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20mph Speed Limits in Scotland.

Implementation Guide

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Introduction

The Scottish Government remains committed to making our streets safer and to the transformation of our towns and cities to ensure people are prioritised over motor vehicles. Increasing the options for people to walk, wheel or cycle when they make those everyday short journeys.

Managing the levels of vehicle speed is one of the biggest challenges faced in road safety. Many drivers do not recognise the risks involved with speeding and often, for them, the perceived advantages outweigh the perceived problems that can result from it. The speed of a vehicle directly influences the risk of a collision as well as the severity of injuries sustained, and the likelihood of death resulting from that collision.

We know, the average person, is seven times more likely to die if they are hit with a vehicle at 30 mph than they are at 20 mph. That is why the Scottish Government is committed to implementing 20 mph speed limits on those roads where it is appropriate to do so by the end of 2025.

Scotland's Road Safety Framework to 2030 (RSF2030) supports this commitment. It promotes a strong and strategic approach to creating a safe system, with speed management being a priority, as well as the subsequent 2022 Programme for Government commitment to "Roll out our national strategy for expanding 20 mph zones, with more roads and areas reducing their speed limits to 20 mph – making our streets feel safer and encouraging active travel".

The strategy advocates a vision "Slower today for a safer tomorrow" and aims to reduce speed in our towns, cities, and villages by 2025, by implementing 20mph speed limits where appropriate.

Setting speed limits based on Safe System principles

In 2023, 65% of all pedestrian casualties, 61% of all pedal cyclist casualties, 31% of all motorcyclist casualties and 30% of car casualties occurred on roads with a speed limit of 30 mph**.** In total, there were 2,794 casualties on roads with a speed limit of 30 mph or less.

The RSF2030 adopts the highly regarded international best practice 'Safe System' approach to road safety. The safe system principles recognise that people are fragile, and they will at times make errors which can lead to collisions; however, no one should die or be seriously injured on the road as a result.

One component of the safe system "Safe Speeds" aims to establish appropriate speed limits according to the features of the road, the function it serves, and the physical tolerance of those who use it.

20 mph schemes are a fitting example of the Safe System in action, they reduce speed and the risk of collisions occurring by providing more time for a driver to react to unexpected events and if the collision does occur at 20 mph it reduces the risk of causing death or severe injury inside and outside the vehicle.

Traditional approaches for setting speed limits have prioritised vehicular traffic flow and efficiency. Speed limits have been set using mean speeds together with accident rate and are usually considered in reaction to speed-related collisions on the road network. Newer approaches are based on the safe system survivable speeds and reflect the mobility needs of vulnerable road users, such as pedestrians and cyclists, as well as their levels of safety, prioritising people.

Reducing vehicle speeds in areas where the road user mix includes a high volume of vulnerable road users, such as pedestrians and cyclists, and on non-divided rural roads, is especially important.

Even small reductions in speed lower the risk of fatal and serious collisions.

Road safety is a shared responsibility amongst everyone, including those that design, build, operate and use the roads.

The wider ambitions of lowering speed limits

Lowering speed limits to appropriate levels goes well beyond reducing collisions, saving lives, and preventing serious injuries for all types of road users; it also has a huge influence on many other objectives for societal well-being.

Environmental benefits

Intense acceleration and deceleration are known to cause greater emissions, increased noise nuisance and increased passenger discomfort, particularly if it is associated with rapid acceleration and deceleration. Slower and calmer driving reduces emission rates for carbon monoxide, volatile organic compounds and oxides of nitrogen, depending on the gear engaged and the level of driver acceleration/ braking. Vehicle speed was found to be a strong contributing factor to the degree of heavy metal contamination, such as cadmium, lead, zinc, and nickel, in road dust.

The largest source of noise in urban areas is traffic-induced noise, which accounts for 80% of all communal noise sources. The Beuhlmann and Egger, 2017 study in the UK, measured traffic noise and found that 30 km/h (19 mph) road speeds reduced acoustic energy levels by about half. Environmental noise has been linked to sleep disorders, heart disease, stress and, among children, decreased school performance, including decreased learning, lower reading comprehension, and concentration deficits.

Health and Quality of Life

Lowering speed limits can also result in broader health impacts. They can reduce the perception of road danger, which may encourage active mobility, namely walking and cycling for transportation which significantly enhances physical activity levels, leading to better physical health. Using active mobility reduces the risk of more than 25 chronic diseases thus increasing longevity .

