

Visibility

Unimpeded visibility splays are necessary to ensure that all road users have a clear view of approaching traffic so highway safety is maintained. If visibility is obscured, this can result in unsafe manoeuvres which are likely to lead to conflict and unsafe conditions.

Designers are required to check visibility within:

- 1. The horizontal plane, to ensure views are not obscured by any vertical obstructions.
- 2. The vertical plane, to ensure that visibility is not compromised by obstructions such as the crest of a hill, a bridge or at a dip in the road ahead.

Minimum visibility distances

Minimum visibility distances will be based on the Stopping Sight Distance which is the distance drivers need to be able to see ahead in order to be able to stop at a given speed. The relevant speeds are the 85th percentile speeds measured on the existing road, or in the case of new roads, the proposed design speed. These are set out in the Table 1.

DMRB visibility distances apply to roads which do not possess the characteristics of a ‘street’, i.e. where the movement function outweighs the place function.

Table 1: Minimum visibility distances

| Design/recorded speed (mph) | Minimum visibility distance (m) |
|-----------------------------|---------------------------------|
| 10 | 11 |
| 20 | 25 |
| 30 MfS | 43 |
| 30 DMRB | 90 |
| 40 | 120 |
| 50 | 160 |
| 60 | 215 |

Vertical Visibility

Visibility in the vertical plane should also be checked to ensure that forward visibility is not obscured by humps or dips in the road. Appropriate gradients to enable new developments to meet modern accessibility requirements are outlined in 3.2.7 Gradients.

Horizontal Visibility

In the horizontal plane, measurements are taken in two directions (see figs 1–3):

X distance

The X distance is the distance set back from the edge of the major arm where a driver would be located whilst waiting to leave the minor arm.

The X distance is measured from the edge of carriageway on the major arm into the minor arm, along the centreline of the minor arm.

- Generally within Bristol’s constrained network, an X distance of 2.4m will be adequate for most accesses.



- A greater X distance of 4.5m may be necessary for larger developments or on faster or busier roads. The requirement for this will be site specific and designers should seek advice from the Highway Authority.
- An absolute minimum X distance of 2m can be considered at lightly used accesses, such as private driveways and in very lightly trafficked and slow speed situations.

Y-distance

The Y direction is the distance motorists can see any approaching traffic on exiting the minor arm.

It is measured along the nearside edge of the carriageway of the major arm of the junction. The following diagrams show how visibility splays are measured at a junction

- The minimum visibility distances are to be used for Y-distance on new streets.
- For existing roads/streets the Y-distance applicable to the existing 85th percentile speed will be required. These can be established through the use of speed surveys.
- For 85th percentile speeds greater than 40mph, designers will be expected to refer to the requirements contained in DMRB.

Within the visibility splays, any structures such as fencing, boundary walls or landscaping must be no more than 0.6m high. This is to ensure that a motorist emerging onto the adopted highway has a clear view of approaching pedestrians/vehicles.

