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Background Paper – Public Health Wales believes that lowering the default speed limit to 20mph in Wales could have substantial public health benefits

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Purpose and Summary of Document:

This document provides the background to our position statement on 20mph speed limits, featuring a review of the available evidence, the policy, regulatory and legislative context, and global perspectives.

1 Introduction

This document provides supporting evidence to the Public Health Wales position statement on 20mph speed limits.

2 Background

Higher vehicle speeds increase the risk of crashing and the severity of any resulting injuries^{1,2}. Pedestrians hit by a car at 30mph are five times more likely to die than those hit at 20mph^{2,3}, with the greatest risk to the young, old and most deprived^{4,5}.

Vehicle speed, and speed limits that are too high, has been argued to be an overlooked Public Health problem⁶. Past setting of speed limits has been arbitrary (urban 30mph speed limits were set in 1934; speed limits in Wales are set in accordance with Welsh Assembly Government Circular 24/2009). Current health related thinking is that speed limits should maximise safety for all road users and minimize costs, including travel time, crashes, noise, air pollution, global warming and road maintenance^{7,8}.

Urban, residential area maximum speeds of 20mph are increasingly being advocated for and implemented to reduce crash and injury risks as well as many of the other negative factors associated with cars; noise and air pollution, physical inactivity, community severance and personal isolation and loneliness^{9,10}.

The current default speed limit in Wales is 30mph and some local authorities in Wales have introduced short 20mph zones, usually outside schools, but these are rarely large enough to contain complete journeys. This means that traffic conditions outside the zone can be a barrier to active travel¹¹.

The Wales Act 2017, which became law in April 2018, gave Wales powers which included setting speed limits¹². Highways Authorities set speed limits at a local level for the roads for which they are responsible.

2.1 Notes

This statement relates to a default 20mph speed limit. 20mph zones usually use traffic calming to force vehicles to slow down. 20mph limits are usually only noted by roadside signs and roundels painted onto the road surface¹³. This document refers to 20mph limits and reduction from 30mph to 20mph.

Elsewhere, the evidence refers to 30kph (18.6mph) and reductions from 50kph (31mph). For simplicity, only 20mph and 30mph are used here.

This paper only considers the public health implications. It does not address issues such as adherence and enforcement.

3 Literature Review

3.1 Road traffic crashes

In Wales, around 100 people die and 6,500 are injured on the roads each year at a total cost of around £500M¹⁴. Half of these injuries occur on 30mph roads (51.9%), with one fifth (19.3%) being pedestrian casualties on 30mph roads. These injuries disproportionately affect the young, the old and those living in the most deprived areas^{4,5}.

Crash risk is directly linked to vehicle speed^{2,4,8} and the risk of fatal pedestrian injury rises from 1% at 20mph to 5.5% at 30mph^{2,3}. Crash risk drops by 2-7% for every 1mph decrease in average speeds¹⁵. Child pedestrians are at greatest risk from higher speeds because they are unable to accurately judge speeds of vehicles travelling at more than 20mph¹⁶.

3.1.1 Effects of reducing speed limits to 20mph on road traffic injuries

In the UK, evaluations of 20mph limits have shown decreases in crashes of 54%(Camden¹⁷), casualties of 20% to 56% (Calderdale – 22%¹⁸, Fife – 20% all casualties, 28% child casualties¹⁹, Portsmouth – 22%²⁰), casualties in the most deprived areas of 26% to 34% (Fife – 34% all casualties, 26% child casualties¹⁹) and cyclists of 40% (Bristol²¹).

Based on methods described elsewhere¹³, crash data for Wales for 2014-16, and an estimated effect size of 25%, it is reasonable to suggest that a default 20mph speed limit could save around six lives per year, prevent 1000 casualties and save the Welsh economy £50M (table 1). A similar study in the north-west of England found that 140 child casualty KSIs could be avoided there with the introduction of 20mph speed limits²².

Table 1:- Estimated road traffic casualty savings following the introduction of 20mph speed limits (method as Jones and Brunt¹³; data updated).

