, as approach speeds will be affected.

## Annexure B: Sight Distances in Metres

Speed Zone	Sight Distance in metres	Additional Lengths for Road Conditions		
		Unsealed Road	Downhill Grade*	Curves with frequent Trucks
110 km/h	285 m	+35 m	+20-40 m	+35 m
100 km/h	250 m	+30 m	+15-30 m	+30 m
90 km/h	215 m	+25 m	+10-25 m	+25 m
80 km/h	180 m	+20 m	+10-20 m	+20 m
70 km/h	150 m	+15 m	+7-15 m	+15 m
60 km/h	125 m	+10 m	+5-10 m	+10 m

\* Depending on steepness of grade

Adapted from Austroads Guide to Road Design "Safe Intersection Sight Distance" [Part 3](#) and [Part 4a](#).

## Annexure C: Choosing Informal Bus Stop Locations in Rural Areas

### Choosing Informal Bus Stop Locations in Rural Areas

These guidelines are to assist bus drivers and bus operators in assessing the safety of informal bus stops in rural areas for school and public bus services. This one-page guide has been adapted from the 'Guidelines for choosing informal bus stop locations v1.0'.

#### Is the area safe to stop?

- Is the stop clearly visible to other road users?
- Is there enough space for the bus to safely pull completely off the road? Or, if stopping on or partly on the road, is the stop at least 100 metres from any nearby turn, bend or crest which may limit visibility?
- Is the stop located on a stretch of road with broken centre lines, centre lines indicating that traffic approaching the bus and travelling in the same direction may safely pass, or, if the road is unmarked, is the road wide enough to allow other vehicles to pass safely?
- Is the stop more than 10 metres from any stretch of road with double barrier centre lines?
- Is the stop at least 20 metres from any nearby intersection? If the stop area is less than 5 metres from the edge of the road, is the stop at least 50 metres from the intersection?
- Is the stop more than 100 metres from any sharp turn, bend, crest or other portion of the road that may limit visibility?
- Is there at least 4 metres distance from the edge of the road for pedestrians to wait?

#### Safely boarding and disembarking the bus

- Bus drivers should ensure that the warning lights are activated for school bus services when:
  - slowing the bus to make a stop,
  - the bus is stationary at a stop,
  - there are students nearby, and
  - for 10-20 seconds after the passenger has disembarked and the doors have been closed;
- refrain from opening the doors to the bus until the bus is completely stationary;
- ensure passengers have completely disembarked and moved away from the bus, or have boarded and are safely seated, before closing the door and driving off.

**If you answered NO to any of these questions, then the area may not be safe to stop.**

Passengers, parents/carers, bus drivers and operators should consider whether there is an alternative place to stop nearby. In instances where a nearby safe stop cannot be identified, the matter should be referred to Public Transport on 8924 7666 or email [public.transport@nt.gov.au](mailto:public.transport@nt.gov.au) for further consideration and assessment.