Chapter 2

System Characteristics

Highway System Characteristics

The Nation's highway system encompasses an extensive network of roadways that facilitates the movement of people and goods. The system supports the growth of the national economy by providing access to national and international markets and supports the defense of the Nation by providing the means for the rapid deployment of military forces and their support systems.

This section examines the characteristics of the Nation's roadways, addressing ownership, purpose, and usage. This information is presented for the National Highway System (NHS), including its Interstate Highway System component, and for the overall highway system. Separate statistics are presented for Federal-aid highways, which include those roadways that are generally eligible for Federal assistance under current law.

The statistics reported in this section rely heavily on data collected from States through the Highway Performance Monitoring System (HPMS). Note that the terms highways, roadways, and roads are generally used interchangeably in this section and elsewhere in the report. Subsequent sections within this chapter explore the characteristics of bridges and transit systems.

Q&A

Are the 2008 HPMS data cited in this report fully consistent with those reported in the *Highway Statistics 2008* publication?

No. The statistics reflected in this report are based on the latest available 2008 HPMS data as of the date the chapters were written, and include revisions that were not reflected in the *Highway Statistics 2008* publication.

The HPMS database is subject to further change on an ongoing basis if States identify a need to revise their data. Such changes will be reflected in the next edition of the C&P report.

Additional information on HPMS is available at http://www.fhwa.dot.gov/policy/ohpi/hpms/index.htm.

Roads by Ownership

As shown in *Exhibit 2-1*, approximately 77.4 percent of the Nation's public road mileage was owned by local governments in 2008. In general, local governments construct and maintain these roads, although intergovernmental agreements may authorize State governments to perform construction or maintenance activities on them. In 2008, State governments owned 19.3 percent of the Nation's public road mileage. The 3.2 percent of total public road mileage under the control of the Federal government in 2008 were located primarily in National Parks and Forests, on Indian reservations, and on military bases. These figures do not reflect privately owned roads or roads not available for use by the general public.

Q&A

Why does the Federal government own so many miles of road?

Approximately 30 percent of all land in the United States is owned by the Federal government. These lands have many uses: national defense; recreation; range and grazing; minerals and oil/gas extraction; timber harvest; and preservation of fish, wildlife, watersheds, wilderness, and areas of natural, scenic, scientific, or cultural value. Each use requires the presence of roads to provide access.

Roads on Indian lands provide access and mobility for tribal residents between housing and education, medical services, stores, and places of employment.

Transportation plays a key role in the way people access and enjoy their Federal lands. Use of roads by private vehicles and tour buses continues to be the primary method of travel to and within Federal and Indian lands.

Exhibit 2-1

Highway Miles by Owner and by Size of Area, 2000–2008

	2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Rural Areas (under 5,000 in population)						
Federal	116,707	117,775	118,866	123,393	124,482	0.8%
State	663,763	664,814	683,789	669,678	632,679	-0.6%
Local	2,311,263	2,297,168	2,200,786	2,197,410	2,223,172	-0.5%
Subtotal Rural Areas	**3,091,733**	**3,079,757**	**3,003,441**	**2,990,482**	**2,980,333**	-0.5%
Urban Areas (5,000 or more in population)						
Federal	1,484	2,820	3,570	4,988	7,077	21.6%
State	111,540	111,774	132,599	150,053	151,631	3.9%
Local	746,344	787,319	857,852	887,485	920,299	2.7%
Subtotal Urbanized Areas	**859,368**	**901,913**	**994,021**	**1,042,526**	**1,079,007**	2.9%
Total Highway Miles						
Federal	118,191	120,595	122,437	128,381	131,559	1.3%
State	775,303	776,588	816,388	819,731	784,310	0.1%
Local	3,057,607	3,084,487	3,058,638	3,084,896	3,143,471	0.3%
Total	**3,951,101**	**3,981,670**	**3,997,463**	**4,033,008**	**4,059,340**	**0.3%**
Percentage of Total Highway Miles						
Federal	3.0%	3.0%	3.1%	3.2%	3.2%	
State	19.6%	19.5%	20.4%	20.3%	19.3%	
Local	77.4%	77.5%	76.5%	76.5%	77.4%	
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	

Source: Highway Performance Monitoring System (as of November 2009).

Roadways within a community with a population of 5,000 or more are classified as urban; roadways in areas outside urban boundaries are classified as rural. Some statistics in this section are presented separately for small urban areas that have populations of 5,000 to 49,999 and urbanized areas with populations over 50,000.

In 2008, the highway system in the Nation comprised nearly 4.06 million miles, compared with slightly more than 3.95 million miles in 2000. Total mileage in urban areas grew by an average annual rate of 2.9 percent between 2000 and 2008. However, highway miles in rural areas decreased at an average annual rate of 0.5 percent over the same time period.

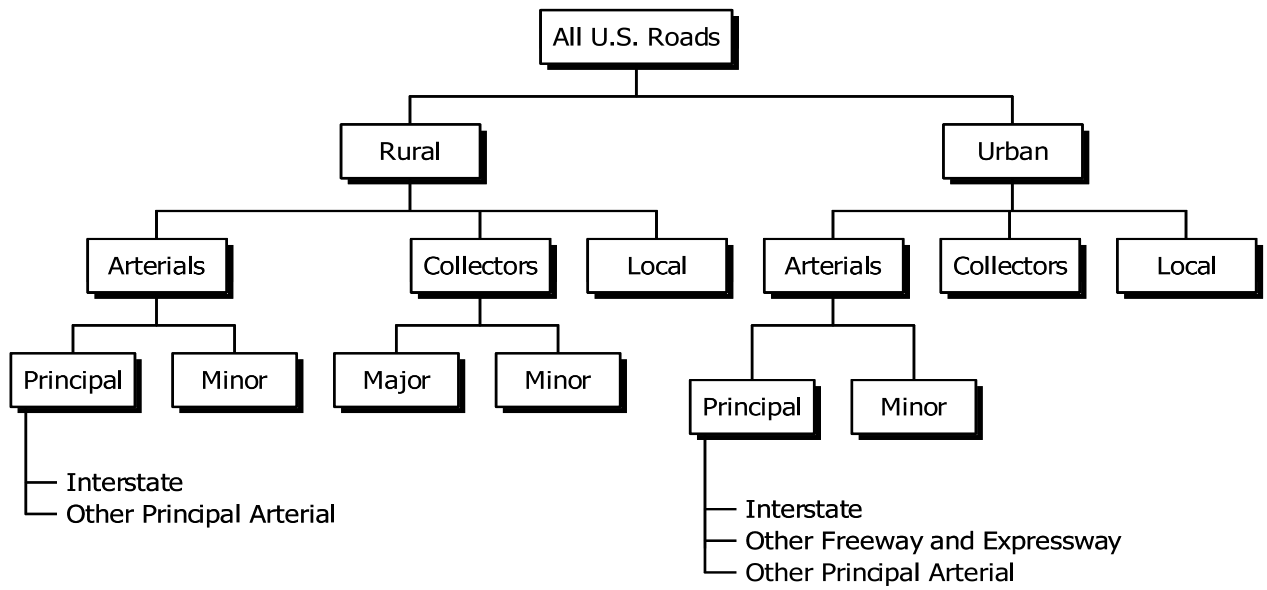
Two factors have continued to contribute to this increase in urban highway mileage, in addition to the construction of new roads. First, based on the 2000 decennial census, the boundaries of urban areas have expanded resulting in the reclassification of some mileage from rural to urban. States implemented these boundary changes in their HPMS data reporting gradually. As a result, the impact of the census-based changes on these statistics is not confined to a single year. Second, greater focus has been placed on Federal agencies to provide a more complete reporting of Federally owned mileage. As a result, reported Federal mileage in urban areas increased at an average annual rate of 21.6 percent from 2000 to 2008. This is due primarily to more accurate reporting of Department of Defense mileage on military bases within urban areas. In rural areas, Federally owned mileage increased at an annual rate of 0.8 percent over the same period.

Roads by Purpose

Roads may also be classified by the purpose they serve, which is commonly called functional classification. *Exhibit 2-2* shows the hierarchy of the Highway Functional Classification System (HFCS), which is used extensively in this report in the presentation of highway and bridge statistics.

Exhibit 2-2

Highway Functional Classification System Hierarchy



Source: FHWA Functional Classification Guidelines.

Review of Functional Classification Concepts

Roads serve two important functions: providing access and providing mobility. The better any individual segment is serving one of these functions, the worse it is at serving the other. Thus, routes on the Interstate Highway System allow a driver to travel long distances in a relatively short time, but do not allow the driver to enter each property along the way. Contrarily, a subdivision street allows a driver access to any address along its length, but does not allow the driver to travel at high speeds and is frequently interrupted by intersections that often contain traffic control devices.

Arterials provide the highest level of mobility at the highest speed for long, uninterrupted travel. Arterials typically have higher design standards than other roads because they often include multiple lanes and have some degree of access control.

The rural arterial system provides interstate and intercounty service so that all developed areas are within a reasonable distance of an arterial highway. This system is broken down into principal and minor routes, of which principal roads are more significant. Virtually all urbanized areas with more than 50,000 people and most urban areas with more than 25,000 people are connected by rural principal arterial highways. The rural principal arterial system is divided into two subgroups: Interstate highways and other principal arterials.

Similarly, in urban areas the arterial system is divided into principal and minor arterials. The urban principal arterial system includes Interstate highways, other freeways and expressways, and other principal arterials. The urban principal arterial system serves major metropolitan centers, corridors with the highest traffic volume, and those with the longest trip lengths. It carries most trips entering and leaving metropolitan areas and provides continuity for rural arterials that cross urban boundaries. Urban minor arterial routes provide service for trips of moderate length at a lower level of mobility. They connect with the urban principal arterial system and other minor arterial routes.

Collectors provide a lower degree of mobility than arterials. They are designed for travel at lower speeds and for shorter distances. Generally, collectors are two-lane roads that collect traffic from local roads and distribute it to the arterial system.

The rural collector system is stratified into two subsystems: major and minor collectors. Major collectors serve larger towns not accessed by higher-order roads, and important industrial or agricultural centers that generate significant traffic but are not served by arterials. Rural minor collectors are typically spaced at intervals consistent with population density to collect traffic from local roads and to ensure that a collector road serves all small urban areas.

In urban areas, the collector system provides traffic circulation within residential neighborhoods and commercial and industrial areas. Unlike arterials, collector roads may penetrate residential communities, distributing traffic from the arterials to the ultimate destination for many motorists. Urban collectors also channel traffic from local streets onto the arterial system. Unlike rural collectors, the urban collector system has no subclassification.

Local roads represent the largest element in the American public road system in terms of mileage. For rural and urban areas, all public road mileage below the collector system is considered local. Local roads provide basic access between residential and commercial properties, connecting with higher-order highways.

It is important to note the distinction between those roads functionally classified as local, and locally owned roads. Some roads functionally classified as local are owned by the Federal or State government, while local governments own some arterials and collectors as well as a large percentage of roads functionally classified as local.

System Characteristics

Exhibit 2-3 summarizes the percentage of highway route miles, lane miles, and vehicle miles traveled (VMT) for 2008 stratified by functional system and by population area. Route miles represent the length of a roadway, while lane miles represent the length of the roadway multiplied by the number of lanes on that roadway. As noted

Exhibit 2-3

Percentage of Highway Miles, Lane Miles, and VMT by Functional System and by Size of Area, 2008

Functional System	Miles	Lane Miles	VMT
Rural Areas (less than 5,000 in population)			
Interstate	0.7%	1.4%	8.1%
Other Principal Arterial	2.3%	2.9%	7.4%
Minor Arterial	3.3%	3.3%	5.1%
Major Collector	10.3%	9.9%	6.2%
Minor Collector	6.5%	6.2%	1.8%
Local	50.2%	47.9%	4.4%
Subtotal Rural Areas	73.4%	71.6%	33.1%
Small Urban Areas (5,000–49,999 in population)			
Interstate	0.1%	0.1%	0.9%
Other Freeway and Expressway	0.0%	0.1%	0.3%
Other Principal Arterial	0.3%	0.5%	2.1%
Minor Arterial	0.5%	0.6%	1.5%
Collector	0.6%	0.6%	0.8%
Local	3.4%	3.2%	1.1%
Subtotal Small Urban Areas	5.0%	5.1%	6.7%
Urbanized Areas (50,000 or more in population)			
Interstate	0.4%	1.0%	15.2%
Other Freeway and Expressway	0.2%	0.6%	7.2%
Other Principal Arterial	1.3%	2.2%	13.5%
Minor Arterial	2.1%	2.6%	11.2%
Collector	2.2%	2.2%	5.1%
Local	15.4%	14.7%	7.9%
Subtotal Urbanized Areas	21.6%	23.3%	60.1%
Total	100.0%	100.0%	100.0%

Source: Highway Performance Monitoring System (as of November 2009).

earlier, rural areas have populations of less than 5,000, small urban areas have populations between 5,000 and 49,999, and urbanized areas have populations of 50,000 or more.

In 2008, 73.4 percent of the Nation's highway mileage and 71.6 percent of lane miles were located in rural areas. In contrast, only 33.1 percent of the VMT occurred on roads in rural areas. Those roads classified as rural local constituted slightly over one-half of all highway mileage, but carried only 4.4 percent of total VMT. Roads in small urban areas accounted for 5.0 percent of highway mileage, 5.1 percent of lane miles, and 6.7 percent of VMT.

Only 21.6 percent of the Nation's total highway mileage and 23.3 percent of lane miles are located in urbanized areas. However, these routes carried 60.1 percent of the Nation's VMT in 2008. Urbanized Interstate System highways made up only 0.4 percent of total route mileage, but carried 15.2 percent of total VMT.

Exhibit 2-4 shows trends in public road route mileage from 2000 to 2008. Overall route mileage increased by 108,251 between 2000 and 2008, which corresponds to an annual growth rate of about 0.3 percent. The number of route miles in rural areas decreased by 111,406 between 2000 and 2008, while urban route miles increased 219,657 over the same period. Among individual functional classes, urban local roads had the largest increase in the number of miles as 159,626 were added between 2000 and 2008, while the functional class of urban collectors had the largest percentage increase of approximately 3.3 percent annually.

Exhibit 2-4

Highway Route Miles by Functional System, 2000–2008

Functional System	2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Rural Areas (less than 5,000 in population)						
Interstate	33,152	33,107	31,477	30,615	30,227	-1.1%
Other Principal Arterial	99,023	98,945	95,998	95,009	95,002	-0.5%
Minor Arterial	137,863	137,855	135,683	135,589	135,256	-0.2%
Major Collector	433,926	431,754	420,293	419,289	418,473	-0.5%
Minor Collector	272,477	271,371	268,088	262,966	262,852	-0.4%
Local	2,115,293	2,106,725	2,051,902	2,046,796	2,038,517	-0.5%
Subtotal Rural Areas	**3,091,733**	**3,079,757**	**3,003,441**	**2,990,264**	**2,980,327**	**-0.5%**
Urban Areas (5,000 or more in population)						
Interstate	13,523	13,640	15,359	16,277	16,789	2.7%
Other Freeway and Expressway	9,196	9,377	10,305	10,817	11,401	2.7%
Other Principal Arterial	53,558	53,680	60,088	63,180	64,948	2.4%
Minor Arterial	90,302	90,922	98,447	103,678	107,182	2.2%
Collector	88,798	89,846	103,387	109,639	115,087	3.3%
Local	603,992	644,449	706,436	738,156	763,618	3.0%
Subtotal Urban Areas	**859,368**	**901,913**	**994,021**	**1,041,747**	**1,079,025**	**2.9%**
Total Highway Route Miles	**3,951,101**	**3,981,670**	**3,997,462**	**4,032,011**	**4,059,352**	**0.3%**

Source: Highway Performance Monitoring System (as of November 2009).

As noted earlier, the decline in rural route mileage can be partially attributed to changes in urban boundaries resulting from the 2000 Census. These boundary changes have also affected the classification of lane mileage and VMT.

Exhibit 2-5 shows the number of highway lane miles by functional system and by population area. Between 2000 and 2008, lane miles on the Nation's highways have grown at an average annual rate of about 0.4 percent, from 8.3 million to 8.5 million. The number of lane miles in rural areas decreased by 226,280 over this period, while the number of lane miles in urban areas increased by 489,540. Among individual functional classes, urban local roads had the largest increase in the number of lane miles with 319,246 added between 2000 and 2008, while the functional class of urban collector had the largest percentage increase of approximately 3.3 percent annually. These increases are attributable to the construction of new urban roadways, the expansion of existing urban roads, and the reclassification of rural collectors and rural local roads to urban collectors and urban local roads, respectively.

