



# Submission to the Scottish Parliament re blanket 20mph urban speed limit proposals

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This note is based on a joint submission by the Alliance of British Drivers and Eric Bridgstock to an inquiry by the REC Committee of the Scottish Parliament in 2019.

## 20mph - ROAD SAFETY

### INTRODUCTION

The recently published Atkins AECOM/Maher 20mph research study<sup>[1]</sup> is equivocal on the road safety effects of 20mph limits; while being broadly supportive of the concept, evidence gathered and analysed to date provides little evidence of casualty reductions greater than (and in some cases actually inferior to) those achieved on average nationally on roads retaining the current default 30mph limit. Also, poor compliance is very likely where the appropriate supporting road engineering is absent.

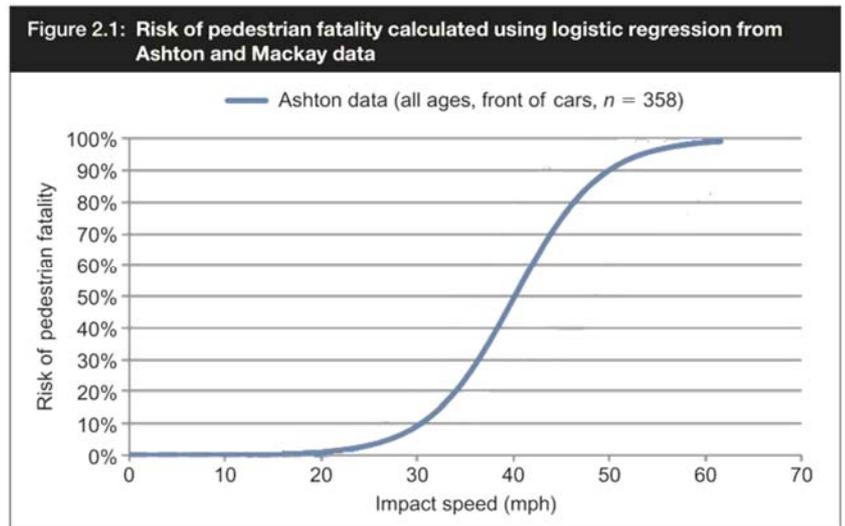
"... Based on the evidence available to date, this study has found no significant change in collisions and casualties, in the short term, in the majority of the case study areas (including the aggregated set of residential case studies). While some individual case study areas show a reduction in collisions/ casualties, when background trends are accounted for, these results are based on very small sample sizes and it is not possible to attach any confidence to their significance."<sup>[2]</sup>

### FAILURE OF 20MPH TO DELIVER THE CASUALTY REDUCTIONS ANTICIPATED BY SOME

In 2009, much was made of a 22% reduction in all injuries in Portsmouth, attributable to introducing 20mph speed limits, even though that was actually worse than the national trend when adjusted for traffic volume. Less was said about their increase in serious injuries by 57% (89 to 143) in 2011.

ABD proffers the following reasons for the failure of 20mph to reduce casualties:

- Vulnerable road users are given the perception that 20mph zones are safer than 30mph areas and behave less cautiously in them, while actual speeds are typically reduced by perhaps 1-2mph
- Drivers have to devote a more attention to speedometer-watching to keep below 20mph. This increased workload degrades driver observation, hazard perception and hazard response<sup>[3]</sup>
- A distracted driver striving to maintain 20mph is more likely to collide with a vulnerable road user at 20mph than an observant one travelling at higher speed, who is able to brake to reduce impact speed and/or take evasive action
- Only 2% of UK adult and 0.6% of UK child pedestrian casualties are fatalities
- From the Ashton-Mackay<sup>4</sup> curve, right, the average impact speed of UK RTAs involving pedestrians is already typically 20mph or lower.



<sup>1</sup> 20mph Research Study Highlight & Full Reports to DfT by Atkins, AECOM & Maher, UCL, November 2018.

<sup>2</sup> Highlight 20mph Research Study Report to DfT by Atkins, A ECOM & Maher, UCL, November 2018; p.64: under "Early Safety Outcomes"

