

20mph Schemes



Contents

Executive summary	1
Safe speeds	3
20mph speed limits	5
20mph zones	5
Traffic calming	6
Benefits of 20mph schemes	7
Unintended consequences of 20mph schemes	8
Going forward	8
The Process	9
Stage 1 – Application	9
Stage 2 – Broad assessment	9
Stage 3 – Detailed assessment	10
Stage 4 – Implementation	10
Conclusion	10

Executive summary

Swindon's draft Road Safety Strategy for 2021 – 2023 advocates the adoption of a Safe Systems approach to road safety. It is built upon 5 pillars of action to support a holistic approach to delivery, one of which is 'Safe Speeds'.

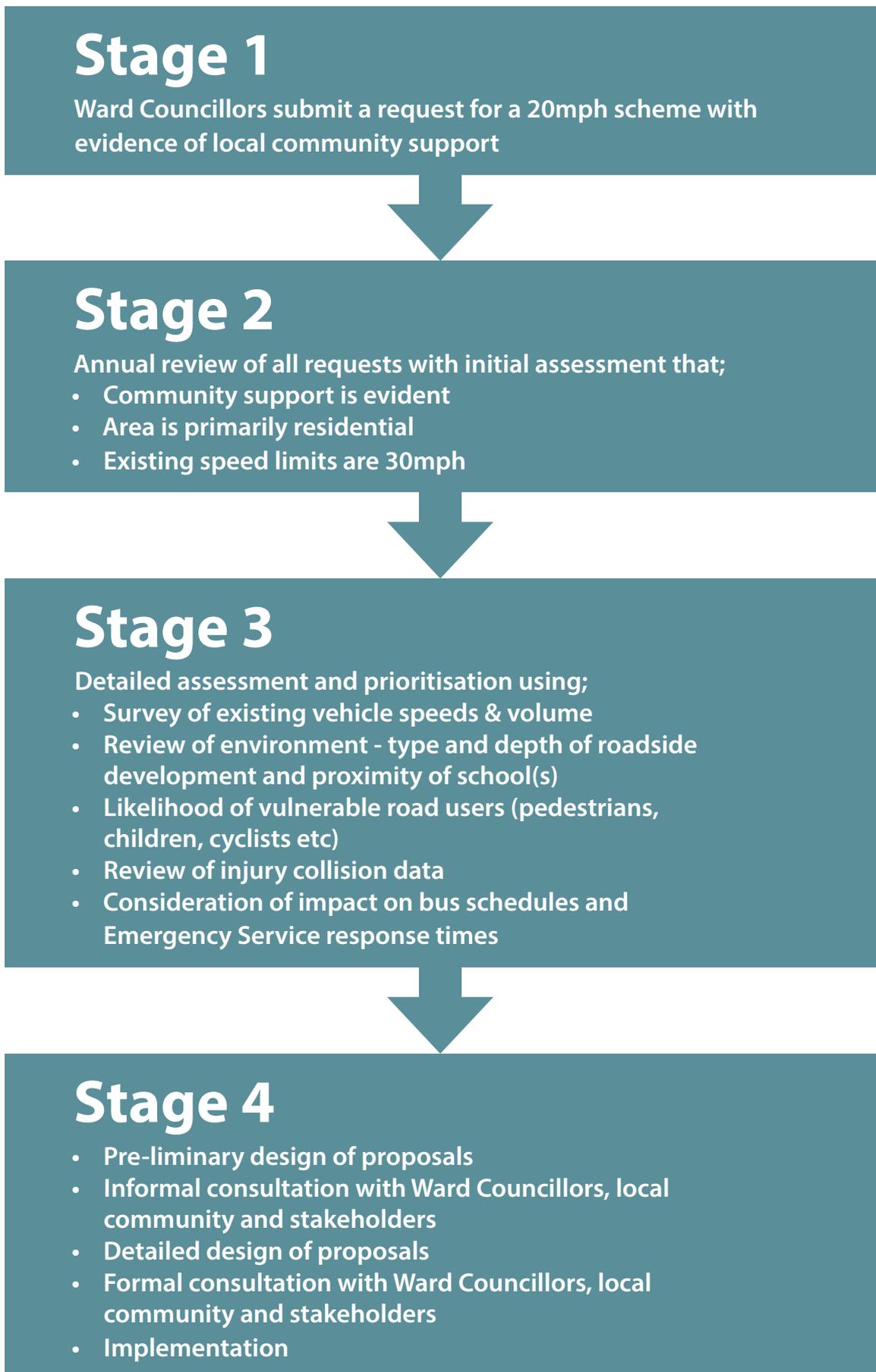
The aim of speed management policies should be to achieve a safe distribution of speeds consistent with a speed limit that reflects the function of the road and its environment. It is important that drivers can understand the reasons for slower speeds – potential hazards such as schools, shopping streets or in residential areas – so they respect and adhere to the speed limit.

