ROAD SAFETY MEASURES

Overview:

- 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.

PHOTO	DESCRIPTION
	**Speed Table** 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. 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. **Cost (£)** 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 **£10,000 to £50,000** where a table covers a whole junction. 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.
	**Speed Cushions** While these can be used as an effective way of reducing speeds, they are not an appropriate form of traffic calming for entry speeds as they result in late braking and a risk to motorists of loss of control. Significant noise issues for residents may occur (especially night and early morning times) whose properties have house frontages close to the highway. In order for speed tables to be effective and meet DfT guidance multiple sets need to be installed on each approach and street lighting present. Central Government is also looking for Council's to reduce and remove cushions/bumps due to pollution which makes it hard to justify installation. **Cost (£)** Typical the costs are **£100,000 - 200,000**

Footway Build-outs
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).

Buildouts can be difficult to achieve where there are many private driveways restricting their positioning.

Cost (£)
A build-out is normally furnished with bollards and dropped kerbs/tactile facility and usually cost in the region of **£12,000.**

Priority Narrowing
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.

Cost (£)
A single priority narrowing with associated signing and road markings may cost around **£24,000**

Priority Give Way (Chicanes)
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.

Cost (£)
A chicane incorporating two narrowings with associated signing and road markings could cost **£24,000**

If the work is taking place on a narrow carriageway then the alterations required to meet the criteria maybe significant. The cost of such works is typically around **£50,000** per priority give way.

Sheltered Parking
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.

Cost (£)
A section of sheltered parking, including bollards, signs and road markings, could cost **£24,000.**

Refuge/Traffic Island

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.

Cost (£)

A refuge with no associated carriageway widening may cost in the region of **£15,000.** However, widening is often required to facilitate a refuge where the overall cost could easily be **£60,000 - £120,000.** This is dependent on road classifications.

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 **£20,000**. However, with refuges a mini-roundabout could easily cost **£50,000 - £100,000.** 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 **£80,000**. Dual Crossing **£180,000.**

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 a 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 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 (£)

A Zebra Crossing with anti-skid carriageway surfacing and associated Street Lighting can easily cost **£30,000 - £40,000**.

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 dependent upon its size and the local availability of electricity supply. A general cost of a VAS would be **£10,000 - £15,000**

Mobile VAS are becoming more popular as Parish Councils can move them around the Village onto existing street columns, with LCC permission, and costs significantly less than the permanent sign.

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**. With traffic calming the cost would increase to **£100,000** plus.

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 **£10,000 - £12,000**

Transverse Bar Markings
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**.

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 **£3,000** for a set of 2 sections of dropped kerbs opposite one another.

	**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 **£5,000** 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 **£3,000** – this is dependant on location & road classification
	**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 **£600.00**
	**Carriageway Roundel** Only if Limited Order and approved 30 mph. **Cost (£)** Carriageway roundel costs up to **£200** dependant on size and speed limit.
	**Lighting Column** Provision of a standard street lighting column including service connection. **Cost (£)** Costs up to **£7,000** (Cost can vary depending on the length of ducting needed and closest electricity source. This can cost up to £80 per metre).
Surveys / Data collection	• A street lighting assessment typically costs between **£1,250 and £2,500** • A pedestrian survey typically costs between **£350 and £1,000** • A vehicle/speed survey typically costs between **£350 and £2,000** • A topographical survey typically costs between **£1,400 and £4,000**

Traffic Management	• Traffic management using two way temporary signals is likely to cost around **£2,000** / per day • A Temporary Traffic Regulation Order (TTRO) would be required if road closures are required to complete any works at **£1,450** plus external design costs
Design fees	• Engineering design fees would be agreed in advance