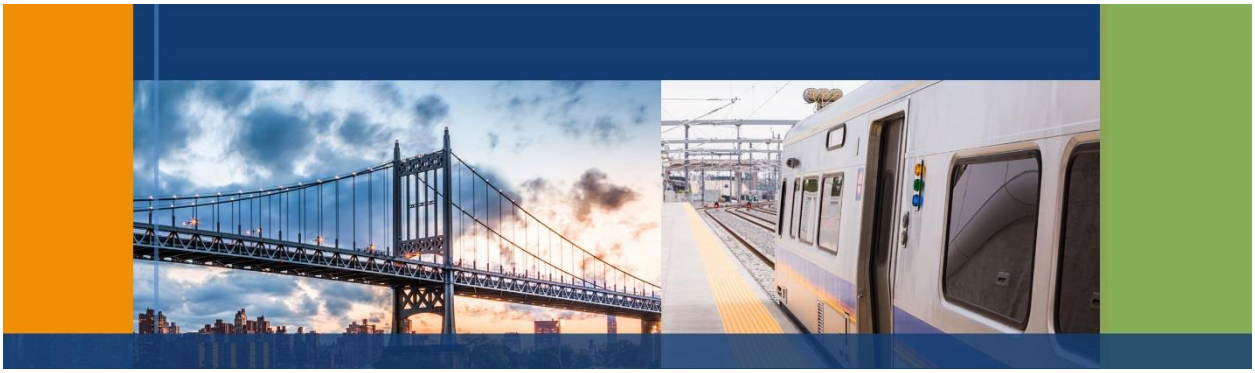

CHAPTER 1: System Assets

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System Assets – Highways

The Nation's extensive network of roadways and bridges facilitates movement of people and goods, promotes the growth of the American economy, affords access to national and international markets, and supports national defense by providing the means for rapid deployment of military forces and their support systems.

A public road is defined as a road or street under the jurisdiction of and maintained by a public authority and open to public travel. Although most public roads carry a mix of vehicular users and non-vehicular uses, this section focuses on vehicular use. Chapter 3 includes information on a broader range of transportation modes. (See Chapter 11 of the 23rd C&P Report for more detailed information on pedestrian and bicycle transportation.)

Road statistics reported in this section draw on data collected from States through the Highway Performance Monitoring System (HPMS). The terms highways, roadways, and roads are generally used interchangeably in this section and elsewhere in the report. The mileage data presented in this section do not reflect turn lanes, bike paths, pedestrian walkways, and alleys.

Route mileage measures road distances from one point to another, whereas lane mileage accounts for the number of lanes in operation—thus accounting for travel in both directions. VMT measures the distance traveled by motorized vehicles of all kinds on the Nation's road network over the course of a year. Person miles traveled weights travel by the number of occupants in a vehicle. (Note that data on passenger miles traveled presented in the transit sections of this report do not include the drivers of transit vehicles; data on person miles traveled presented in this section include both drivers and passengers for all motorized vehicles).

Bridge statistics reported in this section draw on data collected from States through the National Bridge Inventory (NBI). This information details physical characteristics, traffic loads, and the evaluation of the condition of each bridge longer than 20 feet. As of December 2016, the NBI contained records for 614,387 bridges. Data for input to NBI are collected regularly from the States as set forth in the National Bridge Inspection Standards.

KEY TAKEAWAYS

- The nation's highway assets included 4.1 million miles of public roadways (route miles) and 8.7 million lane miles in 2016. Considering motorized vehicles only, these roads carried 3.2 trillion miles of vehicular travel and 4.8 trillion miles of person travel in 2016.
- Federal-aid highways are a subset of public roads eligible for Federal-aid highway assistance. These include 24.7 percent of route miles, which carried 84.9 percent of vehicle miles traveled (VMT) in 2016.
- The National Highway System (NHS), a subset of Federal-aid highways, included 5.3 percent of the nation's route miles and carried 54.8 percent of VMT in 2016. The NHS carried 73.6 percent of VMT by combination trucks.
- The Interstate System, a subset of the NHS, constituted just 1.2 percent of route miles but carried 25.4 percent of the Nation's VMT in 2016.
- Local governmental agencies own 79.1 percent of the Nation's route miles, which carry 26.1 percent of VMT. State governments own 16.9 percent of route miles, which carry 73.6 percent of VMT.
- Local governments own 49.9 percent of the Nation's bridges, but these include only 22.3 percent of total bridge deck area and carry only 12.3 percent of bridge traffic. State governments own 48.2 percent of bridges, which include 76.6 percent of total bridge deck area and carry 87.3 percent of bridge traffic.
- The number of lane miles on the Nation's roadways increased by almost 3.0 percent between 2006 and 2016.
- Total bridge deck area increased by approximately 10.1 percent between 2006 and 2016.

Tunnels

Under MAP-21, FHWA was charged with establishing a national tunnel inspection program. In 2015, development began on the National Tunnel Inventory database system, and inventory data were collected for all highway tunnels reported. Concurrently, FHWA implemented an extensive program to train inspectors **nationwide** on tunnel inspection and condition evaluation.

The 2015 preliminary inventory included 473 tunnels. Of these, 271 (57.3 percent) are on the NHS. States own 304 (64.3 percent) of the tunnels, 83 (17.5 percent) are owned by local governments, 77 (16.3 percent) are owned by Federal agencies, and 9 (1.9 percent) are owned by others. Further information can be found at (https://www.fhwa.dot.gov/bridge/inspection/tunnel/).

Complete inventory and condition data for all tunnels will be collected annually, beginning in 2018, and will be available for use in subsequent C&P Reports.

As shown in *Exhibit 1-1*, highway mileage and its accompanying lane mileage have each increased between 2006 and 2016, at an average annual rate of 0.3 percent. Highway VMT grew at an average annual rate of 0.5 percent between 2006 and 2016. Person miles traveled grew at average annual rate of 1.0 percent during this period, due in part to the increase in VMT and in part due to an increase in estimated average vehicle occupancy.

Exhibit 1-1 ■ Highway and Bridge Extent and Travel, 2006–2016

Category	2006	2008	2010	2012	2014	2016	Average Annual Rate of Change 2016/2006
Route Miles	4,033,011	4,059,352	4,083,768	4,109,421	4,194,257	4,157,292	0.3%
Lane Miles	8,454,762	8,518,776	8,616,206	8,641,051	8,830,511	8,775,538	0.4%
VMT (trillions)	3.034	2.993	2.986	2.988	3.040	3.189	0.5%
Person Miles Traveled (trillions)[1]	4.961	4.931	5.063	5.100	5.205	5.458	1.0%
Bridges	597,561	601,506	604,493	607,380	610,749	614,387	0.3%
Bridge Deck Area (millions of square meters)	333.9	343.5	351.5	358.5	365.5	371.5	1.1%
Bridge Average Daily Traffic (billions)	4.277	4.432	4.439	4.485	4.504	4.627	0.8%

[1] Values for 2006 and 2008 were based on a vehicle occupancy rate of approximately 1.63 based on data from the 2001 NHTS. Values for 2010, 2012, 2014, and 2016 were based on a vehicle occupancy rate of approximately 1.70, based on data from the 2009 NHTS. Data include Puerto Rico.

[2] Average Daily Traffic (ADT) identifies the volume of traffic over all bridges for a one day (24-hour period) during a data reporting year.

Sources: Highway Performance Monitoring System; Highway Statistics, Table VM-1, various years; National Bridge Inventory.

Exhibit 1-1 also shows that the number of bridges cataloged in NBI increased at an annual rate of 0.3 percent between 2006 and 2016, from 594,101 to 614,387. Total bridge deck area grew at an average annual rate of 1.1 percent, while bridge crossings (measured as annual daily traffic) increased at an average annual rate of 0.8 percent.

Roads and Bridges by Ownership

State and local governments own the vast majority of public roads and the bridges located on these roads. As shown in *Exhibit 1-2*, local governments own 79.1 percent of the Nation's public route mileage and 49.9 percent of all bridges. State governments own 16.9 percent of public route mileage and 48.2 percent of the Nation's bridges. Although many roads and bridges are constructed or improved with Federal funding, State and local governments assume ownership responsibilities for maintaining those facilities and keeping them safe for public use. The Federal government owns a relatively small share of the Nation's route miles (3.7 percent) which are located primarily in military installations, tribal lands, National Forests and National Parks. These roads carry only 0.2 percent of total VMT.

VMT Trends Since 2016

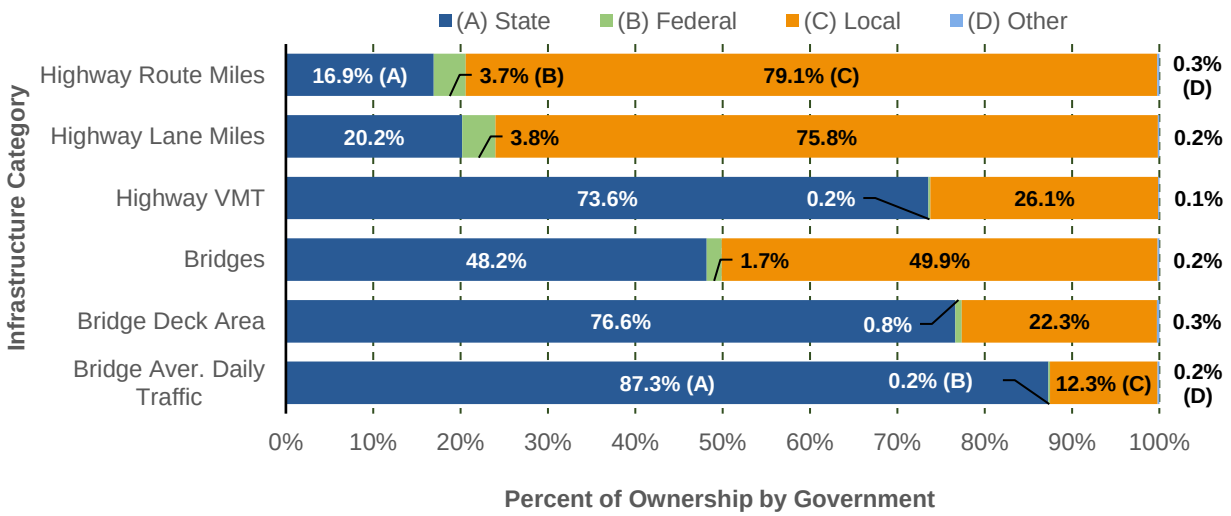
Based on data from Table VM-2 of the annual Highway Statistics publication, VMT grew by 1.2 **percent** in 2017 and by 0.9 percent in 2018.

The December 2019 Traffic Volume Trends (TVT) report estimated a 0.9-percent increase in VMT from 2018 to 2019, to a level of 3.269 trillion.

The TVT report 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 percentage change in traffic for the current month compared with 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 http://www.fhwa.dot.gov/ohim/tvtw/tvtfaq.cfm.

