FREIGHT FACTS AND FIGURES 2010

OFFICE OF FREIGHT MANAGEMENT AND OPERATIONS

U.S. Department of Transportation
Federal Highway Administration
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This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.
Freight Facts and Figures 2010 is a snapshot of the volume and value of freight flows in the United States, the physical network over which freight moves, the economic conditions that generate freight movements, the industry that carries freight, and the safety, energy, and environmental implications of freight transportation. This snapshot helps decision makers, planners, and the public understand the magnitude and importance of freight transportation in the economy. An electronic version of this publication is available at www.ops.fhwa.dot.gov/freight.

Chapter 1 summarizes the basic demographic and economic characteristics of the United States that contribute to the demand for raw materials, intermediate goods, and finished products. Chapter 2 identifies the freight that is moved and the trading partners who move it. Chapter 3 describes the freight transportation system; volumes of freight moving over the system; the amount of highway, rail, and port activities required to move the freight; and the performance of the system. Chapter 4 highlights the transportation industry that operates the system. Chapter 5 covers the safety aspects, energy consumption, and environmental implications of freight transportation.

Many of the tables and figures in this report are based on the Economic Census, which is conducted once every five years. The most recently published data are for 2007 (except for the Vehicle Inventory and Use Survey, which was last conducted in 2002).

Several of the tables and maps are based on the Freight Analysis Framework (FAF), version 3, which builds on the Economic Census to estimate all freight flows to, from, and within the United States, except shipments between foreign countries that are transported through the United States. Shipments to and from Puerto Rico are counted with Latin America.

FAF covers all modes of transportation. The truck, rail, water, and pipeline categories include shipments transported by only one mode. Air includes shipments weighing more than 100 pounds moved by air or by air and truck. Multiple modes and mail includes all other shipments transported by more than one mode, such as bulk products moved by rail and water and mixed cargo hauled by truck and rail. Multiple modes and mail also includes shipments weighing less than 100 pounds sent via postal and courier services. Other and unknown includes a small quantity of shipments moved by any mode not included within the other mode definitions and unknown modes. Visit www.ops.fhwa.dot.gov/freight/freight_analysis/faf for more information.
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The Nation’s 117 million households, 7.6 million business establishments, and 89,500 governmental units are part of an enormous economy that demands the efficient movement of freight. While the U.S. economy has been affected by the recent global recession, it is expected to recover and continue to grow. Long-term economic growth will result in even greater demand for freight transportation.

Freight transportation has grown over time with the expansion of population and economic activity within the United States and with the increasing interdependence of economies across the globe. The U.S. population grew by 34 percent between 1980 and

### Table 1-1. Economic and Social Characteristics of the United States: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident population</td>
<td>226,546</td>
<td>248,791</td>
<td>281,425</td>
<td>(R) 301,580</td>
<td>304,375</td>
<td>34.4</td>
</tr>
<tr>
<td>(thousands)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Households (thousands)</td>
<td>80,776</td>
<td>93,347</td>
<td>104,705</td>
<td>116,011</td>
<td>116,783</td>
<td>44.6</td>
</tr>
<tr>
<td>Median household income (2000 $)</td>
<td>35,057</td>
<td>38,257</td>
<td>41,990</td>
<td>41,454</td>
<td>40,233</td>
<td>14.8</td>
</tr>
<tr>
<td>(thousands)</td>
<td>106,940</td>
<td>125,840</td>
<td>142,583</td>
<td>153,836</td>
<td>154,287</td>
<td>44.3</td>
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<tr>
<td>Employment (thousands)</td>
<td>99,303</td>
<td>118,793</td>
<td>136,891</td>
<td>146,047</td>
<td>145,362</td>
<td>46.4</td>
</tr>
<tr>
<td>Agriculture, forestry, fishing, and hunting (percent)</td>
<td>NA</td>
<td>1.9</td>
<td>1.8</td>
<td>1.4</td>
<td>1.5</td>
<td>NA</td>
</tr>
<tr>
<td>Mining</td>
<td>NA</td>
<td>0.5</td>
<td>0.3</td>
<td>0.5</td>
<td>0.6</td>
<td>NA</td>
</tr>
<tr>
<td>Construction</td>
<td>NA</td>
<td>6.9</td>
<td>7.3</td>
<td>8.1</td>
<td>7.5</td>
<td>NA</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>NA</td>
<td>16.8</td>
<td>14.4</td>
<td>11.2</td>
<td>10.9</td>
<td>NA</td>
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<tr>
<td>Wholesale and retail trade</td>
<td>NA</td>
<td>14.7</td>
<td>14.6</td>
<td>14.3</td>
<td>14.2</td>
<td>NA</td>
</tr>
<tr>
<td>Transportation and utilities</td>
<td>NA</td>
<td>5.1</td>
<td>5.4</td>
<td>5.2</td>
<td>5.3</td>
<td>NA</td>
</tr>
<tr>
<td>Information</td>
<td>NA</td>
<td>2.9</td>
<td>3.0</td>
<td>2.4</td>
<td>2.4</td>
<td>NA</td>
</tr>
<tr>
<td>Financial activities</td>
<td>NA</td>
<td>7.1</td>
<td>6.8</td>
<td>7.2</td>
<td>7.0</td>
<td>NA</td>
</tr>
<tr>
<td>Professional and business services</td>
<td>NA</td>
<td>9.4</td>
<td>10.0</td>
<td>10.7</td>
<td>10.7</td>
<td>NA</td>
</tr>
<tr>
<td>Education and health services</td>
<td>NA</td>
<td>17.5</td>
<td>19.1</td>
<td>21.0</td>
<td>21.6</td>
<td>NA</td>
</tr>
<tr>
<td>Leisure and hospitality</td>
<td>NA</td>
<td>8.0</td>
<td>8.2</td>
<td>8.5</td>
<td>8.8</td>
<td>NA</td>
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<tr>
<td>Other services</td>
<td>NA</td>
<td>4.3</td>
<td>4.7</td>
<td>4.8</td>
<td>4.8</td>
<td>NA</td>
</tr>
<tr>
<td>Public administration</td>
<td>NA</td>
<td>4.7</td>
<td>4.5</td>
<td>4.6</td>
<td>4.7</td>
<td>NA</td>
</tr>
<tr>
<td>Business establishments (thousands)</td>
<td>NA</td>
<td>6,176</td>
<td>7,070</td>
<td>7,705</td>
<td>7,601</td>
<td>NA</td>
</tr>
<tr>
<td>Governmental units</td>
<td>381,831</td>
<td>85,006</td>
<td>87,576</td>
<td>89,527</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Gross domestic product (millions of 2000 $)</td>
<td>(R) 5,839,000</td>
<td>(R) 8,033,900</td>
<td>(R) 11,226,000</td>
<td>(R) 13,254,100</td>
<td>13,312,200</td>
<td>128.0</td>
</tr>
<tr>
<td>Foreign trade (millions of 2000 $)</td>
<td>631,335</td>
<td>1,168,168</td>
<td>2,572,000</td>
<td>3,399,774</td>
<td>3,776,712</td>
<td>522.5</td>
</tr>
<tr>
<td>(percent)</td>
<td>74.0</td>
<td>71.6</td>
<td>78.8</td>
<td>78.7</td>
<td>77.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Goods (percent)</td>
<td>74.0</td>
<td>71.6</td>
<td>78.8</td>
<td>78.7</td>
<td>77.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Services (percent)</td>
<td>26.0</td>
<td>28.4</td>
<td>21.2</td>
<td>21.3</td>
<td>23.0</td>
<td>-11.4</td>
</tr>
</tbody>
</table>

Key: NA = not available; R = revised.

1Based on the 2002 Census Industry Classification system. Data for 1990 do not appear in the source document; they are estimated using the Bureau of Labor Statistics crosswalk from the 1990 Census Industry Classification system to the 2002 Census Industry Classification system.

2Data for governmental units come from the Census of Governments, which is collected every five years.

2008 while the economy, measured by Gross Domestic Product (GDP), more than doubled in real terms. Household income, another indicator of economic growth, also rose by 15 percent. Foreign trade grew faster than the overall economy, quintupling in real value between 1980 and 2008, reflecting unprecedented global interconnectivity.

Although freight moves throughout the United States, the demand for freight transportation is driven primarily by the geographic distribution of population and economic activity. While both population and economic activity have grown faster in the West and South than in the Northeast and Midwest, the growth in economic activity per capita has been highest in the Northeast.

### Table 1-2. Population and Gross Domestic Product (GDP) by Region: 1980-2008

<table>
<thead>
<tr>
<th>Region</th>
<th>Resident Population (thousands)</th>
<th>GDP (millions of 2000 $)</th>
<th>GDP per capita (millions of 2000 $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northeast</td>
<td>226,549</td>
<td>248,789</td>
<td>282,172</td>
</tr>
<tr>
<td>Midwest</td>
<td>49,136</td>
<td>50,828</td>
<td>(R) 53,930</td>
</tr>
<tr>
<td>South</td>
<td>58,868</td>
<td>59,670</td>
<td>(R) 64,815</td>
</tr>
<tr>
<td>West</td>
<td>75,372</td>
<td>85,454</td>
<td>(R) 101,869</td>
</tr>
<tr>
<td>West</td>
<td>43,173</td>
<td>52,837</td>
<td>(R) 64,467</td>
</tr>
<tr>
<td>Northeast</td>
<td>1,107,283</td>
<td>1,604,121</td>
<td>2,077,436</td>
</tr>
<tr>
<td>Midwest</td>
<td>1,262,917</td>
<td>1,566,939</td>
<td>2,174,719</td>
</tr>
<tr>
<td>South</td>
<td>1,608,531</td>
<td>2,220,755</td>
<td>3,212,076</td>
</tr>
<tr>
<td>West</td>
<td>1,075,817</td>
<td>1,602,514</td>
<td>2,284,873</td>
</tr>
<tr>
<td>Northeast</td>
<td>22,535</td>
<td>31,560</td>
<td>(R) 38,521</td>
</tr>
<tr>
<td>Midwest</td>
<td>21,453</td>
<td>26,260</td>
<td>(R) 33,552</td>
</tr>
<tr>
<td>South</td>
<td>21,341</td>
<td>25,988</td>
<td>(R) 31,532</td>
</tr>
<tr>
<td>West</td>
<td>24,919</td>
<td>30,329</td>
<td>(R) 35,442</td>
</tr>
</tbody>
</table>

**Percent change, 1980 to 2008:**

- Northeast: 34%
- Midwest: 12%
- South: 49%
- West: 64%

**Key:** R = revised.

*As of October 26, 2006, the Bureau of Economic Analysis renamed the gross state product (GSP) series to gross domestic product (GDP) by state.*

**Notes:** Numbers may not add to totals due to rounding. Chained dollars are not additive, especially for periods farther away from the base year of 2000. Because of this, GDP for all regions is not equal to total GDP.
The U.S. economy, as measured by GDP, is projected to increase by 46 percent and the U.S population by 10 percent between 2008 and 2018. Employment in transportation and material-moving is expected to increase by 4 percent over this period, which is less than employment as a whole. These projections are based on long-term U.S. economic trends.
II. FREIGHT TO BE MOVED AND TRADING PARTNERS

The American economy stretches across a continent with links to the world, drawing on natural resources and manufactured products from many locations to serve markets at home and abroad. More freight is moving greater distances as part of far flung supply chains among distant trading partners.

Table 2-1. Weight of Shipments by Transportation Mode: 2007, 2009, and 2040 (millions of tons)

<table>
<thead>
<tr>
<th>Mode</th>
<th>2007</th>
<th></th>
<th></th>
<th>2009</th>
<th></th>
<th></th>
<th>2040</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Domestic</td>
<td>Exports</td>
<td>Imports</td>
<td>Total</td>
<td>Domestic</td>
<td>Exports</td>
<td>Imports</td>
<td>Total</td>
</tr>
<tr>
<td>Total</td>
<td>18,581</td>
<td>16,576</td>
<td>656</td>
<td>1,349</td>
<td>16,122</td>
<td>14,397</td>
<td>651</td>
<td>1,073</td>
<td>27,104</td>
</tr>
<tr>
<td>Truck</td>
<td>12,766</td>
<td>12,580</td>
<td>95</td>
<td>91</td>
<td>10,868</td>
<td>10,713</td>
<td>86</td>
<td>69</td>
<td>18,445</td>
</tr>
<tr>
<td>Rail</td>
<td>1,894</td>
<td>1,745</td>
<td>61</td>
<td>87</td>
<td>1,689</td>
<td>1,575</td>
<td>57</td>
<td>57</td>
<td>2,408</td>
</tr>
<tr>
<td>Water</td>
<td>794</td>
<td>360</td>
<td>52</td>
<td>382</td>
<td>734</td>
<td>351</td>
<td>51</td>
<td>332</td>
<td>1,143</td>
</tr>
<tr>
<td>Air, air &amp; truck</td>
<td>19</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>11</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>41</td>
</tr>
<tr>
<td>Multiple modes &amp; mail</td>
<td>1,531</td>
<td>519</td>
<td>409</td>
<td>603</td>
<td>1,336</td>
<td>458</td>
<td>423</td>
<td>455</td>
<td>3,119</td>
</tr>
<tr>
<td>Pipeline</td>
<td>1,270</td>
<td>1,100</td>
<td>4</td>
<td>166</td>
<td>1,220</td>
<td>1,069</td>
<td>5</td>
<td>147</td>
<td>1,509</td>
</tr>
<tr>
<td>Other &amp; unknown</td>
<td>313</td>
<td>269</td>
<td>29</td>
<td>15</td>
<td>265</td>
<td>229</td>
<td>27</td>
<td>9</td>
<td>440</td>
</tr>
</tbody>
</table>

1In this table, multiple modes & mail includes export and import shipments that move domestically by a different mode than the mode used between the port and foreign location.
2Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.
Notes: Numbers may not add to totals due to rounding. The 2009 data are provisional estimates, which are based on selected modal and economic trend data.

The U.S. transportation system moved, on average, 51 million tons worth $45 billion each day in 2007. Preliminary estimates from the Freight Analysis Framework (FAF) show that tonnage decreased 2.4 percent in 2008 and an additional 11.1 percent in 2009 after years of growth. Early indications suggest that tonnage is starting to rebound in 2010, increasing 4.6 percent since 2009 and reaching 91 percent of 2007 tonnage. Between 2010 and 2040, tonnage is forecast to increase at 1.6 percent per year. Annual tons per capita are forecast to increase 27 percent from 55 in 2010 to 70 in 2040.

Version 3 of the FAF and the 2007 Commodity Flow Survey (CFS) include significant improvements and corrections to version 2 of the FAF and the 2002 CFS. Tables in this chapter should not be compared to those in previous editions of *Freight Facts and Figures*. Revised estimates of tonnage and value for 2002 and 1997 will be published in future editions of *Freight Facts and Figures* in order to provide consistent trend statistics.
The value of freight moved is expected to increase faster than the weight, rising from $890 per ton in 2007 to $2,145 per ton in 2040 when controlling for inflation. Exports at $1,825 per ton and imports at $1,484 per ton are significantly higher than domestic shipments at $805 per ton in 2007, but the relative differences are expected to be much less in 2040 when exports reach $2,831 per ton, imports reach $2,793 per ton, and domestic shipments reach $2,019 per ton in 2007 dollars. Exports and imports accounted for 11 percent of the tons and 19 percent of the value in 2007 and are forecast to reach 16 percent of the tons and 21 percent of the value in 2040.

Bulk shipments account for about 85 percent of the tonnage but only 30 percent of the value of goods moved in 2007. Top commodities include gravel, cereal grains, and coal. Higher value, time-sensitive shipments account for two-thirds of the value of all commodity movements but only one-eighth of the tonnage. Top commodities include machinery, electronics, and motorized vehicles.

### Table 2-2. Value of Shipments by Transportation Mode: 2007, 2009, and 2040 (billions of 2007 dollars)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2009</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>Exports</td>
<td>Imports</td>
</tr>
<tr>
<td>Total</td>
<td>16,536</td>
<td>13,338</td>
<td>2,002</td>
</tr>
<tr>
<td>Truck</td>
<td>10,783</td>
<td>10,223</td>
<td>271</td>
</tr>
<tr>
<td>Rail</td>
<td>511</td>
<td>374</td>
<td>45</td>
</tr>
<tr>
<td>Water</td>
<td>286</td>
<td>99</td>
<td>13</td>
</tr>
<tr>
<td>Air, air &amp; truck</td>
<td>1,079</td>
<td>152</td>
<td>422</td>
</tr>
<tr>
<td>Multiple modes &amp; mail</td>
<td>2,923</td>
<td>1,680</td>
<td>397</td>
</tr>
<tr>
<td>Pipeline</td>
<td>623</td>
<td>552</td>
<td>4</td>
</tr>
<tr>
<td>Other &amp; unknown</td>
<td>331</td>
<td>257</td>
<td>44</td>
</tr>
</tbody>
</table>

Notes: Numbers may not add to totals due to rounding. The 2009 data are provisional estimates, which are based on selected modal and economic trend data.

---

### Table 2-3. Top Commodities: 2007

<table>
<thead>
<tr>
<th>Millions of Tons</th>
<th>Total, all commodities 18,581</th>
<th>Billions of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel</td>
<td>2,263</td>
<td>Machinery 1,762</td>
</tr>
<tr>
<td>Cereal grains</td>
<td>1,475</td>
<td>Electronics 1,432</td>
</tr>
<tr>
<td>Coal</td>
<td>1,444</td>
<td>Motorized vehicles 1,269</td>
</tr>
<tr>
<td>Non-metal mineral products</td>
<td>1,392</td>
<td>Mixed freight 1,058</td>
</tr>
<tr>
<td>Waste/scrap</td>
<td>1,323</td>
<td>Pharmaceuticals 880</td>
</tr>
<tr>
<td>Natural gas &amp; related</td>
<td>1,277</td>
<td>Textiles/leather 696</td>
</tr>
<tr>
<td>Gasoline</td>
<td>1,005</td>
<td>Gasoline 691</td>
</tr>
<tr>
<td>Fuel oils</td>
<td>744</td>
<td>Miscellaneous manufactured products 689</td>
</tr>
<tr>
<td>Natural sands</td>
<td>570</td>
<td>Plastics/rubber 579</td>
</tr>
<tr>
<td>Crude petroleum</td>
<td>558</td>
<td>Articles of base metal 573</td>
</tr>
</tbody>
</table>

Notes: Natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

---

TABLE 2-2. VALUE OF SHIPMENTS BY TRANSPORTATION MODE: 2007, 2009, AND 2040

TABLE 2-3. TOP COMMODITIES: 2007
**Table 2-4. Hazardous Materials Shipments by Transportation Mode: 2007**

<table>
<thead>
<tr>
<th>Transportation mode</th>
<th>Value</th>
<th>Tons</th>
<th>Ton miles</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ Billion</td>
<td>Percent</td>
<td>Millions</td>
<td>Percent</td>
</tr>
<tr>
<td>All modes, total</td>
<td>1,448</td>
<td>100.0</td>
<td>2,231</td>
<td>100.0</td>
</tr>
<tr>
<td>Single modes, total</td>
<td>1,371</td>
<td>94.6</td>
<td>2,112</td>
<td>94.6</td>
</tr>
<tr>
<td>Truck(^1)</td>
<td>837</td>
<td>57.8</td>
<td>1,203</td>
<td>53.9</td>
</tr>
<tr>
<td>For-hire</td>
<td>359</td>
<td>24.8</td>
<td>495</td>
<td>22.2</td>
</tr>
<tr>
<td>Private(^2)</td>
<td>478</td>
<td>33.0</td>
<td>708</td>
<td>31.7</td>
</tr>
<tr>
<td>Rail</td>
<td>69</td>
<td>4.8</td>
<td>130</td>
<td>5.8</td>
</tr>
<tr>
<td>Water</td>
<td>69</td>
<td>4.8</td>
<td>150</td>
<td>6.7</td>
</tr>
<tr>
<td>Air</td>
<td>2</td>
<td>0.1</td>
<td>5</td>
<td>2.0</td>
</tr>
<tr>
<td>Pipeline(^3)</td>
<td>393</td>
<td>27.2</td>
<td>629</td>
<td>28.2</td>
</tr>
<tr>
<td>Multiple modes, total</td>
<td>71</td>
<td>4.9</td>
<td>111</td>
<td>5.0</td>
</tr>
<tr>
<td>Parcel, U.S. Postal Service, or Courier</td>
<td>8</td>
<td>0.5</td>
<td>&lt;1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Other multiple modes</td>
<td>28</td>
<td>1.9</td>
<td>57</td>
<td>2.5</td>
</tr>
<tr>
<td>Unknown and other modes, total</td>
<td>7</td>
<td>0.5</td>
<td>8</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Key:** S = data are not published because of high sampling variability or other reasons.
\(^1\)Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.
\(^2\)Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.
\(^3\)Excludes crude oil shipments.

