V. SAFETY, ENERGY, AND ENVIRONMENTAL IMPLICATIONS OF FREIGHT TRANSPORTATION

Growing demand for freight transportation heightens concerns about its safety, energy consumption, and environmental impacts. While safety in all freight modes continues to be monitored actively, the availability of energy consumption data has declined with the discontinuation of the Vehicle Inventory and Use Survey.

Table 5-1. Fatalities by Freight Transportation Mode: 1990, 2000, and 2010-2012

	1990	2000	2010	2011	2012
Total transportation fatalities (passenger and freight)	**(R) 47,379**	**(R) 44,376**	**34,968**	**34,349**	**U**
Highway (passenger and freight)	**44,599**	**41,945**	**(R) 32,999**	**32,367**	**33,561**
Large truck occupants[1]	705	754	(R) 530	635	697
Others killed in crashes involving large trucks	4,567	4,528	3,146	3,122	3,224
Large truck occupants[1] (percent)	1.6	1.8	1.6	2.0	2.1
Others killed in crashes involving large trucks (percent)	10.2	10.8	9.6	9.6	9.6
Railroad (passenger and freight)	**729**	**631**	**600**	**(R) 557**	**U**
Highway-rail crossing[2]	130	119	125	(R) 110	U
Railroad[2,3]	599	512	475	(R) 447	U
Trespassers	543	463	438	407	U
Waterborne (passenger and freight)	**186**	**111**	**(R) 93**	**(R) 62**	**U**
Vessel-related[4]	85	42	41	28	U
Freight ship	0	0	10	1	U
Tank ship	5	0	1	0	U
Tug/towboat	13	1	4	0	U
Offshore supply	2	0	1	0	U
Fishing vessel	47	26	9	14	U
Mobile offshore drilling units	0	0	0	0	U
Platform	1	0	0	0	U
Freight barge	0	0	0	0	U
Tank barge	0	0	1	0	U
Miscellaneous[5]	11	15	15	13	U
Not vessel-related[4]	101	69	(R) 52	(R) 34	U
Pipeline	**9**	**38**	**(R) 22**	**(R) 14**	**12**
Hazardous liquid pipeline	3	1	1	1	3
Gas pipeline	6	37	(R) 21	(R) 13	9

Key: P = preliminary; R = revised; U = unavailable at date of publication.

[1] Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.

[2] Includes fatalities involving motor vehicles at private highway-rail grade crossings and fatalities not involving motor vehicles at all highway-rail grade crossings resulting from freight and passenger rail operations including commuter rail. Excludes highway-rail grade crossing fatalities involving motor vehicles at public highway-rail grade crossings which are counted under Highway.

[3] Includes Amtrak. Fatalities include those resulting from train accidents, train incidents, and nontrain incidents.

[4] Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Not vessel-related casualties include deaths from falling overboard or from accidents involving onboard equipment.

[5] Includes industrial vessel, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

Notes: Caution must be exercised in comparing fatalities across modes because significantly different definitions are used.

While the amount of freight transportation activity has increased in recent decades, the number of fatalities has declined or remained stable, with the exception of waterborne casualties that are not vessel related. Trucks accounted for approximately 12 percent of all highway fatalities in 2012. The vast majority of fatalities involve passenger travel on highways.

Table 5-1. Fatalities by Freight Transportation Mode: 1990, 2000, and 2010-2012

Source: Total: U.S. Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, available at www.bts.gov as of April 28, 2014. **Highway:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, Traffic Safety Facts, Large Trucks (annual issues) **2010-2012:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, Traffic Safety Facts - Highlights (annual issues). **Railroad:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at http://safetydata.fra.dot.gov/officeofsafety/default.asp as of October 4, 2013. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 30, 2013. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm as of October 4, 2013.

Table 5-2. Injuries by Freight Transportation Mode: 1990, 2000, and 2010-2012

	1990	2000	2010	2011	2012
Total transportation fatalities (passenger and freight)	**3,269,465**	**3,217,115**	**(R) 2,258,768**	**(R) 2,234,245**	**U**
Highway (passenger and freight)	**3,230,667**	**3,188,750**	**(R) 2,239,000**	**2,217,000**	**2,362,000**
Large truck occupants[1]	41,822	30,832	20,000	23,000	25,000
Others injured in crashes involving large trucks	108,000	109,000	60,000	66,000	79,000
Large truck occupants[1] (percent of highway)	1.3	1.0	0.9	1.0	1.1
Others injured in crashes involving large trucks (percent of highway)	3.3	3.4	3.9	3.0	3.3
Railroad (passenger and freight)	**(R) 22,957**	**(R) 10,614**	**(R) 7,671**	**(R) 7,550**	**U**
Highway-rail grade crossing[2]	(R) 221	(R) 190	(R) 169	(R) 216	U
Railroad[2,3]	(R) 22,736	(R) 10,424	(R) 7,502	(R) 7,334	U
Trespassers	560	414	390	368	U
Waterborne (passenger and freight)	**NA**	**(R) 758**	**(R) 677**	**(R) 901**	**U**
Vessel-related[4]	175	151	135	247	U
Freight ship	10	5	17	24	U
Tank ship	13	3	0	10	U
Tug/towboat	19	18	0	27	U
Offshore supply	9	6	3	1	U
Fishing vessel	31	21	15	46	U
Mobile offshore drilling units	13	0	10	6	U
Platform	9	0	0	0	U
Freight barge	3	2	0	4	U
Tank barge	3	0	0	0	U
Miscellaneous[5]	12	96	90	129	U
Not vessel-related[4]	NA	607	(R) 542	(R) 654	U
Pipeline	**76**	**81**	**(R) 109**	**(R) 57**	**58**
Hazardous liquid pipeline	7	4	4	2	4
Gas pipeline	69	77	(R) 105	(R) 55	54

Key: NA = not available; R = revised; U = unavailable at date of publication.

[1] Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.

[2] Includes injuries involving motor vehicles at private highway-rail grade crossings and fatalities not involving motor vehicles at all highway-rail grade crossings resulting from freight and passenger rail operations including commuter rail. Excludes highway-rail grade crossing injuries involving motor vehicles at public highway-rail grade crossings which are counted under Highway.

[3] Includes train accidents and other incidents. Most injuries involve workers on duty and are included under other incidents (4,050 in 2012).

