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Quality Assurance Statement

The Federal Highway Administration provides high-quality information to serve Government, industry, and the public in a manner that promotes public understanding. Standards and policies are used to ensure and maximize the quality, objectivity, utility, and integrity of its information. FHWA periodically reviews quality issues and adjusts its programs and processes to ensure continuous quality improvement.
With over 4 million miles of public roads, including more than 163,000 miles of the National Highway System roadways, our nation is connected coasts to coasts and communities to communities. The 2010 edition of Our Nation’s Highways includes updates on this complex roadway system and the latest changes due to the American Recovery and Reinvestment Act of 2009.

The Federal Highway Administration (FHWA), Office of Highway Policy Information establishes various travel monitoring policies and guidelines, collect and analyze a wide range of data including revenue, finance, vehicle registration, licensed drivers, highway fuel consumption, travel trend, travel behavior, and travel conditions in order to keep you updated on the state of our nation’s treasured highway system. We hope that this edition will continue to serve you as a valuable resource.

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INTRODUCTION. A NEW BEGINNING

On February 17, 2009, President Obama signed into law the American Recovery and Reinvestment Act of 2009 (Recovery Act), whose main goals are to create new jobs as well as save existing ones, spur economic activity, invest in long-term economic growth, and foster unprecedented levels of accountability and transparency in government spending.

The passage of the Recovery Act has brought about a renewed focus on the importance of infrastructure throughout the United States. In addition to the physical improvements to the national roadway system, the Recovery Act has also increased the awareness of the need for preserving and improving our highway infrastructure.

Figure A-1. Cumulative Funds Awarded to State Agencies

Since its enactment in February 2009, cumulative funds of near 27 billion dollars has been obligated by states for transportation-related projects.
To date, over 12,000 projects have been funded or partially funded by the Recovery Act. These projects have both short-term and long-term benefits. While they immediately create an increase in employment opportunities, they also improve roadway system for travel and commerce for years to come.

Data Source for Figure A-1 and A-2: US Department of Transportation, Federal Highway Administration, Recovery Act Data System
The Recovery Act has helped spur economic recovery by creating employment opportunities for people across the country. The hours of work grew more slowly grows in the winter months due to weather-related construction interruptions.
There are a wide range of transportation projects funded under the Recovery Act. These projects include: Bridge Improvement, Bridge Replacement, New Bridge Construction, New Construction, Pavement Improvement, Pavement Widening, Safety/Traffic Management, Transportation Enhancements, and Other. Pavement projects are the main type of activities under the Recovery Act.
CHAPTER 1. HIGHWAY INFRASTRUCTURE

“Travel is fatal to prejudice, bigotry, and narrow-mindedness.”
–Mark Twain

Improvements of the highway infrastructure not only provide benefits to the economic system due to an increase in infrastructure development, but also encourages and provides ways for the American public to experience all that the United States has to offer. Since the introduction of a plan for an interstate system to Congress in 1939, the Nation has devoted significant resources to the creation of a roadway system that connects every major population center. With the interstate system acting as the system’s backbone, we have enjoyed freedom of travel and efficiency of commerce as never before.

The Federal Highway Administration established a Functional Classification Schema in 1989 that classifies roadways by their functions. The three basic categories that comprise our highway system are local roads, collectors, and arterials. Local roads serve homes, businesses, farms, and small communities, and provide access to collector roadways. Collectors channel traffic from the local roads to the arterials, which provide safe, reliable, and efficient travel between larger towns and major cities. The key purposes of all roadways are to provide access and mobility. Local roads chiefly provide access, while mobility is the primary function of arterials. Figures 1-1 and 1-2 illustrate the relationships between the classes of roadways and their relative functions.

Data Source: Figures 1-1 and 1-2 are redrawn from Figure II-1 and II-4 of FHWA Functional Classification Guidelines, 1989, Office of Planning, Federal Highway Administration, US Department of Transportation. (www fhwa dot gov/planning/fcsec2 _1.htm).
Figure 1-1. Hierarchy of Our Highway System

Figure 1-2. Access and Mobility
Figure 1-3. National Highway System
Our National Highway System (NHS) roadways are important to our Nation’s economy, defense, and mobility. The NHS includes all Interstate highways (arterials), the Strategic Highway Network (defense purpose), intermodal connectors (roads connecting to major intermodal facilities), and other principal arterials. Currently, the NHS includes over 163,000 miles (262,267 kilometers) of highway.
Figure 1-4. National Truck Network

