

“Setting Local Speed Limits”

**A review of recent installations
of 20mph area schemes
(signage only).**

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Background

In 2013, the Department for Transport issued a guidance document covering the issue of “setting local speed limits”, DfT Circular 01/2013, which built on previous experience and guidance notes. In this review report, extracts from this DfT guidance document will be shown in italics.

In the introduction to the circular, it states:

“Speed limits should be evidence-led and self-explaining and seek to reinforce people’s assessment of what is a safe speed to travel. They should encourage self-compliance.....This guidance is to be used for setting all local speed limits on single and dual carriageway roads in both urban and rural areas.

As well as being the legal limit, speed limits are a key source of information to road users, particularly as an indicator of the nature and risks posed by that road both to themselves and to all other road users”.

Prior to 2015 a large number of 20mph schemes were initiated and from our legal Order records the following numbers of roads were treated, with the corresponding capital costs shown:

Year	Number of 20mph roads implemented	Capital cost of installation (£)
2011	29	67,000
2012	103	554,000
2013	397	
2014	415	
2015	470	Plus additional 225,000 in 2015
2016	85	25,000
total	1,499	£ 871,000

Many of these roads will have been part of area based residential schemes covering a number of roads in one project.

The Issues

With so many schemes having been implemented in recent years, we are now receiving complaints that in some places drivers are not abiding by the 20mph speed restriction and in fact vehicle speeds exceed this by a large margin. There is local demand in some roads for speed reduction measures to be added to the schemes in order to physically reduce speed or, alternatively, requests are being made for Police enforcement. Hence it is clear that in such locations the spirit of the DfT guidance is not being met in that the schemes do not “*encourage self-compliance*”.

Traffic calming measures such as humps, speed cushions and build outs are known to be successful at reducing speeds but they are several times more expensive to install than speed limits, have ongoing maintenance costs and are unpopular with some residents and drivers.

Humps are generally the most effective speed reducing measure, although the Government’s proposed plan for tackling air quality, which states local authorities are responsible for identifying proposals to tackle pollution in their area, suggests considering the removal of road humps to improve traffic flow and air quality.

The situation in some signed 20mph roads goes against the DfT guidance which states that “*general compliance needs to be achievable without an excessive reliance on enforcement*”.

It is for these reasons that the review is being carried out. The guidance also states that “*the principle should be to ensure that the appropriate traffic travels on the appropriate roads, and at an appropriate speed*” and thus it follows that implementing a 20mph restriction is not always the appropriate measure to take. Thus the character and usage of a particular road needs to form part of the assessment.

DfT guidance for setting local speed limits.

In section 3 of the guidance, the DfT advises on the underlying principles behind any decision to impose a local speed limits and advises that the following factors should be taken into account:

- ***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).

In paragraph 24, the guidance advises that “.. *the visible characteristics of a road affect the speed that a driver chooses: to be effective, the reasons for a limit need to be apparent*”. In paragraph 26 it goes on to say that “*Where there is poor compliance with an existing speed limit on a road or stretch of road the reasons for the non-compliance should be examined before a solution is sought. If the speed limit is set too low for no clear reason and the risk of collisions is low, then it may be appropriate to increase the limit*”.

Paragraph 27 sets out an underlying principle as follows:

“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.”

Paragraph 29 goes on to say:

“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 DfT talks in terms of “mean” speed, ie “average” speed, as its measure and not of 85th percentile speed which is the other reading used to describe traffic speed. The clear message here is that the speed limit should be appropriate for the road type and road environment and there should be a clear understanding by drivers of why the limit is there, in other words the perceived hazard should be readily apparent and separate from the usual range of distractions a driver will experience on his/her journey.

In applying a local speed limit, the guidance in paragraph 37 advises that the length of speed limit should not be less than 600 metres to avoid too many changes along the route. In exceptional circumstances this may be reduced to 400 metres for lower speed limits or even 300 metres on roads with a purely local access function, or where a variable 20mph limit is introduced, for example, outside a school.

Where speed limits are imposed, it is important that the motorist knows exactly what speed limit applies. In 20mph zones, for example, the terminal signs will be complemented by a range of physical features through the zone. For speed limits, however, which do not have such physical features it is important that sufficient repeater signs are provided that the driver knows “*unhesitatingly*” what speed limit is in force.