Exhibit 1-2 ■ Highway and Bridge Ownership by Level of Government, 2016



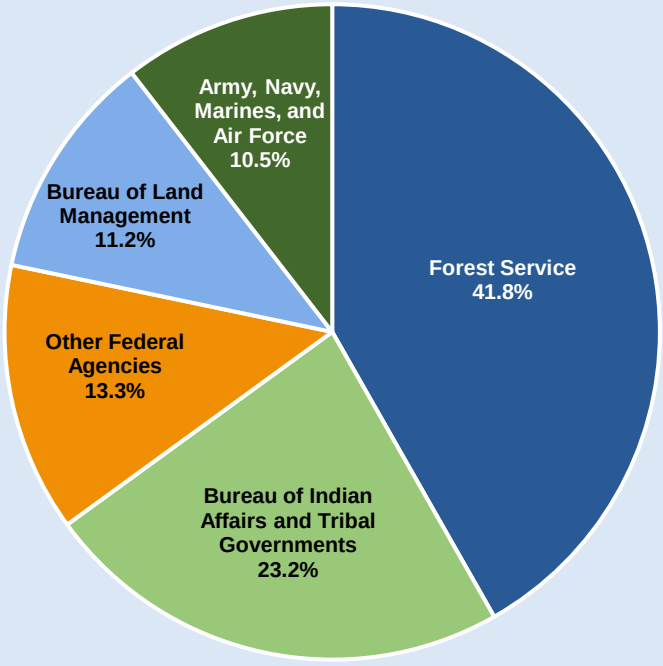
Note: Highways/bridges owned by Tribal governments are included within the "Federal" category. The "Other" category contains highways/bridges owned by Private, Railroad, and Other Public Entity and highways/bridges where ownership code is not available.

Sources: Highway Performance Monitoring System, National Bridge Inventory.

Roads Owned by the Federal Government

As shown in *Exhibit 1-2*, the Federal government and Tribal governments owned a combined 3.7 percent of the Nation's route miles of publicly owned roads in 2016. *Exhibit 1-3* shows that of these route miles, the U.S. Forest Service owns the largest share, approximately 41.8 percent. The Bureau of Indian Affairs and Tribal governments own a combined 23.2 percent of Federally owned route miles; approximately 11.2 percent is owned by the Bureau of Land Management. Roads on military installations (owned by the Army, Navy, Marines, and Air Force) comprise 10.5 percent. The remaining 13.3 percent of Federally owned route miles is divided among multiple agencies including the National Park Service, the U.S. Army Corps of Engineers, the Fish and Wildlife Service, the Bureau of Reclamation, the Tennessee Valley Authority, and other Federal agencies.

Exhibit 1-3 ■ Distribution of Route Miles Owned by Federal Agencies, 2016



Source: Highway Performance Monitoring System.

Roads and Bridges by System Subset

Federal-aid highways are a subset of all public roads. The term Federal-aid highway is defined in 23 U.S.C. 101(a)(6) as "a public highway eligible for assistance under this chapter other than a highway functionally classified as a local road or rural minor collector." (Functional classification is discussed later in this section.)

The NHS is a subset of Federal-aid highways, containing the most critical routes for movement of passengers and goods. The Interstate System is a subset of the NHS. The NHS and Interstate System are discussed in more detail below.

Exhibit 1-4 compares the relative magnitudes of these subsets to the total extent of the Nation's highways and bridges. Relative to the average public road, Federal-aid highways consist of longer routes and facilitate higher traffic volumes at increased speeds. The same is true for NHS routes

relative to the average Federal-aid highway, and the average Interstate highway relative to the average NHS route.

Exhibit 1-4 ■ Interstate, NHS, and Federal-aid Highway Extent, Bridge Count, and Travel, 2016

Category	Interstate	NHS	FAH	All Public Roads	Share of Total		
					Interstate	NHS	FAH
Highway Route Miles	48,474	222,331	1,026,319	4,157,292	1.2%	5.3%	24.7%
Lane Miles	225,481	769,508	2,485,190	8,775,538	2.6%	8.8%	28.3%
VMT (trillions)	0.811	1.749	2.710	3.189	25.4%	54.8%	85.0%
Bridges	57,309	144,610	329,324	614,387	9.3%	23.5%	53.6%
Bridge Deck Area (millions of sq. meters)	98.393	215.604	313.277	371.464	26.5%	58.0%	84.3%
Bridge Average Daily Traffic (billions)	2.094	3.670	4.436	4.627	45.3%	79.3%	95.9%

Sources: Highway Performance Monitoring System; National Bridge Inventory.

Although Federal-aid highways constitute just 24.7 percent of the Nation's route mileage, they carry 85.0 percent of the Nation's VMT. The NHS includes 5.3 percent of the Nation's route mileage, but carries 54.8 percent of highway traffic. The Interstate System makes up only 1.2 percent of the Nation's roads, but carries 25.4 percent of VMT.

Federal-aid highways include 53.6 percent of the nation's bridges, compared with 23.5 percent for the NHS and 9.3 percent for Interstate highways. The Interstate System and the NHS have a larger share of multilane roadways (four lanes or more) and tend to include larger bridges than does the average Federal-aid highway.

Ownership of Federal-aid Highway Components

Only 0.6 percent of Federal-aid highway route miles are owned by the Federal government. State governments own 55.6 percent of Federal-aid highway route miles, whereas local governments own 43.8 percent.

State governments owned 60.2 percent of Federal-aid highway lane-miles in 2016, whereas 39.3 percent was owned by local governments. The remaining 0.5 percent of lane-miles was owned by the Federal government.

Based on mileage, State governments own more than 90.7 percent of the NHS. In contrast, the Federal government owns less than 0.1 percent of the 222,331 NHS route mileage, and local governments own 9.2 percent. State governments own more than 99.9 percent of the 48,192 miles in the Interstate System; the Federal government owns none of the Interstate System.

Federal-aid Highways

Federal-aid highways comprised approximately 1.03 million route miles in 2016 and facilitated approximately 2.71 trillion VMT. As shown in *Exhibit 1-5*, highway route mileage on Federal-aid highways increased by 42,226 miles between 2006 and 2016, to approximately 1.03 million miles in 2016. Lane mileage increased by 126,676 miles to almost 2.49 million lane miles in 2016 and VMT increased from 2.57 trillion in 2006 to 2.71 trillion VMT in 2016, an increase of more than 136 billion VMT. The number of bridges on Federal-aid highways increased from 312,062 in 2006 to 329,324 in 2016. This is an annual rate of change of approximately 0.5 percent.

Exhibit 1-5 ■ Federal-aid Highways Extent and Travel, 2006–2016

Category	2006	2008	2010	2012	2014	2016	Average Annual Rate of Change 2016/2006
Highway Route Miles	984,093	994,358	1,007,777	1,005,378	1,020,461	1,026,319	0.4%
Lane Miles	2,364,514	2,388,809	2,451,140	2,433,012	2,445,667	2,485,190	0.5%
VMT (trillions)	2.574	2.534	2.525	2.527	2.572	2.710	0.5%
Bridges	312,062	316,012	319,108	321,724	325,467	329,324	0.5%

Sources: Highway Performance Monitoring System; National Bridge Inventory.

National Highway System

With the Interstate System largely 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, a subset of the Federal-aid highways, that would give priority for Federal resources to roads most important for 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 Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21) modified the scope of the NHS to include some additional principal arterial and related connector route mileage not previously designated as part of the NHS. This modification increased the size of the NHS by approximately 36 percent, bringing it from 164,154 miles in 2011 up to 224,446 miles.[3]

The NHS was designed to be a dynamic system capable of changing in response to future travel and trade demands. States may propose modifications to the NHS provided they meet the criteria established for the NHS and enhance the characteristics of the NHS, as specified in 23 U.S.C. 103 and 23 CFR 470. States must cooperate with local and regional officials in proposing such modifications. FHWA has approval authority for modifications to the NHS. Each year, FHWA receives requests to modify hundreds of NHS segments. FHWA processes these requests and updates the official map record of the NHS on its website (see https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/) throughout the year.

The modifications approved by the FHWA from 2014 to 2016 resulted in decreases in highway miles and lane miles on the NHS to 222,331, and 769,508, respectively. However, VMT and the number of bridges on the NHS increased during the same period. *Exhibit 1-6* shows the changes in the NHS from 2006 to 2016. Route miles and lane miles increased at an average annual rate change of 3.1 percent while VMT on the NHS increased at an annual average rate change of 2.6 percent. The number of bridges increased at average annual rate of 2.3 percent.

Exhibit 1-6 ■ NHS Extent and Travel, 2006–2016

Category	Year						Average Annual Rate of Change 2016/2006
	2006	2008	2010	2012	2014	2016	
Route Miles	163,472	164,108	159,326	223,357	226,767	222,331	3.1%
Lane Miles	568,074	574,011	575,546	771,184	771,245	769,508	3.1%
VMT (trillions)	1.354	1.327	1.311	1.644	1.661	1.749	2.6%
Bridges	115,202	116,523	116,669	117,485	143,165	144,610	2.3%

Sources: Highway Performance Monitoring System; National Bridge Inventory.

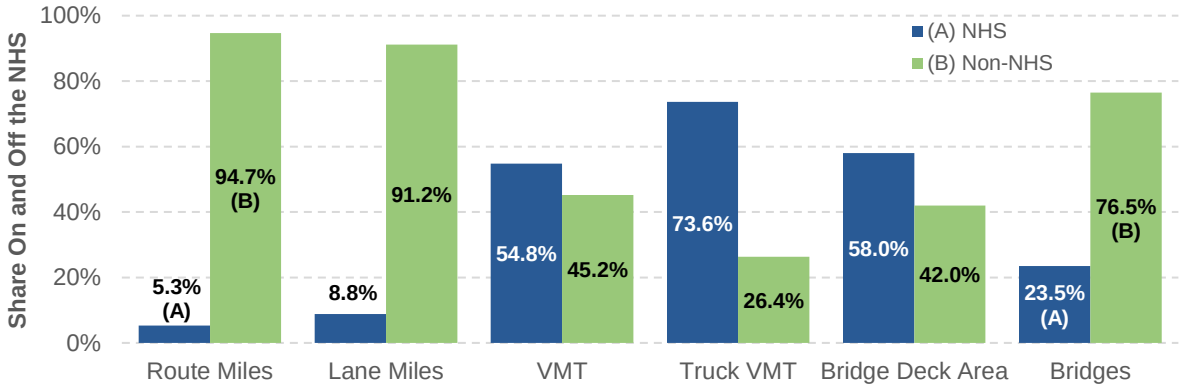
[3] See https://www.fhwa.dot.gov/planning/national_highway_system/nhs_maps/map21estmileage.cfm. Figures adjusted to include Puerto Rico based on data from Highway Statistics 2011, Tables HM-41 and HM-20.

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 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. These roads provide access between major intermodal passenger and freight facilities and the other four components that comprise the NHS.

In view of the importance of the NHS for truck traffic and freight, highways that are part of the NHS are designed to accommodate high amounts of traffic at higher speeds in the safest and most efficient ways possible. Additionally, NHS highways are constructed at higher load-carrying capability to withstand the heavier loads conveyed by combination trucks, which include a power unit (truck tractor) and one or more trailing units (a semitrailer or trailer).