[4] Vessel-related injuries include those involving damage to vessels, such as collisions or groundings. Not vessel-related injuries include those from falls overboard or from accidents involving onboard equipment.

[5] Includes industrial vessel, oil recovery, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

Historically, the highway mode has accounted for nearly all injuries in freight transportation, but the number of injuries has dropped substantially since 1990.

Table 5-2. Injured Persons by Freight Transportation Mode: 1990, 2000, and 2010-2012

Source: Total: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics*, available at www.bts.gov as of April 28, 2014. **Highway:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, Traffic Safety Facts, Large Trucks (annual issues). **2010-2012:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis,Traffic Safety Facts - Highlights (annual issues). **Railroad:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at http://safetydata.fra.dot.gov/officeofsafety/default.asp as of October 4, 2013. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 30, 2013. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm as of October 4, 2013.

Table 5-3. Crashes, Accidents, and Incidents by Freight Transportation Mode: 1990, 2000, and 2010-2012

	1990	2000	2010	2011	2012
Highway (passenger and freight)	**6,471,000**	**6,394,000**	**5,419,000**	**5,338,000**	**5,615,000**
Large truck[1]	371,801	437,861	276,000	287,000	317,000
Large truck[1] (percent of total)	5.7	6.8	5.1	5.4	5.6
Rail (passenger and freight)					
Highway-rail grade crossing[2,3]	5,715	3,502	2,027	(R) 2,060	1,967
Railroad[2,4]	2,879	2,983	1,902	(R) 2,022	1,739
Waterborne (passenger and freight)					
Vessel-related	3,613	5,403	5,434	6,381	U
Pipeline[5]	**430**	**380**	**591**	**593**	**570**
Hazardous liquid pipeline	140	(R) 146	(R) 350	(R) 346	364
Gas pipeline	290	(R) 234	(R) 241	(R) 247	206

Key: R = revised; U = unavailable at date of publication.

[1] Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
[2] Includes Amtrak.
[3] Includes both accidents and incidents. Most highway-rail grade crossing accidents are also counted under highway.
[4] Train accidents only.
[5] In 2002, the Pipeline and Hazardous Materials Safety Administration lowered the threshold for determining incidents for volume released from 50 barrels to 5 gallons, resulting in a significant increase in the number of pipeline incidents reported.

The number of crashes and other freight transportation accidents has declined in all modes except water and hazardous liquid pipeline since 1990, despite an increase in freight transportation activity.

Table 5-3. Crashes, Accidents, and Incidents by Freight Transportation Mode: 1990, 2000, and 2010-2012
Source: Total: U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, National Transportation Statistics, available at *www.bts.gov* as of October 4, 2013. **Highway:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, Traffic Safety Facts, Large Trucks (annual issues). **2010-2012:** U.S. Department of Transportation, National Highway Transportation Safety Administration, National Center for Statistics and Analysis, Traffic Safety Facts - Highlights (annual issues). **Railroad:** U.S. Department of Transportation, Federal Railroad Administration, Office of Safety Analysis, available at *http://safetydata.fra.dot.gov/officeofsafety/default.asp* as of October 4, 2013. **Waterborne:** U.S. Department of Homeland Security, U.S. Coast Guard, Data Administration Division, personal communication, September 6, 2011. **Pipeline:** U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Pipeline Safety Program, Pipeline Library, available at *http://primis.phmsa.dot.gov/comm/PipelineLibrary.htm* as of April 2, 2014.

Table 5-4. Hazardous Materials Transportation Incidents: 1990, 2000, 2010-2012

	1990	2000	2010	2011	2012
Total	**8,879**	**17,557**	**(R) 14,800**	**(R) 15,026**	**15,433**
Accident-related	297	394	359	(R) 376	397
Air	**297**	**1,419**	**(R) 1,294**	**1,400**	**1,460**
Accident-related	0	3	2	2	2
Highway	**7,296**	**15,063**	**12,652**	**(R) 12,810**	**13,241**
Accident-related	**249**	**329**	**321**	**(R) 334**	**362**
Rail	**1,279**	**1,058**	**749**	**(R) 745**	**662**
Accident-related	48	62	35	40	33
Water[1]	**7**	**17**	**105**	**71**	**70**
Accident-related	0	0	1	0	0
Other[2]	**0**	**0**	**NA**	**NA**	**NA**
Accident-related	0	0	NA	NA	NA

Key: NA = not available; R = revised.

[1] Water category includes only packaged (nonbulk) marine. Non-packaged (bulk) marine hazardous materials incidents are reported to the U.S. Coast Guard and are not included.

[2] Other category includes freight forwarders and modes not otherwise specified.

Notes: Hazardous materials transportation incidents required to be reported are defined in the Code of Federal Regulations (CFR), 49 CFR 171.15, 171.16 (Form F 5800.1). Hazardous materials deaths and injuries are caused by the hazardous material in commerce. Accident-related means vehicular accident or derailment. Each modal total also includes fatalities caused by human error, package failure, and causes not elsewhere classified. As of 2005, the "Other" data are no longer included in the hazardous materials information system report.

Because most hazardous materials are transported by truck, the majority of incidents related to the movement of hazardous materials occur on highways or in truck terminals. A very small share of hazardous materials transportation incidents are the result of a vehicular crash or derailment (referred to as "accident related"). Approximately two percent of incidents were accident related in 2012, but they accounted for 79 percent of all property damage. Most hazardous materials incidents occur because of human error or package failure, particularly during loading and unloading.

Table 5-4. Hazardous Materials Transportation Incidents: 1990, 2000, and 2010-2012
Source: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials Safety, Hazardous Materials Information System Database, available at *www.phmsa.dot.gov/hazmat/library/data-stats* as of September 20, 2013.

Table 5-5a. Commercial Motor Carrier Compliance Reviews by Safety Rating: 2012

Safety rating	2012		
	Federal	State	Total
Satisfactory	2,224	1,362	3,586
Conditional	2,446	1,058	3,504
Unsatisfactory	217	129	346
Not rated	207	1,578	1,785
Total	**5,094**	**4,127**	**9,221**

Notes: These data include any review that resulted in a safety rating, including Motor Carrier Safety Compliance Reviews or CSA2010 reviews. As a result, the total number of reviews in this table differs from the total in Table 5-5b because that table includes reviews that did not result in a formal safety rating. A compliance review is an on-site examination of a motor carrier's records and operations to determine whether the carrier meets the Federal Motor Carrier Safety Administration's safety fitness standard.

