Report of the Director of Place

Economy, Environment and Infrastructure Policy Development Committee

15 July 2021

Traffic Calming – An overview

Purpose:	To provide a brief overview on the background and issues for consideration associated with the introduction of Traffic Calming works
Report Author:	Alan Ferris
Finance Officer:	Paul Roach
Legal Officer:	Debbie Smith
Access to Services Officer:	Rhian Millar
FOR INFORMATION	

1. Introduction

1.1 This report has been prepared to assist members in assessing the range of traffic calming options that are available in addressing road safety concerns.

1.2 It should be noted that this is an overview of the ambition of undertaking such works, the processes involved together with an outline of a number of solutions which can be implemented. Where schemes are being considered via community budgets or other sources of funding the Traffic Management Team can provide more detailed advice on the factors which need to be considered in developing such a scheme.

2. Traffic calming - considerations

2.1 Traffic calming is a tool used predominantly in response to concerns over a pattern of collisions where speed is at the least seen as being a

contributory factor; or in situations where recorded traffic speeds are a significant cause for concern. Although the enforcement of the speed limit is the responsibility of the police, high demand for enforcement often stretches available resource, limiting the opportunity for effective speed limit enforcement activities.

2.2 Traffic calming can also be a key driver in encouraging the use of public transport, cycling and walking, and discouragement of using the car for non essential journeys. Traffic calming has a significant role to play in achieving these objectives by improving the safety of vulnerable road users. This supports a raft of Welsh Government policies most particularly it assists in supporting the aspirations of the Active Travel (Wales) Act 2013.

2.3 Whilst traffic calming measures have improved safety overall, they have not always been universally popular. Some of the issues and limitations that have been exposed include:

- Buses – journey times can increase, as can passenger discomfort and concerns about passenger safety (especially when humps or cushions are placed at or near bus stops). There are also some concerns about increased wear to buses.

- Emergency services – physical speed-reducing measures can adversely affect the response times of emergency services vehicles. This is particularly relevant to fire and ambulance services. All services should plan routes in traffic-calmed areas with the local highway authority, so that the fastest routes are used, rather than the shortest. Road traffic cushions are designed to provide minimal disturbance to large emergency response vehicles such as fire engines and ambulances.

- Public opinion – can be very supportive, but in some cases resistance from residents has required removal of measures. Key factors are the priority of road safety on the local agenda, the quality of the scheme design and the approach adopted for the consultation process.

- Cyclists – can find some traffic calming measures uncomfortable, particularly where measures have high upstands. Design of measures needs to take cyclists into account and, where feasible, provide encouragement in the form of cycle bypasses.

- Motorcyclists – can find some measures difficult to negotiate.

- Equestrians – reported to find that some measures, such as pinch points, have an adverse effect on their safety.

- Disabled or older occupants of vehicles, particularly those with pre-existing back conditions, can find measures, specifically but not

exclusively vertical deflections, more uncomfortable and more difficult to negotiate than more able bodied persons do.

- Local environment – traffic calming measures change speed profiles and in some circumstances may lead to higher emission and noise levels. Care needs to be taken to minimise any such adverse effects by encouraging smooth driving patterns, this is generally achieved by ensuring that any features are located at a spacing which discourages acceleration and deceleration patterns, which lead to increased noise and emissions.

- General Maintenance – The introduction of traffic calming on the existing highway in many cases leads to increased stresses on the existing surface. This in turn decreases the lifespan of the highway in proximity to features, designed to manage the flow of traffic and reduce collisions. In addition, alteration to the flow of water may affect the maintenance requirements of drainage systems. Good design requires that these issues be considered and where necessary provision is made to improve the carriageway and drainage condition prior to the introduction of traffic calming features. This may have a significant impact on the overall cost of any traffic calming scheme.

2.4 Consultation requirements

Highway Authorities have a statutory duty to consult the police (Highways Act 1980) when road hump schemes are proposed for a road or area and they must also post notices in the street and in local papers advertising the scheme. The 1999 Highways (Road Hump) Regulations require consultation with the fire service, ambulance service and organisations representing those who use the road.

