



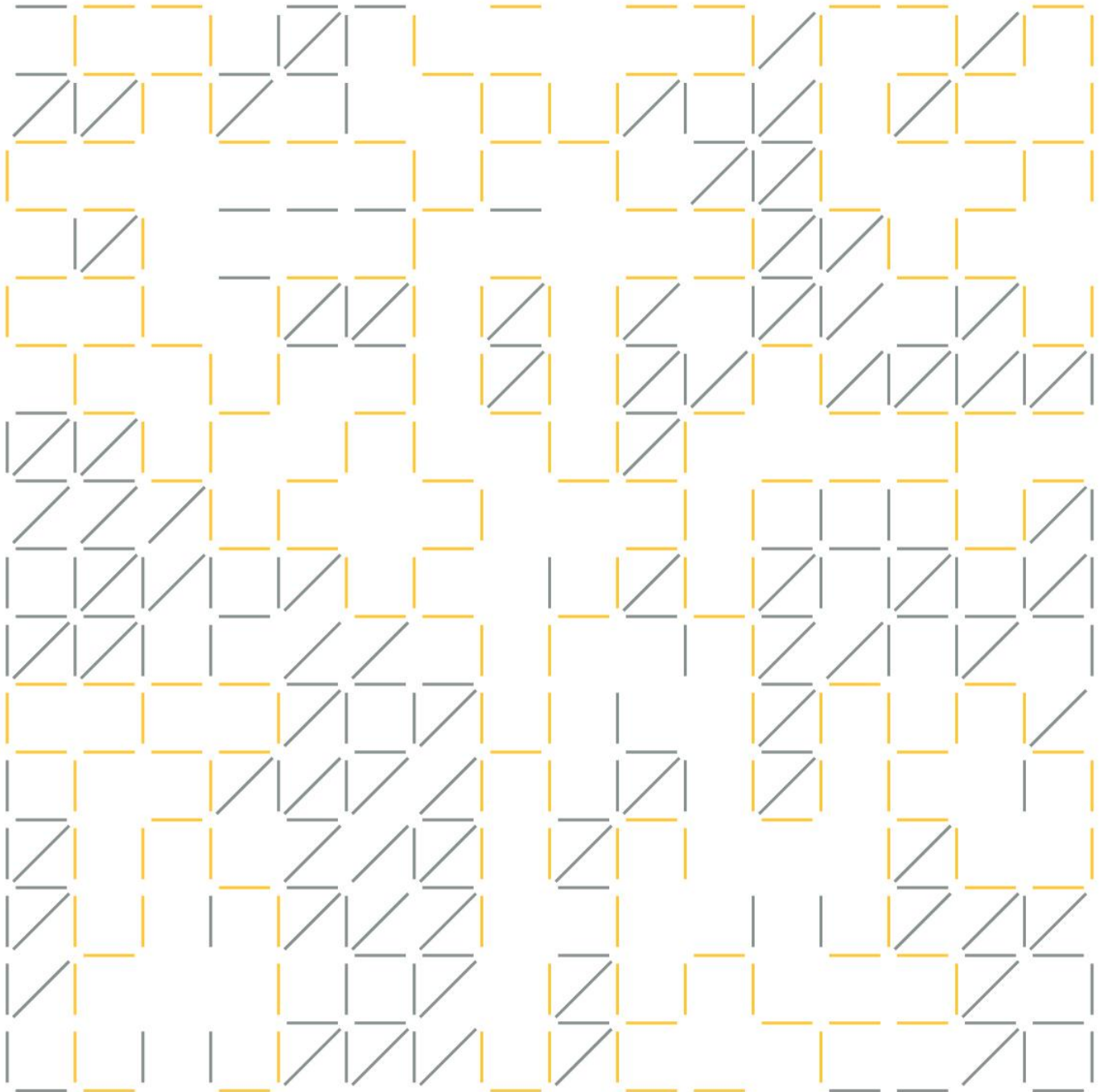
Transport  
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## Transport Research Institute. Technical Paper 101

The value of prevention – casualty reductions in switching from a 30mph to 20mph speed limit default in Wales

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November 2022

## Headlines

The use of 20mph, as part of a Safe Systems approach, is becoming more common across the UK and the rest of the world.

Wales is the first country of the UK to make 20mph the default speed limit and it will become law on 17 September 2023.

A Welsh Government report has estimated the direct costs of introducing the 20mph default to be £32.3M.

This report estimates the casualty savings of 20mph, in the first year alone, to be just over £92M; nearly three times higher than the implementation costs.

However, evidence suggests that the health benefits of 20mph are far, far greater than casualty savings alone. They include increased physical activity, and therefore less obesity, less stress and less anxiety, as well as other health benefits such as reduced noise and air pollution.