**Note:** Numbers and percents may not add to totals due to rounding.

Trucks move more than one-half of all hazardous materials shipped from within the United States. However, truck ton miles of hazardous shipments account for a much smaller share, about one-third of all ton miles, because such shipments travel relatively short distances. By contrast, rail accounts for only 5 percent of hazardous shipments by weight but nearly 29 percent of ton miles.

**Table 2-5. Hazardous Materials Shipments by Hazard Class: 2007**

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Description</th>
<th>Value</th>
<th>Tons</th>
<th>Ton miles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$ Billions</td>
<td>Percent</td>
<td>Millions</td>
</tr>
<tr>
<td>Class 1</td>
<td>Explosives</td>
<td>12</td>
<td>0.8</td>
<td>3</td>
</tr>
<tr>
<td>Class 2</td>
<td>Gases</td>
<td>132</td>
<td>9.1</td>
<td>251</td>
</tr>
<tr>
<td>Class 3</td>
<td>Flammable liquids</td>
<td>1,170</td>
<td>80.8</td>
<td>1,753</td>
</tr>
<tr>
<td>Class 4</td>
<td>Flammable solids</td>
<td>4</td>
<td>0.3</td>
<td>20</td>
</tr>
<tr>
<td>Class 5</td>
<td>Oxidizers and organic peroxides</td>
<td>7</td>
<td>0.5</td>
<td>15</td>
</tr>
<tr>
<td>Class 6</td>
<td>Toxic (poison)</td>
<td>21</td>
<td>1.5</td>
<td>11</td>
</tr>
<tr>
<td>Class 7</td>
<td>Radioactive materials</td>
<td>21</td>
<td>1.4</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Class 8</td>
<td>Corrosive materials</td>
<td>51</td>
<td>3.6</td>
<td>114</td>
</tr>
<tr>
<td>Class 9</td>
<td>Miscellaneous dangerous goods</td>
<td>30</td>
<td>2.1</td>
<td>63</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,448</td>
<td>100.0</td>
<td>2,231</td>
</tr>
</tbody>
</table>

**Note:** Numbers and percents may not add to totals due to rounding.
Flammable liquids, especially gasoline, are the predominant hazardous material transported in the United States. In terms of ton miles, flammable liquids account for about 56 percent of total ton miles of hazardous materials shipments. The next largest class of hazardous materials, in terms of ton miles, is gases at about 17 percent.

International trade has grown rapidly and is placing pressure on the domestic transportation network and on all modes. Trucks are the most common mode used to move imports and exports between international gateways and inland locations.

Foreign trade has had a major impact on all U.S. borders and coasts. Since 1951, the value of merchandise trade has grown by fourteenfold in inflation-adjusted terms. However, overall growth has been affected by short-term


**Figure 2-1. Value of Merchandise Trade by Coasts and Borders: 1951-2009**

**Notes:** The value of 2009 coal exports ($4.24) from Mobile, AL, Charleston, SC, and Norfolk, VA, are considered proprietary information and are consolidated. In this figure, the total value of coal exports for the above three cities are included under the Atlantic Coast Customs District.


<table>
<thead>
<tr>
<th>Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040</th>
<th>Table 2-6. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions of Tons</td>
<td>Billions of 2007 Dollars</td>
</tr>
<tr>
<td>Total</td>
<td>2,005</td>
</tr>
<tr>
<td>Truck</td>
<td>763</td>
</tr>
<tr>
<td>Rail</td>
<td>259</td>
</tr>
<tr>
<td>Water</td>
<td>137</td>
</tr>
<tr>
<td>Air, air &amp; truck</td>
<td>10</td>
</tr>
<tr>
<td>Multiple modes &amp; mail</td>
<td>152</td>
</tr>
<tr>
<td>Pipeline</td>
<td>344</td>
</tr>
<tr>
<td>Other &amp; unknown</td>
<td>41</td>
</tr>
<tr>
<td>No domestic mode</td>
<td>298</td>
</tr>
</tbody>
</table>

1 Excludes truck moves to and from airports. 
2 Includes truck moves to and from airports. 
3 Multiple modes & mail include U.S. Postal Service, courier shipments, and all intermodal combinations, except air and truck. In this table, oceangoing export and import shipments that move between ports and domestic locations by single modes are classified by the domestic mode rather than multiple modes & mail. 
4 No domestic mode includes waterborne import shipments of crude petroleum off-loaded directly at the domestic destination (refineries) with no domestic mode of transportation.

Note: Numbers may not add to totals due to rounding.
downturns, such as between 1981 and 1986 and in 2009. In 2009, ports and airports on the Atlantic Coast remain the most significant in terms of value, but Gulf Coast ports also have experienced rapid growth in recent years.

Nearly 80 percent of freight tonnage in U.S. foreign trade moves by water, but air and truck transportation are also important when freight value is considered. By value, the water share drops to 47 percent, with air and truck accounting for 28 percent and 18 percent respectively. Rail and pipeline account for the balance.
Canada is this country’s top trading partner followed by China and Mexico. China’s share of trade with the United States almost tripled between 1999 and 2009, from 5 percent of total merchandise trade to 14 percent.

Trade with Canada and Mexico has grown rapidly over the past decade. Trucks carry about 62 percent of the value of goods traded with these countries.

### Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 1999-2009 (billions of current U.S. dollars)

<table>
<thead>
<tr>
<th>Partner</th>
<th>2009 Rank</th>
<th>2009</th>
<th>1999</th>
<th>2004 (R)</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>1</td>
<td>362</td>
<td>445</td>
<td>601</td>
<td>431</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>2</td>
<td>95</td>
<td>231</td>
<td>408</td>
<td>366</td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>3</td>
<td>197</td>
<td>267</td>
<td>367</td>
<td>306</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>4</td>
<td>189</td>
<td>184</td>
<td>204</td>
<td>147</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
<td>82</td>
<td>109</td>
<td>152</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6</td>
<td>78</td>
<td>82</td>
<td>112</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>7</td>
<td>54</td>
<td>72</td>
<td>83</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>8</td>
<td>45</td>
<td>53</td>
<td>73</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>9</td>
<td>28</td>
<td>37</td>
<td>61</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Taiwan</td>
<td>10</td>
<td>54</td>
<td>56</td>
<td>61</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>11</td>
<td>25</td>
<td>35</td>
<td>63</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>12</td>
<td>33</td>
<td>39</td>
<td>52</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td>13</td>
<td>34</td>
<td>35</td>
<td>44</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>14</td>
<td>13</td>
<td>22</td>
<td>43</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>15</td>
<td>17</td>
<td>30</td>
<td>64</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Ireland</td>
<td>16</td>
<td>17</td>
<td>36</td>
<td>39</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>17</td>
<td>22</td>
<td>29</td>
<td>46</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>18</td>
<td>31</td>
<td>39</td>
<td>44</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>19</td>
<td>18</td>
<td>21</td>
<td>40</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>20</td>
<td>16</td>
<td>26</td>
<td>67</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>21</td>
<td>18</td>
<td>24</td>
<td>37</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>22</td>
<td>17</td>
<td>22</td>
<td>33</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>23</td>
<td>19</td>
<td>24</td>
<td>33</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>24</td>
<td>23</td>
<td>25</td>
<td>28</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>25</td>
<td>8</td>
<td>15</td>
<td>36</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Top 25 total</strong></td>
<td></td>
<td>1,504.7</td>
<td>1,060.5</td>
<td>2,789.4</td>
<td>2,179.9</td>
<td></td>
</tr>
<tr>
<td><strong>U.S. total trade</strong></td>
<td></td>
<td>1,717.6</td>
<td>2,287.6</td>
<td>3,611.0</td>
<td>2,615.7</td>
<td></td>
</tr>
<tr>
<td><strong>Top 25 as % of total</strong></td>
<td></td>
<td>87.6</td>
<td>85.7</td>
<td>77.0</td>
<td>83.3</td>
<td></td>
</tr>
</tbody>
</table>

**Key:** R = revised.

1Top 25 trading partners change each year. Totals represent the top 25 trading partners for each year, not necessarily the top 25 trading partners listed here for 2009.

**Note:** Numbers may not add to totals due to rounding.

---

### Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1999-2009 (billions of current U.S. dollars and millions of short tons)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck</td>
<td>385</td>
<td>NA</td>
<td>453</td>
<td>NA</td>
<td>554</td>
<td>182</td>
<td>455</td>
<td>155</td>
</tr>
<tr>
<td>Rail</td>
<td>78</td>
<td>NA</td>
<td>108</td>
<td>NA</td>
<td>140</td>
<td>148</td>
<td>96</td>
<td>108</td>
</tr>
<tr>
<td>Air</td>
<td>34</td>
<td>1</td>
<td>32</td>
<td>&lt;1</td>
<td>41</td>
<td>&lt;1</td>
<td>39</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Water</td>
<td>23</td>
<td>183</td>
<td>46</td>
<td>244</td>
<td>93</td>
<td>232</td>
<td>59</td>
<td>189</td>
</tr>
<tr>
<td>Pipeline</td>
<td>12</td>
<td>NA</td>
<td>39</td>
<td>NA</td>
<td>88</td>
<td>99</td>
<td>49</td>
<td>99</td>
</tr>
<tr>
<td>Other</td>
<td>25</td>
<td>NA</td>
<td>34</td>
<td>NA</td>
<td>47</td>
<td>7</td>
<td>37</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>559</td>
<td>NA</td>
<td>712</td>
<td>NA</td>
<td>964</td>
<td>668</td>
<td>735</td>
<td>557</td>
</tr>
</tbody>
</table>

**Key:** NA = not available.

1The U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated the weight of exports for truck, rail, pipeline, and other modes using weight-to-value ratios derived from imported commodities that vary by country, mode, and commodity. Notes: 1 short ton = 2,000 pounds. Mode “Other” includes shipments transported by mail, other and unknown modes, and shipments through Foreign Trade Zones. Totals for the most recent year differ slightly from the Freight Analysis Framework (FAF) due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.

---

**Table 2-7. Top 25 Trading Partners of the United States in Merchandise Trade: 1999-2009**


**Table 2-8. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1999-2009**

In addition to total trade with Canada and Mexico, trucks carry most of the trade in each direction across both borders, and rail is the second largest mover of bidirectional freight. Pipelines also carry a significant volume of imports from Canada.

Table 2-9. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 1999-2009 (millions of current U.S. dollars)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2004</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exports to Canada, total</strong></td>
<td>146,374</td>
<td>171,878</td>
<td>235,681</td>
<td>184,693</td>
</tr>
<tr>
<td>Truck</td>
<td>123,140</td>
<td>135,897</td>
<td>178,593</td>
<td>142,545</td>
</tr>
<tr>
<td>Rail</td>
<td>11,755</td>
<td>16,597</td>
<td>29,438</td>
<td>19,973</td>
</tr>
<tr>
<td>Pipeline</td>
<td>114</td>
<td>1,584</td>
<td>4,313</td>
<td>2,632</td>
</tr>
<tr>
<td>Other</td>
<td>11,360</td>
<td>17,777</td>
<td>23,294</td>
<td>19,456</td>
</tr>
<tr>
<td>Mail</td>
<td>6</td>
<td>23</td>
<td>43</td>
<td>48</td>
</tr>
<tr>
<td><strong>Exports to Mexico, total</strong></td>
<td>76,129</td>
<td>97,304</td>
<td>129,587</td>
<td>110,378</td>
</tr>
<tr>
<td>Truck</td>
<td>66,924</td>
<td>79,349</td>
<td>100,264</td>
<td>89,417</td>
</tr>
<tr>
<td>Rail</td>
<td>5,711</td>
<td>13,633</td>
<td>21,965</td>
<td>15,291</td>
</tr>
<tr>
<td>Pipeline</td>
<td>144</td>
<td>87</td>
<td>1,250</td>
<td>788</td>
</tr>
<tr>
<td>Other</td>
<td>3,350</td>
<td>4,216</td>
<td>6,107</td>
<td>4,882</td>
</tr>
<tr>
<td>Mail</td>
<td>&lt;1</td>
<td>2</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Imports from Canada, total</strong></td>
<td>183,724</td>
<td>236,735</td>
<td>301,128</td>
<td>201,089</td>
</tr>
<tr>
<td>Truck</td>
<td>118,901</td>
<td>132,762</td>
<td>141,353</td>
<td>105,079</td>
</tr>
<tr>
<td>Rail</td>
<td>46,255</td>
<td>57,947</td>
<td>63,757</td>
<td>41,058</td>
</tr>
<tr>
<td>Pipeline</td>
<td>12,056</td>
<td>36,828</td>
<td>82,018</td>
<td>45,630</td>
</tr>
<tr>
<td>Other</td>
<td>6,387</td>
<td>8,994</td>
<td>13,555</td>
<td>9,098</td>
</tr>
<tr>
<td>Mail</td>
<td>13</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>Imports from Mexico, total</strong></td>
<td>95,023</td>
<td>127,646</td>
<td>163,478</td>
<td>140,576</td>
</tr>
<tr>
<td>Truck</td>
<td>76,448</td>
<td>104,944</td>
<td>134,224</td>
<td>117,787</td>
</tr>
<tr>
<td>Rail</td>
<td>14,693</td>
<td>20,183</td>
<td>25,265</td>
<td>19,303</td>
</tr>
<tr>
<td>Pipeline</td>
<td>2</td>
<td>&lt;1</td>
<td>193</td>
<td>155</td>
</tr>
<tr>
<td>Other</td>
<td>1,256</td>
<td>1,839</td>
<td>2,717</td>
<td>2,175</td>
</tr>
<tr>
<td>Mail</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>FTZ</strong></td>
<td>2,624</td>
<td>680</td>
<td>1,079</td>
<td>1,156</td>
</tr>
</tbody>
</table>

1 “Other” includes “flyaway aircraft” or aircraft moving under their own power (i.e., aircraft moving from the manufacturer to a customer and not carrying any freight), powerhouse (electricity), vessels moving under their own power, pedestrians carrying freight, and unknown and miscellaneous.

2 Foreign Trade Zones (FTZs) were added as a mode of transport for land import shipments beginning in April 1995. Although FTZs are treated as a mode of transportation in the Transborder Freight Data, the actual mode for a specific shipment into or out of an FTZ is unknown because U.S. Customs does not collect this information.

**Note:** Numbers may not add to totals due to rounding.

---

**Table 2-9. Value of U.S. Exports to and Imports from Canada and Mexico by Land Transportation Mode: 1999-2009**

**III. THE FREIGHT TRANSPORTATION SYSTEM**

Freight in America travels over one of the world’s largest and best networks of highways, railroads, waterways, pipelines, and airways. Existing and anticipated increases in the number of freight vehicles, vessels, and other conveyances on both public and private infrastructure are stressing system capacity, increasing maintenance requirements, and threatening system performance.

**Road infrastructure increased slowly over the past 28 years despite a large increase in the volume of traffic. Between 1980 and 2008, route miles of public roads increased by about 5 percent compared with a 95 percent increase in vehicle miles traveled.**

---

**Table 3-1. Miles of Infrastructure by Transportation Mode: 1980-2008**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public roads, route miles</strong></td>
<td>3,859,837</td>
<td>3,866,926</td>
<td>3,951,101</td>
<td>4,059,343</td>
<td>5.2</td>
</tr>
<tr>
<td>National Highway System (NHS)</td>
<td>N</td>
<td>N</td>
<td>161,189</td>
<td>164,096</td>
<td>N</td>
</tr>
<tr>
<td>Interstates</td>
<td>41,120</td>
<td>45,074</td>
<td>46,673</td>
<td>47,013</td>
<td>14.3</td>
</tr>
<tr>
<td>Other NHS</td>
<td>N</td>
<td>N</td>
<td>114,516</td>
<td>117,083</td>
<td>N</td>
</tr>
<tr>
<td>Other</td>
<td>N</td>
<td>N</td>
<td>3,789,912</td>
<td>3,895,246</td>
<td>N</td>
</tr>
<tr>
<td><strong>Strategic Highway Corridor Network (STRAHNET)</strong></td>
<td>N</td>
<td>N</td>
<td>62,066</td>
<td>62,253</td>
<td>N</td>
</tr>
<tr>
<td>Interstate</td>
<td>N</td>
<td>N</td>
<td>46,675</td>
<td>47,013</td>
<td>N</td>
</tr>
<tr>
<td>Non-Interstate</td>
<td>N</td>
<td>N</td>
<td>15,389</td>
<td>15,240</td>
<td>N</td>
</tr>
<tr>
<td><strong>Railroad</strong></td>
<td>183,077</td>
<td>175,909</td>
<td>170,512</td>
<td>139,326</td>
<td>-23.9</td>
</tr>
<tr>
<td>Class I</td>
<td>NA</td>
<td>NA</td>
<td>133,189</td>
<td>120,597</td>
<td>94,082</td>
</tr>
<tr>
<td>Regional</td>
<td>NA</td>
<td>18,375</td>
<td>20,978</td>
<td>16,690</td>
<td>N</td>
</tr>
<tr>
<td>Local</td>
<td>NA</td>
<td>24,337</td>
<td>28,937</td>
<td>28,554</td>
<td>N</td>
</tr>
<tr>
<td><strong>Inland waterways</strong></td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>11,000</td>
<td>0.0</td>
</tr>
<tr>
<td>Great Lakes-St. Lawrence Seaway</td>
<td>2,342</td>
<td>2,342</td>
<td>2,342</td>
<td>2,342</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Pipelines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>218,393</td>
<td>208,752</td>
<td>176,996</td>
<td>173,000</td>
<td>-20.8</td>
</tr>
<tr>
<td>Gas</td>
<td>1,051,774</td>
<td>1,189,200</td>
<td>1,369,300</td>
<td>1,525,000</td>
<td>45.0</td>
</tr>
</tbody>
</table>

**Key:** N = not applicable; NA = not available.

*Excludes Class III railroads.*

---

**Table 3-1. MILES OF INFRASTRUCTURE BY TRANSPORTATION MODE: 1980-2008**

A vast number of vehicles and vessels move goods over the transportation network. The number of commercial trucks climbed 56 percent between 1980 and 2008. In comparison, the number of rail freight cars declined with improved utilization and the deployment of larger cars. The number of U.S.-flag water vessels decreased by 69 percent over the same period while the world fleet expanded by 41 percent.

The growing demand for goods and services contributes to the increase in travel by trucks at a slightly faster rate than for all vehicles.

### Table 3-2. Number of U.S. Vehicles, Vessels, and Other Conveyances: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck, single-unit 2-axle 6-tire or more</td>
<td>4,373,784</td>
<td>4,486,981</td>
<td>5,926,030</td>
<td>6,790,882</td>
</tr>
<tr>
<td>Truck, combination</td>
<td>1,416,869</td>
<td>1,708,895</td>
<td>2,096,619</td>
<td>2,215,856</td>
</tr>
<tr>
<td>Truck, total</td>
<td>5,790,653</td>
<td>6,195,876</td>
<td>8,022,649</td>
<td>9,006,738</td>
</tr>
<tr>
<td>Trucks as percent of all highway vehicles</td>
<td>3.6</td>
<td>3.2</td>
<td>3.6</td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Rail</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class I, locomotive</td>
<td>28,094</td>
<td>18,835</td>
<td>20,028</td>
<td>24,003</td>
</tr>
<tr>
<td>Class I, freight cars</td>
<td>1,168,114</td>
<td>658,902</td>
<td>560,154</td>
<td>450,297</td>
</tr>
<tr>
<td>Nonclass I, freight cars</td>
<td>102,161</td>
<td>103,527</td>
<td>132,448</td>
<td>109,487</td>
</tr>
<tr>
<td>Car companies and shippers freight cars</td>
<td>440,552</td>
<td>449,832</td>
<td>688,194</td>
<td>833,188</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonself-propelled vessels</td>
<td>31,662</td>
<td>31,209</td>
<td>33,152</td>
<td>31,238</td>
</tr>
<tr>
<td>Self-propelled vessels</td>
<td>7,126</td>
<td>8,236</td>
<td>8,202</td>
<td>9,063</td>
</tr>
<tr>
<td>Oceangoing steam and motor ships</td>
<td>864</td>
<td>636</td>
<td>454</td>
<td>272</td>
</tr>
<tr>
<td>US Flag fleet as percent of world fleet</td>
<td>3.5</td>
<td>2.7</td>
<td>1.6</td>
<td>0.8</td>
</tr>
</tbody>
</table>

2. Nonself-propelled vessels include dry-cargo barges, tank barges, and railroad-car floats.
3. Self-propelled vessels include dry cargo, passenger, off-shore support, tankers, and towboats.
4. *1,000 gross tons and over.*
Despite doubling over the past two decades, truck traffic remains a relatively small share of highway traffic as a whole. In 2008, commercial trucks accounted for about 8 percent of highway vehicle miles traveled. Truck tractors hauling semitrailers and other truck combinations account for approximately two-thirds of commercial truck travel, while single-unit trucks with six or more tires account for the remainder.