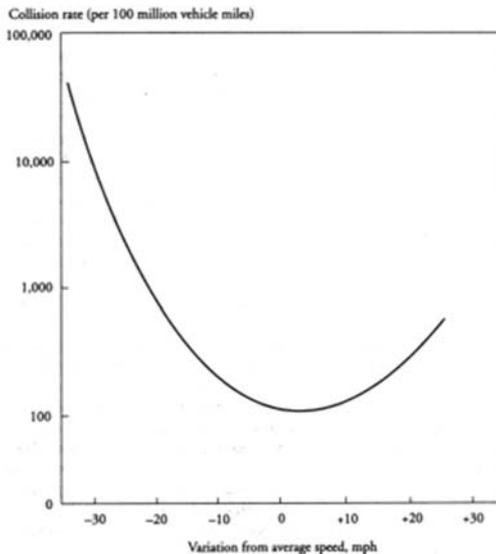
<sup>3</sup> University of Western Australia study: Vanessa K. Bowden et al. Lowering thresholds for speed limit enforcement impairs peripheral object detection and increases driver subjective workload, Accident Analysis & Prevention (2017). DOI: [10.1016/j.aap.2016.09.029](https://doi.org/10.1016/j.aap.2016.09.029)

<sup>4</sup> [https://nacto.org/docs/usdg/relationship\\_between\\_speed\\_risk\\_fatal\\_injury\\_pedestrians\\_and\\_car\\_occupants\\_richards.pdf](https://nacto.org/docs/usdg/relationship_between_speed_risk_fatal_injury_pedestrians_and_car_occupants_richards.pdf); p.12.

## RELATIONSHIP BETWEEN SPEED AND COLLISIONS

It is often quoted that a 1mph reduction in mean speed brings a 5% reduction in risk or number of collisions, or some similar figure. That is self-evidently invalid - it would mean that a reduction of mean speed from, say, 70mph to 50mph would remove all risk ( $20\text{mph} \times 5\% = 100\%$ ), which is clearly not the case.

This claim stems from report TRL421<sup>[5]</sup>, which expressed this sort of relationship between speed and collisions but, crucially, never identified a causal link, undermining its credibility.



Further, a report by Goran Nilsson<sup>[6]</sup> making similar claims is often misquoted. It states that the conclusions were based on slower speeds but all other factors unchanged (i.e. no change to speed limit, no enforcement, etc.). Changes of speed limit, enforcement, etc. invalidate its application.

Most drivers (85% traditionally) will travel in accordance with the conditions for the safety of all road users. Forcing lower speeds introduces hazards which are never accounted for. Slower speed does not automatically imply safer - see Solomon Curve<sup>[7]</sup>, left.

## THE CONTRIBUTION OF OTHER FACTORS

Reports of 20mph schemes sometimes include some examples where switches to 20mph were *associated with* reductions in collisions or casualties "significantly greater than would otherwise have been expected".

It is often convenient to associate introduction of 20mph with casualty reductions better than local or national trend but those reductions have invariably been brought about by engineering changes (e.g. junctions, crossings), changes in traffic volume, regression to the mean, etc. Indeed those reductions could well have been greater had the speed limit not been reduced.

## ANALYSIS OF AN ACCIDENT/COLLISION

In all walks of life, safe is defined as being *free from harm to people*; or given that few things (and especially roads or transport in general can ever be totally safe) safe is defined as *presenting an acceptable level of risk of harm to people*.

To make roads safer, we must reduce risk to road users, with success measured in the level of casualties. Preventing casualties/collisions requires an understanding of what causes "accidents" in the first place.

The recipe for an accident involves a **hazard (or hazardous condition)** AND a **triggering event**. A hazard could be a sharp knife in the washing-up bowl, or a football on the stairs. No accident will occur if no-one puts their hand in the bowl, or uses the stairs (they would constitute **triggering events**).

In road safety, **hazards** can originate in the:

1. driver - tired, drunk/drugged, poor eyesight, using phone
2. vehicle - dirty/misted windows, not properly lit at night, badly maintained
3. weather conditions or time of day - fog, snow/ice, darkness, twilight, bright sun, high winds
4. road layout - unfamiliar, confusing, missing signs, too many signs
5. other road users - vehicles, cyclists, pedestrians, animals.

<sup>5</sup> The effects of drivers' speed on the frequency of road accidents, Taylor, Lynam, Baruya, TRL421, 2000

<sup>6</sup> Traffic Safety Dimensions and the Power Model to Describe the Effect of Speed on Safety, Goran Nilsson, 2004, ISSN 1404-272X

<sup>7</sup> Accidents on main rural highways related to speed, driver, and vehicle, David Solomon, 1964

Triggering events are numerous and varied: misjudgement, poor observation, lapse of concentration, unsignalled manoeuvre, an act of aggressive driving, vehicle failure, falling asleep, and so on.

The combination of hazard and triggering event initiates an accident sequence, which will become an accident unless something can prevent it. An accident sequence, once started, can be stopped or mitigated by the actions of those involved, crash barriers, seatbelts, air-bags, crumple zones, ABS, etc. or simply luck (eg. you fall asleep and drift across the road but awaken before meeting any oncoming traffic).

