

Wide area 20mph scheme data shows need for authorities to include faster roads: implications for DfT guidance

Summary

An analysis of recent UK 20mph signed-only schemes draws four conclusions:

1. Mean speed reductions are double the previous estimate;
2. Greatest reductions seen on previously faster roads;
3. Close correlation between pre-existing speeds and speed reductions; and
4. Since most casualties are on faster roads, including them in schemes will bring disproportionately greater road casualty reductions.

As Local Authorities become more receptive to including faster roads in 20mph schemes – [Wales](#), [Cornwall](#) and [Oxfordshire](#) do not have pre-existing speeds as a criteria – the changing outcomes illustrate the shortcomings of the decade old DfT guidance.

Paragraph 96 in the [2013 DfT guidance](#) suggested that 20mph schemes without traffic calming will reduce mean speeds by about 1mph, implying a likely reduction in casualties of about 6%. The latest data shows that speeds reduced by 2mph to 6mph, indicating casualty reductions of 12% to 40% (figure 1), if faster roads are included. This prediction is consistent with data from [Edinburgh](#), which showed a 1/3 reduction in casualties, [Cheshire West](#) & [Calderdale](#) and, most recently, Transport for London's [arterial roads](#)¹.

Detail

When Scottish Borders Council implemented 20mph in 100 communities across the authority, speeds reduced by [3mph on average and by 6mph on the faster roads](#). Pre-existing speeds averaged 25mph, ranging from 15mph to 36mph. Data from a further 250 sites in Edinburgh, Hampshire, Oxfordshire, Wales and Kent showed similar patterns:

- Scottish Borders Council was a comprehensive trial of 20mph across 114 sites.
- Edinburgh had two schemes: a pilot in South Edinburgh (28 sites) followed by a citywide 20mph rollout (59 sites)
- Wales (14 sites) and Oxfordshire (130 sites) were trials to assess how best to roll out 20mph and included both rural and urban settings.
- Kent trialed two town-wide schemes: Tonbridge (10 sites) and Faversham (11 sites).
- Hampshire data (14 sites) was from an earlier trial, often on short stretches of road.

Over the entire 380 sites, average mean speeds fell from 23.7mph to 21.9mph - 1.9mph lower (8%). Data from Scottish Borders Council is probably the most robust because it has the highest correlation ($R^2 = 0.7$) and has been analysed in most detail by academics from Napier University. Hampshire data is less useful since 20mph was implemented by a sceptical Local Authority on short stretches of road.

Bath and North-East Somerset schemes showed a similar pattern, but the data was not in a form which could be incorporated in the analysis – see figure 6.

¹ <https://tfl-newsroom.prgloo.com/news/tfl-press-release-new-data-showsignificantimprovements-in-road-safety-in-london-since-introduction-of20mphspeed-limits>

Signed-only 20mph schemes speed reductions: DfT guidance implications

The [DfT's freeflow speed report](#)² (see figure 7) shows that mean speeds are 5mph lower on 20mph than on 30mph roads. With the caveat that there were very few (8) 20mph sites are few (8) and on streets that are atypical of streets in other 20mph schemes, this provides further support for the implication that 20mph signs alone do bring worthwhile reductions in speeds.

Recent data from the Transport for London showed speeds reduced by 1.7mph to 5mph when 20mph was introduced on arterial roads, with casualties falling reducing by 25% to 64% for different severities and road user types – see figure 8.

Annex A from the DfT's Speed Limit Assessment Tool, based on data from before 2010 and from many fewer sites, had a lower R^2 of 0.39 and showed a lower expected reduction in speeds of 4.4%.

The latest results from multiple sites and a higher R^2 show a speed reduction benefit of double that indicated by the DfT's 2013 guidance in its Speed Limit Assessment Tool.

² <https://www.gov.uk/government/statistics/vehicle-speed-compliance-statistics-for-great-britain-january-to-march-2021>

