

## ABD Position on 20 mph Speed Limits

Local authorities considering the introduction of 20 mph speed limits, particularly where these would not be self-enforcing, should consider the following issues:

- The purpose of speed limits
- How drivers adjust their speed to changing conditions
- How drivers respond to speed limits
- How speed limits should be set
- The evidence from existing 20 mph schemes

### The purpose of speed limits

Speed limits have been around so long that few people ever question what they are really for, or how they interact with the way drivers vary their speed according to the conditions. If set incorrectly, speed limits can create conflicts between drivers' desire to stay within the law and their own assessment of a safe speed. Speed limits have three legitimate purposes:

- To guide inexperienced drivers away from grossly exceeding safe speeds
- To warn drivers of expected hazard density
- To enable the police to prosecute those who drive at recklessly high speeds

The first and third of these should be self-evident. The second one, to warn drivers of expected hazard density, requires further explanation, as discussed below.

### How drivers adjust their speed

Drivers use their experience and judgement to vary their speed in response to the changing road environment they see ahead of and around them, including:

- Road width and geometry (bends, junctions, etc)
- Weather conditions and time of day/night
- Roadside development (motorway, rural, suburban, town centre, schools, parked vehicles, etc)
- Vulnerable road users (pedestrians, cyclists, horse riders)

All the factors listed here affect the maximum safe speed at a particular moment in time during a journey. As these factors change, so will the safe speed.

This process is a continuous feedback loop between observation, assessment and response. The resulting speed choice is intuitive and non-numeric, i.e. **Drivers do not think in terms of miles per hour**. This is very important to understand.

Safe driving is primarily a mental process of continuous risk management, balancing speed against the clear space around the vehicle and the likelihood of something or someone entering that space – the surprise factor. This is directly related to the hazard density. For a more detailed explanation of this process, the ABD recommends the book *Mind Driving* by Stephen Haley ([www.skilldriver.org](http://www.skilldriver.org)).

Thus it is vital that speed limits broadly align with the non-numerical judgement of experienced drivers of a safe speed for the hazard density (the second purpose of speed limits). If set below this level, drivers who wish to stay within the law will need continually to refer to their speedometers. **The speed limit then becomes a distraction** that diverts drivers' attention from the more important tasks of hazard observation, assessment and response.

## How drivers respond to speed limits

Because drivers adjust their speed intuitively and non-numerically, most drivers will travel at what they consider to be a safe speed regardless of the limit (unless they are expecting enforcement activity). Thus any change in speed limit (in either direction) leads to a much lower change in actual speeds, usually less than a quarter of the change in the limit. The commonly held belief that a 10 mph change in speed limit produces the same change in actual speeds is wrong.

The following is an extract from the 1980 edition of the government's circular to highway authorities on how to set local speed limits. It is worth reading carefully. Note the sentence highlighted in bold. It follows that the reverse can occur – lowering a speed limit can lead to more frustration and driving behaviour conducive to an increase in accidents.

*It is a common but mistaken belief that drivers allow themselves a set margin over the prevailing speed limit, and that if a limit is raised by 10 mph, they will travel 10 mph faster. In fact, an increase in an unrealistic speed limit rarely brings an increase in traffic speeds. ("Unrealistic" is here used to mean "substantially below the 85 percentile speed"). It is much more likely that there will be no change, or even a fall. It seems that drivers relieved of the frustrations of too low a limit rarely abuse the higher one. Indeed **it is not unusual for the accident rate to fall when a poorly-observed limit is raised**. This may mean that reduced frustration leads to changes in driving behaviour conducive to accident reduction.*

## How speed limits should be set

Taking into account the above, to achieve their purpose, speed limits must:

- Represent the maximum safe speed for the road in ideal conditions, allowing drivers to vary their speed within the limit as conditions change
- Be set at a level that most drivers would not wish to exceed (the 85<sup>th</sup> percentile principle)

Note that a speed limit should represent the maximum safe speed under ideal conditions. It should not be set at a level that may be appropriate only part of the time, e.g. a permanent 20 mph limit outside a school that may only be reasonable at arrival and dispersal times – less than 5% of the total number of hours in a year.

