Sustainability and Transport Overview & Scrutiny Committee

Thursday 8 November 2018

20mph speed limits – Year 1 Interim Monitoring Report

1. Introduction

This report summarises findings from Year 1 interim monitoring of 20mph speed limits in Birmingham, to evaluate the impact of the programme to date. It examines data on changes in traffic speeds and road casualties, comparing this for before and after scheme implementation. In addition, it also considers our wider behaviour change campaign "Slower is Safer", and the vital partnership role of West Midlands Police in the enforcement of speed limits.

2. Background and Context

In 2012 the City Council approved the development of a policy for the implementation of 20mph speed limits, and following consultation it was agreed that there should be a phased approach to the delivery of this across the city, starting with a pilot scheme announced in 2014.

In 2016 20mph speed limits were introduced in three pilot areas, implemented on a 'signs and lines' only basis, with no physical traffic calming measures. This was funded through the Cycle City Ambition Fund (Birmingham Cycle Revolution) programme. The fourth and final pilot area (B2) is currently being implemented; this will mean that about two-thirds of the inner-city area (within a 20-minute cycling time) will now have 20mph limits.

Areas are as follows:

- **Area A1**: City Centre, comprising the whole city centre area inside the ring road (A4540 Middleway)
- **Area A2**: Central East, including Washwood Heath, Bordesley Green & Small Heath
- **Area A3**: Central South, including Balsall Heath, Sparkbrook, Moseley & Kings Heath
- **Area B2**: Central South-West, including Edgbaston, Harborne & Selly Oak

The policy proposed that all residential roads should be 20mph, as well as those with a designated local centre 'place' function or significant local trip attracters. Roads which form part of the city's main distributor highway network and/or accommodate bus routes (mostly classified A and B roads) would remain at their current speed limit, unless local circumstances justified a reduction.

3. 20mph Slower is Safer: Behaviour Change Campaign

The introduction of 20mph speed limits is just one element of a package of measures designed to reduce vehicle speeds. Lowering the speed limit should not be seen as an end in itself, but as part of a continuous process to bring about a change in driver behaviour and attitudes, with the ultimate aim of establishing 20mph as the default maximum speed appropriate for residential areas.

Implementation of new 20mph speed limits in Birmingham has been accompanied by a high-profile publicity campaign to persuade people of the benefits of driving at 20mph on residential roads. This campaign has a city-wide reach, but focusses more intensively on areas where new 20mph speed limits are in place. Under the banner of 'Slower is Safer', this established campaign is working with schools, workplaces and local communities allowing activities to be tailored to local needs and issues. It is being delivered with the support of key partners, including West Midlands Police and West Midlands Fire Service as part of the Birmingham Road Safety Partnership.

The campaign approach draws from social norms theory and the concept of social proof, which centres on the idea that people's behaviour is strongly influenced by the perceived views and behaviour of others around them. If people think that their neighbours are positive about the introduction of 20mph speed limits, then it is far more likely they will adopt a positive stance and comply with this.

Working with partners and communities and linking with existing events, the council has delivered a series of activities for engaging with targeted groups or areas, while also generating stories for press coverage and content for social media. This has ranged from road safety activities with schools and roadside education events aimed at drivers, to led walks or bike rides and 20mph themed stunts. In particular the 'Kids Court' driver education initiative, where speeding drivers were invited into the classroom to speak with children, generated a large amount of media interest and also had a very powerful impact on those involved. To increase the reach of this engagement activity and hopefully achieve greater coverage, a number of 20mph toolkits have been developed to enable schools, employers, residents and community groups to deliver activities in their own localities.

It is not anticipated that the desired change in driver behaviour will be immediate, but that this will be a longer term process that redefines the relationship which motorists have with residential roads. As a behaviour change intervention, the Slower is Safer scheme will be best assessed over a longer period than one year, but there are promising signs from how this is developing in terms of levels of awareness and engagement. Behaviour adaptations to create new social norms can take a number of years, such as previously seen in relation to the wearing of seatbelts and attitudes to drink driving.

4. Enforcement

20mph speed limits are enforceable in the same way as any other speed limit, and the council has had the full support of the police in doing this within resource available to them. 20mph speed limits can be enforced as part of specific roadside activity, using calibrated speed measurement devices, but cannot currently be enforced by speed cameras (fixed or mobile).

Enforcement of new speed limits can be particularly impactful when these are first introduced, and West Midlands Police have supported us with enforcement activity as part of launch events as well as during regular campaigns. Depending on the nature and extent of infringement, drivers are either prosecuted or offered the opportunity to receive roadside education. The latter is in the form of an informal discussion about the rationale behind 20mph limits, following which the driver is handed a tablet computer to watch a 'Talking Heads' video featuring Birmingham school children talking about road danger and the potential impact on them. When questioned, the majority of drivers thought that this roadside education would have a lasting impact on them.