As shown in *Exhibit 1-7*, only 5.3 percent of the Nation's highway route mileage and 8.8 percent of the Nation's lane mileage were located on the NHS in 2016. Of the total number of the Nation's bridges, 23.5 percent are located on the NHS. However, these bridges account for 58.0 percent of the total bridge deck area in the Nation. Approximately 54.8 percent of the Nation's total VMT occurs on the NHS. The NHS is crucial to truck traffic, which carries cargo long distances, often across multiple State lines. Approximately 73.6 percent of combination truck VMT occurred on the NHS in 2016. Freight transportation is discussed in more detail in Part III of this report.

Exhibit 1-7 ■ Highway and Bridge Extent and Travel, Shares on and off the National Highway System, 2016



Source: Highway Performance Monitoring System, National Bridge Inventory.

Interstate System

The Federal-aid Highway Act of 1956 declared that completion of the originally planned 41,000 route miles of the "National System of Interstate and Defense Highways" as essential to the National interest. The Act committed the Nation to completing the Interstate System within the Federal-State partnership of the Federal-aid Highway Program, with the States responsible for construction according to approved standards by the American Association of State Highway Officials (AASHO), the forerunner of the American Association of State Highway and Transportation Officials (AASHTO). The Act also addressed the challenging issue of how to pay for construction by establishing the Highway Trust Fund to dedicate revenue from highway user taxes, such as the motor fuels tax, to the Interstate System and other Federal-aid highway and bridge projects.

As shown in *Exhibit 1-8,* there were small increases in the size of the Interstate System from 2006 to 2016. The total number of route miles increased from 46,836 route miles in 2006 to 48,474 route miles in 2016. Lane miles increased from 212,029 lane miles in 2006 to 225,481 lane miles in 2016. The number of bridges increased from 55,270 bridges in 2006 to 57,309 bridges in 2016.

Exhibit 1-8 ■ Interstate System Extent and Travel, 2006–2016

Category	2006	2008	2010	2012	2014	2016	Annual Rate of Change 2016/2006
Route Miles	46,836	46,892	47,019	47,182	47,714	48,474	0.3%
Lane Miles	212,029	213,542	214,880	217,165	220,124	225,481	0.6%
VMT (trillions)	0.727	0.741	0.725	0.731	0.736	0.811	1.1%
Bridges	55,270	55,626	55,339	55,959	56,553	57,309	0.4%

Sources: Highway Performance Monitoring System; National Bridge Inventory.

Roads and Bridges by Purpose

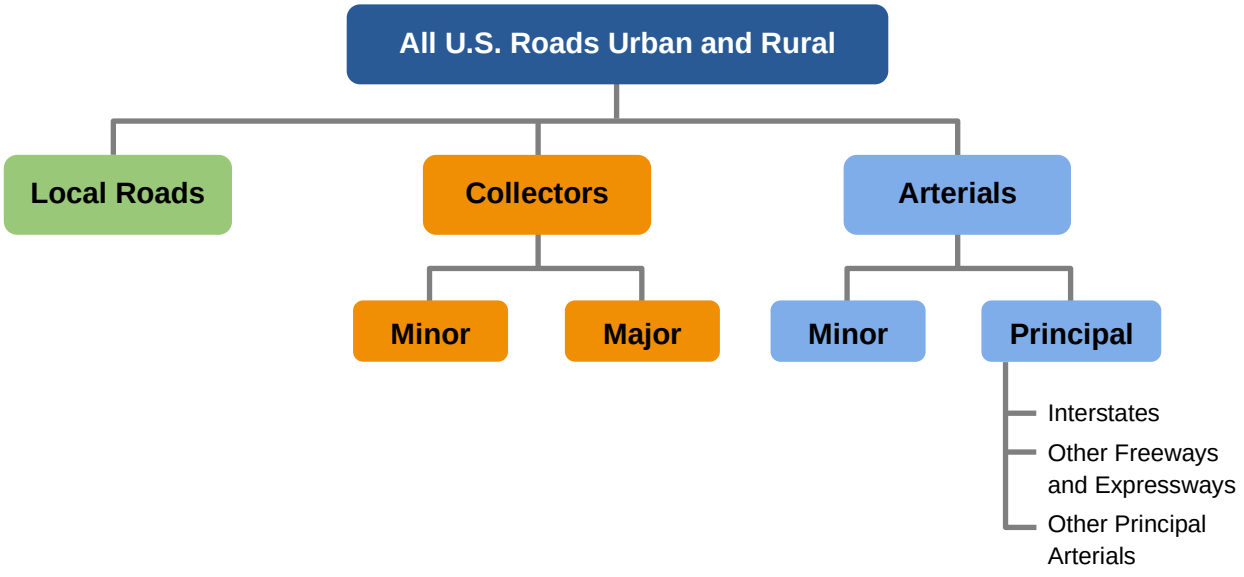
The Nation's roadway system serves movements from long-distance freight needs to neighborhood travel. Because of the diverse needs for vehicular travel, the network is categorized under the Highway Functional Classification System. Each functional classification defines the role an element of the network plays in serving motorized/vehicular travel needs.

Exhibit 1-9 presents a formal FHWA hierarchy of road functional classifications. Although the functional classification definitions do not change for each setting, roads are divided also into rural and urban classifications.

Classification of Roadways as Rural vs. Urban

Roadways in a census tract with a population of 5,000 or more are classified as urban; all other roadways are classified as rural. Census Tracts are small, relatively permanent statistical subdivisions of a county or equivalent entity that are updated by local participants prior to each decennial census as part of the Census Bureau's Participant Statistical Areas Program. The Census Bureau delineates census tracts in situations where no local participant existed or where state, local, or tribal governments declined to participate. The primary purpose of census tracts is to provide a stable set of geographic units for the presentation of statistical data.

Exhibit 1-9 ■ Highway Functional Classification System Hierarchy



Source: Highway Functional Classification Concepts, Criteria and Procedures–2013 Edition.

Arterials serve the longest distances with the fewest access points. Because they have the longest distance between other routes, arterials facilitate the highest speed limits. Several functional classifications are included in the arterial category:

- **Interstates** are the highest classification of arterials, facilitating the highest level of mobility. Interstates support long-distance travel at higher speeds with minimal conflict from traffic entering or leaving the roadway. Interstates are relatively easy to locate due to their official designation by the Secretary of Transportation and distinct signage.
- **Other Freeways and Expressways** are very similar to Interstates in that they have directional travel lanes, usually separated by a physical barrier. Access and egress points are limited primarily to on- and off-ramps at grade-separated interchanges.
- **Other Principal Arterials** can serve specific land parcels directly and have at-grade intersections with other roadways that are managed by traffic devices.
- **Minor Arterials**, the lowest of arterial classifications, provide service for trips of moderate length and connectivity between higher arterial classifications and roads with lower functional classifications that provide greater access to businesses and homes.

Collectors serve the critical roles of gathering traffic from local roads and funneling vehicles into the arterial network. Although subtly different, two classifications are included in the collector category:

- **Major Collectors** are longer, have fewer points of access, have higher speed limits, and can have more travel lanes.
- **Minor Collectors** is the classification used for all collectors not classified as major collectors. One distinction between the two classifications is that minor collectors are focused more on providing access to adjacent properties than on mobility.

Local Roads are any road not classified as an arterial or collector. They are not intended for use in long-distance travel, except at the origination or termination of a trip. They are intended to grant access at the maximum level to adjacent properties. Local roads are often designed to discourage through-traffic. (Local functional class should not be confused with local government ownership: the Federal government and State governments own some roadways functionally classified as local.)

Extent and Vehicular Travel by Functional System

The Nation's network of public roads is diversely constructed to fit the needs of its surrounding environment. Roads in an urban setting will often have multiple lanes on a facility to support high levels of demand for vehicular traffic, whereas a rural setting will have fewer lanes supporting lower traffic levels.

As shown in *Exhibit 1-10,* almost half (49.1 percent) of the Nation's highway mileage was classified as rural local in 2016. Urban local roads comprised an additional 19.7 percent of total highway miles.

Exhibit 1-10 also details the breakdown of travel occurring in rural and urban settings. Urban areas have a higher share of VMT and lower

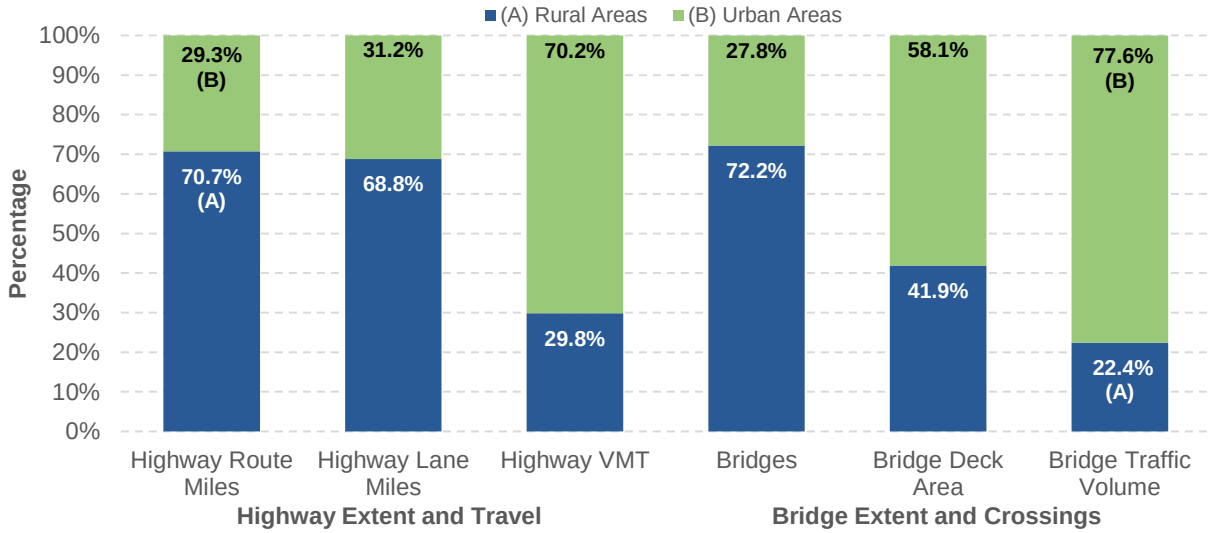
Relationship of Federal-aid Highways to Functional Classes

Public roads that are functionally classified higher than rural minor collector, rural local, or urban local are called Federal-aid highways and are eligible for Federal-aid highway assistance. Although bridges follow the hierarchy scheme, the NBI makes no distinction between urban major and urban minor collectors as HPMS does.

There are exceptions to the general rules limiting Federal-aid funding to Federal-aid highways. For example, States may use funding from their Surface Transportation Block Grant (STBG) Program apportionments to fund projects on existing bridges and tunnels not on Federal-aid highways. Highway Safety Improvement Program (HSIP) funds may be used on safety projects on any public road.

highway route mileage because urban settings tend to be more consolidated environments. With higher population concentrations, more vehicles use the highway route mileage in urban areas. Alternatively, rural areas cover much more land across the country and have a higher share of the highway mileage to provide connectivity and access in areas with lower population density.