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Figure 1: summary results

	Sites	R2	Pre-speeds			Post speeds			Change			
			Min	mean	Max	Min	mean	Max	Min	mean	Max	mean(%)
Scottish Borders	114	0.70	14.70	25.51	35.90	14.30	22.30	27.40	0.40	3.21	8.50	12.6%
Hampshire	14	0.34	17.67	23.22	27.82	16.67	22.47	26.60	1.00	0.75	1.22	3.2%
Wales	14	0.34	18.42	24.30	33.30	17.40	22.09	29.10	1.02	2.21	4.20	9.1%
Oxford	130	0.34	15.70	21.99	32.30	15.50	21.14	26.30	0.20	0.85	6.00	3.9%
Edinburgh (pilot)	28	0.24	14.85	22.85	29.80	12.65	20.92	26.25	2.20	1.93	3.55	8.5%
Edinburgh (citywide)	59	0.18	15.20	23.89	31.46	11.40	21.92	28.10	3.80	1.97	3.36	8.3%
Tonbridge	10	0.69	23.70	28.66	33.20	22.70	25.49	28.60	1.00	3.17	4.60	11.1%
Faversham	11	0.37	17.60	24.01	32.40	16.50	22.50	29.16	1.10	1.51	3.24	6.3%
Overall	380	0.47	14.70	23.77	35.90	11.40	21.83	29.16	3.30	1.94	6.74	8.2%
Implied casualty reduction @6%									19.8%	11.6%	40.4%	
Unweighted for traffic volumes. Higher speeds will tend to correlate with more traffic and more casualties												

