

## Chapter 5

# Heavy Vehicles and Characteristics

Summary Statistics from Tables in this Chapter

Source		
Table 5.1	Class 3-8 single-unit trucks, 2010	
	<i>Registration (thousands)</i>	8,217
	<i>Vehicle miles (millions)</i>	110,674
	<i>Fuel economy (miles per gallon)</i>	7.3
Table 5.2	Class 7-8 combination trucks, 2010	
	<i>Registration (thousands)</i>	2,553
	<i>Vehicle miles (millions)</i>	175,911
	<i>Fuel economy (miles per gallon)</i>	5.9
Tables 5.14 and 5.15	Freight Shipments, 2007 Commodity Flow Survey	
	<i>Value (billion dollars)</i>	11,685
	<i>Tons (millions)</i>	12,543
	<i>Ton-miles (billions)</i>	3,345
Table 5.16	Transit buses in operation, 2010	66,810



*Class 3-8 single-unit trucks include trucks over 10,000 lbs. gross vehicle weight with the cab/engine and cargo space together as one unit. Most of these trucks would be used for business or for individuals with heavy hauling or towing needs. Very heavy single-units, such as concrete mixers and dump trucks, are also in this category. The data series was recently changed by the FHWA back to 2007.*

**Table 5.1**  
**Summary Statistics for Class 3-8 Single-Unit Trucks, 1970–2010**

Year	Registrations (thousands)	Vehicle travel (million miles)	Average annual miles per vehicle	Fuel use (million gallons)	Fuel economy (miles per gallon)
1970	3,681	27,081	7,357	3,968	6.8
1975	4,232	34,606	8,177	5,420	6.4
1976	4,350	36,390	8,366	5,706	6.4
1977	4,450	39,339	8,840	6,268	6.3
1978	4,518	42,747	9,461	6,955	6.1
1979	4,505	42,012	9,326	7,050	6.0
1980	4,374	39,813	9,102	6,923	5.8
1981	4,455	39,568	8,882	6,867	5.8
1982	4,325	40,658	9,401	6,803	6.0
1983	4,204	42,546	10,120	6,965	6.1
1984	4,061	44,419	10,938	7,240	6.1
1985	4,593	45,441	9,894	7,399	6.1
1986	4,313	45,637	10,581	7,386	6.2
1987	4,188	48,022	11,467	7,523	6.4
1988	4,470	49,434	11,059	7,701	6.4
1989	4,519	50,870	11,257	7,779	6.5
1990	4,487	51,901	11,567	8,357	6.2
1991	4,481	52,898	11,805	8,172	6.5
1992	4,370	53,874	12,328	8,237	6.5
1993	4,408	56,772	12,879	8,488	6.7
1994	4,906	61,284	12,492	9,032	6.8
1995	5,024	62,705	12,481	9,216	6.8
1996	5,266	64,072	12,167	9,409	6.8
1997	5,293	66,893	12,638	9,576	7.0
1998	5,414	67,894	12,540	9,741	7.0
1999	5,763	70,304	12,199	9,372	7.5
2000	5,926	70,500	11,897	9,563	7.4
2001	5,704	72,448	12,701	9,667	7.5
2002	5,651	75,866	13,425	10,321	7.4
2003	5,849	77,757	13,294	8,881	8.8
2004	6,161	78,441	12,732	8,959	8.8
2005	6,395	78,496	12,275	9,501	8.3
2006	6,649	80,344	12,084	9,852	8.2
2007	8,117	119,979	14,781	16,314	7.3
2008	8,228	126,855	15,417	17,144	7.4
2009	8,356	120,207	14,386	16,253	7.4
2010	8,217	110,674	13,469	15,072	7.3
<i>Average annual percentage change</i>					
1970–2010	2.0%	3.6%	1.5%	3.4%	0.2%
2000–2010	3.3%	4.6%	1.2%	4.7%	-0.1%

**Source:**

U. S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2010*, Washington, DC, 2012, Table VM1 and annual. (Additional resources: [www.fhwa.dot.gov](http://www.fhwa.dot.gov))

<sup>a</sup> Due to FHWA methodology changes, data from 2007-on are not comparable with previous data.



*Class 7-8 combination trucks include all trucks designed to be used in combination with one or more trailers with a gross vehicle weight rating over 26,000 lbs. The average vehicle travel of these trucks (on a per truck basis) far surpasses the travel of other trucks due to long-haul freight movement. The data series was recently changed by the FHWA back to 2007.*

**Table 5.2**  
**Summary Statistics for Class 7-8 Combination Trucks, 1970–2010**

Year	Registrations (thousands)	Vehicle travel <sup>a</sup> (million miles)	Average annual miles per vehicle	Fuel use (million gallons)	Fuel economy (miles per gallon)
1970	905	35,134	38,822	7,348	4.8
1975	1,131	46,724	41,312	9,177	5.1
1980	1,417	68,678	48,467	13,037	5.3
1981	1,261	69,134	54,825	13,509	5.1
1982	1,265	70,765	55,941	13,583	5.2
1983	1,304	73,586	56,431	13,796	5.3
1984	1,340	77,377	57,744	14,188	5.5
1985	1,403	78,063	55,640	14,005	5.6
1986	1,408	81,038	57,555	14,475	5.6
1987	1,530	85,495	55,879	14,990	5.7
1988	1,667	88,551	53,120	15,224	5.8
1989	1,707	91,879	53,825	15,733	5.8
1990	1,709	94,341	55,202	16,133	5.8
1991	1,691	96,645	57,153	16,809	5.7
1992	1,675	99,510	59,409	17,216	5.8
1993	1,680	103,116	61,379	17,748	5.8
1994	1,681	108,932	64,802	18,653	5.8
1995	1,696	115,451	68,073	19,777	5.8
1996	1,747	118,899	68,059	20,192	5.9
1997	1,790	124,584	69,600	20,302	6.1
1998	1,831	128,159	69,994	21,100	6.1
1999	2,029	132,384	65,246	24,537	5.4
2000	2,097	135,020	64,387	25,666	5.3
2001	2,154	136,584	63,409	25,512	5.4
2002	2,277	138,737	60,930	26,480	5.2
2003	1,908	140,160	73,459	23,815	5.9
2004	2,010	142,370	70,831	24,191	5.9
2005	2,087	144,028	69,012	27,689	5.2
2006	2,170	142,169	65,516	28,107	5.1 <sup>b</sup>
2007	2,635	184,199	69,905	30,904	6.0
2008	2,585	183,826	71,113	30,561	6.0
2009	2,617	168,100	64,234	28,050	6.0
2010	2,553	175,911	68,904	29,885	5.9
<i>Average annual percentage change</i>					
1970–2010	2.6%	4.1%	1.4%	3.6%	0.5%
2000–2010	2.0%	2.7%	0.7%	1.5%	1.1%

**Source:**

U. S. Department of Transportation, Federal Highway Administration, *Highway Statistics 2010*, Washington, DC, 2012, Table VM1 and annual. (Additional resources: [www.fhwa.dot.gov](http://www.fhwa.dot.gov))

<sup>a</sup> The Federal Highway Administration changed the combination truck travel methodology in 1993.

<sup>b</sup> Due to FHWA methodology changes, data from 2007-on are not comparable with previous data.



Truck sales rose in 2010 and 2011 for the first time since the sales peak in 2004. Trucks under 10,000 lbs. continue to dominate truck sales.