Fig 1: Visibility splays on a straight road

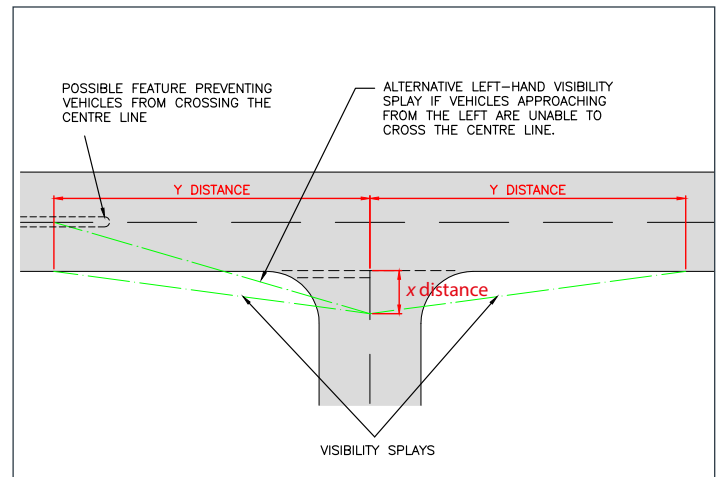


Fig 2: Visibility splays on the inside of a bend

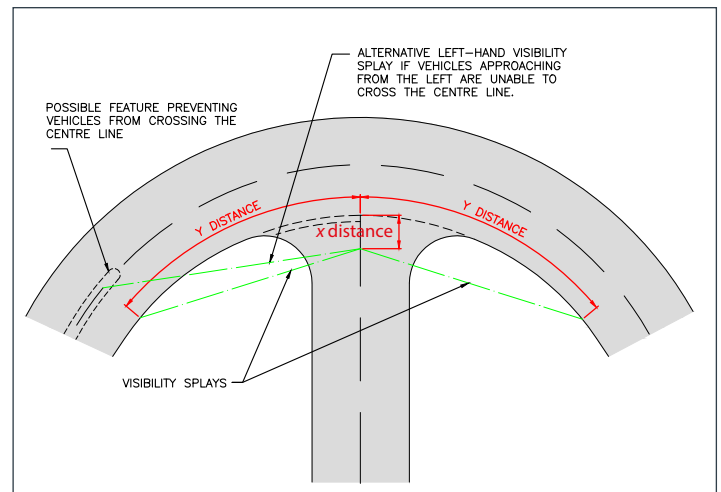
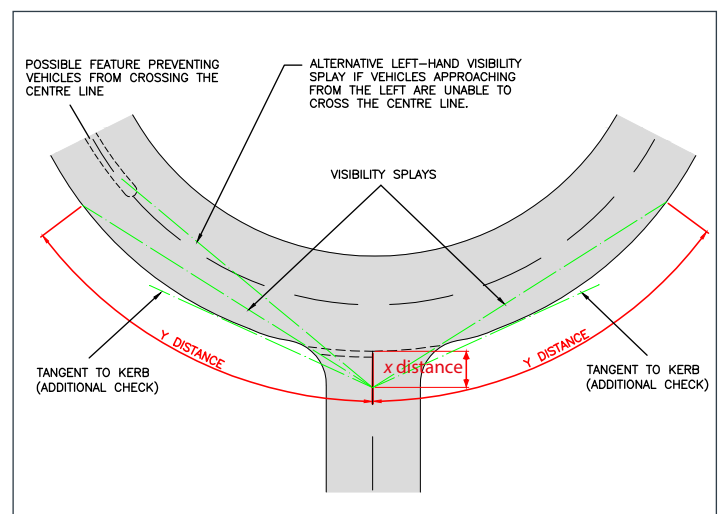


Fig 3: Visibility splays on the outside of a bend

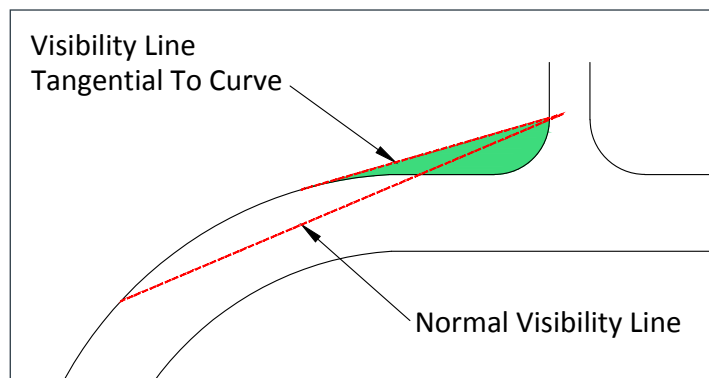


Tangential Visibility

This additional check takes place where the junction is on the outside of a bend. This is to ensure that cars do not disappear from the sight line as they approach on a bend.

This splay is taken from the same point within the minor arm to the outermost tangent on the curve of the road.

Fig 4: Visibility splays for access on outside of bend



Forward Visibility

Minimum visibility distances are required for forward visibility on lower speed roads. For roads of over 40mph, DMRB standards should be used.

These splays must be kept clear of obstructions which would obscure visibility of a pedestrian or approaching vehicle.

For new residential streets a design speed of 20mph should be used. Whilst walking pace is the design speed for shared surface streets or private drives, visibility should be provided to allow for 20mph, to ensure that conflict is minimised.

Excessive forward visibility at junctions may encourage higher traffic speeds. Care should be taken to avoid this.

The visibility distance is measured along the centreline of the inner traffic lane as shown in *Fig 5*.

