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HAS MOTORIZATION IN THE U.S. PEAKED?

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16. Abstract <p>This study examined recent trends in the numbers of light-duty vehicles (cars, pickup trucks, SUVs, and vans) in the U.S. fleet. The analysis considered both the absolute numbers and the rates per person, per licensed driver, and per household. The period examined was from 1984 through 2011.</p> <p>The absolute number of vehicles reached a maximum in 2008. However, it is likely that this was only a temporary maximum and that the decline after 2008 was primarily driven by the current economic downturn that started in 2008. Consequently, with the improving economy and the expected increase in the U.S. population, it is highly likely that (from a long-term perspective) the absolute number of vehicles has not yet peaked.</p> <p>On the other hand, the rates of vehicles per person, licensed driver, and household reached their maxima prior to the onset of the current economic downturn. Consequently, it is likely that the declines in these rates prior to the current economic downturn (i.e., prior to 2008) reflect other societal changes that influence the need for vehicles (e.g., increases in telecommuting and in the use of public transportation). Therefore, the recent maxima in these rates have better chances of being long-term peaks as well. However, because the changes in the rates from 2008 on likely reflect both the relevant societal changes and the current economic downturn, whether the recent maxima in the rates will represent long-term peaks as well will be influenced by the extent to which the relevant societal changes turn out to be permanent.</p>					
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Introduction

In the U.S., there are currently about 253 million registered motor vehicles of all types (FHWA, 2013). Some of the milestones in motorization are shown in Table 1 (U.S. Census Bureau, 2004b). The initial motorization proceeded at a very rapid pace. For example, the total number increased by a factor of 1,000 in a span of 20 years from 1901 to 1921. However, from 1921 it took the next 47 years to increase the fleet by a factor of 10.

Table 1
Selected milestones in the motorization of the U.S.
(U.S. Census Bureau, 2004b).

Number of all vehicles	Year first reached
10,000	1901
100,000	1906
1,000,000	1913
10,000,000	1921
100,000,000	1968

This study analyzed the recent trends in motorization to examine whether we have reached the peak. The focus of this research was on light-duty vehicles (cars, pickup trucks, SUVs, and vans). In addition to the absolute number of registered vehicles, of interest were also the rates per person, per licensed driver, and per household.

Method

Registered light-duty vehicles (cars, pickup trucks, SUVs, and vans) were examined, as well as the corresponding rates per person, per licensed driver, and per household. The data were analyzed for each year from 1984 through 2011.

The number of light-duty vehicles was obtained or calculated from the information in FHWA (2013). For 1984 through 2006, this number was the sum of cars and other 2-axle, 4-tire vehicles. For 2007 through 2011, this number was the sum of short-wheel-base and long-wheel-base light-duty vehicles.

The sources of other relevant data were as follows:

- resident population: ProQuest (2012)
- licensed drivers: FHWA (2013)
- households: U.S. Census Bureau (2013)

Results

Absolute number of vehicles

Figure 1 presents the number of registered light-duty vehicles from 1984 to 2011. These data are also presented in Table 2, along with the corresponding values for population, licensed drivers, and households.

The number of light-duty vehicles in 1984 stood at 156.8 million. The number reached a maximum of 236.4 million in 2008. In 2011 (the latest year available), the number was 233.8 million.

