

Maia Allen

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### Economic Analysis of SB17-278

Senate Bill 17-278 intends to discourage the alteration of personal motor vehicles to remove or tamper with pollution control systems, and in general, to prohibit engagement in nuisance exhibition of motor vehicle exhaust. Nuisance exhibition of motor vehicle exhaust is defined under the bill as knowingly emitting soot, smoke, or other particulates from a motor vehicle.

The bill only applies to motor vehicles less than fourteen thousand pounds, which would include personal motor vehicles. Presumably, most incidents of nuisance exhibition of exhaust are a result of personal pleasure by misuse of personally owned vehicles. By limiting the legislation to apply to motor vehicles under fourteen thousand pounds, it eliminates ambiguity with larger vehicles that emit normal diesel exhaust that could be mistaken as nuisance exhaust while targeting the presumable offenders.

The bill would impose a fine of thirty five dollars to anyone who tampers with pollution control systems, or who operates a vehicle that has been tampered with. In addition, the bill would penalize anyone who knowingly releases motor vehicle exhaust in a manner that creates a hazard to other drivers, cyclists, or pedestrians with a one hundred dollar fine. Overall, the bill aims to curb excessive exhaust and pollution.

Motor vehicle exhaust can be thought of as an externality. In economics an externality is defined as any action taken by one agent that directly affects the well-being of another not through a transaction. In other words, an externality is a consequence of some action that impacts people other than the actor. Emissions of excessive motor vehicle exhaust impose social costs on society as a whole and can be thought of as negative externalities. Major environmental, health, and safety costs arise from the actions defined in the bill, yet the offender does not bear all of the costs.

This type of externality is defined as a non-pecuniary externality, meaning that the interaction between those who create excessive exhaust and those affected by the smoke occurs entirely outside the market. Non-pecuniary externalities are best corrected by turning them into market transactions. This can be done by raising the costs of polluting activities through fines or taxes such that the actor pays not only his private cost of the actions, but the total social cost of the actions.

Internalizing non-pecuniary externalities into the market creates a new supply and demand equilibrium. In the new market, the offender pays the normal costs associated with altering a pollution control system or emitting black smoke (these costs include the cost of gas, time spent altering a vehicle, etc.), and he also pays the social cost which is accomplished by levying a fine or a tax. Meanwhile, the rest of society bears the cost of the externality, but at a lesser quantity as the higher price of the negative actions incentivize the offender to pollute less.

Determining a quantitative number for the total social cost of pollution is quite difficult. Many effects have to be considered to determine an appropriate amount. Even if all variables are accounted for there is still quite a bit of ambiguity. Some efforts have been put into estimating

social costs attributed to particulate air pollution, and they suggest that these costs are not small. These estimates range from \$267 billion to \$885 billion annually.<sup>1</sup> If all 7.5 billion people on earth contributed uniformly to particulate air pollution, damages per capita would range from \$35.60 to \$118.00 per year. These numbers do not include the safety risks associated with lost visibility due to black smoke, so we can expect an even greater number for the actual cost. However, it is plausible that individuals who knowingly release excessive exhaust are contributing significantly more to the total amount of particulate air pollution and cause a greater per capita social cost. The Colorado General Assembly can correct this externality within the State by fining individuals at least more than \$35.60.

Difficulty in assessing the social costs implies that there will be difficulty in determining an appropriate fine amount to discourage all offenses defined in the bill. Large social costs imply that the fines imposed on creating unnecessary exhaust need to be substantial. Any fine amount will correct at least some externalities outside of the market and is preferable to the status quo. However, the quantitative analysis suggests that the fine needs to be much greater than \$35.60 at the minimum and perhaps even greater than \$118.00.

The government is the only authority that can correct non-pecuniary externalities by internalizing them into the market. Thus, the State has a responsibility to correct externalities when they arise. Senate Bill 17-278 would fulfill this responsibility, and should be passed to benefit the general welfare.

The bill would benefit from further improvements however. Large social costs and relatively small private costs of pollution imply that fines associated with pollution should be

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<sup>1</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2553058/>

high. Since those who tamper with pollution control systems in their vehicles presumably intend to produce excessive pollution repeatedly, there should be a much higher fine associated with the action. A \$35 fine is not satisfactory and needs to be increased significantly to correct the externalities associated with tampering with pollution control systems.

SB17-278 will certainly benefit the general welfare of the State. In the future the General Assembly should look to establish more legislation that seeks to internalize non-pecuniary externalities, especially with regard to pressing environmental issues. This can easily be done by levying higher taxes on oil and gas, or creating fines to discourage other anti-environmental behavior. Meanwhile, the General Assembly can promote a healthier, and safer society by passing SB17-278.