Fig 5: Forward visibility splay, image credit MfS/DfT

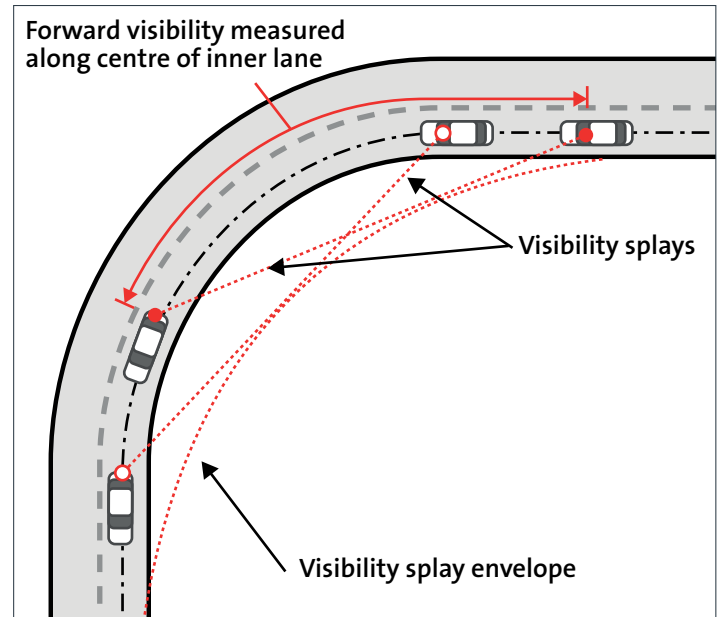
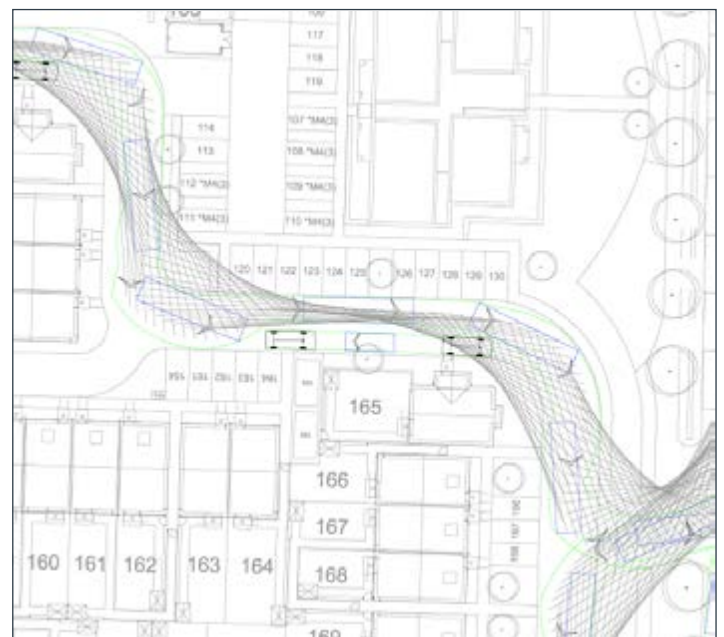


Fig 6: Example of forward visibility requirements



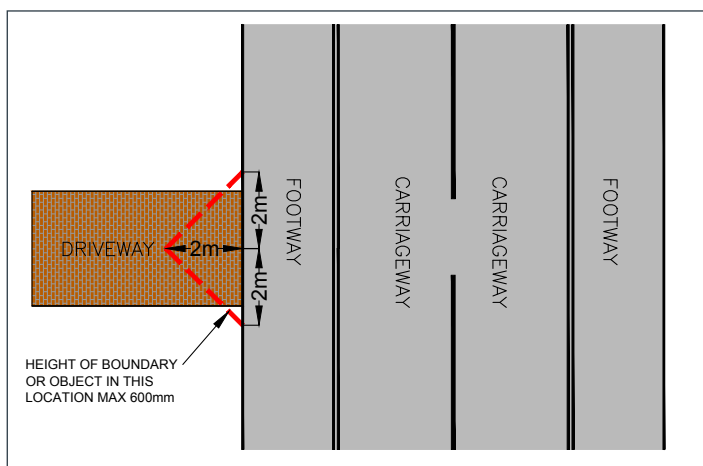
Pedestrian Visibility

A 2m x 2m pedestrian inter-visibility splay to the back edge of the footway will be required so that drivers have clear sight of pedestrians when emerging onto the highway.

The splays must be kept free of any obstructions and any boundary walls/fencing should be no more than 0.6m high. Whilst such visibility splays would not be adopted, they should be provided.

Where a garage is proposed the opening should be no less than 3m wide. This gives a slightly smaller inter-visibility splay, but the presence of an open(ing) garage door acts as adequate warning to pedestrians of emerging vehicles.

Fig 7: Pedestrian visibility



Traffic Signal Visibility splays

Designers should note that traffic signal junction design requires additional visibility splays to allow sufficient visibility from behind the stop line.

This is measured from 2.5m behind the stop line on each arm, and shall also incorporate any waiting areas on the footway adjacent to any crossing.

For further information about visibility at traffic signalised junctions, and their design, see [Traffic Signs Manual](#) Chapter 6.