



Transport
for NSW

Centre for Road Safety

Advice for choosing locations of informal school bus stops

Centre for Road Safety, December 2016

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Author: Centre for Road Safety
Date: December 2016
Version: 1
Division: Freight, Strategy and Planning

1 About this advice

There are thousands of “informal school bus stops” used for picking up or setting down school children on rural school bus routes across NSW. They are generally agreed between bus operators and parents, and are not sign posted or developed as formal bus stops.

This advice has been prepared for use when considering locations for informal school bus stops. Separate guidelines are being prepared for road managers (councils and Roads and Maritime Services) in regards to formal sign posted school bus stops.

This advice identifies important factors for consideration from a road safety perspective when deciding on the location of an informal school bus stop.

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

Parents/carers play an important role in ensuring the safety of students getting to and from school bus stops. A primary aged child is still developing an understanding of danger and safety. Currently available research suggests that children do not perform the same as adults when carrying out tasks such as crossing roads. While they are often keen to do things for themselves, an adult should always be responsible for a child in the traffic environment. Children up to 15 years of age are at three times more risk than older teenagers and adults to be involved in a fatal crash. To reduce risks at bus stops, parents/carers should meet their child at the bus stop, never on the opposite side of the road.

Comprehensive road safety advice for parents and carers can be found at www.safetytown.com.au/parents.

Bus operators and parents can help reduce risks by deciding on safer stopping locations.

This advice focusses on the safety of:

- school students and parents/carers who may need to cross a road near a bus stop
- school students walking to and waiting at a bus stop
- bus movements.

The advice is in a checklist format and includes a process for estimating sight lines to oncoming traffic, which are a very important safety factor.

This advice is not intended as a formal standard or requirement. It is recognised that ideal road and roadside conditions often cannot be met in rural road environments, and one factor may need to be weighed against other factors in deciding on a bus stop location. As an example, the ideal location from a sight line point of view might not be ideal in terms of access to the stop.

Where suitable conditions cannot be achieved, greater parental involvement or alternatives such as dropping children off on the return trip of a bus along the route might need to be considered.

Where there are continuing concerns about the safety of an informal school bus stop and no practical alternatives are available, advice can be sought from the relevant local council. (Local councils are in a position to identify State Road and refer them to Roads and Maritime Services.)

This advice complements the “TfNSW School Bus Safety Guidelines for Contract Holders of Transport for NSW Rural and Regional Bus Services”. Those guidelines provide a bus driver protocol for student pick-up and drop-off, which is reproduced on page 3 of this advice.

1.1 Acknowledgement

This advice has been prepared with consideration of guidance available in other jurisdictions, and acknowledges in particular the New Zealand Land Transport Safety Authority guidelines from 2004, and Queensland Transport guidelines from 2002.

2 Contract Holder Student Pick-up and Drop-off Protocol

Bus drivers need to be vigilant when students are boarding and disembarking from the school bus. Drivers should:

- ensure they pull over in an area where it is safe for the student to access or disembark from the bus. If possible, this should be away from street corners or bends in the road where the student's visibility could be impeded
- wait until the bus is stationary before opening the doors
- wait until students are safely seated before leaving the pick-up zone
- when dropping students off, warn students of oncoming traffic if visible to the driver instruct students to remain at the drop-off point and not to cross the roadway until after the bus has departed and there is better line of sight for those students.

Source: "TfNSW School Bus Safety Guidelines for Contract Holders of Transport for NSW Rural and Regional Bus Services"

3 Safety issues to consider

Issue	Considerations	Guidance	Observed Site Conditions
Sight line for vehicles approaching from behind the bus	<ul style="list-style-type: none"> All school bus stops should be sited so that they are clearly visible to motorists. 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. Higher speed zones need a longer sight line for motorists to make judgements, take action and stop when necessary. Curves and crests, and roadside vegetation can all reduce sight lines. The stopping distance is greater, and requires a longer sight line: <ul style="list-style-type: none"> on a down grade on unsealed roads where there are frequent trucks, on curves with close roadside vegetation or other sight line obstructions. Estimating sight lines by timing 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. 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. 	<p>Minimum seconds that a vehicle approaching at the speed limit needs to be visible from beside the roadway:</p> <p>100 km/h speed zones</p> <ul style="list-style-type: none"> Estimate 250m 9 seconds on flat roads add 1-3 s on a down grade add 2 s on curves with frequent trucks add 1 s on unsealed roads <p>80 km/h speed zones</p> <ul style="list-style-type: none"> Estimate 180m 8 seconds on flat roads add 1-2 s on a down grade add 1 s on curves with frequent trucks add 1 s on unsealed roads <p>60 km/h speed zones</p> <ul style="list-style-type: none"> Estimate 125m 7 seconds on flat roads add 1-2 s on a down grade add 1 s on curves with frequent trucks add 1 s on unsealed roads 	
Sight line for vehicles approaching from in front of the bus	<ul style="list-style-type: none"> As above. For traffic approaching from in front of the bus, the bus itself may block the line of sight to school students at the roadside. 		

Issue	Considerations	Guidance	Observed Site Conditions
Road shoulder width for a bus to stop clear of traffic	<ul style="list-style-type: none"> • NSW Road Rules require that, outside a built up area, heavy vehicles (including buses) must only stop on a road shoulder. • 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. • 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>. • 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. • The width, shape and condition of the shoulder must be suitable for safe pull-off and re-entering traffic. 	<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"> • School students must be able to wait in an area well clear of passing traffic. • 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. • The end of an overtaking lane is another hazardous roadside area. • Roadside hazards can include steep drains, poor draining ground, trip hazards, encroaching vegetation, snakes and other dangers. 	<p>A cleared, firm, all weather waiting area, 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>	

Pedestrian route to and from the bus stop	<ul style="list-style-type: none"> • School students require a safe route to their bus stop. • This includes students walking to the bus stop and those dropped off by carers. • The route should not contain roadway features that would force or encourage a child to walk in traffic lanes or shoulders. 	Bus stops should not be located in areas that require pedestrian access via narrow bridges or culverts, roads with no shoulder, or a non-signalised railway level crossing.	
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Issue	Considerations	Guidance	Observed Site Conditions
Potential wet weather issues	<ul style="list-style-type: none"> • Wet weather can affect the usability of: <ul style="list-style-type: none"> ○ Pedestrian access to a stop ○ The waiting area ○ The parking area ○ The bus pull-off area. • 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. 	<p>It is desirable that bus stops be located in areas where wet weather will not affect:</p> <ul style="list-style-type: none"> • pedestrian access, • waiting areas, • parking areas, and • bus pull-off areas. 	
Location relative to intersections	<ul style="list-style-type: none"> • 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. • A bus stopped on the approach to an intersection might obstruct sight lines between turning and oncoming traffic. • The closer a bus stops to an intersection, the greater the likelihood of blocking sight lines. 	<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"> • 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. • 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. 	<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>	

Issue	Considerations	Guidance	Observed Site Conditions
<p>Parking, where there are multiple families using a bus stop</p>	<ul style="list-style-type: none"> The bus stop location should have sufficient space for carers dropping off or waiting to pick up children. This will vary depending on the number children using the stop. 	<p>Bus stops should be located in an area with sufficient space for carers to drop off or pick up school children, on the same side of the road as the bus stop.</p> <p>This must be separate from the area where children wait for the bus.</p> <p>There must be clear and safe access from parking areas to where children wait for the bus.</p>	

Appendix A Estimating sight distance

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 5 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.

Appendix 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 "Safe Intersection Sight Distance" in Austroads Guide to Road Design Parts 3 and 4a