The Surface Transportation Assistance Act of 1982 authorized the establishment of a national network of highways designed for use by large trucks. The National Network covers over 200,000 miles (321,890 kilometers) and includes the Interstate Highway System and some other highways. On these highways, Federal width and length limits apply.
Data Source: US Department of Transportation, Federal Highway Administration

Note: Figure 1-4 is for illustration purpose only and shall not be used or interpreted as the official NN network to be used for truck size and weight enforcement purpose.
By the late 1980s, the U.S. highway network was near completion. Now, virtually all population centers are linked by paved roadways. The total number of lane-miles has been increasing as highways are widened with additional lanes to carry more vehicles; on the whole, capacity has been added to existing highways rather than building new ones.

Note: In 1997, forest development roads ceased being treated as public roads. This is why Figure 1-5 (above) indicates significant drops in both centerline and lane mileage in 1998.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Local governments own the majority of public roads at about 76 percent ownership. The Federal Government owns approximately 3 percent of public roads, most of which are located in national parks and forests, military garrisons, and Indian reservations. State governments own the remaining 19 percent of public roads, which includes most of the Interstate system highways.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Bridges are one of the key components of our nation’s highway system. Their integrity can have a significant impact on the safety and efficiency of travel. The National Bridge Inventory (NBI) collects information on the nation's bridges located on public roads, including Interstate Highways, U.S. highways, State and county roads, as well as publicly-accessible bridges on Federal lands. Each State is required to conduct periodic inspections of all bridges and report the data to the FHWA.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Bridge Technology, National Bridge Inventory
Figure 1-8. Toll Road, Bridges, and Tunnels Centerline Miles by States: 2008

Roads, bridges, and tunnels that require drivers to pay a fee for usage are referred to as toll highways, turnpikes, or toll structures. The fee collected is typically used to repay the money previously borrowed for the road construction. As the debit is paid off, the toll may be used for ongoing operations and maintenance. This figure shows the centerline length of toll roads, bridges, and tunnels by State in 2008.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Bridge Technology, National Bridge Inventory
CHAPTER 2. HIGHWAY TRAVEL

While motor vehicles—automobiles, light trucks, vans, sports utility vehicles, and motorcycles—are the main forms of personal transportation, freight-carrying trucks predominate among all modes of freight movement in terms of tonnage and dollar value. The following figures and diagrams are snapshots of vehicle travel statistics on our highway system.

Figure 2-1. Passenger Travel Mode Choice by Number of Trips

Among all of the travel modes in the United States—rail, air, water, highway—the personal motor vehicle (automobile, light truck, van, and motorcycle) is predominant.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, National Household Travel Survey.
In 2008, the U.S. transportation system moved nearly 21.5 billion tons of freight worth 16.8 trillion dollars. Trucks provided the majority of freight movement with 61.6 percent in weight and 66.8 percent of dollar value.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Facts and Figures 2009
Figure 2-3. 2008 Interstate Travel Peak Hour Operating Conditions

V/C - the Volume to Capacity ratio analysis is primarily based on data from Highway Performance Monitoring System, Travel Monitoring and Analysis System.
V/C < 0.8 — typically indicates adequate capacity.
V/C > 0.8 — roadway approaching or exceeding capacity - unstable travel.
V/C > 1.0 — roadway exceeds capacity - highly congested and unstable travel.

In 2008, travel data covering urban interstate highways during peak travel time indicates that approximately 14% of travel was experiencing moderate congestion, and 37% was experiencing the so called “stop-go” highly congested condition. On the other hand, only 2% of travel on rural interstate highways was experiencing moderate congestion and less than 1% was experiencing highly congested condition during peak travel time.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System (HPMS), Travel Monitoring and Analysis System (TMAS).
Vehicle miles traveled (VMT) is one of the most widely used measures of travel intensity and facility utilization. For any given segment of roadway, the VMT is obtained by multiplying the Annual Average Daily Traffic (AADT) by the length of the roadway segment. For example, on a 5-mile highway segment traveled by 5,000 vehicles daily (an average obtained over a year), the VMT would be 25,000. VMT is a measure of total vehicle activity.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Ownership levels, personal preference, and economic factors affect the variation in usage of different types of vehicles. As a result, VMT for the vehicle types also differ. The above figure indicated that single unit truck has been growing steadily over the last decade while combination truck growths stay flat. On the passenger travel side, after decades increase in sport utility vehicle travel, the travel growth has been leveled off for the last four years.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Over the last 15 years, the annual average VMT growth rate for toll roads exceeds 4 percent as compared with the 2 percent average of all other roadway types. Although VMT for toll road is still growing, VMT growth rates for toll road have been declining since 2003. The toll VMT growth rate is more than the national average of all roads.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
CHAPTER 3. VEHICLES

While vehicle ownership is one of the many indicators related to income and wealth, it also has strong implications for the environment and energy use. The following figures show the status of vehicle ownership in 2008 as well as historical trends.