Swindon's Road Safety Strategy Action Plan states that we will review Swindon's speed limits "...to ensure they remain appropriate and enforceable. Particular attention will be given to the safety of vulnerable road users and the use of 20mph speed limits on residential streets."

This draft policy sets out the approach we will take to requests for 20mph schemes including the criteria that will be used when considering such requests and how potential schemes would be prioritised across the Borough.

Figure 1 illustrates the 4-stage process any request for a 20mph scheme would go through from its initial conception to final implementation.

Figure 1: 4-stage process for assessing 20mph scheme requests



Safe speeds

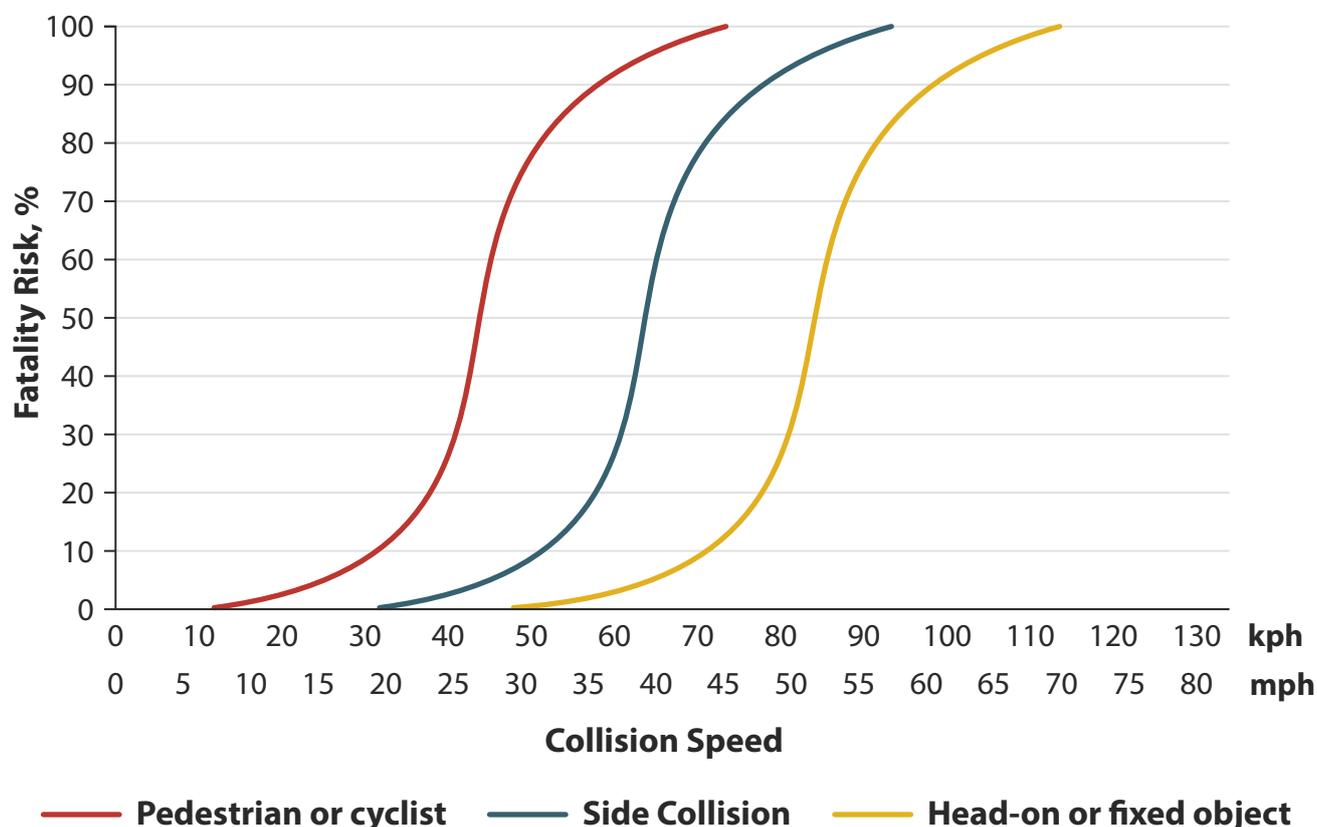
Swindon's draft Road Safety Strategy for 2021 – 2023 proposes the adoption of a Safe Systems approach to road safety. One of the key principles of this approach is based on the belief that as humans, we are vulnerable – our unprotected bodies can only withstand low kinetic forces before the risk of death increases.