The safety fitness of motor carriers is a top priority of the U.S. Department of Transportation. As part of its efforts to improve safety, federal and state governments conducted 9,221 safety compliance reviews that resulted in a formal safety rating in 2012. Of that total, only about 4 percent of motor carriers received an unsatisfactory rating.

Table 5-5b. Commercial Motor Carrier Compliance Reviews by Type: 2009-2012

Review Type	2009			2010			2011			2012		
	Federal	State	Total	Federal	State	Total	Federal	State	Total	Federal	State	Total
Total Reviews	**12,326**	**7,979**	**20,305**	**(R) 12,308**	**7,877**	**(R) 20,185**	**11,094**	**(R) 7,336**	**(R) 18,430**	**12,373**	**7,848**	**20,221**
Motor Carrier Safety Compliance Reviews[1]	10,084	6,429	16,513	(R) 8,858	5,705	(R) 14,563	(R) 4,613	(R) 3,650	(R) 8,263	0	0	0
Cargo Tank Facility Reviews	84	22	106	121	(R) 24	(R) 145	78	19	97	77	15	92
Shipper Reviews	341	38	379	310	80	390	(R) 256	(R) 59	(R) 315	234	81	315
Non-Rated Reviews (excludes SCR & CSA2010)	1,243	815	2,058	1,725	636	2,361	(R) 951	(R) 531	(R) 1,482	1,156	567	1,723
CSA Offsite	136	207	343	333	356	689	(R) 318	(R) 301	(R) 619	233	341	574
CSA Onsite Focused/ Focused CR	260	260	520	591	(R) 617	(R) 1,208	(R) 4,344	(R) 1,911	(R) 6,255	7,274	3,198	10,472
CSA Onsite Comprehensive	178	208	386	370	(R) 460	(R) 830	(R) 534	(R) 865	(R) 1,399	3,399	3,646	7,045
Total Security Contact Reviews	**1,378**	**581**	**1,959**	**1,276**	**621**	**1,897**	**603**	**(R) 302**	**(R) 905**	**505**	**216**	**721**

Key: R = revised; SCR = Security Contact Reviews; CSA = Compliance, Safety, Accountability; CR = Compliance Review.

[1] Beginning in 2012, all reviews that were previously considered Motor Carrier Safety Compliance Reviews are now included in the CSA Onsite Comprehensive Investigations total.

Notes: These data include all compliance reviews conducted in the specified years. As a result, the total number of reviews in this table differs from the total in table 5-5a because that table only includes reviews that resulted in a formal safety rating. A compliance review is an on-site examination of a motor carrier's records and operations to determine whether the carrier meets the Federal Motor Carrier Safety Administration's safety fitness standard.

Federal and state governments also conduct shipper, cargo tank facility, and onsite comprehensive safety analysis reviews.

Table 5-5a. Commercial Motor Carrier Compliance Reviews by Safety Rating: 2012
Source: U.S. Department of Transportation, Federal Motor Carrier Administration, Motor Carrier Management Information System (MCMIS), Compliance Review Activity by Safety Rating for Fiscal Years, available at *www.fmcsa.dot.gov* as of September 20, 2013.

Table 5-5b. Commercial Motor Carrier Compliance Reviews by Type: 2009-2012
Source: U.S. Department of Transportation, Federal Motor Carrier Administration, Motor Carrier Management Information System (MCMIS), Compliance Review Activity by Safety Rating for Fiscal Years, available at www.fmcsa.dot.gov as of September 25, 2013.

Table 5-6. Roadside Safety Inspection Activity Summary by Inspection Type: 2000 and 2010-2012

	2000		2010		2011		2012	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
All inspections								
Number of inspections	2,453,776	100.0	3,569,373	100.0	3,601,302	100.0	3,582,221	100.0
With no violations	639,593	26.1	1,225,324	34.3	1,342,133	37.3	1,395,748	39.0
With violations	1,814,183	73.9	2,344,049	65.7	2,259,169	62.7	2,186,473	61.0
Driver inspections								
Number of inspections	2,396,688	100.0	3,470,871	100.0	3,484,536	100.0	3,464,458	100.0
With no violations	1,459,538	60.9	2,316,960	66.8	2,422,611	69.5	2,463,117	71.1
With violations	937,150	39.1	1,153,911	33.2	1,061,925	30.5	1,001,341	28.9
With OOS violations	191,031	8.0	183,350	5.3	173,980	5.0	170,015	4.9
Vehicle inspections								
Number of inspections	1,908,300	100.0	2,413,094	100.0	2,425,973	100.0	2,442,853	100.0
With no violations	584,389	30.6	834,551	34.6	880,172	36.3	928,661	38.0
With violations	1,323,911	69.4	1,578,543	65.4	1,545,801	63.7	1,514,192	62.0
With OOS violations	452,850	23.7	480,416	19.9	491,730	20.3	491,541	20.1
Hazardous materials inspections								
Number of inspections	133,486	100.0	211,154	100.0	208,852	100.0	204,427	100.0
With no violations	101,098	75.7	180,522	85.5	183,150	87.7	180,587	88.3
With violations	32,388	24.3	30,632	14.5	25,702	12.3	23,840	11.7
With OOS violations	9,964	7.5	9,210	4.4	7,998	3.8	7,670	3.8

Key: OOS = out of service.

Notes: A roadside inspection is an examination of individual commercial motor vehicles and drivers to determine if they are in compliance with the Federal Motor Carrier Safety Regulations and/or Hazardous Materials Regulations. Serious violations result in the issuance of driver or vehicle OOS orders. Serious violations include operating a vehicle in a hazardous condition, hazardous materials onboard, or lack of required operating authority. These violations must be corrected before the driver or vehicle can return to service. Moving violations also may be recorded in conjunction with a roadside inspection.

Less than one-fourth of all roadside inspections of commercial vehicles resulted in the vehicle being placed out of service (OOS) for a serious violation. A much lower percentage of driver and hazardous materials inspections resulted in OOS orders. In 2012, about five percent of driver inspections and less than four percent of hazardous materials inspections resulted in an OOS order.

Table 5-6. Roadside Safety Inspection Activity Summary By Inspection Type: 2000 and 2010-2012
Source: U.S. Department of Transportation, Federal Motor Carrier Safety Administration, Motor Carrier Management Information System (MCMIS), Roadside Inspection Activity Summary for Fiscal Years, special tabulation, October, 17, 2013.

