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**FUEL-ECONOMY DISTRIBUTIONS OF  
PURCHASED NEW VEHICLES IN THE U.S.:  
MODEL YEARS 2008 AND 2014**

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FUEL-ECONOMY DISTRIBUTIONS OF PURCHASED NEW VEHICLES  
IN THE U.S.: MODEL YEARS 2008 AND 2014

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16. Abstract  We have recently shown that the average EPA-rated fuel economy of purchased, new, light-duty vehicles in the U.S. improved from 20.8 mpg for model year 2008 vehicles to 25.3 mpg for model year 2014 vehicles. This report provides information about the changes in the sales-weighted distributions of fuel economy for the same model years. The findings indicate that the improvements are also present throughout the distributions of vehicle fuel economy. For example, (1) 22.2% of model year 2008 vehicles had fuel economy lower than 16.0 mpg, as compared with only 3.2% of model year 2014 vehicles, and (2) only 1.3% of model year 2008 vehicles had fuel economy of 32.0 mpg or higher, as compared with 16.7% of model year 2014 vehicles.					
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## **Introduction**

For the past several years, we have been monitoring (on a monthly basis) the EPA-rated fuel economy of new, light-duty vehicles sold in the U.S. Our data (Sivak and Schoettle, 2015) start with October 2007 (the conventional beginning month of model year 2008 vehicle sales), and currently go through January 2015.

Our recent analysis has shown that the average fuel economy of light-duty vehicles improved from 20.8 mpg for model year 2008 vehicles to 25.3 mpg for model year 2014 vehicles (Sivak and Schoettle, 2015). This report provides information about the changes in the sales-weighted distributions of fuel economy for the same model years.

## **Method**

The distributions of fuel economy were calculated from the monthly sales of individual models of light-duty vehicles (cars, SUVs, vans, and pickup trucks) and the combined fuel-economy ratings (i.e., window-sticker ratings) published in the EPA Fuel Economy Guide for the respective models (EPA, periodically updated).

Vehicles purchased from October 2007 through September 2008 were assumed to be model year 2008, and those purchased October 2013 through September 2014 were assumed to be model year 2014. The fuel-economy information was available for 99.6% of vehicles purchased.

For cases in which the EPA Fuel Economy Guide contained multiple fuel-economy ratings for a vehicle model, the average of these ratings was used (without regard to sales figures for each specific engine or vehicle-model variant). Additionally, for very low sales-volume manufacturers (e.g., Ferrari, Rolls-Royce, etc.), all vehicle models for that manufacturer were aggregated and one average fuel-economy rating was calculated. Analogously, the sales figures for such manufacturers and models were also aggregated.

## Results

Table 1 and Figure 1 provide distributions of vehicle fuel economy for each model year in 1-mpg steps. Table 2 and Figure 2 show the corresponding distributions in 3-mpg steps. Figure 3 and Table 3 document the cumulative distributions.

The improvement in fuel economy from model year 2008 to model year 2014 is evident in each table-and-figure pair. The main findings can be illustrated in two ways. The first way is to compare the percentages of vehicles not reaching or exceeding a given fuel economy. Here are two such examples, one from each tail of the distributions:

- For model year 2008 vehicles, 22.2% had fuel economy lower than 16.0 mpg; the corresponding percentage for model year 2014 vehicles was only 3.2%.

- For model year 2008 vehicles, only 1.3% had fuel economy 32.0 mpg or higher; the corresponding percentage for model year 2014 vehicles was 16.7%.