2.5 20mph speed limits

Research indicates that the speed reduction achieved with the use of 20 mph signs alone is likely to be small, about 1 mph (Mackie, 1998). Therefore, 20 mph speed limits enforced by signs alone would be most appropriate where 85th percentile speeds are already low (24 mph or below) and further traffic calming measures are not needed. 20 mph speed limits without self-enforcing features have the attraction of being relatively inexpensive to implement. However, regard must be given to the prevailing speeds before any intervention, because the higher they are, the less likely it is that speeds could be reduced to 20 mph. Previously the police have written to the Council indicating that they will not support the introduction of 20mph limits without traffic calming where the 85^{th} percentile speed is high. 20 mph speed limits that are not part of a 20 mph zone require terminal signs and repeater signs. The terminal signs should be placed on both sides of the carriageway to form a gateway. Terminal signs should be directly lit or highly reflective.

2.6 20mph zones

20 mph zones should be used where a speed reduction to 20 mph is desirable and where traffic calming measures would be needed to ensure

that speeds are at or below 20 mph (e.g. roads where 85th percentile speeds exceed 24 mph before calming). 20 mph zones are particularly appropriate where there is an existing record of accidents to children occurring over an area, or where concentrations of pedestrians and/or cyclists exist or are anticipated. They can help protect children walking and cycling to and from school, and may help to encourage other children to walk or cycle.

A 20 mph zone should have entry treatments with signing at the gateways to the zone and suitable speed reducing measures .Within the zone speed control measures are needed, which include road humps, raised junctions, speed cushions, horizontal deflections, mini-roundabouts, bends and reductions in the width of the carriageway. The combination and design of measures chosen will depend on the road type, the layout of streets in the area, the level and type of traffic flow and the quality of the streetscape. The speed control capacity of some measures can be much less than that of road humps, and the extensive use of these devices within a 20 mph zone may not result in an acceptable reduction in speed levels. Narrowings will normally need to be 3.5 metres or less to be effective at controlling vehicle speeds. However, this can cause problems for cyclists if a cycle lane bypass is not provided.

A review of the first 230 zones in England, Wales and Scotland (Webster & Mackie, 1996) indicated that average speeds reduced by 9 mph, annual accident frequency fell by 60 percent, the overall reduction in child accidents was 70 percent, and there was an overall reduction in accidents involving cyclists of 29 per cent. Traffic flow in the zones was reduced on average by 27 percent, but flows on the surrounding roads increased by 12 percent. There was generally little measured accident migration to surrounding roads.

2.7 Road humps

Road Humps are the most economically effective means of reducing traffic speeds. In terms of design, they run between the channels of the road covering the running width of the carriageway but allowing drainage channels to operate as normal. In terms of size, the humps are 3.7 m long and are normally 75mm high but can be as high as 100mm.

Road humps are designed to slow all traffic. Consequently, careful consideration has to be given to ensure that the impact of the traffic calming is not overly onerous on emergency services response times and bus timetabling. Both the Ambulance service and bus companies have also expressed concern over the impact that this form of traffic calming has on the comfort of their respective passengers.

In general terms each feature on the highway will cost around £2k to £3k.

2.8 Speed cushions

Speed cushions are a form of vertical deflection designed to slow the speed of general private cars but allowing wider wheel base vehicles to

straddle the feature. Consequently, this type of traffic calming has significantly less impact on the emergency services and bus timetabling.

The features themselves are 1.6m wide and 2.0m long. The height of the feature is set at a maximum of 75mm. The cushions are generally arranged in lane to assist with the smooth flow of traffic.

In general terms a set of speed cushions will cost between £3.5k and £5k.

2.9 Speed plateaus

These features are designed to run from kerb line to kerb line. They are therefore suited to support pedestrian activity, slowing traffic at locations where pedestrians are expected to be crossing the road. The features themselves are effective at slowing all traffic. However, the flat top construction makes them less onerous on bus and ambulance services.

In terms of construction, these are 1.5 m ramps leading to a plateau which is 6m long. The plateau is constructed 75mm above the existing carriageway. Careful consideration needs to be given to road drainage in the vicinity of these features and will often add considerably to the cost of introducing them.

An outline cost for the introduction of a single plateau would be £12k to £15k where drainage works required are limited.

2.10 Narrowings and Chicanes

Horizontal carriageway deflections, such as localised narrowings and chicanes, have been installed to influence vehicle speeds, though not always successfully. In the case of kerb build-outs and pinch points, the narrowed carriageway, even if reduced to a single lane, still allows most vehicles to be driven relatively quickly through the available gap, unless there is opposing traffic to prevent this occurring. Studies have indicated that balanced vehicle flow is one of the most important aspects when opting for localised road narrowings. Unfortunately, in many residential streets traffic is either tidal or such low-flow that it is unlikely that vehicles from opposite directions will meet at the narrowing.