The 85<sup>th</sup> percentile is the measure of speed that was used for decades as the best way to set speed limits, based on international evidence. If set at this level, only 15% of drivers would wish to drive faster. In 2006 the government replaced the 85<sup>th</sup> percentile with the mean (average) speed for setting limits. This means that half of all drivers will regard a speed limit as too low if set this way.

Correctly set speed limits produce the following benefits:

- A high level of voluntary compliance
- A low spread of speeds
- Less tailgating of slow drivers
- The least frustration and 'road rage'
- The lowest accident risk

With correctly set speed limits you get less conflict between the minority of drivers who religiously obey any speed limit, however absurd, and the majority who continue to use their

own judgement. So you get a low spread of speeds, which is especially important on single-carriageway roads as it leads to less overtaking. This, plus the reduced frustration generally, is what produces the lowest accident risk.

Speed limits set too low produce the following disbenefits:

- A high level of non-compliance
- Instead of varying their speed within the limit, drivers are likely to regard the speed limit as a minimum or target speed. Where repeater signs are used (as they would be in signed-only 20 mph limits), drivers may travel faster than they would otherwise do.
- As previously explained, drivers who wish to remain within the law would need to divert part of their attention to the speedometer, the speed limit thus creating an unnecessary distraction.
- Research shows that the drivers with the least accident involvement are those who travel in the 80-90<sup>th</sup> percentile range of the speed distribution. Setting limits below the 85<sup>th</sup> percentile, therefore, criminalises the safest drivers.
- Where drivers see that many speed limits are set too low, they may ignore all limits.

Speed limits should NOT be used:

- To micromanage drivers' speed – the ability to vary speed according to changing conditions is a fundamental driving skill
- To achieve political objectives unrelated to road safety, e.g. to discourage car use

The maximum safe speed varies yard by yard and minute by minute of a driver's journey. Even correctly set speed limits, constrained as they are by 10 mph increments and the need to avoid excessively frequent speed limit changes, cannot provide more than an approximate guide to the maximum safe speed at any specific point in space or time.

Speed limits must only ever be used for genuine road safety reasons. It is unacceptable to punish drivers for exceeding a speed limit set for other purposes.

### 20 mph speed limits: the evidence

20 mph speed limits can take two forms:

- 20 mph zones, with traffic calming
- Signed-only 20 mph limits

20 mph Zones:

- Have signs at entry and exit points only
- Are effective at reducing speeds
- Casualty reductions are often due to traffic transferring to other roads
- Traffic calming features can divert drivers' attention from observation of other hazards
- Humps, cushions and speed tables can cause dangerous tyre and suspension damage
- Greater noise and emissions due to accelerating and decelerating

20 mph zones have been in existence for many years and are effective in reducing speeds because of their 'traffic calming' features. Casualty reductions are mainly due to traffic diverting to avoid the traffic calming. Drivers focussed on spotting the next speed hump or table will have less time to scan the road and footways ahead for other hazards, such as pedestrians about to step into the road.

20 mph signed-only speed limits:

- Have 20 mph repeaters as well as terminal signs
- Do not have traffic calming
- The performance of five schemes, which have been analysed by independent road safety researcher Eric Bridgstock, is summarised below

**Portsmouth** (from the council's Second Year report):

- There were 19 KSI (killed and seriously injured) casualties per year before the scheme and 20 KSI per year afterwards
- Pedestrian KSI increased by 38%
- Cyclist KSI increased by 11%
- Portsmouth recorded a 6% increase in KSI overall while nationally KSI fell by 12%
- Traffic volume fell by 12% in the 20 mph area
- Average speed reduction was just 0.9 mph

There was a small increase in overall KSIs after the scheme was introduced, with larger increases for pedestrians and cyclists – the vulnerable road users that 20 mph limits are supposed to benefit most. It is important to take account of changes in traffic flow and national trends when assessing casualty figures. The downward trend in road casualties accelerated markedly from 2008 as a result of recessionary factors. Note the low overall reduction in average speed.

**Bristol:**

The number of overall casualties in the first 12 months of operation reduced by 5 in the Inner East Area and increased by 8 in the Inner South Area. This represents a net increase of three, and that is without knowing by how much the traffic volume fell, but all 20 mph schemes experience reduced traffic – it is often an objective.