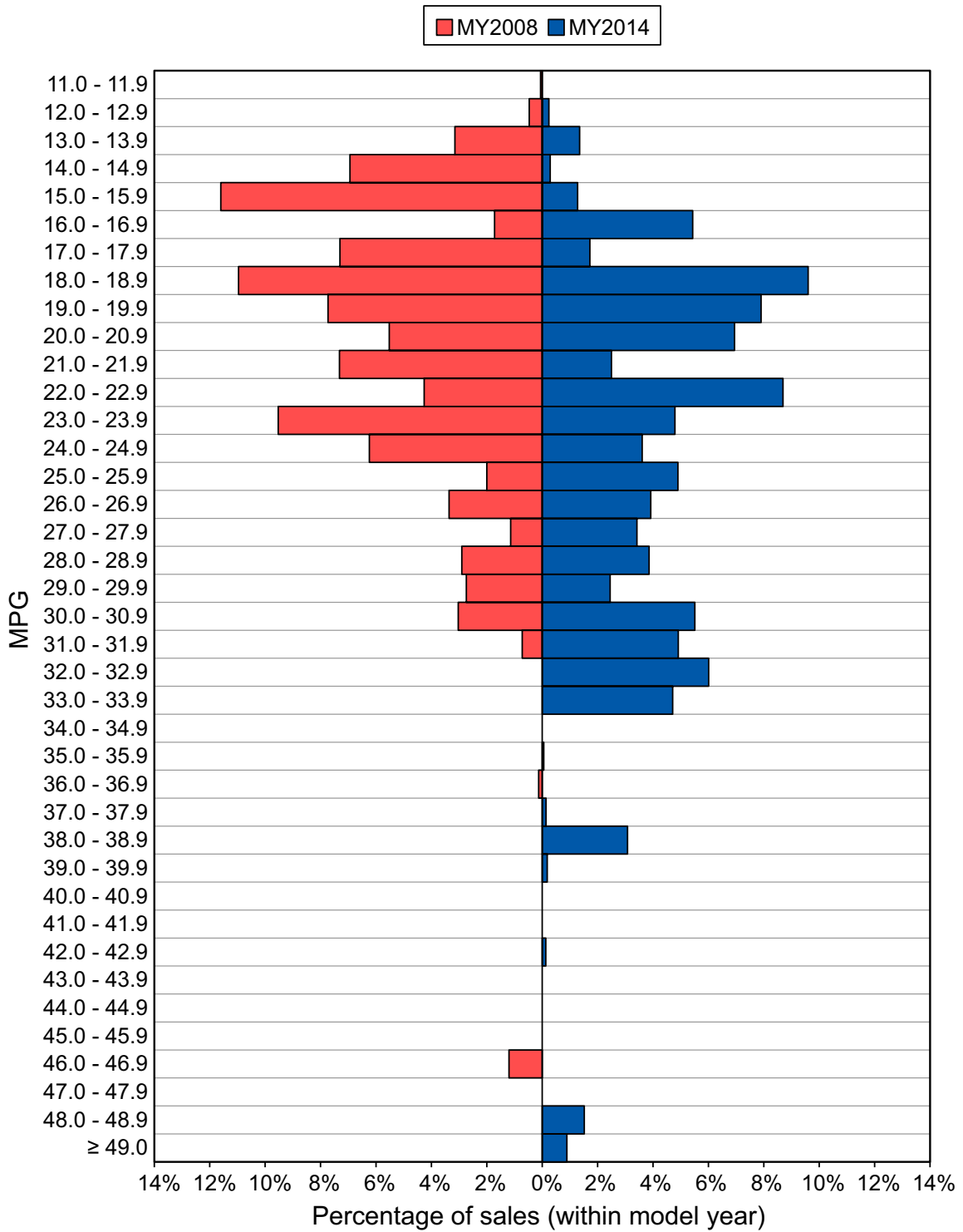
The second way to illustrate the main findings is to compare the fuel economy at a given percentile of the distributions. Here are two such examples, one from each tail of the distributions:

- 25% of model year 2008 vehicles had fuel economy of 17.0 mpg or lower, compared with 19.4 mpg for model year 2014 vehicles.

- 25% of model year 2008 vehicles had fuel economy of 23.8 mpg or higher, compared with 30.4 mpg for model year 2014 vehicles.

Table 1  
Distributions of vehicle fuel economy in 1-mpg steps for model years 2008 and 2014.

MPG	2008	2014
11.0 - 11.9	<0.1%	-
12.0 - 12.9	0.5%	0.2%
13.0 - 13.9	3.2%	1.4%
14.0 - 14.9	6.9%	0.3%
15.0 - 15.9	11.6%	1.3%
16.0 - 16.9	1.7%	5.4%
17.0 - 17.9	7.3%	1.7%
18.0 - 18.9	11.0%	9.6%
19.0 - 19.9	7.7%	7.9%
20.0 - 20.9	5.5%	6.9%
21.0 - 21.9	7.3%	2.5%
22.0 - 22.9	4.3%	8.7%
23.0 - 23.9	9.5%	4.8%
24.0 - 24.9	6.2%	3.6%
25.0 - 25.9	2.0%	4.9%
26.0 - 26.9	3.4%	3.9%
27.0 - 27.9	1.1%	3.4%
28.0 - 28.9	2.9%	3.9%
29.0 - 29.9	2.7%	2.5%
30.0 - 30.9	3.0%	5.5%
31.0 - 31.9	0.7%	4.9%
32.0 - 32.9	-	6.0%
33.0 - 33.9	-	4.7%
34.0 - 34.9	<0.1%	-
35.0 - 35.9	-	<0.1%
36.0 - 36.9	0.1%	-
37.0 - 37.9	-	0.1%
38.0 - 38.9	-	3.1%
39.0 - 39.9	-	0.2%
42.0 - 42.9	-	0.1%
46.0 - 46.9	1.2%	-
48.0 - 48.9	-	1.5%
52.0 - 52.9	-	0.3%
62.0 - 62.9	-	0.2%
71.0 - 71.9	-	0.1%
81.0 - 81.9	-	<0.1%
84.0 - 84.9	-	<0.1%
92.0 - 92.9	-	0.1%
112.0 - 112.9	-	<0.1%
115.0 - 115.9	-	0.2%