The Safe System approach advocates a conscious shift away from simply trying to prevent all collisions to preventing death and mitigating serious injury. It is built upon 5 Pillars of Action to support a holistic approach to delivery, of which one of these is 'Safe Speeds'.

20mph schemes can be an important part of a Safe System Approach that seeks to modify roads, design and behaviour, to minimise the risk of collisions occurring and to ensure that when collisions do occur, the impacts are unlikely to result in death or serious injury.

The role of speed in crash likelihood has been confirmed through numerous studies. One model, illustrated below, shows the three impact speed-fatality probability relationships for pedestrian/cyclist crashes; side-impact collisions & head-on collisions. These are often quoted as the maximum or 'survivable' impact speeds which can be tolerated.

Figure 2: Speed: Fatality relationship



Source: Wramborg 2005

The aim of speed management policies should be to achieve a safe distribution of speeds consistent with the speed limit that reflects the function of the road and the road environment. This should imply a mean speed appropriate to the prevailing road environment, and all vehicles moving at speeds below or at the posted speed limit, while having regard to the traffic conditions.

A key factor when setting a speed limit is what the road looks like to the road users. Drivers are likely to expect and respect lower limits, and be influenced when deciding on what is an appropriate speed, where they can see there are potential hazards, for example outside schools, in residential areas or villages and in shopping streets.

A principal aim in determining appropriate speed limits should, therefore, be to provide a consistent message between speed limit and what the road looks like, and for changes in speed limit to be reflective of changes in the road layout and characteristics.

The following are important factors when considering what an appropriate speed limit is:

- history of collisions, including frequency, severity, types and causes;
- road geometry and engineering (width, sightlines, bends, junctions, accesses and safety barriers etc.);
- road function (strategic, through traffic, local access etc.);
- Composition of road users (including existing and potential levels of vulnerable road users);
- existing traffic speeds; and
- road environment, including level of road-side development and possible impacts on residents (e.g. severance, noise, or air quality).

Successful 20 mph zones and 20 mph speed limits are generally self-enforcing, i.e. the existing conditions of the road together with measures such as traffic calming or signing, publicity and information as part of the scheme, lead to a mean traffic speed compliant with the speed limit.

To achieve compliance there should be no expectation on the police to provide additional enforcement beyond their routine activity, unless this has been explicitly agreed.

In order to be most effective, it is important that drivers understand and comply with the lower speed limits. As they require drivers to change their driving behaviour and speed choice, they need to be supported by a coordinated strategy of complementary measures to make sure that road users know which roads have 20mph speed limits, why, when they apply and that they are legal limits with which drivers must comply.

20mph zones and limits are best introduced over a network of streets that share characteristics to avoid too many changes of speed limit and confusion for drivers and other road users.

There is a significant difference between the characteristics of a 20mph speed limit and a 20mph zone.

20mph speed limits

20mph limits are areas where the speed limit has been reduced to 20mph but there are no physical measures to reduce vehicle speeds within the area. Drivers are alerted to the speed limit by 20mph speed limit repeater signs.

Research into signed-only 20 mph speed limits shows that they generally lead to only small reductions in traffic speeds. The latest research revealed in residential areas median speeds had fallen by 0.8mph and 85th percentile speeds by 1.1mph on important local roads.

Signed-only 20 mph speed limits are therefore most appropriate for areas where vehicle speeds are already low. This may, for example, be on roads that are very narrow, through engineering or on-road car parking. If the mean speed is already at or below 24 mph on a road, introducing a 20 mph speed limit through signing alone is likely to lead to general compliance with the new speed limit.

Where average speeds exceed 24mph, the introduction of signage only is unlikely to lead to 20mph compliance.

The implementation of 20 mph limits over a larger number of roads should be considered where mean speeds at or below 24 mph are already achieved over a number of roads.

