

Early retirement of old vehicles won't save the planet, says study

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Lifespan caps for passenger vehicles have limited effect on reducing greenhouse gas emissions and could drive up costs and material use, finds a new study published in *Environmental Research: Infrastructure*

and Sustainability. The research shows that although light-duty vehicles (LDVs) contribute 17% to the annual greenhouse gas emissions in the United States, imposing a 15-year lifespan cap on LDV fleets under a business-as-usual scenario will not lead to any meaningful reductions in GHG emissions.

To combat delayed uptake of electric vehicles (EVs), some have argued for limits on the [vehicle](#)'s serviceable years, called a lifespan cap. However, this study finds that lifespan caps to drive the adoption of EVs could amplify some of the negative effects of EVs, including increased usage of critical materials and increased ecotoxicity related to battery production. Also, the costs of accelerated EV deployment are estimated to be very high and often exceed current estimates for the social costs of carbon.

According to the study, lifespan caps are only effective when implemented alongside complementary strategies, such as electricity grid emissions intensity reductions, vehicle fuel consumption improvements, and vehicle production emissions reductions to boost the GHG emissions benefits, while reducing abatement costs.

The team, led by researchers at the University of Toronto, used the Fleet Life Cycle Assessment and Material Flow Estimation (FLAME) model, coupled with comprehensive cost calculations and sensitivity analyses for electric vehicle survival curves and battery degradation, to evaluate the effectiveness and cost-efficiency of vehicle lifespan caps in reducing the GHG emissions of LDV fleets in the US.

Heather MacLean, Professor at the Faculty of Applied Science and Engineering at the University of Toronto, says, "Lifespan caps can be a powerful tool to accelerate the benefits of new vehicle technologies, particularly when it comes to reducing GHG emissions; however, they can also accelerate the costs. Our results show that while they may be

suitable in some situations, [lifespan](#) caps are best positioned as part of a larger integrated strategy for tackling transportation GHG emissions."

More information: Are vehicle lifespan caps an effective and efficient method for reducing US light-duty vehicle fleet GHG emissions?, *Environmental Research Infrastructure and Sustainability* (2024). [DOI: 10.1088/2634-4505/ad397e](https://doi.org/10.1088/2634-4505/ad397e)

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