Exhibit 1-10 ■ Highway and Bridge Extent and Travel by Functional System and Area, 2016



Functional System	Highway Route Miles	Highway Lane Miles	Highway VMT	Bridges	Bridge Deck Area	Bridge Traffic Volume
Rural Areas (less than 5,000 in population)						
Interstate	0.7%	1.4%	7.8%	4.1%	6.8%	9.0%
Other Freeway and Expressway	0.2%	0.3%	1.1%			
Other Principal Arterial	2.2%	2.7%	6.0%			
Other Principal Arterial[1]				6.1%	8.8%	5.7%
Minor Arterial	3.2%	3.2%	4.5%	6.2%	5.7%	2.8%
Major Collector	9.8%	9.4%	5.0%	15.0%	8.7%	2.8%
Minor Collector	6.2%	5.9%	1.5%	7.8%	3.1%	0.7%
Local	48.4%	46.0%	4.0%	33.1%	8.9%	1.3%
Subtotal Rural Areas	**70.7%**	**68.8%**	**29.8%**	**72.2%**	**41.9%**	**22.4%**
Urban Areas (5,000 or more in population)						
Interstate	0.5%	1.2%	17.7%	5.2%	19.7%	36.2%
Other Freeway and Expressway	0.3%	0.7%	7.8%	3.4%	11.0%	16.6%
Other Principal Arterial	1.6%	2.7%	15.1%	4.8%	11.8%	12.3%
Minor Arterial	2.7%	3.4%	12.9%	5.1%	8.2%	7.6%
Collector[1]				3.7%	3.7%	2.8%
Major Collector	3.1%	3.2%	6.5%			
Minor Collector	0.4%	0.4%	0.5%			
Local	20.7%	19.7%	9.6%	5.5%	3.7%	2.2%
Subtotal Urban Areas	**29.3%**	**31.2%**	**70.2%**	**27.8%**	**58.1%**	**77.6%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

[1] Highway data reflect revised HPMS functional classifications. Bridge data still use the previous classifications, so that rural Other Freeway and Expressway is included as part of the rural Other Principal Arterial category, and urban Major Collector and urban Minor Collector are combined into a single urban Collector category.

Sources: Highway Performance Monitoring System; National Bridge Inventory.

Although urban Interstate highway route mileage comprised only 0.5 percent of the Nation's highway route mileage, these highways carried the Nation's highest share of VMT by classification at 17.7 percent. Urban Interstate bridges also received the highest share of bridge traffic volume by classification with 36.2 percent in 2016.

Approximately 70.7 percent of the Nation's highway route mileage was located in rural areas, as was 68.8 percent of lane mileage. Local roads in urban and rural settings had the highest share of the Nation's lane mileage. Approximately 77.6 percent of bridge traffic volume was on the 27.8 percent of bridges in urban areas. Urban areas accounted for 58.1 percent of bridge deck area, compared with 41.9 percent for rural areas. The percentage of highway VMT occurring in urban areas (70.2 percent) was more than double that of rural areas (29.8 percent).

The difference seen in *Exhibit 1-10* between the functional classes reported under the highway portion of the exhibit and the bridge portion is due to the NBI not having been updated to use the new functional classifications instituted in the HPMS in 2013 and described in *Highway Functional Classification: Concepts, Criteria and Procedures, 2013 Edition*.

Exhibit 1-11 shows the highway route miles in the Nation based on functional system. The Nation's public highways comprised approximately 4.16 million route miles in 2016, up from the more than 4.0 million route miles in 2006. Total route mileage in urban areas grew from 1,041,747 route miles in 2006 to 1,226,171 route miles in 2016. Highway route miles in rural areas, however, decreased from approximately 3.0 million route miles in 2006 to slightly more than 2.93 million route miles in 2016. The largest decrease in route mileage was seen in rural local roadways.

Impact of Census Redesignations on Rural and Urban Data Trends

The declines in rural route mileage and rural lane mileage shown in *Exhibits 1-11* and *1-12*, respectively, are primarily a function of the expansion of urban boundaries following the 2010 Census.

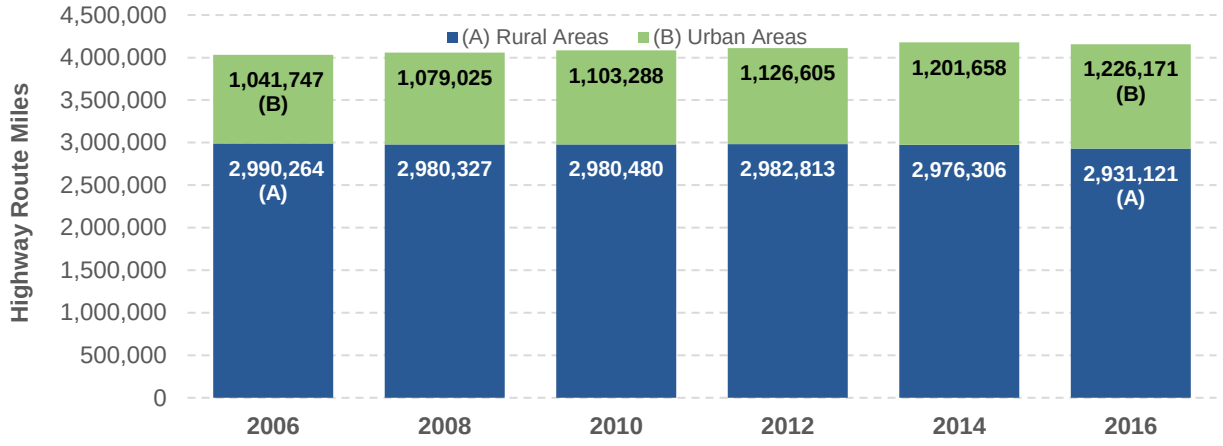
While data are not available to quantify the magnitude of this effect for all functional classes, an analysis comparing the lengths of individual Interstate routes in each State between 2006 and 2016 suggests that at least 76 percent of the growth in urban Interstate route miles and 51 percent of the growth in urban Interstate lane miles was attributable to boundary changes rather than new construction or widening.

Although *Exhibits 1-11* and *1-12* show average annual decreases from 2006 to 2016 in rural Interstate route mileage and rural Interstate lane mileage of 0.5 percent and 0.4 percent, respectively, after removing apparent urban reclassifications each of these measures appears to have grown at an average annual rate of at least 0.2 percent per year.

These estimated impacts of urban boundary changes may be conservative, as the approach used to develop the analysis did not capture potential boundary changes involving Interstate routes that were renumbered between 2006 and 2016.
Source: FHWA staff analysis of HPMS data.

In addition to the construction of new roads, two factors have continued to contribute to the increase in urban highway route mileage. First, based on population growth reflected in the decennial census, more people are living in areas that were previously rural, and thus urban boundaries have expanded in some locations. This expansion has resulted in the reclassification of some route mileage from rural to urban. States have 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 route mileage.

Exhibit 1-11 ■ Highway Route Miles by Functional System and Area, 2006–2016



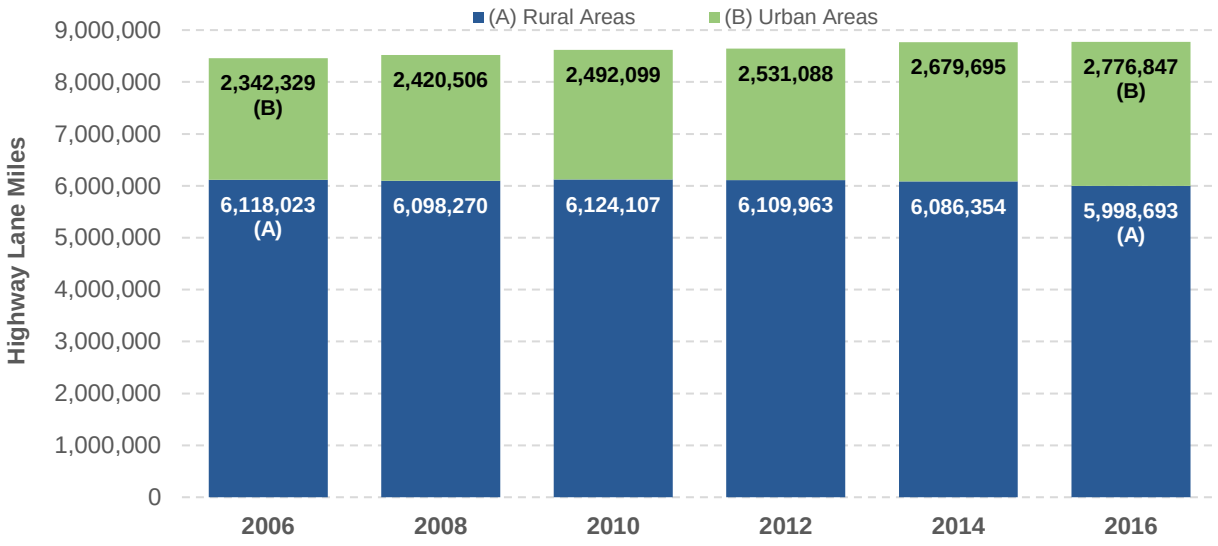
Functional System	2006	2008	2010	2012	2014	2016	Annual Rate of Change 2016/2006
Rural Areas (less than 5,000 in population)							
Interstate	30,615	30,227	30,260	30,564	29,095	29,177	-0.5%
Other Freeway & Expressway[1]			3,299	4,395	3,299	6,378	
Other Principal Arterial[1]			92,131	91,462	92,131	89,772	
Other Principal Arterial[1]	95,009	95,002					0.1%
Minor Arterial	135,589	135,256	135,681	135,328	132,672	134,034	-0.1%
Major Collector	419,289	418,473	418,848	419,353	418,848	407,870	-0.3%
Minor Collector	262,966	262,852	263,271	262,435	263,271	258,719	-0.2%
Local	2,046,796	2,038,517	2,036,990	2,039,276	2,036,990	2,005,171	-0.2%
Subtotal Rural Areas	**2,990,264**	**2,980,327**	**2,980,480**	**2,982,813**	**2,976,306**	**2,931,121**	**-0.2%**
Urban Areas (5,000 or more in population)							
Interstate	16,277	16,789	16,922	17,150	18,567	19,312	1.7%
Other Freeway and Expressway	10,817	11,401	11,371	11,521	11,784	12,302	1.3%
Other Principal Arterial	63,180	64,948	65,505	65,593	66,761	66,517	0.5%
Minor Arterial	103,678	107,182	108,375	109,337	112,228	113,316	0.9%
Collector[1]	109,639	115,087					3.0%
Major Collector[1]			115,538	116,943	127,809	130,294	
Minor Collector[1]			3,303	3,588	11,754	16,961	
Local	738,156	763,618	782,273	802,473	852,755	867,469	0.7%
Subtotal Urban Areas	**1,041,747**	**1,079,025**	**1,103,288**	**1,126,605**	**1,201,658**	**1,226,171**	0.6%
Total Highway Route Miles	**4,032,011**	**4,059,352**	**4,083,768**	**4,109,418**	**4,177,964**	**4,157,292**	**0.3%**

[1] Starting in 2010, the HPMS data reflect revised functional classifications. Rural Other Freeway and Expressway has been split from the rural Other Principal Arterial category, and urban Collector has been split into urban Major Collector and urban Minor Collector. The annual rate of change was computed based on the older combined categories.

Source: Highway Performance Monitoring System.

