ROAD SAFETY MEASURES

There are many different techniques that can be used in the highway to improve road safety. The following notes describe a variety of measures aimed at controlling vehicle speeds and making conditions safer for both pedestrians and drivers. It is important to bear in mind that not all types of these ideas are appropriate for all site conditions. An idea of costs is also given, however, as described these can vary a lot depending on various features. In most cases it will be necessary to carry out alterations to street lighting to ensure that features are adequately illuminated. The cost of this is excluded from the costs quoted below and it can vary substantially, depending on local conditions, from about £600 for a single lighting column to several thousand pounds for a comprehensive review of the existing street lighting system.

<table>
<thead>
<tr>
<th>PHOTO</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td><img src="image1" alt="Speed Table Image" /></td>
<td><strong>Speed Table</strong>&lt;br&gt;These take the form of a raised plateaux set across the road. They achieve significant speed reduction and also make it easier and safer for pedestrians to cross the road on the top of the table where speeds are at their lowest. &lt;br&gt;&lt;br&gt;Speed tables can cause a degree of noticeable traffic noise where there is a regular presence of certain types of goods vehicles and vehicles with trailers. Whilst such situations are relatively few, special consideration needs to be given to their siting and also the chosen profile of a speed table can have an effect on such matters. &lt;br&gt;&lt;br&gt;<strong>Cost (£)</strong>&lt;br&gt;Dependant upon site constraints and appropriate specification for a particular site, the cost of speed tables (usually including specific drainage facilities and adjusted surrounding footway levels) can vary dramatically from <strong>£3,000 to £30,000</strong> where a table covers a whole junction. A general guideline cost would be in the region of <strong>£8,000</strong>. However, it should be noted that such traffic calming techniques are best adopted in the form of a series where speeds are contained over a length of road rather than at a single point.</td>
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<tr>
<td><img src="image2" alt="Speed Cushions Image" /></td>
<td><strong>Speed Cushions</strong>&lt;br&gt;These are similar to the speed table but take the form of small plateaux with a gap between them. Whilst there are not as effective a speed reducing device as a speed table, speed cushions allow wider vehicles to straddle them making it easier for buses and emergency service appliances to pass along a route and still reduce the speed of the vast majority of traffic. &lt;br&gt;&lt;br&gt;<strong>Cost (£)</strong>&lt;br&gt;For a set of 2 cushions would be approximately <strong>£2,000</strong>. However, it should be noted that such traffic calming techniques are best adopted in the form of a series where speeds are contained over a length of road rather than at a single point.</td>
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<tr>
<td><img src="image3" alt="Footway Build-outs Image" /></td>
<td><strong>Footway Build-outs</strong>&lt;br&gt;This is usually where the footway is built out into the carriageway to provide a better view point for pedestrians wanting to cross the road. It is particularly beneficial near parked cars (see sheltered parking) but can also be used as part of a chicane system (see chicanes and priority narrowing). &lt;br&gt;&lt;br&gt;Buildouts can be difficult to achieve where there are many private driveways restricting their positioning. &lt;br&gt;&lt;br&gt;<strong>Cost (£)</strong>&lt;br&gt;A build-out is normally furnished with bollards and dropped kerbs/tactile facility and usually cost in the region of <strong>£4,000</strong>.</td>
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<tr>
<td>Technique</td>
<td>Description</td>
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<tr>
<td><strong>Priority Narrowing</strong></td>
<td>This involves introducing a road narrowing which effectively creates a one-way priority system at that point. The speed reducing effect of such a measure would rely upon the regular presence of oncoming vehicles in order to ensure that traffic without priority has to periodically give way and consequently reduce its speed. Measures such as these can be difficult to achieve as they rely heavily on good visibility from approaching drivers. The presence of private drives and side roads also restrict the opportunities where priority narrowings can be placed.</td>
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<tr>
<td><strong>Chicane</strong></td>
<td>This can take the form of a set or various sets of carriageway narrowings. The narrowing(s) can allow two-way traffic flow or can give priority to drivers travelling in a certain direction (see priority narrowing). The aim of chicanes is to break up the traffic flow and so reduce vehicle speeds. Measures such as these can be difficult to achieve as they rely heavily on good visibility from approaching drivers. The presence of private drives and side roads also restricts opportunities where chicanes can be placed.</td>
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<tr>
<td><strong>Sheltered Parking</strong></td>
<td>This normally involves the introduction of footway or verge build-outs at the end of existing sections of on–street parking. The parking would be defined by a white line or change in carriageway surface. Whilst visually narrowing the appearance of the road, sheltered parking offers a degree of protection to parked vehicles and the build-outs can provide safer points for pedestrians to cross the road near to the parked vehicles. Buildouts can be difficult to achieve where there are many private driveways restricting their position.</td>
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<tr>
<td><strong>Refuge/Traffic Island</strong></td>
<td>These are placed in the centre of the carriageway. Refuges are designed to provide a safe harbour for pedestrians crossing the road. Refuges make the road look narrower and consequently can cause a degree of speed reduction, particularly when introduced with a road widening which has the effect of deviating the flow of traffic. Central islands achieve the same effect but are used purely for the purpose of speed reduction without crossing facilities. The sites where refuges can be involved are limited as they reply heavily on good forward visibility from approaching drivers and should not be placed across or very near to private drives or side roads. Also, if the road is quite narrow with no opportunity to widen it then there could be insufficient space to site a refuge.</td>
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### Mini-Roundabouts

