

Personal Transportation

In the U.S., the predominant mode of travel is by automobile and light truck, accounting for about 85% of passenger miles traveled in 2014.¹ The U.S. has less than 5% of the world's population, but has 15% of the world's cars, compared to 7.5% in Japan, 7.0% in China, 5.5% in Germany, and 2.7% in Canada.^{2,3} The following consumption patterns indicate that the current automobile-dominated transportation system is not sustainable.

Patterns of Use

Miles Traveled

- Total U.S. passenger miles traveled in 2014 was 4.37 trillion.¹
- U.S. population increased 28% from 1990 to 2014, while vehicle miles traveled increased 41% 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 2013, average vehicle occupancy had decreased to 1.5 persons per vehicle.³
- In 2014, the U.S. had 260 million registered vehicles and 214 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 2015 model year vehicle was 24.7 mpg; 29.3 mpg average for a new passenger car and 21.7 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

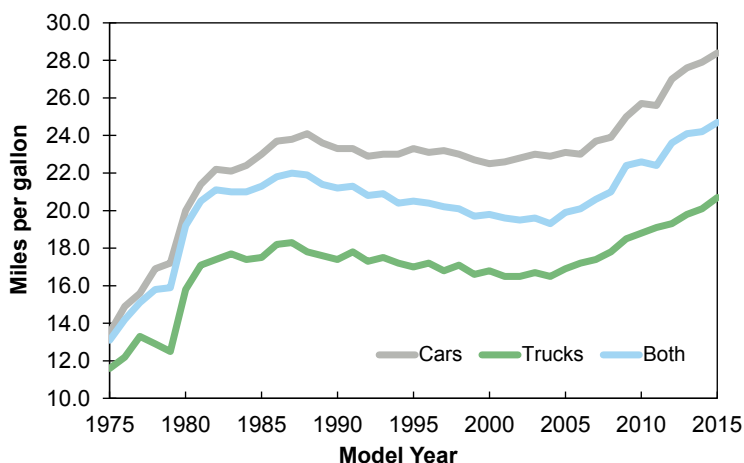
Vehicle Size

- From 1988 to 2015, average vehicle weight increased 24% (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 2015, while the average weight of a pickup truck increased by 25%.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 37% of new vehicles sold in the U.S. in 2015.⁸

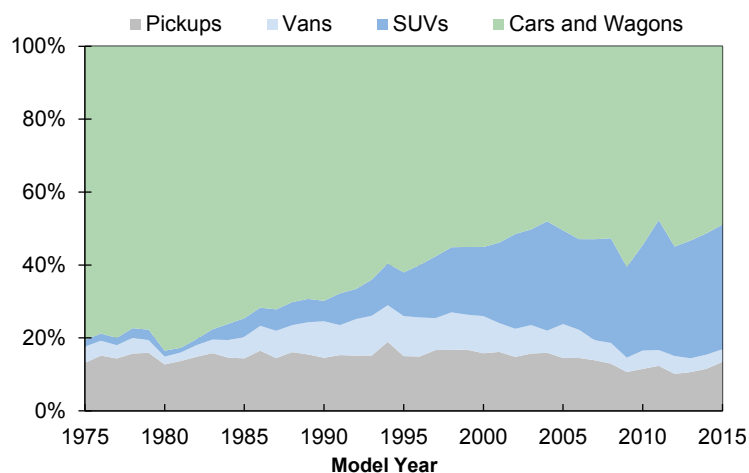
Energy Use

- The transportation sector makes up 28% of total U.S. energy use. From 1973-2014, the percentage of U.S. energy used in the transportation sector increased by 12%.³
- In 2013, American cars and light trucks used 15.1 Quadrillion Btus of energy, representing 15.5% of total U.S. energy consumption.³
- In 2015, 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 26% of U.S. greenhouse gas emissions in 2014—1,810 million metric tons CO₂e.¹²
- Passenger cars and light-duty trucks were responsible for 763 million metric tons CO₂e and 338 million metric tons CO₂e, respectively, together making up 61% of U.S. transportation emissions and 16% of total U.S. emissions.¹²

MPG by Model Year⁸



Market Share by Vehicle Type, 1975-2015⁸



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.

