Chapter 1.

ENERGY AND ECONOMICS

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Transportation Accounts for 28% of Total U.S. Energy Consumption

In 2010, the transportation sector used 27.4 quadrillion Btu of energy, which was 28% of total U.S. energy use. Nearly all of the energy consumed in this sector is petroleum (94%), with small amounts of renewable fuels (4%) and natural gas (3%). With the future use of plug-in hybrids and electric vehicles, transportation will begin to use electric utility resources. The electric-utility sector draws on the widest range of sources and uses only a small amount of petroleum (1%). Over the last five years, the energy sources have not changed significantly, although renewable fuel use has grown slightly in each sector.

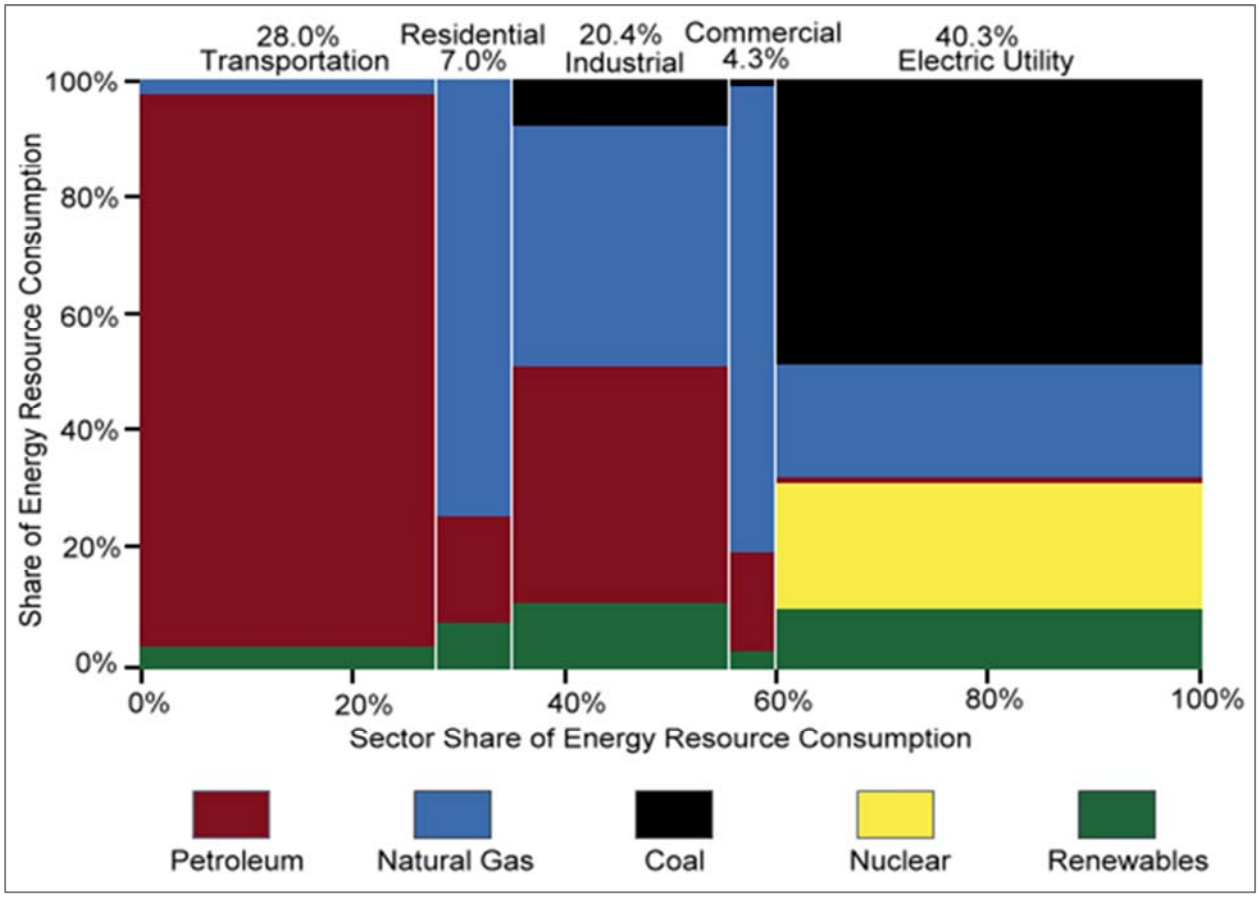


FIGURE 1. U.S. Energy Consumption by Sector and Energy Source, 2010

Sources:

Energy Information Administration, *Monthly Energy Review, July 2011*, Tables 2.2, 2.3, 2.4, 2.5, and 2.6.
http://www.eia.gov/totalenergy/data/monthly

The Transportation Sector Uses More Petroleum than the United States Produces

Petroleum consumption in the transportation sector surpassed U.S. petroleum production for the first time in 1989, creating a gap that must be met with imports of petroleum. By the year 2035, transportation petroleum consumption is expected to grow to almost 17 million barrels per day; at that time, the gap between U.S. production and transportation consumption will be almost 4 million barrels per day when including the non-petroleum sources and 7 million barrels per day if using only conventional sources of petroleum fuel.

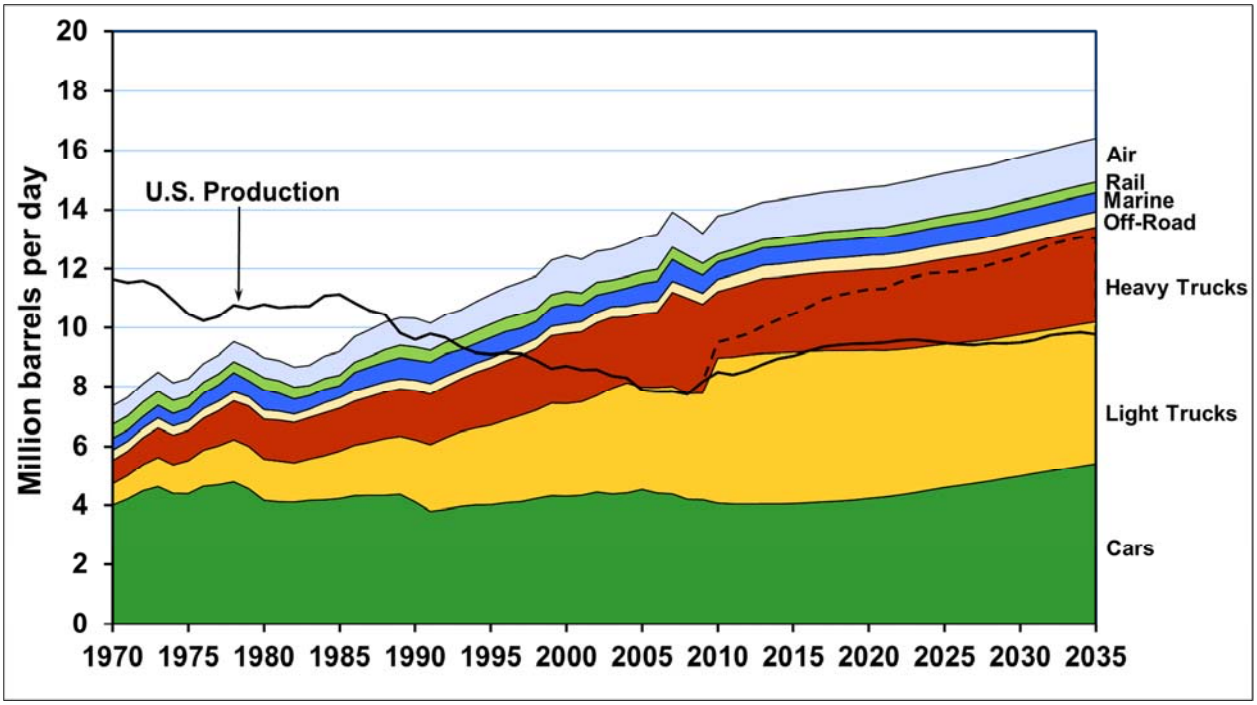


FIGURE 2. Transportation Petroleum Use by Mode and the U.S. Production of Petroleum, 1970-2035