			Fatal	Serious	Slight	Total
Annual averages in 30mph limits (based on 2014-16)		Casualties	23	486	3422	3931
		Costs (£M)	£42.4	£100.5	£54.6	£197.4
25% effect of 20mph limit	Estimated annual averages	Casualties	17	364	2567	2948
		Costs (£M)	£31.8	£75.4	£40.9	£148.1
	Savings	Casualties	6	121	856	983
		Cost saving (£M)	£10.6	£25.1	£13.6	£49.4
4.4% effect of 20mph limit	Estimated annual averages	Casualties	22	464	3271	3758
		Costs (£M)	£40.5	£96.0	£52.2	£188.7
	Savings	Casualties	1	21	151	173
		Cost saving (£M)	£1.9	£4.4	£2.4	£8.7

3.2 Noise

Noise, including traffic noise, has been linked to poor health outcomes ranging from poor sleep to depression and aggression, heart disease and hypertension^{23,24}, as well as affecting the cognitive skills of children^{25,26}.

Transport is the main source of noise pollution, more because of the frequency and length of accelerations, than mean speeds^{1,27}. As a result, it has been argued that reducing speed limits in built up areas would not only reduce noise pollution, but that it is the cheapest way to achieve this^{4,28,29}.

Evidence suggests noise reductions of between 1.7db and 3db if speed limits are cut from 30mph to 20mph^{11,26,30}.

3.3 Public opinion

In 2018, Public Health Wales reported that 76% of the Welsh public (n=1001) supported the introduction of 20mph speed limits to reduce road traffic injuries, with just 12% disagreeing³¹. This was consistent with previous similar findings of 77% and 78% support for residential 20mph limits, rising to 89% around schools^{32,33}.

Where 20mph speed limits have been planned 55% of people supported them (Edinburgh³⁴), but where already introduced, support is generally higher; 88% Bristol²¹, 71% Fife¹⁹, 80% Calderdale (down from 89% pre-introduction)¹⁸.

3.4 Active travel and physical activity

Increased active travel is a Public Health goal and lower urban speed limits have been suggested to promote walking and cycling, particularly for people with limited or restricted mobility³⁵⁻³⁹.

Evaluation has suggested increases in walking and cycling of between 2% and 61% with the introduction of 20mph limits^{19,21,40}.

3.5 Travel to school

Welsh Government are keen to increase walking and cycling to school to increase physical activity levels and reduce personal car use^{41,42}. Recently, active travel to school has declined and car travel increased⁴³. Although not directly related to current data, in the past parents have consistently stated that one of the main reasons that they do not allow their children to walk is traffic danger^{25,44-46}. In addition, when pollution exposures of people walking and cycling have been compared with car travel, generally, exposure inside the vehicle has been found to be higher than that outside⁴⁷.

Reducing residential area vehicle speeds is believed to offer children greater opportunity for physical activity, including walking to school⁴⁸. Current approaches to 20mph tend to cover the area immediately around schools, but this is where there are most child pedestrians and according to critical mass arguments, already safest²⁸. It also means that those walking are only protected from speeding traffic for part of their journey.

To date, there is no evidence demonstrating the effect of reducing speed limits to 20mph on travel to school.

3.6 Air pollution

Air pollution accounts for 6% of attributable deaths, with at least half of this due to traffic^{28,49}. Just as with road traffic injuries, the young and the old are more vulnerable²⁶.

Higher travel speeds increase pollution⁵⁰ and there is evidence that as a result of smoother driving styles, reducing braking and acceleration, improved traffic flow, and possible reductions in fuel consumption, 20mph produces less pollution than 30mph^{29,51}. Acceleration has been suggested to account for 35-55% of all air pollutants in a commuter trip²⁹.

20mph limits have been associated with reductions in hydrocarbons of 10% and NO_x emissions of 25 to 32%²⁹. However, a model has also suggested that 20mph speed limits will cause a 4.1% increase in NO_x, a 2% increase in NO₂ and a 1.6% increase in PM₁₀, assuming traffic flows are maintained at the same level¹¹. Further evidence suggests that lower speed limits will make driving less attractive leading to a switch to other, less polluting forms of transport, leading to improvements in air quality⁶⁹.