Types of roads and speed limits that should apply to them

Urban roads tend to have street lighting and thus are subject to the national speed limit of 30mph. This applies to both dual carriageways and single carriageway roads, but given the nature of dual carriageways it is likely that they will have a higher

speed limit in force, usually 40 or 50mph. Urban roads tend to be subdivided into types depending on the function they perform within the urban environment, ranging from main inter-district distributor roads down to local housing access roads and culs-de-sac.

Rural roads do not normally have street lighting and thus are subject to the national speed limits of 60mph for single carriageway roads and 70mph for dual carriageways. They might have lower speed limits in force and this will be displayed by road signage. Both urban and rural roads can form part of the arterial road network across the county and many will have A or B classifications, although many urban roads on this network will not (usually being C class) – nonetheless their importance as part of this arterial network will be clear.

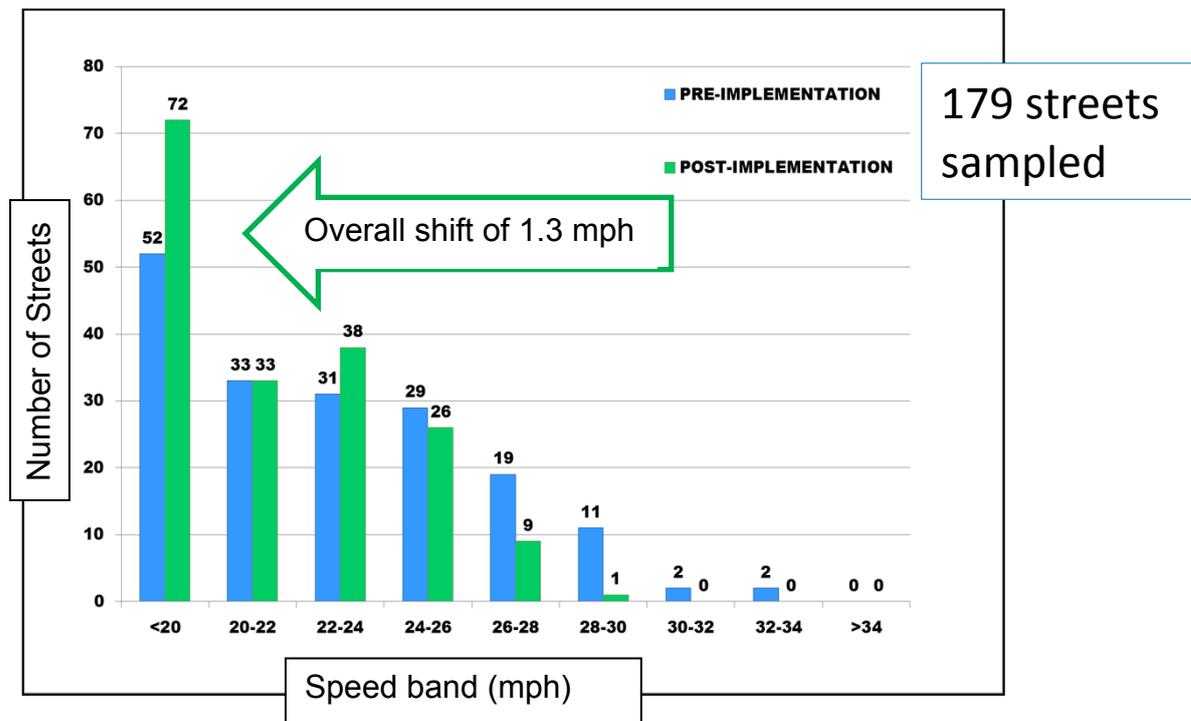
For the purpose of this review, the table below summarises the road types present across B&NES and suggests their normal speed limit together with possible alternative speed limits, and this will form the basic framework for this review.

Types of roads in B&NES and Speed Limits appropriate to type.

Road type	Road function	National speed limit	Standard B&NES alternatives	Alternative for short length around localised hazard
URBAN (lit roads)				
Inter-district arterial (A and B class)	To take main traffic flow through towns and cities along arterial roads.	Dual c'ways 30 mph	60, 50 or 40mph	30 mph
		Single c'ways 30 mph	40 or 30 mph only	20 mph
Local distributor roads (arterial roads).	Main routes through district housing, likely to connect to type above	30 mph	30 mph	20 mph
Housing access roads and culs-de-sac	Off the main routes and mainly giving access to local housing.	30 mph	30 mph	20 mph
RURAL (usually unlit)				
Inter-community roads (A and B class)	Carries traffic across countryside between communities	Dual c'ways 70 mph	60, 50 or 40 mph	30 mph with buffer
		Single c'ways 60 mph	50 or 40 mph	30 mph, 20mph when lights flash
Main road through villages	Carries inter-community traffic through a village or town	-Unlit, 60 mph	30 mph	20 mph
		-Lit, 30mph	30 mph	20 mph
Village side roads	Giving access to local housing and community facilities	-Unlit, 60 mph	30 mph	20 mph
		-Lit, 30mph	30 mph	20 mph

Change in average traffic speed

Following installation of around 1,500 street based schemes over the last 5 years or so, a sample study has been carried out in some 179 streets. Speed measurements have been taken before and after the implementation of the 20mph speed limit and the change can be see graphically as below.