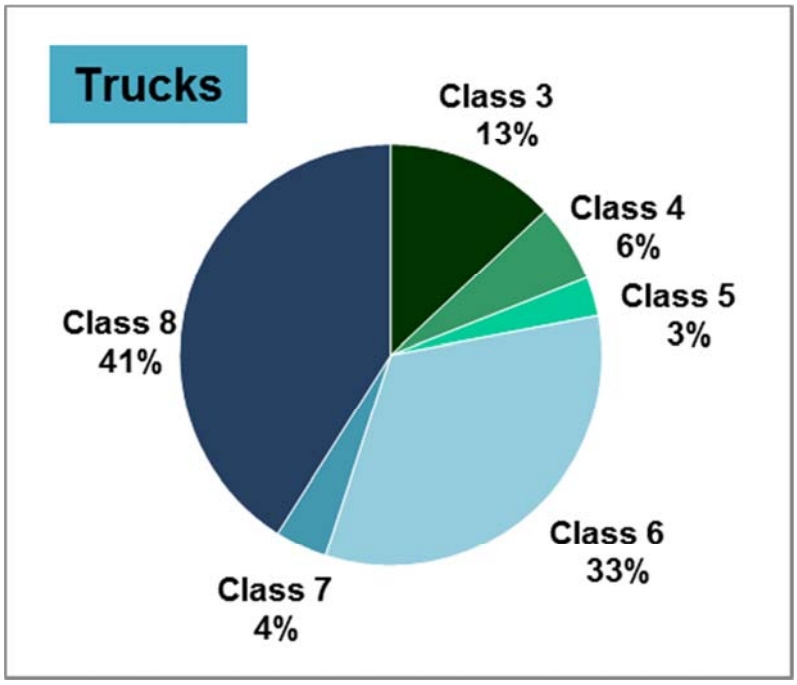
Note: The U.S. production has two lines after 2005. The solid line is conventional sources of petroleum, including crude oil, natural gas plant liquids, and refinery gains. The dashed line adds in other non-petroleum sources, including ethanol, biomass, liquids from coal, other blending components, other hydrocarbons, and ethers. The sharp increase in values between 2009 and 2010 is caused by the data change from historical to projected values. The sharp increase in the value for heavy trucks between 2006 and 2007 is the result of a methodology change in the Federal Highway Administration data.

Sources:

1970-2009: Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 30*, Oak Ridge, TN, 2011. http://cta.ornl.gov/data

2010-2035: Energy Information Administration, *Annual Energy Outlook 2011*, DOE/EIA-0383(2011), Washington, DC, 2011. http://www.eia.gov/oiaf/archive/aeo10/index.html

Class 8 Trucks Use the Majority of Fuel Consumed by Medium/Heavy Trucks



Class 8 trucks comprise only 41% of the heavy- and medium-truck fleet, but they account for 78% of the fuel consumed by medium and heavy trucks. Though more than half of all medium and heavy trucks are Class 3-6, they use less than one-quarter of total fuel. Class 3-6 trucks tend to have higher fuel economy than Class 7-8 trucks and are typically driven fewer miles.

Note: See page 69 for truck class definitions.