Table 5-7. Fuel Consumption by Transportation Mode: 2007-2011

	2007	2008	2009	2010	2011
Highway[1]					
Gasoline, diesel and other fuels (million gallons)	176,203	170,765	168,140	(R) 170,411	168,597
Truck, total	47,219	47,704	44,303	(R) 45,023	42,377
Single-unit 2-axle 6-tire or more truck	16,314	17,144	16,253	(R) 15,097	14,183
Combination truck	30,904	30,561	28,050	(R) 29,927	28,193
Truck (percent of total)	26.8	27.9	26.3	(R) 26.4	25.1
Rail, Class I (in freight service)					
Distillate / diesel fuel (million gallons)	(R) 4,087	(R) 3,911	(R) 3,220	(R) 3,519	3,710
Water					
Residual fuel oil (million gallons)	6,327	(R) 5,258	(R) 4,589	(R) 5,143	4,560
Distillate / diesel fuel oil (million gallons)	1,924	(R) 1,983	(R) 1,913	(R) 2,003	2,133
Gasoline (million gallons)	1,222	1,136	1,130	1,167	1,104
Pipeline					
Natural gas (million cubic feet)	621,364	647,956	670,174	(R) 674,124	683,715

Key: R = revised.

[1] Based on a new methodology, FHWA revised its annual vehicle-miles traveled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at *www.fhwa.dot.gov/policyinformation/statistics.cfm*. Data in this table should not be compared to those in pre-2011 editions of *Freight Facts and Figures*.

In recent years, increases in fuel costs, a slight decrease in the number of trucks on the road, and improved energy efficiency have affected the number of gallons of fuel burned by commercial trucks. From 2007 to 2011, truck fuel consumption declined by 10 percent, from 47.2 billion gallons to 42.4 billion gallons. Fuel use in Class I freight railroads declined by 9 percent, from 4.1 billion gallons in 2007 to 3.7 billion gallons in 2011.

Table 5-8. Energy Consumption by Selected Freight Transportation Mode: 2007-2011 (trillions of Btus)

	2007	2008	2009	(R) 2010	2011
Truck	6,326	6,382	5,922	6,038	5,683
Class I Rail	(R) 567	(R) 542	(R) 447	488	515
Water	1,367	(R) 1,204	(R) 1,094	1,194	1,117
Pipeline (natural gas only)	642	668	691	695	705

Key: R = revised; Btu = British Thermal Unit.

Notes: Class I railroads have annual carrier operating revenue of $433.2 million or more. Based on a new methodology, FHWA revised its annual vehicle-miles traveled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at *www.fhwa.dot.gov/policyinformation/statistics.cfm*. Data in this figure should not be compared to those in pre-2011 editions of *Freight Facts and Figures*. Data do not include energy consumed by oil pipelines (crude petroleum and petroleum products) or coal slurry/water slurry pipelines.

In 2011, trucking accounted for a large majority of freight transportation energy consumption, followed by water, a distant second.

Table 5-7. Fuel Consumption by Transportation Mode: 2007-2011
Source: U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table VM-1. **Rail:** Association of American Railroads, Railroad Facts (Washington, DC: annual issues), p. 61. **Water:** U.S. Department of Energy, Energy Information Administration, Fuel Oil and Kerosene Sales 2011 (Washington, DC: 2012), tables 2, 4, and similar tables in earlier editions; U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table MF-24, available at *www.fhwa.dot.gov/policyinformation/statistics/2011/* as of September 20, 2013. **Pipeline:** U.S. Department of Energy, Natural Gas Annual 2011, (Washington, DC: January 2013), table 15 and similar tables in earlier editions.

Table 5-8. Energy Consumption by Selected Freight Transportation Mode: 2007-2011 (trillions of BTUs)
Source: U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table VM-1. **Rail:** Association of American Railroads, Railroad Facts (Washington, DC: annual issues), p. 61. **Water:** U.S. Department of Energy, Energy Information Administration, Fuel Oil and Kerosene Sales 2011 (Washington, DC: 2012), tables 2, 4, and similar tables in earlier editions; U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table MF-24, available at *www.fhwa.dot.gov/policyinformation/statistics/2011/* as of September 20, 2013. **Pipeline:** U.S. Department of Energy, Natural Gas Annual 2011, (Washington, DC: January 2013), table 15 and similar tables in earlier editions.

Table 5-9. Single-Unit Truck Fuel Consumption and Travel: 2007-2011

	2007	2008	2009	2010	2011
Number registered (thousands)	8,117	8,288	8,356	8,217	7,819
Vehicle-miles traveled (millions)	119,979	126,855	120,207	(R) 110,738	103,515
Fuel consumed (million gallons)	16,314	17,144	16,253	(R) 15,097	14,183
Average miles traveled per vehicle	14,782	15,306	14,386	(R) 13,476	13,239
Average miles traveled per gallon	7.4	7.4	7.4	7.3	7.3
Average fuel consumed per vehicle (gallons)	2,010	2,068	1,945	(R) 1,837	1,814

Key: R = revised.
Notes: Single-unit trucks have 2-axles and at least 6 tires or a gross vehicle weight rating exceeding 10,000 pounds. Based on a new methodology, FHWA revised its annual vehicle-miles traveled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at *www.fhwa.dot.gov/policyinformation/statistics.cfm*. Data in this table should not be compared to those in pre-2011 editions of *Freight Facts and Figures*.

Miles per gallon for single-unit trucks (based on total travel and fuel consumption) have been relatively stable in recent years. Single-unit trucks traveled fewer miles overall and fewer miles per vehicle, resulting in reduced fuel consumption even though there was little change in miles per gallon. In 2011, single-unit trucks consumed 914 million fewer gallons than the previous year.

Table 5-10. Combination Truck Fuel Consumption and Travel: 2007-2011

	2007	2008	2009	2010	2011
Number registered (thousands)	2,635	2,585	2,617	2,553	2,452
Vehicle-miles traveled (millions)	184,199	183,826	168,100	(R) 175,789	163,692
Fuel consumed (million gallons)	30,904	30,561	28,050	(R) 29,927	28,193
Average miles traveled per vehicle	69,896	71,106	64,231	(R) 68,859	66,768
Average miles traveled per gallon	6.0	6.0	6.0	5.9	5.8
Average fuel consumed per vehicle (gallons)	11,727	11,821	10,718	(R) 11,723	11,500

Key: R = revised.
Notes: Based on a new methodology, FHWA revised its annual vehicle-miles traveled, number of vehicles, and fuel economy data beginning with 2007. Information on the new methodology is available at *www.fhwa.dot.gov/policyinformation/statistics.cfm*. Data in this table should not be compared to those in pre-2011 editions of *Freight Facts and Figures*.