**Table 5.3**  
**New Retail Truck Sales by Gross Vehicle Weight, 1970–2011<sup>a</sup>**  
**(thousands)**

Calendar year	Class 1 6,000 lbs. or less	Class 2 6,001– 10,000 lbs.	Class 3 10,001– 14,000 lbs.	Class 4 14,001– 16,000 lbs.	Class 5 16,001– 19,500 lbs.	Class 6 19,501– 26,000 lbs.	Class 7 26,001– 33,000 lbs.	Class 8 33,001 lbs. and over	Total
<b>Domestic sales (import data are not available)</b>									
1970 <sup>b</sup>	1,049	408	6	12	58	133	36	89	1,791
1975	1,101	952	23	1	9	159	23	83	2,351
1976	1,318	1,401	43	<sup>c</sup>	9	153	22	97	3,043
1977	1,306	1,803	36	3	5	163	28	141	3,485
1978	1,334	2,140	73	6	3	156	41	162	3,915
1979	1,271	1,574	15	3	3	146	50	174	3,236
1980	985	975	4	<sup>c</sup>	2	90	58	117	2,231
1981	896	850	1	<sup>c</sup>	2	72	51	100	1,972
1982	1,102	961	1	<sup>c</sup>	1	44	62	76	2,248
1983	1,314	1,207	<sup>c</sup>	<sup>c</sup>	1	47	59	82	2,710
1984	2,031	1,224	6	<sup>c</sup>	5	55	78	138	3,538
1985	2,408	1,280	11	<sup>c</sup>	5	48	97	134	3,983
<b>Domestic and import sales</b>									
1986	3,380	1,214	12	<sup>c</sup>	6	45	101	113	4,870
1987	3,435	1,175	14	2	8	44	103	131	4,912
1988	3,467	1,333	14	21	8	54	103	148	5,149
1989	3,313	1,297	19	27	7	39	93	145	4,942
1990	3,451	1,097	21	27	5	38	85	121	4,846
1991	3,246	876	21	24	3	22	73	99	4,365
1992	3,608	1,021	26	26	4	28	73	119	4,903
1993	4,119	1,232	27	33	4	27	81	158	5,681
1994	4,527	1,506	35	44	4	20	98	186	6,421
1995	4,422	1,631	40	53	4	23	107	201	6,481
1996	4,829	1,690	52	59	7	19	104	170	6,930
1997	5,085	1,712	53	57	9	18	114	179	7,226
1998	5,263	2,036	102	43	25	32	115	209	7,826
1999	5,707	2,366	122	49	30	48	130	262	8,716
2000	5,965	2,421	117	47	29	51	123	212	8,965
2001	6,073	2,525	102	52	24	42	92	140	9,050
2002	6,068	2,565	80	38	24	45	69	146	9,035
2003	6,267	2,671	91	40	29	51	67	142	9,357
2004	6,458	2,796	107	47	36	70	75	203	9,793
2005	6,586	2,528	167	49	46	60	89	253	9,777
2006	6,136	2,438	150	50	49	70	91	284	9,268
2007	5,682	2,623	166	51	45	54	70	151	8,842
2008	4,358	1,888	135	36	40	39	49	133	6,680
2009	3,528	1,306	112	20	24	22	39	95	5,145
2010	4,245	1,513	161	12	31	29	38	107	6,137
2011	4,714	1,735	195	10	42	41	41	171	6,951
<i>Average annual percentage change</i>									
1970–1985	5.7%	7.9%	4.1%	-	-15.1%	-6.6%	6.8%	2.8%	5.5%
1986–2011	1.3%	-1.4%	11.8%	6.9% <sup>d</sup>	8.1%	-0.4%	-3.5%	-1.7%	1.4%
2001–2011	-2.5%	-3.7%	6.7%	-15.2%	5.8%	-0.2%	-7.8%	-2.0%	-2.6%

**Source:**

Ward's Communication's, *Motor Vehicle Facts and Figures 2011*, Southfield, MI, 2011, p. 27, and annual; 2010–2011: Ward's Communications, www.wardsauto.com. (Additional resources: www.wardsauto.com)

<sup>a</sup> Sales include domestic-sponsored imports.

<sup>b</sup> Data for 1970 is based on new truck registrations.

<sup>c</sup> Data are not available.

<sup>d</sup> 1987–2011.



*The Census Bureau has discontinued the Vehicle Inventory and Use Survey; it was not conducted in 2007. The 2002 data remain the latest available.*

## Vehicle Inventory and Use Survey

The Vehicle Inventory and Use Survey (VIUS), which was formerly the Truck Inventory and Use Survey (TIUS), provides data on the physical and operational characteristics of the Nation's truck population. It is based on a probability sample of private and commercial trucks registered (or licensed) in each state. In 1997, the survey was changed to the Vehicle Inventory and Use Survey due to future possibilities of including additional vehicle types. The 2002 VIUS, however, only includes trucks. Copies of the 2002 VIUS report or CD may be obtained by contacting the U.S. Bureau of the Census, Transportation Characteristics Surveys Branch (301) 457-2797. Internet site: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html)

Since 1987, the survey has included minivans, vans, station wagons on truck chassis, and sport utility vehicles in addition to the bigger trucks. The 1977 and 1982 surveys did not include those vehicle types. The estimated number of trucks that were within the scope of the 2002 VIUS and registered in the United States as of July 1, 2002 was 85.2 million. These trucks were estimated to have been driven a total of 1,115 billion miles during 2002, an increase of 6.8% from 1997. The average annual miles traveled per truck was estimated at 13,100 miles.

In the 2002 VIUS, there are several ways to classify a truck by weight. The survey respondent was asked the average weight of the vehicle or vehicle-trailer combination when carrying a typical payload; the empty weight (truck minus cargo) of the vehicle as it was usually operated; and the maximum gross weight at which the vehicle or vehicle-trailer combination was operated. The Census Bureau also collected information on the Gross Vehicle Weight Class of the vehicles (decoded from the vehicle identification number) and the registered weight of the vehicles from the State registration files. Some of these weights are only provided in categories, while others are exact weights. Since all these weights could be quite different for a single truck, the tabulations by weight can be quite confusing. In the tables presented here, the Gross Vehicle Weight Class was used.



**Table 5.4**  
**Truck Statistics by Gross Vehicle Weight Class, 2002**

Manufacturer's gross vehicle weight class	Number of trucks	Percentage of trucks	Average annual miles per truck	Harmonic mean fuel economy	Percentage of fuel use
1) 6,000 lbs and less	51,941,389	61.0%	11,882	17.6	42.7%
2) 6,001 – 10,000 lbs	28,041,234	32.9%	12,684	14.3	30.5%
Light truck subtotal	79,982,623	93.9%	12,163	16.2	73.2%
3) 10,001 – 14,000 lbs	691,342	0.8%	14,094	10.5	1.1%
4) 14,001 – 16,000 lbs	290,980	0.3%	15,441	8.5	0.5%
5) 16,001 – 19,500 lbs	166,472	0.2%	11,645	7.9	0.3%
6) 19,501 – 26,000 lbs	1,709,574	2.0%	12,671	7.0	3.2%
Medium truck subtotal	2,858,368	3.4%	13,237	8.0	5.2%
7) 26,001 – 33,000 lbs	179,790	0.2%	30,708	6.4	0.9%
8) 33,001 lbs and up	2,153,996	2.5%	45,739	5.7	20.7%
Heavy truck subtotal	2,333,786	2.7%	44,581	5.8	21.6%
<b>Total</b>	<b>85,174,776</b>	<b>100.0%</b>	<b>13,088</b>	<b>13.5</b>	<b>100.0%</b>

**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and Use Survey*, Microdata File on CD, 2005. (Additional resources: [www.census.gov/svsd/www.tiusview.html](http://www.census.gov/svsd/www.tiusview.html))

**Table 5.5**  
**Truck Harmonic Mean Fuel Economy by Size Class, 1992, 1997, and 2002**  
**(miles per gallon)**

Manufacturer's gross vehicle weight class	1992 TIUS	1997 VIUS	2002 VIUS
1) 6,000 lbs and less	17.2	17.1	17.6
2) 6,001–10,000 lbs	13.0	13.6	14.3
Light truck subtotal	15.7	15.8	16.2
3) 10,000–14,000 lbs	8.8	9.4	10.5
4) 14,001–16,000 lbs	8.8	9.3	8.5
5) 16,001–19,500 lbs	7.4	8.7	7.9
6) 19,501–26,000 lbs	6.9	7.3	7.0
Medium truck subtotal	7.3	8.6	8.0
7) 26,001–33,000 lbs	6.5	6.4	6.4
8) 33,001 lbs and over	5.5	5.7	5.7
Large truck subtotal	5.6	6.1	5.8

**Sources:**

Estimates are based on data provided on the following public use files: U.S. Department of Commerce, Bureau of the Census, Census of Transportation, Washington, DC, *1992 Truck Inventory and Use Survey*, 1995; *1997 Vehicle Inventory and Use Survey*, 2000, and *2002 Vehicle Inventory and Use Survey*, 2005. (Additional resources: [www.census.gov/svsd/www.tiusview.html](http://www.census.gov/svsd/www.tiusview.html))

**Note:** Based on average fuel economy as reported by respondent.



*As expected, most light trucks travel within 50 miles of their home base and refuel at public stations. About sixty percent of heavy trucks travel over 50 miles from their home base and 36% of them refuel at central company-owned refueling stations.*