Exhibit 2-5

Highway Lane Miles by Functional System and by Size of Area, 2000–2008

Functional System	2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Rural Areas (less than 5,000 in population)						
Interstate	135,000	135,032	128,012	124,506	122,956	-1.2%
Other Principal Arterial	253,586	256,458	249,480	248,334	250,153	-0.2%
Minor Arterial	287,750	288,391	283,173	282,397	281,071	-0.3%
Major Collector	872,672	868,977	845,513	843,262	841,353	-0.5%
Minor Collector	544,954	542,739	536,177	525,932	525,705	-0.4%
Local	4,230,588	4,213,448	4,103,804	4,093,592	4,077,032	-0.5%
Subtotal Rural Areas	**6,324,550**	**6,305,044**	**6,146,159**	**6,118,023**	**6,098,270**	**-0.5%**
Urban Areas (5,000 or more in population)						
Interstate	74,647	75,864	84,016	89,036	91,924	2.6%
Other Freeway and Expresswa	42,055	43,467	47,770	50,205	53,073	3.0%
Other Principal Arterial	187,030	188,525	210,506	221,622	228,792	2.6%
Minor Arterial	229,410	233,194	250,769	269,912	274,225	2.3%
Collector	189,839	192,115	220,177	235,240	245,262	3.3%
Local	1,207,984	1,288,898	1,412,872	1,476,314	1,527,230	3.0%
Subtotal Urban Areas	**1,930,966**	**2,022,064**	**2,226,111**	**2,342,329**	**2,420,506**	**2.9%**
Total Highway Lane Miles	**8,255,516**	**8,327,108**	**8,372,270**	**8,460,352**	**8,518,776**	**0.4%**

Source: Highway Performance Monitoring System - November 2009.

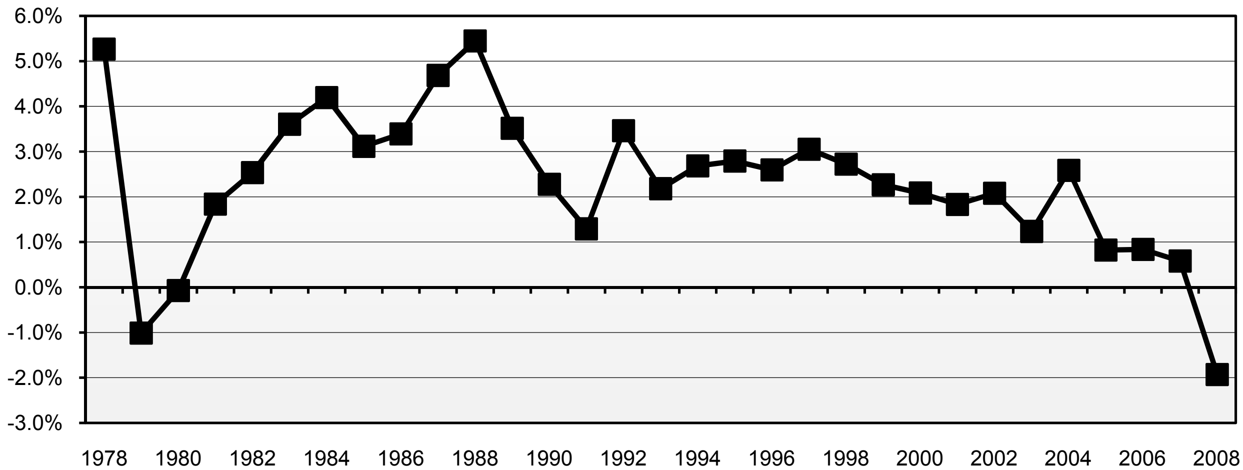
Highway Travel

This section describes highway infrastructure use, which is typically defined by highway VMT. Total VMT declined by 1.9 percent between 2007 and 2008 to 2.99 trillion, the first year-to-year decline since 1980. *Exhibit 2-6* shows annual VMT growth rates from 1978 to 2008. Highway-travel growth has typically been lower during periods of slow economic growth and/or higher fuel prices, and higher during periods of economic expansion.

Although annual VMT growth has varied somewhat from year to year, it has generally been trending downward. Annual VMT growth last exceeded 4 percent in 1988, last exceeded 3 percent in 1997, and last exceeded 2 percent in 2004. Total VMT grew by less than 1 percent per year from 2005 to 2007. Over the 30-year period from 1978 to 2008, VMT grew at an average annual rate of 2.2 percent; for the 20-year period from 1988 to 2008, VMT grew by an average 1.9 percent per year. Over the 10-year period from 1998 to 2008, VMT grew at an average annual rate of 1.2 percent; the average annual VMT growth rate dropped to 0.6 percent during the last 5 years of this period.

Exhibit 2-6

Annual VMT Growth Rates, 1978–2008



Source: Highway Statistics, various years, Tables VM-1 (50 States plus D.C.) and VM-2 (Puerto Rico).

Q&A

How have economic recessions and changes in fuel prices corresponded to the changes in VMT growth rates identified in *Exhibit 2-6*?

The Business Cycle Dating Committee of the National Bureau of Economic Research has identified periods of economic contractions from January 1980 to June 1980, July 1981 to November 1982, July 1990 to March 1991, March 2001 to November 2001, and December 2007 to June 2009. While these dates do not correspond exactly to the timing of declines in VMT growth rates over this 30-year period, they are associated with periods of weaker than average VMT growth.

In constant dollar terms, the price of regular unleaded gasoline increased by 60 percent between 1978 and 1981, contributing to the declines in VMT observed in 1979 and 1980. Unleaded gasoline prices dropped by 46 percent in constant dollar terms between 1980 and 1988, the year with the highest annual growth rate identified in *Exhibit 2-6*. These prices increased by 14 percent in constant dollar terms between 1988 to 1990, corresponding to a period of declining VMT growth, before dropping by 23 percent between 1990 and 1998. From 1998 to 2008, unleaded gasoline prices increased by 143 percent to a new all-time high; over this same period, the rate of VMT growth gradually declined, reaching a negative value in 2008.

Exhibit 2-7 shows trends in VMT by functional class and passenger miles traveled (PMT) since 2000. During the period from 2000 to 2008, VMT grew at an average annual rate of 1.0 percent per year from approximately 2.76 trillion to 2.99 trillion. Total PMT grew more quickly over this 8-year period by approximately 1.3 percent per year, rising to a total of approximately 4.9 trillion in 2008.

VMT in rural areas totaled approximately 0.99 trillion in 2008. From 2000 to 2008, travel declined on all rural functional classifications except for roads classified as rural local. Rural minor arterials experienced the largest reduction in VMT in percentage terms, declining at an average annual rate of 1.6 percent over this period. As noted earlier, the decline in rural VMT can be partially attributed to the expansion of urban boundaries resulting from the 2000 Census.

Exhibit 2-7

Vehicle Miles Traveled (VMT) and Passenger Miles Traveled (PMT), 2000–2008

Functional System	(Millions of Miles) 2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Rural Areas (less than 5,000 in population)						
Interstate	269,533	281,461	267,397	258,324	243,693	-1.3%
Other Principal Arterial	249,177	258,009	241,282	232,224	222,555	-1.4%
Minor Arterial	172,772	177,139	169,168	162,889	152,246	-1.6%
Major Collector	210,595	214,463	200,926	193,423	186,275	-1.5%
Minor Collector	58,183	62,144	60,278	58,229	55,164	-0.7%
Local	127,560	139,892	132,474	133,378	131,796	0.4%
Subtotal Rural Areas	**1,087,820**	**1,133,107**	**1,071,524**	**1,038,467**	**991,729**	**-1.1%**
Urban Areas (5,000 or more in population)						
Interstate	397,176	412,481	459,767	482,677	481,520	2.4%
Other Freeway and Expressway	178,185	190,641	209,084	218,411	223,837	2.9%
Other Principal Arterial	401,356	410,926	453,868	470,423	465,965	1.9%
Minor Arterial	326,889	341,958	365,807	380,069	380,734	1.9%
Collector	137,007	143,621	164,330	175,516	177,665	3.3%
Local	236,051	241,721	257,617	268,394	271,329	1.8%
Subtotal Urban Areas	**1,676,664**	**1,741,348**	**1,910,473**	**1,995,489**	**2,001,050**	**2.2%**
Total VMT	**2,764,484**	**2,874,455**	**2,981,998**	**3,033,957**	**2,992,779**	**1.0%**
Total PMT*	**4,390,076**	**4,667,038**	**4,832,394**	**4,933,689**	**4,871,683**	**1.3%**

**Assumes approximately 1.59 passengers per vehicle per mile in 2000 and approximately 1.63 passengers per vehicle per mile in 2002, 2004, 2006, and 2008.*

Sources: VMT data from Highway Performance Monitoring System; PMT data from Highway Statistics, Table VM-1.

Q&A

What has happened to highway travel since 2008?

The December 2009 Traffic Volume Trends (TVT) report showed an estimated increase in VMT of 0.2 percent between 2008 and 2009. VMT on rural Interstates and other rural arterials increased by 1.3 percent, VMT on other rural roads increased by 0.7 percent, and VMT on urban Interstates increased by 0.3 percent. VMT on other urban arterials decreased by 0.2 percent, while VMT on other urban roads decreased by 0.8 percent. These estimates should be considered preliminary, and will be revised when 2009 HPMS data are available.

The TVT is a monthly report based on hourly traffic count data. These data, collected at approximately 4,000 continuous traffic-counting locations nationwide, are used to calculate the percent change in traffic for the current month compared to the same month in the previous year. Because of limited TVT sample sizes, caution should be used with these estimates.

For additional information on ongoing traffic trends, visit https://www.fhwa.dot.gov/ohim/tvtw.

VMT in urban areas totaled approximately 2.00 trillion in 2008. Urban VMT increased at an average annual rate of 2.2 percent over this period. Urban collectors experienced the largest increase in VMT in percentage terms, growing at an average annual rate of 3.3 percent. In 2008, the urban portion of the Interstate System alone carried approximately 0.5 trillion VMT, the highest level among the functional classes.

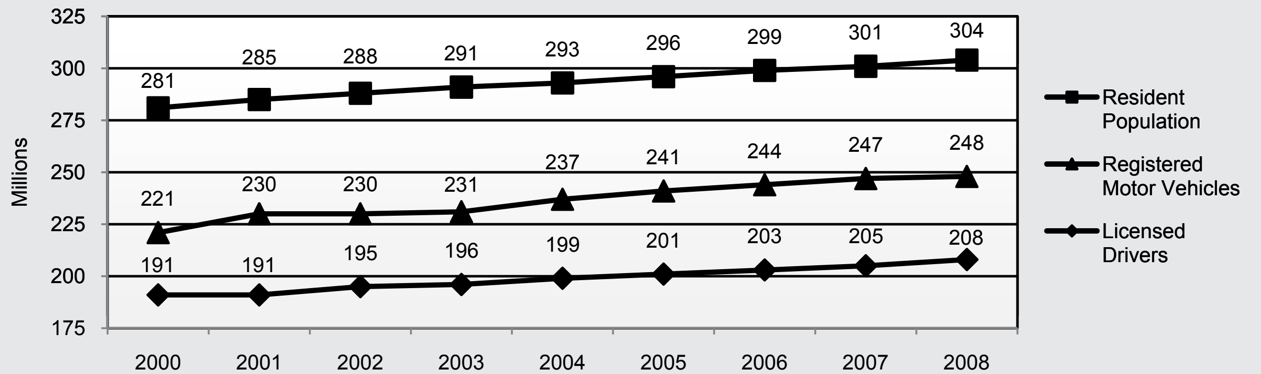
What has happened in recent years to the size of the Nation's vehicle fleet?

Q&A

From 2000 to 2008, the number of registered motor vehicles increased 12.2 percent, the resident population increased 8.2 percent, and the number of licensed drivers increased 8.9 percent.
[See Exhibit 2-8.]

Exhibit 2-8

Licensed Drivers, Vehicle Registrations, and Resident Population, 2000–2008



Source: Highway Statistics 2008, http://www.fhwa.dot.gov/policyinformation/statistics/2008/dlchrt.cfm.

However, recently the number of registered vehicles has grown more slowly than resident population and the number of licensed drivers. From 2007 to 2008, resident population and the number of licensed drivers grew approximately 10 percent and 14.6 percent, respectively. The number of registered vehicles increased only 0.4 percent.

Exhibit 2-9 depicts highway travel by functional classification and vehicle type. Three types of vehicles are identified: passenger vehicles which include motorcycles, buses, and light trucks (two-axle, four-tire models); single-unit trucks having six or more tires; and combination trucks, including trailers and semitrailers. Passenger vehicle travel accounted for 92.4 percent of total VMT in 2008; combination trucks accounted for 4.8 percent of VMT, and single-unit trucks accounted for the remaining 2.8 percent. The share of truck travel on the rural portion of the Interstate System is considerably higher; in 2008, single-unit and combination trucks together accounted for 19.5 percent of total VMT on the rural portion of the Interstate System.

From 2000 to 2008, travel on all functional classifications combined among all vehicle types grew fastest among single-unit trucks, at an average annual rate of 2.2 percent. Passenger vehicle travel grew by 1.0 percent per year, and combination truck traffic grew by 0.8 percent per year over the same period.

Combination truck travel and passenger vehicle travel grew more quickly on the urban portion of the Interstate System than other urban roads from 2000 to 2008. Over this period, combination truck travel on the urban portion of the Interstate System increased at an average annual rate of 3.2 percent, while passenger vehicle travel increased by 2.4 percent on the urban portion of the Interstate System. In contrast, single-unit truck travel grew more quickly on other urban roads over this period; single-unit truck VMT increased by an average of 1.9 percent annually on the urban portion of the Interstate System while increasing by 4.6 percent annually on other urban roads.

Exhibit 2-9

Highway Travel by Functional System and by Vehicle Type, 2000–2008

Functional System	(Millions of Miles)* 2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Rural Interstate						
PV	215,696	225,584	212,693	206,528	195,749	-1.2%
SU	8,236	8,745	8,548	7,674	7,299	-1.5%
Combo	44,248	45,633	45,754	43,711	40,242	-1.2%
Other Arterial						
PV	378,950	391,381	367,357	354,873	335,202	-1.5%
SU	13,644	14,606	14,771	13,835	13,646	0.0%
Combo	28,005	27,818	27,817	25,791	25,426	-1.2%
Other Rural						
PV	368,096	385,340	362,662	355,582	343,556	-0.9%
SU	13,722	14,963	15,611	15,084	15,478	1.5%
Combo	12,555	14,090	15,035	13,990	13,820	1.2%
Total Rural						
PV	962,742	1,002,305	942,712	916,983	874,507	-1.2%
SU	35,602	38,314	38,930	36,593	36,423	0.3%
Combo	84,808	87,541	88,606	83,492	79,488	-0.8%
Urban Interstate						
PV	361,284	375,625	416,220	437,552	435,741	2.4%
SU	8,716	9,106	10,512	10,301	10,127	1.9%
Combo	23,465	23,887	26,481	29,430	30,223	3.2%
Other Urban						
PV	1,217,379	1,263,296	1,375,906	1,436,544	1,435,803	2.1%
SU	26,182	28,467	31,665	33,436	37,400	4.6%
Combo	26,747	27,215	30,310	29,784	33,797	3.0%
Total Urban						
PV	1,578,663	1,638,921	1,792,126	1,874,096	1,871,544	2.2%
SU	34,898	37,573	42,177	43,737	47,527	3.9%
Combo	50,212	51,102	56,791	59,214	64,020	3.1%
Total						
PV	**2,541,405**	**2,641,226**	**2,734,838**	**2,791,079**	**2,746,051**	**1.0%**
SU	**70,500**	**75,887**	**81,107**	**80,330**	**83,950**	**2.2%**
Combo	**135,020**	**138,643**	**145,397**	**142,706**	**143,508**	**0.8%**

PV = Passenger Vehicles (including buses, motorcycles and two-axle, four-tire vehicles); SU = Single-Unit Trucks (6 or more tires); Combo = Combination Trucks (trailers and semitrailers).

** Data do not include Puerto Rico.*

Source: Highway Statistics, various years, Table VM-1.

Federal-Aid Highways

The term "Federal-aid highways" includes roads that are generally eligible for Federal funding assistance under current law, which includes public roads that are not functionally classified as rural minor collector, rural local, or urban local. As shown in *Exhibit 2-10*, Federal-aid highway mileage totaled approximately 1.0 million in 2008. Federal-aid highways included 2.4 million lane miles and carried 2.5 trillion VMT in 2008. VMT on Federal-aid highways grew at an average annual rate of 1.0 percent from 2000 to 2008, outpacing the rates of increase in both highway miles and lane miles.

Exhibit 2-10

Federal-Aid Highway Miles, Lane Miles, and VMT, 2000–2008

	2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Highway Miles	959,339	959,125	971,036	984,093	994,358	0.4%
Lane Miles	2,271,990	2,282,024	2,319,417	2,364,514	2,388,809	0.6%
VMT (millions)	2,342,690	2,430,698	2,531,629	2,573,956	2,534,490	1.0%

Source: Highway Performance Monitoring System.

The highway miles on Federal-aid highways made up 24.5 percent of the total highway miles on the Nation's roadways in 2008, while the number of lane miles on Federal-aid highways was approximately 28.0 percent of the total lane miles in the Nation. The VMT carried on Federal-aid highways made up 84.7 percent of the VMT for the Nation.

While the system characteristics information presented in this chapter is available for all functional classes, some data pertaining to system conditions and performance presented in other chapters are not available in the HPMS for roads classified as rural minor collector, rural local, or urban local. Thus, some data presented in other chapters may reflect only Federal-aid highways.