Social Cohesivity and Community Severance

Lower speeds can improve accessibility and reduce the disconnection caused by roads that become urban barriers. Traffic levels and traffic speeds not only discourage walking and active mobility but limit social contact between residents on opposite sides of the road. In both urban and rural areas, such severance can prevent children from safely crossing from their homes to get to school or prevent safe travel between homes and nearby workplaces.

Travel benefits

In many cases, lowering speed limits have been prevented because of fears that this measure will increase overall travel times and congestion. Research shows that any increases in travel times and congestion are negligible, and in some cases, they can even be improved through reduced speed limits. It is often not understood that in many urban areas, average speeds are already significantly lower than the speed limit due to congestion. The actual speeds in the top 25 most congested cities in the world are well below 30 km/h (19 mph).

Emerging effects around the world

Edinburgh

Researchers from the University of Edinburgh worked with the City of Ediburgh Council in 2019 to gauge the effectiveness of 20 mph restrictions .The study found that a reduction of not only speed but road traffic collisions was achieved across Edinburgh, even without extra traffic-calming measures and police patrols – making the scheme cost-effective. Similar evidence was found in the 20 mph speed limits in Bristol (Bornioli, 2019) .

Netherlands / Norway / Finland

In the Netherlands in 1993, an analysis of 150 30 km/h zones without through traffic and with sufficient speed-reduction measures found an average decrease in the number of injury crashes of 22%.

Oslo in Norway and Helsinki in Finland have both deployed 30 km/h zones effectively as a key part of the success in reducing cyclist and pedestrian deaths to zero in 2019.

Stockholm Declaration

The Stockholm declaration, 2020, was adopted by governments globally, calling to mandate a maximum road travel speed of 20 mph in areas where vulnerable road users and vehicles mix in a frequent and planned manner. Lower speeds in cities, towns and villages are internationally recognised as a key element in reducing road casualties. Speed limits affect everyone, not only motorists and their passengers but pedestrians, cyclists, and communities. As well as influencing safety and risk they can influence quality of life and the environment we live in.

Spain

In May 2021, Spain introduced a new speed limit of 30 km/h on single-lane urban roads in towns and cities. A first evaluation of crash data for the year 2021 compared with 2019 shows that the number of deaths in road crashes on urban roads has decreased by around 25%, which means 97 fewer deaths. The number of fatal pedestrian crashes went down by 32%. Regarding cyclists, the reduction was equal to 48%. These first results communicated by the General Traffic Directorate of Spain are very promising, and the impact of the 30 km/h urban speed limit across the country will be further assessed over time.

The Road Assessment Criteria

From June 2022 Road authorities began assessing their 30 mph road network to ascertain roads which are appropriate for a lower speed limit of 20 mph. To apply a level of consistency when assessing their road network, the following road criteria was created and was used by all road authorities.

Identifying any of the following place criteria on a road with a speed limit of 30 mph will give an indication that the road is appropriate for a reduced speed limit of 20 mph. Several factors should be considered when making the assessment which include - but are not restricted to the following:

1) Is the road within 100 m walk of any educational setting e.g. Early years, primary, secondary, further & higher education.
2) Does the number of residential and/or retail premises fronting the road (on one or both sides) exceed 20 over a continuous road length of between 400 – 600 m.
3) Other key buildings which attract members of the public should also be considered.
4) Is the road within 100 m walk of an area of public interest such as a community centre, place of worship, sports facility (including playparks), hospital, GP, or health centre.
5) Does the composition of road users imply a lower speed of 20 mph which will improve the conditions and facilities for vulnerable road users and other mode shift. (build capacity by reflecting on future delivery plans such as active and sustainable travel, consider existing and future levels of vulnerable road users)
6) Will the road, surrounding environment and the community be improved by a lower speed limit of 20 mph e.g. quality of life, social cohesiveness, severance, noise, or air quality, active travel)

Points to Note - The presumption is that all 30 mph roads are appropriate for a lower speed limit of 20 mph. However, there will be some anomalies, where roads meet the criteria but are not appropriate and others which do not meet the place criteria but are appropriate for a 20 mph speed limit. This is where local knowledge and community feedback is key to setting the most appropriate speed limit for the environment.

In general, a road suitable to remain at 30 mph will typically be on A and B Class roads with little frontage activity and where people walking, wheeling, and cycling do not need to share space with motor traffic.