Figure 2: pre-speeds versus change in speed correlation

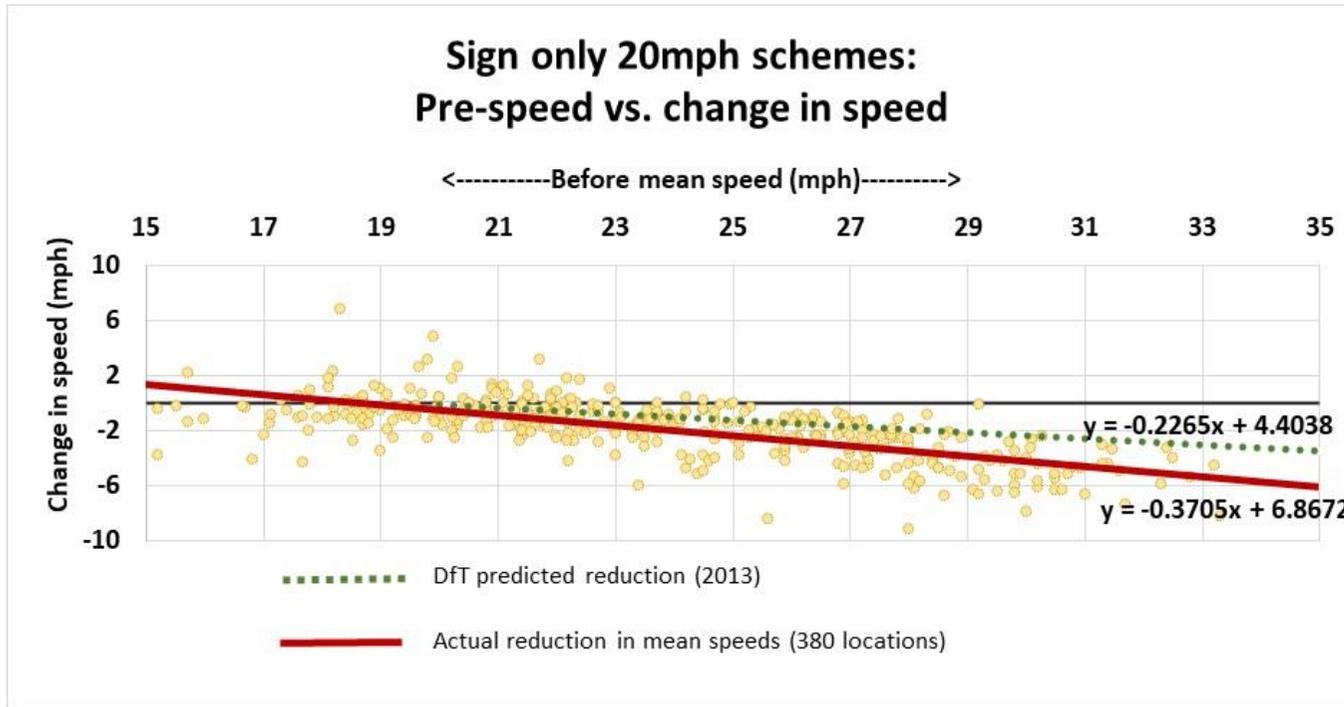