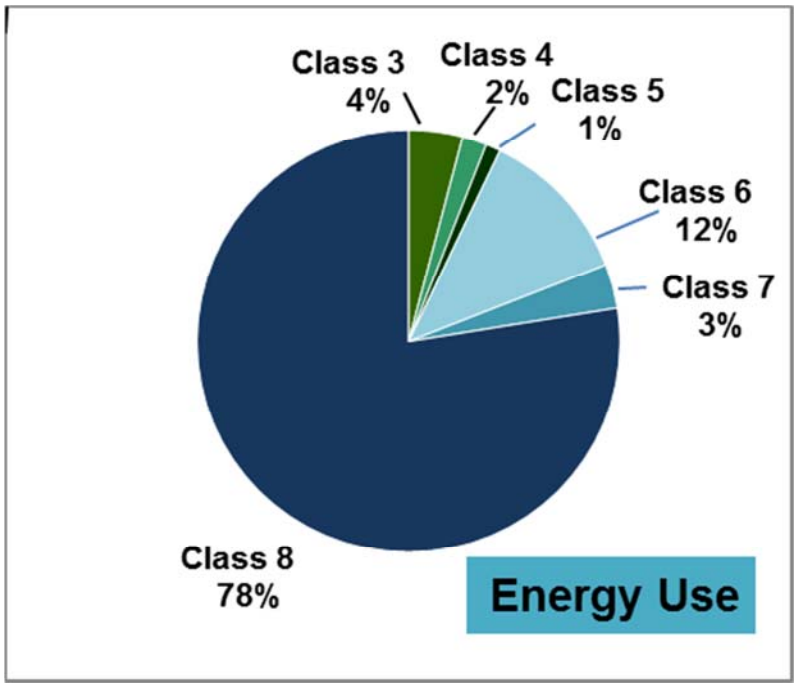


FIGURE 3. Medium and Heavy Truck Fleet Composition and Energy Usage, 2002

Source:
Oak Ridge National Laboratory, *Transportation Energy Data Book: Edition 30*, Oak Ridge, TN, 2011.
http://cta.ornl.gov/data

Improvements in Fuel Economy for Low-MPG Vehicles Yield the Greatest Fuel Savings

An increase in fuel economy by 5 miles per gallon (mpg) does not translate to a constant fuel savings amount. Thus, trading a low-mpg car or truck for one with just slightly better mpg will save more fuel than trading a high-mpg car or truck for one that is even higher. For example, trading a truck that gets 15 mpg for a new one that gets 20 mpg will save 16.7 gallons of fuel for every 1,000 miles driven. In contrast, trading a 35 mpg car for a new car that gets 40 mpg will save 3.6 gallons of fuel for every 1,000 miles driven. These fuel savings are additive; that is, going from 15 mpg to 25 mpg saves 26.7 gallons per thousand miles driven — 16.7 gallons (15-20 mpg difference) plus 10.0 gallons (20-25 mpg difference).