The nation’s truck fleet has grown significantly in number and dis-
Of trucks weighing more than 10,000 pounds registered to businesses, individuals, and organizations other than government, most growth has occurred at either end of the weight spectrum. Distance traveled has more than doubled in 15 years for trucks weighing between 10,000 pounds and 26,000 pounds and for trucks weighing over 80,000 pounds. Trucks between 60,000 pounds and 80,000 pounds form the largest category in both number of trucks and vehicle miles traveled because in most cases 80,000 pounds is the maximum weight allowed on the highway system without special permits.

Federal and state governments are concerned about truck weight because of the damage that heavy trucks can do to roads and bridges. To monitor truck weight, approximately 182 million weighs were made in 2009, about 64 percent were weigh-in motion and 36 percent were static. Less than 1 percent of weighs discover violations.

### Table 3-4. Commercial Vehicle Weight Enforcement Activities: 2005-2009 (thousands)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>All weighs</td>
<td>230,465</td>
<td>229,451</td>
<td>217,444</td>
<td>200,419</td>
<td>182,257</td>
</tr>
<tr>
<td>Weigh-in-motion</td>
<td>136,381</td>
<td>142,599</td>
<td>132,258</td>
<td>119,826</td>
<td>116,176</td>
</tr>
<tr>
<td>Static weighs¹</td>
<td>94,084</td>
<td>86,852</td>
<td>85,186</td>
<td>80,593</td>
<td>66,081</td>
</tr>
<tr>
<td>Semiportable scales</td>
<td>494</td>
<td>423</td>
<td>426</td>
<td>358</td>
<td>373</td>
</tr>
<tr>
<td>Fixed scales</td>
<td>93,038</td>
<td>85,900</td>
<td>84,214</td>
<td>79,645</td>
<td>65,182</td>
</tr>
<tr>
<td>Portable scales</td>
<td>552</td>
<td>529</td>
<td>547</td>
<td>591</td>
<td>525</td>
</tr>
<tr>
<td>Violations²</td>
<td>568</td>
<td>621</td>
<td>530</td>
<td>555</td>
<td>490</td>
</tr>
<tr>
<td>Axle weight violations</td>
<td>275</td>
<td>270</td>
<td>234</td>
<td>249</td>
<td>221</td>
</tr>
<tr>
<td>Gross weight violations</td>
<td>118</td>
<td>150</td>
<td>127</td>
<td>120</td>
<td>116</td>
</tr>
<tr>
<td>Bridge weight violations</td>
<td>174</td>
<td>202</td>
<td>170</td>
<td>186</td>
<td>153</td>
</tr>
<tr>
<td>Permits³</td>
<td>3,626</td>
<td>4,598</td>
<td>4,828</td>
<td>5,216</td>
<td>4,529</td>
</tr>
<tr>
<td>Non-divisible trip permits</td>
<td>2,712</td>
<td>3,399</td>
<td>3,743</td>
<td>3,693</td>
<td>3,286</td>
</tr>
<tr>
<td>Non-divisible annual permits</td>
<td>233</td>
<td>251</td>
<td>332</td>
<td>322</td>
<td>299</td>
</tr>
<tr>
<td>Divisible trip permits</td>
<td>288</td>
<td>426</td>
<td>398</td>
<td>490</td>
<td>370</td>
</tr>
<tr>
<td>Divisible annual permits</td>
<td>393</td>
<td>522</td>
<td>354</td>
<td>710</td>
<td>574</td>
</tr>
</tbody>
</table>

¹Static weighs include the total number of vehicles weighed from semi portable, portable, and fixed scales.
²Violations include those from axle, gross, and bridge formula weight limits.
³Permits issued are for divisible and non-divisible loads on a trip or on an annual basis, as well as the over width movement of a divisible load.

Freight moving in combination trucks depends heavily on the Interstate System. Although only one-fourth of the distance traveled by all traffic is on the Interstate System, one-half of combination-truck vehicle miles of travel is on the Interstate System.

| Table 3-5. Annual Vehicle Distance Traveled by Highway Category and Vehicle Type: 2008 |
|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
|                                  | Combination Trucks  | Single-Unit Trucks | Other Trucks and Vans | All Passenger Vehicles | Total, All Motor Vehicles |
| Interstate vehicle miles (millions) | 70,465                | 17,427                        | 247,447                     | 384,042                      | 719,381                       |
| Interstate percent                | 49                          | 21                             | 22                           | 23                           | 24                           |
| Non-Interstate vehicle miles (millions) | 73,043                     | 66,524                        | 861,156                      | 1,253,406                     | 2,241,128                     |
| Non-Interstate percent            | 51                          | 79                             | 78                           | 77                           | 76                           |
| Total vehicle miles, all roadways (millions) | 143,507                | 83,951                        | 1,108,603                    | 1,637,448                     | 2,973,509                     |

1Trucks on a single frame with at least two axles and six tires.  
2Other 2-axle 4-tire vehicles which are not passenger cars; including vans, pickup trucks, and sport/utility vehicles.  
3Passenger cars, motorcycles, and buses.  

The National Network was established by Congress in 1982 to facilitate interstate commerce and encourage regional and national economic growth by requiring states to allow conventional combination trucks on the Interstate System and portions of the Federal-aid Primary System of highways. The National Network, which is approximately 200,000 miles in length, has not changed significantly in 28 years.
Longer combination vehicles (LCVs) are tractors pulling 1) a semitrailer longer than 28 feet and a trailer longer than 28 feet, 2) a semitrailer longer than 28 feet and a trailer no more than 28 feet long, or 3) a 28-foot semitrailer and two 28-foot trailers. Although all states allow conventional combinations consisting of a 28-foot semitrailer and a 28-foot trailer, only 14 states and 6 state turnpike authorities allow LCVs on at least some parts of their road networks. Allowable routes for LCVs have been frozen since 1991.
Most trucks larger than pickups, minivans, other light vans, and sport utility vehicles typically operate close to home. About one-half of all trucks usually travel to destinations within 50 miles of their base, and three-fourths stayed within their base state. Less than 10 percent of trucks larger than pickups, minivans, other light vans, and sport utility vehicles typically travel to places more than 200 miles away, but these trucks account for 30 percent of the mileage.

<table>
<thead>
<tr>
<th>Range of Operations</th>
<th>Number of Trucks (thousands)</th>
<th>Truck Miles (millions)</th>
<th>Miles per Truck (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off the road</td>
<td>183</td>
<td>2,263</td>
<td>12</td>
</tr>
<tr>
<td>50 miles or less</td>
<td>2,942</td>
<td>42,531</td>
<td>15</td>
</tr>
<tr>
<td>51 to 100 miles</td>
<td>685</td>
<td>19,162</td>
<td>28</td>
</tr>
<tr>
<td>101 to 200 miles</td>
<td>244</td>
<td>11,780</td>
<td>48</td>
</tr>
<tr>
<td>201 to 500 miles</td>
<td>232</td>
<td>17,520</td>
<td>76</td>
</tr>
<tr>
<td>501 miles or more</td>
<td>293</td>
<td>26,706</td>
<td>91</td>
</tr>
<tr>
<td>Not reported</td>
<td>716</td>
<td>25,061</td>
<td>35</td>
</tr>
<tr>
<td>Not applicable</td>
<td>226</td>
<td>150</td>
<td>1</td>
</tr>
<tr>
<td>Operated in Canada</td>
<td>2</td>
<td>72</td>
<td>43</td>
</tr>
<tr>
<td>Operated in Mexico</td>
<td>2</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>Operated within the home base state</td>
<td>4,196</td>
<td>84,974</td>
<td>20</td>
</tr>
<tr>
<td>Operated in states other than the home base state</td>
<td>496</td>
<td>40,901</td>
<td>83</td>
</tr>
<tr>
<td>Not reported</td>
<td>599</td>
<td>19,046</td>
<td>32</td>
</tr>
<tr>
<td>Not applicable</td>
<td>226</td>
<td>150</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:** Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light cars, and sport utility vehicles. Numbers may not add to totals due to rounding.

Three-fourths of the miles traveled by trucks larger than panels, pickups, minivans, other light vans, and government-owned vehicles are for the movement of products that range from electronics to sand and gravel. Most of the remaining mileage is for empty backhauls and empty shipping containers.

**Table 3-7. Truck Miles by Products Carried: 2002**

<table>
<thead>
<tr>
<th>Products carried</th>
<th>Millions of miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>145,173</td>
</tr>
<tr>
<td>Animals and fish, live</td>
<td>735</td>
</tr>
<tr>
<td>Animal feed and products of animal origin</td>
<td>2,088</td>
</tr>
<tr>
<td>Grains, cereal</td>
<td>1,368</td>
</tr>
<tr>
<td>All other agricultural products</td>
<td>2,661</td>
</tr>
<tr>
<td>Basic chemicals</td>
<td>876</td>
</tr>
<tr>
<td>Fertilizers and fertilizer materials</td>
<td>1,666</td>
</tr>
<tr>
<td>Pharmaceutical products</td>
<td>305</td>
</tr>
<tr>
<td>All other chemical products and preparations</td>
<td>1,351</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>1,124</td>
</tr>
<tr>
<td>Bakery and milled grain products</td>
<td>3,553</td>
</tr>
<tr>
<td>Meat, seafood, and their preparations</td>
<td>3,056</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>445</td>
</tr>
<tr>
<td>All other packaged foodstuffs</td>
<td>7,428</td>
</tr>
<tr>
<td>Logs and other wood in the rough</td>
<td>1,149</td>
</tr>
<tr>
<td>Paper or paperboard articles</td>
<td>3,140</td>
</tr>
<tr>
<td>Printed products</td>
<td>765</td>
</tr>
<tr>
<td>Pulp, newsprint, paper, paperboard</td>
<td>1,936</td>
</tr>
<tr>
<td>Wood products</td>
<td>3,561</td>
</tr>
<tr>
<td>Articles of base metal</td>
<td>3,294</td>
</tr>
<tr>
<td>Base metal in primary or semifinished forms</td>
<td>2,881</td>
</tr>
<tr>
<td>Nonmetallic mineral products</td>
<td>3,049</td>
</tr>
<tr>
<td>Tools, nonpowered</td>
<td>7,759</td>
</tr>
<tr>
<td>Tools, powered</td>
<td>6,478</td>
</tr>
<tr>
<td>Electronic and other electrical equipment</td>
<td>3,024</td>
</tr>
<tr>
<td>Furniture, mattresses, lamps, etc.</td>
<td>2,043</td>
</tr>
<tr>
<td>Machin ery</td>
<td>3,225</td>
</tr>
<tr>
<td>Miscellaneous manufactured products</td>
<td>4,008</td>
</tr>
<tr>
<td>Precision instruments and apparatus</td>
<td>734</td>
</tr>
<tr>
<td>Textile, leather, and related articles</td>
<td>1,538</td>
</tr>
<tr>
<td>Vehicles, including parts</td>
<td>3,844</td>
</tr>
<tr>
<td>All other transportation equipment</td>
<td>636</td>
</tr>
<tr>
<td>Coal</td>
<td>301</td>
</tr>
<tr>
<td>Crude petroleum</td>
<td>132</td>
</tr>
<tr>
<td>Gravel or crushed stone</td>
<td>2,790</td>
</tr>
<tr>
<td>Metallic ores and concentrates</td>
<td>45</td>
</tr>
<tr>
<td>Monumental or building stone</td>
<td>462</td>
</tr>
<tr>
<td>Natural sands</td>
<td>1,089</td>
</tr>
<tr>
<td>All other nonmetallic minerals</td>
<td>499</td>
</tr>
<tr>
<td>Fuel oils</td>
<td>1,232</td>
</tr>
<tr>
<td>Gasoline and aviation turbine fuel</td>
<td>849</td>
</tr>
<tr>
<td>Plastic and rubber</td>
<td>2,393</td>
</tr>
<tr>
<td>All other coal and refined petroleum products</td>
<td>1,172</td>
</tr>
<tr>
<td>Hazardous waste (EPA manifest)</td>
<td>190</td>
</tr>
<tr>
<td>All other waste and scrape (non-EPA manifest)</td>
<td>2,647</td>
</tr>
<tr>
<td>Recyclable products</td>
<td>922</td>
</tr>
<tr>
<td>Mail and courier parcels</td>
<td>4,760</td>
</tr>
<tr>
<td>Empty shipping containers</td>
<td>794</td>
</tr>
<tr>
<td>Passengers</td>
<td>274</td>
</tr>
<tr>
<td>Mixed freight</td>
<td>14,659</td>
</tr>
<tr>
<td>Products, equipment, or materials not elsewhere classified</td>
<td>265</td>
</tr>
<tr>
<td>Products not specified</td>
<td>6,358</td>
</tr>
<tr>
<td>Not applicable±</td>
<td>150</td>
</tr>
<tr>
<td>No product carried</td>
<td>28,977</td>
</tr>
</tbody>
</table>

±Excludes pickups, panels, minivans, sport utilities, and station wagons.  
Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.  
Vehicles not in use. When the survey respondent had partial-year ownership of the vehicle, annual miles were adjusted to reflect miles traveled when not owned by the respondent.
Long-haul freight truck traffic in the United States is concentrated on major routes connecting population centers, ports, border crossings, and other major hubs of activity. Except for Route 99 in California and a few toll roads and border connections, most of the heaviest traveled routes are on the Interstate System.

Note: Long-haul freight trucks typically serve locations at least 50 miles apart, excluding trucks that are used in movements by multiple modes and mail.

Figure 3-5. Average Daily Long-Haul Freight Traffic on the National Highway System: 2007

By 2040, long-haul freight truck traffic in the United States is expected to increase dramatically on Interstate highways and other arterials throughout the nation. Forecast data indicate that truck travel may reach 662 million miles per day.
Selected routes carry a significant concentration of trucks, either as an absolute number or as a percentage of the traffic stream. Nearly 6,000 miles of the NHS carry more than 8,500 trucks per day on sections where at least every fourth vehicle is a truck.
The number of NHS miles carrying large volumes and high percentages of trucks is forecast to increase dramatically by 2040. Segments with more than 8,500 trucks per day and where at least every fourth vehicle is a truck are forecast to approach 21,000 miles, an increase of almost 250 percent from 2007.

**Notes:** AADTT is average annual daily truck traffic and includes all freight-hauling and other trucks with six or more tires. AADT is average annual daily traffic and includes all motor vehicles.
Recurring congestion caused by volumes of passenger vehicles and trucks that exceed capacity on roadways during peak periods is concentrated primarily in major metropolitan areas. In 2007, peak-period congestion resulted in traffic slowing below posted speed limits on 11,700 miles of the NHS and created stop-and-go conditions on an additional 6,700 miles.
Assuming no changes in network capacity, increases in truck and passenger vehicle traffic are forecast to expand areas of recurring peak-period congestion to 36 percent of the NHS in 2040 compared with 11 percent in 2007. This will slow traffic on 20,300 miles of the NHS and create stop-and-go conditions on an additional 39,000 miles.
Congested highways carrying a large number of trucks substantially impede interstate commerce, and trucks on those segments contribute significantly to congestion. Recurring congestion slows traffic on 4,700 miles and creates stop-and-go conditions on 3,700 miles of the NHS that carry more than 8,500 trucks per day.
Assuming no change in network capacity, the number of NHS miles with recurring congestion and a large number of trucks is forecast to increase nearly four-fold between 2007 and 2040. On highways carrying more than 8,500 trucks per day, recurring congestion will slow traffic on close to 7,200 miles and create stop-and-go conditions on an additional 23,500 miles.

**Figure 3-12. Peak-Period Congestion on High-Volume Truck Portions of the National Highway System: 2040**

**Notes:** High-volume truck portions of the National Highway System carry more than 8,500 trucks per day, including freight-hauling long-distance trucks, freight-hauling local trucks, and other trucks with six or more tires. Highly congested segments are stop-and-go conditions with volume/service flow ratios greater than 0.95. Congested segments have reduced traffic speeds with volume/service ratios between 0.75 and 0.95. The volume/service flow ratio is estimated using the procedures outlined in the HPMS Field Manual, Appendix N.
In addition to calculating peak-period congestion from traffic volumes, as shown in other figures, the Federal Highway Administration (FHWA) directly measures operating speeds and travel-time reliability on major truck routes by tracking more than 500,000 trucks. Average truck speeds drop below 55 miles per hour near major urban areas, border crossings and gateways, and in mountainous terrain.
Truck speed and travel time reliability statistics from the cooperative research initiative between private industry and FHWA can be summarized by location, date, and time of day. As expected, average speeds in the peak period between 6 a.m. and 9 a.m. and between 4 p.m. and 7 p.m. are less than those recorded in the non-peak period between 10 a.m. and 2 p.m. on all routes.

<table>
<thead>
<tr>
<th>Interstate Route</th>
<th>Average Operating Speed Peak Period Average Speed</th>
<th>Average Operating Speed Non-Peak Period Average Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>52.8</td>
<td>52.0</td>
</tr>
<tr>
<td>10</td>
<td>57.4</td>
<td>56.7</td>
</tr>
<tr>
<td>15</td>
<td>56.7</td>
<td>56.2</td>
</tr>
<tr>
<td>20</td>
<td>59.2</td>
<td>58.8</td>
</tr>
<tr>
<td>24</td>
<td>57.2</td>
<td>56.6</td>
</tr>
<tr>
<td>25</td>
<td>58.9</td>
<td>58.5</td>
</tr>
<tr>
<td>26</td>
<td>53.7</td>
<td>53.3</td>
</tr>
<tr>
<td>35</td>
<td>56.8</td>
<td>55.9</td>
</tr>
<tr>
<td>40</td>
<td>58.6</td>
<td>58.3</td>
</tr>
<tr>
<td>45</td>
<td>54.9</td>
<td>53.9</td>
</tr>
<tr>
<td>55</td>
<td>57.0</td>
<td>56.8</td>
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<tr>
<td>65</td>
<td>57.9</td>
<td>57.3</td>
</tr>
<tr>
<td>70</td>
<td>56.8</td>
<td>56.5</td>
</tr>
<tr>
<td>75</td>
<td>56.7</td>
<td>56.1</td>
</tr>
<tr>
<td>76</td>
<td>54.5</td>
<td>54.5</td>
</tr>
<tr>
<td>77</td>
<td>54.7</td>
<td>54.3</td>
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<tr>
<td>80</td>
<td>57.7</td>
<td>57.4</td>
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<tr>
<td>81</td>
<td>56.6</td>
<td>56.6</td>
</tr>
<tr>
<td>84</td>
<td>54.2</td>
<td>53.3</td>
</tr>
<tr>
<td>85</td>
<td>57.3</td>
<td>56.5</td>
</tr>
<tr>
<td>87</td>
<td>54.1</td>
<td>53.8</td>
</tr>
<tr>
<td>90</td>
<td>57.1</td>
<td>56.8</td>
</tr>
<tr>
<td>91</td>
<td>53.4</td>
<td>52.9</td>
</tr>
<tr>
<td>94</td>
<td>56.7</td>
<td>56.2</td>
</tr>
<tr>
<td>95</td>
<td>56.2</td>
<td>55.2</td>
</tr>
</tbody>
</table>

*Note:* Includes trucks registered to companies and individuals in the United States except pickups, minivans, other light cars, and sport utility vehicles.
Delay, reliability, and similar performance measures are typically based on the difference between speed limits and actual speeds. Speed limits for trucks vary from state to state and differ from limits set for passenger vehicles in nine states.