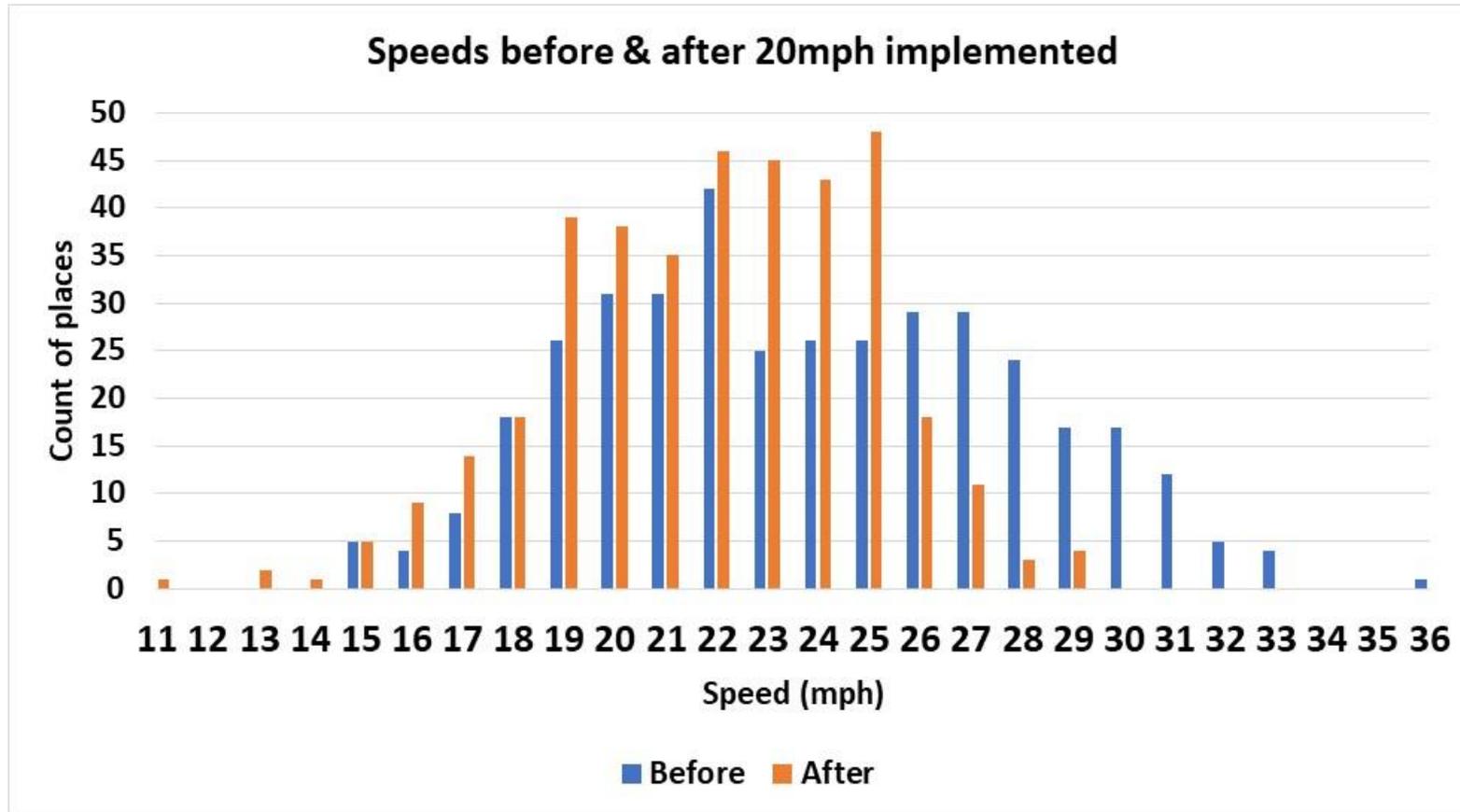
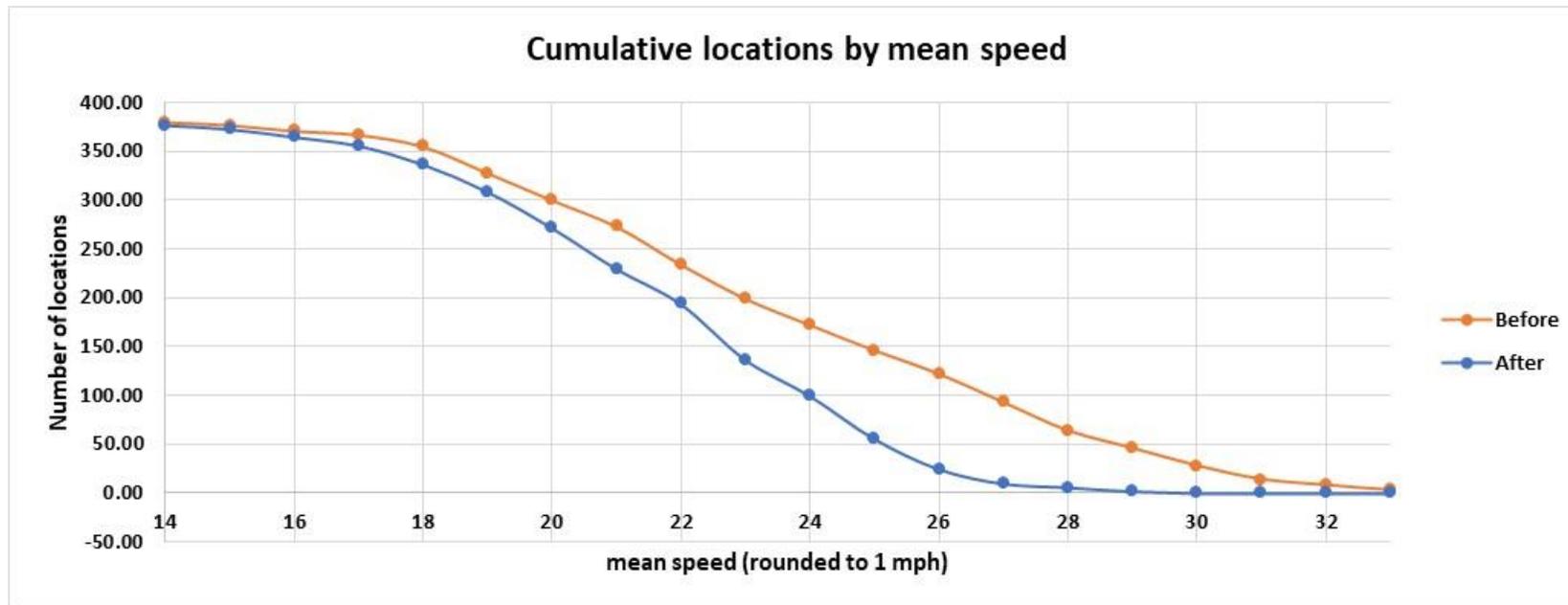