Mini-roundabouts can be used to improve traffic flow at a junction by giving traffic on the minor legs of the junction more opportunity to exit onto the main route. They should normally be used where there is a significant volume of minor road traffic. Mini-roundabouts can also provide an effective speed reducing device for traffic using the major route and are therefore sometimes used as part of a package of speed reducing measures.

Mini-roundabouts would be less effective where there is little minor road traffic to cause the major route drivers to give way. However, they are generally more effective where refuges are incorporated into the layout to regulate driver approach speeds and behaviour.

**Cost (£)**

A mini-roundabout without refuges but including signing, carriageway resurfacing and road markings could cost around £10,000. However, with refuges a mini-roundabout could easily cost £25,000 upwards. Mini-roundabouts are usually more effective when introduced with other traffic calming measures.

### Pelican Crossing

These signalised pedestrian crossing points are used where pedestrian road crossing movements are particularly high and the road in question experiences excessive speed.

Pelican crossings are introduced with zig zag road markings which prohibit parking near to the crossing point. It can therefore be inappropriate to introduce a pelican crossing where on-street parking demands are already a particular issue.

**Cost (£)**

Pelican Crossings with anti-skid carriageway surfacing and associated street lighting can easily cost £35,000.

### Zebra Crossing

This a formal pedestrian crossing point which is highlighted by flashing belisha beacons. Zebra Crossings can be used as an alternative to Pelican Crossings where pedestrian crossing movements are not as frequent and where traffic is generally travelling at a lower speed. There still needs to be a recognised demand for zebra crossings, however, their safe use does rely on the judgement of the pedestrians as to when to enter the road at a safe point.

Zebra Crossings are introduce with zig zag road markings which prohibit parking near to the crossing point. It can therefore be inappropriate to introduce a pelican crossing where on-street parking demands are already a particular issue.

**Cost (£)**

A Zebra Crossing with anti-skid carriageway surfacing and associated Street Lighting can easily cost £10,000.

### Vehicle Activated Sign (VAS)

These are electronic signs which display a symbol and/or message when triggered by vehicles travelling at excessive speed. They are normally intended to supplement rather than replace traditional signing and lining and are aimed at addressing specific road safety problems.

VAS should be used strategically where they will have the maximum effect. To introduce them on a widespread basis as simply ‘another traffic sign’ would cause drivers to become used to them and their effect would diminish.

**Cost (£)**

The cost of VAS is dependant upon its size and the local availability of electricity supply. A general cost of a VAS would be £7,000.