Road safety will be improved by removing/reducing hazards or preventing triggering events.

*Does 20mph remove hazards?*

- Speed limits encourage lawful drivers to drive at, or below, that speed
- So is a lawful driver exceeding a speed limit a hazard? If that were the case, then simply lowering a speed limit would immediately make vehicles "hazardous" that were previously not hazardous - that is obviously illogical, since the number on a sign has negligible bearing on the accident scenario
- Any moving vehicle is hazardous to some degree, and that hazard may vary with speed but, in terms of speed alone and within the scenarios we are considering, there is no threshold that would be recognised as intolerable.

Conclusion: 20mph does not remove hazards (or have any measurable positive effect on them).

*Does 20mph remove triggering events? Simply NO.*

In fact, it can introduce *events*, since pedestrians and cyclists can be lulled into a false sense of safety and can take less care when using the road. Slower speeds can also reduce driver concentration levels.

Conclusion: 20mph does not make roads safer - it actually makes them less safe.

#### ECONOMIC BENEFIT of 20mph?

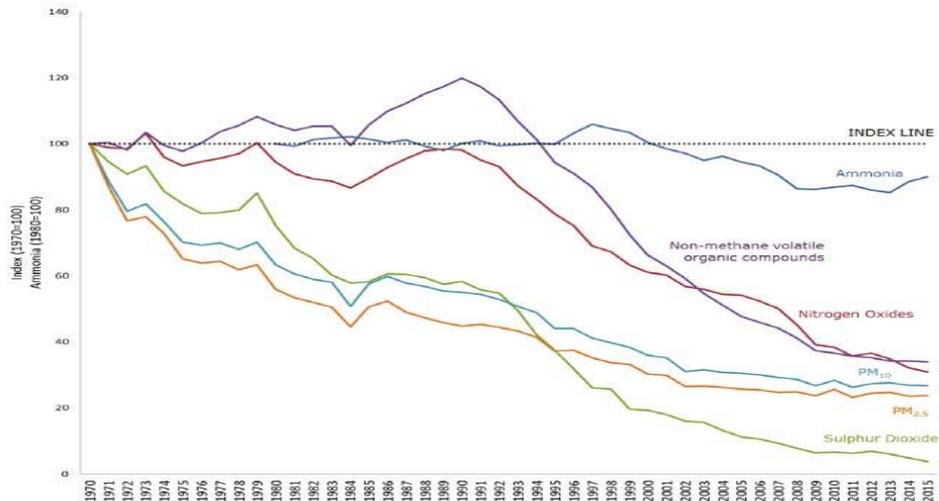
It is often claimed that although reducing speed limits might not reduce the number of collisions, it might reduce the severity of injuries (or deaths might become serious injuries and serious injuries become slight ones). There may therefore be substantial economic benefits as the costs of personal injury accidents can be substantial.

However this benefit is likely to be very small as the reduction in average traffic speed from imposing a 20 mph speed limit is minimal. In reality in the real world 20-mph schemes tend to reduce average traffic speeds by less than 2 mph and it's often less than 1 mph.

## 20mph - URBAN AIR QUALITY

UK outdoor air quality has actually been steadily improving for over 40 years.

Emissions time-series figure reproduced below, with permission from a *Local Transport Today* article authored by Mr. P. Dobson (LTT726; 07-20/07/2017, p.20).



The index line is a comparator that shows the level of emissions if they had remained constant from the beginning of the time series.

Legal limits for various vehicular/industrial emissions including nitrogen oxides and particulates (NO<sub>2</sub>, NO<sub>x</sub> and PM<sub>2.5</sub>/ PM<sub>10</sub>) are being continually tightened.

The urban London average level is 14 µg/m<sup>3</sup>. Of that 14µg/m<sup>3</sup>, 7µg/m<sup>3</sup> (±c.2 µg/m<sup>3</sup> due to natural variability) is the global average background, exposure to which is unavoidable even in the Amazon rainforest<sup>[8]</sup>.

If all vehicle traffic were removed from our roads, air pollution would fall by only 2µg/m<sup>3</sup>.<sup>[9]</sup>

But aren't 40,000 people a year dying because of poor urban air quality? Categorically NOT....

Sadiq Khan's figure on pollution deaths is a "zombie statistic and it's simply not true", according to respiratory physician (& former government adviser), Professor Tony Frew.