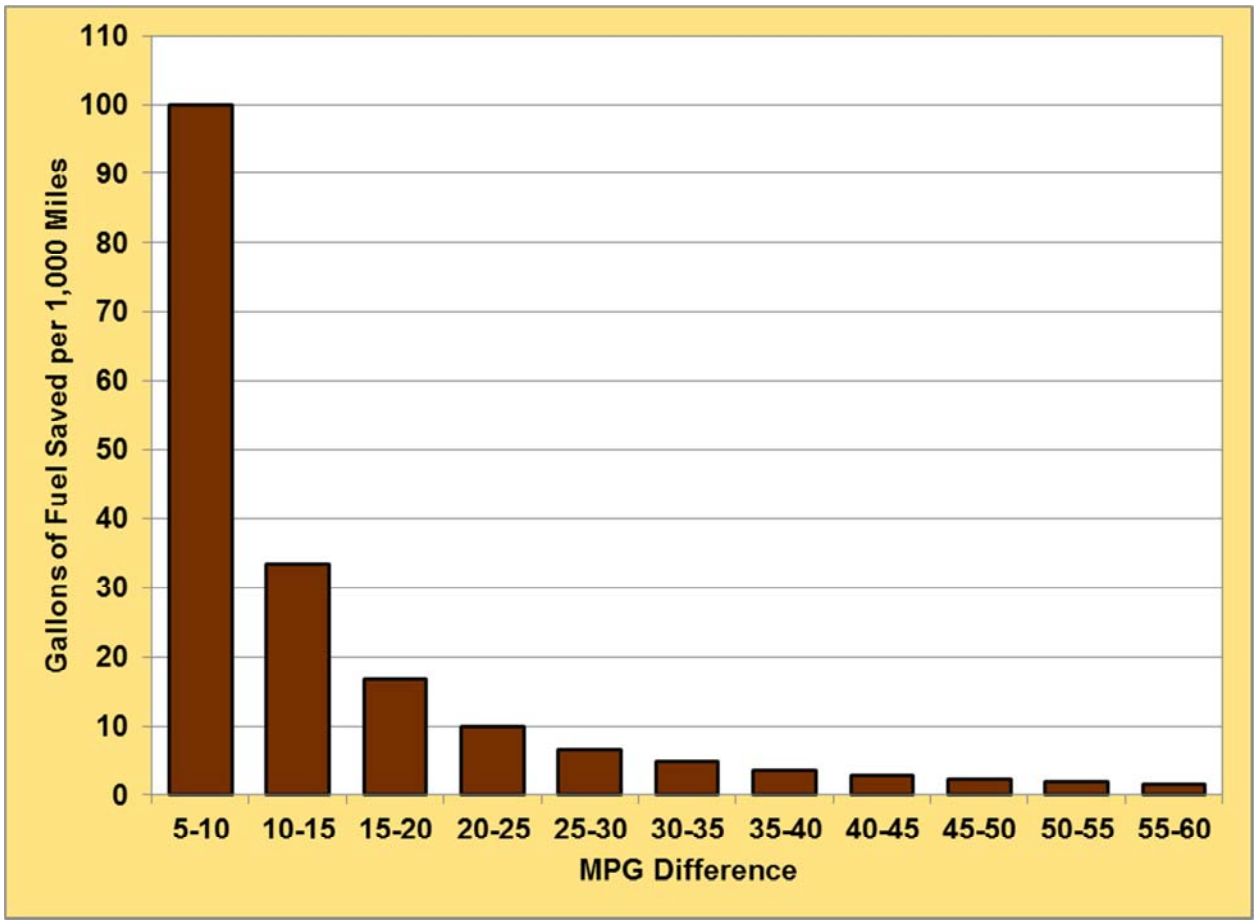


FIGURE 4. Fuel Savings per Thousand Miles

Note: Each category on the horizontal axis shows a five mile per gallon improvement in fuel economy.

Source:

U.S. Department of Energy and Environmental Protection Agency, *Fuel Economy Guide*.
http://www.fueleconomy.gov

Carbon Dioxide Emissions from Transportation Grow

Carbon dioxide (CO_2) emissions grew by 16% — from 1,489 million metric tons in 1990 to 1,724 in 2009. Increases in the amount of CO_2 emissions from highway vehicles, both light and heavy, can be attributed to greater miles traveled. The increased use of ethanol in gasoline nationwide, however, means that CO_2 emissions have not grown at the same rate as fuel use.