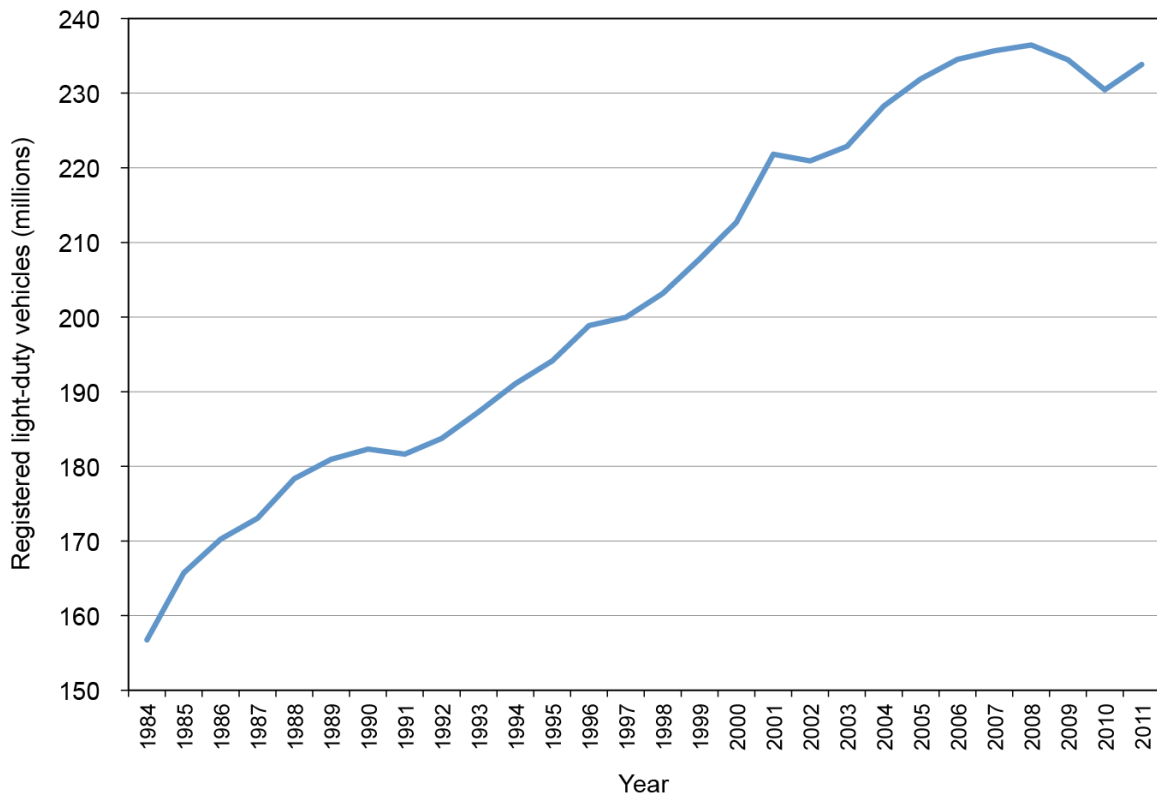


Figure 1. Registered light-duty vehicles, 1984-2011.

Table 2.
Registered light-duty vehicles, population, licensed drivers, and households, 1984-2011.

Year	Vehicles (thousands)	Population (thousands)	Drivers (thousands)	Households (thousands)
1984	156,751	235,825	155,424	85,407
1985	165,730	237,924	156,868	86,789
1986	170,251	240,133	159,487	88,458
1987	173,049	242,289	161,818	89,479
1988	178,348	244,499	162,853	91,066
1989	180,943	246,819	165,555	92,830
1990	182,317	249,623	167,015	93,347
1991	181,636	252,981	168,995	94,312
1992	183,747	256,514	173,125	95,669
1993	187,292	259,919	173,149	96,391
1994	191,072	263,126	175,403	97,107
1995	194,125	266,278	176,628	98,990
1996	198,862	269,394	179,539	99,627
1997	199,973	272,647	182,709	101,018
1998	203,169	275,854	184,980	102,528
1999	207,788	270,040	187,170	103,874
2000	212,706	282,162	190,625	104,705
2001	221,821	284,969	191,276	108,209
2002	220,932	287,625	194,296	109,297
2003	222,857	290,108	196,166	111,278
2004	228,276	292,805	198,889	112,000
2005	231,905	295,517	200,549	113,343
2006	234,525	298,380	202,810	114,384
2007	235,678	301,231	205,742	116,011
2008	236,448	304,094	208,321	116,783
2009	234,468	306,772	209,618	117,181
2010	230,444	309,330	210,115	117,538
2011	233,841	311,592	211,875	119,927

Vehicle rates

Figure 2 and Table 3 present the rates of vehicles per three variables of interest: person, licensed driver, and household. All three rates reached their maxima between 2001 and 2006.

Vehicles per person. In 1984 there were 0.66 vehicles per person. This rate increased to a maximum of 0.79 in 2006. The latest rate—for 2011—was 0.75.

Vehicles per licensed driver. In 1984 there were 1.01 vehicles per licensed driver. This rate increased to a maximum of 1.16, which was reached in 2001, 2005, and 2006. The rate in 2011 was 1.10.

Vehicles per household. In 1984 there were 1.84 vehicles per household. This rate increased to a maximum of 2.05, which was reached in 2001, 2005, and 2006. The rate in 2011 was 1.95.



Figure 2. Registered light-duty vehicles per person, per licensed driver, and per household, 1984-2011.

Table 3.
Registered light-duty vehicles per person, per licensed driver, and per household,
1984-2011.