**Table 5.6**  
**Truck Statistics by Size, 2002**

	Manufacturer's gross vehicle weight class			Total
	Light (< 10,000 lbs)	Medium (10,001– 26,000 lbs)	Heavy (> 26,000 lbs)	
	Range of operation			
Under 50 miles	69.2%	61.5%	40.7%	68.2%
51–100 miles	8.5%	11.7%	13.5%	8.7%
101–200 miles	2.4%	3.2%	6.7%	2.5%
201–500 miles	1.1%	1.8%	7.6%	1.3%
501 miles or more	1.4%	2.2%	10.4%	1.7%
Off-road	1.1%	3.5%	3.2%	1.2%
Vehicle not in use	2.2%	4.4%	3.2%	2.3%
Not reported	14.1%	11.7%	14.7%	14.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>
	Primary refueling facility			
Gas station	96.9%	62.4%	28.4%	93.9%
Truck stop	0.7%	7.7%	31.9%	1.8%
Own facility	2.0%	27.3%	36.2%	3.7%
Other nonpublic facility	0.3%	2.6%	3.5%	0.5%
Other	0.0%	0.0%	0.0%	0.0%
<b>All</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and Use Survey*, Microdata. File on CD, 2005. (Additional resources: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html))



*More medium truck owners listed construction as the truck's major use than any other major use category. Construction was the second highest major use for light trucks and heavy trucks.*

**Table 5.7**  
**Percentage of Trucks by Size Ranked by Major Use, 2002**

Rank	Light (< 10,000 lbs average weight)	Medium (10,001 – 26,000 lbs average weight)	Heavy (> 26,000 lbs average weight)
1	<b>Personal</b> 81.5%	<b>Construction</b> 18.4%	<b>For hire</b> 30.1%
2	<b>Construction</b> 4.6%	<b>Agriculture</b> 16.2%	<b>Construction</b> 15.9%
3	<b>Other services<sup>a</sup></b> 2.5%	<b>For hire</b> 9.6%	<b>Agriculture</b> 12.2%
4	<b>Not in use</b> 2.2%	<b>Retail</b> 7.1%	<b>Retail</b> 5.4%
5	<b>Agriculture</b> 1.9%	<b>Not in use</b> 6.4%	<b>Not in use</b> 5.1%
6	<b>Retail</b> 1.5%	<b>Leasing</b> 6.2%	<b>Waste management</b> 5.0%
7	<b>Unknown</b> 1.3%	<b>Wholesale</b> 5.5%	<b>Manufacturing</b> 4.9%
8	<b>Leasing</b> 0.7%	<b>Waste management</b> 5.4%	<b>Wholesale</b> 4.8%
9	<b>Manufacturing</b> 0.7%	<b>Utilities</b> 5.0%	<b>Leasing</b> 4.6%
10	<b>Utilities</b> 0.6%	<b>Personal</b> 4.8%	<b>Unknown</b> 3.2%
11	<b>Waste management</b> 0.6%	<b>Unknown</b> 4.4%	<b>Personal</b> 2.5%
12	<b>Wholesale</b> 0.6%	<b>Manufacturing</b> 3.3%	<b>Mining</b> 2.4%
13	<b>Information services</b> 0.4%	<b>Other services<sup>a</sup></b> 3.2%	<b>Other services<sup>a</sup></b> 1.3%
14	<b>For hire</b> 0.4%	<b>Food services</b> 1.6%	<b>Utilities</b> 1.1%
15	<b>Food services</b> 0.3%	<b>Information services</b> 1.3%	<b>Food services</b> 1.1%
16	<b>Arts</b> 0.2%	<b>Mining</b> 1.1%	<b>Arts</b> 0.3%
17	<b>Mining</b> 0.1%	<b>Arts</b> 0.5%	<b>Information services</b> 0.1%

**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and Use Survey*, Micro data File on CD, 2005. (Additional resources: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html))

<sup>a</sup> Business and personal services.



Nearly half of trucks in fleets of 11-20 and 21-50 vehicles use company-owned facilities. Most trucks in smaller fleets use public gas stations for fueling.

**Table 5.8**  
**Percentage of Trucks by Fleet Size and Primary Fueling Facility, 2002**

Truck fleet size	Primary refueling facility				Total
	Gas station	Truck stop	Own facility	Other's facility	
1-5	73.8%	6.1%	18.2%	1.9%	100.0%
6-10	55.3%	5.7%	35.5%	3.4%	100.0%
11-20	41.1%	5.1%	48.9%	4.9%	100.0%
21-50	42.9%	3.7%	49.8%	3.6%	100.0%
51 or more	48.3%	6.3%	44.4%	1.0%	100.0%
Fleets of 6 or more vehicles	47.6%	5.2%	43.9%	3.4%	100.0%
<b>No fleet</b>	<b>96.4%</b>	<b>1.6%</b>	<b>1.7%</b>	<b>0.3%</b>	<b>100.0%</b>

**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and Use Survey*, Microdata File on CD, 2005. (Additional resources: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html))



*Most trucks are fueled at gas stations but for-hire or warehousing trucks are more often fueled at truck stops. Mining trucks and vehicle leasing or rental trucks fuel at the companies' own facility more than 30% of the time.*

**Table 5.9**  
**Share of Trucks by Major Use and Primary Fueling Facility, 2002**

Major use	Gas station	Truck stop	Own facility	Others facility	Other	All
Personal	98.6%	0.6%	0.7%	0.1%	0.1%	100.0%
Other services	96.0%	1.4%	1.6%	0.9%	0.1%	100.0%
All	93.9%	1.8%	3.7%	0.5%	0.0%	100.0%
Information services	92.3%	0.4%	7.2%	0.1%	0.0%	100.0%
Retail trade	86.6%	3.5%	8.6%	1.2%	0.0%	100.0%
Construction	84.7%	3.3%	9.8%	2.2%	0.0%	100.0%
Accommodation or food services	82.4%	7.5%	8.8%	1.3%	0.0%	100.0%
Manufacturing	81.5%	5.1%	11.9%	1.5%	0.0%	100.0%
Arts, entertainment, recreation services	81.1%	4.3%	14.2%	0.3%	0.0%	100.0%
Waste mgmt, landscaping, admin/support services	78.2%	3.0%	17.1%	1.6%	0.0%	100.0%
Wholesale trade	76.2%	6.6%	12.0%	5.1%	0.0%	100.0%
Utilities	72.6%	1.8%	24.3%	1.3%	0.0%	100.0%
Agriculture, forestry, fishing, hunting	62.7%	6.7%	29.4%	1.0%	0.1%	100.0%
Vehicle leasing or rental	60.2%	1.3%	31.8%	6.8%	0.0%	100.0%
Mining	48.7%	8.5%	34.3%	8.5%	0.0%	100.0%
For-hire or warehousing	33.3%	38.7%	25.8%	2.3%	0.0%	100.0%
<b>Overall</b>	<b>93.9%</b>	<b>1.8%</b>	<b>3.7%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>100.0%</b>