A minimum road length for the speed limit is suggested between 400-600 m. The length adopted will depend on the conditions at or beyond the end points.

National 20 mph speed limits Implementation

As part of the initial national 20 mph speed limit implementation phase road authorities have been considering the introduction of 20 mph speed limits indicated by speed limit signs, with no supporting speed reducing features.

Research has found, implementing sign only using a city/village wide approach may be more effective than implementing limits on specific streets as it encourages a more consistent reduction in speed across a wider area . This approach has demonstrated a higher reduction in speed and may also contribute to changing travel and driving behaviour positively in the longer term.

The use of Temporary Traffic Road Orders (TTRO) to implement 20 mph speed limits, has allowed for progress to be made with implementation, gives the community time to experience the change and for the lower speed limit to be monitored and evaluated over a maximum period of 18 month. During this period, a measured and informed decision can then be made as to whether the 20 mph speed limit can be refined or modified in terms of:

- Reducing or shifting the extents of the speed limit in length.
- Considering speed management measures to aid better compliance; or used as an opportunity to implement local plans that are complemented by the lower speed limit, such as active travel measures.
- Evidencing or accepting that the road is not appropriate and reverting to a speed limit of 30 mph either partially or in full.

In addition, some road authorities have already carried out sufficient assessments and are able to implement 20 mph speed limits on a permanent basis with a Traffic Road Order (TRO).

Ultimately it will be for each road authority to determine which roads on their network should be subject to a 20 mph speed limit and to decide how best to give effect to this by way of orders made under section 84 and section 88 of the Road Traffic Regulation Act 1984 (legislation.gov.uk).

Communications

A comprehensive and early formal / informal consultation of all those who may be affected by the introduction of a 20 mph scheme is an essential part of the implementation process.

Taking all, who may be affected, along on a journey has been found to be effective in gaining support. This needs to include residents, all tiers of local government, the police and emergency services, public transport providers and any other relevant local groups (including for example, groups representing pedestrians, cyclists, drivers, or equestrians).

Research was undertaking by the SG (Scottish Government) Marketing and Insights Team to establish a communication toolkit which can be used to promote a behaviour change. The toolkit has been developed and shared with all road authorities alongside a FAQ to assist with public enquiries.

Figure 1 - 20 mph campaign asset for social media

Enforcement

Implementing 20 mph speed limits in a pragmatic and measured way allows for appropriate roads to be monitored and evaluated on their effectiveness and it helps to identify if the road is credible and self-enforcing which will reduce the need for police enforcement.

It is recognised that after a period of monitoring, the speed on some roads may need to be refined or modified, either in length or with additional speed management measures, to create suitable self-enforcing roads.

Any changes should continue to be monitored, and where compliance levels are not at an acceptable level, or local knowledge suggest the road is not appropriate, consideration should be given to reverting to a 30 mph speed limit, in part of full, if necessary.

The position of Police Scotland in respect of the enforcement of 20 mph aligns with the enforcement activity criteria for all published speed limits, contained within the Speeding Standard Operating Procedure which states “deployment of resources must prioritise sites which represent the greatest risk and should only be undertaken where considered necessary and in the interests of casualty reduction.”

Legislative Requirements

To manage compliance, it is important the limit is signed correctly and consistently. Road authorities must ensure speed limits meet the legislative process and the requirements of the Traffic Sign Regulations General Directions (TSRGD) legislation.

Any new limit should also be accompanied by publicity and communications.

The TSRGD and the Traffic Signs Manual should be used by road authorities to determine the use, placing and positioning of signs.

Implementing 20 mph Speed Limits – Sign Only

20 mph speed limits do not require traffic calming. They are like other local speed limits. The full requirements for the establishment of a 20 mph limit is set out in The Traffic Signs Regulations and General Directions 2016 (legislation.gov.uk) and the Traffic Signs Manual

Repeaters – 20 mph Limit

The TSRGD (2016) removes the requirement for a minimum of one repeater sign to be placed within a 20 mph speed limit. It is for road authorities to determine how many repeater signs are needed and where they should be placed, taking cognisance of the Traffic Signs Manual Chapter 3 ensuring there are sufficient repeater signs placed to inform road users of the speed limit in force.

Point to Note - When lit roads have a speed limit other than 30 mph, repeater signs can assist road users to understand the limit of the road and assist with compliance.