National Highway System

With the Interstate System essentially complete, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) revised the Federal-aid highway program for the post-Interstate System era. The legislation authorized designation of an NHS that would focus Federal resources on roads that are the most important to interstate travel, economic expansion, and national defense; that connect with other modes of transportation; and that are essential to the Nation's role in the international marketplace.

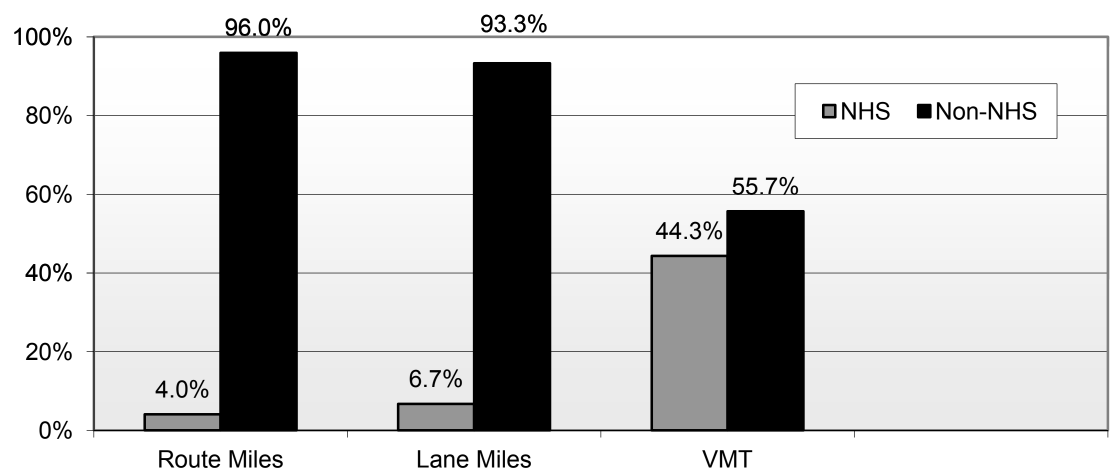
The NHS was designed to be a dynamic system able to change in response to future travel and trade demands. The Department of Transportation may approve modifications to the NHS without congressional approval. States must cooperate with local and regional officials in proposing modifications. In metropolitan areas, local and regional officials must act through metropolitan planning organizations and the State transportation department when proposing modifications. A number of such modifications are proposed and approved each year.

The NHS has five components. The first, the Interstate System, is the core of the NHS and includes the most traveled routes. The second component includes selected other principal arterials deemed most important for commerce and trade. The third is the Strategic Highway Network (STRAHNET), which consists of highways important to military mobilization. The fourth is the system of STRAHNET connectors that provide access between major military installations and routes that are part of STRAHNET. The final component consists of intermodal connectors, which were not included in the National Highway System Designation Act of 1995 but are eligible for NHS funds. These roads provide access between major intermodal passenger and freight facilities and the other four subsystems making up the NHS.

Exhibit 2-11 summarizes NHS route miles, lane miles, and VMT for the NHS components. The NHS is overwhelmingly concentrated on higher functional systems. All Interstate System highways are part of the NHS, as are 83.3 percent of rural other principal arterials, 87.1 percent of urban other freeways and expressways, and 36.3 percent of urban other principal arterials. The share of minor arterials, collectors, and local roads on the NHS is relatively small. As of 2008, there were 162,944 route miles on the NHS, excluding any sections not yet open to traffic. In 2008, while only 4.0 percent of the Nation's total route mileage and 6.7 percent of the total lane miles were on the NHS, these roads carried 44.3 percent of VMT.

Exhibit 2-11

Highway Route Miles, Lane Miles, and VMT on the NHS Compared With All Roads, by Functional System, 2008



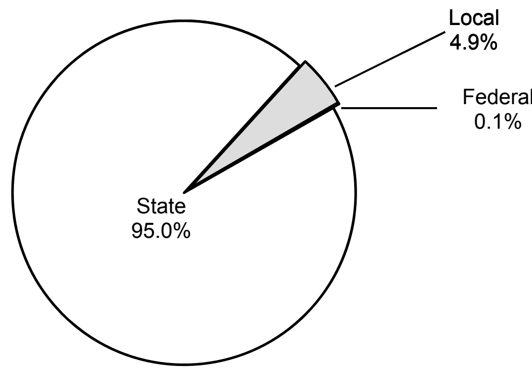
	Route Miles		Lane Miles		VMT (Millions)	
	Total on NHS	Percent of Functional System on NHS	Total on NHS	Percent of Functional System on NHS	Total on NHS	Percent of Functional System on NHS
Rural NHS						
Interstate	30,147	100.0%	122,640	100.0%	242,785	100.0%
Other Principal Arterial	78,665	83.3%	212,675	85.4%	193,116	87.1%
Minor Arterial	2,235	1.7%	5,152	1.8%	4,049	2.7%
Major Collector	664	0.2%	1,467	0.2%	1,092	0.6%
Minor Collector	17	0.0%	27	0.0%	6	0.0%
Local	23	0.0%	46	0.0%	14	0.0%
Subtotal Rural NHS	**111,751**	**3.8%**	**342,007**	**5.7%**	**441,062**	**44.6%**
Urban NHS						
Interstate	16,619	100.0%	90,954	100.0%	476,524	100.0%
Other Freeway and Expressway	9,810	87.1%	46,407	88.3%	204,855	92.1%
Other Principal Arterial	23,118	36.3%	86,092	38.2%	187,789	40.9%
Minor Arterial	1,229	1.2%	3,809	1.4%	5,921	1.6%
Collector	317	0.3%	831	0.3%	940	0.5%
Local	100	0.0%	233	0.0%	200	0.1%
Subtotal Urban NHS	**51,193**	**4.7%**	**228,093**	**9.2%**	**876,230**	**44.2%**
Total NHS	**162,944**	**4.0%**	**570,100**	**6.7%**	**1,317,292**	**44.3%**

Source: Highway Performance Monitoring System, November 2009.

Exhibit 2-12 describes the ownership of NHS mileage. Approximately 95.0 percent of route miles were State-owned in 2008. Only 4.9 percent were locally owned, and the Federal government owned the remaining 0.1 percent. In contrast, as noted earlier in this chapter, 19.3 percent of all route miles in the United States were State-owned, 77.4 percent were owned by local governments, and the Federal government owned 3.2 percent in 2008. The NHS is concentrated on higher functional systems, which tend to have higher shares of State-owned mileage.

Exhibit 2-12

NHS Mileage by Owner, 2008



Source: Highway Performance Monitoring System, November 2009.

Interstate System

With the strong support of President Dwight D. Eisenhower, the Federal-Aid Highway Act of 1956 declared that the completion of the "National System of Interstate and Defense Highways" was essential to the national interest. It made a national commitment to the completion of the Interstate System within the Federal–State partnership of the Federal-aid highway program, with the State responsible for construction to approved standards. The 1956 Act resolved the challenging issue of how to pay for construction by establishing the Highway Trust Fund to ensure that revenue from highway user taxes, such as the motor fuels tax, would be dedicated to the Interstate System and other Federal-aid highway and bridge projects.

President Eisenhower wrote in his memoirs that "more than any single action by the government since the end of the war, this one would change the face of America. Its impact on the American economy . . . was beyond calculation." The Dwight D. Eisenhower National System of Interstate and Defense Highways, as it is now called, accelerated interstate and regional commerce, enhanced the country's competitiveness in international markets, increased personal mobility, facilitated military transportation, and accelerated metropolitan development throughout the United States. Although the Interstate System accounted for only 1.2 percent of the Nation's total roadway mileage in 2008, it carried 24.2 percent of all highway travel.

Exhibit 2-13 combines data presented earlier in this section for rural and urban Interstate System highways. From 2000 to 2008, Interstate System miles grew at an average annual rate of 0.1 percent to 47,019. Over this same period, Interstate System lane miles grew by 0.3 percent annually to 214,880, and the traffic carried by the Interstate System grew by 1.1 percent per year to 0.7 trillion VMT in 2008.

Exhibit 2-13

Interstate Highway Miles, Lane Miles, and VMT, 2000–2008

	2000	2002	2004	2006	2008	Annual Rate of Change 2008/2000
Highway Miles	46,675	46,747	46,836	46,892	47,019	0.1%
Lane Miles	209,647	210,896	212,029	213,542	214,880	0.3%
VMT(millions)	666,708	693,941	727,163	741,002	725,213	1.1%

Source: Highway Performance Monitoring System, November 2009.

Freight Travel

The movement of freight dominates trucking activity and is a significant component of highway traffic. Three-fourths of VMT by trucks larger than pickups and vans is for carrying freight, with much of the rest being for empty backhauls or serving construction and utilities. Single-unit and combination trucks accounted for every fourth vehicle on almost 28,000 miles of the NHS in 2007, and 6,000 of those miles carried more than 8,500 trucks on an average day.

As shown in *Exhibit 2-14*, approximately half of trucks larger than pickups and vans typically operate locally—within 50 miles of home—and account for about 30 percent of truck VMT. In contrast, 10 percent of trucks larger than pickups and vans that operate more than 200 miles away from home account for 40 percent of truck VMT. Long-distance truck travel also accounts for nearly all freight ton miles and a large share of truck VMT. Based on the previous version of the Freight Analysis Framework (FAF version 2.3), *Exhibit 2-15* shows that almost all of the ton miles carried by trucks is among places at least 50 miles apart, and two-thirds of those ton miles cross state lines.

As reflected in *Exhibit 2-16*, trucks are a critical component of the Nation's freight transportation system, serving approximately two-thirds the value and weight of freight moved to, from, and within the United States. (It should be noted that these raw tonnage statistics do not take into account the distance these goods were moved; for example, if a container was transported 3,000 miles across the country on rail, and two miles by truck from an intermodal yard to a retail store, both rail and truck would have moved the same tonnage.)

Exhibit 2-14

Trucks and Truck Miles by Range of Operations

Location	Number of Trucks (percent)	Truck Miles (percent)
Off the road	3.3%	1.6%
50 miles or less	53.3%	29.3%
51 to 100 miles	12.4%	13.2%
101 to 200 miles	4.4%	8.1%
201 to 500 miles	4.2%	12.1%
501 miles or more	5.3%	18.4%
Not reported	13.0%	17.3%
Not applicable	4.1%	0.1%
Total	**100%**	**100%**

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

Source: U.S. Department of Commerce, Census Bureau, 2002 Vehicle Inventory and Use Survey: United States, EC02TV-US, Table 3a (Washington, DC: 2004), available at http://www.census.gov/prod/ec02/ec02tv-us.pdf as of April 24, 2008.

Exhibit 2-15

Ton Miles by Truck, 2002

Trip Type	Trip Percentage
Local (less than 50 miles)	1%
Within State	36%
To Other States	15%
From Other States	15%
Through State	34%
Total	**100%**

Note: Numbers do not add to 100 due to rounding.

Source: Freight Analysis Framework 2.3 in FHWA, Freight Facts and Figures 2009, Table 3-7.

Freight Statistics

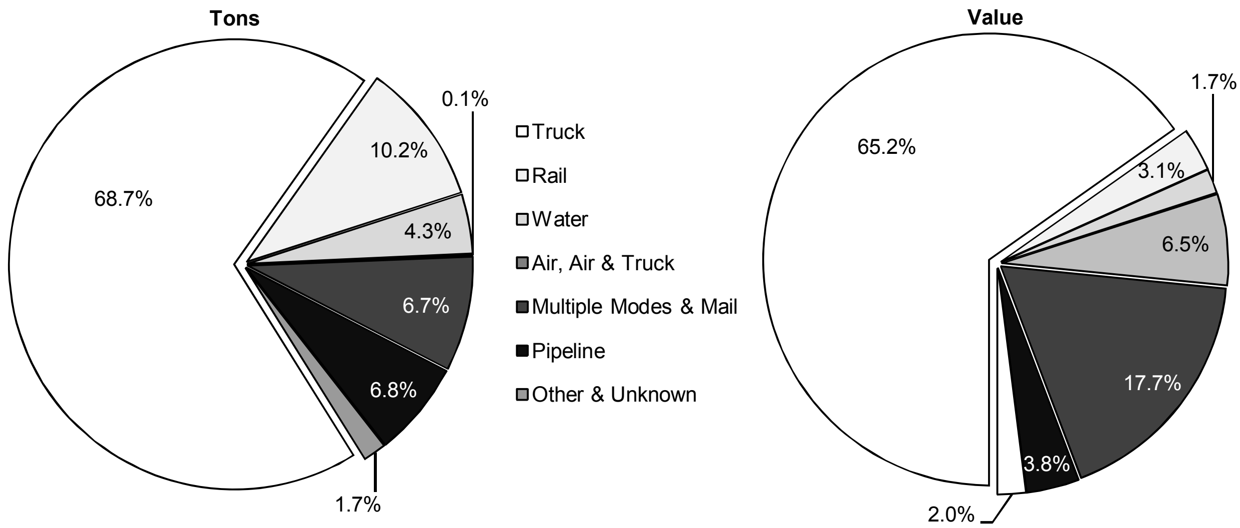
Many of the freight statistics in this section are derived from the Freight Analysis Framework (FAF) version 3 (FAF³) and FAF version 2 (FAF²). Both versions of the FAF include all freight flows to, from, and within the United States. FAF estimates are recalibrated every 5 years primarily with data from the Commodity Flow Survey (CFS), and are updated annually with provisional estimates. The CFS, conducted every 5 years by the Census Bureau and U.S. DOT's Bureau of Transportation Statistics, measures approximately two-thirds of the tonnage covered by the FAF. FAF³ incorporates data from the 2007 CFS and FAF² was based on 2002 data.

Statistics on trucking activity are primarily from FHWA's Highway Performance Monitoring System and the Census Bureau's Vehicle Inventory and Use Survey (VIUS). The VIUS links truck size and weight, miles traveled, energy consumed, economic activity served, commodities carried, and other characteristics of significant public interest, but was discontinued after 2002. See www.ops.fhwa.dot.gov/freight/freight_analysis/faf for additional information.

Exhibit 2-16

Goods Movement by Mode, 2007

An average of 51 million tons of freight worth $45 billion was moved by the transportation system per day in 2007



Notes: 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. Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode. Numbers may not add to 100 due to rounding.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1.

The Freight Transportation System

The FHWA's *Freight Facts and Figures 2010* publication shows that the transportation system of the United States moves nearly 51 million tons of freight worth more than $45 billion each day to meet the logistical needs of the Nation's 117 million households, 7.7 million business establishments, and 89,500 government units. The economy depends on freight transportation to link businesses with suppliers and markets throughout the Nation and the world. American farms and mines reach out to customers across and beyond the continent, using inexpensive transportation to compete against farms and mines in other countries. Domestic manufacturers increasingly use distant sources of raw materials and other inputs to produce goods for local and worldwide customers, all of which require efficient and reliable transportation to maintain a competitive advantage in a global marketplace. Wholesalers and retailers depend on fast and reliable transportation to obtain inexpensive or specialized goods through extensive supply chains. In the expanding world of e-commerce, households increasingly rely on freight transportation to deliver purchases directly to their door. Even service providers, public utilities, construction companies, and government agencies depend on freight transportation to get needed equipment and supplies from sources scattered throughout the world.

Freight Facts and Figures 2010 reports that the U.S. freight transportation system includes 9 million single-unit and combination trucks, more than 1.4 million locomotives and rail cars, and more than 40,000 marine vessels. The system operates on more than 400,000 miles of arterial highways, 140,000 miles of railroads, 13,000 miles of inland waterways and the Great Lakes-St. Lawrence Seaway system, and 1.6 million miles of petroleum and natural gas pipelines. The U.S. Army Corps of Engineers' *Waterborne Commerce of the United States 2007* publication identifies 146 ports that handle more than 1 million tons of freight per year.

The freight transportation system is more than equipment and facilities. As reported in *Freight Facts and Figures 2010*, freight transportation establishments with payrolls primarily serving for-hire transportation and warehousing employ 4.2 million workers. Truck drivers account for the largest freight transportation occupation in the U.S. numbering 2.4 million in 2009. Other freight transportation occupations included other rail and water vehicle operators, as well as other freight transportation-related occupations such as equipment manufacturing, equipment maintenance, and other transportation support service providers.

The projections shown in *Exhibit 2-17* estimate that the tonnage of commodities moved by truck will increase by nearly 70 percent between 2009 and 2040. The demand for freight movement grows with population, with production of goods for domestic consumption and export activity, and with shifting supply chains for each sector of the economy. Sectors such as agriculture and mining originate substantial freight, particularly bulk products. The manufacturing and wholesale trade sectors are both destinations and origins of freight movement, including both bulk inputs to basic industries and retail goods going to and from manufacturing and distribution centers. The construction sector consumes sand and gravel, steel, sheet rock, and other heavy materials; public utilities consume bulk energy products; and the retail trade and service sectors consume vast quantities of high-value, time-sensitive goods. As shown in *Exhibit 2-18*, by tonnage, trucks carry almost 90 percent of high-value goods and over 70 percent of the time-sensitive bulk goods.