Year	Vehicles per person	Vehicles per driver	Vehicles per household
1984	0.66	1.01	1.84
1985	0.70	1.06	1.91
1986	0.71	1.07	1.92
1987	0.71	1.07	1.93
1988	0.73	1.10	1.96
1989	0.73	1.09	1.95
1990	0.73	1.09	1.95
1991	0.72	1.07	1.93
1992	0.72	1.06	1.92
1993	0.72	1.08	1.94
1994	0.73	1.09	1.97
1995	0.73	1.10	1.96
1996	0.74	1.11	2.00
1997	0.73	1.09	1.98
1998	0.74	1.10	1.98
1999	0.77	1.11	2.00
2000	0.75	1.12	2.03
2001	0.78	1.16	2.05
2002	0.77	1.14	2.02
2003	0.77	1.14	2.00
2004	0.78	1.15	2.04
2005	0.78	1.16	2.05
2006	0.79	1.16	2.05
2007	0.78	1.15	2.03
2008	0.78	1.14	2.02
2009	0.76	1.12	2.00
2010	0.74	1.10	1.96
2011	0.75	1.10	1.95

Discussion

Private, commercial, and public vehicles

Because historical data on only privately owned light-duty vehicles are not available, the data in the analysis included all light-duty vehicles (private, commercial, and public). Thus, the absolute numbers and the rates derived in this study are higher than they would have been if only privately owned vehicles were included. Furthermore, these statistics on all light-duty vehicles cannot distinguish whether trends for privately owned vehicles exhibit different trends from trends for commercial and/or public vehicles.

Trend in absolute numbers of vehicles

The number of vehicles reached a maximum—at least for the time being—in 2008, the year of the onset of the current economic downturn. The value in 2011 was somewhat higher than the lowest post-2008 value, which was reached in 2010. This is the expected pattern, with the changes in the number of vehicles lagging the changes in the general economy.

Given that U.S. economic conditions are improving and that the U.S. population is expected to continue to grow (but by only about 11% from 2011 to 2025 [U.S. Bureau of the Census, 2013]), it is highly likely that the maximum number of vehicles reached in 2008 will be surpassed in the near future.

Trends in vehicle rates

Each of the three rates (the number of vehicles per person, per licensed driver, and per household) reached a maximum (to date) between 2001 and 2006—*prior* to the start of the current economic downturn in 2008. In other words, these rates started to decline not because of economic changes but because of other societal changes that influence the need for vehicles. (The changes in the rates from 2008 on reflect both the postulated societal changes and the economic downturn.) Thus, in contrast to the absolute numbers, the recent maxima in the rates have a better chance of being long-term peaks as well.

Two examples of societal changes that might have contributed to the decrease in the vehicle rates are changes in telecommuting and in the use of public transportation: In 2000, 3.3% of workers telecommuted; by 2010 that percentage increased to 4.3% (U.S. Census Bureau, 2012). Analogously, in 2000, public transportation was used for commuting by 4.7% of workers (U.S. Census Bureau, 2004a); by 2009 that percentage increased to 5.0% (U.S. Census Bureau, 2011).

The absolute numbers of persons, licensed drivers, and households were highly correlated for the 28-year period examined. (The three, pair-wise, correlation coefficients were all 0.995 or greater.) Therefore, it is not surprising that the respective rates show the same general pattern.

However, in the future, the absolute numbers of these three variables might be less strongly correlated. An example of an argument for less strong intercorrelations in the future relies on two recent trends. The first trend is a shift toward older persons in the age distribution of drivers (Sivak and Schoettle, 2012). The second trend is that the peak probability of purchasing a vehicle per licensed driver has recently shifted from those 35 to 44 years of age to those 55 to 64 years of age (Sivak, 2013).

Conclusions

This study examined recent trends in the numbers of light-duty vehicles (cars, pickup trucks, SUVs, and vans) in the U.S. fleet. The analysis considered both the absolute numbers and the rates per person, per licensed driver, and per household. The period examined was from 1984 through 2011.

The absolute number of vehicles reached a maximum in 2008. However, it is likely that this was only a temporary maximum and that the decline after 2008 was primarily driven by the current economic downturn that started in 2008. Consequently, with the improving economy and the expected increase in the U.S. population, it is highly likely that (from a long-term perspective) the absolute number of vehicles has not yet peaked.

On the other hand, the rates of vehicles per person, licensed driver, and household reached their maxima prior to the onset of the current economic downturn. Consequently, it is likely that the declines in these rates prior to the current economic downturn (i.e., prior to 2008) reflect other societal changes that influence the need for vehicles (e.g., increases in telecommuting and in the use of public transportation). Therefore, the recent maxima in these rates have better chances of being long-term peaks as well. However, because the changes in the rates from 2008 on likely reflect both the relevant societal changes and the current economic downturn, whether the recent maxima in the rates will represent long-term peaks as well will be influenced by the extent to which the relevant societal changes turn out to be permanent.

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