These before and after readings show that:

- the number of streets falling below 22mph (20mph plus 10% speedometer error) has increased by 24% (from 85 to 105).
- the number of streets falling into the 22-26mph band has increased by 7% (from 60 to 64).
- the number of streets falling into the 26-30mph band has reduced by 67% (from 30 to 10).
- No treated streets have average speeds above 30mph.
- The imposition of these 20mph limits has caused a small overall reduction in vehicle speeds of 1.3 mph.

The national situation regarding speed change where signage only schemes have been introduced also indicates that 1-2 mph reduction has been seen, with examples such as:

Manchester: average speed reduction of 0.7 mph.

Islington: average speed reduction of 1.0 mph,

Bristol: average speed reducing by 0.9 mph,

Brighton: 1mph average speed decrease observed.

Hence, the picture in B&NES seems to be reflecting the national findings.

Change in accident rate

Accidents are defined as “random, multi-factored events” and therefore changing the road environment across all sample streets in the same way, by reducing the speed limit for example, will not necessarily result in consistent changes to the accident situation across all streets, due to this randomness. Also to be noted is that the imposition of the 20mph schemes in B&NES was not a targetted measure to address accident statistics in those areas. However, some interesting information has arisen, as follows.

The accident rate per 12 months after installation can be seen in the chart below with the change from the equivalent “before” situation being seen in the row underneath – blue cell colouring indicates an improving situation with yellow colouring indicating a worsening situation.

	Bath zones									Rural				Control area
	Twerton	Newbridge / Weston	Oldfield / Westmoreland	Walcot / Lansdown	Abbey / Kingsmead	Batheaston / Bathampton / Bathford	Odd Down / Combe Down	Lyncombe / Widcombe	Bathwick	Peasedown St John	Paulton	Keynsham	Saltford	Midsomer Norton
Total Accidents per 12 months after	6.0	10.1	7.5	1.4	7.2	0.0	2.4	1.6	0.8	3.0	3.2	12.0	0.8	9.7
Change from "before"	-1.7	-1.9	-6.5	-2.2	-2.8	-1.3	1.4	0.6	-0.2	0.3	2.8	2.0	-0.2	-1.3
Total casualties per 12 months after														
Change from "before"														
KSI Rate per 12 months after														
Change from "before"														

No 20mph area restrictions
↓

Generally, the 12 month accident rate per area is relatively small and, correspondingly, the change in accident rate resulting from the schemes is also relatively small, whether coloured blue or yellow. The Bath areas seem to have

pered better with more areas improving that not, but the rural areas show the reverse trend. Overall, the blue cells outnumber the yellow cells 8:5, suggesting a general improvement in accident rate due to these schemes. Interestingly, the control area of Midsomer Norton which does not have a 20 mph area scheme also shows an improvement in accident rate of similar scale to the Bath schemes.

Change in casualty rate

Due to the randomness of accidents, it would not be expected that reducing speed alone would have a uniform effect on casualty numbers or rates across the scheme areas. The actual results recorded per 12 months can be seen in the chart below, again showing the “after” rate per 12 months in the upper row with the change from “before” in the coloured row below it. Again, blue colouring indicates an improving situation with yellow indicating a worsening one.