Research undertaken in Wales suggested that the effect of reducing speed limits to 20mph could reduce emissions of some, but not all, road transport related pollutants¹³. This research and TEAG⁵¹ concluded that it would be incorrect to assume that 20mph speed limits would be detrimental to ambient local air quality. Local conditions, including congestion, vehicle mix and technological improvements all make it difficult to reach definitive conclusions.

3.7 Safer, healthier, happier communities

There is evidence that 20mph speed limits support greater social inclusion and community cohesion^{11,35}, facilitate community support networks and create a pleasant living environment³⁶ and increase the viability of local businesses^{12,29,53,54}. People who travel to shops on foot have been found to spend more money than those who travel by car^{55,56}.

3.8 Inequalities

Traffic in the most deprived areas travels at a wider range of speeds than traffic in the least deprived areas⁵⁷. This means that the introduction of 20mph speed limits could contribute to the narrowing of inequalities^{11,35,58}.

3.9 Travel times

A perceived cost of lower speed limits is that travel times will increase and reduce productivity⁵⁹, as well as increase commuting and delivery costs. However, lower limits in residential areas have been shown to have minimal effect on individual travel time and to reduce travel times at a societal level^{29,60-1}. The current UK average traffic delay associated with congestion is 3.55 minutes for every 10 miles travelled⁶².

3.10 Return on Investment

In Bristol, the return on investment in terms of health service savings of 20mph speed limits was calculated as £24.72 through increased walking and £7.47 through increased cycling for every £1 spent⁶³.

4 Position of other organisations

4.1 NHS organisations

In Scotland, NHS Greater Glasgow and Clyde and the Glasgow Centre for Population Health jointly supported the Scottish Parliament proposal for a default 20mph speed limit as a significant public health measure, highlighting the benefits of reductions in crashes and casualties⁶⁴. Other benefits cited were encouraging walking and cycling, active travel to school, reduced noise and air pollution, improved liveability and environmental quality for residents, visitors, workers and retailers and the cost savings to health and health services, to local authorities in terms of signage and to motorists following reductions in insurance costs and delays associated with crashes⁶⁴. They also highlighted the need to normalise lower traffic speeds, change the car-dominated culture and encourage more people to walk, cycle and use public transport⁶⁴.

4.2 Wales

In June 2018, the Institute for Welsh Affairs published "Re-energising Wales" about the need for Wales to meet carbon emission targets⁶⁵. To help to achieve this, it recommended that a default 20mph limit in urban areas⁶⁵.

RCPCH Wales⁶⁶ called for 20mph limits in built up areas to create safe places for children to walk, cycle and play.

4.3 UK

NICE, the National Institute for Health and Care Excellence, recommended 20mph speed limits to reduce unintentional injuries to under 15 year olds, to contribute to reductions in obesity, to reduce premature mortality and support improvements in air quality^{58,67,68}.

The Faculty of Public Health (FPH) have called for specific and urgent action in setting 20mph limits for streets used by pedestrians and cyclists^{69,70}, to help to improve the health of the population and reduce health inequalities by encouraging a shift away from car based transport to active travel.

The British Medical Association (BMA) have stated that UK transport policy should include 20mph speed limits⁴.

In 2010, the Association of Directors of Public Health, with the National Heart Forum, Living Streets and Sustrans, called for a default speed limit, for built up areas, of 20mph to reduce health inequalities, encourage active travel, and increase physical activity and social inclusion⁷¹.

Public Health England has highlighted the growing evidence base on the benefits of 20mph speed limits, including the strong public support for 20mph in residential streets⁷².

RoSPA believes that 20mph zones are very effective at preventing injuries and would like to see their wider use in residential areas⁷³.

Brake have called for a default urban speed limit of 20mph⁷⁴.

4.4 International organisations

The European Transport Safety Council has encouraged member states to adopt speed limits of 20mph in residential areas and areas with large numbers of pedestrians and cyclists⁷⁵.

The WHO "Ten Strategies for Keeping Children Safe on the Road"⁹ includes controlling speeds and setting and enforcing maximum speed limits of 20mph on roads with high pedestrian concentrations.

The OECD⁷⁶ and the Global Network for Road Safety Legislators⁷⁷ emphasised that safe speeds are an essential part of the Safe System and that reasonable speed limits are 20mph in built up areas.

