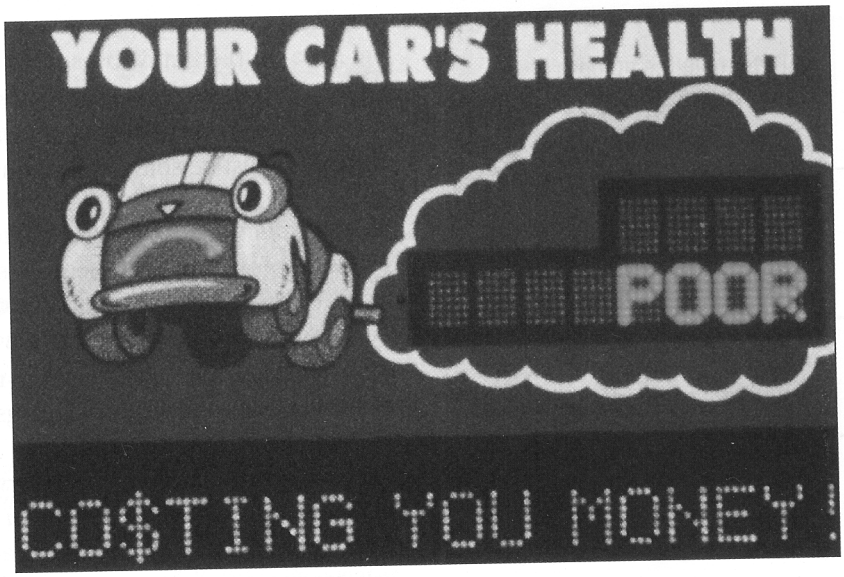
Roadside Pollution Detector

Dr. Donald Stedman, a chemist at the University of Denver, has developed a device that monitors exhaust emissions on highways.

The pollution detector sits on the side of a highway and shines a beam of infrared light across the road. After the beam passes through a car's exhaust fumes, it strikes a rotating mirror on the other side of the highway, which reflects the light onto four different sensors. These sensors detect changes in the infrared beam, and then each sensor uses that information to make different measurements. One detector gauges the amount of carbon dioxide in the exhaust. The second calculates the amount of carbon monoxide. A third sensor measures the amount of hydrocarbons, which contribute to the production of smog.

A car driving down the highway will break the infrared beam, then an exhaust reading is taken after the car passes for half a second to ensure that the beam measures data from the middle of the exhaust fumes.



A carbon monoxide rating of higher than 4.5% gets a poor rating on the display.

Stedman put the detector into action on a highway exit ramp in Denver. The device gives every car that drives by an emissions rating and automatically displays the rating on a nearby billboard. If less than 1.3% of the car's exhaust is carbon monoxide, it earns a "good" rating. A rating of less than 4.5% carbon monoxide receives a "fair" rating. A rating higher than 4.5% is a "poor" rating. Stedman has found that the billboard not only informs people that their cars are polluters but also motivates the drivers to get their cars fixed.

Stedman has determined that only a small percentage of cars are responsible for automobile pollution. In fact, half of all the pollution from automobiles is created by about 10% of the cars on the road.

Stedman adds that the drivers will share the economic benefits of cleaning up their act. "If you have a gross-polluting car," he says, "you will save the amount of money that the repair might cost you in your fuel economy in a couple of years because you get a tremendous 10 to 15% fuel-economy improvement by fixing a gross-polluting car."

1. *How does Dr. Stedman think his device will benefit society?*
2. *Why do you feel Dr. Stedman's research is important?*

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