Exhibit 2-17

Weight of Shipments by Transportation Mode (Millions of Tons)

Mode	2007	2009	2040 Projected	Compound Annual Growth, 2009–2040
Truck	12,766	10,868	18,445	1.7%
Rail	1,894	1,689	2,408	1.2%
Water	794	734	1,143	1.4%
Air, Air & Truck	13	11	41	4.3%
Multiple Modes & Mail*	1,531	1,336	3,119	2.8%
Pipeline	1,270	1,220	1,509	0.7%
Other & Unknown	313	265	440	1.6%
Total	**18,581**	**16,122**	**27,104**	**1.7%**

** 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.*

Note: Data do not include imports and exports that pass through the United States from a foreign origin to a foreign destination by any mode. Numbers may not add to total due to rounding.

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Growth in freight tonnage drives long-term growth in truck VMT. *Freight Facts and Figures 2010* shows that, from 1980 to 2008, combination truck VMT more than doubled and the VMT for single-unit trucks grew by about 95 percent. VMT decreased slightly for both types of trucks in 2008.

Exhibit 2-18

The Spectrum of Freight Moved in 2007

Parameter	Commodity Type: High Value/Time Sensitive	Commodity Type: Bulk
Top Three Commodity Classes	Machinery Electronics Mixed Freight	Gravel Cereal Grains Coal
Share of Total Tons	13%	85%
Share of Total Value	65%	30%
Key Performance Variables	Reliability Speed Flexibilty	Reliability Cost
Share of Tons by Domestic Mode	87% Truck 5% Multiple Modes and Mail 4% Rail	71% Truck 12% Rail 9% Pipeline 4% Multiple Modes and Mail 3% Water
Share of Value by Domestic Mode	70% Truck 16% Multiple Modes and Mail 10% Air 2% Rail	71% Truck 12% Pipeline 7% Multiple Modes and Mail 6% Rail 2% Water

Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.1, 2010.

Freight Highways

The National Network is approximately 200,000 miles of public roads designated under the Surface Transportation Assistance Act of 1982 (Public Law 97-424) that requires States to allow trucks of certain specific sizes and configurations on the "Interstate System and those portions of the Federal-aid Primary System ... serving to link principal cities and densely developed portions of the States ... utilized extensively by large vehicles for interstate commerce." Required conventional combination trucks are up to 102 inches wide and include tractors with a single semitrailer up to 48 feet in length or with two 28-foot trailers. Most States currently allow conventional combinations with single trailers up to 53 feet in length.

Q&A

What corridors are included in the National Network and where are the routes designated as major freight corridors located?

With approximately 200,000 miles, the National Network is extensive. A map of the network is available in the *Freight Facts and Figures 2009* or online at: http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/09factsfigures/figure3_3.htm.

Likewise, the 27,500 miles of the National Network that carry the largest concentration of freight are identified as major freight corridors. A map of the major U.S. freight corridors can be found in the *FHWA Freight Story, 2008,* or online at: http://ops.fhwa.dot.gov/freight/freight_analysis/freight_story/major.htm.

The National Network has not changed significantly since it was designated in 1982 and is especially important for maintaining truck access to ports and industrial activities in central cities and supporting interstate commerce by regulating the size of trucks.

Freight Transportation and the Cost of Goods

Geographic access of communities to the major freight corridors and performance of the major freight corridors help reduce the cost of goods to the benefit of consumers and businesses, which in turn stimulates economic activity and creates jobs. While deregulation and other factors lowered the cost of freight transportation for a given level of service over the past four decades, congestion, rising fuel prices, environmental constraints, and other factors could increase the cost of moving all goods in the years ahead. If these factors are not mitigated, then the increased cost of moving freight will be felt throughout the economy, affecting businesses and households alike.

The long and often vulnerable supply chains of high-value, time-sensitive commodities are particularly sensitive to congestion. Congestion results in enormous costs to shippers, carriers, and the economy. For example, Nike spends an additional $4 million per week to carry an extra 7 to 14 days of inventory to compensate for shipping delays.[1] One day of delay requires APL's eastbound trans-Pacific services to increase its use of containers and chassis by 1,300, which adds $4 million in costs per year.[2] A week-long disruption to container movements through the Ports of Los Angeles and Long Beach could cost the national economy between $65 million and $150 million per day.[3] Freight bottlenecks on highways throughout the United States cause more than 243 million hours of delay to truckers annually.[4] At a delay cost of $26.70 per hour, the conservative value used by the FHWA's Highway Economic Requirements System model for estimating national highway costs and benefits, these bottlenecks cost truckers about $6.5 billion per year.

Congestion costs are compounded by continuing increases in operating costs per mile and per hour. The cost of highway diesel fuel more than doubled in constant dollars over the decade ending in 2010 and would have quadrupled if the peak in 2008 had continued.[5] Future labor costs are projected to increase at a faster rate than in the past in response to the growing shortage of truck drivers.[6] To attract and retain more drivers, carriers will reduce the number of hours drivers are on the road, which will in turn increase operating costs. Railroads also are facing labor recruitment challenges.[7] Beyond fuel and labor, truck operating costs are affected by needed repairs to damaged equipment caused by deteriorating roads; taxes and tolls to pay for repair of infrastructure; and insurance and additional equipment required to meet security, safety, and environmental requirements.

Increased costs to carriers are reflected eventually in increased prices paid for freight transportation. Between 2003 and 2008, prices increased 23 percent for truck transportation, 49 percent for rail transportation, 28 percent for scheduled air freight, 27 percent for water transportation, 37 percent for pipeline transportation of crude petroleum, 22 percent for other pipeline transportation, and 12 percent for freight transportation support activities.[8]

When the entire economy is taken into account, transportation services contribute about 5 percent to the production of the gross domestic product (GDP).[9] For-hire and in-house trucking provide more than one-half of this contribution. The importance of transportation varies by economic sector. For example, $1 of final demand for agricultural products requires 14.2 cents in transportation services, compared with 9.1 cents for manufactured goods and about 8 cents for mining products.[10] An increase in transportation cost affects inexpensive bulk commodities more than high-value, time-sensitive commodities that have higher margins. In either case, an increase in transportation costs will ripple through all these industries, affecting not only the cost of goods from all economic sectors but also markets for the goods.

[1] John Isabell, "Maritime and Infrastructure Impact on Nike's Inbound Delivery Supply Chain," TRB Freight Roundtable, October 24, 2006 www.trb.org/conferences/FDM/Isabell.pdf.

[2] John Bowe, "The High Cost of Congestion," TRB Freight Roundtable, October 24, 2006 www.trb.org/conferences/FDM/Bowe.pdf.

[3] U.S. Congressional Budget Office, *The Economic Costs of Disruptions in Container Shipments*, March 26, 2006 www.cbo.gov/ftpdocs/71xx/doc7106/03-29-Container_Shipments.pdf.

[4] FHWA, *An Initial Assessment of Freight Bottlenecks on Highways*, October 2005 www.fhwa.dot.gov/policy/otps/bottlenecks.

[5] FHWA, *Freight Facts and Figures 2010*, figure 5-2, page 57.

[6] America Trucking Associations, *The U.S. Truck Driver Shortage: Analysis and Forecasts*, 2005 www.truckline.com/StateIndustry/Documents/ATADriverShortageStudy05.pdf.

[7] Federal Railroad Administration, *An Examination of Employee Recruitment and Retention in the U.S. Railroad Industry*, 2007 www.fra.dot.gov/us/content/1891.

[8] FHWA, *Freight Facts and Figures 2010*, table 4-5, page 50.

[9] FHWA, *Freight Facts and Figures 2010*, page 45.

[10] DOT, Bureau of Transportation Statistics, "The Economic Importance of Transportation Services: Highlights of the Transportation Satellite Accounts," BTS/98-TS4R, April 1998, figure 2, page 5.

The National Network and the NHS are approximately 200,000 miles in length, but the National Network includes 65,000 miles of highway beyond the NHS and the NHS includes 50,000 miles not on the National Network. Both the National Network and the NHS were created for the purpose of supporting interstate commerce. However, the National Network seeks to regulate the size of trucks while the NHS focuses on Federal investments.

Only a small portion of the National Network and the NHS carries the largest concentrations of freight flows. The Federal Highway Administration (FHWA) has identified approximately 27,500 miles of major freight corridors. Interstate highways account for more than 95 percent of the mileage of these major freight corridors. The corridors account for about 60 percent of the length of the Interstate System and less than 17 percent of the National Network.

Freight Challenges

The challenges of moving the Nation's freight cheaply and reliably on an increasingly constrained infrastructure without affecting safety and degrading the environment are substantial, and traditional strategies to support passenger travel may not apply. The freight transportation challenge differs from that of urban commuting and other passenger travel in several ways:

- Freight often moves long distances through localities and responds to distant economic demands, while the majority of passenger travel occurs between local origins and destinations. Freight movement often creates local problems without local benefits.

- Freight movements fluctuate more quickly and in greater relative amounts than passenger travel. While both passenger travel and freight respond to long-term demographic change, freight responds more quickly than passenger travel to short-term economic fluctuations. Fluctuations can be national or local. The addition or loss of just one major business can dramatically change the level of freight activity in a locality.

- Freight movement is heterogeneous compared with passenger travel. Patterns of passenger travel tend to be very similar across metropolitan areas and among large economic and social strata. The freight transportation demands of farms, steel mills, and clothing boutiques differ radically from one another. Solutions aimed at average conditions are less likely to work because the freight demands of economic sectors vary widely.

- Improvements targeted at freight demand are needed because freight accounts for a larger share of VMT on the transportation system and improvements targeted at general traffic or passenger travel are less likely to aid the flow of freight as an incidental by-product.

Local public action is difficult to marshal because freight traffic and the benefits of serving that traffic rarely stay within a single political jurisdiction. One-half of the weight and two-thirds of the value of all freight movements cross a State or international boundary. Federal legislation established metropolitan planning organizations (MPOs) four decades ago to coordinate transportation planning and investment across State and local lines within urban areas, but freight corridors extend well beyond even the largest metropolitan regions and usually involve several States. Creative and ad hoc arrangements are often required through pooled-fund studies and multi-State coalitions to plan and invest in freight corridors that span regions and even the continent, but there are few institutional arrangements that coordinate this activity. One example of a more established multi-State arrangement is the I-95 Corridor Coalition. Additional information about this coalition and similar groups can be found at www.ops.fhwa.dot.gov/freight/corridor_coal.htm.

Challenges for Freight Transportation: Congestion

Congestion affects economic productivity in several ways. American businesses require more operators and equipment to deliver goods when shipping takes longer, more inventory when deliveries are unreliable, and more distribution centers to reach markets quickly when traffic is slow. Likewise, both businesses and households are affected by sluggish traffic on the ground and in the air, reducing the number of workers and job sites within easy reach of any location. The growth in freight is a major contributor to congestion in urban areas and on intercity routes, and congestion affects the timeliness and reliability of freight transportation. Long-distance freight movements are often a significant contributor to local congestion, and local congestion typically impedes freight to the detriment of local and distant economic activity.

Growing freight demand increases recurring congestion at freight bottlenecks, places where freight and passenger service conflict with one another, and where there is not enough room for local pickup and delivery. Congested freight hubs include international gateways such as ports, airports, and border crossings, and major domestic terminals and transfer points such as Chicago's rail yards. Bottlenecks between freight hubs are caused by converging traffic at highway intersections and railroad junctions, steep grades on highways and rail lines, lane reductions on highways and single-track portions of railroads, and locks and constrained channels on waterways. A preliminary study for the FHWA identified intersections in large cities, where both personal vehicles and trucks clog the road, as the largest highway freight bottlenecks.[1]

As passenger cars and trucks compete for space on the highway system, commuter and intercity passenger trains compete with freight trains for space on the railroad network. Rail freight is growing at the same time that rising fuel prices and environmental concerns are encouraging greater use of commuter and high-speed rail.

Congestion also is caused by restrictions on freight movement, such as the lack of space for trucks in dense urban areas and limited delivery and pickup times at ports, terminals, and shipper loading docks. One estimate of urban congestion attributes 947,000 hours of vehicle delay to delivery trucks parked at curbside in dense urban areas where office buildings and stores lack off-street loading facilities.[2] Limitations on delivery times place significant demands on highway rest areas when large numbers of trucks park outside major metropolitan areas waiting for their destination to open and accept their shipments.[3]

Bottlenecks cause recurring, predictable congestion in selected locations while the temporary loss of capacity, or nonrecurring congestion, is widespread and less predictable. Sources of nonrecurring delay include incidents, weather, work zones, and other disruptions. These nonrecurring, often-unpredictable, sources of highway delay have been estimated to exceed delay from recurring congestion.[4] Weather, maintenance activities, and incidents have similar effects on aviation, railroads, pipelines, and waterways. Aviation is regularly disrupted by local weather delays; and inland waterways are closed by regional flooding, droughts, and ice.

Chapter 4 includes a broader discussion of highway congestion.

[1] FHWA, *An Initial Assessment of Freight Bottlenecks on Highways*, October 2005 www.fhwa.dot.gov/policy/otps/bottlenecks.

[2] Oak Ridge National Laboratory, *Temporary Losses of Highway Capacity and Impacts on Performance: Phase 2*, 2004, table 36, page 88 www-cta.ornl.gov/cta/Publications/Reports/ORNL_TM_2004_209.pdf.

[3] FHWA, *Study of Adequacy of Commercial Truck Parking Facilities*, 2002 www.tfhrc.gov/safety/pubs/01158.

[4] Oak Ridge National Laboratory, *Temporary Losses of Highway Capacity and Impacts on Performance: Phase 2*, 2004, table 41, page 101 www-cta.ornl.gov/cta/Publications/Reports/ORNL_TM_2004_209.pdf.

The growing needs of freight transportation can bring into focus conflicts between interstate and local interests. Many communities do not want the noise and other aspects of trucks and trains that pass through with little benefit to the locality, but those transits can have a huge impact on national freight movement and regional economies.

Beyond the challenges of intergovernmental coordination, freight transportation raises additional issues involving the relationships between public and private sectors. Virtually all carriers and many freight facilities are privately owned. *Freight Facts and Figures 2010* shows that the private sector owns $1.07 trillion

Challenges for Freight Transportation: Safety, Energy, and the Environment

Freight transportation is not just an issue of throughput and congestion. The growth in freight movement has heightened public concerns about safety, energy consumption, and the environment.

Highways and railroads account for nearly all fatalities and injuries involving freight transportation. Most of these fatalities involve people who are not part of the freight transportation industry, such as trespassers at railroad facilities and occupants of other vehicles killed in crashes involving large trucks. The FHWA's *Freight Facts and Figures 2010* publication shows that, of the 33,808 highway fatalities in 2009, 1.5 percent were occupants of large trucks and 8.5 percent were others killed in crashes involving large trucks (the remaining 90 percent of fatalities were attributed to other types of personal and commercial vehicles). Chapter 5 discusses highway safety in more detail.

According to *Freight Facts and Figures 2010* single-unit and combination trucks accounted for 22 percent of all gasoline, diesel, and other fuels consumed by motor vehicles, and 69 percent of the fuel consumed by freight transportation in 2008. Fuel consumption by trucks resulted in three-fourths of the 522.6 million metric tons of carbon dioxide (CO_2) equivalent generated by freight transportation, and freight accounted for 28 percent of transportation's contribution to this major greenhouse gas. Trucks and other heavy vehicles are also a major contributor to air quality problems related to nitrogen oxide (NO_x) (33 percent of all mobile sources) and particulate matter of 10 microns in diameter or smaller (PM-10) (23.3 percent of all mobile sources). Freight modes combined account for 49 percent of all mobile sources of NO_x and 36 percent of all mobile sources of PM-10.

Environmental issues involving freight transportation go well beyond emissions. Disposal of dredge spoil, the mud and silt that must be removed to deepen water channels for commercial vessels, is a major challenge for allowing larger ships to berth. Land use and water quality concerns are raised against all types of freight facilities, and invasive species can spread through freight movement. Issues relating to environmental sustainability are discussed in Chapter 11.

Incidents involving hazardous materials exacerbate public concern and cause real disruption. *Freight Facts and Figures 2010* shows that, of the 14,777 accident-related hazardous materials transportation incidents in 2009, highways accounted for 12,691, air accounted for 1,357, and rail accounted for 641. The railcar fire in the Howard Street tunnel under Baltimore City in 2001 illustrates the perceived and real problems of transporting hazardous materials. This incident, which occurred on tracks next to a major league baseball stadium at game time during the evening rush hour, forced the evacuation of thousands of people and closed businesses in much of downtown Baltimore. A vital railroad link between the Northeast and the South, as well as a local rail transit line and all east-west arterial streets through downtown, were closed for an extended period.

in transportation equipment plus $681.2 billion in transportation structures. In comparison, public agencies own $502 billion in transportation equipment plus $2.47 trillion in highways. Freight railroad facilities and services are owned almost entirely by the private sector, while trucks owned by the private sector operate over public highways. Likewise, air cargo services owned by the private sector operate in public airways and mostly at public airports. Privately owned ships operate over public waterways and at both public and private port facilities. Most pipelines are privately owned but significantly controlled by public regulation. In the public sector, virtually all truck routes are owned by State or local governments, and airports and harbors are typically owned by regional or local authorities. Air and water navigation is typically handled at the Federal level, and safety is regulated by all levels of government. As a consequence of this mixed ownership and management, most solutions to freight problems require joint action by both public and private sectors. Financial, planning, and other institutional mechanisms for developing and implementing joint efforts have been limited, inhibiting effective measures to improve the performance and minimize the public costs of the freight transportation system.

