Should Uber and Lyft be electrifying more vehicles?

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Professor Jeremy Michalek and his Ph.D student Matthew Bruchon have published a study investigating what vehicle electrification would look like in a world where ridesourcing companies like Uber and Lyft were

held responsible for the air pollution and carbon emissions created by their business.

Ridesourcing has changed the way people travel, affecting air emissions in the process. Researchers like those at the Center for Air, Climate and Energy Solutions (CACES) have quantified the negative health effects of airborne particulates created by cars in rates of cardiovascular and respiratory disease, and they're also the largest source of greenhouse gasses in the US. With public sector fleets such as the US Postal Service and many private companies moving to shrink their footprint, the Engineering and Public Policy EPP researchers asked what would happen if ridesourcing companies were charged for the costs resulting from the emissions their business creates.

"Air pollution is a classic case where free markets fail," says Michalek. "I get the benefit of driving my car, but the cost of the air pollution it creates is shared with everyone in my region. The conventional way to efficiently correct for this failure is to charge the polluter for the cost its pollution imposes on society so that it has an incentive to reduce pollution when it is cost effective to do so. We wanted to see the effects of such a policy for ridesourcing fleets like Uber and Lyft."

To do so, they first estimated the societal impact of emitted greenhouse gasses and conventional pollutants in terms of higher medical costs and premature deaths in surrounding communities, as well as the broader economic and environmental costs. With these numbers in hand, the team created a model that envisioned how ridesourcing companies might act were they forced to internalize these public costs via an emissions-based fee.

Perhaps unsurprisingly, they found that when companies like Uber and Lyft are charged for the cost of polluting, they find ways to pollute less, including shifting from traditional conventional vehicles to cleaner

hybrid electric vehicles (HEVs) and battery electric vehicles (BEVs). While electrified vehicles have a higher cost in initial capital, their lower operating costs and cleaner environmental profile are well-suited for high use-intensity scenarios like ridesourcing.

To their credit, companies like Uber have already acknowledged the need to electrify the US automotive fleet. Uber and Lyft have pledged to shift to 100% electric vehicles by 2030, and the ridesourcing firms have initiated programs like Uber Green, which allows users to request a hybrid or electric vehicle and rewards drivers with an extra $0.50 from a $1 rider surcharge. The company is also testing programs in major cities to allow Uber drivers to rent EV's.

However, the rate of electrification motivated by private interests today cannot compare to the rate that they might achieve were ridesourcing companies forced to factor in the public costs of increased emissions. Michalek and Bruchon found that with an emissions-based incentive towards electrification, ridesourcing companies would likely cut their emissions by amounts ranging from 10 percent in New York to 22 percent in Los Angeles. In LA alone, they estimate that this represents a reduction of about $29 million per year in health and environmental costs.

While good work is being done by both public and private interests to push for electrification, greater public awareness and stable policy are still needed to internalize the public costs created by private vehicles, including ridesourcing. Doing so will provide greater incentive to eliminate the harmful externalities for our community and environment, and create a cleaner, more efficient vehicle fleet.

More information: Matthew B. Bruchon et al, Effects of Air Emission Externalities on Optimal Ridesourcing Fleet Electrification and Operations, *Environmental Science & Technology* (2021). DOI:

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