20 mph Zone into a 20 mph Speed Limit

Signs must be provided at each entrance to the zone, even where the adjacent speed limit is 20 mph speed limit (without traffic calming features). The lower panel may be varied or omitted, but the speed limit roundel in the upper panel must not be varied to any other speed limit. Normally only one sign is likely to be needed, particularly where the zone commences in a side road at a junction.

Where the adjacent speed limit is 20 mph adjacent speed limit is 20 mph (without traffic calming features), the sign is replaced by a 20 mph terminal sign.

20 mph Speed Limit - Zones

20 mph zones are different from a 20 mph limit as they require traffic calming. The full requirements for the establishment of a 20 mph zone is set out in detail in the TSRGD and the Traffic Signs Manual .

In Scotland, 20 mph should be the standard speed limit in the vicinity of schools. The actual route to school should also be considered for 20 mph speed limits / zones as very few pupils live on the street the school is located, broadening 20 mph zones or speed limits will enable a safer journey to and from school.

Point to note – Speed cushions / humps encourage the braking and acceleration of vehicles which can lead to an increase in noise nuisance, increased passenger discomfort and raise pollution levels, both exhaust and particulate.

The design of a 20 mph zone should ensure, as far as possible, that engineering measures take account of all road users, ensuring hazards are not created for vulnerable road users, particularly those people with a visual or mobility impairment.

Variable/Part Time Limits

Variable speed limits are those which lower the limit to 20 mph according to the time of day as specified in a speed limit order. The requirements for variable message signage are outlined in The Traffic Signs Regulations and General Directions 2016 (legislation.gov.uk).

Advisory 20 mph limits

SEDD Circular No. 6/2001 gave guidance on the situations in which it was appropriate to implement an advisory 20 mph maximum speed. Advisory maximum speeds were originally designed to be used in self-enclosed residential areas with little or no through traffic. Road authorities should be introducing mandatory limits or speed limit zones, as appropriate, in these areas rather than advisory ones.

Monitoring and evaluation of sign only 20 mph speed limit.

The monitoring and evaluation of any speed limit / speed management intervention is vital to determine whether it works, to adapt it if necessary, and to provide evidence for continuing support at the level of decision makers, key stakeholders, and the public.

Monitoring and evaluating will not only provide feedback on the effectiveness but will also help to determine whether a speed limit / speed management intervention is appropriate, whether there are any problems with its implementation and support, and whether there are any ongoing issues that need to be resolved before any further intervention is implemented.

It is important to plan for evaluation early in the design process to allow a baseline to be created.

For the monitoring and evaluation of the speed limit it is recommended to:

a) Determine the aim and outcomes of the evaluation and consider other data that can be monitored such as levels of walking and cycling, air quality, decrease in traffic flow etc.
b) Conduct a “before implementation” speed analysis to create a baseline.
c) Run the speed analysis throughout the entire day over a seven-day period across all selected sites.
d) Conduct at least two “post implementation” speed analysis to be collected at approximately 3 months apart, or as appropriate.
e) Ensure consistency in measurement by monitoring the same sites to gain an equivalent comparison.
f) Write and disseminate a monitoring and evaluation report for committee or public.
g) Use results to plan or promote interventions or speed management measures.
h) Monitor the speed of the newly introduced speed management intervention and repeat as above.

The suggested data to be collected:

a) Traffic volume
b) Traffic classification (Car/Van/HGV)
c) 85th percentile speed
d) mean speed.
e) Using 3 speed bins of vehicles travelling at or below 0-25 mph, between 25–30 mph, above 30 mph

Measurement for action

0-25 mph - Average speeds at or below 25 mph will be assumed to be at a level where no speed management interventions are required – The speeds should be continued to be monitored for any deviations in future.

26-30 mph - Average speeds between 25-30 mph will indicate that softer speed management measures should initially be considered or a reduction/shift in it extents. Once implemented, monitored again and refined further is necessary.

The measures used will depending on the road environment, for instance:

- Gateway features (such as red surfacing, “dragon’s teeth,” countdown signing)
- Adding repeater signs or increasing the number of repeater signs - Carriageway roundels may be used; however, these can be difficult to remove if the 20mph limit is not made permanent.
- Additional road markings to emphasise road features or reduce carriageway widths, such as middle lane hatching, white line cycle lanes.
- Vehicle activated signs.
- Consider your wider delivery plans – do they include active travel measures which can be added to reduce width or road.
- Liaising with Police Scotland to consider if enforcement on a local level can be deployed.