Figure 3-1. Registered Vehicle Growth Trend—Automobiles, Trucks, and Busses: 1970-2008

In the past four decades, the number of registered vehicles in the country has been growing, and the number as compared to the number of licensed drivers has also been growing. Before 1975, the country had roughly 1.0 vehicle per licensed driver. Since then, the ownership of vehicles on a licensed driver basis has been increasing at an accelerating rate, reaching 1.2 at the end of 2008.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Figure 3-2. Vehicles Per Capita by State: 2008

The vehicle ownership rate (# of vehicle per capita) varies markedly from State to State. This map shows that a State’s rates of vehicle ownership ranges from 0.26 vehicles per capita in Nevada to near 0.6 vehicles per capita in Iowa.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
CHAPTER 4. DRIVERS

The 2000 Census revealed the United States had 281.4 million people, an increase of 33 million people since 1990. It is predicted that the 2010 Census will account for a population that has approached 310 million. The growth in numbers of licensed drivers is following the trend of population growth very closely. This section provides an overview of licensed drivers by State, age, sex, and rate per population.

Figure 4-1. Number of Licensed Drivers by Gender: 1970-2008

In 1950, 57 percent of the driving-age population was licensed to drive a motor vehicle. Fifty-eight years later in 2008, that number has increased to 87 percent of the driving-age population. The year 2005 marked the first time that the number of licensed female drivers surpassed male drivers.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
The number of licensed drivers per 1,000 residents differs significantly from State to State. The average percentage of licensed drivers ranges from 58 percent of State residents in New York to more than 87 percent in Vermont.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
In 2008, there were over 208 million licensed drivers in the United States. As the average age of the U.S. population at large shifts upward with the “baby boom” bulge, the trend in licensed drivers follows. In 2008, the 45–49, and 50-54 age groups contained the largest share of drivers.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Altogether, Americans drove over 3 trillion miles in 2007. For about 25 years from 1980-2005, the average annual VMT per licensed driver had been increasing. The annual VMT per licensed driver has been decreasing since 2005. Demographic shifts, the increase in gas prices and the economy may have influenced the shift in driving behavior.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
For household-based travel, short trips account for the vast majority of trips. Over half of all vehicle trips are between 1 and 10 miles. However, Daily Vehicle Miles in this category only accounts for 24.2 percent of household based travel.

Conversely, trips of 100 miles or more account for less than one percent of all vehicle trips, but over 17 percent of all household-based vehicle miles travelled.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
The 2009 National Household Travel Survey (NHTS) data shows that peak commute periods also include high levels of non-work travel for purposes such as family and personal, school and church, and social activities. Including trips by all modes of transportation, the number of non-work trips occurring in midday actually exceeds the number of commuting trips in peak travel periods. As most of the trips throughout the midday are local, short trips, they potentially have a greater impact on energy use and air quality than on highway congestion.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
The above two figures depict the hourly travel patterns for urban and rural interstate highways for both weekdays and weekend. The diurnal (24 hours) distribution pattern for urban interstates during weekdays and the single peak of weekend trend pattern provides us the information to devise trend demand management strategies.
Figure 4-8 illustrates the daily distribution pattern for rural and urban interstate highways. Friday is the heaviest travel day for both rural and urban interstate. While weekend travel on rural interstate is in par with weekend travel, travel on urban interstate on the weekend is still lagging behind weekday travel.
Figure 4-9 Monthly Traffic Distribution

Figure 4-9 illustrates the monthly travel patterns for rural and urban interstate highways. The 2004, 2006 and 2008 data demonstrates the yearly seasonal phenomenon.

Data Source for Figure 4-7, 4-8, and 4-9: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Traffic Monitoring and Analysis System
CHAPTER 5. MOTOR FUEL

The number of registered vehicles has increased every year in the last four decades, and the number of licensed drivers is also climbing. The result is more travel on the Nation’s highways, which in turn leads to an increase in the number of vehicle miles traveled. One key ingredient that has made the VMT growth possible is fuel, which includes gasoline, diesel, natural gas, and other less common fuels.