West Midlands Police have also been very active in publicising prosecutions for speeding in 20mph areas through their social media channels. They continue to run regular enforcement campaigns in 20mph areas and as part of one of these this summer (2018) they issued over 300 drivers with a Traffic Offence Report. It is important that people see that these speed limits are continuing to be enforced and with the ongoing commitment from our partners in the police we would expect to see the benefits of 20mph limits further accrue over a number of years.

5. Environmental Impact

The introduction of 20mph speed limits aims to help make our roads safer, which will in turn give people greater confidence to walk or cycle more for local trips. The greatest environmental benefit from changes in speed limits will come from unlocking the potential for walking or cycling instead of driving short distances, reducing emissions and improving the air that we breathe. It has been shown that adopting a smoother driving style can also help, and 20mph limits can encourage drivers to maintain a reduced, steady pace. As 20mph speed limits do not involve any physical traffic calming measures there are no road humps that may increase acceleration and braking related emissions.

With regards to air quality, while there are mixed views as to whether the reviewed evidence suggests that driving at lower speeds causes an increase or decrease in local pollutant emissions, studies tend to agree that in locations where traffic flows are low, such as on residential roads, the impact of a 20mph limit is not detrimental to ambient local air quality.

As part of the baseline study for our 20mph programme, diffusion tubes measured air quality in specific locations, and this process will be repeated as part of the final 3 year evaluation.

6. Monitoring of Vehicle Speeds

A number of roads across the city had their speeds measured before and after the implementation of 20mph speed limits in October 2016. Before (pre-intervention) speed monitoring was carried out between December 2014 and February 2015 and after (post-intervention) speed monitoring was carried out between October and November 2017. The roads were monitored in both directions on weekdays between 7am and 7pm for a full week each time. Some of the roads selected – both inside and outside of the 20mph pilot areas – remained at 30mph and were used as comparison sites.

The measurements used here are the 85th percentile speed, i.e. the speed at or below which 85% of vehicles are observed to travel under free-flowing conditions past a fixed monitoring point. The Association of Chief Police Officers (ACPO) minimum threshold for determining whether there is a speeding problem on a road is if the 85% speed is more than 10% plus 2mph over the legal speed limit, so for a 30mph road this is 35mph and for a 20mph road it is 24mph.

The results from this speed monitoring were analysed in terms of the actual 85% speed recorded and the change (decrease or increase) from before to after the introduction of 20mph speed limits. Changes were classified as being small, medium or large (or no change) using the following criteria:

- Small – less that a 1mph decrease or increase;
- Medium – decrease or increase of between 1mph and 5mph;
- Large – more than a 5mph decrease or increase.

The average 85th percentile speed on roads where a 20mph speed limit was introduced decreased by 1.4mph, from 27.7mph before implementation to 26.3mph afterwards.

Table 1 – average 85th percentile vehicle speed before and after implementation of 20mph limits

Area – roads included	Average Before Speed in mph	Average After Speed in mph	Change in Speed in mph
All new 20mph speed limits	**27.7**	**26.3**	**- 1.4**
A1 – 20mph roads	**27.9**	**26.1**	**- 1.8**
A1 – all roads (including 30mph)	27.8	26.6	- 1.2
A2 – 20mph roads	**27.3**	**27.2**	**- 0.1**
A2 – all roads (including 30mph)	27.6	27.5	- 0.1
A3 – 20mph roads	**27.3**	**25.6**	**- 1.7**
A3 – all roads (including 30mph)	27.6	26.1	- 1.5
20mph zone scheme	**33.8**	**26.8**	**- 7.1**
A1 – existing 20mph road	28.0	28.2	+ 0.2
30mph roads (20mph area)	29.0	29.1	+ 0.1
30mph roads (other areas)	32.1	32.3	+ 0.2
30mph roads (all areas)	31.0	31.1	+ 0.1

Decreases in average vehicle speed varied across the three pilot areas as follows:

- In area A1 it decreased by 1.8mph, from 27.9mph to 26.1mph;
- In area A2 it decreased by 0.1mph, from 27.3mph to 27.2mph;
- In area A3 it decreased by 1.7mph, from 27.3mph to 25.6mph.

In comparison, roads where the speed limit remained at 30mph saw a small average vehicle speed increase of 0.1mph, from 31.0mph to 31.1mph. There was little difference to this figure depending on whether the roads were inside (+0.1mph) or outside (+0.2mph) the 20mph pilot area.

The clear majority (69.1%) of roads where a 20mph speed limit was introduced saw a reduction in their speed. The results show that there were a higher proportion of roads with a decrease in their speed in the 20mph pilot areas than in the comparison sites where there was not any change to the speed limit. This was particularly the case in areas A1 and A3:

- 69.1% of roads in 20mph pilot areas saw a decrease in their speed, compared to 50% of roads in the control group;
- 77.8% of roads in 20mph pilot area A1 saw a decrease in their speed;
- 83.3% of roads in 20mph pilot area A3 saw a decrease in their speed.

