

Fuel economy up, but consumption up even more

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(Phys.org) —Although vehicle fuel economy has improved 40 percent since 1970, the total amount of fuel used has increased by more than half, says a University of Michigan researcher.

Using data from the U.S. [Department of Transportation](#) from 1970 to 2010, Michael Sivak of the U-M Transportation Research Institute examined the impact of changes in vehicle fuel economy, distance traveled and vehicle load (number of occupants) on [fuel consumption](#) and the potential effects of future changes on reductions of fuel used for personal transportation.

Sivak found that during the 40-year period, vehicle distance traveled increased 155 percent overall, but because vehicle load fell 27 percent, occupant distance traveled rose only 84 percent.

Vehicle fuel economy (of the entire fleet of light-duty vehicles) improved from 7.7 gallons/100 miles to 4.6 gallons/100 miles. However, because of the decrease in vehicle load, occupant fuel economy improved by just 17 percent.

"As a consequence of the changes in vehicle fuel economy, vehicle distance traveled and vehicle load, the total amount of fuel used increased by 53 percent," Sivak said.

Looking forward, Sivak said that a 20 percent improvement in fuel economy for the entire [vehicle fleet](#) would result in an 18 percent drop

in the amount of fuel used—due to a [rebound effect](#) in which about 10 percent of the gain in fuel economy would be lost due to an increased amount of travel.

"Importantly, however, changes in fuel economy of [new vehicles](#) take a long time to substantially influence the fuel economy of the entire fleet," he said. "This is the case because it takes a long time to turn over the fleet. Consequently, an 18 percent reduction in fuel used by vehicles purchased in a given year—due to a 20 percent improvement in their fuel economy—would result in only about a 1 percent reduction of the fuel used by the entire fleet.

"The required long lead time to substantially influence the fuel economy of the entire fleet has been used to argue that policy emphasis should be on reducing vehicle distance traveled through an increased fuel tax—which would have an immediate fleet-wide effect."

More information: [deepblue.lib.umich.edu/bitstre ...
.42/96632/102926.pdf](https://deepblue.lib.umich.edu/bitstream/handle/2026.1/96632/102926.pdf)

Provided by University of Michigan

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