Exhibit 1-12 shows the change in highway lane miles from 2006 to 2016 by functional class and shows the changes in rural areas vs. urban areas of the Nation. Urban areas have seen an increase in lane miles from more than 2.34 million in 2006 to slightly less than 2.78 million in 2016. The largest decrease in lane miles occurred on rural local roadways, a loss of 83,250 lane miles of roadway, whereas urban local roadways experienced the largest increase in lane miles, at 265,551 lane miles.

Exhibit 1-12 ■ Highway Lane Miles by Functional System and Area, 2006–2016



Functional System	Highway Lane Miles						Annual Rate of Change 2016/2006
	2006	2008	2010	2012	2014	2016	
Rural Areas (less than 5,000 in population)							
Interstate	124,506	122,956	123,762	124,927	118,688	119,159	-0.4%
Other Freeway and Expressway[1]			11,907	16,593	20,677	24,542	
Other Principal Arterial[1]			243,065	240,639	233,985	231,532	
Other Principal Arterial[1]	248,334	250,153					0.3%
Minor Arterial	282,397	281,071	287,761	281,660	274,271	276,685	-0.2%
Major Collector	843,262	841,353	857,091	842,722	823,609	818,994	-0.3%
Minor Collector	525,932	525,705	526,540	524,870	517,026	517,439	-0.2%
Local	4,093,592	4,077,032	4,073,980	4,078,552	4,098,098	4,010,342	-0.2%
Subtotal Rural Areas	**6,118,023**	**6,098,270**	**6,124,107**	**6,109,963**	**6,086,354**	**5,998,693**	**-0.2%**
Urban Areas (5,000 or more in population)							
Interstate	89,036	91,924	93,403	95,197	102,541	105,457	1.7%
Other Freeway and Expressway	50,205	53,073	53,231	54,160	55,385	58,943	1.6%
Other Principal Arterial	221,622	228,792	235,127	234,469	231,099	237,381	0.7%
Minor Arterial	269,912	274,225	285,954	283,608	287,061	296,203	0.9%
Collector[1]	235,240	245,262					3.7%
Major Collector[1]			252,435	250,760	272,931	278,414	
Minor Collector[1]			7,404	7,948	25,168	58,584	
Local	1,476,314	1,527,230	1,564,546	1,604,946	1,705,510	1,741,865	1.7%
Subtotal Urban Areas	**2,342,329**	**2,420,506**	**2,492,099**	**2,531,088**	**2,679,695**	**2,776,847**	**1.7%**
Total Highway Lane Miles	**8,460,352**	**8,518,776**	**8,616,206**	**8,641,051**	**8,766,049**	**8,775,540**	**0.4%**

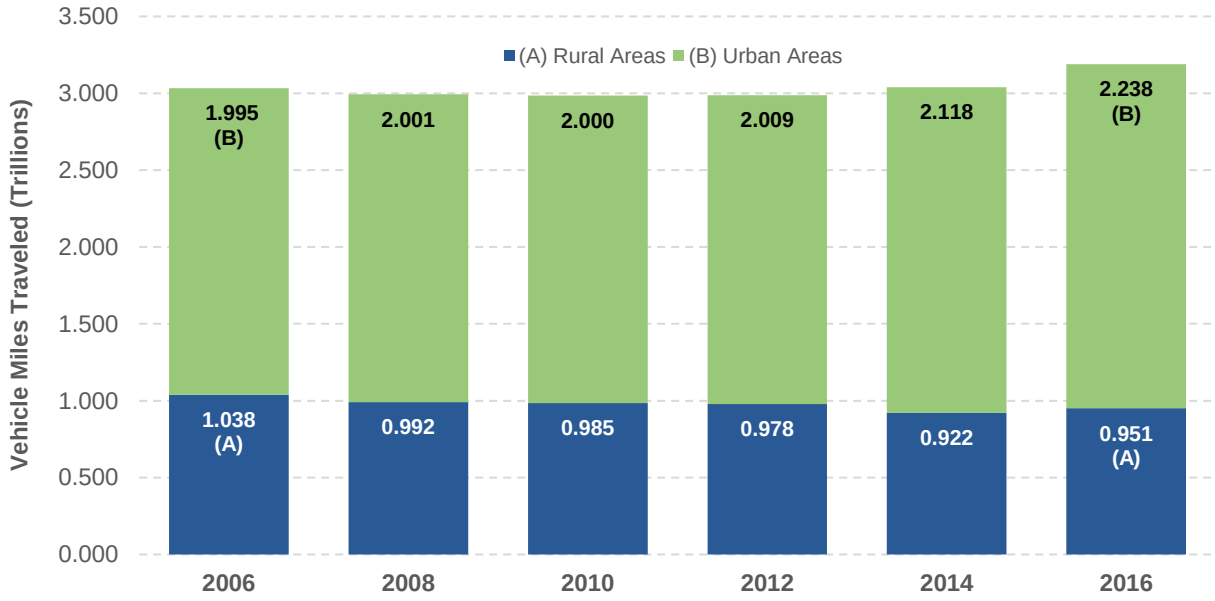
[1] Starting in 2010, the HPMS data reflect revised functional classifications. Rural Other Freeway and Expressway has been split from the rural Other Principal Arterial category, and urban Collector has been split into urban Major Collector and urban Minor Collector. The annual rate of change was computed based on the older combined categories.

Source: Highway Performance Monitoring System.

Exhibit 1-13 shows VMT in trillions of miles by functional class from 2006 to 2016. VMT in rural areas decreased from 1.04 trillion miles in 2006 to 0.95 trillion miles in 2016. Urban VMT increased from just under 2.0 trillion to slightly less than 2.24 trillion during the same period. *Exhibit 1-13* also shows the largest average annual decrease of 2.0 percent was on rural minor collectors and the largest gain was on the combined functional classifications of urban major and minor collectors, an

increase of 2.5 percent. Overall, VMT on rural roadways declined by an average annual rate of 0.9 percent and VMT on urban roadways increased by an average annual rate of 1.2 percent between 2006 and 2016.

Exhibit 1-13 ■ VMT by Functional System and Area, 2006–2016



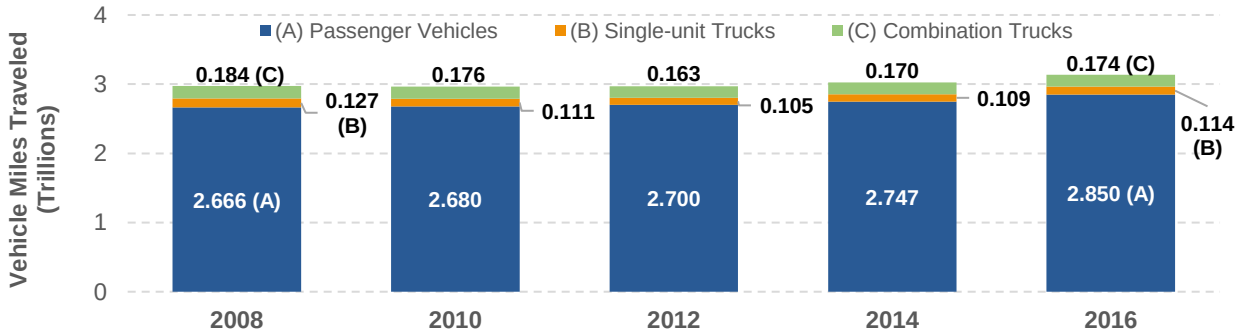
Functional System	Annual Travel Distance (Trillions of Miles)						Annual Rate of Change 2016/2006
	2006	2008	2010	2012	2014	2016	
Rural Areas (less than 5,000 in population)							
Interstate	0.258	0.244	0.246	0.246	0.232	0.247	-0.4%
Other Freeway & Expressway[1]			0.020	0.020	0.026	0.034	
Other Principal Arterial[1]			0.206	0.203	0.188	0.190	
Other Principal Arterial[1]	0.232	0.223					-0.3%
Minor Arterial	0.163	0.152	0.151	0.149	0.141	0.144	-1.3%
Major Collector	0.193	0.186	0.176	0.176	0.159	0.160	-1.9%
Minor Collector	0.058	0.055	0.053	0.053	0.050	0.048	-2.0%
Local	0.133	0.132	0.133	0.130	0.126	0.128	-0.4%
Subtotal Rural Areas	**1.038**	**0.992**	**0.985**	**0.978**	**0.922**	**0.951**	**-0.9%**
Urban Areas (5,000 or more in population)							
Interstate	0.483	0.482	0.483	0.490	0.525	0.563	1.6%
Other Freeway and Expressway	0.218	0.224	0.222	0.225	0.228	0.250	1.4%
Other Principal Arterial	0.470	0.466	0.461	0.460	0.471	0.483	0.3%
Minor Arterial	0.380	0.381	0.378	0.375	0.393	0.412	0.8%
Collector[1]	0.176	0.178					2.5%
Major Collector[1]			0.179	0.177	0.195	0.207	
Minor Collector[1]			0.004	0.004	0.012	0.016	
Local	0.268	0.271	0.273	0.278	0.295	0.306	1.3%
Subtotal Urban Areas	**1.995**	**2.001**	**2.000**	**2.009**	**2.118**	**2.238**	**1.2%**
Total VMT	**3.034**	**2.993**	**2.985**	**2.987**	**3.040**	**3.189**	**0.5%**

[1] Starting in 2010, the HPMS data reflect revised functional classifications. Rural Other Freeway and Expressway has been split from the rural Other Principal Arterial category, and urban Collector has been split into urban Major Collector and urban Minor Collector. The annual rate of change was computed based on the older combined categories.

Source: Highway Performance Monitoring System.

Exhibit 1-14 shows an analysis of the types of vehicles comprising the Nation's VMT between 2008 and 2016. Three groups 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 those with trailers and semitrailers. Passenger vehicle travel accounted for 90.8 percent of total VMT in 2016, combination trucks accounted for more than 5.5 percent, and single-unit trucks accounted for 3.6 percent.

Exhibit 1-14 ■ Highway Travel by Functional System and Vehicle Type, 2008–2016



Functional System Vehicle Type	Annual Travel Distance (Trillions of Miles)					Annual Rate of Change 2016/2008
	2008	2010	2012	2014	2016	
Rural						
Interstate						
Passenger Vehicles	0.181	0.185	0.188	0.175	0.184	0.2%
Single-unit Trucks	0.012	0.011	0.009	0.009	0.010	-2.2%
Combination Trucks	0.050	0.049	0.049	0.047	0.050	0.0%
Other Arterial						
Passenger Vehicles	0.322	0.324	0.325	0.309	0.318	-0.2%
Single-unit Trucks	0.020	0.019	0.017	0.016	0.016	-2.9%
Combination Trucks	0.032	0.033	0.030	0.029	0.029	-1.1%
Other Rural						
Passenger Vehicles	0.335	0.328	0.327	0.304	0.302	-1.3%
Single-unit Trucks	0.019	0.018	0.018	0.017	0.016	-2.3%
Combination Trucks	0.016	0.016	0.014	0.013	0.012	-3.7%
Total Rural						
Passenger Vehicles	0.839	0.837	0.840	0.789	0.804	-0.5%
Single-unit Trucks	0.051	0.048	0.044	0.043	0.042	-2.5%
Combination Trucks	0.098	0.099	0.093	0.089	0.091	-0.9%
Urban						
Interstate						
Passenger Vehicles	0.424	0.427	0.434	0.463	0.492	1.9%
Single-unit Trucks	0.017	0.014	0.015	0.016	0.019	1.6%
Combination Trucks	0.036	0.036	0.036	0.041	0.042	2.1%
Other Urban						
Passenger Vehicles	1.403	1.415	1.427	1.495	1.554	1.3%
Single-unit Trucks	0.059	0.048	0.046	0.050	0.053	-1.3%
Combination Trucks	0.050	0.042	0.035	0.039	0.041	-2.5%
Total Urban						
Passenger Vehicles	1.827	1.842	1.861	1.958	2.046	1.4%
Single-unit Trucks	0.075	0.062	0.061	0.067	0.072	-0.6%
Combination Trucks	0.086	0.077	0.071	0.080	0.083	-0.4%
Total Passenger Vehicles	**2.666**	**2.680**	**2.700**	**2.747**	**2.850**	**0.8%**
Total Single-unit Trucks	**0.127**	**0.111**	**0.105**	**0.109**	**0.114**	**-1.3%**
Total Combination Trucks	**0.184**	**0.176**	**0.163**	**0.170**	**0.174**	**-0.7%**

Notes: Data do not include Puerto Rico. The procedures used to develop estimates of travel by vehicle type have been significantly revised; the data available do not support direct comparisons prior to 2007.