Most speed decreases were rated as being either small (18) or medium (23) in extent. This was also the case for most speed increases recorded, both inside and outside of the 20mph pilot areas.

Table 2 - summary of changes (decreases or increases) in vehicle speed on roads monitored

AREA	SPEED DECREASE			NO CHANGE	SPEED INCREASE			TOTAL
	L	M	S		S	M	L	
A1	2	8	4	0	1	3	0	18
	Total = 14 (77.8%)			-	Total = 4 (22.2%)			
A2	0	5	6	2	6	3	2	24
	Total = 11 (45.8%)			(8.4%)	Total = 11 (45.8%)			
A3	2	10	8	1	2	1	0	24
	Total = 20 (83.3%)			(4.2%)	Total = 3 (12.5%)			
20mph zone	2	0	0	0	0	0	0	2
OVERALL	**6**	**23**	**18**	**3**	**9**	**7**	**2**	68
(20mph)	**TOTAL = 47 (69.1%)**			**(4.4%)**	**TOTAL = 18 (26.5%)**			
Control	0	8	7	0	5	10	0	30
Group	Total = 15 (50%)			-	Total = 15 (50%)			

One road (Gibbins Road) included as part of this monitoring was located within a 20mph zone scheme, where physical traffic calming measures were included as part of the intervention. This saw the greatest speed decrease (-7.1mph) of all roads monitored. This is in line with other comparisons nationally between 20mph speed limits and 20mph zones, which show that 20mph zones are more effective in achieving greater reductions in the average speed than 20mph speed limits[1].

However, 20mph zones are much more expensive to implement and as they include physical traffic calming measures such as road humps they can prove unpopular and face resistance, including from the emergency services. While 20mph zones remain a valid option for individual roads where there is an identified problem with traffic speed, they are not suitable as an area-wide intervention.

[1] 20mph Research – Analysis of speed outcomes in 20mph limit areas, Atkins 2017

7. Monitoring of Road Traffic Collision Data

The STATS 19 database is a collection of all road traffic collisions that resulted in personal injury and were reported to the police within 30 days of the incident. Using STATS 19, the City Council regularly monitors, reviews and analyses collision data as part of our efforts to make Birmingham's roads as safe as possible for everyone, especially vulnerable road users.

Road traffic collisions (RTCs) are categorised as resulting in fatal, serious or slight injuries. Those resulting in fatal or serious injuries are often grouped together under the acronym 'KSI' – standing for killed or seriously injured. RTC levels are usually monitored over a three year period, due to the relatively low numbers involved and the potential for a small number of casualties to skew these figures for any one year – especially in relation to KSI data.

Before (pre-intervention) RTC data was captured for the three year period from October 2013 to September 2016. However after (post-intervention) RTC data is only available for one year – from November 2016 to October 2017, so it should be noted that this is what is being compared here. Data has been analysed for residential 'C' and 'U' classified roads, where *most* of the speed limits were reduced to 20mph; and excluding main 'A' and 'B' classified roads, where *most* of the speed limits remained at 30mph.

Table 3 - comparison of collision data from before and after implementation of 20mph speed limits

Area		**Before 20mph speed limit (*annual average for Oct '13 – Sep '16*)**				**After 20mph speed limit (*annual figures for Nov '16 – Oct '17*)**			
		Fatal	Serious	Slight	Total	Fatal	Serious	Slight	Total
A1	Number	0.7	17.3	105.3	123.3	0	8	85	93
					% change:	-100%	-53.8%	-19.3%	-24.6%
A2	Number	0.7	16.0	113.3	130.0	1	9	85	95
					% change:	-50%	-43.8%	-25%	-26.9%
A3	Number	0.7	12.7	76.0	89.3	1	8	66	75
					% change:	-50%	-36.8%	-13.2%	-16.0%
City wide	Number	6.3	149.3	872.3	1,028.0	4	99	655	758
					% change:	-36.8%	-33.7%	-24.9%	-26.3%

Overall, total collisions decreased at roughly the same rate in areas A1 (-24.6%) and A2 (-26.9%) as the city wide figure (-26.3%), but at a slightly lower rate in area A3 (-16.0%).

KSI collisions in areas A1 (-55.6%) and A2 (-40.0%) decreased at a higher rate than the city wide figure (-33.8%), while area A3 (-32.5%) was roughly in line with this.

The pilot areas were partly selected based on the number and severity of RTCs, particularly those involving child pedestrians, so it is pleasing to see that **in areas where collision numbers were higher, KSI figures have decreased at a higher percentage than compared to the city as a whole.**

Future monitoring of RTC data will be able to use figures from a three year period following the introduction of 20mph speed limits, so should help to provide a more robust picture in terms of whether the core objectives of the scheme have been achieved.