Care also has to be given to ensure that the feature does not cause disadvantage to other road users, in particular cyclists. This may require the introduction of bypass features to allow cyclists to pass the feature without feeling threatened to the closer proximity to vehicles. The creation of such bypasses have to be carefully designed to ensure that they can be maintained and kept free of detritus.

Chicanes and narrowings vary widely in terms of cost. Simple features may cost as little as £1.5k whilst more elaborate chicanes may cost upwards of £10k.

2.11 Driver Feedback Signing

These “driver feedback signs” are traffic calming devices that are proven to give drivers instant feedback as to their speed, thereby encouraging a reduced speed where appropriate without the threat of a speeding conviction. These signs provide an effective visual indication of approaching vehicle’s speed activated by a radar detection system which is coupled to a decoder that illuminates the LED’s (light emitting diodes) with the relative speed. The signage is designed to show the drivers speed in green for those obeying the limit with the speed shown in red for those exceeding it.

Recent studies have shown that these have a modest effect in lowering vehicle speeds.

Costs will vary depending upon local factors, such as the cost of connection to an electricity supply. The cost of purchase and installation of vehicle activated signs can range between £4k and £10k.

2.12 Road Safety Cameras

Safety cameras provide a valuable and cost-effective method of preventing, detecting and enforcing speed and traffic light offences. They encourage changed driver behaviour and are also proven to make a significant contribution to improving road safety for all road users. Safety cameras therefore play an important role in an integrated road safety strategy.

Safety cameras are those that enforce speeding and / or traffic light offences. A number of independent research studies of the National Safety Camera Programme have shown that cameras are an extremely effective mechanism for reducing vehicle speeds and road casualties at camera sites.

An overall study of the effectiveness of cameras has recorded a 42 per cent reduction in death and serious injury and a 22 per cent reduction in personal injury collisions at camera sites.

Welsh Government require that Highway Authorities are able to demonstrate that there is a considerable history of collisions on a section of road, and that consideration of all other engineering options have been exhausted, before a new site will be authorised.

The cost of implementing a camera system is highly variable but will be in excess of £150k.

2.13 Psychological Traffic calming is an approach trialled by the Department for Transport, where reducing driver confidence has proven to reduced vehicle speeds. There are a number of techniques that can be employed from:

- reducing the width of the carriageway to make drivers slow to ensure that they can pass oncoming vehicles without clipping wing mirrors,

- removing positive messaging to motorists, reducing their confidence that they have priority, especially through junction areas, blurring the distinction between ‘vehicle areas’ and ‘pedestrian areas’.
- changing the urban realm from a purely utilitarian highway environment to an area which will make a considerate motorist think that vulnerable road users are likely to be using the highway as well. This can be achieved through planting, the two measures above and public art / other appropriate interventions.

3. Financial implications

There are no financial implications associated with this report.

4. Legal Implications

There are no legal implications associated with this report.

5. Integrated Assessment Implications

5.1 The Council is subject to the Equality Act (Public Sector Equality Duty and the socio-economic duty), the Well-being of Future Generations (Wales) Act 2015 and the Welsh Language (Wales) Measure, and must in the exercise of their functions, have due regard to the need to:

- Eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Acts.
- Advance equality of opportunity between people who share a protected characteristic and those who do not.
- Foster good relations between people who share a protected characteristic and those who do not.
- Deliver better outcomes for those people who experience socio-economic disadvantage
- Consider opportunities for people to use the Welsh language
- Treat the Welsh language no less favourably than English.
- Ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs.

5.1.1 The Well-being of Future Generations (Wales) Act 2005 mandates that public bodies in Wales must carry out sustainable development. Sustainable development means the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the ‘well-being goals’.

5.1.2 Our Integrated Impact Assessment (IIA) process ensures we have paid due regard to the above. It also takes into account other key issues and priorities, such as poverty and social exclusion, community cohesion, carers, the United Nations Convention on the Rights of the Child (UNCRC) and Welsh language.

5.2 As noted, this report is for information only. An IIA assessment will be undertaken to consider the impact on the community and different user groups of any proposed road safety interventions.

Background Papers: None.