<table>
<thead>
<tr>
<th>State</th>
<th>Truck</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Alaska</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Arizona</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Arkansas</td>
<td>65</td>
<td>70</td>
</tr>
<tr>
<td>California</td>
<td>55</td>
<td>70</td>
</tr>
<tr>
<td>Colorado</td>
<td>75</td>
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</tr>
<tr>
<td>Connecticut</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Delaware</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Florida</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Georgia</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Hawaii</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Idaho</td>
<td>65</td>
<td>75</td>
</tr>
<tr>
<td>Illinois</td>
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<tr>
<td>Indiana</td>
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</tr>
<tr>
<td>Iowa</td>
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<td>70</td>
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<tr>
<td>Kansas</td>
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<tr>
<td>Kentucky</td>
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</tr>
<tr>
<td>Louisiana</td>
<td>70</td>
<td>70</td>
</tr>
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<td>Maine</td>
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<td>Montana</td>
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<td>75</td>
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<tr>
<td>Nebraska</td>
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<td>75</td>
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<tr>
<td>Nevada</td>
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</tr>
<tr>
<td>New Hampshire</td>
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<tr>
<td>New Jersey</td>
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<tr>
<td>New Mexico</td>
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</tr>
<tr>
<td>New York</td>
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<td>North Carolina</td>
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<td>North Dakota</td>
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</tr>
<tr>
<td>Ohio</td>
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<tr>
<td>Oregon</td>
<td>55</td>
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<td>Pennsylvania</td>
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<td>75</td>
</tr>
<tr>
<td>Utah</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Vermont</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Virginia</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Washington</td>
<td>60</td>
<td>70</td>
</tr>
<tr>
<td>West Virginia</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Wyoming</td>
<td>75</td>
<td>75</td>
</tr>
</tbody>
</table>

1Urban Interstate.
2Effective July 10, 2007, the posted speed limit is 70 miles per hour (mph) in designated areas on I-75 and I-71.
3In sections of I-10 and I-20 in rural West Texas, the speed limit for passenger cars and light trucks is 80 mph. For large trucks, the speed limit is 70 mph in the daytime and 65 mph at night. For cars, it is also 65 mph at night.
4Portions of I-15 have a posted limit of 80 mph. Effective July 1, 2010, the posted speed limit may be as high as 70 mph where indicated by lawfully placed signs, erected subsequent to a traffic engineering study.

Trucks carry most of the tonnage and value of freight in the United States, but railroads and waterways carry significant volumes over long distances. The largest volume of freight transported by rail is coal moving between the Powder River Basin in Wyoming and the Midwest, while the principal inland waterways volume movement is along the Lower Mississippi River.
The classic forms of rail intermodal transportation are trailer-on-flatcar and container-on-flatcar, and these are spread throughout the United States. The largest concentrations are on routes between the Pacific Coast ports and Chicago and between Chicago and New York.
The top 25 water ports handle about two-thirds of the weight of all foreign and domestic goods moved by water. These goods are primarily bulk commodities such as coal, crude petroleum, and grain.
Containerized cargo has grown rapidly over the past few years and is concentrated at a few large water ports. The Ports of Los Angeles and Long Beach together handle about 35 percent of all container traffic at water ports in the United States. Container trade at these two ports increased by 70 percent between 1998 and 2009, slightly higher than the growth rate reported for container cargo overall.

Note: The statistics include both government and non-government shipments by vessel into and out of U.S. foreign trade zones, the 50 states, District of Columbia, and Puerto Rico.
Table 3-10. Top 25 Airports by Landed Weight of All-Cargo Operations: 2000-2008

<table>
<thead>
<tr>
<th>Airport</th>
<th>Rank</th>
<th>2000</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memphis, TN (Memphis International)</td>
<td>1</td>
<td>6,318</td>
<td>9,343</td>
<td>9,425</td>
<td>9,772</td>
<td>9,750</td>
</tr>
<tr>
<td>Anchorage, AK (Ted Stevens Anchorage International)</td>
<td>2</td>
<td>8,084</td>
<td>10,364</td>
<td>10,588</td>
<td>10,562</td>
<td>8,976</td>
</tr>
<tr>
<td>Louisville, KY (Louisville International-Standiford Field)</td>
<td>3</td>
<td>3,987</td>
<td>4,591</td>
<td>5,015</td>
<td>5,216</td>
<td>5,223</td>
</tr>
<tr>
<td>Miami, FL (Miami International)</td>
<td>4</td>
<td>2,929</td>
<td>3,550</td>
<td>3,591</td>
<td>3,715</td>
<td>3,494</td>
</tr>
<tr>
<td>Los Angeles, CA (Los Angeles International)</td>
<td>5</td>
<td>2,892</td>
<td>2,927</td>
<td>3,627</td>
<td>3,431</td>
<td>2,876</td>
</tr>
<tr>
<td>Indianapolis, IN (Indianapolis International)</td>
<td>6</td>
<td>2,884</td>
<td>2,545</td>
<td>2,627</td>
<td>2,652</td>
<td>2,564</td>
</tr>
<tr>
<td>New York, NY (John F. Kennedy International)</td>
<td>7</td>
<td>2,793</td>
<td>2,811</td>
<td>2,615</td>
<td>2,557</td>
<td>2,222</td>
</tr>
<tr>
<td>Chicago, IL (O’Hare International)</td>
<td>8</td>
<td>2,062</td>
<td>2,412</td>
<td>2,208</td>
<td>2,201</td>
<td>2,103</td>
</tr>
<tr>
<td>Oakland, CA (Metropolitan Oakland International)</td>
<td>9</td>
<td>1,811</td>
<td>1,797</td>
<td>1,798</td>
<td>1,811</td>
<td>1,742</td>
</tr>
<tr>
<td>Newark, NJ (Newark Liberty International)</td>
<td>10</td>
<td>1,961</td>
<td>1,870</td>
<td>1,867</td>
<td>1,873</td>
<td>1,727</td>
</tr>
<tr>
<td>Fort Worth, TX (Dallas/Fort Worth International)</td>
<td>11</td>
<td>1,691</td>
<td>1,655</td>
<td>1,722</td>
<td>1,753</td>
<td>1,614</td>
</tr>
<tr>
<td>Ontario, CA (Ontario International)</td>
<td>12</td>
<td>1,220</td>
<td>1,344</td>
<td>1,401</td>
<td>1,394</td>
<td>1,350</td>
</tr>
<tr>
<td>Philadelphia, PA (Philadelphia International)</td>
<td>13</td>
<td>1,454</td>
<td>1,401</td>
<td>1,366</td>
<td>1,375</td>
<td>1,264</td>
</tr>
<tr>
<td>Atlanta, GA (William B. Hartsfield International)</td>
<td>14</td>
<td>1,090</td>
<td>1,014</td>
<td>1,180</td>
<td>1,261</td>
<td>1,167</td>
</tr>
<tr>
<td>Honolulu, HI (Honolulu International)</td>
<td>15</td>
<td>692</td>
<td>828</td>
<td>979</td>
<td>1,134</td>
<td>1,032</td>
</tr>
<tr>
<td>San Francisco, CA (San Francisco International)</td>
<td>16</td>
<td>1,267</td>
<td>797</td>
<td>829</td>
<td>1,039</td>
<td>775</td>
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<tr>
<td>Houston, TX (George Bush Intercontinental)</td>
<td>17</td>
<td>480</td>
<td>710</td>
<td>696</td>
<td>769</td>
<td>754</td>
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<tr>
<td>Seattle, WA (Seattle-Tacoma International)</td>
<td>18</td>
<td>1,060</td>
<td>709</td>
<td>709</td>
<td>691</td>
<td>747</td>
</tr>
<tr>
<td>Chicago/Rockford, IL (Chicago/Rockford International)</td>
<td>19</td>
<td>654</td>
<td>696</td>
<td>696</td>
<td>737</td>
<td>710</td>
</tr>
<tr>
<td>Phoenix, AZ (Sky Harbor International)</td>
<td>20</td>
<td>920</td>
<td>778</td>
<td>726</td>
<td>711</td>
<td>675</td>
</tr>
<tr>
<td>Portland, OR (Portland International)</td>
<td>21</td>
<td>882</td>
<td>747</td>
<td>730</td>
<td>713</td>
<td>656</td>
</tr>
<tr>
<td>Denver, CO (Denver International)</td>
<td>22</td>
<td>900</td>
<td>763</td>
<td>711</td>
<td>642</td>
<td>625</td>
</tr>
<tr>
<td>Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)</td>
<td>23</td>
<td>622</td>
<td>702</td>
<td>620</td>
<td>612</td>
<td>562</td>
</tr>
<tr>
<td>Salt Lake City, UT (Salt Lake City International)</td>
<td>24</td>
<td>751</td>
<td>590</td>
<td>548</td>
<td>535</td>
<td>521</td>
</tr>
<tr>
<td>Boston, MA (General Edward Lawrence Logan International)</td>
<td>25</td>
<td>703</td>
<td>574</td>
<td>550</td>
<td>530</td>
<td>492</td>
</tr>
</tbody>
</table>

| Top 25 airports¹ | 52,381 | 55,955 | 56,973 | 57,715 | 53,621 |
| Top 25 as % of U.S. total | 70.1 | 73.5 | 74.6 | 75.4 | 75.2 |

¹Dedicated to the exclusive transportation of cargo, all-cargo operations do not include aircraft carrying passengers that also may be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

²Anchorage includes a large share of all-cargo operations in-transit.

³Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2008.

⁴Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.

Note: 1 short ton = 2,000 pounds.

The Federal Aviation Administration reports that Memphis International and Anchorage International are two of the most important U.S. airports that handle all-cargo aircraft.

All-cargo aircraft do not include aircraft carrying passengers as well as cargo.
Transportation facilities that move international trade into and out of the United States demonstrate the importance of all modes and intermodal combinations to global connectivity. The top 25 foreign-trade gateways measured by value of shipments are comprised of 12 water ports, 5 land-border crossings, and 8 air gateways.
IV. THE FREIGHT TRANSPORTATION INDUSTRY

The private sector owns a significant share of assets in the transportation industry: $1.07 trillion in equipment plus $681.2 billion in private structures, compared to $502 billion in transportation structures plus $2.47 trillion in highways owned by public agencies.\(^1\) Freight railroad facilities and services are almost entirely private, while trucks in the private sector operate over public highways, air-cargo services in the private sector operate in public airways and mostly public airports, and ships in the private sector serve public waterways and both public and private port facilities. Pipelines are mostly in the private sector, although significantly controlled by public regulation. In the public sector, virtually all truck routes are owned by state or local governments. Airports and harbors are typically owned by public authorities (although terminals are usually owned or managed by private operators). Air and water navigation is mostly federal, and safety is regulated by all levels of government.

Freight transportation is a big part of the economy. The value generated by transportation services in moving goods and people on the transportation system is about five percent of GDP. Of this five percent, three-fifths is generated by for-hire transportation services, and the rest is generated by in-house transportation (transportation provided by businesses for their own use). Most in-house transportation is in-house trucking, which contributed 40 percent more value to GDP than for-hire trucking in 1996 (the latest year for which data are available).

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\(^1\) Fixed assets are for 2008 and include both passenger and freight transportation. See the Bureau of Economic Analysis at www.bea.gov/national/FA2004/index.asp, tables 2.1, 3.1s, and 7.1b.

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**Figure 4-1. Value Added by Freight Transportation to U.S. Gross Domestic Product by Transportation Mode: 1992 and 1996**

*Source: U.S. Department of Transportation, Bureau of Transportation Statistics, special tabulation, September 2000.*
The freight industry has many components, encompassing companies large and small. All told there were nearly 220,000 transportation and warehousing establishments in 2007, with more than one-half of those primarily engaged in trucking. Revenue generated by trucking accounts for about 34 percent of transportation and warehousing sector revenue while warehousing accounts for a small percentage of the total.

Revenue grew while employment declined in both the national (Class I) railroads and the regional and local railroads between 2000 and 2008.

---

**Table 4-1. Economic Characteristics of Transportation and Warehousing Establishments in Freight-Dominated Modes: 2002 and 2007**

<table>
<thead>
<tr>
<th>NAICS</th>
<th>Establishments</th>
<th>Revenue (millions of current $)</th>
<th>Payroll (millions of current $)</th>
<th>Paid Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation and warehousing</td>
<td>199,618</td>
<td>219,706</td>
<td>382,152</td>
<td>639,916</td>
</tr>
<tr>
<td>Rail transportation</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Water transportation</td>
<td>1,890</td>
<td>1,721</td>
<td>23,331</td>
<td>34,447</td>
</tr>
<tr>
<td>Truck transportation</td>
<td>112,642</td>
<td>120,390</td>
<td>164,219</td>
<td>217,833</td>
</tr>
<tr>
<td>Pipeline transportation</td>
<td>2,188</td>
<td>2,529</td>
<td>22,031</td>
<td>25,718</td>
</tr>
<tr>
<td>Support activities for transportation</td>
<td>33,942</td>
<td>42,130</td>
<td>57,414</td>
<td>86,596</td>
</tr>
<tr>
<td>Couriers and messengers</td>
<td>12,655</td>
<td>13,004</td>
<td>58,165</td>
<td>77,877</td>
</tr>
<tr>
<td>Warehousing and storage</td>
<td>12,671</td>
<td>13,938</td>
<td>16,548</td>
<td>21,921</td>
</tr>
</tbody>
</table>

**Table 4-2. Economic Characteristics of Freight Railroads: 2000 and 2008**

<table>
<thead>
<tr>
<th>Class I</th>
<th>Non-Class I</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of railroads</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Freight revenue (billions of current dollars)</td>
<td>33.1</td>
<td>59.4</td>
</tr>
<tr>
<td>Operating revenue (billions of current dollars)</td>
<td>34.1</td>
<td>61.2</td>
</tr>
<tr>
<td>Employees</td>
<td>168,360</td>
<td>164,439</td>
</tr>
</tbody>
</table>

**Key:** NA = not available; NAICS = North American Industry Classification System.

**Notes:** Total includes air transportation, transit and ground passenger transportation, and scenic and sightseeing transportation. Data are for establishments in which transportation is the primary business. Data exclude transportation provided privately, such as trucking organized “in-house” by a grocery company. Data are not collected for rail transportation nor for governmental organizations even when their primary activity would be classified in industries covered by the census. For example, data are not collected for publicly operated buses and subway systems.
Productivity has improved in all modes, particularly railroads. Between 1987 and 2008, output-per-hour worked more than doubled in line-haul railroading but grew only 30 percent in long-distance, general-freight trucking.

Line-haul railroads do not include switching and terminal operations or short-distance (or local) railroads.

Long-distance, general-freight trucking establishments exclude local trucking and truck operators that require specialized equipment, such as flatbeds, tankers, or refrigerated trailers.

**Figure 4-2. Productivity in Selected Transportation Industries: 1987-2008 (output per employee)**

1Based on the number of paid hours. Real gross domestic product (GDP) in the business and nonfarm business sectors is the basis of the output components of the productivity measures. These output components are based on and are consistent with the National Income and Product Accounts, including the GDP measure, prepared by the Bureau of Economic Analysis of the U.S. Department of Commerce.

Notes: In 2009, the Bureau of Labor Statistics (BLS) revised its data for air transportation output per hour worked to include both full-time and part-time workers. Prior to 2009, BLS assumed all air transportation workers were full-time employees.

Employment in many transportation industries has remained steady or has grown over the past two decades with the notable exception of railroads and pipelines, which have declined by 58 percent and 30 percent, respectively, between 1980 and 2009. Consequently, in 2008 rail transportation employed only 5 percent of those working in the transportation and warehousing industry compared with about 18 percent in 1980. By comparison, employment in trucking in 2009 accounted for 30 percent of total transportation and warehousing sector employment.

Table 4-3. Employment in For-Hire Transportation Establishments Primarily Serving Freight: 1980-2009 (thousands)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total U.S. labor force</strong></td>
<td>90,528</td>
<td>109,487</td>
<td>131,785</td>
<td>(R) 136,790</td>
<td>130,920</td>
</tr>
<tr>
<td><strong>Transportation and warehousing</strong></td>
<td>2,961</td>
<td>3,476</td>
<td>4,410</td>
<td>(R) 4,508</td>
<td>4,235</td>
</tr>
<tr>
<td>Rail transportation</td>
<td>518</td>
<td>272</td>
<td>232</td>
<td>(R) 231</td>
<td>219</td>
</tr>
<tr>
<td>Water transportation</td>
<td>NA</td>
<td>57</td>
<td>56</td>
<td>(R) 67</td>
<td>64</td>
</tr>
<tr>
<td>Truck transportation</td>
<td>NA</td>
<td>1,122</td>
<td>1,406</td>
<td>(R) 1,389</td>
<td>1,266</td>
</tr>
<tr>
<td>Pipeline transportation</td>
<td>NA</td>
<td>60</td>
<td>46</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Support activities for transportation</td>
<td>NA</td>
<td>364</td>
<td>537</td>
<td>(R) 592</td>
<td>549</td>
</tr>
<tr>
<td>Couriers and messengers</td>
<td>NA</td>
<td>375</td>
<td>605</td>
<td>(R) 573</td>
<td>547</td>
</tr>
<tr>
<td>Warehousing and storage</td>
<td>NA</td>
<td>407</td>
<td>514</td>
<td>(R) 672</td>
<td>642</td>
</tr>
</tbody>
</table>

**Key:** NA = not available; R = revised.

1Annual averages.
2Excludes farm employment.
3Industries in the support activities for transportation subsector provide services that support transportation. These services may be provided to transportation carrier establishments or to the general public. This subsector includes a wide array of establishments, including air traffic control services, marine cargo handling, and motor vehicle towing.

**Notes:** These data include workers employed in transportation industries but not necessarily in a transportation occupation, such as a lawyer working for a trucking company. Moreover, these data exclude workers in transportation occupations employed by non-transportation industries, such as a truck driver employed by a retail company.
Freight transportation jobs are not limited to for-hire carriers. Truck driving is by far the largest freight transportation occupation in the United States, and many drivers work for retailers and other establishments with shipper-owned trucks. There were nearly 2.75 million truck drivers in 2009; about 57 percent of these professionals drive heavy/tractor trailer trucks, 30 percent drive light/delivery service trucks, and about 13 percent are driver/sales workers. Several industry analysts believe the number of truck drivers is below demand and driver shortages will worsen in the future.

<table>
<thead>
<tr>
<th>Occupation (SOC code)</th>
<th>2000</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle operators, pipeline operators, and primary support</td>
<td>373,660</td>
<td>382,360</td>
<td>372,720</td>
<td>363,050</td>
</tr>
<tr>
<td>Driver/sales worker (53-3031)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Truck drivers, heavy and tractor-trailer (53-3032)</td>
<td>1,577,070</td>
<td>1,693,590</td>
<td>1,672,580</td>
<td>1,550,930</td>
</tr>
<tr>
<td>Truck drivers, light or delivery services (53-3033)</td>
<td>1,033,220</td>
<td>922,900</td>
<td>908,960</td>
<td>834,780</td>
</tr>
<tr>
<td>Locomotive engineers (53-4011)</td>
<td>29,390</td>
<td>41,760</td>
<td>42,760</td>
<td>43,560</td>
</tr>
<tr>
<td>Rail yard engineers, dinkey operators, and hostlers (53-4013)</td>
<td>4,020</td>
<td>4,950</td>
<td>5,480</td>
<td>5,360</td>
</tr>
<tr>
<td>Railroad brake, signal, and switch operators (53-4021)</td>
<td>16,830</td>
<td>23,120</td>
<td>24,610</td>
<td>24,270</td>
</tr>
<tr>
<td>Railroad conductors and yardmasters (53-4031)</td>
<td>40,380</td>
<td>37,540</td>
<td>39,580</td>
<td>41,540</td>
</tr>
<tr>
<td>Sailors and marine oilers (53-5011)</td>
<td>30,090</td>
<td>32,520</td>
<td>32,420</td>
<td>31,950</td>
</tr>
<tr>
<td>Captains, mates, and pilots of water vessels (53-5021)</td>
<td>21,080</td>
<td>30,540</td>
<td>30,600</td>
<td>30,450</td>
</tr>
<tr>
<td>Ship engineers (53-5031)</td>
<td>7,370</td>
<td>13,710</td>
<td>11,190</td>
<td>10,850</td>
</tr>
<tr>
<td>Bridge and lock tenders (53-6011)</td>
<td>4,790</td>
<td>4,750</td>
<td>4,490</td>
<td>4,290</td>
</tr>
<tr>
<td>Gas compressor and gas pumping station operators (53-7071)</td>
<td>6,510</td>
<td>4,230</td>
<td>4,050</td>
<td>4,160</td>
</tr>
<tr>
<td>Pump operators, except wellhead pumpers (53-7072)</td>
<td>13,730</td>
<td>10,400</td>
<td>9,280</td>
<td>10,310</td>
</tr>
<tr>
<td>Transportation equipment manufacturing and maintenance occupations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus and truck mechanics and diesel engine specialists (49-3031)</td>
<td>258,800</td>
<td>250,370</td>
<td>248,620</td>
<td>232,810</td>
</tr>
<tr>
<td>Rail car repairers (49-3043)</td>
<td>10,620</td>
<td>23,190</td>
<td>20,780</td>
<td>20,910</td>
</tr>
<tr>
<td>Transportation Infrastructure construction and maintenance occupations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rail-track laying and maintenance equipment operators (47-4061)</td>
<td>9,940</td>
<td>14,050</td>
<td>15,020</td>
<td>14,880</td>
</tr>
<tr>
<td>Signal and track switch repairers (49-9097)</td>
<td>5,540</td>
<td>6,090</td>
<td>6,570</td>
<td>6,450</td>
</tr>
<tr>
<td>Dredge operators (53-7071)</td>
<td>3,100</td>
<td>1,910</td>
<td>1,990</td>
<td></td>
</tr>
<tr>
<td>Secondary support service occupations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispatchers, except police, fire, and ambulance (43-5032)</td>
<td>167,180</td>
<td>190,190</td>
<td>193,210</td>
<td>185,100</td>
</tr>
<tr>
<td>Postal service mail carriers (43-5052)</td>
<td>354,980</td>
<td>348,070</td>
<td>354,570</td>
<td>339,030</td>
</tr>
<tr>
<td>Shipping, receiving, and traffic clerks (43-5071)</td>
<td>864,530</td>
<td>755,790</td>
<td>760,950</td>
<td>715,130</td>
</tr>
<tr>
<td>Transportation inspectors (53-6051)</td>
<td>26,520</td>
<td>24,130</td>
<td>24,940</td>
<td>24,250</td>
</tr>
<tr>
<td>Tank car, truck, and ship loaders (53-7121)</td>
<td>17,460</td>
<td>14,870</td>
<td>12,330</td>
<td>11,560</td>
</tr>
</tbody>
</table>