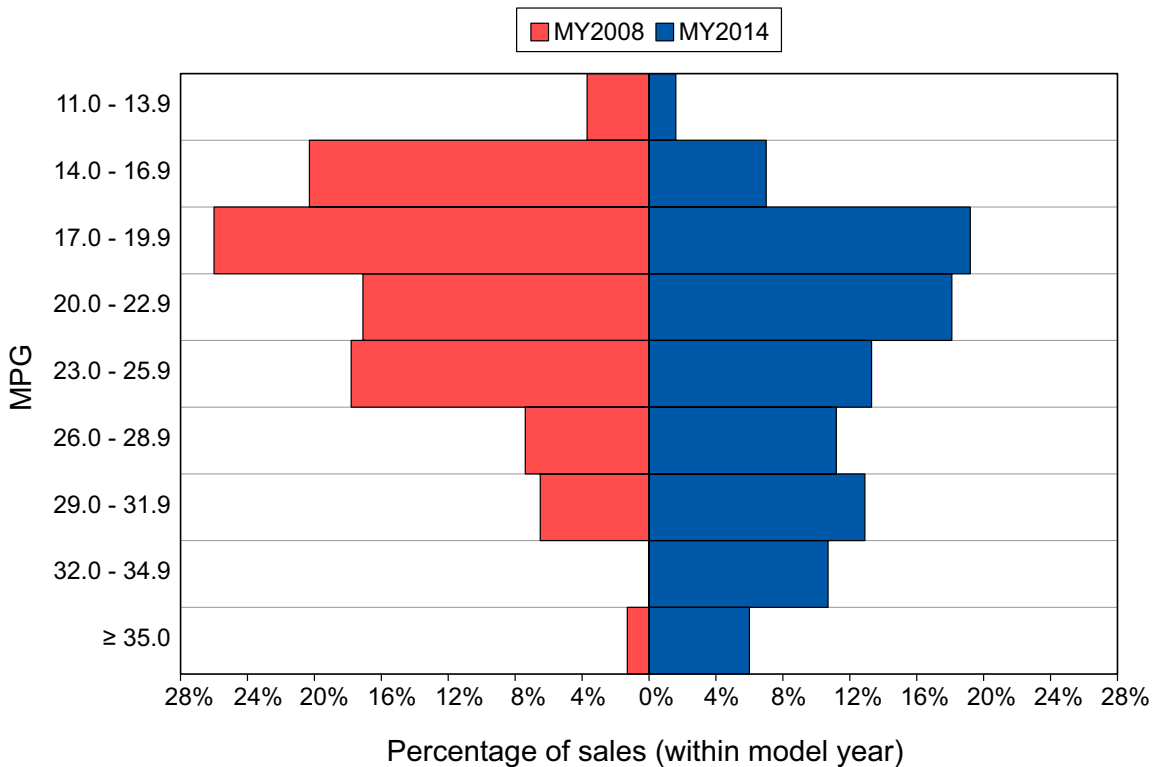
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Figure 1. Distributions of vehicle fuel economy in 1-mpg steps for model years 2008 and 2014.



Table 2  
Distributions of vehicle fuel economy in 3-mpg steps for model years 2008 and 2014.

MPG	2008	2014
11.0 – 13.9	3.6%	1.6%
14.0 – 16.9	20.3%	7.0%
17.0 – 19.9	26.0%	19.2%
20.0 – 22.9	17.1%	18.1%
23.0 – 25.9	17.8%	13.3%
26.0 – 28.9	7.4%	11.2%
29.0 – 31.9	6.5%	12.9%
32.0 – 34.9	<0.1%	10.7%
≥ 35.0	1.3%	6.0%



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Figure 2. Distributions of vehicle fuel economy in 3-mpg steps for model years 2008 and 2014.

