

Abstract: This thesis investigates the cost-effectiveness of different environmental policies in the automobile market. The first part of the thesis focuses on the cost-effectiveness of “Mandatory Vehicle Inspection and Maintenance” programs. The results predict that the marginal abatement cost for a major representative program (the Ontario Drive Clean program) is so high that even a small reduction in the abatement target leads to substantial social cost savings. Furthermore, even for relatively high levels of the abatement target, the optimal minimum testing age is substantially higher and the frequency of testing is much lower than what is common in many jurisdictions. The second part of the thesis looks at the cost-effectiveness of the market-based incentives in automobile market. The results suggest that a higher price of gasoline shifts vehicle holdings towards more fuel efficient vehicles and also reduces annual demand for miles traveled, whereas changes in vehicle prices have little to no impact on annual demand for miles traveled and only shift vehicle holdings. Furthermore, achieving any abatement target through a wide range of fees and/or tax on miles driven is more expensive than a tax on gasoline. The only exceptions are fees on new fuel inefficient vehicles and the Feebate program, where vehicles with low fuel efficiency are charged fees and vehicles with high fuel efficiency receive rebates. However, the maximum amount of abatement that can be achieved by these are relatively small.

Abatement Cost Function, Vehicle Inspection and Maintenance Programs, Mobile Source of Air Pollution, Disaggregate Demand for Miles Traveled, Discrete/Continuous Model