4.5 Opinions of key individuals

Professor Danny Dorling was asked to contribute to the British Academy paper "If you could do just one thing... Nine local actions to reduce health

inequalities”³⁵. His suggested intervention was “the implementation of 20mph speed limits where 30mph ones have usually been in place”. His rationale was the reduction in inequalities in road traffic injury rates, the lower risk of serious injury in the event that a crash occurs, reductions in congestion, air pollution and CO2 emissions, stronger communities, increases in walking and cycling and reductions in obesity. He concluded that 20mph speed limits would be a cheap and effective way of improving Public Health and would reduce the wider harms of car use.

5 UK Legislative and Regulatory Context

5.1 Wales

The Well-being of Future Generations (Wales) Act 2015 calls for collaboration to achieve sustainable health and well-being improvements⁷⁸. It encourages the implementation of public health interventions that maximise health gains. Default 20mph speed limits would contribute to achieving all seven goals of the Act (table 3).

5.2 England

The Mayor of London, Sadiq Khan, announced in July 2018 that all Transport for London Roads within the Congestion Charging Zone would have 20mph limits by 2020⁷⁹.

5.3 Scotland

In Scotland, Mark Ruskell, a Green MSP is aiming to make 20mph the default speed limit for Scotland by 2021. This proposal has been drafted and consulted on and the right to introduce a Member’s Bill secured⁸⁰. The Bill is due to be presented to the Scottish Parliament in 2018.

6 Global Perspectives

Germany has 20mph limits on roads in residential areas as standard⁵⁹ and 70% of urban roads in the Netherlands are limited to 20mph⁷⁶. In Japan, speed limits have been decreased from 37mph to 20mph on urban residential streets to reduce traffic crashes⁷⁶.

Table 3: - An assessment of how default 20mph speed limits could support delivery of the Well-Being of Future Generations Act

GOAL	Description	Contribution of 20mph limits to WCFG Act
A prosperous Wales	Innovative, productive, low carbon society. Recognises limits of global environment & uses resources efficiently & proportionately. Develops a skilled & well educated population in an economy which develops wealth & provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work.	Improved motorised traffic flow Increased walking & cycling due to fewer crashes, more time & space between vehicles & reduced fear of speeding traffic Local economies more viable & socially resilient Improved public transport & commercial vehicle flow. Increased productivity with less ill health
A resilient Wales	Nation maintains & enhances a biodiverse natural environment with health functioning ecosystems that support social, economic & ecological resilience & the capacity to adapt to change	As above, & Improved air quality enhancing the natural environment & supporting ecological resilience.
A healthier Wales	A society in which physical & mental well-being is maximised & in which choices & behaviours that benefit future health are understood	As above, & Improved cardio-respiratory health linked to improved air quality Improved general health linked to reduced noise pollution, reduced obesity & increased physical activity due to more active travel & outdoor play Improved mental health linked to all of above.
A more equal Wales	A society that enables people to fulfil their potential	As above, & Reduced inequalities since more deprived areas have greater ranges of traffic speeds & vehicle types.
A Wales of cohesive communities	Attractive, viable, safe & well connected communities	As above & Improved social cohesion & connectedness.
A Wales of vibrant culture & thriving Welsh language	A society that promotes & protects culture, heritage & the Welsh language & which encourages people to participate in the arts, & sports & recreation	As above, & Increased walking, cycling & outdoor play.
A globally responsible Wales	A nation which, when doing anything to improve the economic, social, environmental & cultural well being of Wales takes account of whether doing such a thing may make a positive contribution to global well being & the capacity to adapt to change	As above, & Increased active travel, decreased fossil fuel use and reduced impacts of climate change.

From: Jones and Brunt¹³

7 Conclusions

The road safety benefits of 20mph speed limits alone are sufficient to justify their adoption as the default speed limit. However, the potential public health benefits extend beyond just casualty reduction and include encouraging walking and cycling³⁶ and community benefits in terms of health, wellbeing and social capital^{6,8,35}.

Much of the information presented here is from the grey literature and relates to the implementation of an intervention in different places and different intensities. However, acknowledging that the evidence is less robust than is ideal, the fact that it is all suggestive, at best, of significant health benefits and, at worst, no effect on health, is of note.

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