20mph zones

20 mph zones are predominantly used in urban areas, both town centres and residential areas, and in the vicinity of schools. They should also be used around shops, markets, playgrounds and other areas with high pedestrian or cyclist traffic, though they should not include roads where motor vehicle movement is the primary function. It is generally recommended that they are imposed over an area consisting of several roads.

20mph zones use traffic calming measures to reduce the adverse impact of motor vehicles on built up areas. The principle is that the traffic calming slows vehicles down to speeds below the limit, and in this way the zone becomes 'self-enforcing'.

A 20 mph zone is indicated by 20 mph zone entry and exit signs. The statutory provisions require that no point within the zone must be further than 50 metres from a traffic calming feature (unless in a cul-de-sac less than 80 metres long).

Traffic authorities can place any of the following:

- repeater speed sign (TSRGD diagram 670)
- a speed roundel road marking (TSRGD diagram 1065)
- or a combination of both of these signs
- traffic calming features

Only where speeds are already constrained to near the limit should local authorities consider placing the speed limit sign or a roundel marking, in addition to physical features within a zone.

Traffic calming

Traffic calming can incorporate a wide range of measures designed to work in partnership to reduce speeds and improve the overall environment, and in effect this means there can be significant differences between schemes.

Traffic calming measures include;

- Vertical deflections
- Horizontal deflections
- Road narrowing
- Central islands

Vertical deflections in the carriageway are the most effective and reliable of the speed reduction measures currently available. There are several different techniques available to achieve this:

- Road hump
- Plateau (speed table)
- Speed Cushion
- Uneven road surface (rumble strips)

Horizontal deflections in the carriageway are less effective than vertical ones in achieving reductions in speed, although their impact is significantly increased when used in combination with a vertical measure. Essentially all horizontal shifts may be classified as chicanes. The impact of chicanes is reduced if the design has to allow for the passage of HGVs as the wider carriageway increases the speed that it can be negotiated at. Chicanes can significantly reduce parking spaces.

Road narrowing can also be used to support vertical deflections. It is not a speed-reducing device in itself, but it can be a reminder or encouragement to drive slowly or calmly. The effectiveness of this measure in controlling speed can be increased if the carriageway width is reduced to a single lane. However, this is largely dependent on the balance of the opposing traffic flows. The extra space created by road narrowing can be used to provide some combination of widened footways, dedicated cycle lanes and formalised parking bays, or to provide more space for public transport, for example, bus lanes.

Central islands have only a limited effect on reducing speeds unless combined with another measure such as a chicane. They do, however, provide useful pedestrian refuges.

Benefits of 20mph schemes

Accident risk is not usually the only intended outcome to a traffic calming scheme, as transport policy.

Important benefits of 20mph schemes include:

- quality of life and community benefits;
- encouragement of healthier and more sustainable transport modes such as walking and cycling;
- Environmental benefits as, generally, driving more slowly at a steady pace will save fuel and reduce pollution.

Increased walking and cycling can make a very positive contribution to improving health and tackling obesity, improving accessibility and tackling congestion, and reducing carbon emissions and improving the local environment.

20mph zones and limits can also lead to a reduction of traffic flow in the area. Although results of studies do vary and depends on the characteristics of a particular area, it is generally suggested that traffic volumes reduce following the implementation of a 20mph zone or limit.

Unintended consequences of 20mph schemes

Concerns do get raised that traffic calming used in 20mph zones has unintended negative consequences, such as causing vehicle damage and injuring vehicle occupants when vehicles go over the calming, slowing emergency services, or increases in vehicle emissions.

Research to evaluate the impact on road humps did not show evidence of any vehicle damage from the humps or significant and permanent changes to the vehicle's suspension systems. The report concluded that the levels of discomfort caused by the humps were generally acceptable if they were traversed at an appropriate speed (15-20mph) and that the forces on the spine were an order of magnitude smaller than what typically causes an injury. However, some people with conditions such as degenerative discs or weak bones are more susceptible to an injury.

The Transport Research Laboratory (TRL) looked at the average speed of a fire tender running over different types of traffic calming in an estate in Surrey. The authors estimated that on average, traffic calming measures caused a time delay of 1.25-1.40 seconds, and that the average speeds were lowest over flat top humps, and highest over speed cushions.

When implementing 20mph zones, consultation with the emergency services, as well as the local community would be beneficial to identify any issues before the traffic calming is put in. This would help to provide safer roads and meet the concerns of the emergency services, or to identify other ways to ensure rapid response times without losing the significant road safety benefits of a 20mph zone.