Figure 5-1. Highway Fuel Usage Trend: 1970–2008

From 1970 to 2008, total highway fuel consumption increased from 92 billion gallons to nearly 181 billion gallons in 2007. The vehicle fuel consumption decreased to 175 billion gallons in 2008. Although consumption of gasoline/gasohol and special fuels is increasing, diesel consumption is increasing at a faster rate than gasoline.

Data Source for Figure 5-1 and 5-2: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics
Figure 5-2. Fuel Consumption by State and Type: 2008
CHAPTER 6. FUNDING AND EXPENDITURES

Receipts from the Federal taxation of motor fuel, along with a number of other highway-related taxes (shown below), are deposited in the Federal Highway Trust Fund. The Trust Fund has two accounts—highway and mass transit—and is dedicated to funding Federal surface transportation programs. In this way, the taxes on highway users stay within the highway system by funding highway facilities. The Trust Fund has provided a stable funding source for highway programs since it was established in 1956.

Table 6-1. Federal Highway User Fees

<table>
<thead>
<tr>
<th>Motor Fuels</th>
<th>Cents Per Gallon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>18.4</td>
</tr>
<tr>
<td>Gasohol</td>
<td>18.4</td>
</tr>
<tr>
<td>Diesel and Kerosene fuel</td>
<td>24.4</td>
</tr>
<tr>
<td>Special fuels</td>
<td>18.3</td>
</tr>
<tr>
<td>Liquefied Petroleum Gas</td>
<td>13.6</td>
</tr>
<tr>
<td>Liquefied Natural Gas</td>
<td>11.9</td>
</tr>
<tr>
<td>Other Special Fuels</td>
<td>18.4</td>
</tr>
</tbody>
</table>

Other User Fees

<table>
<thead>
<tr>
<th>Other User Fees</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tires</td>
<td>Tax is imposed on tires sold by manufacturers, producers, or importers at the rate of $0.0945 ($0.04725 in the case of a bias ply or super single tire) for each 10 pounds of the maximum rated load capacity over 3,500 pounds.</td>
</tr>
<tr>
<td>Truck and trailer sales</td>
<td>12 percent of retailer’s sales price for tractors and trucks over 33,000 pounds gross vehicle weight (GVW) and trailers over 26,000 pounds GVW. The tax applies to parts and accessories sold in connection with the vehicle</td>
</tr>
<tr>
<td>Heavy use vehicles (annual fee)</td>
<td>Trucks 55,000-75,000 pounds GVW, $100 plus $22 for each 1,000 pounds (or fraction thereof) in excess of 55,000 pounds Trucks over 75,000 pounds GVW, $550</td>
</tr>
</tbody>
</table>

Revenue sources of the Federal Highway Trust Fund include the Federal fuel tax and a variety of other fees. The Federal gas tax rate has not changed since 1996.

Data Source for Table 6-1 and Figure 6-1: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Figure 6-1. Ratio of Relative Trust Apportionments/Allocations to Relative Trust Fund Payments: 2008

This chart shows a comparison by State of Highway Trust Fund (HTF) Highway Account receipts attributable to highway users, and apportionments and allocations to the States from the HTF. The ratio is computed from each State’s percentage received from the total apportionments and allocations for the 50 States, the District of Columbia, and U.S. Territories divided by that State’s percentage contribution to the total receipt. U.S. Territories do not contribute to the receipt of HTF.
The Highway Trust Fund (HTF) is the federal funding source for all surface transportation programs; and it has two accounts—highway and mass transit. Revenue for both the highway and transit accounts is from fuel, truck, and tire sales taxes. The fuel tax rates have been changed several times since the Highway Trust Fund was established. Variation in the volume of fuel sales affects receipts. Fuel tax is collected by the Internal Revenue Service at the fuel terminal level.

Note: Under a Congressional mandate known as the Delayed Deposit Provision, about $6 billion of FY 1998 Highway Trust Fund revenue was delayed from FY 1998 to FY 1999.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Figure 6-3. Highway Funding and Expenditures by Local, State, and Federal Government: 1970–2008

Total highway funding by all units of government—Federal, State, and local—reached nearly $193 billion in 2008. The vast majority of federal funds are transferred to state highway agencies as part of the Federal Aid Highway program. The Federal Expense are dollar amount spent on roadways within the National Parks, military installations and other federal owned facilities.