Framework for a National Freight Policy

To establish a better understanding of the freight challenge and freight activities by all levels of government and the private sector, the Transportation Research Board convened individuals from transportation providers, shippers, State agencies, port authorities, and the U.S. Department of Transportation (DOT) to form a Freight Transportation Industry Roundtable. Members of the roundtable developed an initial Framework for a National Freight Policy to identify freight activities and focus those activities toward common objectives. The framework continues to evolve within the DOT as part of its outreach to members of the freight community.

The objectives and strategies of the framework summarize a large number of tactics and activities, including the freight programs that were launched under the Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU authorized $4.6 billion for freight-oriented infrastructure investments, expanded eligibility for freight projects under previous programs, modified the tax code to encourage up to $15 billion in private investment, initiated a program to enhance the capacity of the freight profession, and launched the National Cooperative Freight Research Program.

SAFETEA-LU and local recognition of freight challenges have stimulated a variety of freight plans, investments, and management initiatives in State departments of transportation, MPOs, port authorities, and the private sector. Several State departments of transportation have begun collaborative planning efforts for multistate freight corridors; and public-private partnerships such as the Intermodal Freight Technology Working Group (IFTWG) have been established to pursue creative financial and technological options for improving the efficiency, safety, and security of freight movement. These activities and their relationship to the Framework for a National Freight Policy are described in the FHWA's *Freight Story 2008*.

Freight challenges are not new, but their ongoing importance and increased complexity warrant creative solutions by all with a stake in the vitality of the American economy. Enhanced freight planning, improved institutional arrangements for multi-State freight projects, and performance management requirements are among proposed responses to freight challenges being considered through reauthorization of the Federal-aid highway program.

Bridge System Characteristics

The National Bridge Inventory (NBI) contains records for 603,310 bridges longer than 20 feet (6.1 meters) in total length located on public roads in the United States in 2009. Information concerning the Nation's bridges is collected on a regular basis in accordance with the National Bridge Inspection Standards. These standards are discussed in more detail in Chapter 3.

This section presents information on the characteristics of the Nation's bridges, including ownership, deck area, the amount of traffic carried, and the functional classification of roadways on which bridges are located.

Q&A

Why do the bridge statistics presented in this report cover the period from 2001 to 2009, rather than the 2000 to 2008 data presented for highways?

This report is based on the latest available data at the time the writing of each chapter commenced; in the case of bridge data, it covers information in the National Bridge Inventory as of October 2009. Final 2009 numbers would reflect information in the NBI as of December 2009.

However, it should be noted that the majority of bridges are inspected once every 24 months. Therefore, the "2009" NBI data actually reflect the conditions of individual bridges from late 2007 through late 2009, or late 2008 on average.

In contrast, the HPMS data cited earlier in this chapter were based on annual reports entered into the system in 2009, which reflected the system as of the end of 2008; these data are commonly referred to as "2008" HPMS data.

Bridges by Owner

Exhibit 2-19 identifies bridges by owner. The majority of State and local bridges are owned by highway agencies. However, some bridges are owned by State or local park, forest, and reservation agencies; toll authorities; and other State or local agencies. At the Federal level, bridge ownership is spread across a number of agencies; many such bridges are owned by units within the Department of Interior and by the Department of Defense. A small number (less than 1 percent) of bridges carrying public roadways are owned by private entities. Bridges carrying railroads are not included in the database unless they also carry a public road or cross a public road where information of certain features, such as vertical or horizontal clearances, is required for management of the highway system.

Q&A

How do the bridge ownership percentages compare with the road ownership percentages?

In 2009, bridge ownership was nearly equally divided between State (slightly more than 48.6 percent) and local (slightly more than 50.2 percent) agencies. As noted earlier, the majority of roadways were owned by local agencies (77.4 percent) in 2008.

Exhibit 2-19

Bridges by Owner, 2001–2009

Owner	2001	2003	2005	2007	2009	Annual Rate of Change 2009/2001
Federal	8,769	8,437	8,276	8,404	8,452	-0.5%
State	278,504	281,684	283,644	286,623	290,062	0.5%
Local	299,224	299,499	301,162	302,921	303,014	0.2%
Private	2,302	1,511	1,435	1,451	1,426	-5.8%
Unknown/Unclassified	1,354	1,206	1,151	481	356	-15.4%
Total	**590,153**	**592,337**	**595,668**	**599,880**	**603,310**	**0.3%**

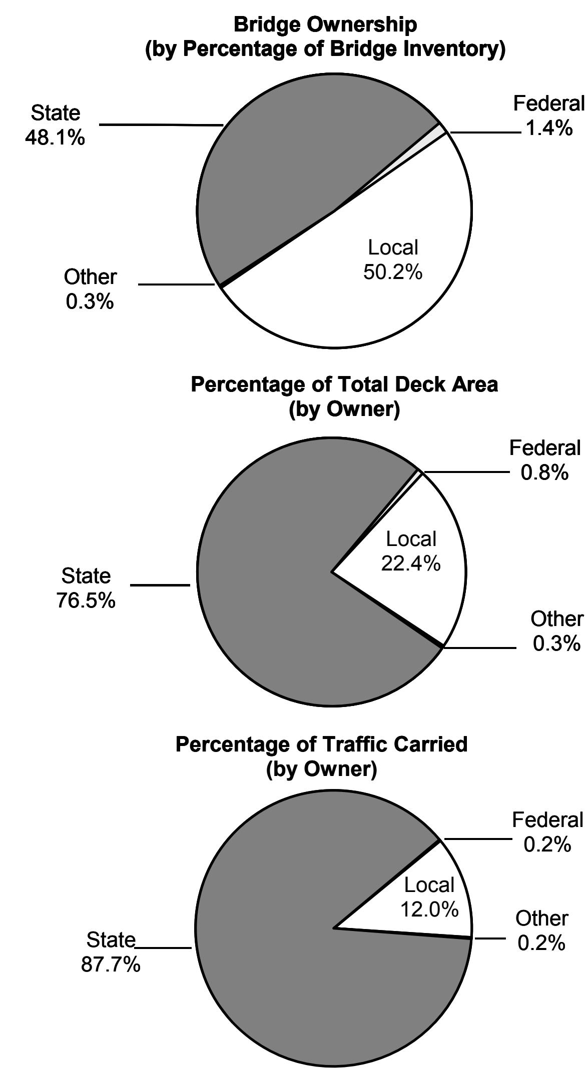
Source: National Bridge Inventory as of October 2009.

Between 2001 and 2009, the total number of bridges grew at an average annual rate of 0.3 percent to 603,310. This increase has been concentrated in State-owned and locally owned bridges; the number of bridges owned by the Federal government and private entities decreased over this period. Of note is the steady reduction in the number of bridges recorded as unknown/unclassified from 1,354 in 2001 to 356 in 2009. The reduction is the result of the continued efforts to properly and accurately record data for all bridges on the Nation's roadways.

In 2009, State agencies owned 290,062 bridges, while local agencies owned 303,014. While these numbers are relatively even in terms of raw counts, it is important to recognize that State agencies own a disproportionate amount of larger bridges with higher traffic volumes. As shown in *Exhibit 2-20*, while States owned 48.1 percent of total bridges in 2009, these bridges constituted 76.5 percent of total bridge deck area and carried 87.7 percent of total bridge traffic. In 2009, State agencies were responsible for the maintenance and operation of more than 3.4 times the deck area of local agencies. In addition, bridges owned by State agencies carried more than 7.3 times the traffic of bridges owned by local agencies.

Exhibit 2-20

Bridge Inventory Characteristics for Ownership, Traffic, and Deck Area, 2009



Source: National Bridge Inventory as of October 2009.

Bridges by Functional Classification

Highway functional classifications are maintained in the NBI according to the hierarchy used for highway systems previously described in this chapter. The number of bridges by functional classification is summarized and compared with previous years in *Exhibit 2-21.*

As noted earlier in this chapter, changes in urban area boundaries resulting from the 2000 Census have led to reductions in the number of rural bridges. The number of bridges on all rural functional classifications has shown, for the most part, a steady decline since 2001, while the number of urban bridges on all functional classifications has, in the majority of years, shown an unbroken increase. The number of bridges on urban collectors has increased at an average annual rate of 3.3 percent between 2001 and 2009, increasing the fastest among the functional classes identified.

Exhibit 2-22 shows the relationship between bridges among various rural and urban functional classes. In 2009, there were approximately 2.9 rural bridges for every 1 urban bridge. However, urban bridges carried more than 3.2 times the ADT of rural bridges and comprised slightly less than 1.3 times the deck area of rural bridges.

In 2009, the 206,127 bridges on roads classified as rural local constituted 34.2 percent of the total number of bridges, but accounted for only 9.6 percent of total bridge deck area and carried only 1.4 percent of total bridge traffic. In contrast, the 29,743 urban Interstate System bridges made up only 4.9 percent of total bridges, but accounted for 19.3 percent of total bridge deck area and carried 35.8 percent of total bridge ADT.

Interstate bridges in urban areas carried almost 3.9 times the ADT carried by rural interstate bridges in 2009. In fact, the ADT carried on urban Interstate System bridges was more than 1.5 times the ADT carried on all rural bridges combined in 2009.

Exhibit 2-21

Number of Bridges by Functional System, 2001–2009

Functional System	2001	2003	2005	2007	2009	Annual Rate of Change 2009/2001
Rural						
Interstate	27,579	27,769	26,946	26,134	25,268	-1.1%
Other Arterial	75,335	76,064	75,273	74,616	74,506	-0.1%
Collector	143,517	143,457	142,869	141,679	141,053	-0.2%
Local	209,845	209,218	207,866	206,165	206,127	-0.2%
Subtotal Rural	456,276	456,508	452,954	448,594	446,954	-0.3%
Urban						
Interstate	27,875	27,601	28,566	29,309	29,743	0.8%
Other Arterial	64,074	65,451	68,625	72,567	74,797	2.0%
Collector	15,405	15,278	16,873	18,629	19,992	3.3%
Local	26,043	27,085	28,344	30,666	31,773	2.5%
Subtotal Urban	133,397	135,415	142,408	151,171	156,305	2.0%
Not coded	480	415	306	115	51	-24.4%
Total	**590,153**	**592,338**	**595,668**	**599,880**	**603,310**	**0.3%**

Source: National Bridge Inventory as of October 2009.

Exhibit 2-22

Bridges by Functional System Weighted by Numbers, ADT, and Deck Area, 2009

Functional System	Number of Bridges	Percent by Total Number	Percent of Total Deck Area	Percent of Total ADT
Rural				
Interstate	25,268	4.2%	7.1%	9.2%
Other Principal Arterial	35,699	5.9%	8.7%	5.8%
Minor Arterial	38,807	6.4%	6.1%	3.3%
Major Collector	93,036	15.4%	9.3%	3.2%
Minor Collector	48,017	8.0%	3.3%	0.8%
Local	206,127	34.2%	9.6%	1.4%
Subtotal Rural	**446,954**	**74.1%**	**44.1%**	**23.7%**
Urban				
Interstate	29,743	4.9%	19.3%	35.8%
Other Freeways & Expressways	19,512	3.2%	10.6%	16.1%
Other Principal Arterial	27,442	4.5%	11.3%	11.9%
Minor Arterial	27,843	4.6%	7.4%	7.3%
Collector	19,992	3.3%	3.6%	2.7%
Local	31,773	5.3%	3.8%	2.4%
Subtotal Urban	**156,305**	**25.9%**	**55.9%**	**76.3%**
Unclassified	51	0.0%		
Total	**603,310**	**100.0%**	**100.0%**	**100.0%**

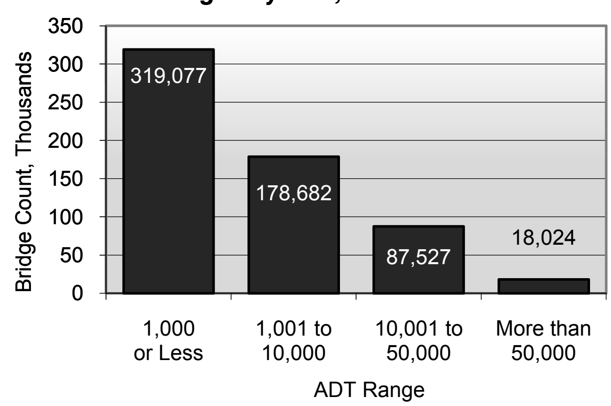
Source: National Bridge Inventory as of October 2009.

Bridges by Traffic Volume

As shown in *Exhibit 2-23*, many bridges carry relatively low volumes of traffic on a typical day. Approximately 319,077 bridges, 52.9 percent of the total bridges in the Nation, have an ADT of 1,000 or less. An additional 178,682 bridges, 29.6 percent of all bridges, have an ADT between 1,001 and 10,000. Only 18,024 of the Nation's bridges, or 3.0 percent, have an ADT higher than 50,000. The remaining 87,527 bridges, 14.5 percent, have an ADT between 10,001 and 50,000.

Exhibit 2-23

Number of Bridges by ADT, 2009



Source: National Bridge Inventory as of October 2009.

NHS Bridges

Exhibit 2-24 shows that the 117,510 bridges on the National Highway System (NHS) as of 2009 constituted 19.5 percent of total bridges in the Nation, but included 49.2 percent of total bridge deck area and carried 71.0 percent of total bridge traffic. Taken together, rural and urban Interstate bridges accounted for 9.1 percent of the total bridges, but carried 45.1 percent of total bridge traffic in 2009. As referenced earlier in this chapter, the NHS includes the entire Interstate System, as well as additional critical routes. The STRAHNET system, including Interstate highways and other routes critical to national defense, included 67,843 bridges in 2009. All STRAHNET routes, including STRAHNET connectors, are included as part of the NHS.

Exhibit 2-24

Interstate, STRAHNET, and NHS Bridges Weighted by Numbers, ADT, and Deck Area, 2009

Federal System *	Number of Bridges	Percent by Total Number of Bridges	Percent of Total Deck Area	Percent of Total ADT
Interstate System	55,011	9.1%	26.3%	45.1%
STRAHNET	67,843	11.2%	30.8%	49.9%
National Highway System	117,510	19.5%	49.2%	71.0%

** The NHS includes all of STRAHNET; STRAHNET includes the entire Interstate System.*

Source: National Bridge Inventory as of October 2009.

Transit System Characteristics

System History

The first transit systems in the United States date to the late 19th century. These were privately owned, for-profit businesses that were instrumental in defining the urban communities of that time. By the postwar period, competition from the private automobile was making it impossible for transit businesses to operate at a profit. As they started to fail, local, State, and national government leaders began to realize the importance of sustaining transit services. In 1964, Congress passed the Urban Mass Transportation Act, which established the agency now known as the Federal Transit Administration (FTA) to administer Federal funding for transit systems. The Act also changed the character of the industry by specifying that Federal funds for transit were to be given to public agencies rather than private firms; this accelerated transit systems' transition from private to public ownership and operation. The Act also required local governments to contribute matching funds in order to receive Federal aid for transit services, setting the stage for the multilevel governmental partnerships that continues to characterize the transit industry today.

State governments' involvement in the provision of transit services is generally through financial support and performance oversight. In some cases, States have undertaken outright ownership and operation of transit services; six States—Connecticut, Delaware, Massachusetts, Maryland, Pennsylvania, and Washington—own and operate transit systems directly.

Colorful Transit Vocabulary

Modal network refers to a system of routes and stops served by one type of transit technology; this could be a bus network, a light rail network, a ferry network, or a demand response system. Transit operators often maintain several different modal networks, most often motor bus systems augmented with demand response service.

Articulated bus is an extra-long (54 ft. to 60 ft.) bus with two connected passenger compartments. The rear body section is connected to the main body by a joint mechanism that allows the vehicles to bend when in operation for sharp turns and curves and yet have a continuous interior.

Automated Guideway Systems are driverless, rubber-tire vehicles usually running alone or in pairs on a single broad concrete rail, typical of most airport trains.

Demand response service usually consists of passenger cars, vans, or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. The vehicles do not operate over a fixed route or on a fixed schedule, except on a temporary basis to satisfy a special need. A vehicle may be dispatched to pick up several passengers at different pickup points before taking them to their respective destinations.

Públicos or "public cars" are typically 17-passenger vans that serve towns throughout Puerto Rico, stopping in each community's main plaza or at a destination requested by a passenger. They operate without a set schedule, primarily during the day; the public service commission fixes routes and fares. Some routes have vehicles in good condition, with air-conditioning, workable radios, and seats without holes. San Juan-based Público companies include Blue Line for trips to Aguadilla and the northwest coast, Choferes Unidos de Ponce for Ponce, Línea Caborrojeña for Cabo Rojo and the southwest coast, Línea Boricua for the interior and the southwest, Línea Sultana for Mayagüez and the west coast, and Terminal de Transportación Pública for Fajardo and the east.