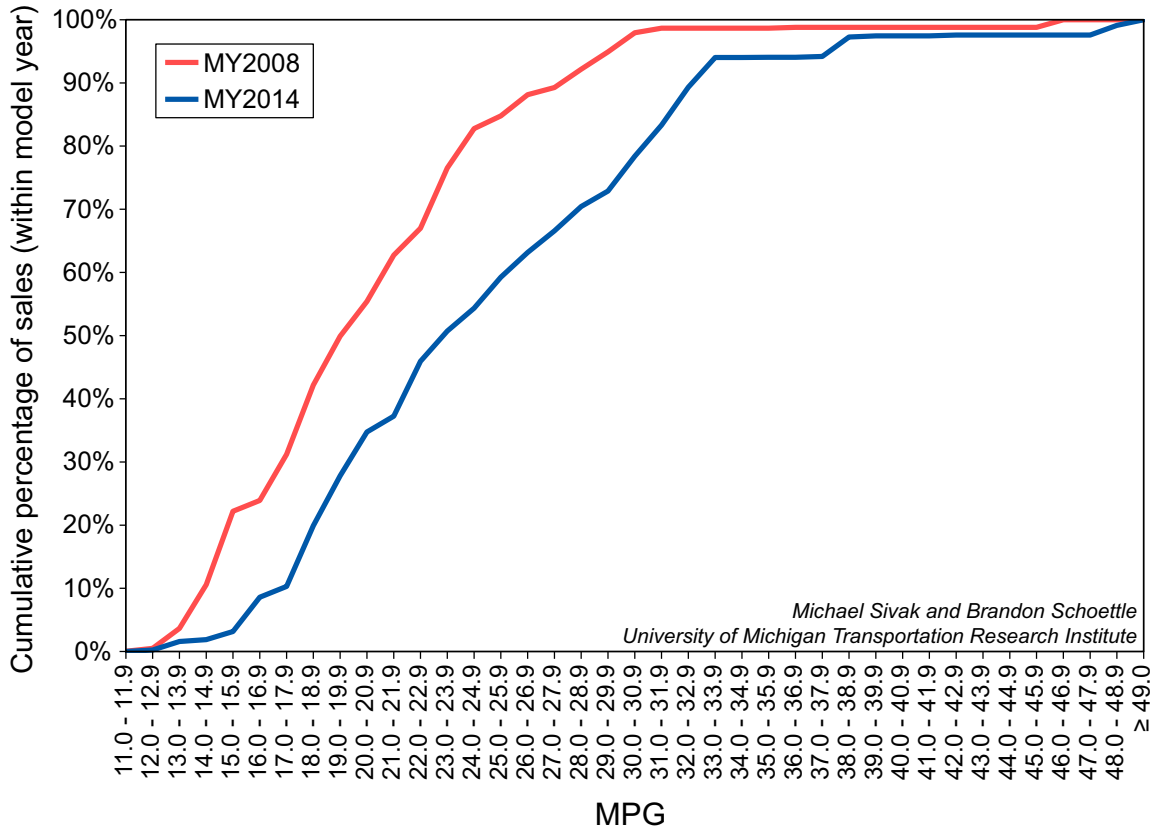


Figure 3. Cumulative distributions of vehicle fuel economy for model years 2008 and 2014.

Table 3  
Selected percentiles of vehicle fuel economy for model years 2008 and 2014.

Percentile	2008	2014
Minimum	11.4 mpg	12.0 mpg
10%	14.6 mpg	17.3 mpg
25%	17.0 mpg	19.4 mpg
50% (median)	20.0 mpg	23.8 mpg
75%	23.8 mpg	30.4 mpg
90%	28.0 mpg	33.3 mpg
Maximum	46.0 mpg	115.0 mpg

## Conclusions

The present findings indicate that the improvements in the average, sales-weighted fuel economy from model year 2008 vehicles to model year 2014 vehicles are also present throughout the respective distributions of fuel economy. For example, (1) 22.2% of model year 2008 vehicles had fuel economy lower than 16.0 mpg, as compared with only 3.2% of model year 2014 vehicles, and (2) only 1.3% of model year 2008 vehicles had fuel economy of 32.0 mpg or higher, as compared with 16.7% of model year 2014 vehicles.

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