## Context

Reducing vehicle speed is one of the four key elements of achieving a “Safe System”. Given that the most harmful road user interactions are in “local” areas where people are often pedestrians and bicycle users (WHO, 2017)<sup>1</sup> many road transport authorities are considering moving the default from 30mph to 20mph (or 50kph to 30kph).

While 30kph has been common practice across many of the mainland European countries since the 1980s, 20mph has only relatively recently, and mostly since 2000, become more commonplace in the UK and in particular through signs-only rather than physical traffic calming (zones). Beyond individual UK towns and cities (e.g. Bristol, Edinburgh Manchester, Portsmouth, Warrington) and most recently over 100 settlements across settlements within Scottish Borders Council’s area, the pace of implementation has been incremental.

Following agreement between the Scottish National Party and Scottish Green Party, Transport Scotland is currently considering the merits and demerits of a national switch compared with increasing the funding available to those local authorities that wish to make the change. This is set out in the National Strategy for 20mph (Scottish Government, 2021<sup>2</sup>) that aims to expand 20mph speed limits across Scotland so that all appropriate roads in built-up areas have the safer speed limit by 2025. By introducing a more consistent approach across Scotland speed limits will be simplified for drivers, but more importantly it aims to provide greater road user equity. It should reduce perceptions of road danger, encourage people to walk, wheel and cycle and create more pleasant streets and neighbourhoods.

In Wales, the legislative process is already underway and the switch from default 30mph to 20mph is due to occur on 17<sup>th</sup> September 2023. An exceptions process has been developed where current 30mph could remain where the movement function is significant and the place function limited/absent. This will be determined by each of the 22 local Councils across Wales. This needs to be based on evidence of effectiveness rather than lobby group pressure, not least given that representative sample surveys show consistent support for 20mph across the UK.<sup>3, 4</sup>

## 20mph and casualty reduction

While the benefits of 20mph speed limits goes well beyond casualty reduction the acute impacts of casualties, including the psychological trauma, is very significant. This is clearly so for the casualties and their relatives and friends, but there is also a significant societal burden in terms of the costs, loss of life, loss of earnings, and substantial costs to health

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<sup>1</sup> [Managing speed \(who.int\)](#) accessed 6<sup>th</sup> September 2022.

<sup>2</sup> [Scottish Government and Scottish Green Party: draft shared policy programme - gov.scot \(www.gov.scot\)](#) accessed 6<sup>th</sup> September 2022.

<sup>3</sup> Beaufort Survey ref needed

<sup>4</sup> British Social Attitudes Survey various years (request made to BSA for the years)

services, possibly including care which may need to remain in place across the rest of the life-course for those with life-changing injuries.

This paper focusses on the likely reductions in costs to society, also known as the value of prevention, as a result of reductions in vehicle speed, consequent reduced kinetic energy in the highway network, and their impact on the number and severity of casualties.

Previous UK studies reporting on the effects of 20mph speed limits on casualties have shown reductions in fatalities, serious and slight injuries.<sup>5, 6, 7</sup> In 2017, Jones and Brunt modelled some of the health effects of a switch from 30mph to 20mph.<sup>8</sup> As part of that work they estimated the value of prevention per road traffic casualty (figure 1), using the Department for Transport’s value of a statistical life costings.<sup>9</sup>

**Figure 1: Method of casualty savings by Jones and Brunt (2017) – based on one year**

**Table 2** Worked example of crash casualty effects calculation (2011 data)

Row		Fatal	Serious	Slight
A	Crash casualties on roads with 30 mph limit	24	514	4851
B	Estimated value of prevention, per casualty	£1 888 195	£211 608	£19 578
C	Estimated value of prevention 30 mph crash casualties $C=A*B$	£45 316 680	£108 766 512	£94 972 878
D	Casualties avoided by implementing 20 mph limits—42% of actual casualties $D=A*0.42$	10	216	2037
E	Estimated value of 20 mph limits in Wales in 2011 $E=D*B$	£19 033 005.6	£45 681 935.0	£39 888 608.8
F	Total cost savings $F=E_{fatal}+E_{serious}+E_{slight}$	£104 603 549.4		

<sup>5</sup> Bornioli, A., Bray, I., Pilkington, P., Parkin, J. 2020 Effects of city-wide 20mph (30km/hour) speed limits on road injuries in Bristol, UK, *Injury Prevention*, 26: 85-88. doi:10.1136/injuryprev-2019-043305

<sup>6</sup> Atkins, 2010 Interim Evaluation of the Implementation of 20mph speed limits in Portsmouth. London: Department of Transport.

<sup>7</sup> City of Edinburgh Council, 2022. Evaluation of the 20mph Speed Limit Roll Out – Three Years Post-Implementation. 18<sup>th</sup> August.

