Professor Adrian Davis submission of 10 October 2022

PE1944/C: Enforce engine idling ban

Headline: Localised education and promotion programmes to discourage idling by parent/carers close to schools have had limited impact in terms of improvements in air quality. City-wide or national-wide banning of idling combined with fear of fines, and environmental awareness appear to be most effective. The petition is supported on the basis of scientific evidence.

Detail

Air pollution has a major negative impact on society, and idling engines are a contributor to air pollution. During idling, petrol vehicles emit a minimum amount of nitrogen oxides (NO_x) and negligible particulate matter (PM). Petrol vehicles consume far more fuel at an hourly rate than their diesel counterparts during idling. Higher NOx and comparatively larger PM are produced by diesel vehicles than petrol vehicles on average during idling.[i] Health costs resulting from exposure to air pollution totalled more than £20 billion and contribute to approximately 40 000 deaths per year (at 2016 estimates).[ii]

Highway Code Rule 123 addresses 'The Driver and the Environment', stating that drivers must not leave a parked vehicle unattended with the engine running or leave a vehicle engine running unnecessarily while the vehicle is stationary on a public road. The RAC says most instances of idling engines come from 'avoidable' road situations such as waiting to pick someone up outside a workplace or school. However, fines are imposed only if a motorist refuses to switch off their engine when asked to do so by an authorised person. RAC research found that 26% of those caught idling are spotted doing so outside schools.[iii]

Previous attempts to address vehicle idling through public education have had some limited success. For example, a campaign targeting idling in school parking lots in one Canadian suburb resulted in a 34% decline in the number of vehicles observed idling while waiting, and a decrease in the average amount of time spent idling from 3.7 to 2.5 minutes.[iv] The long term effectiveness is unknown. If rolled out nationally, however, the researchers note that there would be significant air quality and Greenhouse Gas emission (GHG) reductions. Other research has found that anti-idling campaigns are

effective in reducing PM2.5 and carbon and particle number concentrations at schools with significant amounts of passenger cars and buses – so long as campaign lasts.[v, vi] In the UK, a large-scale field experiment assessed the effectiveness of three interventions (outcome efficacy, self-regulation, and social norm messages) designed to decrease engine idling.[vii] The researchers observed whether the drivers turned off their idling engine while waiting, and also recorded air quality at the railway crossings. Three messages were trialled:

> *Social norm message:* "Join other responsible drivers in Canterbury. Turn off your engine when the barriers are down"
>
> *Outcome efficacy message:* "Turn off your engine when the barriers are down. You will improve air quality in the area"
>
> *Self-regulation message:* "Think about your actions. When the barriers are down please turn off your engine"

The social norm and outcome efficacy messages reduced engine idling rates compared to baseline by up to 42%. The self-regulation message only led to small variations. These behavioral changes translated into a reduction in $PM_{2.5}$ concentrations while drivers were waiting for barriers to rise at railway crossings. Hence, this research demonstrated that using psychologically relevant messages on road signage can successfully reduce engine idling and improve air quality.

The Taiwanese government adopted an idling reduction policy in 2011 to curb GHG emissions from motorized vehicles.[viii] The policy states that parked vehicles, excluding those waiting at red lights, shall turn off their engines after 3 minutes. Evidence found that the most important factor influencing minimal acceptable time before switching off the engine, after fear of being fined, was environmental perceptions.

Note that a recurring issue is that short-term campaigns mean that effects of messages decay within weeks of campaigns ending. This is a risk where there is no enforcement or longer term programme.

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[i] Shancita, I., et al 2014. A review on idling reduction strategies to improve fuel economy and reduce exhaust emissions of transport vehicles, *Energy Conservation & Management*, 88: 794-807.

[ii] Royal College of Physicians, Every breath you take, London: RCP.

[iii] Engine idling - why it's so harmful and what's being done | RAC Drive accessed 07/10/2022

[iv] Carrico, A., et al, 2009. Costly myths: An analysis of idling beliefs and behaviour in personal motor vehicles, *Energy Policy*, 37(8): 2881-2888.

[v] Ryan, et al. 2013. The impact of an anti-idling campaign on outdoor air quality at four urban schools, *Environmental Science: Processes and Impacts,* 15: 2030-2037.

[vi] Ryan, P. et al 2013.

[vii] Abrams, D., Lalot, F., Hopthrow, T. et al 2021 Cleaning up our acts: Psychological interventions to reduce engine idling and improve air quality, *Journal of Environmental Psychology*, 74: 101587

[viii] Jou., R-C., Wu, Y-C., Liu, J-L., 2014. Minimum acceptable time for turning off idling engines: Evidence from Taiwan, *Transport Research Part D: Transport & Environment*, 30: 62-71.