Figure 3: Speed distributions (before and after)



As well as a reduction in mean speeds, the chart shows a more tightly packed distribution in the 19mph to 25mph range in 20mph schemes.

Figure 4: cumulative benefit gap by pre-existing speed



Shows the speed and casualty reduction benefit foregone from excluding roads with mean speeds above specific mean speeds.

Figure 5: Speed reductions by road type (slow, medium, fast)

	No of sites	Old mean speed	Change	%age
Already low speed (up to 24mph)	208 sites	20.6	-0.7	-4%
Now broadly compliant (24-27 mph)	104 sites	26.1	-2.4	-9%
Large reduction (28mph+)	68 sites	30.0	-4.9	-16%

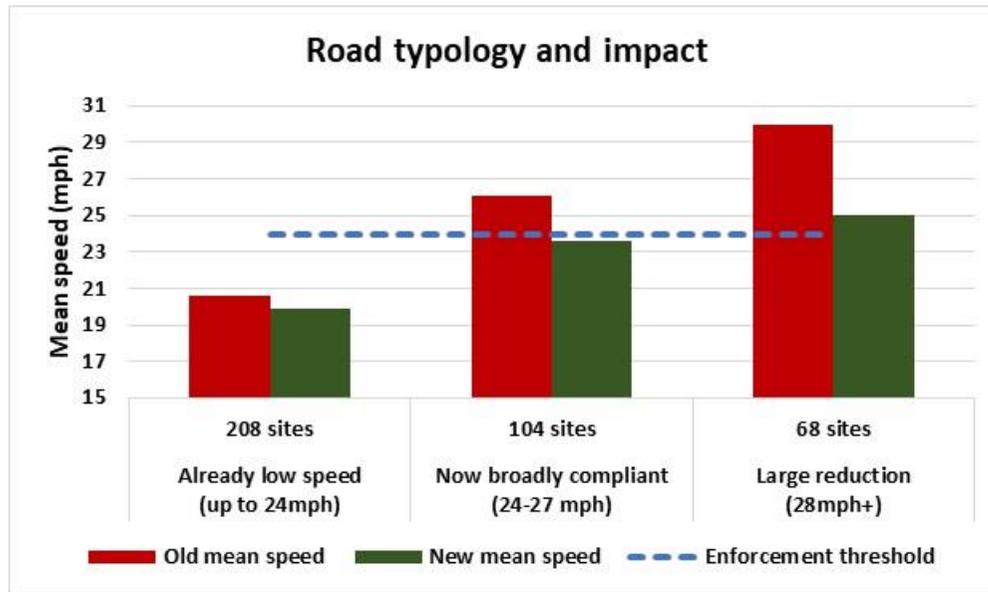


Figure 6: Bath & North East Somerset chart

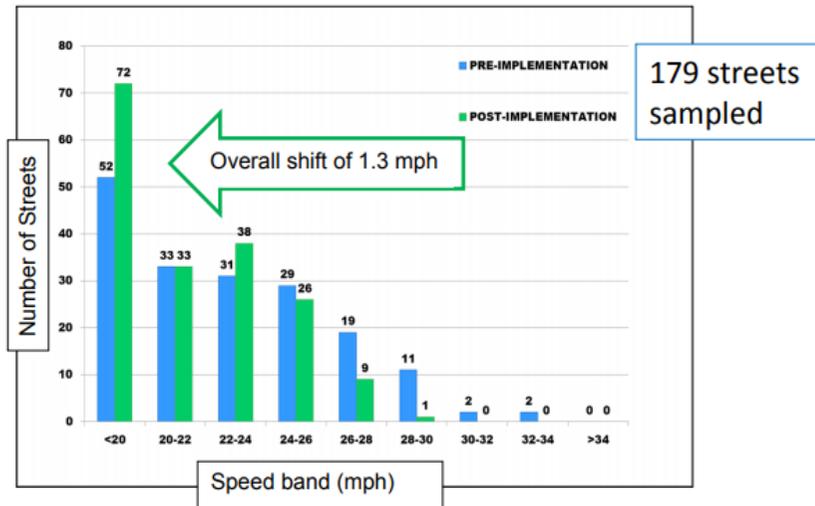


Figure 7: DfT Freeflow speed comparison chart

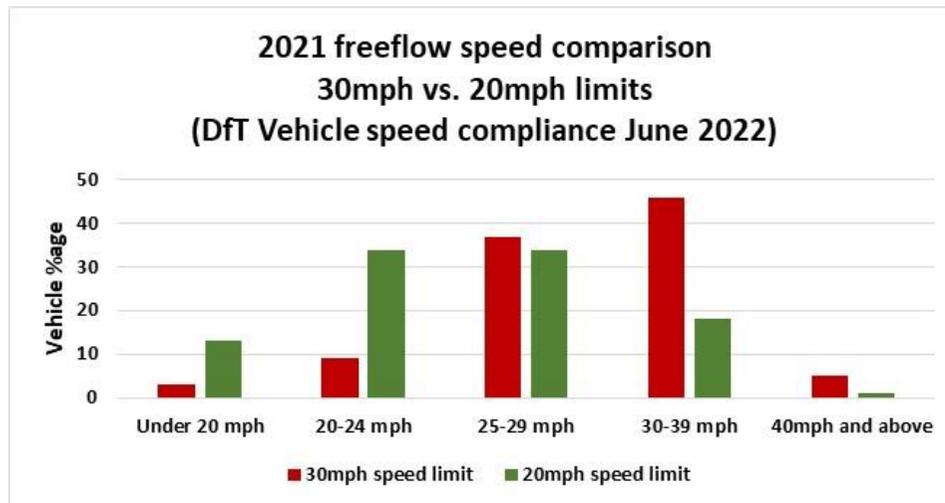


Figure 8: TfL arterial roads (infographic only)

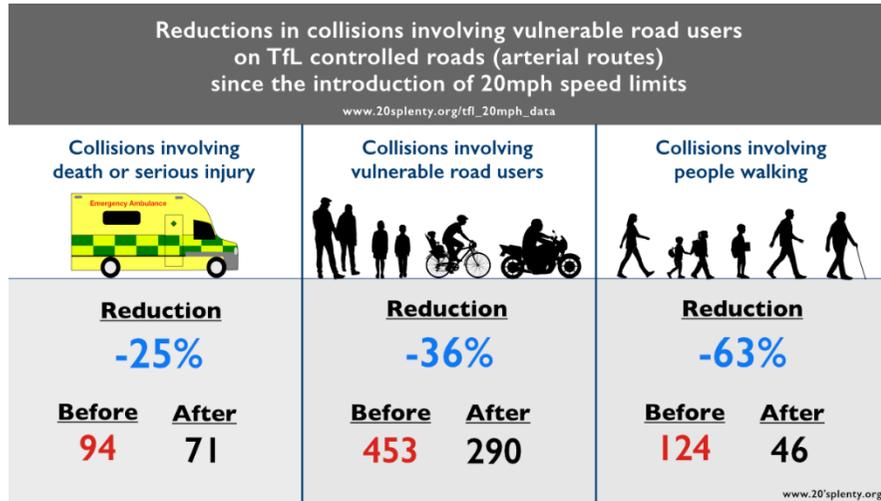


Figure 9 Projected speeds