Miles per gallon for combination trucks (based on total travel and fuel consumption) also remained relatively stable between 2007 and 2011. During the same period, vehicle-miles traveled by combination trucks declined by 20.5 billion (about 11 percent).

Table 5-9. Single-Unit Truck Fuel Consumption and Travel: 2007-2011
Source: U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table VM-1. Available at *www.fhwa.dot.gov/policyinformation/statistics/2011/* as of September 1, 2013.

Table 5-10. Combination Truck Fuel Consumption and Travel: 2007-2011
Source: U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: annual issues), table VM-1. Available at *www.fhwa.dot.gov/policyinformation/statistics/2011/* as of September 1, 2013.

Table 5-11. Energy Intensities of Selected Domestic Freight Transportation Modes: 2007-2011

	2007	2008	2009	2010	2011
Highway[1] (Btu per vehicle-mile)	21,238	21,008	21,024	(R) 21,499	21,698
Railroad (Class I) (Btu per freight-car-mile)	14,846	14,573	13,907	13,733	14,043
Railroad (Class I) (Btu per ton-mile)	320	305	291	289	298
Domestic Waterborne Commerce (Btu per ton-mile)	225	252	225	217	NA

Key: Btu = British thermal unit; NA = not available; R = revised.

[1] Includes heavy single-unit and combination trucks. Heavy single-unit trucks are trucks that have two axles and at least six tires or a gross vehicle weight rating exceeding 10,000 pounds. Based on a new methodology, FHWA revised its annual vehicle-miles traveled, number of vehicles, and fuel economy data beginning with 2007. Energy intensity data are based on the new FHWA methodology. Information on the new methodology is available at *www.fhwa.dot.gov/policyinformation/statistics.cfm*. Data in this table should not be compared to those in pre-2011 editions of *Freight Facts and Figures*.

Energy intensity is the amount of energy used to produce a given level of output or activity, in this case vehicle-miles and ton-miles. In recent years, the energy intensity of trucking has remained relatively stable, while rail and water have improved somewhat.

Table 5-11. Energy Intensities of Domestic Freight Transportation Modes: 2007-2011
Source: Oak Ridge National Laboratory, Transportation Energy Data Book: Edition 32 (Oak Ridge, TN: annual issues), table 2.15, available at *http://cta.ornl.gov/data/index.shtml* as of September 20, 2013.

Table 5-12. Estimated National Average Vehicle Emissions Rates: 2000, 2005, 2011, and 2012 (grams per mile)

	2000	2005	2011	2012
	Gasoline			
Cars				
Exhaust HC	0.82	0.45	0.24	0.21
Nonexhaust HC	0.61	0.38	0.19	0.17
Total HC	1.43	0.82	0.43	0.37
Exhaust CO	14.31	7.83	4.39	3.93
Exhaust NO_x	1.90	1.17	0.64	0.54
Light trucks[1]				
Exhaust HC	1.22	0.89	0.61	0.56
Nonexhaust HC	0.63	0.44	0.31	0.29
Total HC	1.85	1.33	0.92	0.86
Exhaust CO	22.21	14.95	10.21	9.43
Exhaust NO_x	2.76	1.94	1.41	1.29
Heavy trucks[2]				
Exhaust HC	2.75	1.87	1.19	1.09
Nonexhaust HC	1.22	0.94	0.70	0.65
Total HC	3.97	2.81	1.89	1.74
Exhaust CO	62.88	47.27	32.95	30.67
Exhaust NO_x	5.84	4.50	3.45	3.27
	Diesel			
Cars				
Exhaust HC	0.26	0.16	0.07	0.07
Exhaust CO	1.14	0.57	0.63	0.72
Exhaust NO_x	1.36	1.96	1.09	0.96
Light trucks[1]				
Exhaust HC	0.65	0.66	0.55	0.51
Exhaust CO	3.51	3.74	3.15	2.91
Exhaust NO_x	6.04	5.83	4.26	3.92
Heavy trucks[2]				
Exhaust HC	1.06	1.10	0.86	0.81
Exhaust CO	4.59	4.64	3.28	3.02
Exhaust NO_x	23.20	16.84	9.84	8.80

Key: CO = carbon monoxide; HC = hydrocarbon; NO_x = nitrogen oxides.

[1] Includes pick-up trucks, sport-utility vehicles, and minivans with a gross vehicle weight rating up to 8,500 pounds.

[2] Includes trucks with a gross vehicle weight rating over 8,500 pounds.

Notes: This table is based on MOVES2010b, the latest highway vehicle emissions factor model from the U.S. Environmental Protection Agency. Similar tables in previous editions of *Freight Facts and Figures* were based on earlier models. Thus, the data in this table should not be compared to those in previous editions.

Air quality is affected by freight vehicle emissions. Compared with gasoline-fueled cars and trucks, diesel-fueled heavy trucks emit small amounts of carbon monoxide (CO), but large amounts of nitrogen oxides (NO_x). However, since 2000 diesel-fueled heavy-duty truck emissions of NO_x have declined by 62 percent.

Table 5-12. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 2000, 2005, 2011, and 2012

Source: Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory, special tabulation, October 25, 2013.

Table 5-13. Freight Nitrogen Oxides (NO_x) and Particulate Matter (PM-10) Emissions by Single-Unit and Combination Trucks: 2000, 2002, 2005, 2012, 2020, and 2030 (thousands of short tons)

Mode	2000	2002	2005	2012	2020	2030
NO_x emissions	5,227	5,029	4,240	2,345	1,333	1,022
Total PM-10 emissions	219	216	210	116	59	40
Exhaust emissions	203	199	192	98	36	12
Brake emissions	13	13	14	15	18	22
Tire emissions	3	4	4	4	5	6

Note: Single-unit trucks have 2-axles and at least 6 tires or a gross vehicle weight rating exceeding 10,000 pounds.