Jitneys are generally small-capacity vehicles that follow a rough service route, but can go slightly out of their way to pick up and drop off passengers. In many U.S. cities (e.g., Pittsburgh and Detroit), the term "jitney" refers to an unlicensed taxicab. In some U.S. jurisdictions, the limit to a jitney is seven passengers.

Revenue service is the time when a vehicle is actively providing service to the general public and carrying passengers or at least available to them. Revenue from fares is not necessary because vehicles are considered to be in revenue service even when the ride is free.

In 1962, the United States Congress passed legislation that required the formation of metropolitan planning organizations (MPOs) for urbanized areas with populations greater than 50,000. MPOs are composed of State and local officials who work to address the transportation planning needs of an urbanized area at a regional level. Twenty-nine years later, the Intermodal Surface Transportation Efficiency Act of 1991 made MPO coordination an essential prerequisite for Federal funding of many transit projects.

State and local transit agencies have evolved into a number of different institutional models. A transit provider may be a unit of a regional transportation agency; may be operated directly by the State, county, or city government; or may be an independent agency with an elected or appointed Board of Governors. Transit operators can provide service directly with their own equipment or they may purchase transit services through an agreement with a contractor. All public transit services must be open to the general public without discrimination and meet the accessibility requirements of the Americans with Disabilities Act of 1990 (ADA).

System Infrastructure

Urban Transit Agencies

In 2008, there were 690 agencies in urbanized areas that were required to submit data to the National Transit Database (NTD), of which 667 were public agencies, including six State departments of transportation (DOTs). The remaining 23 agencies were either private operators or independent agencies (e.g., nonprofit organizations). Of the 690 agencies, 116 received either a reporting exemption for operating nine or fewer vehicles or a temporary reporting waiver. The remaining 574 reporting agencies provided service on 1,479 separate modal networks; all but 166 agencies operated more than one mode. In 2008, there were an additional 1,396 transit operators serving rural areas. Not all transit providers are included in these counts because those that do not receive grant funds from the FTA are not required to report to the NTD. Some, but not all, agencies report anyway, as this can help their region receive more Federal transit funding.

The Nation's motor bus and demand response systems are much more extensive than the Nation's rail transit system. In 2008, there were 658 motor bus systems and 633 demand response systems in urban areas, compared with 17 heavy rail systems, 29 commuter rail systems, and 35 light rail systems. While motor bus and demand response systems were found in every major urbanized area in the United States, 84 urbanized areas were served by at least one of the three primary rail modes, including 55 by commuter rail, 25 by light rail, and 24 by heavy rail (listed in *Exhibit 2-25*). In addition to these modes, there were 67 publicly operated transit vanpool systems, 20 ferryboat systems, seven trolleybus systems, four automated guideway systems, four inclined plane systems, and one cable car system operating in urbanized areas of the United States and its territories.

The transit statistics presented in this report also include the San Francisco Cable Car, the Seattle Monorail, the Roosevelt Island Aerial Tramway in New York, and the Alaska Railroad (which is a combination of long-distance passenger rail, sightseeing, and freight transportation services.)

Exhibit 2-25

Rail Modes Serving Urbanized Areas, by State

Mode: Heavy Rail

Rail System Name	City	State	Vehicles
Los Angeles County Metropolitan Transportation Authority (LACMTA)	Los Angeles	CA	70
San Francisco Bay Area Rapid Transit District (BART)	Oakland	CA	540
Santa Clara Valley Transportation Authority (VTA)	San Jose	CA	
Washington Metropolitan Area Transit Authority (WMATA)	Washington	DC	830
Miami-Dade Transit (MDT)	Miami	FL	98
Metropolitan Atlanta Rapid Transit Authority (MARTA)	Atlanta	GA	188
City and County of Honolulu Department of Transportation Services (DTS)	Honolulu	HI	
Chicago Transit Authority (CTA)	Chicago	IL	1,016
Massachusetts Bay Transportation Authority (MBTA)	Boston	MA	320
Maryland Transit Administration (MTA)	Baltimore	MD	54
Port Authority Trans-Hudson Corporation (PATH)	Jersey City	NJ	266
Port Authority Transit Corporation (PATCO)	Lindenwold	NJ	84
MTA New York City Transit (NYCT)	New York	NY	5,288
Staten Island Rapid Transit Operating Authority (SIRTOA)	Staten Island	NY	46
The Greater Cleveland Regional Transit Authority (GCRTA)	Cleveland	OH	22
Southeastern Pennsylvania Transportation Authority (SEPTA)	Philadelphia	PA	278
Puerto Rico Highway and Transportation Authority (PRHTA)	San Juan	PR	40

Mode: Commuter Rail

Rail System Name	City	State	Vehicles
Altamont Commuter Express (ACE)	Stockton	CA	18
North County Transit District (NCTD)	Oceanside	CA	26
Peninsula Corridor Joint Powers Board (PCJPB)	San Carlos	CA	96
Riverside County Transportation Commission (RCTC)	Riverside	CA	
Southern California Regional Rail Authority (Metrolink)	Los Angeles	CA	173
Connecticut Department of Transportation (CDOT)	Newington	CT	22
Delaware Transit Corporation (DTC)	Dover	DE	
South Florida Regional Transportation Authority (TRI-Rail)	Pompano Beach	FL	34
Northeast Illinois Regional Commuter Railroad Corporation (Metra)	Chicago	IL	1,056
Northern Indiana Commuter Transportation District (NICTD)	Chesterton	IN	66
Massachusetts Bay Transportation Authority (MBTA)	Boston	MA	419
Maryland Transit Administration (MTA)	Baltimore	MD	132
Northern New England Passenger Rail Authority (NNEPRA)	Portland	ME	14
Metro Transit	Minneapolis	MN	
New Jersey Transit Corporation (NJ TRANSIT)	Newark	NJ	944
Metro-North Commuter Railroad Company (MTA-MNCR)	New York	NY	1,089
MTA Long Island Rail Road (MTA LIRR)	Jamaica	NY	1,018
Metro Regional Transit Authority (Metro)	Akron	OH	
Tri-County Metropolitan Transportation District of Oregon (TriMet)	Portland	OR	
Pennsylvania Department of Transportation (PENNDOT)	Harrisburg	PA	20
Southeastern Pennsylvania Transportation Authority (SEPTA)	Philadelphia	PA	315
Regional Transportation Authority (RTA)	Nashville	TN	5
Capital Metropolitan Transportation Authority (CMTA)	Austin	TX	
Dallas Area Rapid Transit (DART)	Dallas	TX	21
Fort Worth Transportation Authority (The T)	Fort Worth	TX	15
Metropolitan Transit Authority of Harris County, Texas (Metro)	Houston	TX	
Utah Transit Authority (UTA)	Salt Lake City	UT	18
Virginia Railway Express (VRE)	Alexandria	VA	78
Central Puget Sound Regional Transit Authority (ST)	Seattle	WA	38

Exhibit 2-25

Rail Modes Serving Urbanized Areas, by State (Continued)

Mode: Light Rail

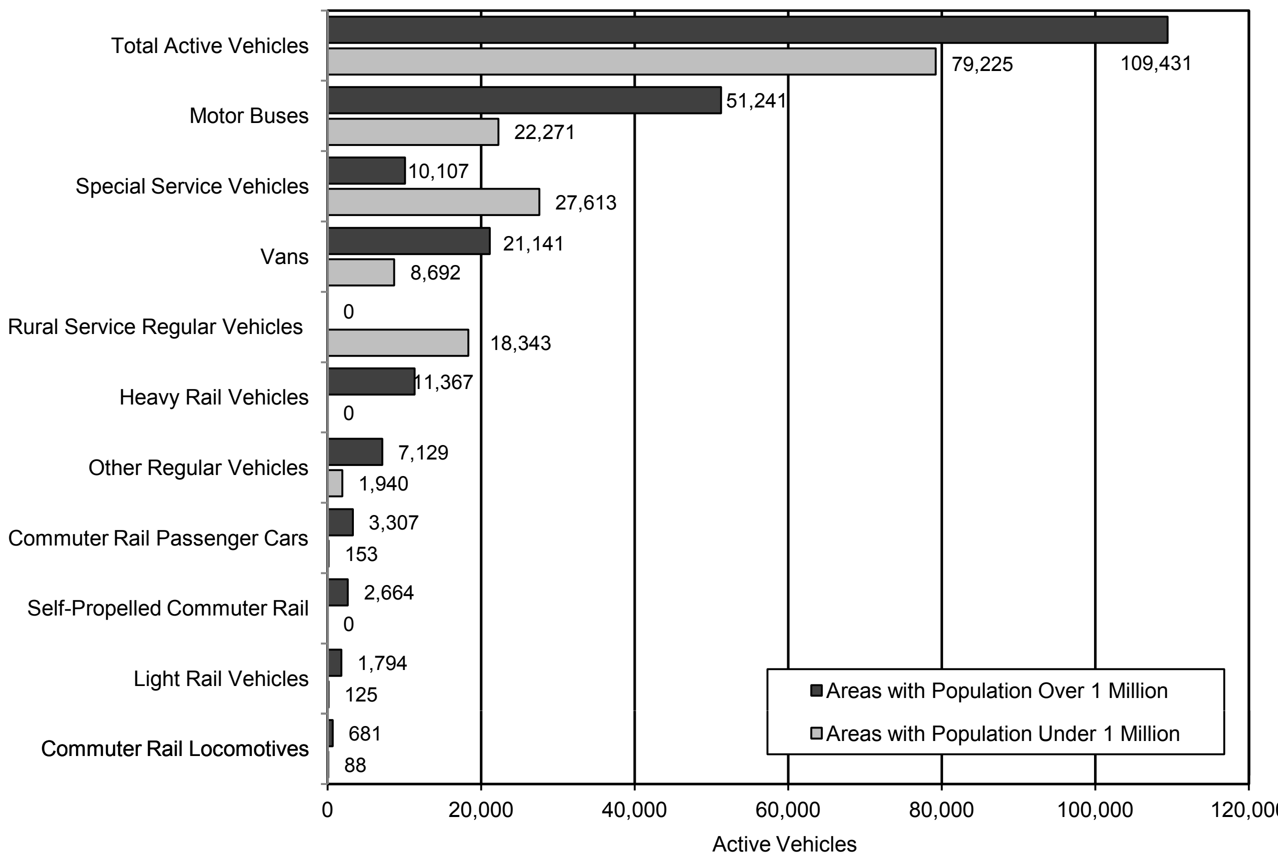
Rail System Name	City	State	Vehicles
Central Arkansas Transit Authority (CATA)	Little Rock	AR	3
City of Phoenix Public Transit Department (Valley Metro)	Phoenix	AZ	
City of Tucson (COT)	Tucson	AZ	
Regional Public Transportation Authority (RPTA)	Phoenix	AZ	
Los Angeles County Metropolitan Transportation Authority (LACMTA)	Los Angeles	CA	102
North County Transit District (NCTD)	Oceanside	CA	4
Sacramento Regional Transit District (Sacramento RT)	Sacramento	CA	56
San Diego Metropolitan Transit System (MTS)	San Diego	CA	93
San Francisco Municipal Railway (MUNI)	San Francisco	CA	139
Santa Clara Valley Transportation Authority (VTA)	San Jose	CA	54
Denver Regional Transportation District (RTD)	Denver	CO	101
Hillsborough Area Regional Transit Authority (HART)	Tampa	FL	8
New Orleans Regional Transit Authority (NORTA)	New Orleans	LA	22
Massachusetts Bay Transportation Authority (MBTA)	Boston	MA	152
Maryland Transit Administration (MTA)	Baltimore	MD	36
Metro Transit	Minneapolis	MN	27
Bi-State Development Agency (METRO)	St. Louis	MO	56
Charlotte Area Transit System (CATS)	Charlotte	NC	19
New Jersey Transit Corporation (NJ TRANSIT)	Newark	NJ	17
New Jersey Transit Corporation (NJ TRANSIT)	Newark	NJ	59
Niagara Frontier Transportation Authority (NFT Metro)	Buffalo	NY	23
The Greater Cleveland Regional Transit Authority (GCRTA)	Cleveland	OH	17
Tri-County Metropolitan Transportation District of Oregon (TriMet)	Portland	OR	85
Port Authority of Allegheny County (Port Authority)	Pittsburgh	PA	51
Southeastern Pennsylvania Transportation Authority (SEPTA)	Philadelphia	PA	127
Memphis Area Transit Authority (MATA)	Memphis	TN	12
Dallas Area Rapid Transit (DART)	Dallas	TX	85
Island Transit (IT)	Galveston	TX	4
Metropolitan Transit Authority of Harris County, Texas (Metro)	Houston	TX	17
Utah Transit Authority (UTA)	Salt Lake City	UT	46
Hampton Roads Transit (HRT)	Hampton	VA	
Central Puget Sound Regional Transit Authority (ST)	Seattle	WA	2
Central Puget Sound Regional Transit Authority (ST)	Seattle	WA	
King County Department of Transportation (King County Metro)	Seattle	WA	2
Kenosha Transit (KT)	Kenosha	WI	3

Transit Fleet

Exhibit 2-26 provides an overview of the Nation's 188,656 transit vehicles in 2008 by type of vehicle and size of urbanized area. Although some types of vehicles are specific to certain modes, many vehicles—particularly small buses and vans—are used by several different transit modes. For example, vans may be used to provide vanpool, demand response, Público, or motor bus services.

Exhibit 2-26

Transit Active Fleet by Vehicle Type, 2008



Notes:

1: "Other Regular Vehicles" includes aerial tramway vehicles, Alaska railroad vehicles, automated guideway vehicles, automobiles, cable cars, ferryboats, inclinded plane vehicles, jitneys, Públicos, taxicabs, and trolleybuses.

2: Source for "Special Service Vehicles" is the FTA, Fiscal Year Trends Report on the Use of Section 5310 Elderly and Persons with Disabilities Program Funds, 2002.

Source: National Transit Database except where otherwise noted.

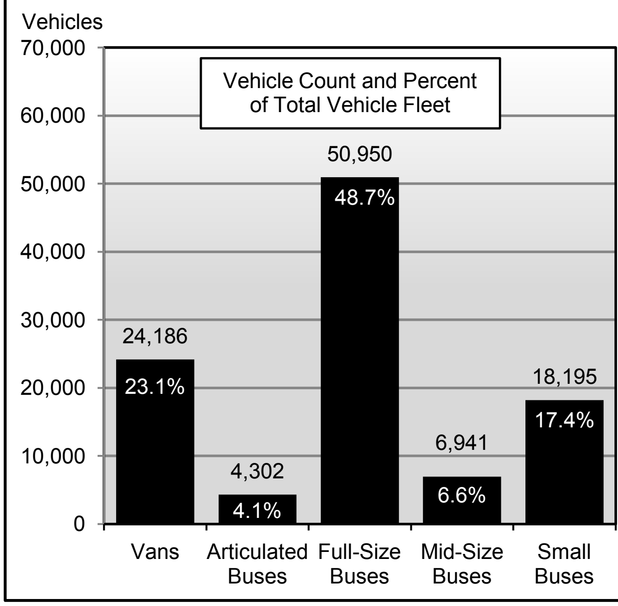
Exhibit 2-27 shows the composition of the Nation's urban transit road vehicle fleet in 2008. Almost half of these vehicles, 48.7 percent, are full-sized motor buses. Additional information on trends in the number and condition of vehicles over time is included in Chapter 3.

Track, Stations, and Maintenance Facilities

Maintenance facility counts are broken down by mode and by size of the urbanized areas in *Exhibit 2-28*. Additional data on the age and condition of these facilities is included in Chapter 3.

Exhibit 2-27

Composition of Urban Transit Road Vehicle Fleet, 2008



Source: Transit Economic Requirements Model and National Transit Database.

Exhibit 2-28

Maintenance Facilities for Directly Operated Services, 2008

	Population Category		
Maintenance Facility Type[1]	**Over 1 Million**	**Under 1 Million**	**Total**
Heavy Rail	59	0	59
Commuter Rail	49	1	50
Light Rail	38	6	44
Other Rail [2]	3	4	7
Motorbus	302	242	544
Demand Response	34	78	112
Ferryboat	7	0	7
Other Nonrail [3]	6	5	11
Total Urban Maintenance Facilities	497	336	833
Rural Transit [4]		510	510
Total Maintenance Facilities	497	846	1,343

[1] Includes owned and leased facilities.
[2] Alaska railroad, automated guideway, cable car, inclined plane, and monorail.
[3] Aerial tramway, jitney, Público, and vanpool.
[4] Vehicles owned by operators receiving funding from FTA as directed by 49 USC Section 5311. These funds are for transit services in areas with populations of less than 50,000. (Section 5311 Status of Rural Public Transportation 2000, Community Transportation Association of America, April 2001.)
Source: National Transit Database.

