

## Literature Summary Regarding 20mph Zones and Air Quality

---

The results from research examining the impact of 20mph zones on air quality have been varied, with contestation regarding the significance of the impact in reducing emissions. However, Williams (2013) points out that it would be incorrect to assume a 20mph speed restriction would be detrimental to ambient local air quality, due to the range of effects on vehicle emissions. The volume and concentration of emissions produced is influenced by driving style, the type of emission and vehicle, road infrastructure and existing traffic management. These factors increase the complexity of quantifying the impacts of 20mph zones on air quality.

Promoting steady driving speeds can help reduce emissions. Emissions may increase in 20mph zones as vehicles use more fuel to accelerate between calming measures, for example speed humps and pedestrian crossings. However, TfL (2018) report that in 20mph zones vehicles move smoother with fewer accelerations and decelerations, thus producing no net increase in emissions. A smoother driving style can be achieved through using speed limits and average speed technology on the roadside, as well as real-time driving speed information (Vardoulakis et al., 2017).

Although some studies could not conclude whether 20mph zones had any significant impacts on air quality (Owen, 2005; Cleland et al., 2020), other studies noticed that different emission types were affected by 20mph zones. TfL (2018) produced an evidence summary regarding the impact on vehicle speed. The report highlights that petrol and diesel cars observe different changes in emission types when driving at 20mph and 30mph. Petrol cars release 8.3% less  $PM_{10}$  when driving at 20mph. However, petrol cars saw an increase of nitrous oxide and carbon dioxide emissions when driving at the lower speed. Diesel cars, on the other hand, observed a decrease in all three types of pollutants when driving at 20mph (Williams, 2013).

Additionally, local air quality depends upon the number of vehicles using a road. It is therefore possible that in some situations the amount of traffic using a particular road could be reduced following the introduction of a speed limiting scheme (Atkins 2010). 20mph zones can make pedestrians and cyclists feel safer, which can encourage more people to participate in active travel, rather than using a car for shorter journeys. This will have indirect positive effects on local air quality if there are fewer cars on the road (Jones and Brunt 2017).

Davis (2018) undertook a literature review of evidence about 20mph speed limits with regards to road safety, active travel, and air pollution impacts. They concluded that the limited literature is consistent with small improvements in air quality, but the methodological strength of research makes the evidence weak. A rapid evidence review undertaken by Atkins, AECOM, and Maher (2018) found similar conclusions to Davis (2018) and noted that exhaust emissions are difficult to quantify due to other associated factors found in 20mph zones. They stress that methodologies should be continually improved to be able to come to more significant conclusions about the impact 20mph limits have on air quality.

Overall, it is challenging to conclude the direct impacts 20mph zones have on air quality. Emissions are influenced by several factors, including driving style, engine type, and road infrastructure. However, there can be indirect impacts as more people could be encouraged to participate in active travel options, thus reducing the number of cars on the road. Future recommendations include enhancing methodologies and ensuring that existing and new 20mph zones have regular data monitoring to help assess impacts.

#### References:

Atkins, AECOM, Maher M. 2018. 20mph Research Study. [20mph research study: supporting technical appendix, rapid evidence review \(publishing.service.gov.uk\)](#)

Atkins and Portsmouth City Council. 2010. Interim Evaluation of the Implementation of 20 mph Speed Limits in Portsmouth, Department for Transport.

Cleland, C., McComb, K., Kee, F., Jepson, R., Kelly, M., Milton, K., Nightingale, G., Kelly, P., Baker, G., Craig, N., Williams, A., Hunter, R. 2020. Effects of 20mph interventions on a range of public health outcomes: A meta-narrative evidence synthesis. *Journal of Transport and Health*. 17.

Davis, A. 2018. The state of evidence on 20mph speed limits with regards to road safety, active travel and air pollution impacts: a literature review of evidence. Bristol: Adrian Davis Associates.

Jones, S., Brunt, H. 2017. Twenty miles per hour speed limits: a sustainable solution to public health problems in Wales. *Journal of epidemiology and Community Health*. 71(7).

Owen., B. 2005. Air quality impacts of speed-restriction zones for road traffic. *Science of the Total Environment*. 340(1-3), pp. 13-22.

TfL. 2018. Speed, emissions, and health: The impact of vehicle speed on emissions and health: an evidence summary.

Vardoulakis., S., Kettle, R., Cosford, P., Lincoln, P., Holgate, S., Grigg, J., Kelly, F., Pencheon, D. 2017. Local action on outdoor air pollution to improve public health. *International Journal of Public Health*. 63. pp. 557-565.

Williams, D. 2013. An evaluation of the estimated effects on vehicle emissions of a 20mph speed restriction in central London. Transport and Environmental Analysis Group, Centre for Transport Studies, Imperial College London