Trucks are the largest contributor to freight emissions nationally, producing 2.3 million tons of NO_x in 2012. However, substantial reductions in freight-related NO_x emissions have been made since the U.S. Environmental Protection Agency required the use of ultra-low sulfur diesel (ULSD) fuel in heavy-duty trucks and other diesel-powered highway vehicles beginning in 2006. Between 2006 and 2012, NO_x emissions from single-unit and combination trucks decreased by 55 percent. PM-10 emissions declined by 47 percent over the same period. Truck-related NO_x and PM-10 emissions are projected to further decline by 56 percent and 66 percent, respectively, from 2012 to 2030.

Table 5-14. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990, 2005, and 2008-2011 (electricity-related emissions distributed among sectors)[1] (millions of metric tonnes of CO_2 equivalent)

Sector	(R)1990	(R)2005	(R)2008	(R)2009	(R)2010	2011
Industry[2]	2,181.3	2,102.4	2,036.3	1,789.8	1,916.9	1,897.2
Transportation[3]	1,556.3	2,017.2	1,920.8	1,845.2	1,856.9	1,833.7
Commercial	953.1	1,243.6	1,223.6	1,159.6	1,216.3	1,169.8
Residential	939.5	1,192.4	1,211.1	1,150.8	1,165.2	1,131.0
Agriculture	519.3	581.5	607.1	593.3	597.1	612.6
U.S. Territories[4]	33.7	58.2	49.8	47.9	58.0	58.0
Total	**6,183.3**	**7,195.3**	**7,048.8**	**6,586.6**	**6,810.3**	**6,702.3**

Key: CO_2 = carbon dioxide; R = revised.

[1] Emissions from electricity generation are allocated to each economic end-use sector on the basis of each sector's share of aggregate electricity consumption. This method assumes each sector consumes electricity that is generated from the national average mix of fuels according to their carbon intensity.

[2] Industry includes manufacturing, construction, and mining. Six manufacturing industries--petroleum refineries, chemicals, primary metals, paper, food, and nonmetallic mineral products-represent the vast majority of energy use and thus GHG emissions in the industrial sector.

[3] Includes emissions from military aircraft (12.6 million metric tonnes in 2011) and "other" transportation, primarily lubricants (9.0 million metric tonnes in 2011). Emissions from international bunker fuels are not included.

[4] Electricity-related emissions were not distributed to U.S. Territories.

Notes: Greenhouse gas (GHG) emissions include CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. CO_2 equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO_2 by weight. Numbers may not add to totals due to rounding.

In addition to CO, NO_x, and particulate matter emissions, the transportation sector releases large quantities of greenhouse gases (GHGs), such as carbon dioxide (CO_2), methane, nitrous oxide, and hydrofluorocarbons. When emissions from electricity are distributed among end-use sectors, transportation is responsible for about 27 percent of all greenhouse gases emitted in the United States in 2011 and nearly 7 percent of all greenhouse gases emitted globally.[1] The industrial sector produces the largest amount of GHG emissions (28 percent).

1 Intergovernmental Panel on *Climate Change, Climate Change 2007: Synthesis Report* (Geneva, Switzerland: 2008).

Table 5-13. Nitrogen Oxides (NO_x) and Particulate Matter (PM-10) Emissions from Single-Unit and Combination Trucks: 2000, 2002, 2005, 2012, 2020, and 2030
Source: U.S. Environmental Protection Agency, MOVES (Motor Vehicle Emission Simulator) model 2010B, special tabulation, October 5, 2013.

Table 5-14. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990, 2005, and 2008-2011
Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, EPA 430-R-13-001 (Washington, DC: April 12, 2013, table ES-8, available at *http://epa.gov/climatechange/ghgemissions/usinventoryreport.html* as of September 13, 2013.

Table 5-15. U.S. Transportation Sector CO_2 Emissions from Fossil Fuel Combustion by Fuel Type: 1990, 2005, and 2008-2011
(millions of metric tonnes of CO_2 equivalent)

Fuel	1990	2005	2008	2009	2010	2011
Petroleum	**(R)1,457.9**	**(R)1858.7**	**(R)1779.3**	**(R)1,711.3**	**(R)1,725.8**	**1,706.2**
Motor gasoline	983.7	1,187.8	1,130.3	1,128.5	(R)1,125.0	1,100.4
Distillate fuel oil	262.9	458.1	(R)443.5	(R)409.7	(R)426.3	435.4
Jet fuel	(R)184.2	189.3	(R)155.1	(R)154.1	(R)151.5	146.5
Residual fuel[1]	22.6	19.3	19.9	15.4	(R)19.3	20.1
Aviation gasoline	3.1	2.4	2.0	1.8	1.9	1.9
Liquefied petroleum gas	1.4	1.7	2.5	1.7	1.8	1.9
Natural Gas	**36.0**	**33.1**	**36.7**	**37.9**	**(R)38.1**	**38.8**
Transportation Total[2]	**(R)1,494.0**	**(R)1,891.7**	**(R)1,816.0**	**(R)1,749.2**	**(R)1,763.9**	**1,745.0**
U.S. Total[2]	**(R)4,748.5**	**(R)5,748.7**	**(R)5,590.6**	**(R)5,222.4**	**(R)5,408.1**	**5,277.2**
Transportation Sector as % of Total	**(R)31.5**	**(R)32.9**	**(R)32.5**	**(R)33.5**	**(R)32.6**	**33.1**

Key: CO_2 = carbon dioxide; R = revised.

[1] Fluctuations in emissions estimates reflect data collection problems.

[2] Electricity-related emissions are not included in the transportation sector and U.S. totals.

[3] Includes greenhouse gas emissions from military aircraft (12.6 million metric tonnes in 2011); "other" transportation, primarily lubricants (9.0 million metric tonnes in 2011); and electricity-related emissions. Emissions from international bunker fuels are not included.

Notes: CO_2 equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO_2 by weight. Numbers may not add to totals due to rounding. Electricity-related emissions are not included in this table.

CO_2 accounts for nearly all of the transportation sector's GHG emissions, primarily from the combustion of fossil fuels. Almost all of the energy consumed by the sector is petroleum-based and includes motor gasoline, diesel fuel, jet fuel, and residual oil. Gasoline-fueled passenger cars and light-duty trucks are responsible for about 61 percent of transportation sector CO_2 emissions while the combustion of diesel fuel in medium- and heavy-duty trucks and jet fuel in aircraft produced much of the rest.