As shown in *Exhibit 2-29*, in 2008, transit providers operated 11,864 miles of track and served 3,078 stations, compared with 11,796 miles of track and 3,053 stations in 2006. Expansion in light rail track mileage (5.1 percent) and stations (3.0 percent) accounted for most of the increase, a trend that continues from the recent past. The Nation's rail system mileage is dominated by the longer distances generally covered by commuter rail. Light and heavy rail typically operate in more densely developed areas and have more stations per track mile.

Exhibit 2-29

Transit Rail Mileage and Stations, 2008

	Population Category		
	Over 1 Million	Under 1 Million	Total
Urbanized Area Track Mileage			
Heavy Rail	2,277	0	2,277
Commuter Rail	7,012	395	7,407
Light Rail	1,459	80	1,539
Other Rail and Tramway*	24	618	641
Total Urbanized Area Track Mileage	**10,772**	**1,092**	**11,864**
Urbanized Area Transit Rail Stations Count			
Heavy Rail	1,041	0	1,041
Commuter Rail	1,147	42	1,189
Light Rail	716	71	787
Other Rail and Tramway	39	22	61
Total Urbanized Area Transit Rail Stations	**2,943**	**135**	**3,078**

** Alaska railroad, automated guideway, cable car, inclined plane, monorail, and aerial tramway.*

Source: National Transit Database.

System Coverage: Urban Directional Route Miles

The extent of the coverage of the Nation's transit system is measured in directional route miles, or simply "route miles." Route miles measure the distance covered by a transit route; even though opposite-direction transit routes may use the same road or track, they are counted separately. Data associated with route miles are not collected for demand response and vanpool modes, since these transit modes do not travel along specific predetermined routes. Route miles data are also not collected for jitney services, since these transit modes often have highly variable route structures.

Exhibit 2-30 enumerates directional route miles by mode over the past 8 years. Growth in both rail (22.2 percent) and nonrail (8.1 percent) route miles is evident over this period. The average 6.7 percent rate of annual growth for light rail clearly outpaces the rate of growth for all other modes.

Exhibit 2-30

Transit Urban Directional Route Miles, 2000–2008

Transit Mode	Route Miles					Average Annual Rate of Change
	2000	2002	2004	2006	2008	2008/2000
Rail	**9,222**	**9,484**	**9,782**	**10,865**	**11,270**	**2.5%**
Commuter Rail [1]	6,802	6,923	6,968	7,930	8,219	2.4%
Heavy Rail	1,558	1,572	1,597	1,623	1,623	0.5%
Light Rail	834	960	1,187	1,280	1,397	6.7%
Other Rail [2]	29	30	30	31	30	0.6%
Nonrail [3]	**196,858**	**225,820**	**216,619**	**223,489**	**212,801**	**1.0%**
Bus	195,884	224,838	215,571	222,445	211,664	1.0%
Ferryboat	505	513	623	620	682	3.8%
Trolleybus	469	468	425	424	456	-0.4%
Total	**206,080**	**235,304**	**226,401**	**234,354**	**224,071**	**1.1%**
Percent Nonrail	95.5%	96.0%	95.7%	95.4%	95.0%	

[1] Includes Alaska rail.
[2] Automated guideway, inclined plane, cable car, and monorail.
[3] Excludes jitney, Público, and vanpool.

Source: National Transit Database.

System Capacity

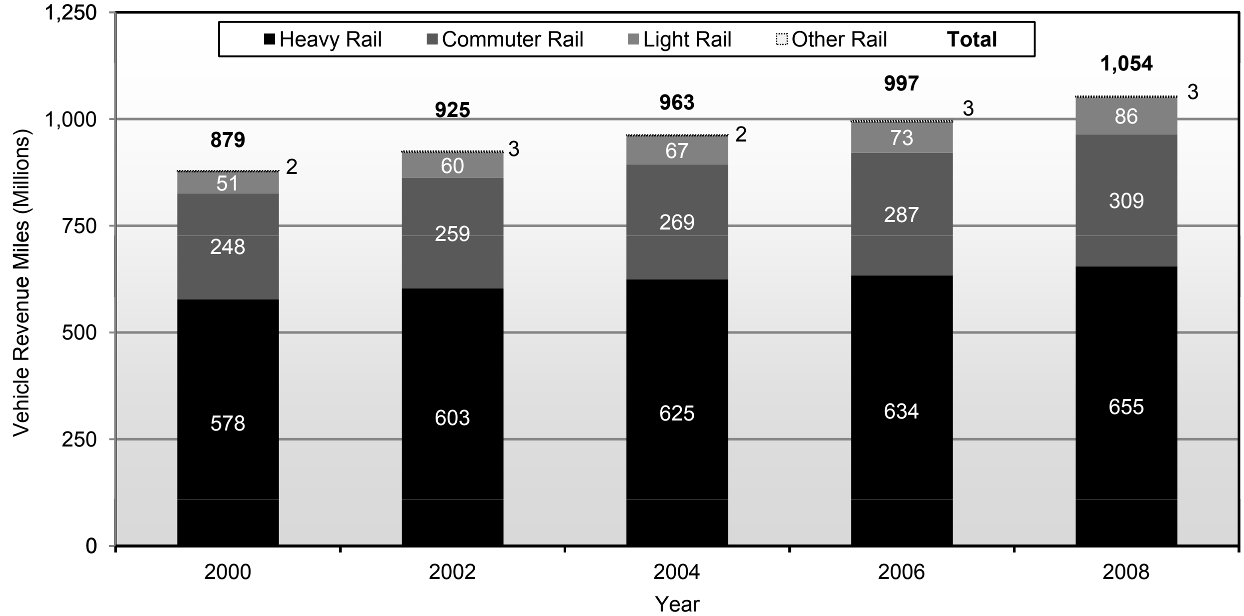
Transit system capacity, particularly in cross-modal comparisons, is typically measured by capacity-equivalent vehicle revenue miles (VRMs). Capacity-equivalent VRMs measure the distance traveled by transit vehicles in revenue service and adjust them by the passenger-carrying capacity of each transit vehicle type, with the average carrying capacity of motor bus vehicles representing the baseline. To calculate capacity-equivalent VRMs, the number of revenue miles for a vehicle is multiplied by the bus-equivalent capacity of that vehicle. Thus, a heavy rail car that seats 2.5 times more people than a full-size bus provides 2.5 capacity-equivalent miles for each revenue mile it travels.

Exhibit 2-31 shows reported VRMs, unadjusted by passenger-carrying capacity. These numbers are of interest because they show the actual number of miles traveled by each mode in revenue service. Unadjusted VRMs provided by both bus services and rail services show consistent growth, with light rail and vanpool miles growing somewhat faster growth than the other modes. Overall, the number of VRMs is up by 20.0 percent since 2000.

The 2008 capacity-equivalent factors for each mode are shown in *Exhibit 2-32*. Unadjusted VRMs for each mode are multiplied by a capacity-equivalent factor in order to calculate capacity-equivalent VRMs. These factors are equal to the average full-seating and full-standing capacities of vehicles in active service for each transit mode divided by the average full-seating and full-standing capacities of all motor bus vehicles in active service. The average capacity of the national motor bus fleet changes slightly from year-to-year as the proportion of large, articulated, and small buses varies. The average capacity of the bus fleet in 2008 was 39 seated and 23 standing for a total of 62 riders.

Exhibit 2-31

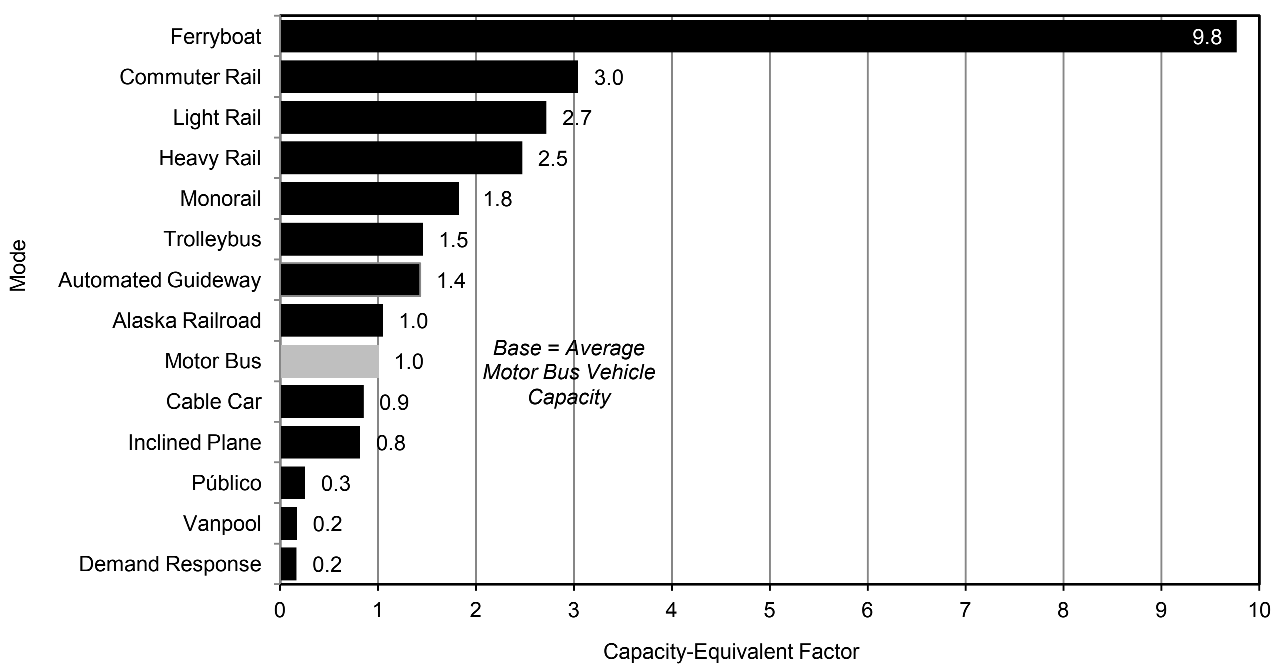
Rail Vehicle Revenue Miles, 2000–2008



Source: National Transit Database.

Exhibit 2-32

2008 Capacity-Equivalent Factors by Mode



Source: National Transit Database.

Total capacity-equivalent VRMs are shown in *Exhibit 2-33*. The most rapid expansion in capacity-equivalent VRMs in the period from 2000 to 2008 has been for vanpools, followed by light rail and then commuter rail. Total capacity-equivalent revenue miles have increased from 3,954 in 2000 to 4,953 in 2008, an increase of 25.3 percent.

Exhibit 2-33

Capacity-Equivalent Revenue Vehicle Miles, 2000–2008

	Vehicle Miles (Millions)					Average Annual Rate of Change
Transit Mode	**2000**	**2002**	**2004**	**2006**	**2008**	**2008/2000**
Rail	**2,046**	**2,274**	**2,413**	**2,681**	**2,799**	**4.0%**
Heavy Rail	1,321	1,469	1,546	1,648	1,621	2.6%
Commuter Rail	595	652	685	832	940	5.9%
Light Rail	127	150	179	197	235	8.0%
Other Rail	3	3	3	4	3	0.5%
Nonrail	**1,908**	**2,037**	**2,064**	**2,118**	**2,154**	**1.5%**
Motor Bus	1,764	1,864	1,885	1,910	1,956	1.3%
Demand Response	76	100	101	121	115	5.4%
Vanpool	11	15	15	22	27	11.3%
Ferryboat	30	32	32	37	32	0.9%
Trolleybus	20	20	20	19	16	-2.4%
Other Nonrail	7	7	12	10	6	-1.6%
Total	**3,954**	**4,311**	**4,478**	**4,800**	**4,953**	**2.9%**

Source: National Transit Database.

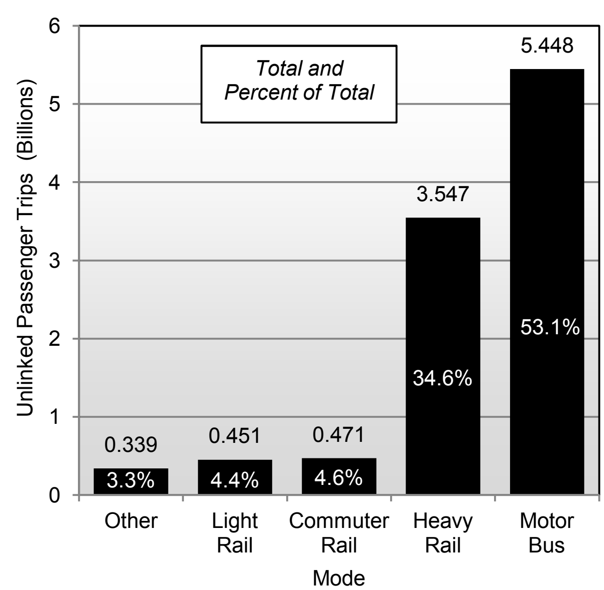
Ridership

There are two primary measures of transit ridership—unlinked passenger trips and passenger miles traveled (PMT). An unlinked passenger trip, sometimes called a boarding, is defined as a journey on *one* transit vehicle. PMT is calculated on the basis of unlinked passenger trips and estimates of average trip length. Either measure provides an appropriate time series since average trip lengths, by mode, have not changed substantially over time. Comparisons across modes, however, may differ substantially depending on which measure is used due to large differences in the average trip length for the different modes.

Exhibit 2-34 and *Exhibit 2-35* show the distribution of unlinked passenger trips and PMT by mode. In 2008, transit services provided 10.2 billion unlinked trips and 53.7 billion PMT. Heavy rail and motorbus modes continue to be the largest segments of both measures. Commuter rail supports relatively more PMT due to its greater average trip length (23.4 miles compared to 3.9 for bus, 4.8 for heavy rail, and 4.4 for light rail).

Exhibit 2-34

2008 Unlinked Passenger Trips

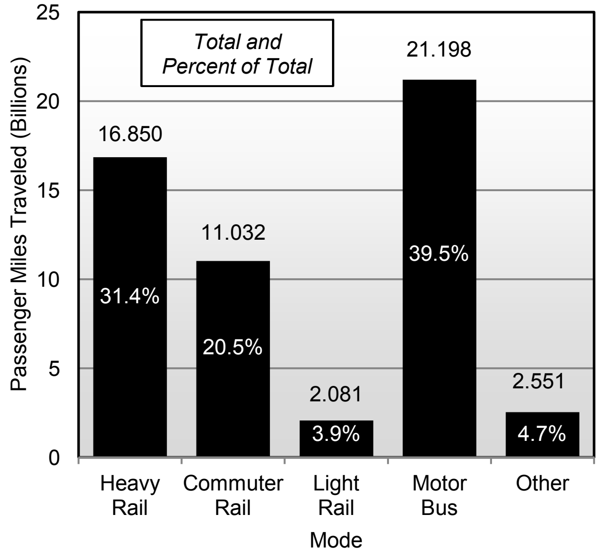


Note: "Other" includes Alaska railroad, automated guideway, cable car, demand response, ferryboat, inclined plane, monorail, Público, and trolleybus.

Source: National Transit Database.

Exhibit 2-35

2008 Passenger Miles Traveled



Note: "Other" includes Alaska railroad, automated guideway, cable car, demand response, ferryboat, inclined plane, monorail, Público, and trolleybus.

Source: National Transit Database.

Exhibit 2-36 provides total PMT for selected years between 2000 and 2008, showing steady growth in all the major modes. Demand response, light rail, and vanpool modes grew at the fastest rates. Demand response (up 4.6 percent per year) has undoubtedly benefited from ADA requirements. Light rail (up 5.7 percent per year) had enjoyed increased capacity during this period due to expansions and addition of new systems.