Going forward

Within the draft Road Safety Strategy Action Plan a key initiative involves reviewing current speed limits -

“The speed limits on Swindon’s roads will be reviewed to ensure they remain appropriate and enforceable. Particular attention will be given to the safety of vulnerable road users and the use of 20mph speed limits on residential streets. In addition we will share data with the Police to aid effective and efficient targeting of enforcement resources.”

We recognise that the speed of vehicles in residential areas is of concern to local communities and we support in principle the introduction of 20mph speed limits and zones where appropriate to do so. There are a number of existing 20mph schemes in Swindon. A plan illustrating the extent of 20mph schemes is available on the Council website:

https://www.swindon.gov.uk/info/20135/traffic_management/901/20mph_speed_limits_and_zones

The aim will always be to achieve a scheme that achieves the desired driver behaviour, is self-enforcing and/or where maximum encouragement is provided to achieve compliance without the need for enforcement.

The process

Stage 1 – Application

In the first instance we would expect applications for 20mph across an area (as opposed to individual streets) to come from the Ward Councillors who represent that area. They know their Wards best and understand the range of views and concerns of their local residents. They are best placed to accurately represent those concerns to the Council.

Stage 2 – Broad assessment

Requests will be collated and reviewed annually in co-ordination with the budget setting cycle of the Council when work priorities are being agreed for the year.

We will consider each application on its merits – however there are some broad criteria which we would expect all applications to meet if they are to proceed to further investigation.

- Community Support – there should be evidence of community wide engagement through a survey, petition or questionnaire with clear majority support as this is vital to the success of the scheme. If the proposal were to be locally controversial we would need to understand how it could work effectively under such circumstances.
- Residential Streets – the roads and streets involved should primarily serve a residential function. We would not expect to include A or B class roads or roads that form part of the primary road network for Swindon – most often these being main bus routes, roads intended for use by heavy goods vehicles and main routes for emergency service responses.
- Speed limit – the existing speed limit should be 30mph. For roads with higher speed limits then a review may be appropriate – but not in consideration of a move to 20mph.

If the existing mean speed is above 30mph then a separate review may be appropriate in order, in the first instance, to bring speeds closer to the existing posted limit.

Stage 3 – Detailed assessment

Subject to meeting the above broader criteria, applications will be assessed further to prioritise locations for further investigation. This is in order to ensure the best and most effective use of resources. The detailed prioritisation factors will include:

- Traffic surveys - to give an indication of traffic volumes and determine whether current mean speeds are at or below 24mph across a range of streets within the requested area.
- Residential nature of the area – whether there are frontages directly onto the streets and the depth of residential development alongside the roads in question.
- Vulnerable Road Users (VRU's) - whether there is a strong likelihood of possible conflicts between cars and pedestrians / cyclists – for example high levels of cycle use or children playing in the streets.
- Injury Collisions - whether there is a record of injury collisions (particularly involving vulnerable road users) within the area over the most recent five years.
- Passenger Transport/Emergency Services - whether there would be a detrimental impact on bus services (timings and reliability) or emergency service response times.
- Schools - whether there is a school nearby resulting in high levels of child pedestrian movements.

Stage 4 – Implementation

Applications that score highly in terms of the above criteria would be prioritised for further investigation to determine the most suitable form of scheme for the road environment – 20mph limit or zone. This would involve some initial design work.

Draft proposals including outline designs would then be subject to consultation with Ward Councillors and then through informal consultation with the local community and other stakeholders. In particular, where speed reduction features are required – there would need to be a clear understanding of the pros and cons of such measures. This is based on community reaction to previous schemes involving speed reduction features.

Depending on the outcome of this informal consultation, and the continued local support for the application, a detailed design/proposal would be agreed and this would then be formally advertised through the statutory Traffic Regulation Order process.

The scheme would be then be implemented subject to the allocation of funding through the normal budget setting process.

Conclusion

There are already a number of 20mph speed limits and 20mph zones in Swindon. However it is likely that there will be a high level of interest initially in new applications. Consideration, design and implementation may therefore need to be phased over several years. It is likely therefore that those applications scoring highly against the above criteria will be dealt with first.

We want to support local communities to ensure that appropriate speed limits are in place in residential areas and that drivers stick to the posted speed limits.

Economy & Development

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