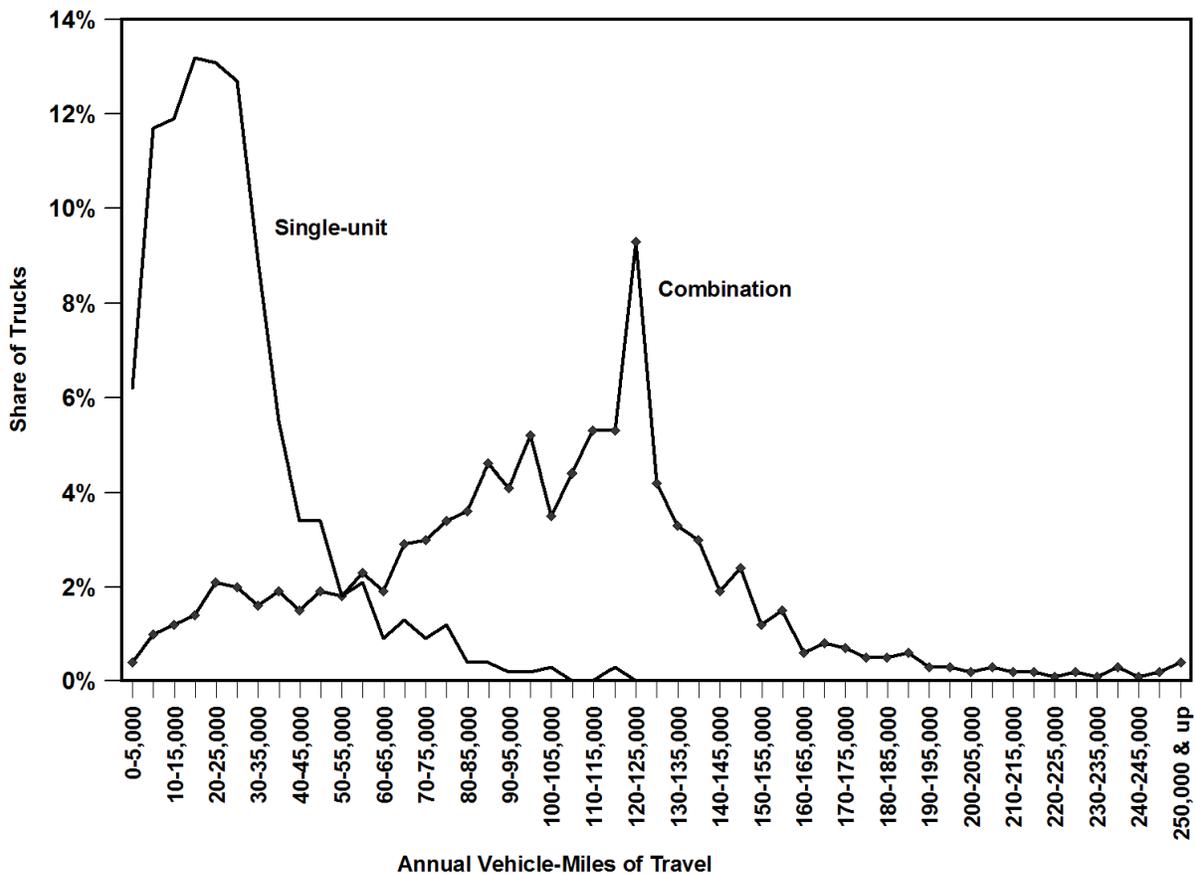
**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and Use Survey*, Microdata File on CD, 2005. (Additional resources: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html))



The figure below shows the distribution of annual travel the two types of Class 7 and 8 vehicles—combination units (separate tractor and trailer) and single units (tractor and trailer on a single chassis). This information is for vehicles two years old or less and comes from the 2002 VIUS. Combination trucks, dominated by box-type trailers, display the greatest amount of annual travel of all heavy vehicle types, as is evidenced both by the range of annual use which is up to 250,000 miles per year, and the peaking that occurs in the 100,000 to 140,000-mile segments. Most of the single-unit trucks in the survey travel 40,000 miles per year or less.

**Figure 5.1. Distribution of Trucks over 26,000 lbs. Less than Two Years Old by Vehicle-Miles Traveled**



**Source:**

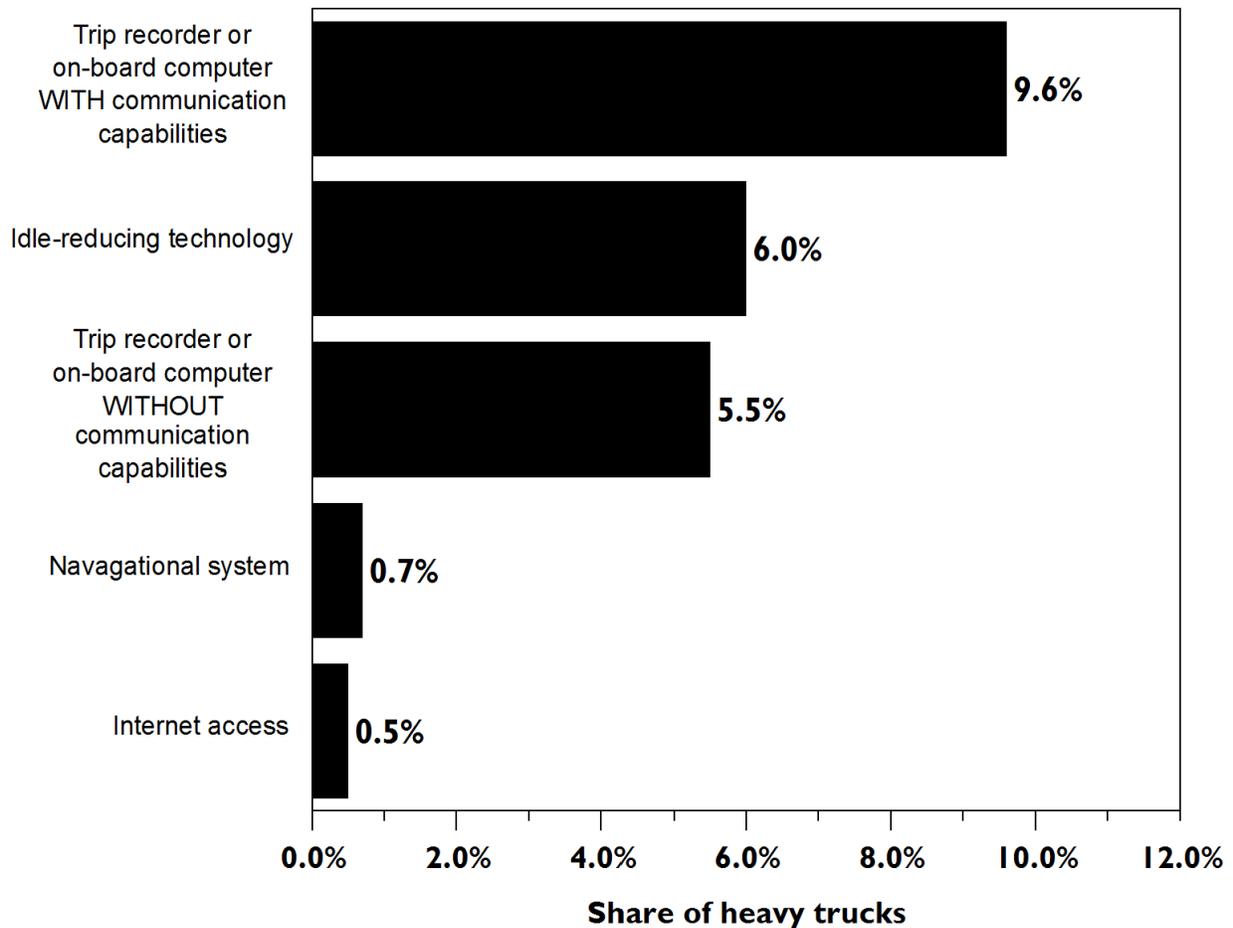
U.S. Department of Commerce, Bureau of the Census, 2002 Vehicle Inventory and Use Survey, Microdata File on CD, 2005. (Additional resources: [www.census.gov/svsd/www/tiusview.html](http://www.census.gov/svsd/www/tiusview.html))

**Note:** Heavy trucks (class 7 & 8) are greater than 26,000 pounds gross vehicle weight based on the manufacturer's rating.



The latest Vehicle Inventory and Use Survey asked truck owners if the truck had certain features as permanent equipment on the truck. Some of the features asked about were onboard computers, idle-reduction devices, navigational systems, and Internet access. Of the 2.3 million heavy trucks (class 7 & 8) in the United States, nearly 10% were equipped with onboard computers that had communication capabilities and another 5% had onboard computers without communication capabilities. Six percent of heavy trucks were equipped with idle-reducing technology. Navigational systems and Internet access were available in less than one percent of heavy trucks.

**Figure 5.2. Share of Heavy Trucks with Selected Electronic Features, 2002**



**Source:**

U.S. Department of Commerce, Bureau of the Census, *2002 Vehicle Inventory and User Survey*, Microdata File on CD, 2005.

**Note:** Heavy trucks (class 7 & 8) are greater than 26,000 pounds gross vehicle weight based on the manufacturer's rating.