Exhibit 2-36

Transit Urban Passenger Miles, 2000–2008

Transit Mode	Passenger Miles (Millions) 2000	2002	2004	2006	2008	Average Annual Rate of Change 2008/2000
Rail	**24,604**	**24,617**	**25,667**	**26,972**	**29,989**	**2.5%**
Heavy Rail	13,844	13,663	14,354	14,721	16,850	2.5%
Commuter Rail	9,400	9,500	9,715	10,359	11,032	2.0%
Light Rail	1,340	1,432	1,576	1,866	2,081	5.7%
Other Rail[1]	20	22	22	25	26	3.3%
Nonrail	**20,497**	**21,328**	**20,879**	**22,533**	**23,723**	**1.8%**
Motor Bus	18,807	19,527	18,921	20,390	21,198	1.5%
Demand Response	588	651	704	753	844	4.6%
Vanpool	407	455	459	689	992	11.8%
Ferryboat	298	301	357	360	390	3.4%
Trolleybus	192	188	173	164	161	-2.2%
Other Nonrail[2]	205	206	265	176	138	-4.8%
Total	**45,101**	**45,945**	**46,546**	**49,504**	**53,712**	**2.2%**
Percent Rail	54.6%	53.6%	55.1%	54.5%	55.8%	

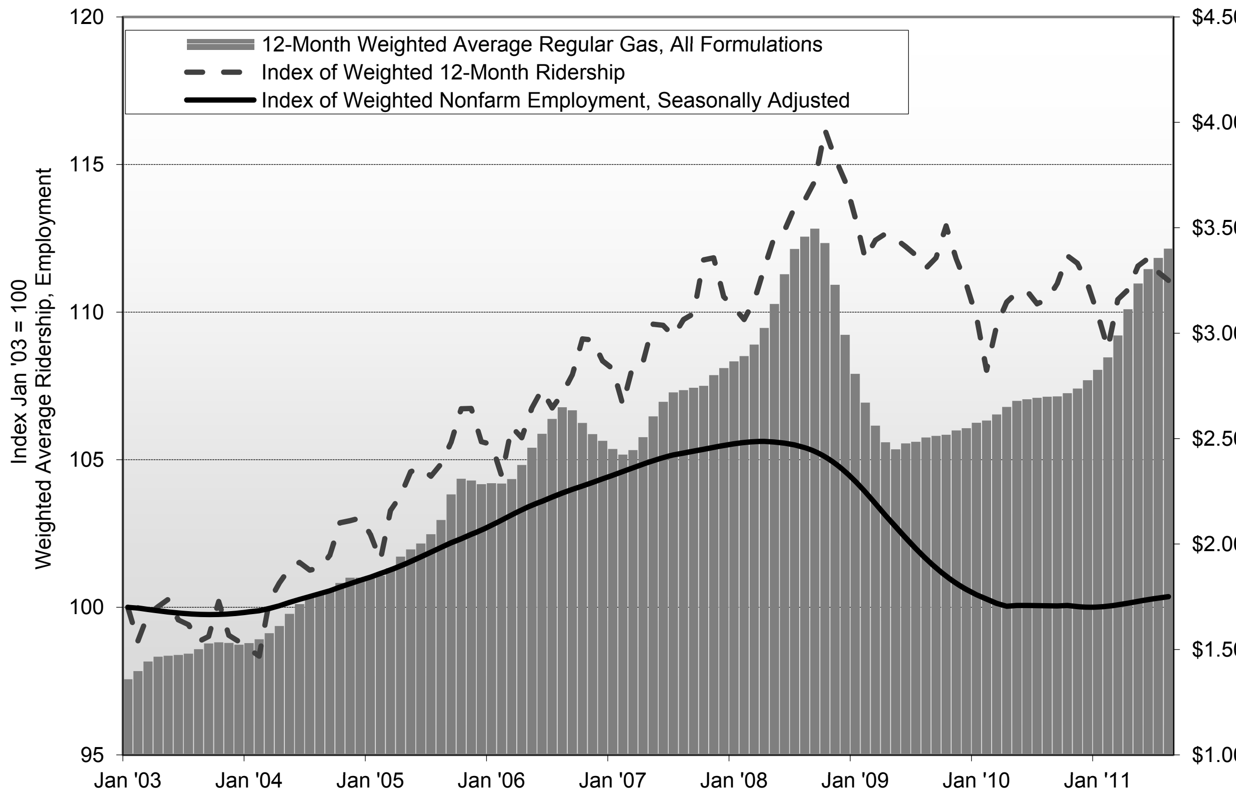
[1] Alaska railroad, automated guideway, cable car, inclined plane, and monorail.
[2] Aerial tramway and Público.

Source: National Transit Database.

Vanpool's rapidly increasing popularity (up 11.8 percent per year), particularly the surge between 2006 and 2008 (up 20 percent per year), can be partially attributed to rising gas prices. Regular gasoline sold for more than $4 per gallon in July of 2008. *Exhibit 2-37* shows the complex relationship between transit ridership, gasoline price, and unemployment using 12-month exponential moving averages (e.g., weighted averages) to smooth out the monthly volatility in transit ridership and fuel prices.

Exhibit 2-37

Transit Ridership Versus Employment



Source: National Transit Database, U.S. Energy Information Administration's Gas Pump Data History, and Bureau of Labor Statistics' Employment Data.

On the most basic level, the effectiveness of transit operations can be gauged by the demand for transit services. People choose to use transit if it meets their needs as well as, or better than, the alternatives. These choices occur in an economic context in which the need for transportation and the cost of that transportation are constantly changing due to factors that have nothing to do with transit.

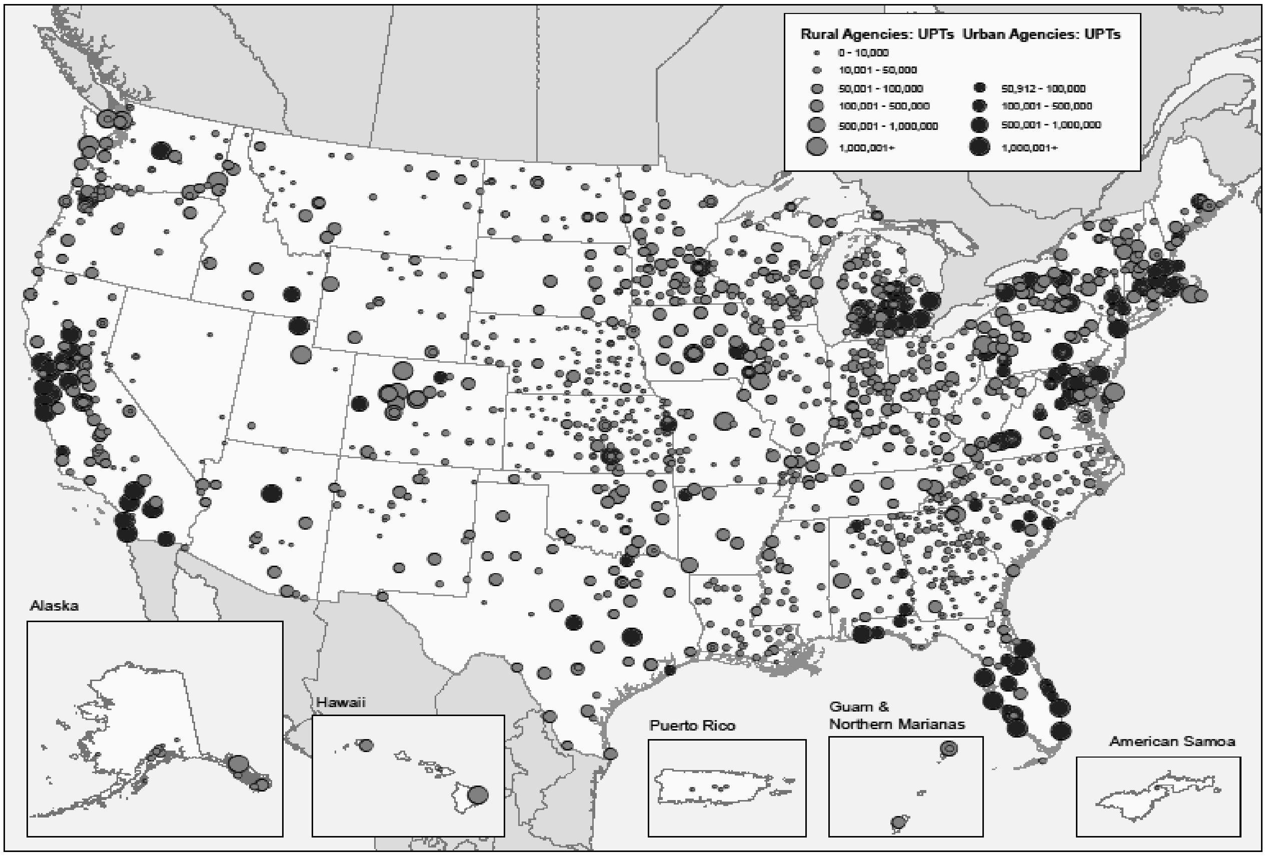
Rural Transit Systems (Section 5311 Providers)

FTA first instituted rural data reporting to the NTD in 2006. In 2008, 1,396 transit operators reported providing rural service. They reported 136.6 million unlinked passenger trips and 486 million vehicle revenue miles. This included 61 Indian tribes who provided 417,000 unlinked passenger trips. Urbanized area agencies, of which there are 304, also reported providing rural service that added another 24 million unlinked passenger trips and 37 million vehicle revenue miles.

The data indicates that rural transit service has been growing rapidly; but, because the NTD is still adding rural reporters, this can't yet be quantified. The data also indicates every State and four territories provides some form of rural transit service, as shown in *Exhibit 2-38*.

Exhibit 2-38

Distribution of Rural and Urban Unlinked Passenger Trips Across the United States

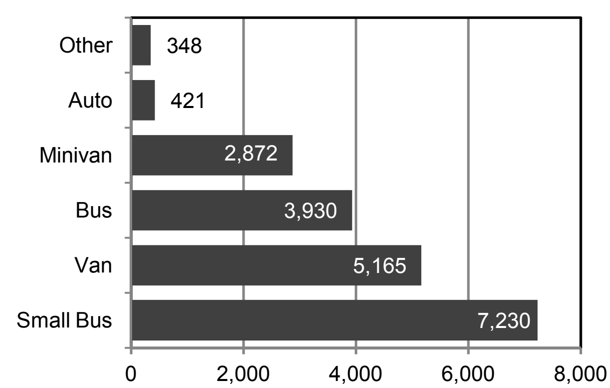


Source: National Transit Database.

Rural systems provide both traditional fixed-route and demand response services, with 1,150 demand response services, 494 motor bus services, and 16 vanpool services. They reported 19,966 vehicles in 2008. *Exhibit 2-39* shows the number of rural transit vehicles in service.

Exhibit 2-39

2008 Rural Transit Vehicles



Source: National Transit Database.

Transit System Characteristics for Americans With Disabilities and the Elderly

The ADA is intended to ensure that persons with disabilities have access to the same facilities and services as other Americans, including transit vehicles and facilities. This equality of access is brought about through the upgrading of transit vehicles and facilities on regular routes, through the provision of demand response transit service for those individuals who are still unable to use regular transit service, and through special service vehicles operated by private entities and some public organizations, often with the assistance of FTA funding.

Since the passage of the ADA in 1990, transit operators have been working to upgrade their regular vehicle fleets and improve their demand response services in order to meet the ADA's requirement to provide persons with disabilities a level of service comparable to that of fixed-route systems. U.S. DOT regulations provide minimum guidelines and accessibility standards for buses; vans; and heavy, light, and commuter rail vehicles. For example, commuter rail transportation systems are required to have at least one accessible car per train and all new cars must be accessible. The ADA deems it discriminatory for a public entity providing a fixed-route transit service to provide disabled individuals with services that are inferior to those provided to nondisabled individuals.

The overall percentage of transit vehicles that are ADA-compliant has not significantly changed in recent years. In 2008, 79.0 percent of all transit vehicles reported in the NTD were ADA-compliant. This percentage has decreased slightly from 80.2 percent in 2006, although it is significantly greater than the 73.3 percent reported for 2000. The percentage of vehicles compliant with the ADA for each mode is shown in *Exhibit 2-40.*

Exhibit 2-40

Urban Transit Operators' ADA Vehicle Fleets by Mode, 2008

Transit Mode	Active Vehicles	ADA-Compliant Vehicles	Percent of Active Vehicles ADA-Compliant
Rail			
Heavy Rail	11,367	10,990	96.7%
Commuter Rail	6,078	3,738	61.5%
Light Rail	1,957	1,600	81.8%
Alaska Railroad	44	27	61.4%
Automated Guideway	54	54	100.0%
Cable Car	40	0	0.0%
Inclined Plane	8	6	75.0%
Monorail	8	8	100.0%
Total Rail	**19,556**	**16,423**	**84.0%**
Nonrail			
Motor Bus	64,647	63,669	98.5%
Demand Response	32,248	23,165	71.8%
Vanpool	10,970	222	2.0%
Ferryboat	151	130	86.1%
Trolleybus	601	599	99.7%
Público	3,718	0	0.0%
Total Nonrail	**112,335**	**87,785**	**78.1%**
Total All Modes	**131,891**	**104,208**	**79.0%**

Source: National Transit Database.

In addition to the services provided by urban transit operators, a recent survey by the University of Montana found that, in 2002, there were 4,836 private and nonprofit agencies that received FTA Section 5310 funding for the provision of "special" transit services (i.e., demand response) to persons with disabilities and the elderly. These providers include religious organizations, senior citizen centers, rehabilitation centers, the American Red Cross, nursing homes, community action centers, sheltered workshops, and coordinated human services transportation providers.

In 2002, the most recent year for which data are available, these providers were estimated to be using 37,720 special service vehicles. Approximately 62 percent of these special service providers were in rural areas, and 38 percent were in urbanized areas. Data collected by FTA show that approximately 76 percent of the vehicles purchased in FY 2002 were wheelchair accessible, about the same as in the previous few years.

In 2008, 73.7 percent of total transit stations were ADA-compliant. This is up from the 2006 count, in which 71.9 percent were compliant. Earlier data on this issue may not be comparable to data provided in this report due to improvements in reporting quality. The ADA requires that new transit facilities and alterations to existing facilities be accessible to the disabled. *Exhibit 2-41* gives data on the number of urban transit ADA stations by mode.

Exhibit 2-41

Urban Transit Operators' ADA-Compliant Stations by Mode, 2008

Transit Mode	Total Stations	ADA Compliant Stations	Percent of Stations ADA Compliant
Rail			
Heavy Rail	1,041	508	48.8%
Commuter Rail	1,189	753	63.3%
Light Rail	787	665	84.5%
Alaska Railroad	10	10	100.0%
Automated Guideway	41	40	97.6%
Inclined Plane	8	7	87.5%
Monorail	2	2	100.0%
Total Rail	**3,078**	**1,985**	**64.5%**
Nonrail			
Motor Bus	1,346	1,258	93.5%
Ferryboat	81	78	96.3%
Trolleybus	5	5	100.0%
Total Nonrail	**1,432**	**1,341**	**93.6%**
Total All Modes	**4,510**	**3,326**	**73.7%**

Source: National Transit Database.

Under the ADA, FTA was given responsibility for identifying "key rail stations" and facilitating the accessibility of these stations to disabled persons by July 26, 1993. Key rail stations are identified on the basis of the following criteria:

- The number of passengers boarding at the key station exceeds the average number of passengers boarding on the rail system as a whole by at least 15 percent.
- The station is a major point where passengers shift to other transit modes.
- The station is at the end of a rail line, unless it is close to another accessible station.
- The station serves a "major" center of activities, including employment or government centers, institutions of higher education, and major health facilities.

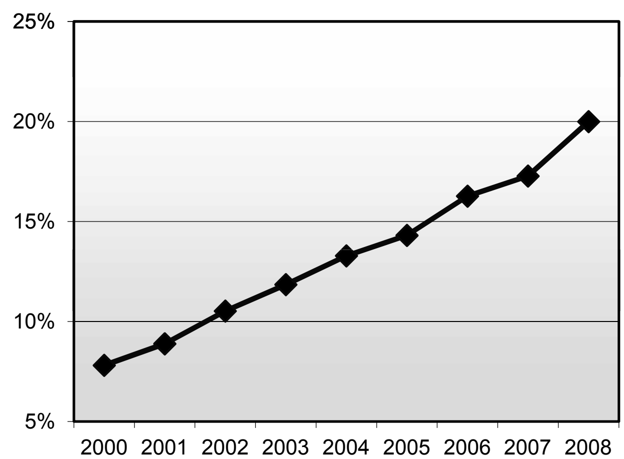
Although ADA legislation required all key stations to be accessible by July 26, 1993, the U.S. DOT ADA regulation in Title 49—Code of Federal Regulations (CFR), Part 37.47(c)(2), permitted the FTA Administrator to grant extensions up to July 26, 2020, for stations requiring extraordinarily expensive structural modifications to bring them into compliance. In 2008, there were 687 key rail stations, of which 27 stations (3.9 percent) were under FTA-approved time extensions. The total number of key rail stations has changed slightly over the years as certain stations have closed. As of June 24, 2010, of the 680 key rail stations, 648 stations are accessible and compliant or accessible but not fully compliant (95.2 percent). "Accessible but not fully compliant" means that these stations are functionally accessible (i.e., persons with disabilities, including wheelchair users, can make use of the station), but there are still minor outstanding issues that must be addressed in order to be fully compliant; these usually involve things like missing or mislocated signage and parking-lot striping errors. There are 32 key rail stations that are not yet compliant and are in the planning, design, or construction stage at this time. Of these, 15 stations are under FTA-approved time extensions up to 2020 (as provided under 49 CFR §37.47(c)(2)), eight of which will expire by June 26, 2012. FTA continues to focus its attention on the 17 stations that are not fully accessible and are not under a time extension, as well as on the 15 stations with time extensions that will be expiring in the coming years.

Transit System Characteristics: Special Interests

Exhibit 2-42 presents an increase in the share of alternative fuel buses from 7.8 percent in 2000 to 20.0 percent in 2008. In 2008, 12.9 percent of buses used compressed natural gas, 5.2 percent used biodiesel, and 1.8 percent used liquefied natural or petroleum gas. Conventional fuel buses, which make up the majority of the U.S. bus fleet, utilized diesel fuel and gasoline.

Exhibit 2-42

Change in Percentage of Urban Bus Fleet Using Alternative Fuels, 2000–2008



Source: National Transit Database.