[The 40,000 typical lifespans lost is a purely statistical construct to try to alarmingly portray the *estimated* average 3 days of life lost by everyone in the UK - if air pollution were the *only* factor influencing life expectancy. But nowadays (courtesy of the fossil-fuel driven economy) people are living years longer, not days shorter! Lifespan correlates much more strongly with wealth than air pollution levels]

"[Urban] Pollution levels are illegal because we made it illegal, not because it's dangerous..." <sup>[10]</sup>

The latest COMEAP (Committee on the Medical Effects of Air Pollutants) research has been unable to substantiate any link between NO<sub>x</sub> & mortality. <sup>[11,12]</sup>

<sup>8</sup> <http://talkradio.co.uk/news/sadiq-khans-40000-pollution-deaths-year-zombie-statistic-and-isnt-true-says-respiratory/>

<sup>9</sup> Tony Frew (Professor of Respiratory Medicine, Royal Sussex Health, in discussion with journalist Andrew Neil on "Sunday Politics" 18th January, 2016: <https://subsaga.com/bbc/news/sunday-politics/2016/12/18.html#transcript> - Timeline 25m:34s to 39m:02s

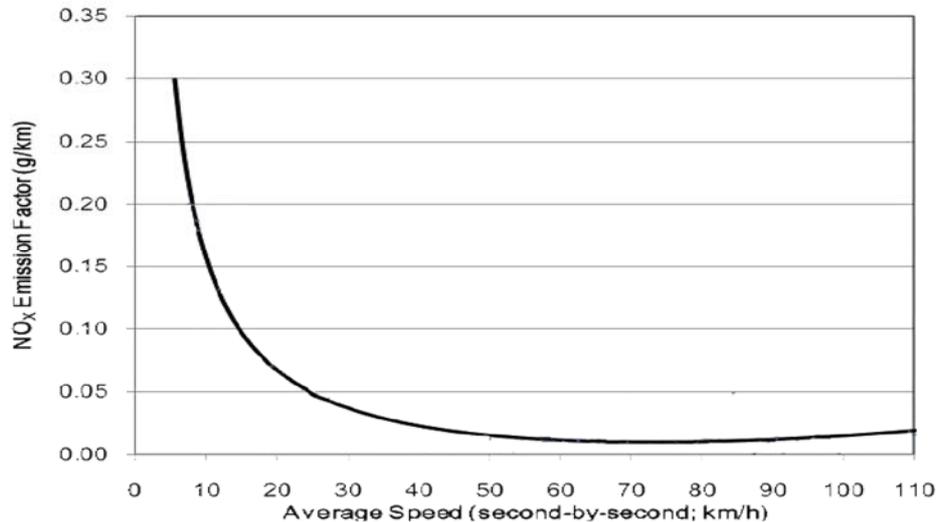
<sup>10</sup> <https://subsaga.com/bbc/news/sunday-politics/2016/12/18.html#transcript> - Timeline 25m:34s to 39m:02s.

<sup>11</sup> <https://www.gov.uk/government/publications/nitrogen-dioxide-effects-on-mortality/associations-of-long-term-average-concentrations-of-nitrogen-dioxide-with-mortality-2018-comeap-summ>

<sup>12</sup> <https://www.gov.uk/government/publications/nitrogen-dioxide-effects-on-mortality>

However, central and local government transport policies have for several decades been aimed at slowing urban traffic speeds towards a standstill <sup>[13]</sup>. This has negated 45 years of progress on vehicle emissions reduction while facilitating the creation of urban vehicle emissions “hotspots”:

Will slowing down urban traffic further improve air quality? The following graph suggests not.



Emissions vs. vehicle speed schematic.

Similar curves apply for all vehicle emissions. See: "London Exhaust Emissions Study - Developing a test programme and analysis of emissions data from passenger cars in London", Transport for London; graphs on pages 18-31.

It's evident from the preceding graph (and the earlier TfL reference) that further reducing average urban traffic speeds can only serve to increase overall emissions; and to worsen existing air quality hotspots and, potentially create new ones.

## 20mph - THE ECONOMY

Speed limit reduction proposals never take account of the associated wasted productive time penalty. The recent 10kph limit reduction on French rural roads reduced average speed by 4.4kph, yielding no tangible casualty reduction improvement. It deflated the French rural economy by 3.8Bn€ per annum<sup>14</sup>.

<sup>13</sup> London average traffic speed was recently reported to be 11mph (roughly 18kph). See ... [http://www.thisislocalondon.co.uk/news/804876.london\\_cars\\_move\\_no\\_faster\\_than\\_chickens](http://www.thisislocalondon.co.uk/news/804876.london_cars_move_no_faster_than_chickens)

<sup>14</sup> <https://www.thenewspaper.com/news/66/6628.asp>