## Fuel Economy Study for Class 8 Trucks

As part of a long-term study sponsored by the U.S. Department of Energy (DOE) Office of Vehicle Technologies (OVT), the Oak Ridge National Laboratory (ORNL) in conjunction with several industry partners has collected data and information related to heavy-truck operation in real-world highway environments. The primary objective of the project was to collect real-world performance and spatial data for long-haul operations of Class 8 tractor-trailers from a fleet engaged in normal freight operations. Six model year 2005 Class 8 trucks from the selected fleet, which operates within a large area of the country extending from the east coast to Mountain Time Zone and from Canada to the US-Mexican border, were instrumented and 60 channels of data were collected for over a year at a rate of 5 Hz (or 5 readings per second). Those channels included information such as instantaneous fuel rate, engine speed, gear ratio, vehicle speed, and other information read from the vehicle's databus; weather information (wind speed, precipitation, air temperature, etc.) gathered from an on-board weather station; spatial information (latitude, longitude, altitude) acquired from a GPS (Global Positioning System) device; and instantaneous tractor and trailer weight obtained from devices mounted on the six participating tractors and ten trailers. Three of the six instrumented tractors and five of the ten instrumented trailers were mounted with New Generation Single Wide-Based Tires and the others with regular dual tires. Over the duration of this phase of the project (just over a year) the six tractors traveled nearly 700,000 miles.

To find out more about this project, contact Oscar Franzese, [franzeseo@ornl.gov](mailto:franzeseo@ornl.gov), 865-946-1304. The final report on this project is available on-line at:  
[cta.ornl.gov/cta/Publications/Reports/ORNL\\_TM\\_2008-122.pdf](http://cta.ornl.gov/cta/Publications/Reports/ORNL_TM_2008-122.pdf).



The type of terrain a truck is traveling on can cause significant differences in fuel efficiency. This study (see page 5-13 for project description) shows fuel economy on severe upslopes is less than half that on flat terrain. On severe downslopes, the fuel economy was two times higher than on flat terrain.

**Table 5.10**  
**Effect of Terrain on Class 8 Truck Fuel Economy**

Type of terrain	Share of data records	Average fuel efficiency (mpg)			
		All trucks	Tractors with dual tires	Tractors with single (wide) tires	Difference between dual and single tires (percent)
Severe upslope (>4%)	0.7%	2.90	2.86	2.94	2.91%
Mild upslope (1% to 4%)	13.2%	4.35	4.25	4.44	4.35%
Flat terrain (1% to 1%)	72.4%	7.33	7.08	7.58	7.13%
Mild downslope (-4% to -1%)	12.6%	15.11	14.64	15.57	6.36%
Severe downslope (<-4%)	1.1%	23.5	21.82	25.3	15.97%

**Source:**

Capps, Gary, Oscar Franzese, Bill Knee, M.B. Lascrain, and Pedro Otaduy. *Class-8 Heavy Truck Duty Cycle Project Final Report*, ORNL/TM-2008/122, Oak Ridge National Laboratory, Oak Ridge, TN, December 2008. (Additional resources: [cta.ornl.gov/cta/publications.shtml#2008](http://cta.ornl.gov/cta/publications.shtml#2008))



*This table presents a distribution of distance traveled, fuel consumed, and fuel economy by speed and by type of tires for the vehicles participating in the project (see page 5-13 for project description). The speed bins are divided into 5-mile intervals, going from 0+ mph (i.e., speed > 0.00 mph) to 85 mph, while the four main columns of the table are organized by the type of tires that were mounted on the tractor and trailers. The first row of the table contains information about fuel consumed while the vehicle was idling (i.e., the vehicle was static with the engine on) with the following rows presenting information about the distance traveled, fuel consumed, and fuel economy for each one of the speed intervals. The next-to-the-last row shows the totals for both traveled distances and fuel consumed as well as the overall fuel economy for each tire-combination category. The latter are then used to compute the percentage difference in terms of fuel economy from dual tire tractors and trailers, which is the most common tire setup for large trucks at the present time.*

**Table 5.11**  
**Fuel Economy for Class 8 Trucks as Function of Speed**  
**and Tractor-Trailer Tire Combination**

Speed (mph)	Dual tire tractor – dual tire trailer			Dual tire tractor – single (wide) tire trailer			Single (wide) tire tractor – dual tire trailer			Single (wide) tire tractor – single (wide) tire trailer		
	Distance traveled (miles)	Fuel cons. (gal)	Fuel econ. (MPG)	Distance traveled (miles)	Fuel cons. (gal)	Fuel econ. (MPG)	Distance traveled (miles)	Fuel cons. (gal)	Fuel econ. (MPG)	Distance traveled (miles)	Fuel cons. (gal)	Fuel econ. (MPG)
Idling	N/A	1,858.5	N/A	N/A	967.9	N/A	N/A	1,676.4	N/A	N/A	706.0	N/A
0+ to 5	281	101.8	2.76	148	50.4	2.93	368.0	124.2	3.0	156	52.8	2.96
5+ to 10	674	198.8	3.39	368	103.2	3.56	808.0	245.4	3.3	331	98.8	3.35
10+ to 15	723	192.0	3.77	396	98.3	4.03	848.0	216.5	3.9	343	87.0	3.95
15+ to 20	744	199.1	3.73	404	100.9	4.00	882.0	221.6	4.0	361	90.5	3.98
20+ to 25	938	228.4	4.11	489	113.6	4.31	1,111.0	244.2	4.6	462	101.1	4.57
25+ to 30	1,178	266.9	4.41	609	131.5	4.63	1,420.0	286.9	5.0	580	117.6	4.93
30+ to 35	1,481	336.8	4.40	753	154.2	4.88	1,774.0	341.1	5.2	708	141.1	5.02
35+ to 40	1,917	403.5	4.75	1,000	193.6	5.17	2,284.0	433.6	5.3	941	184.3	5.10
40+ to 45	2,955	584.1	5.06	1,543	285.9	5.40	3,380.0	603.6	5.6	1,350	254.4	5.31
45+ to 50	4,935	907.9	5.43	2,573	447.7	5.75	5,410.0	872.8	6.2	2,177	360.4	6.04
50+ to 55	9,397	1,629.8	5.77	4,962	811.5	6.11	10,046.0	1,622.7	6.2	3,877	625.5	6.20
55+ to 60	20,656	3,297.2	6.26	11,707	1,721.9	6.80	22,373.0	3,257.8	6.9	8,710	1,246.9	6.99
60+ to 65	38,964	5,879.6	6.63	21,472	2,980.8	7.20	34,517.0	4,840.0	7.1	14,944	2,049.4	7.29
NOT ADJUSTED FOR TERRAIN: See note below.												
65+ to 70	58,304	8,313.2	7.01	27,931	3,652.2	7.65	65,063.0	9,256.4	7.0	27,144	3,880.1	7.00
70+ to 75	56,378	7,483.2	7.53	21,751	2,745.5	7.92	66,882.0	8,435.6	7.9	32,887	4,056.1	8.11
75+ to 85	7,849	808.2	9.71	3,610	403.2	8.95	11,513.0	911.1	12.6	6,817	512.2	13.31
Total <sup>a</sup>	207,374	30,831.0	6.73	99,714	13,994.0	7.13	228,680.0	31,913.0	7.2	101,790	13,858.0	7.35
Percent increase in fuel economy from dual tire trac/trailer	0.00%			5.93%			6.53%			9.20%		

**Source:**

Capps, Gary, Oscar Franzese, Bill Knee, M.B. Lascrain, and Pedro Otaduy. *Class-8 Heavy Truck Duty Cycle Project Final Report*, ORNL/TM-2008/122, Oak Ridge National Laboratory, Oak Ridge, TN, December 2008. (Additional resources: [cta.ornl.gov/cta/publications.shtml#2008](http://cta.ornl.gov/cta/publications.shtml#2008))

**Note:** These data were not adjusted to account for the effects of terrain. The increase in fuel economy for speeds above 70 mph is likely due to the vehicle achieving high speeds while traveling down slope. Therefore, this increase in fuel economy is not expected to be characteristic of all travel at these higher speeds.