**Key:** SOC = Standard Occupational Classification.

Table 4-4. Employment in Selected Freight Transportation and Freight Transportation-Related Occupations: 2000-2009

### Table 4-5: Producer Price Indices for Selected Transportation Services: 1990-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Transportation (NAICS 481)</td>
<td>NA</td>
<td>147.7</td>
<td>162.1</td>
<td>162.3</td>
<td>171.0</td>
<td>180.4</td>
<td>183.7</td>
<td>203.8</td>
</tr>
<tr>
<td>Scheduled Air Transportation (NAICS 4811)</td>
<td>110.2</td>
<td>198.5</td>
<td>198.6</td>
<td>209.3</td>
<td>220.5</td>
<td>224.5</td>
<td>248.9</td>
<td></td>
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<tr>
<td>Non-Scheduled Air Transportation (NAICS 4812)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>100.2</td>
<td>104.9</td>
<td>108.4</td>
<td>109.0</td>
<td>127.8</td>
</tr>
<tr>
<td>Rail Transportation (NAICS 482)</td>
<td>NA</td>
<td>102.6</td>
<td>108.8</td>
<td>113.4</td>
<td>125.2</td>
<td>135.9</td>
<td>140.9</td>
<td>157.3</td>
</tr>
<tr>
<td>Scheduled Freight Air Transportation (NAICS 4811)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.7</td>
<td>109.9</td>
<td>119.9</td>
<td>130.2</td>
<td>141.8</td>
</tr>
<tr>
<td>Nonscheduled Air Transportation (NAICS 4812)</td>
<td>NA</td>
<td>107.5</td>
<td>114.5</td>
<td>121.4</td>
<td>126.5</td>
<td>139.6</td>
<td>151.2</td>
<td>157.2</td>
</tr>
<tr>
<td>Water Transportation (NAICS 483)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.3</td>
<td>106.4</td>
<td>111.1</td>
<td>113.5</td>
<td>127.0</td>
</tr>
<tr>
<td>Deep Sea Freight Transportation (NAICS 48311)</td>
<td>113.1</td>
<td>219.9</td>
<td>225.9</td>
<td>231.9</td>
<td>233.3</td>
<td>230.0</td>
<td>258.3</td>
<td></td>
</tr>
<tr>
<td>Coastal and Great Lakes Freight Transportation (NAICS 48313)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.7</td>
<td>109.9</td>
<td>119.9</td>
<td>130.2</td>
<td>141.8</td>
</tr>
<tr>
<td>Inland Water Freight Transportation (NAICS 483211)</td>
<td>100.0</td>
<td>117.9</td>
<td>124.7</td>
<td>131.0</td>
<td>151.4</td>
<td>182.9</td>
<td>186.1</td>
<td>218.3</td>
</tr>
<tr>
<td>Truck Transportation (NAICS 484)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>103.1</td>
<td>109.0</td>
<td>113.2</td>
<td>115.4</td>
<td>123.0</td>
</tr>
<tr>
<td>General Freight Trucking (NAICS 4841)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>103.5</td>
<td>110.0</td>
<td>114.1</td>
<td>116.5</td>
<td>123.6</td>
</tr>
<tr>
<td>General Freight Trucking, Local (NAICS 48411)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>105.2</td>
<td>111.5</td>
<td>115.3</td>
<td>119.6</td>
<td>130.2</td>
</tr>
<tr>
<td>General Freight Trucking, Long Distance (NAICS 48412)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>103.2</td>
<td>109.7</td>
<td>113.8</td>
<td>115.9</td>
<td>122.2</td>
</tr>
<tr>
<td>Specialized Freight (NAICS 4842)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>102.3</td>
<td>107.0</td>
<td>111.4</td>
<td>113.1</td>
<td>122.1</td>
</tr>
<tr>
<td>Used Household and Office Goods Moving (NAICS 48421)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>102.6</td>
<td>106.0</td>
<td>107.8</td>
<td>108.8</td>
<td>112.2</td>
</tr>
<tr>
<td>Specialized Freight (except Used Goods) Trucking, Local (NAICS 48422)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>102.7</td>
<td>107.1</td>
<td>112.3</td>
<td>114.2</td>
<td>126.7</td>
</tr>
<tr>
<td>Specialized Freight (except Used Goods) Trucking, Long Distance (NAICS 48423)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.7</td>
<td>107.5</td>
<td>112.8</td>
<td>114.8</td>
<td>123.6</td>
</tr>
<tr>
<td>Pipeline Transportation (NAICS 486)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Pipeline Transportation of Crude Oil (NAICS 4861)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>103.9</td>
<td>113.3</td>
<td>112.0</td>
<td>125.4</td>
<td>137.1</td>
</tr>
<tr>
<td>Other Pipeline Transportation (NAICS 4869)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.4</td>
<td>105.2</td>
<td>108.2</td>
<td>115.0</td>
<td>121.6</td>
</tr>
<tr>
<td>Support Activities for Transportation (NAICS 488)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.4</td>
<td>104.1</td>
<td>106.5</td>
<td>108.5</td>
<td>111.7</td>
</tr>
<tr>
<td>Support Activities for Water Transportation (NAICS 4883)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.0</td>
<td>103.5</td>
<td>107.7</td>
<td>112.7</td>
<td>117.3</td>
</tr>
<tr>
<td>Navigational Services to Shipping (NAICS 48833)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>101.5</td>
<td>105.7</td>
<td>113.9</td>
<td>120.6</td>
<td>133.8</td>
</tr>
<tr>
<td>Freight Transportation Arrangement (NAICS 4885)</td>
<td>98.3</td>
<td>97.9</td>
<td>98.9</td>
<td>99.1</td>
<td>98.8</td>
<td>100.2</td>
<td>102.5</td>
<td></td>
</tr>
<tr>
<td>Postal Service (NAICS 491)</td>
<td>100.0</td>
<td>135.2</td>
<td>155.0</td>
<td>155.0</td>
<td>155.0</td>
<td>164.7</td>
<td>171.9</td>
<td>178.9</td>
</tr>
<tr>
<td>Couriers and Messengers (NAICS 492)</td>
<td>NA</td>
<td>NA</td>
<td>100.0</td>
<td>106.1</td>
<td>113.8</td>
<td>121.5</td>
<td>131.5</td>
<td>142.0</td>
</tr>
</tbody>
</table>

**Key:** NA = not available; NAICS = North American Industry Classification System.

1 Base year = 1992.
2 Base year = 1989.
3 Base year = 1996.
4 Base year = 1984.
5 Other pipeline transportation includes pipeline transportation of refined petroleum products (NAICS 48691).
6 Support activities for water transportation includes port and harbor operations (NAICS 48831), marine cargo handling (NAICS 48832), and navigational services to shipping (NAICS 48833).

**Notes:** Index values start at 100.0 in 1990 unless another year is specified. This table shows annual data, which are calculated by the Bureau of Labor Statistics by averaging monthly indices. Data are reported monthly from January to December. The monthly indices, however, are available for fewer than 12 months for some years. In both cases, a simple average of the available monthly indices is reported for each year. Data are not seasonally adjusted.

The prices charged for transportation purchased from carriers and support activities has gone up in most industries. Rail prices increased by about 12 percent from 2007 to 2008, while air and trucking increased by 11 percent and 7 percent respectively.
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 environmental implications of freight transportation only recently have been considered separately from passenger travel. At the same time, the availability of energy consumption data has declined with the demise of the Vehicle Inventory and Use Survey.

Table 5-1. Fatalities by Freight Transportation Mode: 1980-2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total transportation fatalities (passenger and freight)</td>
<td>NA</td>
<td>47,350</td>
<td>44,384</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Highway (passenger and freight)</td>
<td>51,091</td>
<td>44,599</td>
<td>41,945</td>
<td>(R) 37,423</td>
<td>33,808</td>
</tr>
<tr>
<td>Large truck occupants¹</td>
<td>1,262</td>
<td>705</td>
<td>754</td>
<td>(R) 682</td>
<td>503</td>
</tr>
<tr>
<td>Others killed in crashes involving large trucks</td>
<td>4,709</td>
<td>4,567</td>
<td>4,528</td>
<td>(R) 3,563</td>
<td>2,877</td>
</tr>
<tr>
<td>Large truck occupants¹ (percent)</td>
<td>2.5</td>
<td>1.6</td>
<td>1.8</td>
<td>1.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Others killed in crashes involving large trucks (percent)</td>
<td>9.2</td>
<td>10.2</td>
<td>10.8</td>
<td>9.5</td>
<td>8.5</td>
</tr>
<tr>
<td>Railroad (passenger and freight)</td>
<td>1,417</td>
<td>1,297</td>
<td>937</td>
<td>800</td>
<td>703</td>
</tr>
<tr>
<td>Highway-rail crossing¹</td>
<td>833</td>
<td>698</td>
<td>425</td>
<td>(R) 289</td>
<td>245</td>
</tr>
<tr>
<td>Railroad²,³</td>
<td>584</td>
<td>599</td>
<td>512</td>
<td>(R) 511</td>
<td>458</td>
</tr>
<tr>
<td>Waterborne (passenger and freight)</td>
<td>487</td>
<td>186</td>
<td>111</td>
<td>109</td>
<td>185</td>
</tr>
<tr>
<td>Vessel-related⁴</td>
<td>206</td>
<td>85</td>
<td>42</td>
<td>56</td>
<td>54</td>
</tr>
<tr>
<td>Freight ship</td>
<td>8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tank ship</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Tug/towboat</td>
<td>14</td>
<td>13</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Offshore supply</td>
<td>NA</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fishing vessel</td>
<td>60</td>
<td>47</td>
<td>26</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Mobile offshore drilling units</td>
<td>NA</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Platform</td>
<td>NA</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Freight barge</td>
<td>NA</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tank barge</td>
<td>NA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous⁵</td>
<td>56</td>
<td>11</td>
<td>15</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Not vessel-related⁶</td>
<td>281</td>
<td>101</td>
<td>69</td>
<td>53</td>
<td>131</td>
</tr>
<tr>
<td>Pipeline</td>
<td>19</td>
<td>9</td>
<td>38</td>
<td>(R) 8</td>
<td>14</td>
</tr>
<tr>
<td>Hazardous liquid pipeline</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Gas pipeline</td>
<td>15</td>
<td>6</td>
<td>37</td>
<td>(R) 6</td>
<td>10</td>
</tr>
</tbody>
</table>

Key: NA = not available; R = revised.

¹Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
²Includes Amtrak.
³Includes train accidents and other incidents. Most fatalities involve trespassers who are included under other incidents (428 in 2009).
⁴Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.
⁵Includes industrial vessel, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.

Note: 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 in each mode, with the exception of...
not vessel-related waterborne casualties. Trucks account for approximately 10 percent of all highway fatalities. The vast majority of fatalities involve passenger travel on highways.

The highway and railroad modes account for almost all of the injuries in freight transportation, but the number of injuries has dropped substantially since 2000.

Table 5-2. Injured Persons by Freight Transportation Mode: 1980-2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total injured persons (passenger and freight)</strong></td>
<td>NA</td>
<td>NA</td>
<td>3,259,673</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Highway (passenger and freight)</strong></td>
<td>NA</td>
<td>3,230,666</td>
<td>3,188,750</td>
<td>2,346,000</td>
<td>2,217,000</td>
</tr>
<tr>
<td>Large truck occupants¹</td>
<td>NA</td>
<td>41,822</td>
<td>30,832</td>
<td>23,000</td>
<td>17,000</td>
</tr>
<tr>
<td>Others injured in crashes involving large trucks</td>
<td>NA</td>
<td>108,000</td>
<td>109,000</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Large truck occupants¹ (percent)</td>
<td>NA</td>
<td>1.3</td>
<td>1.0</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Others injured in crashes involving large trucks (percent)</td>
<td>NA</td>
<td>3.3</td>
<td>3.4</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Railroad (passenger and freight)</strong></td>
<td>62,246</td>
<td>25,143</td>
<td>11,643</td>
<td>(R) 8,949</td>
<td>7,738</td>
</tr>
<tr>
<td>Highway-rail grade crossing²</td>
<td>3,550</td>
<td>2,407</td>
<td>1,219</td>
<td>(R) 969</td>
<td>712</td>
</tr>
<tr>
<td>Railroad²,³</td>
<td>58,696</td>
<td>22,736</td>
<td>10,424</td>
<td>(R) 7,942</td>
<td>7,177</td>
</tr>
<tr>
<td><strong>Waterborne (passenger and freight)</strong></td>
<td>NA</td>
<td>NA</td>
<td>665</td>
<td>628</td>
<td>722</td>
</tr>
<tr>
<td>Vessel-related⁴</td>
<td>180</td>
<td>175</td>
<td>151</td>
<td>159</td>
<td>186</td>
</tr>
<tr>
<td>Freight ship</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Tank ship</td>
<td>9</td>
<td>13</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Tug/towboat</td>
<td>27</td>
<td>19</td>
<td>18</td>
<td>20</td>
<td>39</td>
</tr>
<tr>
<td>Offshore supply</td>
<td>NA</td>
<td>9</td>
<td>6</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Fishing vessel</td>
<td>28</td>
<td>31</td>
<td>21</td>
<td>17</td>
<td>35</td>
</tr>
<tr>
<td>Mobile offshore drilling units</td>
<td>NA</td>
<td>13</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Platform</td>
<td>NA</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Freight barge</td>
<td>NA</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tank barge</td>
<td>NA</td>
<td>3</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Miscellaneous⁵</td>
<td>98</td>
<td>12</td>
<td>96</td>
<td>96</td>
<td>98</td>
</tr>
<tr>
<td>Not related to vessel casualties⁶</td>
<td>NA</td>
<td>NA</td>
<td>514</td>
<td>469</td>
<td>536</td>
</tr>
<tr>
<td><strong>Pipeline</strong></td>
<td>192</td>
<td>76</td>
<td>81</td>
<td>(R) 61</td>
<td>63</td>
</tr>
<tr>
<td>Hazardous liquid pipeline</td>
<td>15</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Gas pipeline</td>
<td>177</td>
<td>69</td>
<td>77</td>
<td>(R) 59</td>
<td>59</td>
</tr>
</tbody>
</table>

Key: NA = not available; R = revised.
¹Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors.
²Includes Amtrak.
³Includes train accidents and other incidents. Most injuries involve workers on duty (4,180 in 2009).
⁴Vessel-related injuries include those involving damage to vessels, such as collisions or groundings. Injuries not related to vessel casualties include those from falls overboard or from accidents involving onboard equipment.
⁵Includes industrial vessel, passenger (inspected), passenger (uninspected), recreational, research vessel, unclassified, and unknown data.
⁶Note: Numbers may not add to totals due to some injuries being counted in more than one mode.

The number of crashes and other freight transportation accidents have declined in all modes except water in recent years, despite an increase in freight transportation activity.

Because most hazardous materials are transported by truck, most 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

<table>
<thead>
<tr>
<th>Table 5-3. Accidents by Freight Transportation Mode: 1980-2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1980</strong></td>
</tr>
<tr>
<td>Highway (passenger and freight)</td>
</tr>
<tr>
<td>Large truck¹</td>
</tr>
<tr>
<td>Large truck (percent of total)</td>
</tr>
<tr>
<td>Rail (passenger and freight)</td>
</tr>
<tr>
<td>Highway-rail grade crossing²,³</td>
</tr>
<tr>
<td>Waterborne (passenger and freight)</td>
</tr>
<tr>
<td>Pipeline</td>
</tr>
<tr>
<td>Hazardous liquid pipeline</td>
</tr>
</tbody>
</table>

**Key:** NA = not available; R = revised. ¹Large trucks are defined as trucks over the 10,000 pound gross vehicle weight rating, including single-unit trucks and truck tractors. ²Includes Amtrak. ³Includes both accidents and incidents. Most highway-rail grade crossing accidents are also counted under highway. ⁴Train accidents only.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>1980</strong></td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
<tr>
<td>Air</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
<tr>
<td>Highway</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
<tr>
<td>Rail</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
<tr>
<td>Water¹</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
<tr>
<td>Other²</td>
</tr>
<tr>
<td>Accident-related</td>
</tr>
</tbody>
</table>

**Key:** NA = not available; R = revised. ¹Water category only includes packaged (nonbulk) marine. Non-packaged (bulk) marine hazardous materials incidents are reported to the U.S. Coast Guard and are not included. ²Other category includes freight forwarders and modes not otherwise specified. ³Note: 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 is no longer included in the hazardous materials information system report.
vehicular crash or derailment (referred to as “accident related”). Less than 2 percent of incidents were accident related in 2009, but they accounted for 83 percent of all property damage. Most incidents occur because of human error or package failure, particularly during loading and unloading.

The safety fitness of motor carriers has improved markedly over the past few years. In 2009, the share of motor carriers rated satisfactory was 68 percent, up from 51 percent in 2000.

Less than one-fourth of all roadside inspections of commercial vehicles result in the vehicle being taken out of service (OOS) for a serious violation. A much lower percentage of driver and hazardous materials inspections results in OOS orders. In 2009, about 6 percent of driver inspections and 5 percent of hazardous materials inspections result in an OOS order.

The number of gallons of fuel burned by commercial trucks increased significantly over the past 28 years. Between 1980 and 2008, the fuel consumed in highway freight transportation increased from 20 billion to nearly 37 billion gallons annually. This is due to a substantial increase in the number of trucks on the road, an increase in the average number of miles traveled per truck, and a doubling of truck miles traveled. Over the same period, fuel use in Class I freight railroads hovered around 3.9 billion gallons.

<table>
<thead>
<tr>
<th>Safety rating</th>
<th>Number</th>
<th>Percent</th>
<th>Number</th>
<th>Percent</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfactory</td>
<td>5,309</td>
<td>51.1</td>
<td>(R) 6,517</td>
<td>(R) 65.7</td>
<td>6,859</td>
<td>68.0</td>
</tr>
<tr>
<td>Conditional</td>
<td>3,354</td>
<td>32.3</td>
<td>(R) 2,755</td>
<td>(R) 27.8</td>
<td>2,778</td>
<td>27.5</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>1,481</td>
<td>14.3</td>
<td>(R) 438</td>
<td>(R) 4.4</td>
<td>301</td>
<td>3.0</td>
</tr>
<tr>
<td>Not rated</td>
<td>245</td>
<td>2.4</td>
<td>(R) 216</td>
<td>(R) 2.2</td>
<td>152</td>
<td>1.5</td>
</tr>
<tr>
<td>Total</td>
<td>10,389</td>
<td>100.0</td>
<td>(R) 9,926</td>
<td>100.0</td>
<td>10,090</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5-5. Commercial Motor Carrier Compliance Review Activity by Safety Rating: 2000-2009

Key: R = revised.