### 20mph Speed Limits

Speed limits as low as this should normally be introduced with extensive traffic calming measures (eg Speed Tables) to ensure that speeds are in compliance with the limit. They are usually used where there is particularly high degrees of pedestrian activity such as in front of schools.

**Cost (£)**

With associated traffic calming a short section of 20mph speed limit (eg outside a school) could cost £30,000.
**Sign Entry Treatments**
Usually used on the approaches to built up areas where the speed limit signs and town/village nameplates can be incorporated to give maximum impact to approaching drivers. The signs may be placed on high profile backing boards and when introduced with new road markings remind drivers that they are entering an area which requires ‘extra special’ attention.

**Cost (£)**
Approximately £5,000.

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**Coloured Road Surfacing**
Can be used in conjunction with road markings to highlight points in the road where vehicle speeds or the occurrence of accidents is of particular concern. Colours used are normally red or buff but green is sometimes used to highlight cycle lanes.

Coloured surfacing is a deviation from more standard road surfacing and has certain longer term maintenance implications. With this in mind it is important that it is adopted at strategic locations where it is especially needed and not on a widespread basis.

**Cost (£)**
A standard area of coloured surfacing would cost approximately £700.00. However, this technique should be used in conjunction with other measures.

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**Countdown Signs**
These are usually installed to forewarn drivers approaching a lower speed limit which otherwise may be encountered at particularly high speed. They are normally used prior to a package of speed reducing measures introduced within the actual speed limit.

Signs such as these should normally be used where visibility of the main speed limit signs is restricted due to the alignment of the road. They should not be used on a widespread basis as drivers would become used to them and their effect would diminish.

**Cost (£)**
Approximately £1,000.

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**Rumble Strips**
These normally take the form of a series of slightly raised strips of different coloured surfacing set across the width of the road. The appearance and feel of the strips is intended to cause drivers to reduce their speed, however, due to the resultant road noise which can be experienced by nearby residents the locations where rumble strips can be effectively used are limited. Rumble strips are not normally laid within 300 yards of residential properties.

**Cost (£)**
Approximately £3,000.

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**Dropped Kerbs**
These lower height kerbs can be used to create vehicle access points at private drives or to provide easier movement for pedestrians, wheelchair and buggy users who are crossing the road to and from the footway.

**Cost (£)**
Approximately £1,300 for a set of 2 sections of dropped kerbs opposite one another.

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**Tactile Paving**
Used with dropped kerbs at points in the carriageway where it is considered safer for pedestrians to cross the road. Tactile paving is aimed at partially sighted pedestrians where the colour and texture of the surface aids the pedestrians awareness of the situation.

**Cost (£)**
Tactile paving with dropped kerbs would cost around £1,700 for 2 sections of dropped kerbs opposite one another.
**Road Markings**
There are many forms of road markings, usually used to highlight specific situations and cause drivers to take special care. The road markings technique shown is central hatching which is usually placed down the centre of the road to create the narrower traffic lanes and keep opposing vehicle flows away from each other. They also encourage lower speeds when overtaking cyclists or parked vehicles.

**Cost (£)**
Road markings are laid on a daily or half daily basis. The introduction of various markings over a daily period costs **£600.00**.

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**Anti-Skid**
Use small size road stone, which is very hard wearing and is particularly used to deter vehicles from skidding on the approaches to traffic lights, pelican crossings and zebra crossings. Also used to address ‘loss of control’ accidents, usually at bends on higher speed roads.

**Cost (£)**
A section of anti-skid surfacing may cost around **£5,000**.

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**Bollards**
These can be used for various purposes but are normally installed to highlight points where pedestrians may be crossing the road and to deter parking on footways and verges.

**Cost (£)**
Approximately **£250.00**.

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**Traffic Signing**
Different types of signs are required to warn drivers of various traffic calming devices. An example of this is a series of speed tables where road hump signs are normally placed on each approach to the scheme.

**Cost (£)**
Traffic signing associated with traffic calming measures can cost **£2000** upwards.