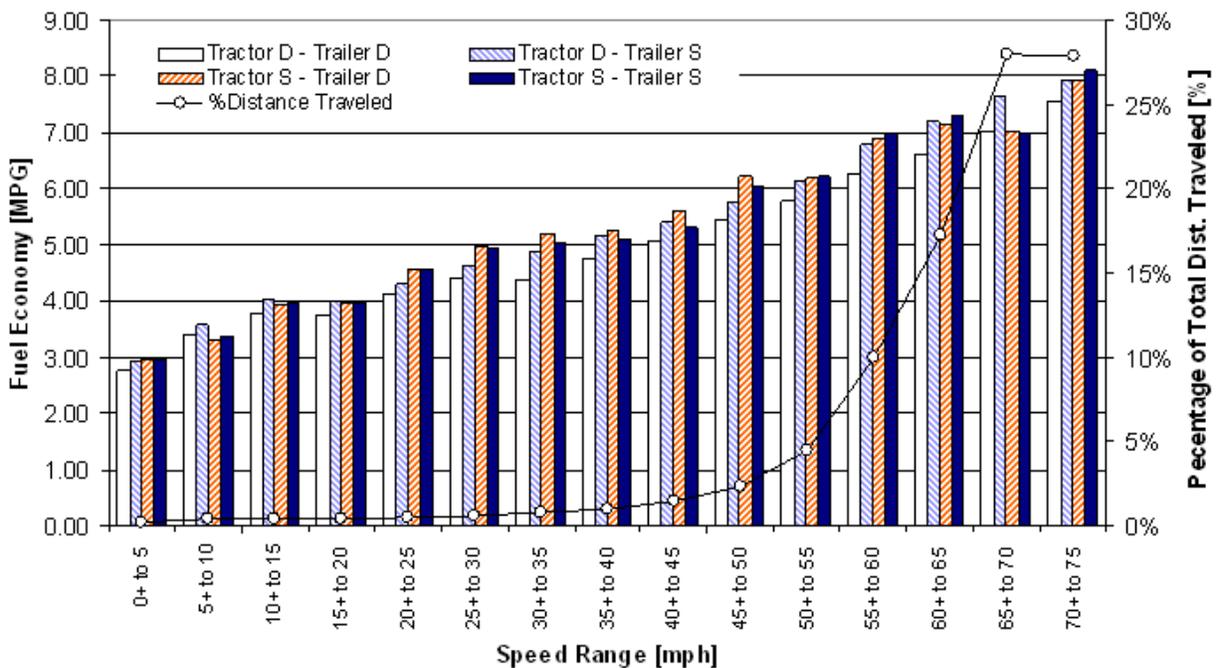
<sup>a</sup> Total Fuel Consumed does not include fuel consumed while idling.



The fuel economy information presented in Table 5.11 is on the upper limits of today's large-truck fleets and is mostly a result of driver training and the extensive vehicle maintenance (including constant tire pressure) to which the fleet company participating in this project adheres. Nevertheless, the results of this extensive test indicate that there are substantial gains in terms of fuel economy for large trucks when single (wide) tires are used in combination with dual tires or alone (best case). Figure 5.3 shows the information from Table 5.10 in a graphical form (bars) and also displays for each speed bin the percentage of the total distance that is traveled at that speed (line). It is possible to observe that above 80% of the distance traveled by long-haul Class 8 trucks is done at speeds above 55 mph. Therefore, any gains in fuel economies at these speeds derived from a given tire combination would have a very large impact on the overall fuel economy of these types of trucks. Figure 5.3 shows that, except for the D-S combination within the 65+ to 70 mph, the combinations with all single (wide) tires perform better and, therefore, obtain the largest overall fuel economy.

**Figure 5.3. Class 8 Truck Fuel Economy as a Function of Speed and Tractor-Trailer Tire Combination and Percentage of Total Distance Traveled as a Function of Speed**

**NOT ADJUSTED FOR TERRAIN: See note below.**



**Source:**

Capps, Gary, Oscar Franzese, Bill Knee, M.B. Lascrain, and Pedro Otaduy. *Class-8 Heavy Truck Duty Cycle Project Final Report*, ORNL/TM-2008/122, Oak Ridge National Laboratory, Oak Ridge, TN, December 2008.

**Note:** D = Dual tire. S = Single (wide) tire.

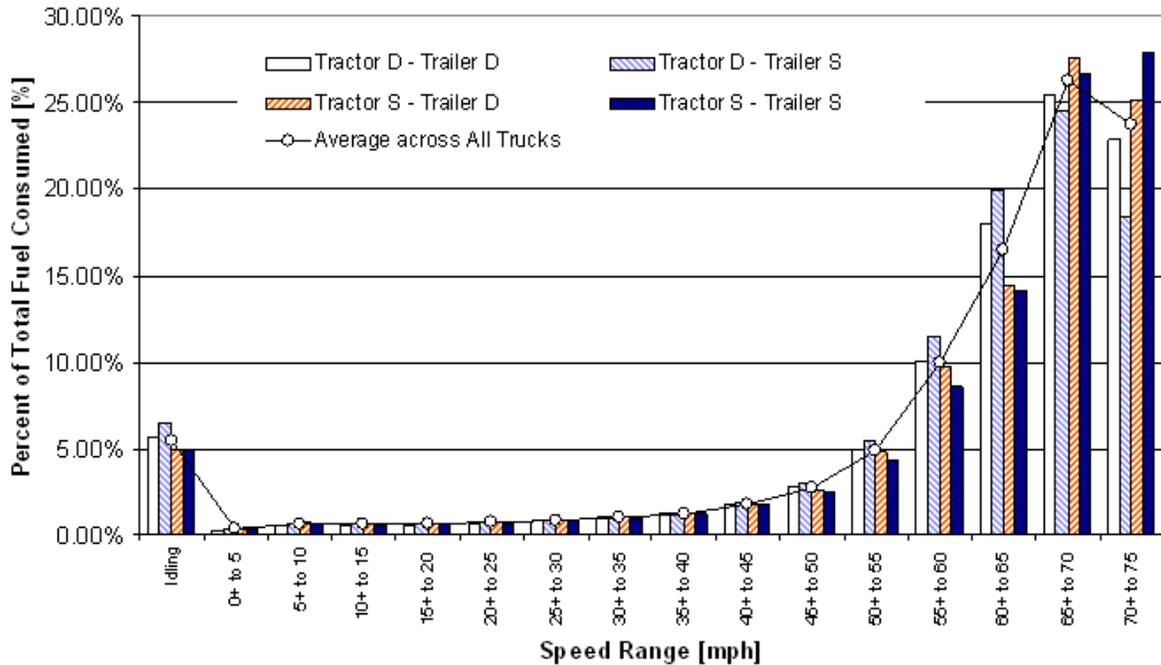
These data were not adjusted to account for the effects of terrain. The increase in fuel economy for speeds above 70 mph is likely due to the vehicle achieving high speeds while traveling down slope. Therefore, this increase in fuel economy is not expected to be characteristic of all travel at these higher speeds.



This graph presents for each one of the four tire-combination categories the percent of total fuel that is consumed when traveling at different speeds (bars) as well as the average percent of fuel consumed for each speed bin (line). As opposed to Table 5.10, the total fuel consumed on this graph includes the fuel consumed while idling.

**Figure 5.4. Class 8 Truck Percent of Total Fuel Consumed as a Function of Speed and Tractor-Trailer Tire Combination**

**NOT ADJUSTED FOR TERRAIN: See note below.**



**Source:**

Capps, Gary, Oscar Franzese, Bill Knee, M.B. Lascrain, and Pedro Otaduy. *Class-8 Heavy Truck Duty Cycle Project Final Report*, ORNL/TM-2008/122, Oak Ridge National Laboratory, Oak Ridge, TN, December 2008.

**Note:** D = Dual tire. S = Single (wide) tire.

These data were not adjusted to account for the effects of terrain. The increase in fuel economy for speeds above 70 mph is likely due to the vehicle achieving high speeds while traveling down slope. Therefore, this increase in fuel economy is not expected to be characteristic of all travel at these higher speeds.



*A typical class 8 truck tractor weighs about 17,000 lbs. The powertrain is nearly a quarter of the weight (24%) while the truck body structure is 19%.*

**Table 5.12**  
**Class 8 Truck Weight by Component**

	Pounds	Share of total
Wheels and tires	1,700	10%
Chassis/frame	2,040	12%
Drivetrain and suspension	2,890	17%
Misc. accessories/systems	3,060	18%
Truck body structure	3,230	19%
Powertrain	4,080	24%
<b>Total</b>	<b>17,000</b>	<b>100%</b>

**Source:**

National Academy of Sciences, *Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles*, prepublication copy, March 2010, p. 5-42.

**Notes:**

- Powertrain includes engine and cooling system, transmission and accessories.
- Truck body structure includes cab-in-white, sleeper unit, hood and fairings, interior and glass.
- Miscellaneous accessories/systems include batteries, fuel system, and exhaust hardware.
- Drivetrain and suspension includes drive axles, steer axle, and suspension system.
- Chassis/frame includes frame rails and crossmembers, fifth wheel and brackets. Wheels and tires include a set of 10 aluminum wheels, plus tires.