**Oxford** (from the Oxford Mail website 4 April 2012):

- Scheme introduced 2009, costing £250,000
- There were 61 KSI casualties in 2008
- There were 71 KSI in 2009 and 72 in 2010

**Warrington Town Centre** (from the council's 20mph Pilots Evaluation Report):

The Town Centre had "a history of vulnerable road user casualties" but during the 18-month 20 mph pilot from Feb 2009, serious injuries increased by 66% and minor injuries by 48%.

**St Peter's Street, St Albans** (Eric Bridgstock's home town):

Figures provided by Hertfordshire County Council showed a 33% increase in injury accidents in the three years after a 20 mph limit was imposed in the main street, compared with the three years prior to commencement of work on the scheme. This was in contrast to an overall reduction of 45% in injury accidents in the City Centre junction improvement scheme using the same before/after basis.

Conclusions:

The above figures were drawn from a limited number of schemes and some of the percentage changes in casualties may not be statistically significant, where the absolute numbers are small. Nevertheless, the fact that all the schemes showed increases in certain types of casualty should give cause for concern. The results certainly do not support the claims of campaign groups, such as 20's Plenty for Us, that 20 mph limits are an unqualified success.

## Concerns of other authorities

The following extracts are from *Local Transport Today*, a fortnightly publication for transportation professionals. The first extract concerns 20 mph speed limits in York, where the Liberal Democrats are critical of the council's approach (LTT, 26 July 2013):

*"We continue to support a targeted use of 20mph limits at known accident blackspots and in areas such as outside schools and shopping areas," say the Lib Dems. But they say evidence for the effects of blanket 20mph limits is "very mixed in regards to accident levels, reducing speeds, helping produce a modal shift away from car use and in reducing emissions. The evidence from the UK's first city-wide 20mph scheme [Portsmouth] showed that serious accident levels went up slightly, the average reduction in speeds was just 1.3mph, and the scheme made little difference to the majority of respondents in the amount they travelled by their chosen mode."*

The second extract shows how Norfolk is not convinced of the wisdom of installing area-wide 20 mph speed limits (LTT, 4 October 2013):

*Norfolk's director of environment, transport and development, Mike Jackson, told councillors last week: "Within Norfolk at present, the commitment of funds to the implementation of 'blanket' 20 mph schemes would not offer good value for money compared to other measures to reduce casualties." He added: "The council should continue to prioritise schemes that target reductions in killed and serious injuries and should not divert resources to area-wide 20 mph speed restrictions, which offer little benefit in this regard."*

It is clear from these two recent reports that those who have taken the trouble to study the evidence are far from convinced of the benefits claimed for 20 mph speed limits. The police are also reluctant to enforce speed limits that are inappropriately low. The following extract comes from the 2011-15 ACPO guidelines on enforcement of 20 mph limits, Appendix A:

*Where limits are not clear (that is they don't feel/ look like the limit or are on inappropriate roads), they will not be routinely enforced (routinely means regular planned attendance where there isn't intelligence of routine offending) only targeted where there is intelligence of obvious deliberate disregard.*

It is clear that ACPO will resist enforcing 20 mph limits imposed on roads where such a low limit is inappropriate. Apart from a poor use of resources to enforce such limits, there is the likelihood that relations between the police and public would be adversely affected by prosecuting large numbers of drivers where the limit is too low.

## Why should 20 mph limits increase casualties?

The most likely factors are:

- Complacency – people, especially pedestrians and cyclists, feel they should be safer with the lower limit (even if actual speeds have barely changed), so they take less care
- Some drivers may increase their speed to 20 mph (because the repeater signs remind them of the limit), where previously they would have been travelling more slowly
- Drivers trying to obey the speed limit spend more time glancing at their speedometer, distracting them from the more important tasks of hazard observation, assessment and response

## Recommendations

20 mph signed-only limits should not be imposed on roads where the current 85<sup>th</sup> percentile speed is significantly more than 20 mph, as there will be a high level of non-compliance and the police are unlikely to enforce the limit.

Where the current 85<sup>th</sup> percentile speed is below 20 mph, given the likely negative effects on safety of imposing a 20 mph limit, consideration should be given to finding better ways of using the money to improve road safety.