Notes: 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. This entails having adequate safety management controls in place to ensure acceptable compliance with applicable safety requirements to reduce the risk associated with: alcohol and controlled substance testing violations; commercial driver’s license standard violations; inadequate levels of financial responsibility; the use of unqualified drivers; improper use and driving of motor vehicles; unsafe vehicles operating on the highways; failure to maintain crash registers and copies of crash reports; the use of fatigued drivers; inadequate inspection, repair, and maintenance of vehicles; transportation of hazardous materials; driving and parking rule violations; violation of hazardous materials regulations; and motor vehicle crashes and hazardous materials incidents. Numbers and percents may not add to totals due to rounding.
### Table 5-6. Roadside Safety Inspection Activity Summary by Inspection Type: 2000-2009

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td><strong>All inspections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inspections</td>
<td>2,453,776</td>
<td>100.0</td>
<td>3,416,942</td>
<td>100.0</td>
</tr>
<tr>
<td>With no violations</td>
<td>639,593</td>
<td>26.1</td>
<td>1,034,702</td>
<td>30.1</td>
</tr>
<tr>
<td>With violations</td>
<td>1,814,183</td>
<td>73.9</td>
<td>2,382,240</td>
<td>69.9</td>
</tr>
<tr>
<td><strong>Driver inspections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inspections</td>
<td>2,396,688</td>
<td>100.0</td>
<td>3,267,279</td>
<td>100.0</td>
</tr>
<tr>
<td>With no violations</td>
<td>1,459,538</td>
<td>60.9</td>
<td>2,068,417</td>
<td>63.2</td>
</tr>
<tr>
<td>With violations</td>
<td>937,150</td>
<td>39.1</td>
<td>1,198,862</td>
<td>36.8</td>
</tr>
<tr>
<td>With OOS violations</td>
<td>191,031</td>
<td>8.0</td>
<td>223,099</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Vehicle inspections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inspections</td>
<td>1,908,300</td>
<td>100.0</td>
<td>2,388,451</td>
<td>100.0</td>
</tr>
<tr>
<td>With no violations</td>
<td>584,389</td>
<td>30.6</td>
<td>810,192</td>
<td>33.8</td>
</tr>
<tr>
<td>With violations</td>
<td>1,323,911</td>
<td>69.4</td>
<td>1,578,259</td>
<td>66.2</td>
</tr>
<tr>
<td>With OOS violations</td>
<td>452,850</td>
<td>23.7</td>
<td>532,265</td>
<td>22.4</td>
</tr>
<tr>
<td><strong>Hazardous materials inspections</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inspections</td>
<td>133,486</td>
<td>100.0</td>
<td>199,732</td>
<td>100.0</td>
</tr>
<tr>
<td>With no violations</td>
<td>101,098</td>
<td>75.7</td>
<td>164,252</td>
<td>82.0</td>
</tr>
<tr>
<td>With violations</td>
<td>32,388</td>
<td>24.3</td>
<td>35,480</td>
<td>18.0</td>
</tr>
<tr>
<td>With OOS violations</td>
<td>9,964</td>
<td>7.5</td>
<td>10,195</td>
<td>5.2</td>
</tr>
</tbody>
</table>

**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. 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.

---

### Table 5-7. Fuel Consumption by Transportation Mode: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasoline, diesel and other fuels (million gallons)</td>
<td>114,960</td>
<td>130,755</td>
<td>162,555</td>
<td>(R) 176,190</td>
<td>170,765</td>
</tr>
<tr>
<td>Truck, total</td>
<td>19,960</td>
<td>24,490</td>
<td>35,229</td>
<td>(R) 38,589</td>
<td>36,703</td>
</tr>
<tr>
<td>Single-unit 2-axle 6-tire or more truck</td>
<td>6,923</td>
<td>8,357</td>
<td>9,563</td>
<td>(R) 10,044</td>
<td>9,889</td>
</tr>
<tr>
<td>Combination truck</td>
<td>13,037</td>
<td>16,133</td>
<td>25,666</td>
<td>(R) 28,545</td>
<td>26,814</td>
</tr>
<tr>
<td>Truck (percent of total)</td>
<td>17.4</td>
<td>18.7</td>
<td>21.7</td>
<td>(R) 21.9</td>
<td>21.5</td>
</tr>
<tr>
<td><strong>Rail, Class I (in freight service)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distillate / diesel fuel (million gallons)</td>
<td>3,904</td>
<td>3,115</td>
<td>3,700</td>
<td>4,062</td>
<td>3,886</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual fuel oil (million gallons)</td>
<td>8,952</td>
<td>6,326</td>
<td>6,410</td>
<td>6,327</td>
<td>5,066</td>
</tr>
<tr>
<td>Distillate / diesel fuel oil (million gallons)</td>
<td>1,478</td>
<td>2,065</td>
<td>2,261</td>
<td>1,924</td>
<td>1,187</td>
</tr>
<tr>
<td>Gasoline (million gallons)</td>
<td>1,052</td>
<td>1,300</td>
<td>1,124</td>
<td>1,222</td>
<td>1,136</td>
</tr>
<tr>
<td><strong>Pipeline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural gas (million cubic feet)</td>
<td>634,622</td>
<td>659,816</td>
<td>642,210</td>
<td>(R) 621,364</td>
<td>647,958</td>
</tr>
</tbody>
</table>

**Key:** R = revised.
In 2008, trucking accounted for more than two-thirds of freight transportation energy consumption. Water was a distant second with roughly one-sixth of freight energy consumption.

Since 1980, miles per gallon by single-unit trucks (based on total travel and fuel consumption) increased by more than 45 percent. Total fuel consumed increased by about 43 percent whereas miles traveled more than doubled, indicating that miles per gallon increased from 5.8 to 8.5 between 1980 and 2008.

Table 5-8. Single-Unit Truck Fuel Consumption and Travel: 1980-2008


| Key: | R = revised.

<table>
<thead>
<tr>
<th>Table 5-8. Single-Unit Truck Fuel Consumption and Travel: 1980-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Number registered (thousands)</td>
</tr>
<tr>
<td>Vehicle miles (millions)</td>
</tr>
<tr>
<td>Fuel consumed (million gallons)</td>
</tr>
<tr>
<td>Average miles traveled per vehicle</td>
</tr>
<tr>
<td>Average miles traveled per gallon</td>
</tr>
<tr>
<td>Average fuel consumed per vehicle (gallons)</td>
</tr>
</tbody>
</table>

Figure 5-1. Share of Energy Consumption by Freight Transportation Mode: 2008

Figure 5-1. Share of Energy Consumption by Freight Transportation Mode: 2008


In contrast to single-unit trucks, miles per gallon by combination trucks (based on total travel and fuel consumption) increased by only 2 percent over the past 28 years. During the same period, vehicle miles traveled more than doubled, resulting in a doubling of gallons of fuel consumed.

<table>
<thead>
<tr>
<th>Table 5-9. Combination Truck Fuel Consumption and Travel: 1980-2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number registered (thousands)</td>
</tr>
<tr>
<td>Vehicle miles traveled (millions)</td>
</tr>
<tr>
<td>Fuel consumed (million gallons)</td>
</tr>
<tr>
<td>Average miles traveled per vehicle</td>
</tr>
<tr>
<td>Average miles traveled per gallon</td>
</tr>
<tr>
<td>Average fuel consumed per vehicle (gallons)</td>
</tr>
</tbody>
</table>

Key: R = revised.

Diesel prices were about 64 percent higher in June 2010 than 10 years earlier (in inflation-adjusted terms).

**Figure 5-2. Monthly Diesel Prices: January 1999-June 2010**

**Table 5-9. Combination Truck Fuel Consumption and Travel: 1980-2008**


**Figure 5-2. Monthly Diesel Prices: January 1999-June 2010**

Energy intensity is the amount of energy used in producing a given level of output or activity, in this case vehicle miles and ton miles. Compared with 1980, the energy intensity of both trucking and freight rail has improved. Domestic freight water transportation, measured by Btu per ton mile, has become less energy efficient.

### Table 5-10. Energy Intensities of Domestic Freight Transportation Modes: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway (Btu per vehicle mile)</td>
<td>24,758</td>
<td>22,795</td>
<td>23,449</td>
<td>(R) 23,252</td>
<td>22,077</td>
</tr>
<tr>
<td>Railroad (Class I) (Btu per freight car mile)</td>
<td>18,742</td>
<td>16,619</td>
<td>14,917</td>
<td>14,846</td>
<td>14,573</td>
</tr>
<tr>
<td>Railroad (Class I) (Btu per ton mile)</td>
<td>597</td>
<td>420</td>
<td>352</td>
<td>320</td>
<td>305</td>
</tr>
<tr>
<td>Domestic water (Btu per ton mile)</td>
<td>358</td>
<td>387</td>
<td>473</td>
<td>590</td>
<td>418</td>
</tr>
</tbody>
</table>

**Key:** Btu = British thermal unit; R = revised.

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\textsubscript{2}) but large amounts of nitrogen oxides (NO\textsubscript{x}). However, since 1990 heavy-duty truck emissions of NO\textsubscript{x} have declined by 67 percent.

Freight transportation also accounts for about one-third of emissions of particulate matter 10 microns in diameter (PM-10) from mobile sources. Most PM-10, however, comes from agricultural fields, wildfires, and fugitive dust. Consequently, freight transportation is a minor factor when considering total PM-10 emissions.

### Table 5-11. Estimated National Average Vehicle Emissions Rates of Heavy-Duty and Light-Duty Vehicles: 1990-2009

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>2000</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cars</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust HC</td>
<td>2.79</td>
<td>0.97</td>
<td>0.39</td>
<td>0.36</td>
</tr>
<tr>
<td>Nonexhaust HC</td>
<td>1.21</td>
<td>0.91</td>
<td>0.57</td>
<td>0.51</td>
</tr>
<tr>
<td><strong>Total HC</strong></td>
<td>4.00</td>
<td>1.88</td>
<td>0.95</td>
<td>0.87</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>42.89</td>
<td>18.53</td>
<td>9.68</td>
<td>9.20</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>2.70</td>
<td>1.29</td>
<td>0.67</td>
<td>0.61</td>
</tr>
<tr>
<td><strong>Light trucks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust HC</td>
<td>3.68</td>
<td>1.45</td>
<td>0.55</td>
<td>0.51</td>
</tr>
<tr>
<td>Nonexhaust HC</td>
<td>1.37</td>
<td>0.98</td>
<td>0.62</td>
<td>0.58</td>
</tr>
<tr>
<td><strong>Total HC</strong></td>
<td>5.05</td>
<td>2.43</td>
<td>1.17</td>
<td>1.09</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>56.23</td>
<td>26.81</td>
<td>12.49</td>
<td>11.76</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>2.62</td>
<td>1.54</td>
<td>0.94</td>
<td>0.88</td>
</tr>
<tr>
<td><strong>Heavy trucks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust HC</td>
<td>3.66</td>
<td>1.22</td>
<td>0.42</td>
<td>0.32</td>
</tr>
<tr>
<td>Nonexhaust HC</td>
<td>2.74</td>
<td>1.62</td>
<td>0.99</td>
<td>0.92</td>
</tr>
<tr>
<td><strong>Total HC</strong></td>
<td>6.40</td>
<td>2.84</td>
<td>1.41</td>
<td>1.24</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>85.61</td>
<td>31.08</td>
<td>12.38</td>
<td>9.66</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>7.19</td>
<td>5.26</td>
<td>2.94</td>
<td>2.58</td>
</tr>
</tbody>
</table>

**Diesel**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust HC</td>
<td>0.68</td>
<td>0.80</td>
<td>0.29</td>
<td>0.23</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>1.49</td>
<td>1.78</td>
<td>1.09</td>
<td>0.99</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>1.83</td>
<td>1.81</td>
<td>0.69</td>
<td>0.53</td>
</tr>
</tbody>
</table>

**Light trucks**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust HC</td>
<td>1.59</td>
<td>1.02</td>
<td>0.55</td>
<td>0.48</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>2.67</td>
<td>1.77</td>
<td>0.93</td>
<td>0.82</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>2.71</td>
<td>1.76</td>
<td>0.94</td>
<td>0.82</td>
</tr>
</tbody>
</table>

**Heavy trucks**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust HC</td>
<td>2.21</td>
<td>0.79</td>
<td>0.45</td>
<td>0.42</td>
</tr>
<tr>
<td>Exhaust CO</td>
<td>10.06</td>
<td>4.10</td>
<td>2.31</td>
<td>2.01</td>
</tr>
<tr>
<td>Exhaust NO\textsubscript{x}</td>
<td>23.34</td>
<td>18.05</td>
<td>8.61</td>
<td>7.77</td>
</tr>
</tbody>
</table>

**Key:** CO = carbon monoxide; HC = hydrocarbon; NO\textsubscript{x} = nitrogen oxides; RFG = reformulated gasoline.

### Table 5-12. Freight Nitrogen Oxides (NO\textsubscript{x}) and Particulate Matter (PM-10) Emissions by Freight Transportation Mode: 2002

<table>
<thead>
<tr>
<th>Mode</th>
<th>Tons (thousands)</th>
<th>Percent</th>
<th>PM-10 Emissions</th>
<th>As a percent of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All mobile sources</td>
<td>All sources</td>
<td></td>
</tr>
<tr>
<td>Heavy-duty vehicles</td>
<td>3,782.0</td>
<td>66.8</td>
<td>33.0</td>
<td>120.0</td>
</tr>
<tr>
<td>Freight railroads</td>
<td>857.2</td>
<td>15.1</td>
<td>7.5</td>
<td>21.3</td>
</tr>
<tr>
<td>Marine vessels</td>
<td>1,011.0</td>
<td>17.9</td>
<td>8.8</td>
<td>44.0</td>
</tr>
<tr>
<td>Air freight</td>
<td>8.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>5,658.4</strong></td>
<td><strong>100.0</strong></td>
<td><strong>49.4</strong></td>
<td><strong>185.6</strong></td>
</tr>
</tbody>
</table>

**Note:** Numbers and percents may not add to totals due to rounding.
Trucks are by far the largest contributor to freight emissions nationally, producing two-thirds of NOx from the freight sector. However, as noted earlier, freight emissions of NOx have declined significantly since the U.S. Environmental Protection Agency required the use of ultra low sulfur diesel fuel in heavy-duty trucks and other diesel-powered highway vehicles beginning in 2006.

Trucks produced two-thirds of PM-10 emissions from the freight sector. Freight emissions of PM-10 are forecast to decline by one-quarter over the next decade, primarily from a reduction in heavy-duty truck emissions. The required use of ULSD fuel in heavy-duty trucks and other diesel-powered highway vehicles will reduce PM emissions and enable the use of advanced pollution control technologies to meet emissions standards.
In addition to CO, NO\textsubscript{X}, and particulate matter emissions, the transportation sector releases large quantities of greenhouse gases (GHGs), such as carbon dioxide (CO\textsubscript{2}), methane, nitrous oxide, and hydrofluorocarbons. These gases trap heat in the atmosphere, affecting the earth’s temperature. Some greenhouse gases occur naturally while others are produced by human activities, such as the burning of fossil fuels.

Table 5-15. U.S. Greenhouse Gas Emissions by Economic End-Use Sector: 1990-2008 (electricity-related emissions distributed among sectors)\textsuperscript{1} (millions of metric tonnes of CO\textsubscript{2} equivalent)

<table>
<thead>
<tr>
<th>Sector</th>
<th>(R)1990</th>
<th>(R)1995</th>
<th>(R)2000</th>
<th>(R)2005</th>
<th>(R)2007</th>
<th>(R)2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry\textsuperscript{2}</td>
<td>2,179.8</td>
<td>2,228.0</td>
<td>2,239.2</td>
<td>2,071.1</td>
<td>2,084.2</td>
<td>2,018.4</td>
</tr>
<tr>
<td>Transportation\textsuperscript{3}</td>
<td>1,548.2</td>
<td>1,698.3</td>
<td>1,935.8</td>
<td>2,020.9</td>
<td>2,008.6</td>
<td>1,890.8</td>
</tr>
<tr>
<td>Commercial</td>
<td>946.8</td>
<td>1,000.2</td>
<td>1,141.5</td>
<td>1,216.5</td>
<td>1,240.1</td>
<td>1,250.6</td>
</tr>
<tr>
<td>Residential</td>
<td>954.0</td>
<td>1,024.5</td>
<td>1,162.4</td>
<td>1,242.2</td>
<td>1,226.9</td>
<td>1,215.6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>464.2</td>
<td>497.1</td>
<td>518.7</td>
<td>523.5</td>
<td>550.5</td>
<td>531.6</td>
</tr>
<tr>
<td>U.S. Territories\textsuperscript{4}</td>
<td>33.7</td>
<td>40.7</td>
<td>46.9</td>
<td>58.9</td>
<td>57.8</td>
<td>49.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,126.8</strong></td>
<td><strong>6,488.8</strong></td>
<td><strong>7,044.5</strong></td>
<td><strong>7,133.2</strong></td>
<td><strong>7,168.1</strong></td>
<td><strong>6,956.8</strong></td>
</tr>
</tbody>
</table>

**Key:** R = revised.

\textsuperscript{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.

\textsuperscript{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.

\textsuperscript{3}Includes emissions from military aircraft (16.3 million of metric tonnes) and “other” transportation, primarily lubricants (9.5 million of metric tonnes). Emissions from international bunker fuels are not included.

\textsuperscript{4}Electricity-related emissions were not distributed to U.S. Territories.

**Notes:** Greenhouse gas (GHG) emissions include CO\textsubscript{2}, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. CO\textsubscript{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\textsubscript{2} by weight. Numbers may not add to totals due to rounding.

When emissions from electricity generation are allocated among end-use sectors (on the basis of each sector’s share of electricity consumption), the industrial sector produces the largest amount of GHG emissions, followed closely by transportation. The transportation sector is responsible for about 27 percent of all greenhouse gases emitted in the United States and nearly 7 percent of all greenhouse gases emitted globally.\textsuperscript{1}

\textsuperscript{1}Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report* (Geneva, Switzerland: 2008)
From 1990 to 2008, transportation GHG emissions rose by 22 percent. However, transportation sector emissions decreased by nearly 6 percent from 2007 to 2008, likely the result of higher fuel prices, which led to a decrease in fuel consumption, and the economic downturn.

CO₂ 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 more than 60 percent of CO₂ emissions in the transportation sector while the combustion of diesel fuel in heavy-duty trucks and jet fuel in aircraft produced much of the rest.

Table 5-16. U.S. Transportation Sector Carbon Dioxide (CO₂) Emissions from Fossil Fuel Combustion by Fuel Type: 1990-2008
(millions of metric tonnes of CO₂ equivalent)

<table>
<thead>
<tr>
<th>Fuel</th>
<th>(R)1990 (millions)</th>
<th>(R)1995 (millions)</th>
<th>(R)2000 (millions)</th>
<th>(R)2005 (millions)</th>
<th>(R)2007 (millions)</th>
<th>(R)2008 (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petroleum</td>
<td>1,449.7</td>
<td>1,569.6</td>
<td>1,773.9</td>
<td>1,862.2</td>
<td>1,858.4</td>
<td>1,749.4</td>
</tr>
<tr>
<td>Motor gasoline</td>
<td>983.6</td>
<td>1,041.7</td>
<td>1,135.7</td>
<td>1,187.3</td>
<td>1,180.4</td>
<td>1,129.4</td>
</tr>
<tr>
<td>Distillate fuel oil</td>
<td>262.9</td>
<td>324.2</td>
<td>402.5</td>
<td>458.1</td>
<td>476.3</td>
<td>441.9</td>
</tr>
<tr>
<td>Jet fuel</td>
<td>176.2</td>
<td>170.9</td>
<td>199.8</td>
<td>193.5</td>
<td>169.3</td>
<td>153.6</td>
</tr>
<tr>
<td>Residual fuel</td>
<td>22.6</td>
<td>29.1</td>
<td>33.3</td>
<td>19.3</td>
<td>29.0</td>
<td>21.4</td>
</tr>
<tr>
<td>Aviation gasoline</td>
<td>3.1</td>
<td>2.7</td>
<td>2.5</td>
<td>2.4</td>
<td>2.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Liquefied petroleum gas</td>
<td>1.3</td>
<td>1.0</td>
<td>0.7</td>
<td>1.6</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>36.0</td>
<td>38.4</td>
<td>35.6</td>
<td>33.1</td>
<td>35.3</td>
<td>35.8</td>
</tr>
<tr>
<td>Transportation Total</td>
<td>1,485.8</td>
<td>1,608.0</td>
<td>1,809.5</td>
<td>1,895.3</td>
<td>1,893.7</td>
<td>1,785.3</td>
</tr>
<tr>
<td>U.S. Total</td>
<td>4,735.7</td>
<td>5,029.5</td>
<td>5,593.4</td>
<td>5,753.3</td>
<td>5,757.0</td>
<td>5,572.8</td>
</tr>
<tr>
<td>% of Total</td>
<td>31.4</td>
<td>32.0</td>
<td>32.4</td>
<td>32.9</td>
<td>32.9</td>
<td>32.0</td>
</tr>
</tbody>
</table>

Key: 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.

Notes: CO₂ 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 CO₂ by weight. Numbers may not add to totals due to rounding. Electricity-related emissions are not included in this table.
Since 1990, the rate of growth of GHG emissions from freight sources has been more than twice as fast as that for passenger travel (47 percent vs. 17 percent). Trucking accounts for the lion’s share of freight emissions followed by freight rail, a distant second.