<sup>8</sup> Jones, S., Brunt, H. 2017 Twenty miles per hour speed limits: a sustainable solution for public health problems in Wales, *Journal of Epidemiology and Community Health*, doi:10.1136/jech-2016-208859

<sup>9</sup> See [ras60002.ods \(live.com\)](https://ras60002.ods.live.com) accessed 24<sup>th</sup> August 2022.

## Updating of cost savings / benefits

We have now revised this 2017 paper for Wales for the three years 2017 to 2019. For the categories Killed, Seriously Injured, and Slight we have applied the Department of Transport's 'average values of prevention'. Drawing on studies published both before and since Jones and Brunt (2017) we have applied a figure of 40% attribution to 20mph in reducing the number and severity of casualties instead of 42% as per Jones and Brunt above, in order to maintain conservative estimates. A post intervention assessment study for the city of Bristol reported a fatality rate reduction of 63% after the implementation of 20mph limits across the city.<sup>10</sup>

## Value of prevention / benefit v Implementation costs

A Regulatory Impact Assessment commissioned by the Welsh Government as part of the preparatory work for default 20mph in Wales calculated direct costs as £32.3M.<sup>11</sup> At the debate ahead of the Senedd vote on 12 July, numerous comments about these costs were made, including that the money could be "better spent" elsewhere.

These analyses suggest that, in road traffic crash casualty savings alone, the benefits, over a three-year period, are between eight and nine times higher than the costs of implementation (£275.8M). **Road crash casualty savings in the first year alone are almost three times the implementation costs** (Figure 2).

The value of prevention over a 30 year period, is a typical time period for Cost Benefit Analysis as used by the Department for Transport and the Welsh Government (WebTAG and WelTag).<sup>12</sup> From casualty reductions alone the saving is clearly a major benefit for society in not having to pay for the multiple costs attendant with road traffic crashes, hospital care and any longer term care, nor the loss of earnings from premature deaths and injuries.

**However, the calculations presented here are a gross over-simplification and under-representation of the health benefits, and value of these, of the introduction of 20mph as the default speed limit. Applying a "monetary" value to the other health benefits is impossible, but we know from previous studies that 20mph encourages more walking and cycling and in doing so improves cardio-respiratory health, as well as reducing stress and anxiety, thereby improving mental health. With more walking and cycling comes less car use, improving air quality and therefore improving health. All of these benefits accumulate in addition to those monetised above, but still grossly underestimate the vast range of potential benefits from the implementation of 20mph and the interactions between lowered speeds, better health and well-being, health care spending, commercial benefits, social benefits and the climate emergency.**

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<sup>10</sup> Bornioli, A., Bray, I., Pilkington, P., Parkin, J. 2020 op cit

<sup>11</sup> Welsh Government, 2022 Welsh Government Regulatory Impact Assessment (RIA): 20MPH Speed Limit Policy. Cardiff: WG.

<sup>12</sup> See [TAG overview - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/tag-overview) accessed 13<sup>th</sup> September 2022.

**Figure 2: Update of Jones and Brunt (2017) – 2017 to 2019**  
**Costs based on 2018 DfT estimates; table RAS60001**

<b>Per three years*</b>				
Row		Killed	Serious	Slight
A	Crash casualties on roads with a 30mph limit (2017 to 2019)	89	1775	7236
B	Estimated value of prevention, per casualty, 2018 pricing	1,958,303	220,058	16,964
C	Estimated value of prevention, for 30mph speed limits, C=A*B	174,288,967	390,602,950	122,751,504
D	Casualties avoided by introducing 20mph limits - 40% of actual casualties	36	710	2894
E	Estimated value of 20mph limits in Wales 2017-2019, E=D*B	70,498,908	156,241,180	49,093,816
F	Total cost savings (£M), F=E <sub>killed</sub> + E <sub>serious</sub> + E <sub>slight</sub>	275.833,904		
<b>Per annum*</b>				
Row		Killed	Serious	Slight
A	Crash casualties on roads with a 30mph limit avg pa	30	592	2412
B	Estimated value of prevention, per casualty, 2018 pricing	1,958,303	220,058	16,964
C	Estimated value of prevention, for 30mph speed limits, C=A*B	58,749,090	130,274,336	40,917,168
D	Casualties avoided by introducing 20mph limits - 40% of actual casualties	12	237	965
E	Estimated value of 20mph limits in Wales 2017-2019, E=D*B	23,499,636	52,153,746	16,366,867
F	Total cost savings (£M), F=E <sub>killed</sub> + E <sub>serious</sub> + E <sub>slight</sub>	92,020,249		

\*Some figures are rounded

### **Addendum**

We have corrected an error in the casualty numbers for 30 mph speed limit roads for the period 2017-2019 which then impacted on calculations for the value of prevention for killed, serious and slight. The overall impact has been a small reduction in these values although the overall impact remains so that the value of prevention is nearly three times higher than the implementation costs.

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