8. Comparison with other 20mph schemes

Birmingham is not alone in introducing 20mph speed limit areas; indeed 20mph speed limits have been introduced in a considerable number of urban areas (and some rural ones) across the UK.

Over the last couple of years there have been some encouraging results published by other local authorities from evaluation of their own 20mph programmes, for example:

- In **Bristol**, their 20mph limit evaluation study[2] (Feb '18) found that following 3 years of implementation there had been a reduction of 2.7mph in average traffic speeds, as well as a reduction in the number of road traffic collisions – equating to an estimated cost saving of over £15million per year.

- **Calderdale** Council's Director of Public Health has presented[3] on a 30% reduction in road traffic collisions achieved in the three year period since the introduction of an area-wide 20mph limit in this West Yorkshire district.

9. Further evidence on the impact of 20mph limits

As highlighted in section 6, 20mph limits may not achieve the same extent of speed reduction that 20mph zones can achieve, but that is not to say that they do not bring important benefits:

- It has been shown that a reduction in average speed of just 1mph means that the "accident" rate falls by approximately 5% (Finch et al, 1994[4])

- It is estimated that a 20mph limit can be introduced at just 1/6th of the cost of implementing a 20mph zone. [5]

- The cost of implementing 20mph limits are likely to be much lower than the cost benefits that reduced speeds bring. The cost of a fatality (in 2016) was estimated at £1,841,315, while the figure for a serious injury was £206,912.[6]

Taking the above into account, while an average reduction of 1.4mph in Birmingham may initially seem insignificant, the financial and human benefits resulting from this are in fact considerable. There is also potential for additional benefits from the wider area that can be covered through a policy of 20mph speed limits, such as encouraging more walking and cycling.

There was some concern that 20mph speed limits would cause delays to bus journey times, but National Express, Birmingham's major bus operator, has commented "20mph areas have not had any material effect on bus speeds. It's congestion that massively slows down buses. If 20mph can help cut congestion, then it's good for buses".

[2] http://eprints.uwe.ac.uk/34851/
[3] www.20splenty.org/calderdale20success
[4] https://trl.co.uk/reports/PR58
[5] www.rospa.com/rospaweb/docs/advice-services/road-safety/drivers/20-mph-zone-factsheet.pdf
[6] www.statista.com/statistics/322862/average-cost-of-road-accidents-and-casualties-in-great-britain-uk/

10. Conclusions and recommendations

Although it is still very early to fully assess the impact of the introduction of 20mph speed limits in parts of Birmingham, there are some promising early indications from this policy:

- The average speed on roads where a 20mph speed limit was introduced decreased by 1.4mph, from 27.7mph before implementation to 26.3mph afterwards;
- In areas where collision numbers were higher, KSI figures have decreased at a higher percentage than compared to the city as a whole.

20mph limits require less signage than 20mph zones, and there is no need for physical traffic calming measures[7]. There is a risk this minimal signage approach can undermine the impact and credibility of the scheme. In future, it would be useful to consider additional signage in some locations, along with entry treatments to make more obvious gateways into 20mph areas and further physical measures in collision hot spots. This will need to be balanced with scheme delivery costs and maintenance.

There were some roads which were originally intended to remain at 30mph but were added to roads with a 20mph speed limit following consultation. Some of these roads are now the ones for which the most complaints are received in relation to poor compliance. In future, it may be necessary to consider whether changes to the speed limit here will have the desired impact, or whether there is a need for further physical traffic calming measures at these locations.

While the council remains committed to rolling out 20mph limits to residential roads across the city, we are still in the process of implementing this in identified pilot areas. A full evaluation study will be carried out after three years of implementation, and may well offer even stronger evidence on the impact of 20mph limits in relation to various factors that will be analysed here.

An implementation plan for the city was produced in 2014, but it will be necessary to review this using analysis of up to date collision data to inform future implementation. It will also be necessary to identify budget for further roll-out of 20mph limits. The cost of doing this would be significantly reduced if the Department for Transport introduced a default 20mph speed limit in urban areas. This is something that could have a significant and meaningful impact in reducing crashes and serious injuries[8], and Birmingham is keen to explore the opportunity to pilot this approach.

11. Further information

- **Contact**: Mel Jones, Head of Transportation and Traffic Services
- **T**: 0121 3037758; **E**: mel.jones@birmingham.gov.uk
- www.birmingham.gov.uk/20mph or 'bham20mph' on Twitter and Facebook

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[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523916/DfT-circular-01-2016.pdf

[8] http://www.brake.org.uk/assets/docs/GO20toolkit/GO20-report-sep15.pdf