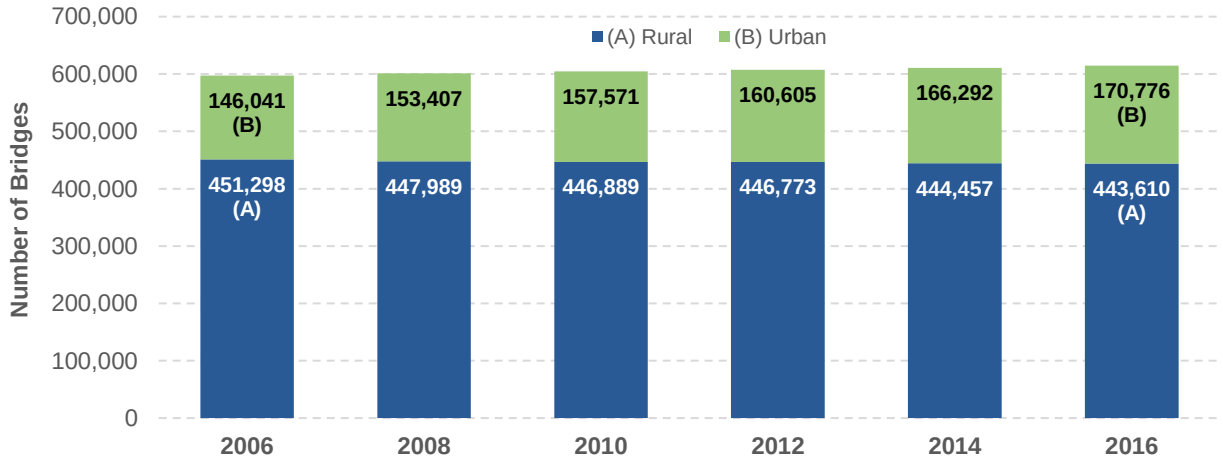
Source: Highway Statistics, various years, Table VM-1.

Passenger vehicle travel grew at an average annual rate of 0.8 percent from 2008 to 2016. During the same period, combination truck traffic declined at an average annual rate of 0.7 percent and single-unit truck traffic declined at an average annual rate of 1.3 percent. Household travel is discussed in more detail in Chapter 3; highway freight transportation is discussed in Part III.

The change in the number of bridges by functional system from 2006 to 2016 is shown in *Exhibit 1-15.* The number of bridges in the Nation has increased from 597,561 in 2006 to 614,387 in 2016, an annual rate of change of approximately 0.3 percent. Rural interstate bridges decreased at an annual rate of 0.6 percent from 2006 to 2016, whereas the number of bridges on urban collectors had the largest average annual increase at 2.7 percent.

The number of bridges on rural local roadways decreased by the largest amount, from 207,130 bridges in 2006 to 203,393 in 2016. During the same period the number of bridges increased by the largest amount—5,389 bridges—on urban collector roadways.

Exhibit 1-15 ■ Number of Bridges by Functional System and Area, 2006–2016



Functional System	Bridges						Annual Rate of Change 2016/2006
	2006	2008	2010	2012	2014	2016	
Rural							
Interstate	26,633	25,997	25,223	25,201	25,057	25,176	-0.6%
Other Principal Arterial	35,766	35,594	36,084	36,460	36,711	37,236	0.4%
Minor Arterial	39,521	39,079	39,048	39,123	38,159	37,942	-0.4%
Major Collector	93,609	93,118	93,059	92,875	92,777	92,142	-0.2%
Minor Collector	48,639	48,242	47,866	47,922	47,758	47,721	-0.2%
Local	207,130	205,959	205,609	205,192	203,995	203,393	-0.2%
Subtotal Rural	**451,298**	**447,989**	**446,889**	**446,773**	**444,457**	**443,610**	**-0.2%**
Urban							
Interstate	28,637	29,629	30,116	30,758	31,496	32,133	1.2%
Other Freeway and Expressway	17,988	19,168	19,791	20,139	20,821	20,695	1.4%
Other Principal Arterial	26,051	26,934	27,373	28,141	28,669	29,478	1.2%
Minor Arterial	26,239	27,561	28,103	28,437	29,943	31,515	1.8%
Collectors	17,618	18,932	20,311	20,590	21,834	23,007	2.7%
Local	29,508	31,183	31,877	32,540	33,529	33,948	1.4%
Subtotal Urban	**146,041**	**153,407**	**157,571**	**160,605**	**166,292**	**170,776**	**1.6%**
Unclassified	**222**	**110**	**33**	**2**	**0**	**1**	**-41.7%**
Total	**597,561**	**601,506**	**604,493**	**607,380**	**610,749**	**614,387**	**0.3%**

Source: National Bridge Inventory.

System Assets – Transit

System History

The first transit systems in the United States date to the 19th century. These systems 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 and associated public infrastructure investments was limiting the ability of transit businesses to operate at a profit. As transit businesses 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 of 1964, which established a program to provide Federal funding for transit systems. The Act changed the character of the industry by specifying that Federal funds for transit be given to public agencies rather than to private firms; this funding shift accelerated the transition from private to public ownership and operation of transit systems. The Act also required local governments to contribute matching funds as a condition for receiving Federal aid for transit services—setting the stage for the multilevel governmental partnerships that characterize today's transit industry.

State government involvement in the provision of transit services is usually through financial support and performance oversight. Some States, however, have undertaken outright ownership of some transit services. Connecticut, Delaware, Georgia, Louisiana, Maryland, Massachusetts, Washington, the U.S. Virgin Islands, and Puerto Rico directly own and operate transit systems. New Jersey and Rhode Island have both set up statewide public transit corporations to operate transit services within their States.

Federal legislation in 1962 instituted the first requirement for transportation planning in urban areas with a population of more than 50,000, but did not require the establishment of metropolitan planning organizations (MPOs).

KEY TAKEAWAYS

Agencies/Reporters

- Most transit systems in the United States report to the National Transit Database (NTD). In 2016, 949 agencies serving almost all 486 urbanized areas and 1,321 rural agencies reported to the NTD.
- In addition, more than 3,800 nonprofit providers operate in rural and urban areas.

Modal Service

- Transit is provided through 18 distinct modes, which belong to two major categories: rail and nonrail. There were 1,107 regular fixed-route bus systems, 190 commuter bus systems, and 16 bus rapid transit systems in 2016.
- Demand-response service was provided by 1,777 systems.
- Open-to-the-public vanpool service was provided by 105 systems.
- Other modes include ferryboat (30 systems), trolleybus (five systems), and other less common modes.
- Rail modes include heavy rail (18 systems), light rail (23 systems), streetcar (26 systems), hybrid rail (five systems), commuter rail (29 systems), and other less common rail modes that run on fixed tracks.

Assets

- Agencies reported 212,668 vehicles in urban and rural areas.
- Rail systems were operated on 13,094 miles of track.
- Fixed-route bus, commuter bus, and bus rapid transit systems operated in over 233,000 mixed-traffic route miles.
- Agencies reported 3,449 passenger stations and 2,424 maintenance facilities.

MPOs are composed of State and local officials who work to address transportation planning needs of urbanized areas at a regional level. Twenty-seven years later, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) made MPO coordination a prerequisite for Federal funding of many transit projects.

In addition, ISTEA made several other changes to transportation law, including changing the name of the Urban Mass Transportation Administration to the Federal Transit Administration (FTA). On the urban side, ISTEA increased transit formula grant funding to all agencies and initiated the use of a formula to allocate capital funds, rather than determine funding allocation based on a discretionary project basis. The Act also increased flexibility in shifting highway trust funds between transit and highway projects.

The Transportation Equity Act for the 21st Century (TEA-21) was passed in 1998 and over the next 6 years increased transit funding by 70 percent. Part of this additional funding was to offset the increased cost of implementing service for persons with disabilities under the Americans with Disabilities Act of 1990 (ADA). The ADA required public transit services to be open to the public without discrimination and to meet all other requirements of the Act. The ADA also further increased flexibility in the use of Federal funds.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was enacted in 2005. This Act created some new programs—especially for smaller transit providers—and new program definitions. Within the urban formula program, a new formula allocation was added for Small Transit Intensive Cities (STIC). In the Capital Investment Grants (CIG), a Small Starts project eligibility category was created, with a streamlined review process for lower-cost alternative approaches to transit projects such as bus rapid transit. In the rural (rather than the urbanized area) program, funding was increased greatly for rural transit providers, intercity fixed-route bus transportation became eligible for rural funds, and funds were made available for Native American Tribal transit.

The Moving Ahead for Progress in the 21st Century (MAP-21) Act was enacted into law on July 6, 2012. MAP-21 consolidated the Jobs Access and Reverse Commute program into the core formula program and added the number of low-income individuals as a new formula factor. Funds for the rural program were to be allocated based on a new service factor—vehicle revenue miles—and a factor for low-income individuals. The Act gave FTA safety oversight authority and directed FTA to issue a new rule requiring transit asset management to promote a state of good repair (SGR). Funds for Tribal transit were increased, and some funds were distributed by a new formula, based in part on vehicle revenue miles. Another significant change was the elimination of the Fixed-Guideway Modernization capital program and the creation of the new, formula-based SGR program in its place. The SGR program would dedicate capital funds to the repair, upgrading, and modernization of the Nation's transit fixed-guideway infrastructure. This fixed-guideway infrastructure would include the rail transit systems, high-intensity motor bus systems operating on high-occupancy vehicle lanes, ferries, and bus rapid transit systems. The Act requires transit agencies to develop a transit asset management plan that inventories their capital assets and evaluates the condition of those assets.

The Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) was enacted into law on December 4, 2015, covering Fiscal Years 2016 through 2020. The FAST Act retained the basic structure of the urban formula program, but increased the STIC formula funding and allowed certain smaller systems (100 demand-response vehicles or fewer) in large urban areas to use some formula funds for operating expenses.

System Infrastructure

Urban and Rural Transit Agencies

State and local transit agencies have evolved into several different institutional models. A transit provider can be a unit of a regional transportation agency operated directly by the State, county, or city government, or an independent agency with an elected or appointed board of governors. Transit operators can provide service directly with their own equipment or they can purchase transit services through an agreement with a contractor.