Table 5-17. U.S. Greenhouse Gas Emissions from Domestic Freight Transportation: 1990-2008
(millions of metric tonnes of CO₂ equivalent)

<table>
<thead>
<tr>
<th>Mode</th>
<th>(R)1990</th>
<th>(R)1995</th>
<th>(R)2000</th>
<th>(R)2005</th>
<th>(R)2007</th>
<th>(R)2008</th>
<th>Percent change, 1990 to 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucking</td>
<td>231.1</td>
<td>277.7</td>
<td>354.5</td>
<td>408.3</td>
<td>425.2</td>
<td>401.2</td>
<td>73.6</td>
</tr>
<tr>
<td>Freight Rail</td>
<td>34.5</td>
<td>39.1</td>
<td>42.8</td>
<td>46.7</td>
<td>47.8</td>
<td>44.4</td>
<td>28.7</td>
</tr>
<tr>
<td>Ships and Other Boats¹</td>
<td>30.6</td>
<td>42.2</td>
<td>48.3</td>
<td>27.9</td>
<td>37.9</td>
<td>24.1</td>
<td>-21.2</td>
</tr>
<tr>
<td>Pipelines²</td>
<td>36.1</td>
<td>38.3</td>
<td>35.2</td>
<td>32.3</td>
<td>34.4</td>
<td>34.9</td>
<td>-3.3</td>
</tr>
<tr>
<td>Commercial Aircraft</td>
<td>23.7</td>
<td>24.8</td>
<td>29.6</td>
<td>26.0</td>
<td>20.3</td>
<td>18.0</td>
<td>-24.1</td>
</tr>
<tr>
<td>Freight Total</td>
<td>356.0</td>
<td>422.1</td>
<td>510.5</td>
<td>541.2</td>
<td>565.5</td>
<td>522.6</td>
<td>47.0</td>
</tr>
<tr>
<td>Passenger Total</td>
<td>1,145.6</td>
<td>1,240.8</td>
<td>1,391.8</td>
<td>1,451.1</td>
<td>1,416.5</td>
<td>1,342.2</td>
<td>17.0</td>
</tr>
<tr>
<td>Transportation Total²</td>
<td>1,548.2</td>
<td>1,698.3</td>
<td>1,935.8</td>
<td>2,020.9</td>
<td>2,008.6</td>
<td>1,890.8</td>
<td>22.1</td>
</tr>
<tr>
<td>Freight as % of Total</td>
<td>23.0</td>
<td>24.9</td>
<td>26.4</td>
<td>26.8</td>
<td>28.2</td>
<td>27.6</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Key: CO₂ = carbon dioxide; R = revised.
¹Fluctuations in emissions estimates reflect data collection problems.
²Includes only CO₂ emissions from natural gas used to power pipelines.
²Includes greenhouse gas emissions from military aircraft (16.3 million metric tonnes); “other” transportation, primarily lubricants (8.5 million metric tonnes); 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. CO₂ 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 CO₂ by weight. Numbers may not add to totals due to rounding.
Between 1990 and 2008, medium- and heavy-duty truck emissions rose by more than 70 percent, the largest percentage increase of any major transportation mode. An increase in truck freight movement is largely responsible for the rise in emissions.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide (CO₂)(R)</td>
<td>230.1</td>
<td>274.8</td>
<td>345.8</td>
<td>396.0</td>
<td>412.5</td>
<td>388.6</td>
</tr>
<tr>
<td>Methane</td>
<td>0.2</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>0.8</td>
<td>1.0</td>
<td>1.2</td>
<td>(R)1</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Hydrofluorocarbons(R)</td>
<td>&lt;0.05</td>
<td>1.7</td>
<td>7.4</td>
<td>11.1</td>
<td>11.5</td>
<td>11.6</td>
</tr>
<tr>
<td>Total Truck (R)</td>
<td>231.1</td>
<td>277.7</td>
<td>354.5</td>
<td>408.3</td>
<td>425.2</td>
<td>401.2</td>
</tr>
<tr>
<td>Total U.S. Transportation(R)</td>
<td>1,548.2</td>
<td>1,698.3</td>
<td>1,935.8</td>
<td>2,020.9</td>
<td>2,008.6</td>
<td>1,890.8</td>
</tr>
<tr>
<td>Total U.S. (R)</td>
<td>6,126.8</td>
<td>6,488.8</td>
<td>7,044.5</td>
<td>7,133.2</td>
<td>7,168.1</td>
<td>6,956.8</td>
</tr>
<tr>
<td>Truck share of transportation total (percent)(R)</td>
<td>14.9</td>
<td>16.4</td>
<td>18.3</td>
<td>20.2</td>
<td>21.2</td>
<td>21.2</td>
</tr>
<tr>
<td>Truck share of U.S. total (percent)(R)</td>
<td>3.8</td>
<td>4.3</td>
<td>5.0</td>
<td>5.7</td>
<td>5.9</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Key: CO₂ = carbon dioxide; R = revised.

Transportation and U.S. totals include greenhouse gas emissions from military aircraft (16.3 million metric tonnes in 2008); “other” transportation, primarily lubricants (9.5 million metric tonnes in 2008); and electricity-related emissions. Emissions from international bunker fuels are not included.

Notes: CO₂ 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 CO₂ by weight. Medium- and heavy-duty trucks weigh 8,501 pounds and above. Numbers may not add to totals due to rounding.

### Table 2-1M. Weight of Shipments by Transportation Mode: 2007, 2009, and 2040 (millions of metric tonnes)

<table>
<thead>
<tr>
<th>Mode</th>
<th>2007</th>
<th>2009</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Domestic</td>
<td>Exports(^1)</td>
</tr>
<tr>
<td>Total</td>
<td>16,856</td>
<td>15,038</td>
<td>595</td>
</tr>
<tr>
<td>Truck</td>
<td>11,581</td>
<td>11,413</td>
<td>86</td>
</tr>
<tr>
<td>Rail</td>
<td>1,718</td>
<td>1,583</td>
<td>56</td>
</tr>
<tr>
<td>Water</td>
<td>720</td>
<td>326</td>
<td>47</td>
</tr>
<tr>
<td>Air, air &amp; truck</td>
<td>12</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Multiple modes &amp; mail(^2)</td>
<td>1,389</td>
<td>471</td>
<td>371</td>
</tr>
<tr>
<td>Pipeline</td>
<td>1,152</td>
<td>998</td>
<td>4</td>
</tr>
<tr>
<td>Other &amp; unknown</td>
<td>284</td>
<td>244</td>
<td>27</td>
</tr>
</tbody>
</table>

\(^1\)In this table, multiple modes & mail includes export and import shipments that move domestically by a different mode than the mode used between the port and foreign location.

\(^2\)Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode.

Notes: 1 metric tonne = 1.1023 short tons. Numbers may not add to totals due to rounding. The 2009 data are provisional estimates, which are based on selected modal and economic trend data.

### Table 2-3M. Top Commodities: 2007

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Millions of Metric Tonnes</th>
<th>Billions of Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total, all commodities</td>
<td>17,534</td>
<td>16,536</td>
</tr>
<tr>
<td>Gravel</td>
<td>2,053</td>
<td>1,762</td>
</tr>
<tr>
<td>Cereal grains</td>
<td>1,338</td>
<td>1,432</td>
</tr>
<tr>
<td>Coal</td>
<td>1,310</td>
<td>1,269</td>
</tr>
<tr>
<td>Non-metal mineral products</td>
<td>1,263</td>
<td>1,058</td>
</tr>
<tr>
<td>Waste/scrap</td>
<td>1,200</td>
<td>880</td>
</tr>
<tr>
<td>Natural gas &amp; related(^3)</td>
<td>1,158</td>
<td>696</td>
</tr>
<tr>
<td>Gasoline</td>
<td>912</td>
<td>691</td>
</tr>
<tr>
<td>Fuel oils</td>
<td>675</td>
<td>689</td>
</tr>
<tr>
<td>Natural sands</td>
<td>517</td>
<td>579</td>
</tr>
<tr>
<td>Crude petroleum</td>
<td>507</td>
<td>573</td>
</tr>
</tbody>
</table>

\(^3\)Natural gas, selected coal products, and products of petroleum refining, excluding gasoline, aviation fuel, and fuel oil.

Note: 1 metric tonne = 1.1023 short tons.
### Table 2-4M. Hazardous Materials Shipments by Transportation Mode: 2007

<table>
<thead>
<tr>
<th>Transportation mode</th>
<th>Value</th>
<th>Metric Tonnes</th>
<th>Tonne kilometers</th>
<th>Average distance per shipment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ Billion</td>
<td>Percent</td>
<td>Millions</td>
<td>Percent</td>
</tr>
<tr>
<td>All modes, total</td>
<td>1,448</td>
<td>100.0</td>
<td>2,024</td>
<td>100.0</td>
</tr>
<tr>
<td>Single modes, total</td>
<td>1,371</td>
<td>94.6</td>
<td>1,916</td>
<td>94.6</td>
</tr>
<tr>
<td>Truck(^1)</td>
<td>837</td>
<td>57.8</td>
<td>1,091</td>
<td>53.9</td>
</tr>
<tr>
<td>For-hire</td>
<td>359</td>
<td>24.8</td>
<td>449</td>
<td>22.2</td>
</tr>
<tr>
<td>Private(^2)</td>
<td>478</td>
<td>33.0</td>
<td>642</td>
<td>31.7</td>
</tr>
<tr>
<td>Rail</td>
<td>69</td>
<td>4.8</td>
<td>118</td>
<td>5.8</td>
</tr>
<tr>
<td>Water</td>
<td>69</td>
<td>4.8</td>
<td>136</td>
<td>6.7</td>
</tr>
<tr>
<td>Air</td>
<td>2</td>
<td>0.1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Pipeline(^3)</td>
<td>393</td>
<td>27.2</td>
<td>571</td>
<td>28.2</td>
</tr>
<tr>
<td>Multiple modes, total</td>
<td>71</td>
<td>4.9</td>
<td>101</td>
<td>5.0</td>
</tr>
<tr>
<td>Parcel, U.S. Postal Service, or Courier</td>
<td>8</td>
<td>0.5</td>
<td>$1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Other multiple modes</td>
<td>28</td>
<td>1.9</td>
<td>51</td>
<td>2.5</td>
</tr>
<tr>
<td>Unknown and other modes, total</td>
<td>7</td>
<td>0.5</td>
<td>8</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Key:** S = data are not published because of high sampling variability or other reasons.

\(^1\) Truck as a single mode includes shipments that went by private truck only, for-hire truck only, or a combination of both.

\(^2\) Private truck refers to a truck operated by a temporary or permanent employee of an establishment or the buyer/receiver of the shipment.

\(^3\) Excludes crude oil shipments.

**Notes:** 1 metric tonne = 1.1023 short tons; 1 tonne kilometer = .6849 ton miles. Numbers and percents may not add to totals due to rounding.

### Table 2-5M. Hazardous Materials Shipments by Hazard Class: 2007

<table>
<thead>
<tr>
<th>Hazard class</th>
<th>Description</th>
<th>Value</th>
<th>Metric tonnes</th>
<th>Tonne kilometers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$ Billions</td>
<td>Percent</td>
<td>Millions</td>
</tr>
<tr>
<td>Class 1</td>
<td>Explosives</td>
<td>12</td>
<td>0.8</td>
<td>3</td>
</tr>
<tr>
<td>Class 2</td>
<td>Gases</td>
<td>132</td>
<td>9.1</td>
<td>206</td>
</tr>
<tr>
<td>Class 3</td>
<td>Flammable liquids</td>
<td>1,170</td>
<td>80.8</td>
<td>1,443</td>
</tr>
<tr>
<td>Class 4</td>
<td>Flammable solids</td>
<td>4</td>
<td>0.3</td>
<td>17</td>
</tr>
<tr>
<td>Class 5</td>
<td>Oxidizers and organic peroxides</td>
<td>7</td>
<td>0.5</td>
<td>12</td>
</tr>
<tr>
<td>Class 6</td>
<td>Toxic (poison)</td>
<td>21</td>
<td>1.5</td>
<td>9</td>
</tr>
<tr>
<td>Class 7</td>
<td>Radioactive materials</td>
<td>21</td>
<td>1.4</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Class 8</td>
<td>Corrosive materials</td>
<td>51</td>
<td>3.6</td>
<td>94</td>
</tr>
<tr>
<td>Class 9</td>
<td>Miscellaneous dangerous goods</td>
<td>30</td>
<td>2.1</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,448</td>
<td>100.0</td>
<td>1,836</td>
</tr>
</tbody>
</table>

**Notes:** 1 metric tonne = 1.1023 short tons; 1 tonne kilometer = .6849 ton miles. Numbers and percents may not add to totals due to rounding.
### Table 2-6M. Domestic Mode of Exports and Imports by Tonnage and Value: 2007 and 2040

<table>
<thead>
<tr>
<th>Mode</th>
<th>2007</th>
<th>2040</th>
<th>2007</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1,819</td>
<td>3,930</td>
<td>3,198</td>
<td>9,850</td>
</tr>
<tr>
<td>Truck&lt;sup&gt;1&lt;/sup&gt;</td>
<td>692</td>
<td>1,734</td>
<td>1,343</td>
<td>3,880</td>
</tr>
<tr>
<td>Rail</td>
<td>235</td>
<td>493</td>
<td>197</td>
<td>419</td>
</tr>
<tr>
<td>Water</td>
<td>124</td>
<td>213</td>
<td>52</td>
<td>92</td>
</tr>
<tr>
<td>Air, air &amp; truck&lt;sup&gt;2&lt;/sup&gt;</td>
<td>9</td>
<td>32</td>
<td>927</td>
<td>3,606</td>
</tr>
<tr>
<td>Multiple modes &amp; mail&lt;sup&gt;3&lt;/sup&gt;</td>
<td>138</td>
<td>387</td>
<td>287</td>
<td>929</td>
</tr>
<tr>
<td>Pipeline</td>
<td>312</td>
<td>592</td>
<td>147</td>
<td>274</td>
</tr>
<tr>
<td>Other &amp; unknown</td>
<td>37</td>
<td>93</td>
<td>112</td>
<td>457</td>
</tr>
<tr>
<td>No domestic mode&lt;sup&gt;4&lt;/sup&gt;</td>
<td>270</td>
<td>387</td>
<td>134</td>
<td>193</td>
</tr>
</tbody>
</table>

<sup>1</sup>Excludes truck moves to and from airports.
<sup>2</sup>Includes truck moves to and from airports.
<sup>3</sup>Multiple modes & mail include U.S. Postal Service, courier shipments, and all intermodal combinations, except air and truck. In this table, oceangoing export and import shipments that move between ports and domestic locations by single modes are classified by the domestic mode rather than multiple modes & mail.
<sup>4</sup>No domestic mode includes waterborne import shipments of crude petroleum off-loaded directly at the domestic destination (refineries) with no domestic mode of transportation.

Notes: 1 metric tonne = 1.1023 short tons. Numbers may not add to totals due to rounding.

### Table 2-8M. Value and Tonnage of U.S. Merchandise Trade with Canada and Mexico by Transportation Mode: 1998-2009

<table>
<thead>
<tr>
<th>Mode</th>
<th>1999</th>
<th>2004</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>559</td>
<td>712</td>
<td>964</td>
<td>735</td>
</tr>
<tr>
<td>Truck&lt;sup&gt;1&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
<td>165</td>
<td>141</td>
</tr>
<tr>
<td>Rail&lt;sup&gt;1&lt;/sup&gt;</td>
<td>78</td>
<td>NA</td>
<td>140</td>
<td>96</td>
</tr>
<tr>
<td>Air</td>
<td>34</td>
<td>&lt;1</td>
<td>41</td>
<td>39</td>
</tr>
<tr>
<td>Water</td>
<td>23</td>
<td>166</td>
<td>93</td>
<td>59</td>
</tr>
<tr>
<td>Pipeline&lt;sup&gt;1&lt;/sup&gt;</td>
<td>12</td>
<td>NA</td>
<td>88</td>
<td>49</td>
</tr>
<tr>
<td>Other&lt;sup&gt;1&lt;/sup&gt;</td>
<td>25</td>
<td>NA</td>
<td>47</td>
<td>37</td>
</tr>
</tbody>
</table>

<sup>1</sup>The U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated the weight of exports for truck, rail, pipeline, and other modes using weight-to-value ratios derived from imported commodities that vary by country, mode, and commodity.

Notes: 1 metric tonne = 1.1023 short tons. Mode “Other” includes shipments transported by mail, other and unknown modes, and shipments through Foreign Trade Zones. Totals for the most recent year differ slightly from the Freight Analysis Framework due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.
Table 3-1M. Kilometers of Infrastructure by Transportation Mode: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Public roads, route kilometers</td>
<td>6,211,518</td>
<td>6,222,926</td>
<td>6,358,386</td>
<td>6,532,576</td>
<td>5.2</td>
</tr>
<tr>
<td>National Highway System (NHS)</td>
<td>N</td>
<td>N</td>
<td>417,439</td>
<td>264,075</td>
<td>N</td>
</tr>
<tr>
<td>Interstates</td>
<td>66,173</td>
<td>72,536</td>
<td>75,109</td>
<td>75,657</td>
<td>14.3</td>
</tr>
<tr>
<td>Other NHS</td>
<td>N</td>
<td>N</td>
<td>184,287</td>
<td>188,418</td>
<td>N</td>
</tr>
<tr>
<td>Other</td>
<td>N</td>
<td>N</td>
<td>6,098,989</td>
<td>6,268,500</td>
<td>N</td>
</tr>
<tr>
<td>Strategic Highway Corridor Network (STRAHNET)</td>
<td>N</td>
<td>N</td>
<td>99,881</td>
<td>100,182</td>
<td>N</td>
</tr>
<tr>
<td>Interstate</td>
<td>N</td>
<td>N</td>
<td>75,113</td>
<td>75,657</td>
<td>N</td>
</tr>
<tr>
<td>Non-Interstate</td>
<td>N</td>
<td>N</td>
<td>24,765</td>
<td>24,525</td>
<td>N</td>
</tr>
<tr>
<td>Railroad</td>
<td>1,294,620</td>
<td>283,085</td>
<td>274,400</td>
<td>224,213</td>
<td>-23.9</td>
</tr>
<tr>
<td>Class I</td>
<td>NA</td>
<td>214,337</td>
<td>194,073</td>
<td>151,403</td>
<td>N</td>
</tr>
<tr>
<td>Regional</td>
<td>NA</td>
<td>29,570</td>
<td>33,759</td>
<td>26,859</td>
<td>N</td>
</tr>
<tr>
<td>Local</td>
<td>NA</td>
<td>39,165</td>
<td>46,567</td>
<td>45,951</td>
<td>N</td>
</tr>
<tr>
<td>Inland waterways</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Navigable channels</td>
<td>17,702</td>
<td>17,702</td>
<td>17,702</td>
<td>17,702</td>
<td>0.0</td>
</tr>
<tr>
<td>Great Lakes-St. Lawrence Seaway</td>
<td>3,769</td>
<td>3,769</td>
<td>3,769</td>
<td>3,769</td>
<td>0.0</td>
</tr>
<tr>
<td>Pipelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil</td>
<td>351,453</td>
<td>335,938</td>
<td>284,834</td>
<td>278,404</td>
<td>-20.8</td>
</tr>
<tr>
<td>Gas</td>
<td>1,692,588</td>
<td>1,913,743</td>
<td>2,203,573</td>
<td>2,454,136</td>
<td>45.0</td>
</tr>
</tbody>
</table>

Key: N = not applicable; NA = not available.
Excludes Class III railroads.

Note: 1 kilometer = .6214 miles.