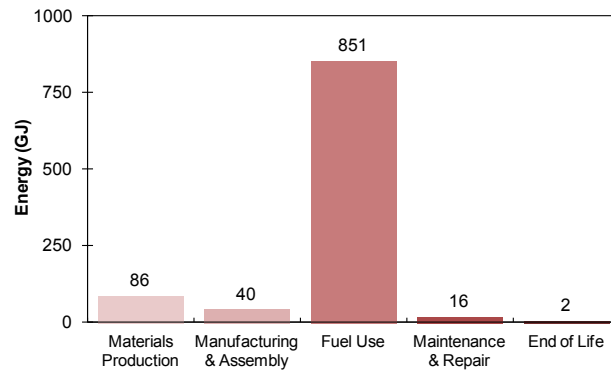
Total Life Cycle Burdens, 1995 Mid-Size Sedan¹³

Environmental Flow	Lifetime (120,000 miles) Total (kg)	Per Mile (g)
CO ₂	61,300	511*
CO	1,940	16
SO _x	137	1.1
NO _x	256	2.1
NMHC	259	2.1
Methane	70	0.58
Solid Waste	4,380	36.5
Energy	995 GJ **	8.3 MJ

* Equivalent to 1.1 lb CO₂/mile

** Equivalent to 163 barrels of oil

Life Cycle Energy Consumption, 1995 Mid-Size Sedan¹³



Solutions and Sustainable Alternatives

Reduce Vehicle Miles Traveled

- Live closer to work. The average commute was 12.2 miles in 2009 (up from 8.5 in 1983).³
- Consider telecommuting or working from home.
- In 2013, 76% of workers in the U.S. commuted by driving alone, and only 9.8% of workers carpoled (a drop from 19.7% in 1980).³ 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.³
- 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.¹⁴

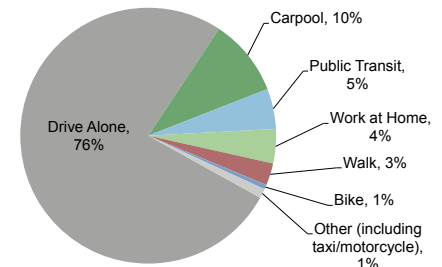
Promote Fuel Efficiency

- 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.¹⁵
- Drive responsibly. Aggressive driving habits can lower highway fuel efficiency by up to 33%, and speeds over 50 mph significantly lower gas mileage.¹⁶
- 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 over 10,000 miles.¹⁷
- 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.¹⁸

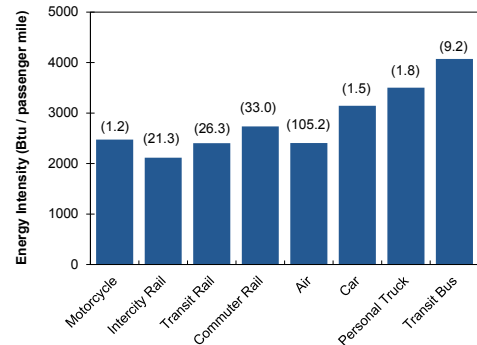
Encourage Supportive Public Policy

- Dense, mixed-use communities encourage foot and bike traffic while reducing travel time between residences, businesses, and office spaces.
- 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.¹⁹
- 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.²⁰

U.S. Modes of Transportation to Work³



Energy Intensity of U.S. Passenger Travel, 2013³
(With average persons per vehicle)



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2. U.S. Central Intelligence Agency (CIA) (2016) "The World Factbook."
3. U.S. Department of Energy (DOE), Oak Ridge National Lab (2015) Transportation Energy Data Book: Edition 34.
4. U.S. Census Bureau (2015) "U.S. and World Population Clock."
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7. U.S. DOT, FHWA (2011) 2009 National Household Travel Survey.
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