*The gross weight of a vehicle (GVW) is the weight of the empty vehicle plus the weight of the maximum payload that the vehicle was designed to carry. In cars and small light trucks, the difference between the empty weight of the vehicle and the GVW is not significantly different (1,000 to 1,500 lbs). The largest trucks and tractor-trailers, however, have a payload capacity share of 200%, which means they can carry 200% of their empty weight. The medium-sized trucks (truck classes 3-6) have payload capacity shares between 50% and 100%.*

**Table 5.13**  
**Gross Vehicle Weight vs. Empty Vehicle Weight**

Vehicle description	Truck class	Gross vehicle weight range (pounds)	Empty vehicle weight range (pounds)	Maximum payload capacity (pounds)	Payload capacity share (percent of empty weight)
Cars		3,200-6,000	2,400-5,000	1,000	20%
Minivans, small SUVs, small pick-ups	1	4,000-2,400	3,200-4,500	1,500	33%
Large SUVs, standard pick-ups	2a	6,001-8,500	4,500-6,000	2,500	40%
Large SUVs, standard pick-ups	2b	8,501-10,000	5,000-6,300	3,700	60%
Utility van, multi-purpose, mini-bus, step van	3	10,001-14,000	7,650-8,750	5,250	60%
City delivery, parcel delivery, large walk-in, bucket, landscaping	4	14,001-16,000	7,650-8,750	7,250	80%
City delivery, parcel delivery, large walk-in, bucket	5	16,001-19,500	9,500-10,000	8,700	80%
City delivery, school bus, large walk-in, bucket	6	19,501-26,000	11,500-14,500	11,500	80%
City bus, furniture, refrigerated, refuse, fuel tanker, dump, tow, concrete, fire engine, tractor-trailer	7	26,001-33,000	11,500-14,500	18,500	125%
Refuse, concrete, furniture, city bus, tow, fire engine (straight trucks)	8a	33,001-80,000	20,000-26,000	54,000	200%
Tractor-trailer: van, refrigerated, bulk tanker, flat bed (combination trucks)	8b	33,001-80,000	20,000-26,000	54,000	200%

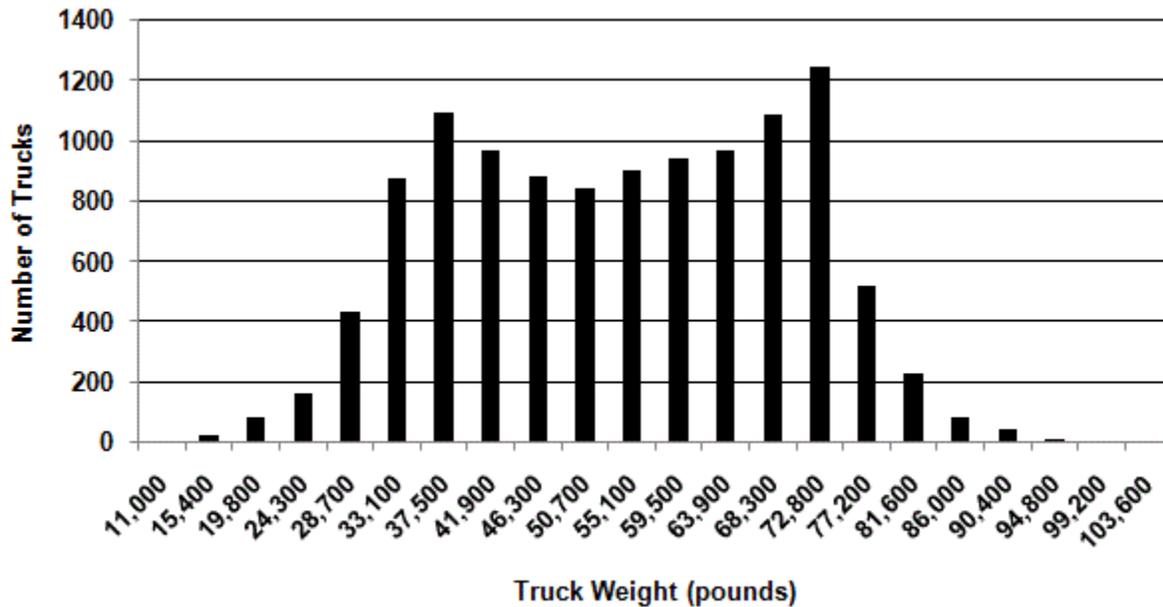
**Source:**

National Academy of Sciences, *Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles*, prepublication copy, March 2010, pp. 2-2 and 5-42.



According to weigh-in-motion data collected by fifteen states, the majority of 5-axle tractor-trailers on the road weigh between 33,000 and 73,000 lbs. Eleven percent of the tractor-trailers had weight recorded around 72,800 lbs and 10% around 68,300 lbs. Another 10% of tractor-trailers were on the lighter end of the scale – around 37,500 lbs. These data show that only a small percent of trucks on the road are near the maximum roadway gross vehicle weight of 80,000 lbs. Thus, most trucks are filling the trailer space to capacity (cubing-out) before they reach the maximum weight limit (weighing-out).

**Figure 5.5. Distribution of Class 8 Trucks by On-Road Vehicle Weight, 2008<sup>a</sup>**



**Source:**

National Academy of Sciences, *Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy-Duty Vehicles*, prepublication copy, March 2010, p. 5-45. Original source: Federal Highway Administration, Vehicle Travel Information System, 2008.

**Note:** Data are from these 15 States: California, Connecticut, Florida, Georgia, Hawaii, Iowa, Minnesota, Missouri, Montana, North Carolina, Oregon, Pennsylvania, South Dakota, Texas, and Washington.

<sup>a</sup> Study reported data on 5-axle tractor-trailers which are class 8 trucks. Single-unit class 8 trucks were not considered in the study.



## Commodity Flow Survey

The Commodity Flow Survey (CFS) is designed to provide data on the flow of goods and materials by mode of transport. The 1993, 1997, 2002, and 2007 CFS are a continuation of statistics collected in the Commodity Transportation Survey from 1963 through 1977, and include major improvements in methodology, sample size, and scope. The 2007 CFS covers business establishments with paid employees that are located in the United States and are classified using the North American Industry Classification System (NAICS) in mining, manufacturing, wholesale trade, and select retail trade industries, namely, electronic shopping and mail-order houses. Establishments classified in services, transportation, construction, and most retail industries are excluded from the survey. Farms, fisheries, foreign establishments, and most government-owned establishments are also excluded.<sup>a</sup>

The 1993, 1997, 2002, and 2007 CFS differ from previous surveys in their greatly expanded coverage of intermodalism (i.e., shipments which travel by at least two different modes, such as rail and truck). Earlier surveys reported only the principal mode. Route distance for each mode for each shipment was imputed using methodologies developed by Oak Ridge National Laboratory. Distance, in turn, was used to compute ton-mileage by mode of transport.

The data can be viewed at: [www.bts.gov/publications/commodity\\_flow\\_survey](http://www.bts.gov/publications/commodity_flow_survey).

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<sup>a</sup> Bureau of Transportation Statistics and U.S. Bureau of the Census, *2007 Economic Census, 2007 Commodity Flow Survey*, December 2008.