	Bath zones									Rural				Control area
	Twerton	Newbridge / Weston	Oldfield / Westmoreland	Walcot / Lansdown	Abbey / Kingsmead	Batheaston / Bathampton / Bathford	Odd Down / Combe Down	Lyncombe / Widcombe	Bathwick	Peasedown St John	Paulton	Keynsham	Saltford	Midsomer Norton
Total Accidents per 12 months after	6.0	10.1	7.5	1.4	7.2	0.0	2.4	1.6	0.8	3.0	3.2	12.0	0.8	9.7
Change from "before"	-1.7	-1.9	-6.5	-2.2	-2.8	-1.3	1.4	0.6	-0.2	0.3	2.8	2.0	-0.2	-1.3
Total casualties per 12 months after	6.8	16.3	9.0	1.4	8.2	0.0	3.2	1.6	0.8	4.0	3.8	13.9	1.6	13.7
Change from "before"	-1.6	1.3	-7.7	-3.2	-3.2	-2.0	2.2	0.6	-0.2	0.7	3.5	0.9	0.6	-1.7
KSI Rate per 12 months after														
Change from "before"														

No 20mph area restrictions



Two areas have changes from blue to yellow when compared with the accident changes in the rows above, one being in Newbridge/ Weston where one particular accident resulted in 5 casualties arising. This shows the effect that one particular accident can have when the total casualty numbers per area are relatively small. Noticeable now is that the number of yellow cells now just outweighs the blue cells, 7:6.

Change in casualty severity

With regard to the severity of casualties arising from these accidents, it could be expected that reducing the speed of vehicles involved in accidents should result in less severe casualty ratings as the energy involved in the collisions will be less. The findings can be seen in the chart below. “KSI” refers to the casualty classifications “killed or seriously injured”.

	Bath zones									Rural				Control area
	Twerton	Newbridge / Weston	Oldfield / Westmoreland	Walcot / Lansdown	Abbey / Kingsmead	Batheaston / Bathampton / Bathford	Odd Down / Combe Down	Lyncombe / Widcombe	Bathwick	Peasedown St John	Paulton	Keynsham	Saltford	Midsomer Norton
Total Accidents per 12 months after	6.0	10.1	7.5	1.4	7.2	0.0	2.4	1.6	0.8	3.0	3.2	12.0	0.8	9.7
Change from "before"	-1.7	-1.9	-6.5	-2.2	-2.8	-1.3	1.4	0.6	-0.2	0.3	2.8	2.0	-0.2	-1.3
Total casualties per 12 months after	6.8	16.3	9.0	1.4	8.2	0.0	3.2	1.6	0.8	4.0	3.8	13.9	1.6	13.7
Change from "before"	-1.6	1.3	-7.7	-3.2	-3.2	-2.0	2.2	0.6	-0.2	0.7	3.5	0.9	0.6	-1.7
KSI Rate per 12 months after	0.5	3.5	1.5	0.0	0.5	0.0	1.6	0.8	0.0	0.0	1.3	1.9	1.6	1.3
Change from "before"	-0.1	2.5	0.2	0.0	-0.2	0.0	1.3	0.8	0.0	-0.3	1.3	1.2	0.9	1.0

No 20mph area restrictions



In this analysis, the picture has changed substantially. Three areas have remained constant with zero KSI rates, but now the yellow changes outweigh the blue by 7:3. This suggests that, overall, the schemes have seen a worsening of the casualty severities, although the control area also shows the same trend.

Nationally, this adverse trend is also prevalent in other authority areas. In one notable case in Portsmouth, one of the earliest area based projects, it was reported that “the number of people killed or seriously injured actually went up, not down, after the limit was lowered”. There is no simple explanation for this adverse trend but it could be that local people perceive the area to be safer due to the presence of the 20mph restrictions and thus are less diligent when walking and crossing roads, cycling or otherwise travelling.

On a national level, the results of these schemes have not been brought together to form an overall view on the effectiveness of signage only schemes, but the Department for Transport is engaged in such a study and is expected to report its findings and recommendations during 2017.

Conclusions.

The study has found that,

- a) Broadly speaking, speed reduction in line with national trends has been achieved, but in real terms the overall reduction in average speed is very small (1.3 mph) and thus is not persuasive in terms of the money spent on these schemes.
- b) Some accident reduction has been observed in Bath, but accident increase, albeit slight, has been seen in outlying towns. Again, this mixed outcome seems to be reflected across the country.
- c) Casualty severity has worsened marginally in Bath and more so in outlying towns. Again, this is reflective of the national situation for reasons which are not yet clear. A number of the schemes have not yet been in place for 3 years and thus the casualty picture might alter over the remaining months.
- d) Overall, the speed limit programme in B&NES seems to have provided little in the way of persuasive argument for continuing the programme into the future.
- e) Indeed, the rise in casualty numbers and severity as per the national trend (albeit with relatively small numbers in B&NES) would suggest against further expansion of area based schemes.
- f) This analysis could be updated when all areas have 36 months of after data available and in the light of the anticipated DfT study on this subject (expected in 2017).