As summarized in *Exhibit 1-16*, approximately 949 transit providers in urbanized areas (UZAs) and 1,321 transit providers in rural areas submitted data to the NTD. *Exhibit 1-17* identifies the population and unlinked transit trips for individual UZAs with a population over 1 million. (Some other exhibits in this report present data on areas over and under 1 million in population.)

Exhibit 1-16 ■ Number of Urban and Rural Agencies by Organizational Structure

Organization Structure	City, County, Local Government Transportation Units	Independent Public Authorities or Agencies	State Government Unit	Private Operators[1]	Other[2]	Total
Urban Agencies	525	263	20	88	53	949
Rural Agencies	643	183	5	302	188	1,321
Total	**1,168**	**446**	**25**	**390**	**241**	**2,270**

[1] Private for-profit corporation, or private nonprofit corporation.

[2] Other includes "Area Agency on Aging;" "Metropolitan Planning Organization, Council of Governments, or Other Planning Agencies;" "Tribe;" and "University."

Source: National Transit Database.

Of the 949 urban reporters, 263 were independent public authorities or agencies; 525 were city, county, or local government transportation units or departments; 20 were State government units or departments of transportation; and 88 were private operators. The remaining 53 agencies were either private operators or independent agencies, such as MPOs, councils of governments (COGs) or other planning agencies, and universities.

Similarly, of the 1,321 rural reporters, 183 were independent public authorities or agencies; 643 were city, county, or local government transportation units or departments; five were State government units or departments of transportation; and 302 were private operators. The remaining 188 agencies were either private operators or independent agencies (e.g., MPOs, COGs, or other planning agencies, universities, and Indian tribes).

All transit providers that receive either urban formula or rural formula funds from FTA must report to the NTD. In the past, small systems operating fewer than nine vehicles could request a reporting exemption; now, all small systems are required to submit a simplified report to the NTD each year, with requirements parallel to those of rural providers. This simplified reporting applies to 288 agencies with fewer than 30 vehicles in maximum service and not operating fixed-guideway service.

Some transit providers only receive funds from the Section 5310 program. This program (49 U.S.C. 5310) provides formula funding to States to assist private nonprofit groups in meeting the transportation needs of older adults and people with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs.

As of 2016, 949 urban agencies reported providing transit service. Of these, 278 agencies, or about 30 percent, operated only one mode. About half (485 agencies) operated two modes, and the remaining 196 operated from three to eight modes. Altogether, there are a total of 1,916 agency-mode combinations. In 2016, an additional 1,321 agencies served rural areas. Roughly 73 percent of rural agencies operated only one transit mode, with the remaining agencies operating anywhere from two to four modes. The Nation's fixed-route bus and demand-response systems are much more extensive than the rail transit system. Bus fixed-route service includes three distinct modes: regular fixed-route bus, commuter bus, and bus rapid transit.

Exhibit 1-17 ■ 2016 Ridership in Urbanized areas over 1 Million Population (2010 Census)

UZA Rank	UZA Name	2010 Population (Millions)	2016 Unlinked Transit Trips (in Millions)
1	New York-Newark, NY-NJ-CT	18.4	4,293
2	Los Angeles-Long Beach-Anaheim, CA	12.2	619
3	Chicago, IL-IN	8.6	611
4	Miami, FL	5.5	152
5	Philadelphia, PA-NJ-DE-MD	5.4	377
6	Dallas-Fort Worth-Arlington, TX	5.1	76
7	Houston, TX	4.9	91
8	Washington, DC-VA-MD	4.6	440
9	Atlanta, GA	4.5	141
10	Boston, MA-NH-RI	4.2	412
11	Detroit, MI	3.7	40
12	Phoenix-Mesa, AZ	3.6	69
13	San Francisco-Oakland, CA	3.3	471
14	Seattle, WA	3.1	219
15	San Diego, CA	3.0	107
16	Minneapolis-St. Paul, MN-WI	2.7	96
17	Tampa-St. Petersburg, FL	2.4	29
18	Denver-Aurora, CO	2.4	104
19	Baltimore, MD	2.2	116
20	St. Louis, MO-IL	2.2	47
21	San Juan, PR	2.1	42
22	Riverside-San Bernardino, CA	1.9	22
23	Portland, OR-WA	1.9	72
24	Cleveland, OH	1.8	114
25	San Antonio, TX	1.8	45
26	Pittsburgh, PA	1.8	39
27	Sacramento, CA	1.7	66
28	San Jose, CA	1.7	29
29	Cincinnati, OH-KY-IN	1.7	44
30	Kansas City, MO-KS	1.6	20
31	Orlando, FL	1.5	15
32	Indianapolis, IN	1.5	28
33	Virginia Beach, VA	1.5	10
34	Milwaukee, WI	1.4	15
35	Austin, TX	1.4	42
36	Columbus, OH	1.4	19
37	Austin, TX	1.4	31
38	Charlotte, NC-SC	1.2	27
39	Providence, RI-MA	1.2	19
40	Jacksonville, FL	1.1	13
41	Memphis, TN-MS-AR	1.1	8
42	Salt Lake City-West Valley City, UT	1.0	46
Total		**135.6**	**9,276**

Note: UZA is urbanized area.

Source: U.S. Department of Commerce, Census Bureau.

As summarized in *Exhibit 1-18*, in 2016, 1,138 agencies reported fixed-route bus service, including 1,107 regular bus systems, 191 commuter bus systems, and 12 bus rapid transit systems. In addition, 1,894 agencies reported operating demand response services (including demand-response taxi). Note that some agencies operate more than one type of fixed-route bus mode and many agencies provide service for both fixed-route bus and flexible-route demand response modes. Because of this, the sum of these mode types is greater than the number of agencies operating these modes.

Exhibit 1-18 ■ Number of Systems by Mode

Mode Type	Urban	Rural	Total
Nonrail			
Regular Bus	727	411	1,138
Commuter Bus	126	65	191
Bus Rapid Transit	11	1	12
Demand Response / Taxi	812	1,082	1,894
Vanpool	86	18	104
Ferryboat	25	5	30
Trolleybus	5	0	5
Público	1	0	1
Rail			
Heavy Rail	15	0	15
Light Rail	23	0	23
Streetcar	18	0	18
Commuter Rail	27	0	27
Hybrid Rail	5	0	5
Monorail/Automated Guideway	7	0	7
Inclined Plane	3	0	3
Aerial Tramway	1	1	2
Cable Car	1	0	1

Note: No total row shown to avoid double-counting of systems.
Source: National Transit Database.

On the rail side, agencies reported operating, 18 heavy rail systems, 29 commuter rail systems, five hybrid rail systems, 23 light rail systems, and 26 streetcar systems. Hybrid rail systems primarily operate routes on the national system of railroads but do not operate with the characteristics of commuter rail. This service typically operates light rail-type vehicles as diesel multiple-unit trains.

Although every major urbanized area in the United States has fixed-route bus and demand-response systems, 48 urbanized areas were also served by at least one of the rail modes, including 27 by commuter rail, 23 by light rail, 15 by heavy rail, 18 by streetcar vehicles, five by hybrid rail vehicle, and 10 by the other rail modes. *Exhibit 1-19* depicts the number of passenger cars for each rail mode by urbanized area.

In addition to fixed-route bus systems, demand-response systems, and rail modes, transit agencies reported operating 104 vanpool systems, 30 ferryboat systems, five trolleybus systems, eight monorail/automated guideway systems, four inclined plane systems, one cable car system, and one público[4] in 2016.

Finally, the transit statistics presented in this report also include those for several minor modes, including the San Francisco Cable Car, Seattle Monorail, Roosevelt Island Aerial Tramway in New York, and Alaska railroad (a long-distance passenger rail system included as public transportation by statutory exemption).

[4] This is a privately owned, market-driven service using vans and small buses that comprises the largest transit system in Puerto Rico.

Exhibit 1-19 ■ Vehicle Revenue Miles for Rail Modes Serving Urbanized Areas, 2016

UZA Rank	Urbanized Area	Commuter Rail	Heavy Rail	Light Rail	Streetcar	Hybrid Rail	Other[1]	Total Rail
1	New York-Newark, NY-NJ-CT	197,736,871	362,594,955	2,463,517	-	1,299,376	-	564,094,719
2	Los Angeles-Long Beach-Anaheim, CA	13,089,698	6,884,795	13,746,952	-	-	-	33,721,445
3	Chicago, IL-IN	47,754,913	71,811,535	-	-	-	-	119,566,448
4	Miami, FL	3,595,531	8,189,085	-	-	-	1,189,377	12,973,993
5	Philadelphia, PA-NJ-DE-MD	23,563,946	21,721,558	-	3,307,488	-	-	48,592,992
6	Dallas-Fort Worth-Arlington, TX	1,164,706	-	9,829,532	89,237	-	-	11,083,475
7	Houston, TX	-	-	3,420,828	-	-	-	3,420,828
8	Washington, DC-VA-MD	2,289,083	77,967,423	-	58,285	-	-	80,314,791
9	Atlanta, GA	-	22,267,826	-	63,298	-	-	22,331,124
10	Boston, MA-NH-RI	23,532,668	23,247,288	6,499,541	-	-	-	53,279,497
11	Detroit, MI	-	-	-	-	-	543,526	543,526
12	Phoenix-Mesa, AZ	-	-	2,912,029	-	-	-	2,912,029
13	San Francisco-Oakland, CA	7,215,731	71,628,728	5,170,134	521,024	-	672,720	85,208,337
14	Seattle, WA	1,794,741	-	4,114,274	267,455	-	229,784	6,406,254
15	San Diego, CA	1,372,271	-	8,673,789	-	684,576	-	10,730,636
16	Minneapolis-St. Paul, MN-WI	538,172	-	5,228,128	-	-	-	5,766,300
17	Tampa-St. Petersburg, FL	-	-	-	66,163	-	-	66,163
18	Denver-Aurora, CO	1,663,629	-	11,355,973	-	-	-	13,019,602
19	Baltimore, MD	6,386,294	5,003,458	3,138,056	-	-	-	14,527,808
20	St. Louis, MO-IL	-	-	6,250,140	-	-	-	6,250,140
21	San Juan, PR	-	1,910,657	-	-	-	-	1,910,657
23	Las Vegas-Henderson, NV	-	-	-	-	-	1,867,222	1,867,222
24	Portland, OR-WA	-	-	8,856,111	405,109	163,721	-	9,424,941
25	Cleveland, OH	-	2,661,244	776,474	-	-	-	3,437,718
27	Pittsburgh, PA	-	-	2,170,843	-	-	11,580	2,182,423
28	Sacramento, CA	-	-	4,369,542	-	-	-	4,369,542
29	San Jose, CA	-	-	3,470,427	-	-	-	3,470,427
30	Cincinnati, OH-KY-IN	-	-	-	29,053	-	-	29,053
32	Orlando, FL	649,088	-	-	-	-	-	649,088
34	Virginia Beach, VA	-	-	393,524	-	-	-	393,524
37	Austin, TX	-	-	-	-	298,379	-	298,379
38	Charlotte, NC-SC	-	-	990,324	54,901	-	-	1,045,225
40	Jacksonville, FL	-	-	-	-	-	165,218	165,218
41	Memphis, TN-MS-AR	-	-	-	-	-	-	-
42	Salt Lake City-West Valley City, UT	5,401,304	-	6,668,973	-	-	-	12,070,277
44	Nashville-Davidson, TN	201,335	-	-	-	-	-	201,335
46	Buffalo, NY	-	-	947,935	-	-	-	947,935
47	Hartford, CT	1,823,515	-	-	-	-	-	1,823,515
49	New Orleans, LA	-	-	-	1,192,948	-	-	1,192,948
52	Tucson, AZ	-	-	-	193,860	-	-	193,860
56	Albuquerque, NM	1,406,934	-	-	-	-	-	1,406,934
88	Little Rock, AR	-	-	-	52,112	-	-	52,112
100	Chattanooga, TN-GA	-	-	-	-	-	18,121	18,121
102	Stockton, CA	1,078,543	-	-	-	-	-	1,078,543
104	Denton-Lewisville, TX	-	-	-	-	644,711	-	644,711
177	Portland, ME	2,129,947	-	-	-	-	-	2,129,947
256	Kenosha, WI-IL	-	-	-	17,523	-	-	17,523
393	Morgantown, WV	-	-	-	-	-	668,979	668,979
400	Johnstown, PA	-	-	-	-	-	2,415	2,415

[1] Other rail modes include cable car, inclined plane, and monorail.