Table 3-1M. Kilometers of Infrastructure by Transportation Mode: 1980-2008

### Table 3-3M. Trucks and Truck Kilometers by Average Weight: 1987-2002

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3,624</td>
<td>4,008</td>
<td>4,701</td>
<td>5,415</td>
<td>49% to 62%</td>
</tr>
<tr>
<td>Light-heavy</td>
<td>1,030</td>
<td>1,259</td>
<td>1,436</td>
<td>1,914</td>
<td>91% to 144%</td>
</tr>
<tr>
<td>4,536 to 6,350</td>
<td>525</td>
<td>694</td>
<td>819</td>
<td>1,142</td>
<td>178% to 243%</td>
</tr>
<tr>
<td>6,351 to 7,257</td>
<td>242</td>
<td>282</td>
<td>316</td>
<td>396</td>
<td>116% to 96%</td>
</tr>
<tr>
<td>7,258 to 8,845</td>
<td>263</td>
<td>282</td>
<td>301</td>
<td>376</td>
<td>49% to 96%</td>
</tr>
<tr>
<td>Medium-heavy</td>
<td>766</td>
<td>732</td>
<td>729</td>
<td>910</td>
<td>55% to 183%</td>
</tr>
<tr>
<td>8,846 to 11,793</td>
<td>766</td>
<td>732</td>
<td>729</td>
<td>910</td>
<td>55% to 183%</td>
</tr>
<tr>
<td>Heavy-heavy</td>
<td>1,829</td>
<td>2,017</td>
<td>2,536</td>
<td>2,591</td>
<td>50% to 173%</td>
</tr>
<tr>
<td>11,794 to 14,969</td>
<td>377</td>
<td>387</td>
<td>428</td>
<td>437</td>
<td>16% to 90%</td>
</tr>
<tr>
<td>14,969 to 18,144</td>
<td>209</td>
<td>233</td>
<td>257</td>
<td>229</td>
<td>10% to 8%</td>
</tr>
<tr>
<td>18,144 to 22,680</td>
<td>292</td>
<td>339</td>
<td>400</td>
<td>318</td>
<td>9% to 10%</td>
</tr>
<tr>
<td>22,680 to 27,216</td>
<td>188</td>
<td>227</td>
<td>311</td>
<td>327</td>
<td>25% to 14%</td>
</tr>
<tr>
<td>27,216 to 36,287</td>
<td>723</td>
<td>781</td>
<td>1,070</td>
<td>1,179</td>
<td>63% to 124%</td>
</tr>
<tr>
<td>36,288 to 45,359</td>
<td>28</td>
<td>33</td>
<td>46</td>
<td>69</td>
<td>135% to 474%</td>
</tr>
<tr>
<td>45,360 to 58,967</td>
<td>8</td>
<td>12</td>
<td>18</td>
<td>26</td>
<td>257% to 2,528</td>
</tr>
<tr>
<td>58,967 or more</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>78% to 530%</td>
</tr>
</tbody>
</table>

Key: VKT = vehicle kilometers traveled.

1Excludes trucks with an average weight of 4,536 kilograms (10,000 pounds) or less.

Notes: 1 kilometer = .6214 miles; 1 kilogram = 2.2046 pounds. Weight includes the empty weight of the vehicle plus the average weight of the load carried. Numbers may not add to totals due to rounding.
### Table 3-6M. Trucks, Truck Kilometers, and Average Distance by Range of Operations and Jurisdictions: 2002

<table>
<thead>
<tr>
<th>Range of Operations</th>
<th>Number of Trucks (thousands)</th>
<th>Truck Kilometers (millions)</th>
<th>Kilometers per Truck (thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5,521</td>
<td>233,622</td>
<td>42</td>
</tr>
<tr>
<td>Off the road</td>
<td>183</td>
<td>3,641</td>
<td>20</td>
</tr>
<tr>
<td>50 miles or less</td>
<td>2,942</td>
<td>68,444</td>
<td>23</td>
</tr>
<tr>
<td>51 to 100 miles</td>
<td>685</td>
<td>30,836</td>
<td>45</td>
</tr>
<tr>
<td>101 to 200 miles</td>
<td>244</td>
<td>18,957</td>
<td>78</td>
</tr>
<tr>
<td>201 to 500 miles</td>
<td>232</td>
<td>28,194</td>
<td>122</td>
</tr>
<tr>
<td>501 miles or more</td>
<td>293</td>
<td>42,978</td>
<td>147</td>
</tr>
<tr>
<td>Not reported</td>
<td>716</td>
<td>40,330</td>
<td>56</td>
</tr>
<tr>
<td>Not applicable</td>
<td>226</td>
<td>241</td>
<td>1</td>
</tr>
<tr>
<td>Operated in Canada</td>
<td>2</td>
<td>116</td>
<td>69</td>
</tr>
<tr>
<td>Operated in Mexico</td>
<td>2</td>
<td>47</td>
<td>30</td>
</tr>
<tr>
<td>Operated within the home base state</td>
<td>4,196</td>
<td>136,746</td>
<td>33</td>
</tr>
<tr>
<td>Operated in states other than the home base state</td>
<td>496</td>
<td>65,821</td>
<td>133</td>
</tr>
<tr>
<td>Not reported</td>
<td>599</td>
<td>30,650</td>
<td>51</td>
</tr>
<tr>
<td>Not applicable</td>
<td>226</td>
<td>241</td>
<td>1</td>
</tr>
</tbody>
</table>

**Notes:** 1 kilometer = 0.6214 miles. Includes trucks registered to companies and vehicles in the United States except pick-ups, minivans, other light cars, and sport utility vehicles. Numbers may not add to totals due to rounding.
Table 3-7M. Truck Kilometers by Products Carried: 2002

<table>
<thead>
<tr>
<th>Products carried</th>
<th>Millions of kilometers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td><strong>233,622</strong></td>
</tr>
<tr>
<td>Animals and fish, live</td>
<td>1,182</td>
</tr>
<tr>
<td>Animal feed and products of animal origin</td>
<td>3,360</td>
</tr>
<tr>
<td>Grains, cereal</td>
<td>2,201</td>
</tr>
<tr>
<td>All other agricultural products</td>
<td>4,282</td>
</tr>
<tr>
<td>Basic chemicals</td>
<td>1,410</td>
</tr>
<tr>
<td>Fertilizers and fertilizer materials</td>
<td>2,681</td>
</tr>
<tr>
<td>Pharmaceutical products</td>
<td>491</td>
</tr>
<tr>
<td>All other chemical products and preparations</td>
<td>2,174</td>
</tr>
<tr>
<td>Alcoholic beverages</td>
<td>1,808</td>
</tr>
<tr>
<td>Bakery and milled grain products</td>
<td>5,717</td>
</tr>
<tr>
<td>Meat, seafood, and their preparations</td>
<td>4,918</td>
</tr>
<tr>
<td>Tobacco products</td>
<td>717</td>
</tr>
<tr>
<td>All other prepared foodstuffs</td>
<td>11,953</td>
</tr>
<tr>
<td>Logs and other wood in the rough</td>
<td>1,849</td>
</tr>
<tr>
<td>Paper or paperboard articles</td>
<td>5,052</td>
</tr>
<tr>
<td>Printed products</td>
<td>1,231</td>
</tr>
<tr>
<td>Pulp, newsprint, paper, paperboard</td>
<td>3,115</td>
</tr>
<tr>
<td>Wood products</td>
<td>5,730</td>
</tr>
<tr>
<td>Articles of base metal</td>
<td>5,301</td>
</tr>
<tr>
<td>Base metal in primary or semifinished forms</td>
<td>4,637</td>
</tr>
<tr>
<td>Nondurable mineral products</td>
<td>4,906</td>
</tr>
<tr>
<td>Tools, nonpowered</td>
<td>12,487</td>
</tr>
<tr>
<td>Tools, powered</td>
<td>10,424</td>
</tr>
<tr>
<td>Electronic and other electrical equipment</td>
<td>4,866</td>
</tr>
<tr>
<td>Furniture, mattresses, lamps, etc.</td>
<td>3,288</td>
</tr>
<tr>
<td>Machinery</td>
<td>5,190</td>
</tr>
<tr>
<td>Miscellaneous manufactured products</td>
<td>6,449</td>
</tr>
<tr>
<td>Precision instruments and apparatus</td>
<td>1,181</td>
</tr>
<tr>
<td>Textile, leather, and related articles</td>
<td>2,475</td>
</tr>
<tr>
<td>Vehicles, including parts</td>
<td>6,186</td>
</tr>
<tr>
<td>All other transportation equipment</td>
<td>1,024</td>
</tr>
<tr>
<td>Coal</td>
<td>484</td>
</tr>
<tr>
<td>Crude petroleum</td>
<td>212</td>
</tr>
<tr>
<td>Gravel or rushed stone</td>
<td>4,490</td>
</tr>
<tr>
<td>Metallic ores and concentrates</td>
<td>73</td>
</tr>
<tr>
<td>Monumental or building stone</td>
<td>744</td>
</tr>
<tr>
<td>Natural sands</td>
<td>1,753</td>
</tr>
<tr>
<td>All other nonmetallic minerals</td>
<td>802</td>
</tr>
<tr>
<td>Fuel oils</td>
<td>1,983</td>
</tr>
<tr>
<td>Gasoline and aviation turbine fuel</td>
<td>1,365</td>
</tr>
<tr>
<td>Plastic and rubber</td>
<td>3,850</td>
</tr>
<tr>
<td>All other coal and refined petroleum products</td>
<td>1,886</td>
</tr>
<tr>
<td>Hazardous waste (EPA manifest)</td>
<td>306</td>
</tr>
<tr>
<td>All other waste and scrape (non-EPA manifest)</td>
<td>4,260</td>
</tr>
<tr>
<td>Recyclable products</td>
<td>1,484</td>
</tr>
<tr>
<td>Mail and courier parcels</td>
<td>7,660</td>
</tr>
<tr>
<td>Empty shipping containers</td>
<td>1,278</td>
</tr>
<tr>
<td>Passengers</td>
<td>440</td>
</tr>
<tr>
<td>Mixed freight</td>
<td>23,590</td>
</tr>
<tr>
<td>Products, equipment, or materials not elsewhere classified</td>
<td>426</td>
</tr>
<tr>
<td>Products not specified</td>
<td>10,232</td>
</tr>
<tr>
<td>Not applicable</td>
<td>241</td>
</tr>
<tr>
<td>No product carried</td>
<td>46,632</td>
</tr>
</tbody>
</table>

1Excludes pickups, panels, minivans, sport utilities, and station wagons.
2Detail lines may not add to total because multiple products/hazardous materials may be carried at the same time.
3Vehicles not in use. When the respondent had partial-year ownership of the vehicle, annual miles were adjusted to reflect miles traveled when not owned by the respondent.

Note: 1 kilometer = 0.6214 miles.
<table>
<thead>
<tr>
<th>Airport</th>
<th>Rank</th>
<th>2008 Landed weight (thousands of metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memphis, TN (Memphis International)</td>
<td>1</td>
<td>5,732, 8,476, 8,550, 8,865, 8,845</td>
</tr>
<tr>
<td>Anchorage, AK (Ted Stevens Anchorage International)</td>
<td>2</td>
<td>7,333, 9,402, 9,605, 9,582, 8,143</td>
</tr>
<tr>
<td>Louisville, KY (Louisville International-Standiford Field)</td>
<td>3</td>
<td>3,617, 4,165, 4,550, 4,732, 4,738</td>
</tr>
<tr>
<td>Miami, FL (Miami International)</td>
<td>4</td>
<td>2,657, 3,221, 3,258, 3,370, 3,170</td>
</tr>
<tr>
<td>Los Angeles, CA (Los Angeles International)</td>
<td>5</td>
<td>2,624, 2,655, 3,290, 3,112, 2,609</td>
</tr>
<tr>
<td>Indianapolis, IN (Indianapolis International)</td>
<td>6</td>
<td>2,616, 2,309, 2,383, 2,406, 2,326</td>
</tr>
<tr>
<td>New York, NY (John F. Kennedy International)</td>
<td>7</td>
<td>2,534, 2,550, 2,372, 2,320, 2,016</td>
</tr>
<tr>
<td>Chicago, IL (O’Hare International)</td>
<td>8</td>
<td>1,870, 2,188, 2,003, 1,996, 1,908</td>
</tr>
<tr>
<td>Oakland, CA (Metropolitan Oakland International)</td>
<td>9</td>
<td>1,643, 1,631, 1,631, 1,643, 1,580</td>
</tr>
<tr>
<td>Newark, NJ (Newark Liberty International)</td>
<td>10</td>
<td>1,779, 1,697, 1,694, 1,700, 1,566</td>
</tr>
<tr>
<td>Fort Worth, TX (Dallas/Fort Worth International)</td>
<td>11</td>
<td>1,534, 1,502, 1,562, 1,591, 1,464</td>
</tr>
<tr>
<td>Ontario, CA (Ontario International)</td>
<td>12</td>
<td>1,107, 1,219, 1,271, 1,265, 1,225</td>
</tr>
<tr>
<td>Philadelphia, PA (Philadelphia International)</td>
<td>13</td>
<td>1,319, 1,271, 1,239, 1,248, 1,146</td>
</tr>
<tr>
<td>Atlanta, GA (William B. Hartfield International)</td>
<td>14</td>
<td>989, 920, 1,070, 1,144, 1,059</td>
</tr>
<tr>
<td>Honolulu, HI (Honolulu International)</td>
<td>15</td>
<td>628, 751, 888, 1,028, 936</td>
</tr>
<tr>
<td>San Francisco, CA (San Francisco International)</td>
<td>16</td>
<td>1,149, 723, 752, 943, 703</td>
</tr>
<tr>
<td>Houston, TX (George Bush Intercontinental)</td>
<td>17</td>
<td>435, 644, 631, 698, 684</td>
</tr>
<tr>
<td>Seattle, WA (Seattle-Tacoma International)</td>
<td>18</td>
<td>961, 643, 643, 627, 677</td>
</tr>
<tr>
<td>Chicago/Rockford, IL (Chicago/Rockford International)</td>
<td>19</td>
<td>593, 632, 631, 669, 644</td>
</tr>
<tr>
<td>Phoenix, AZ (Sky Harbor International)</td>
<td>20</td>
<td>835, 706, 659, 645, 612</td>
</tr>
<tr>
<td>Portland, OR (Portland International)</td>
<td>21</td>
<td>800, 677, 662, 647, 595</td>
</tr>
<tr>
<td>Denver, CO (Denver International)</td>
<td>22</td>
<td>817, 692, 645, 583, 567</td>
</tr>
<tr>
<td>Minneapolis, MN (Minneapolis-St Paul International/Wold-Chamberlain)</td>
<td>23</td>
<td>564, 637, 562, 555, 510</td>
</tr>
<tr>
<td>Salt Lake City, UT (Salt Lake City International)</td>
<td>24</td>
<td>681, 535, 497, 486, 473</td>
</tr>
<tr>
<td>Boston, MA (General Edward Lawrence Logan International)</td>
<td>25</td>
<td>638, 521, 499, 481, 446</td>
</tr>
</tbody>
</table>

**Top 25 airports**

<table>
<thead>
<tr>
<th>2008 Landed weight (thousands of metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>47,520, 50,762, 51,686, 52,359, 48,645</td>
</tr>
</tbody>
</table>

**United States, all airports**

<table>
<thead>
<tr>
<th>2008 Landed weight (thousands of metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>67,807, 69,029, 69,275, 69,476, 64,666</td>
</tr>
</tbody>
</table>

**Top 25 as % of U.S. total**

<table>
<thead>
<tr>
<th>2008 Landed weight (thousands of metric tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70.1, 73.5, 74.6, 75.4, 75.2</td>
</tr>
</tbody>
</table>

1. Dedicated to the exclusive transportation of cargo, all-cargo operations do not include aircraft carrying passengers that also may be carrying cargo. Aircraft landed weight is the certificated maximum gross landed weight of the aircraft as specified by the aircraft manufacturers.

2. Anchorage includes a large proportion of all-cargo operations in-transit.

3. Airport rankings change each year. Totals represent the top 25 airports for each year, not necessarily the top 25 airports listed here for 2008.

4. Limited to airports with an aggregate landed weight in excess of 100 million pounds (50,000 short tons) annually.

Note: 1 metric tonne = 1.1023 short tons.
### Table 5-7M. Fuel Consumption by Transportation Mode: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasoline, diesel and other fuels (million liters)</td>
<td>435,125</td>
<td>494,909</td>
<td>615,273</td>
<td>(R) 666,880</td>
<td>646,349</td>
</tr>
<tr>
<td>Truck, total</td>
<td>75,549</td>
<td>92,695</td>
<td>133,342</td>
<td>(R) 146,061</td>
<td>138,922</td>
</tr>
<tr>
<td>Single-unit 2-axle 6-tire or more truck</td>
<td>26,204</td>
<td>31,631</td>
<td>36,196</td>
<td>(R) 38,016</td>
<td>37,429</td>
</tr>
<tr>
<td>Combination truck</td>
<td>49,345</td>
<td>61,064</td>
<td>97,146</td>
<td>(R) 108,045</td>
<td>101,493</td>
</tr>
<tr>
<td>Truck (percent of total)</td>
<td>17.4</td>
<td>18.7</td>
<td>21.7</td>
<td>21.9</td>
<td>21.5</td>
</tr>
<tr>
<td><strong>Rail, Class I (in freight service)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distillate / diesel fuel (million liters)</td>
<td>14,777</td>
<td>11,790</td>
<td>14,005</td>
<td>15,375</td>
<td>14,709</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distillate / diesel fuel oil (million liters)</td>
<td>33,883</td>
<td>23,944</td>
<td>24,262</td>
<td>23,948</td>
<td>19,174</td>
</tr>
<tr>
<td>Gasoline (million liters)</td>
<td>5,594</td>
<td>7,816</td>
<td>8,558</td>
<td>7,282</td>
<td>4,495</td>
</tr>
<tr>
<td><strong>Pipeline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural gas (million cubic meters)</td>
<td>17,970</td>
<td>18,684</td>
<td>18,185</td>
<td>(R) 17,595</td>
<td>18,348</td>
</tr>
</tbody>
</table>

**Key:** R = revised.

**Notes:** 1 liter = 0.2642 gallons; 1 cubic meter = 35.3147 cubic feet.

### Table 5-8M. Single-Unit Truck Fuel Consumption and Travel: 1980-2008

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number registered (thousands)</strong></td>
<td>4,374</td>
<td>4,487</td>
<td>5,926</td>
<td>6,807</td>
<td>6,791</td>
</tr>
<tr>
<td><strong>Vehicle kilometers (millions)</strong></td>
<td>64,070</td>
<td>83,523</td>
<td>113,453</td>
<td>(R) 131,983</td>
<td>135,100</td>
</tr>
<tr>
<td><strong>Fuel consumed (million liters)</strong></td>
<td>26,204</td>
<td>31,631</td>
<td>36,196</td>
<td>(R) 38,017</td>
<td>37,429</td>
</tr>
<tr>
<td><strong>Average kilometers traveled per vehicle</strong></td>
<td>14,649</td>
<td>18,614</td>
<td>19,145</td>
<td>(R) 19,390</td>
<td>19,894</td>
</tr>
<tr>
<td><strong>Average kilometers traveled per liter</strong></td>
<td>2.4</td>
<td>2.6</td>
<td>3.1</td>
<td>3.5</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Average fuel consumed per vehicle (liter)</strong></td>
<td>5,991</td>
<td>7,050</td>
<td>6,108</td>
<td>(R) 5,585</td>
<td>5,512</td>
</tr>
</tbody>
</table>

**Key:** R = revised.

**Notes:** 1 kilometer = 0.6214 miles; 1 liter = 0.2642 gallons.
## Table 5-9M. Combination Truck Fuel Consumption and Travel: 1980-2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number registered (thousands)</td>
<td>1,417</td>
<td>1,709</td>
<td>2,097</td>
<td>2,221</td>
<td>2,216</td>
</tr>
<tr>
<td>Vehicle kilometers traveled (millions)</td>
<td>110,521</td>
<td>151,820</td>
<td>217,284</td>
<td>(R) 233,418</td>
<td>230,941</td>
</tr>
<tr>
<td>Fuel consumed (million liters)</td>
<td>49,345</td>
<td>61,064</td>
<td>97,145</td>
<td>(R) 108,043</td>
<td>101,493</td>
</tr>
<tr>
<td>Average kilometers traveled per vehicle</td>
<td>78,004</td>
<td>88,841</td>
<td>103,635</td>
<td>(R) 105,096</td>
<td>104,222</td>
</tr>
<tr>
<td>Average kilometers traveled per liter</td>
<td>2.2</td>
<td>2.5</td>
<td>2.2</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Average fuel consumed per vehicle (liters)</td>
<td>34,827</td>
<td>35,733</td>
<td>46,334</td>
<td>(R) 48,646</td>
<td>45,803</td>
</tr>
</tbody>
</table>

**Key:** R = revised.

**Notes:** 1 kilometer = 0.6214 miles; 1 liter = 0.2642 gallons.
Figure 2-2M. U.S. International Merchandise Trade by Transportation Mode: 2009

Notes: 1 metric tonne = 1.1023 short tons. The U.S. Department of Transportation (USDOT), Research and Innovative Technology Administration, Bureau of Transportation Statistics estimated 2009 weight data for truck, rail, and pipeline modes using value-to-weight ratios derived from imported commodities. Totals for the most recent year differ slightly from the USDOT, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework (FAF) due to variations in coverage and FAF conversion of values to constant dollars. Numbers may not add to totals due to rounding.
This report provides an overview of freight transportation, focusing on the volume and value of freight shipments, the extent of the freight network, industry employment and productivity patterns, and related safety, energy use, and environmental effects. Economic and social characteristics of the United States also are provided as background information. Metric data are available for several tables as well.