From 1990 to 2011, transportation CO_2 emissions rose by 17 percent, likely the result of increased demand for travel and the stagnation of vehicle fuel efficiency. More recently, however, transportation sector CO_2 emissions have declined due in part to slow economic growth and higher fuel prices, which in turn have led to a decrease in demand for passenger travel.

Table 5-15. U.S. Transportation Sector CO_2 Emissions from Fossil Fuel Combustion by Fuel Type: 1990, 2005, and 2008-2011

Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, EPA 430-R-13-001 (Washington, DC: April 12, 2013), Annex 2, tables A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-22, A-27, and A-32, available at *http://epa.gov/climatechange/ghgemissions/usinventoryreport.html* as of September 13, 2013.

Table 5-16. U.S. Greenhouse Gas Emissions from Domestic Freight Transportation: 1990, 2005, and 2008-2011 (millions of metric tonnes of CO_2 equivalent)

Mode	1990	2005	2008	(R)2009	2010	2011	Percent change, 1990 to 2011
Trucking	231.1	(R)408.4	(R)427.0	(R)389.2	(R)402.9	401.1	73.6
Freight Rail	34.5	46.7	44.4	37.2	40.0	42.0	21.7
Ships and Other Boats[1]	30.6	27.9	(R)28.4	(R)23.9	(R)27.3	31.4	2.6
Pipelines[2]	(R)36.0	32.2	35.6	(R)36.7	(R)37.1	37.7	4.7
Commercial Aircraft	(R)19.2	(R)21.4	(R)18.0	(R)16.7	(R)16.3	16.5	-14.1
Freight Total	**(R)351.5**	**(R)536.5**	**(R)553.4**	**(R)503.7**	**(R)523.6**	**528.7**	**50.4**
Passenger Total	**(R)1,157.6**	**(R)1,450.9**	**(R)1,340.1**	**(R)1,317.3**	**(R)1,310.1**	**1,283.2**	**10.9**
Transportation Total[3]	**(R)1,556.3**	**(R)2,017.2**	**(R)1,920.8**	**(R)1,845.2**	**(R)1,856.9**	**1,833.7**	**17.8**
Freight as % of Transportation Total	**(R)22.6**	**(R)26.6**	**(R)28.8**	**(R)27.3**	**(R)28.2**	**28.8**	**27.4**

Key: CO_2 = carbon dioxide; R = revised.

[1] Fluctuations in emissions estimates reflect data collection problems.

[2] Includes only CO_2 emissions from natural gas used to power pipelines.

[3] Includes greenhouse gas emissions from military aircraft (12.6 million metric tonnes in 2011); "other" transportation, primarily lubricants (9.0 million metric tonnes in 2011); and electricity-related emissions. Emissions from international bunker fuels are not included.

Notes: U.S. Environmental Protection Agency (EPA) used U.S. Department of Energy fuel consumption data to allocate freight and passenger rail emissions. EPA used U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics data on freight shipped by commercial aircraft and the total number of passengers enplaned to split commercial aircraft emissions. Each passenger was estimated to weigh an average of 150 pounds and luggage was estimated to weigh 50 pounds. Previous *Inventories* included commercial aircraft emissions under passenger travel. CO_2 equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO_2 by weight. Numbers may not add to totals due to rounding.

Since 1990, the rate of growth of GHG emissions from freight sources has been more than four times as fast as that for passenger travel. Trucking accounted for 76 percent of freight emissions followed by freight rail, a distant second.

Table 5-16. U.S. Greenhouse Gas Emissions from Domestic Freight Transportation: 1990, 2005, and 2008-2011
Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, EPA 430-R-13-001 (Washington, DC: April 12, 2013), table ES-8 and Annex 3, tables A-114 and A-115, available at *www.epa.gov/climatechange/ghgemissions/usinventoryreport.html* as of September 13, 2013.

Table 5-17. Medium- and Heavy-duty Truck Greenhouse Gas Emissions: 1990, 2005, and 2008-2011 (millions of metric tonnes of CO_2 equivalent)

	1990	2005	2008	2009	2010	2011
Carbon dioxide	230.1	396.0	(R)413.9	376.3	(R)390.0	388.3
Methane	0.2	(R)0.1	(R)0.1	0.2	(R)0.1	0.1
Nitrous Oxide	0.8	(R)1.1	(R)1.4	(R)1.1	1.1	1.0
Hydrofluorocarbons	≤0.05	11.1	(R)11.6	11.6	11.6	11.7
Total Truck	231.1	(R)408.4	(R)427.1	(R)389.2	(R)402.9	401.1
Total U.S. Transportation[1]	**(R)1,556.3**	**(R)2,017.2**	**(R)1,920.8**	**(R)1,845.2**	**(R)1,856.9**	**1,833.7**
Total U.S.[1]	**(R)6,183.3**	**(R)7,195.3**	**(R)7,048.8**	**(R)6,586.6**	**(R)6,810.3**	**6,702.3**
Truck share of transportation total (percent)	**(R)14.8**	**20.2**	**(R)22.2**	**(R)21.1**	**(R)21.7**	**21.9**
Truck share of U.S. total (percent)	**3.7**	**5.7**	**(R)6.1**	**5.9**	**5.9**	**6.0**

Key: CO_2 = carbon dioxide; R = revised.

[1] Transportation and U.S. totals include greenhouse gas emissions from military aircraft (12.6 million metric tonnes in 2011); "other" transportation, primarily lubricants (9.0 million metric tonnes in 2011); and electricity-related emissions. Emissions from international bunker fuels are not included.

Notes: CO_2 equivalent is computed by multiplying the weight of the gas being measured by its estimated Global Warming Potential (GWP). The Intergovernmental Panel on Climate Change developed the GWP concept to compare the ability of one GHG to trap heat in the atmosphere to another gas. Carbon comprises 12/44 of CO_2 by weight. Medium- and heavy-duty trucks weigh 8,501 pounds and above. Numbers may not add to totals due to rounding.

Between 1990 and 2011, medium- and heavy-duty truck emissions rose by 74 percent, the largest percentage increase of any major transportation mode. An increase in truck freight movement is largely responsible for the rise in emissions over the last 21 years.