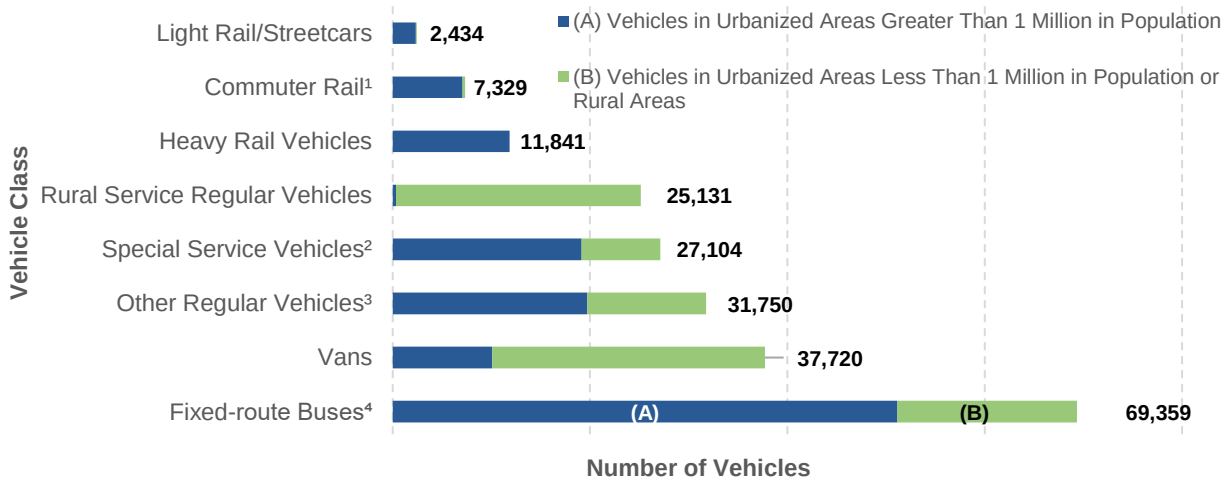
Notes: UZA is urbanized area. Based on primary UZA of the transit system. Some smaller urbanized areas are served by rail that is primary to a larger area. "-" indicates area is not served.

Source: National Transit Database.

Transit Fleet and Stations

Exhibit 1-20 provides an overview of the Nation's fleet of 212,668 transit vehicles as of 2016, segmented by related vehicle type, type of service, and size of urbanized area served. Note here that rail vehicles represent only a small proportion of the nation's total transit fleet (roughly 10 percent) and are almost entirely based in large urban areas. In contrast, rubber-tired, road-based transit vehicles make up close to 90 percent of the national fleet, support a range of service types, and are almost evenly split between service areas that are over and under 1 million population.

Exhibit 1-20 ■ Transit Active Fleet by Vehicle Type, 2016



[1] Includes commuter rail locomotives, commuter rail passenger coaches, and commuter rail self-propelled passenger cars.

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

[3] Includes aerial tramway vehicles, automated guideway vehicles, automobiles, cable cars, cutaways, ferryboats, inclined plane vehicles, monorail vehicles, sport utility vehicles, trolleybuses, and vintage trolleys.

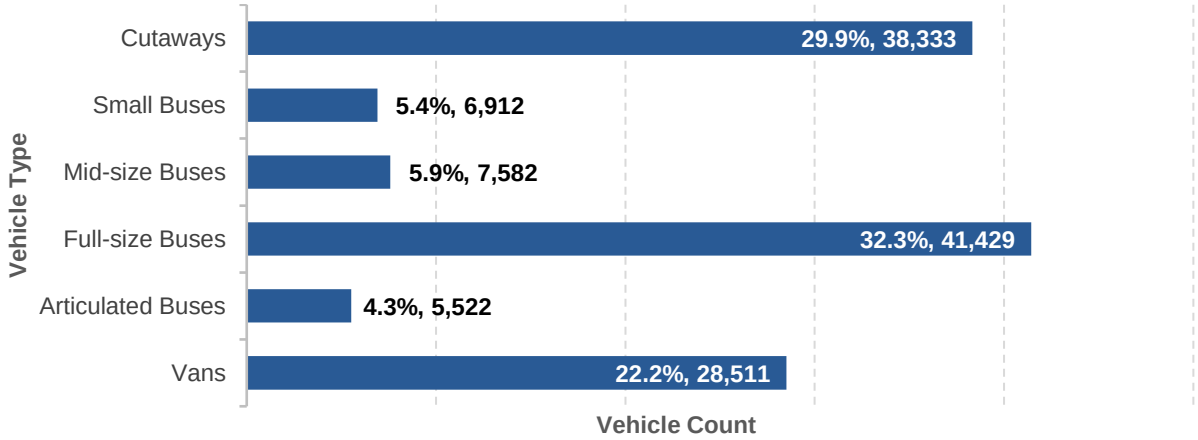
[4] Includes articulated buses, buses, double-decker buses, school buses, and over-the-road-buses.

Source: National Transit Database.

Exhibit 1-21 shows the composition of the Nation's rubber tire transit vehicle fleet as of 2016. These vehicle types serve a mix of urban and rural areas, with urban areas dominated by full-size and articulated buses and rural areas dominated by cutaways, vans, and small buses. Articulated buses are long, 60-foot vehicles that are articulated for better maneuverability on city streets. Full-sized buses are standard 40-foot, 40-seat city buses. Mid-sized buses are in the 30-foot, 30-seat range. Small buses, typically built on truck chassis, are shorter and seat approximately 25 people. Cutaways are typically built on van chassis, and on average have a seating capacity of 15 seats. Vans, as presented here, are the familiar 10-seat passenger vans. Additional information on trends in the number and condition of these vehicles is included in Chapter 8.

Whereas *Exhibit 1-21* depicts fleet by vehicle type, *Exhibit 1-22* depicts fleet by mode. Some modes can be composed of more than one vehicle type. The national fleet includes over 21,000 rail vehicles (passenger cars), and over 153,000 nonrail vehicles, excluding special service vehicles. The bus fleet, which includes bus, commuter bus, and bus rapid transit, accounts for 39 percent of the national fleet, and demand-response for 29 percent of the national fleet.

Exhibit 1-21 ■ Composition of Transit Road Vehicle Fleet, 2016



Note: There is not a one-to-one correspondence between modes and vehicle types. For instance, cutaways are used for both fixed-route bus and demand response. In addition, TERM's classification system for vehicle types differs from that used by NTD.

Sources: Transit Economic Requirements Model (TERM) and National Transit Database.

In addition to fleet counts, *Exhibit 1-22* presents the number of stations by rail and nonrail mode, with heavy rail, commuter rail, light rail and fixed route bus accounting for roughly 90 percent of the total. Despite a brief period of strong investment in the early 2000s, bus rapid transit and commuter bus stations account for only a small share of the station total. The sizes of the ADA fleet and stations are presented in Chapter 4.

Exhibit 1-22 ■ Stations and Fleet by Mode, 2016

Transit Mode	Active Vehicles	Total Stations
Rail		
Heavy Rail	11,841	1,051
Commuter Rail	7,211	1,261
Light Rail	2,129	871
Alaska Railroad	95	11
Monorail/Automated Guideway	163	60
Cable Car	39	0
Inclined Plane	6	6
Hybrid Rail	55	55
Streetcar Rail	361	132
Total Rail	**21,900**	**3,447**
Nonrail		
Bus	68,345	1,514
Demand Response	52,393	0
Vanpool	15,395	0
Ferryboat	183	132
Trolleybus	761	5
Público	2,310	0
Bus Rapid Transit	655	31
Commuter Bus	6,553	235
Demand Response – Taxi	6,534	0
Aerial Tramway	61	2
Total Nonrail	**153,190**	**1,919**
Total All Modes	**175,090**	**5,366**

Source: National Transit Database.

Track and Maintenance Facilities

Exhibit 1-23 shows maintenance facility counts broken down by mode and by size of urbanized area for directly operated service. Modes such as hybrid rail, demand-response taxi, and público are not included because all service is purchased. Chapter 6 includes data on the age and condition of these facilities.

A single facility can be used by more than one mode. In these cases, the count of facilities is prorated based on the number of peak vehicles for each mode.

As *Exhibit 1-24* shows, transit rail providers (including other rail and tramway providers) operated 13,094 miles of track in 2016. 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 1-23 ■ Maintenance Facilities, 2016

Maintenance Facility Type[1]	Over 1 Million	Under 1 Million and Rural Areas	Total
Heavy Rail	61	0	61
Commuter Rail	78	7	85
Light Rail	40	1	41
Hybrid Rail	6	1	7
Other Rail	8	4	12
Streetcar Rail	18	5	23
Fixed-route Bus	459	400	859
Commuter Bus	75	37	111
Bus Rapid Transit	2	1	3
Demand Response	274	281	555
Vanpool	15	8	23
Ferryboat	18	6	24
Trolleybus	4	1	5
Aerial Tramway	1	0	1
Rural Transit	11	604	615
Total Maintenance Facilities	**1,069**	**1,355**	**2,424**

[1] Directly operated service only. Includes owned and leased facilities.

[2] Alaska railroad, automated guideway, cable car, inclined plane, and monorail.

Source: National Transit Database.

Exhibit 1-24 ■ Transit Rail Mileage and Stations, 2016

Urbanized Area Track Mileage	
Heavy Rail	2,272
Commuter Rail	7,907
Light Rail	1,646
Hybrid Rail	202
Streetcar Rail	331
Other Rail and Tramway[1]	736
Total Urbanized Area Track Mileage	**13,094**
Urbanized Area Transit Rail Stations Count	
Heavy Rail	1,051
Commuter Rail	1,261
Light Rail	871
Hybrid Rail	55
Streetcar Rail	132
Other Rail and Tramway[1]	79
Total Urbanized Area Transit Rail Stations	**3,449**

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

Source: National Transit Database.