Data Source for Table 6-1 and Figure 6-1: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
Figure 6-4. State Disbursements for Highways by Type in Dollars: 2008

Disbursements for highways are grouped in the following categories:
1. Capital Outlays: Cost associated with land acquisition, design, construction, reconstruction, resurfacing, rehabilitation, restoration, and installation of guard rails, fencing, signs, and signals.
2. Maintenance Cost: Expenses associated with activities to keep highway in usable condition but do not extend the service life of a highway beyond its original design.
3. Administration and Research: General expenses of administering a highway program including overhead, engineering, and research cost that are not assigned to specific road projects.
4. Enforcement and Safety: General expenses associated with traffic supervision activities of State highway patrols, driver education and training, motorcycle safety, vehicle inspection, enforcement of vehicle size, and weight limitations.
5. Bond Retirement: Service cost associated with borrowing funds for highway, road, and street projects.
Figure 6-5. State Disbursements for Highways by Type as Percentage of Total: 2008
Toll facility revenue is typically the only funding source for repaying money borrowed to construct a toll road and to provide for its ongoing maintenance and operations. Over the last 14 years, toll revenue has been increasing at an annual rate approaching 8 percent, approximately equal to the rate growth associated with FHWA Highway Trust Fund.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Statistics.
The Consumer Price Index (CPI) measures the changes in the cost of purchasing products and services. The CPI is computed by the Bureau of Labor Statistics. The higher the number, the faster the product or service rises in price over time. FHWA has developed an approach to generating a construction cost index, entitled the National Highway Construction Cost Index (NHCCI). The NHCCI is intended as a cost index that can be used to assess the purchasing power of the dollar.
CHAPTER 7. CONDITION, PERFORMANCE AND SAFETY

Our reliance on highways for commerce, to commute to work, shop, vacation, and other activities, is creating significant demand on the system. Performance, reliability, safety, and asset preservation are key concerns for transportation agencies. Operating speeds, congestion, and pavement and bridge condition are some of the ways to measure the performance, condition, and safety of the Nation’s highways.

Figure 7-1. Pavement Surface Smoothness on Rural and Urban Interstate: 2008

The International Roughness Index (IRI) is one of the most widely used measures of pavement smoothness or ride quality. Pavements with an IRI rating of less than 170 are considered to have an acceptable ride quality, while those with an IRI of less than 95 can be considered to have a good or very good ride quality.

Data Source for Figure 7-1 and Figure 7-2: US Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, Highway Performance Monitoring System
Figure 7-2. Pavement Surface Smoothness by State: Rural and Urban Interstate 2008

International Roughness Index Scores:
- Green: Good (less than 95)
- Yellow: Acceptable (between 95 and 170)
- Pink: Poor (greater than 170)
The National Bridge Inventory data documents the conditions of bridges on all public roads, regardless of their ownership. Bridges are evaluated and rated as “not deficient,” “functionally obsolete,” or “structurally deficient.” A bridge rated “functionally obsolete” or “structurally deficient” is not necessarily unsafe for all vehicles. Rather, it typically has an older design that lacks modern safety features such as adequate shoulder space, an appropriate railing system, or other features. Strict observance of signs limiting traffic or speed on the bridge will provide adequate safeguards for those who use bridges rated as structurally deficient or functionally obsolete.

As indicated in the above figure, the number of structurally deficient bridges has been declining since 1992. The number of functionally obsolete bridges has stayed relatively constant since 1992. Of the 603,254 bridges in the United States as of December 2009, 71,179 were rated structurally deficient and 78,468 were rated functionally obsolete.

Data Source: US Department of Transportation, Federal Highway Administration, Office of Bridge Technology, National Bridge Inventory
The fatality rate (fatalities per 100 million vehicle miles of travel) on the Nation’s highways continues to decline. In 2008, the fatality rate reached 1.26, which is a historical low. Although the fatality rate is declining, there were still 37,660 fatalities in 2008.

The highway and transit authorization bill for 2005–2009, SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users), has authorized a new core safety program known as the Highway Safety Improvement Program. FHWA has been working with other Federal, State, and local authorities and private organizations to develop new strategies and approaches to improve highway travel safety.

Data Source: US Department of Transportation, National Highway Traffic Safety Administration, Fatality Analysis Reporting System