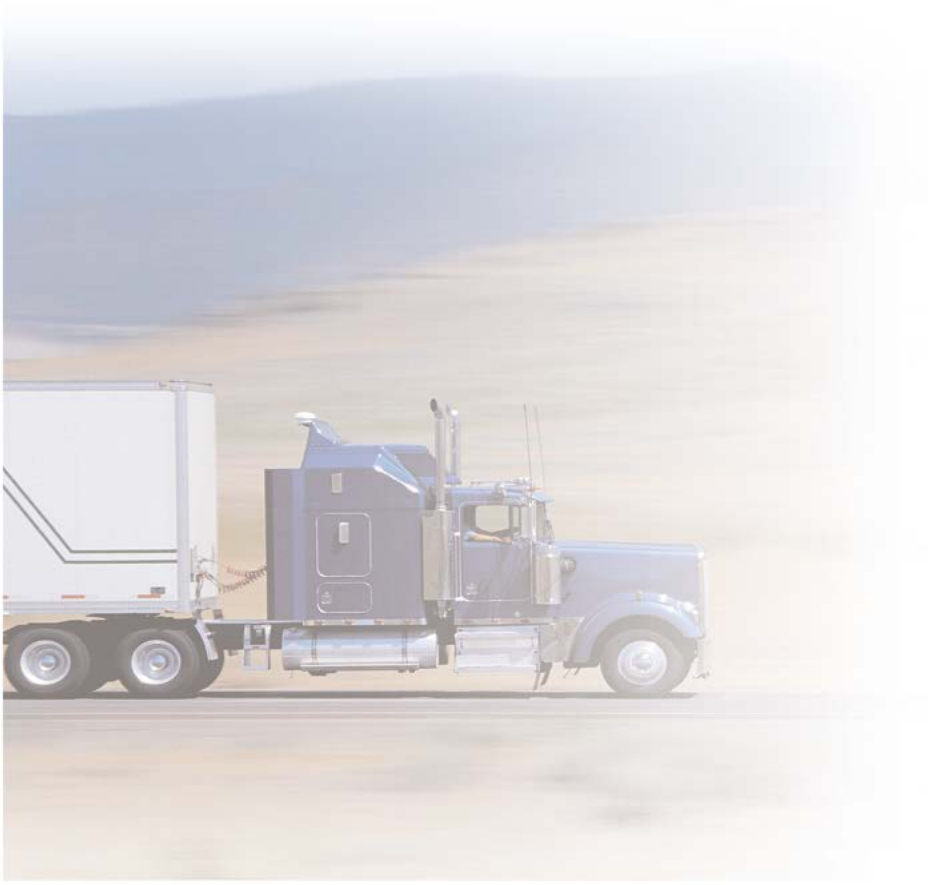

Table 5-17. Medium- and Heavy-Duty Truck Greenhouse Gas Emissions: 1990, 2005, and 2008-2011
Source: U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011, EPA 430-R-13-001 (Washington, DC: April 12, 2013), tables 2-15 and ES-8, available at *http://epa.gov/climatechange/ghgemissions/usinventoryreport.html* as of September 13, 2013.

Table 5-18. Number and Volume of Oil Spills In and Around U.S. Waterways: 1990, 2000, and 2009-2011

	1990		2000		2009		2010[1]		2011	
	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled	Incidents	Gallons spilled
Total, all spills	**8,177**	**7,915,007**	**8,354**	**1,431,370**	**3,304**	**211,601**	**3,008**	**207,712,793**	**3,065**	**210,271**
Vessel sources, total	**2,485**	**6,387,158**	**5,560**	**1,033,643**	**1,645**	**126,658**	**1,508**	**894,934**	**1,531**	**107,663**
Tankship	249	4,977,251	111	608,176	28	14,417	23	421,583	26	1,702
Tank barge	457	992,025	229	133,540	98	4,424	73	965	67	15,852
Other vessels[2]	1,779	417,882	5,220	291,927	1,519	107,816	1,412	472,386	1,438	90,109
Nonvessel sources, total	**2,584**	**1,408,472**	**1,645**	**373,761**	**979**	**54,276**	**1,008**	**206,809,141**	**1,159**	**94,759**
Facilities[3]	2,287	1,059,302	1,054	311,604	927	51,703	869	221,642	1,004	89,467
Pipelines	149	316,928	25	17,021	16	1,657	34	4,627	38	1,687
All other non-vessels[4]	148	32,242	566	45,136	36	916	105	206,582,872	117	3,605
Unknown/Unidentified	**3,108**	**119,377**	**1,149**	**23,966**	**680**	**30,667**	**492**	**8,718**	**375**	**7,849**

[1] The largest spill in U. S. waters began on April 20, 2010 with an explosion and fire on the mobile offshore drilling unit (MODU) Deepwater Horizon. Subsequently, the MODU sank, leaving an open exploratory well to discharge crude oil into the Gulf of Mexico for nearly three months. The most commonly accepted spill amount from the well is approximately 206.6 million gallons.

[2] Other vessels include commercial vessels, fishing boats, freight barges, freight ships, industrial vessels, oil recovery vessels, passenger vessels, unclassified public vessels, recreational boats, research vessels, school ships, tow and tug boats, mobile offshore drilling units, offshore supply vessels, publicly owned tank and freight ships, as well as vessels not fitting any particular class (unclassified).

[3] Facilities include mobile offshore drilling units, offshore supply vessels, offshore platforms, designated waterfront facilities, fixed platforms, mobile facilities, and municipal facilities.

[4] All other non-vessels include aircraft, land vehicles, railroad equipment, bridges, factories, fleeting areas, industrial facilities, marinas, common carriers, sewer drainage, shipyard/repair facilities, and shorelines.

Water quality is affected by oil spills from vessels and pipelines transporting crude oil and petroleum products and by facilities, such as offshore drilling units and platforms. In 2011, vessel-related spills accounted for 51 percent of total gallons spilled. While the amount of oil spilled each year varies considerably, U.S. Coast Guard data show an overall decrease since 1990, with the exception in 2005 when Hurricane Katrina caused numerous spills and in 2010 when the Deepwater Horizon mobile offshore drilling unit sank after an explosion and fire, leaving a well open to discharge crude oil into the Gulf of Mexico. The well discharged 206.6 million gallons of crude oil over nearly three months.

Table 5-18. Number and Volume of Oil Spills In and Around U.S. Waterways: 1990, 2000, and 2009-2011

Source: U.S. Coast Guard, Polluting Incidents In and Around U.S. Waters, A Spill/Release Compendium: 1969-2011 (Washington, DC: December 2012), tables Number of Spills by Source and Volume of Spills by Source.