Personal Transportation

In the U.S., the predominant mode of travel is by automobile and light truck, accounting for about 86% of passenger miles traveled in 2016. The U.S. has less than 5% of the world’s population, but has 14% of the world’s cars, compared to 14.6% in China, 6.7% in Japan, 4.9% in Germany, and 4.4% in Russia. The following consumption patterns indicate that the current transportation system is not sustainable.

Patterns of Use

Miles Traveled
- Total U.S. passenger miles traveled in 2016 was 4.58 trillion.1
- U.S. population increased 30% from 1990 to 2016, while vehicle miles traveled increased 48% over the same time period.1,4,5

Vehicles and Occupancy
- In 1977, the U.S. average vehicle occupancy was 1.87 persons per vehicle.6
- By 2015, average vehicle occupancy had decreased to 1.6 persons per vehicle.3
- In 2016, the U.S. had 269 million registered vehicles and 222 million licensed drivers.1
- In 2009, 23% of U.S. households had three or more vehicles.7

Average Fuel Economy
- Light-duty vehicle fuel economy peaked at 22.0 miles per gallon (mpg) in 1987, declined until the early 2000s, then increased again, surpassing 22.0 mpg in 2009.8
- The average fuel economy for a light-duty 2017 model year vehicle was 25.2 mpg: 30.0 mpg average for a new passenger car and 22.2 mpg average for a new light truck.8
- Even when accounting for recent legislation, the U.S. has some of the lowest required fuel economy standards of any industrialized nation, well below the European Union, China, and Japan.9

Vehicle Size
- From 1988 to 2017, average vehicle weight increased 23% (due to growth in SUV market share), horsepower increased by 89%, and acceleration increased (i.e., 0-60 mph times dropped) by 38%.8
- The average weight of a passenger car increased 17% from 1988 to 2017, while the average weight of a pickup truck increased by 22%.8 Had vehicle weights remained at 1988 levels, model year 2010 cars could have achieved 12% higher fuel economy and trucks a 13% increase.10
- SUVs and pickups accounted for 50% of new vehicles sold in the U.S. in 2017.8

Energy Use
- The transportation sector makes up 29% of total U.S. energy use. From 1973-2017, the percentage of U.S. energy used in the transportation sector increased by 17%.3
- In 2015, American cars and light trucks used 15.1 Quadrillion Btus of energy, representing 15.5% of total U.S. energy consumption.2
- In 2017, 95% of total primary energy used by the transportation sector came from fossil fuels; 92% of total primary energy was from petroleum.11
- The transportation sector accounted for 28.3% of U.S. greenhouse gas emissions in 2016—1,854 million metric tons CO₂e.12
- Passenger cars and light-duty trucks were responsible for 772 million metric tons CO₂e and 334 million metric tons CO₂e, respectively, together making up 60% of U.S. transportation emissions and 17% of total U.S. emissions.17
Live closer to work. The average commute was 12.2 miles in 2009 (up from 12.1 in 2001).

Gallons per mile (gpm) is a better indicator of fuel efficiency than mpg. For example, upgrading from a 16 mpg to 20 mpg vehicle saves 125 gallons of fuel over 10,000 miles, whereas upgrading from a 34 to 50 mpg vehicle saves 94 gallons per year. 

In 2010, the U.S. EPA and National Highway Traffic Safety Administration (NHTSA) raised Corporate Average Fuel Economy (CAFE) standards to 34.1 miles per gallon by model year 2016. These standards are projected to save 1.8 billion gallons of fuel and prevent 960 million metric tons of CO₂ emissions.

In 2012, the Obama Administration finalized standards increasing fuel economy to 54.5 miles per gallon by model year 2025, a step projected to reduce U.S. oil consumption by 12 billion barrels and save consumers more than $1.7 trillion in fuel costs.

Promote Fuel Efficiency
- Consider buying a vehicle that is best-in-class for fuel economy. Each year, the U.S. Environmental Protection Agency and Department of Energy jointly publish the Fuel Economy Guide, which ranks the most efficient vehicles in production.
- Drive responsibly. Aggressive driving habits can lower fuel efficiency by 10% to 40%, and speeds over 50 mph significantly lower gas mileage.
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- Improvements in information technology related to vehicles promise to reduce energy wasted from drivers stuck in traffic. Currently, about one-third of drivers stuck in traffic in major cities are looking for parking.

Encourage Supportive Public Policy
- Dense, mixed-use communities encourage foot and bike traffic while reducing travel time between residences, businesses, and office spaces. 
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Life Cycle Impacts
A typical passenger car is responsible for the following burdens during its lifetime—raw material extraction through end-of-life. Most of these emissions are due to fuel use while driving.

<table>
<thead>
<tr>
<th>Environmental Flow</th>
<th>Lifetime (120,000 miles)</th>
<th>Per Mile (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO₂</td>
<td>61,300</td>
<td>511*</td>
</tr>
<tr>
<td>CO</td>
<td>1,940</td>
<td>16</td>
</tr>
<tr>
<td>SO₂</td>
<td>137</td>
<td>1.1</td>
</tr>
<tr>
<td>NOₓ</td>
<td>256</td>
<td>2.1</td>
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<tr>
<td>NMHC</td>
<td>259</td>
<td>2.1</td>
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<tr>
<td>Methane</td>
<td>70</td>
<td>0.58</td>
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<tr>
<td>Solid Waste</td>
<td>4,380</td>
<td>36.5</td>
</tr>
<tr>
<td>Energy</td>
<td>995 GJ*</td>
<td>8.3 MJ**</td>
</tr>
</tbody>
</table>

* Equivalent to 1.1 lb CO₂/mile
** Equivalent to 163 barrels of oil

Solutions and Sustainable Alternatives
Reduce Vehicle Miles Traveled
- Live closer to work. The average commute was 12.2 miles in 2009 (up from 12.1 in 2001).
- Consider telecommuting or working from home.
- In 2016, 76.6% of workers in the U.S. commuted by driving alone, and only 9.0% of workers car pooled (a drop from 19.7% in 1980). Joining a carpool can help lower household fuel costs, prevent greenhouse gas emissions, and reduce traffic congestion.
- Roughly one-fifth of vehicle trips are shopping-related. Combine errands (trip chaining) to avoid unnecessary driving.
- Use alternative modes of transportation, such as bikes, buses, or trains. According to the Texas Transportation Institute, public transit saved Americans 865 million hours of travel time and 450 million gallons of gasoline in 2011 by reducing traffic congestion.

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