

Fuel Economy

With the price of gasoline at over \$3.50 a gallon the fuel economy of vehicles is becoming more and more important. The Environmental Protection Agency (EPA) rates each make and model of vehicle sold in the United States with a City and Highway miles per gallon. These EPA ratings are derived from tests on special machines called dynamometers that simulate City and Highway driving. In 2002 the U.S. Senate considered comprehensive energy legislation. Senators John McCain and John Kerry proposed raising the Corporate Average Fuel Economy (CAFÉ) standard for cars and trucks. In 2004, American cars needed to achieve an average fuel economy of 27.5 miles per gallon (MPG) while light trucks needed to achieve an average fuel economy of only 20.5 miles per gallon (MPG).

Data Collection: A simple random sample of 36 vehicles was taken from the data file 2004 New Car and Truck Data (04cars.dat) that appears on the *Journal of Statistics Education Data Archive* (www.amstat.org/publications/jse/jse_data_archive.html).

Who? 36 vehicles.

What? Fuel economy as defined as the average of City MPG and Highway MPG.

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|------|------|----|------|------|------|----|------|------|------|------|------|
| 26.5 | 24.5 | 25 | 25 | 24.5 | 23 | 21 | 21.5 | 24 | 21 | 23.5 | 20.5 |
| 17 | 22 | 22 | 22 | 22 | 21 | 20 | 25 | 22.5 | 19.5 | 19.5 | 16 |
| 22 | 29 | 18 | 18.5 | 17.5 | 23.5 | 24 | 23 | 22.5 | 25.5 | 18 | 22.5 |

- Why is the average fuel economy a meaningful summary for these sample data?
- What other summaries would be helpful in describing these sample data?
- What do these data tell you about the fuel economy for new cars and trucks in 2004?
- Do you think that cars and trucks in 2004 were meeting the CAFÉ standard of 24 MPG? How would you support your answer to this question statistically?
- If you were to purchase a 2004 car or truck, what are reasonable values for the fuel economy for the vehicle you purchase?