*Industries covered by the 2007 Commodity Flow Survey (CFS) shipped over 12 billion tons of goods worth over \$11 trillion. Compared to the 1997 CFS, the value of shipments is up 1.3% per year and tons shipped are up 1.6% per year. By value, intermodal shipments increased 4.7% per year from 1997 to 2007.*

**Table 5.14**  
**Growth of Freight in the United States: Comparison of the 1997, 2002 and**  
**2007 Commodity Flow Surveys**  
**(Detail may not add to total because of rounding)**

Mode of transportation	Value of goods shipped				Tons			
	1997 (billion 2007 dollars)	2002 (billion 2007 dollars)	2007 (billions)	Average annual percent change (1997-2007)	1997 (millions)	2002 (millions)	2007 (millions)	Average annual percent change
<b>All modes</b>	<b>8,970.5</b>	<b>9,678.0</b>	<b>11,684.9</b>	<b>2.7%</b>	<b>11,089.7</b>	<b>11,667.9</b>	<b>12,543.4</b>	<b>1.2%</b>
<b>Single modes</b>	<b>7,388.8</b>	<b>8,124.6</b>	<b>9,539.0</b>	<b>2.6%</b>	<b>10,436.5</b>	<b>11,086.7</b>	<b>11,698.1</b>	<b>1.1%</b>
Truck <sup>a</sup>	6,435.3	7,186.0	8,335.8	2.6%	7,700.7	7,842.8	8,778.7	1.3%
For-hire truck	3,748.0	4,330.2	4,955.7	2.8%	3,402.6	3,657.3	4,075.1	1.8%
Private truck	2,630.8	2,818.3	3,380.1	2.5%	4,137.3	4,149.7	4,703.6	1.3%
Rail	412.9	359.5	436.4	0.6%	1,549.8	1,873.9	1,861.3	1.8%
Water	97.9	102.9	114.9	1.6%	563.4	681.2	403.6	-3.3%
Shallow draft	69.6	66.3	91.0	2.7%	414.8	458.6	343.3	-1.9%
Great Lakes	1.9	0.9	<sup>b</sup>	<sup>b</sup>	38.4	38.0	17.8	-7.4%
Deep draft	26.4	35.7	23.1	-1.3%	110.2	184.6	42.5	-9.1%
Air (includes truck and air)	296.0	305.4	252.3	-1.6%	4.5	3.8	3.6	-2.2%
Pipeline <sup>b</sup>	146.6	172.0	399.6	10.5%	618.2	685.0	650.9	0.5%
<b>Multiple modes</b>	<b>1,221.9</b>	<b>1,243.8</b>	<b>1,866.7</b>	<b>4.3%</b>	<b>216.7</b>	<b>216.7</b>	<b>573.7</b>	<b>10.2%</b>
Parcel, U.S. Postal Service or courier	1,105.7	1,138.5	1,561.9	3.5%	23.7	25.5	33.9	3.6%
Truck and rail	97.8	80.6	187.2	6.7%	54.2	43.0	225.6	15.3%
Truck and water	10.6	16.6	58.4	18.6%	33.2	23.3	145.5	15.9%
Rail and water	2.3	3.8	13.9	19.7%	79.3	105.1	54.9	-3.6%
Other multiple modes	5.6	4.4	45.3	-8.0%	26.2	19.8	113.8	15.8%
<b>Other and unknown modes</b>	<b>359.9</b>	<b>309.6</b>	<b>279.1</b>	<b>-2.5%</b>	<b>436.5</b>	<b>364.6</b>	<b>271.6</b>	<b>-4.6%</b>

**Source:**

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Bureau of the Census, *2007 Commodity Flow Survey*, Table 1a. (Additional resources: [www.bts.gov/publications/commodity-flow-survey](http://www.bts.gov/publications/commodity-flow-survey))

<sup>a</sup> "Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

<sup>b</sup> Denotes data do not meet publication standards because of high sampling variability or poor response quality.

<sup>c</sup> CFS data for pipeline exclude most shipments of crude oil.



*Industries covered by the 2007 Commodity Flow Survey (CFS) accounted for 3.3 trillion ton-miles on the nation's highways, railways, waterways, pipelines, and aviation system. Ton-miles increased an average of 2.7% per year from 1997 to 2007.*

**Table 5.15**  
**Growth of Freight Miles in the United States: Comparison of the 1997, 2002 and 2007 Commodity Flow Surveys**  
 (Detail may not add to total because of rounding)

Mode of transportation	Ton-miles				Average miles per shipment			
	1997 (billions)	2002 (billions)	2007 (billions)	Average annual percent change (1997-2007)	1997	2002	2007	Average annual percent change
<b>All modes</b>	<b>2,661.4</b>	<b>3,137.9</b>	<b>3,344.7</b>	<b>2.3%</b>	<b>472</b>	<b>546</b>	<b>619</b>	<b>2.7%</b>
<b>Single modes</b>	<b>2,383.5</b>	<b>2,867.9</b>	<b>2,894.3</b>	<b>2.0%</b>	<b>184</b>	<b>240</b>	<b>234</b>	<b>2.4%</b>
Truck <sup>a</sup>	1,023.5	1,255.9	1,342.1	2.7%	144	173	206	3.6%
For-hire truck	741.1	959.6	1,055.6	3.6%	485	523	599	2.1%
Private truck	268.6	291.1	286.5	0.6%	53	64	57	0.7%
Rail	1,022.5	1,261.6	1,344.0	2.8%	769	807	728	-0.5%
Water	261.7	282.7	157.3	-5.0%	482	568	520	0.8%
Shallow draft	189.3	211.5	117.5	-4.7%	177	450	144	-2.0%
Great Lakes	13.4	13.8	6.9	-6.4%	204	339	657	12.4%
Deep draft	59.0	57.4	33.0	-0.1%	1,024	664	923	-1.0%
Air (includes truck and air)	6.2	5.8	4.5	-3.2%	1,380	1,919	1,304	-0.6%
Pipeline <sup>b</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>	<sup>c</sup>
<b>Multiple modes</b>	<b>204.5</b>	<b>225.7</b>	<b>416.6</b>	<b>7.4%</b>	<b>813</b>	<b>895</b>	<b>975</b>	<b>1.8%</b>
Parcel, U.S. Postal Service or courier	18.0	19.0	28.0	4.5%	813	894	975	1.8%
Truck and rail	55.6	45.5	196.8	13.5%	1,347	1,413	1,007	-2.9%
Truck and water	34.8	32.4	98.4	11.0%	1,265	1,950	1,429	1.2%
Rail and water	77.6	115.0	47.1	-4.9%	1,092	957	1,928	5.8%
Other multiple modes	18.6	13.8	46.4	0.1%	<sup>c</sup>	<sup>c</sup>	1,182	<sup>c</sup>
<b>Other and unknown modes</b>	<b>73.4</b>	<b>44.2</b>	<b>33.8</b>	<b>-7.5%</b>	<b>122</b>	<b>130</b>	<b>116</b>	<b>-0.5%</b>

**Source:**

U.S. Department of Transportation, Bureau of Transportation Statistics and U.S. Department of Commerce, Bureau of the Census, *2007 Commodity Flow Survey*, Table 1a. (Additional resources: [www.bts.gov/publications/commodity-flow-survey](http://www.bts.gov/publications/commodity-flow-survey))

<sup>a</sup> "Truck" as a single mode includes shipments which went by private truck only, for-hire truck only, or a combination of private truck and for-hire truck.

<sup>b</sup> CFS data for pipeline exclude most shipments of crude oil.

<sup>c</sup> Denotes data do not meet publication standards because of high sampling variability or other reasons. Some unpublished estimates can be derived from other data published in this table. However, figures obtained in this manner are subject to these same limitations.



*In 2007, the data changed substantially due to improved estimation methodologies. Unfortunately, those data are no longer comparable to the rest of the historical series.*

**Table 5.16**  
**Summary Statistics on Transit Buses and Trolleybuses, 1994–2010**

Year	Number of active buses	Vehicle-miles (millions)	Passenger-miles (millions)	Btu/passenger-mile	Energy use (trillion Btu)
1994	68,766	2,176	19,019	4,262	81.1
1995	67,802	2,198	19,005	4,307	81.9
1996	72,353	2,234	19,280	4,340	83.7
1997	73,425	2,259	19,793	4,434	87.8
1998	72,788	2,188	20,542	4,399	90.4
1999	74,885	2,290	21,391	4,344	92.9
2000	75,665	2,329	21,433	4,531	97.1
2001	76,675	2,389	22,209	4,146	92.1
2002	76,806	2,425	22,029	4,133	91.1
2003	78,000	2,435	21,438	4,213	90.3
2004	81,630	2,484	21,550	4,364	94.0
2005	82,642	2,498	21,998	4,250	93.5
2006	83,689	2,507	22,985	4,316	99.2
2007	65,808	2,314	21,132	4,372	92.4
2008	67,096	2,388	21,918	4,348	95.3
2009	65,363	2,345	21,645	4,242	91.8
2010	66,810	2,425	21,172	4,118	87.2

**Source:**

American Public Transportation Association, *2012 Public Transportation Fact Book*, Washington, DC, April 2012, Tables 6, 8, 9, 15, and Appendix A. (Additional resources: [www.apta.com](http://www.apta.com))

<sup>a</sup> Data are not continuous between 2006 and 2007 due to changes in estimation methodology. See source document for details.