Above 30 mph - Average speeds of above 30 mph will indicate that speed management measures are required to change the road environment to achieve better speed compliance. Consider using softer features initially, such as road markings or a reduction/change in the extent of the speed limit. Any change should be monitored before moving on to more physical engineering measures which will help to evidence the reason for change.

As all roads have been pre assessed as being appropriate for a speed limit of 20 mph, if not reaching a desired level of speed compliance, it is expected that feasible speed management measures should be exhausted wherever possible, or a reduction/change in the speed limit extents, before any consideration to return them, either in full or partially, to the previous speed limit of 30mph unless other evidence suggests the road is not appropriate.

Longer Term Monitoring and Evaluation

Both the collision history and speed analysis are important factors to monitor over a longer period.

For collision history, to gain an appropriate level of data, an evaluation should not be conducted until at least 1 year of post installation data is available. It is desirable to have 3 years of collision data to provide a larger sample size and a more realistic indication of outcomes.

For speed analysis, although the initial speeds will be monitored as early as possible and evaluated to give early indications on the levels of compliance, the recommended period for a speed analysis after a major engineering change (e.g. a new speed limit or road design element) is 1 year. Waiting a full year will allow motorists to get acclimatised to the new treatment and environment and will allow it to be encountered in all types of weather conditions.

Communicating results

Once an evaluation is complete, it is important to provide feedback to key stakeholders and the public, even if results were not particularly good.

While a speed management intervention may have succeeded in achieving its objectives, it is still helpful to examine and discuss what worked well and why. If the intervention has not been successful, it is important to share this with others so that weaknesses or relevant issues are considered in similar interventions, including whether to introduce such interventions in the future.

Findings should be analysed and it should be considered whether they demonstrate any tangible benefits, problems to be rectified or elements to be abandoned. Moreover, the evaluation could discover unexpected side-effects of the interventions, both positive and negative. These should be considered in the further development of interventions.

Speed Management Interventions

Following the introduction of signs, repeaters and roundels when implementing 20 mph speed limits, if the desired reduction of speed is not being reached, speed management interventions can be considered.

Depending on the geographical area, the types and mix of road users, a mixture of interventions may be required to make speed management successful. Simple and sustainable road engineering measures such as lane-narrowing, refuge islands and medians are highly effective – especially for low to moderate speed environments in cities, towns, and villages. There are many interventions to reduce speeds and manage traffic as demonstrated in the City of Edinburgh Street Design Guidance

A mixture of examples are below:

Lane narrowing

Wider roads allow drivers to select higher travel speeds. This may be because the perceived margin for error is greater. So, narrower lane widths tend to slow traffic speeds . Narrowing the roadway for vehicles will therefore assist speed reduction in a particular area. Even narrowing the perceived lane width can achieve slower speeds. This can be done with painted markings on the road.

Refuge islands and kerb extensions

Refuge islands and medians can provide a staged crossing point for pedestrians and simplifying decision-making. Kerb extensions can also improve pedestrian safety by reducing the crossing distance and the area and time in which pedestrians are at risk. This is particularly helpful for older or disabled pedestrians who may have difficulty choosing a safe gap in traffic at a crossing point. These interventions also result in narrower lanes, thereby contributing to lower speeds

Roundabouts

Roundabouts are effective in reducing the severity of crashes at an intersection because they require traffic to deviate from a straight path and therefore slow down to undertake the manoeuvre. The reduced speeds and direction of travel can result in reduced collision severity.

Repeater Signs

TSRGD 2016 removes the requirement for a minimum of one repeater sign to be placed within a 20 mph limit. It is for road authorities to decide how many repeater signs are needed and where they should be placed, taking cognisance of Chapter 3 of the Traffic Signs Manual ensuring there are sufficient repeater signs placed to inform road users of the speed limit in force.

Gateway treatments at entrances to towns and villages

Gateways are devices used to mark a threshold – usually to a village or higher risk location on the road – where lower speeds are required from drivers. Gateways rely on highly visible vertical treatments to capture driver/rider attention and usually include:

- large signs conveying the message that it is an entry to a location where pedestrians and other vulnerable road users are about to be encountered in greater numbers;
- pavement markings to narrow the perceived width of the carriageway, including painted central medians, for a short distance at least;
- large speed limit signs showing the lower speed limit that applies;
- other pavement markings to indicate clearly that a threshold is being crossed into a different environment;

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