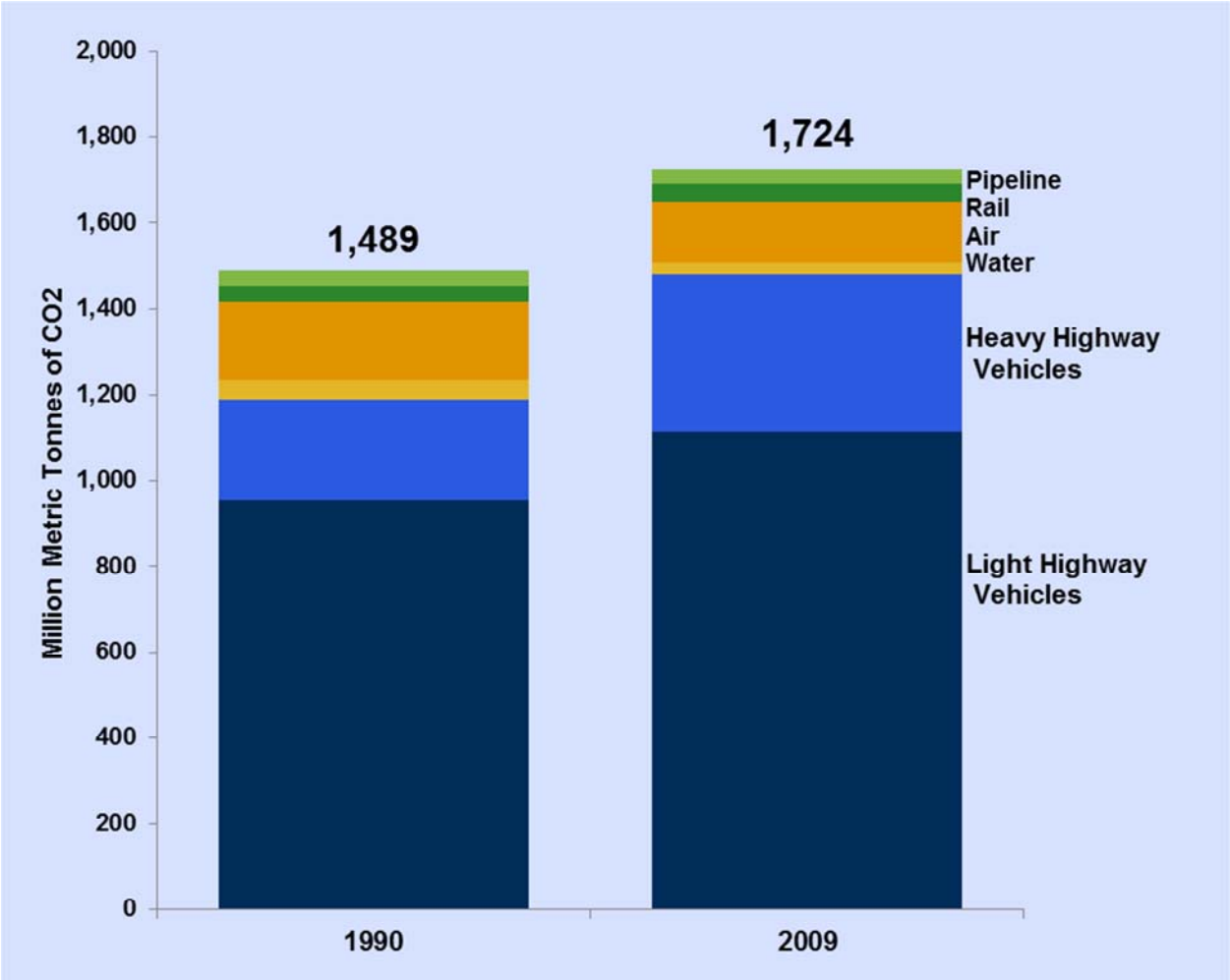


FIGURE 5. Transportation Carbon Dioxide Emissions, 1990 and 2009

Source:
U.S. Environmental Protection Agency, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009, Table 3-12, April 2011. http://epa.gov/climatechange/emissions/usinventoryreport.html

Many Cars Pollute Less Despite Increases in Engine Size and Interior Volume

As new vehicles become more efficient, the amount of carbon dioxide (CO_2) they produce decreases. The Ford Taurus is an example of a car that has increased in both engine size and interior volume over the years, but the amount of CO_2 coming from the tailpipe has decreased. In 1986, the 3.0 liter (L) Taurus with an interior volume of 117 cubic feet emitted 444 grams of CO_2 per mile. Improvements to the vehicle and engine design by 2010 resulted in less CO_2 emissions, despite the larger 3.5L engine and larger interior volume. Moving from a 4-speed transmission to a 6-speed transmission is one of the improvements that made a difference, along with lighter materials, improved aerodynamics, and other factors.

TABLE 1. Carbon Dioxide Emissions from a Ford Taurus

Model Year	Tailpipe CO2 Emissions (Grams per Mile)	Engine Description	Interior Volume (Cubic Feet)	Photo
1986	444	Automatic, 4-spd, 6 cyl, 3.0L	117	
1996	423	Automatic, 4-spd, 6 cyl, 3.0L	118	
2006	444	Automatic, 4-spd, 6 cyl, 3.0L	122	
2010	404	Automatic, 6-spd, 6 cyl, 3.5L	129	

Source:

U.S. Department of Energy and U.S. Environmental Protection Agency, Fuel Economy Guide website, June 2011. http://www.fueleconomy.gov/

Newer Cars and Light Trucks Emit Fewer Tons of CO_2 Annually

The carbon footprint measures a vehicle's impact on climate change in tons of carbon dioxide (CO_2) emitted annually. In model year (MY) 2010 the sales-weighted average of CO_2 emitted by cars was 7.2 tons annually per car. For light trucks, the average was 9.8 tons annually per truck.

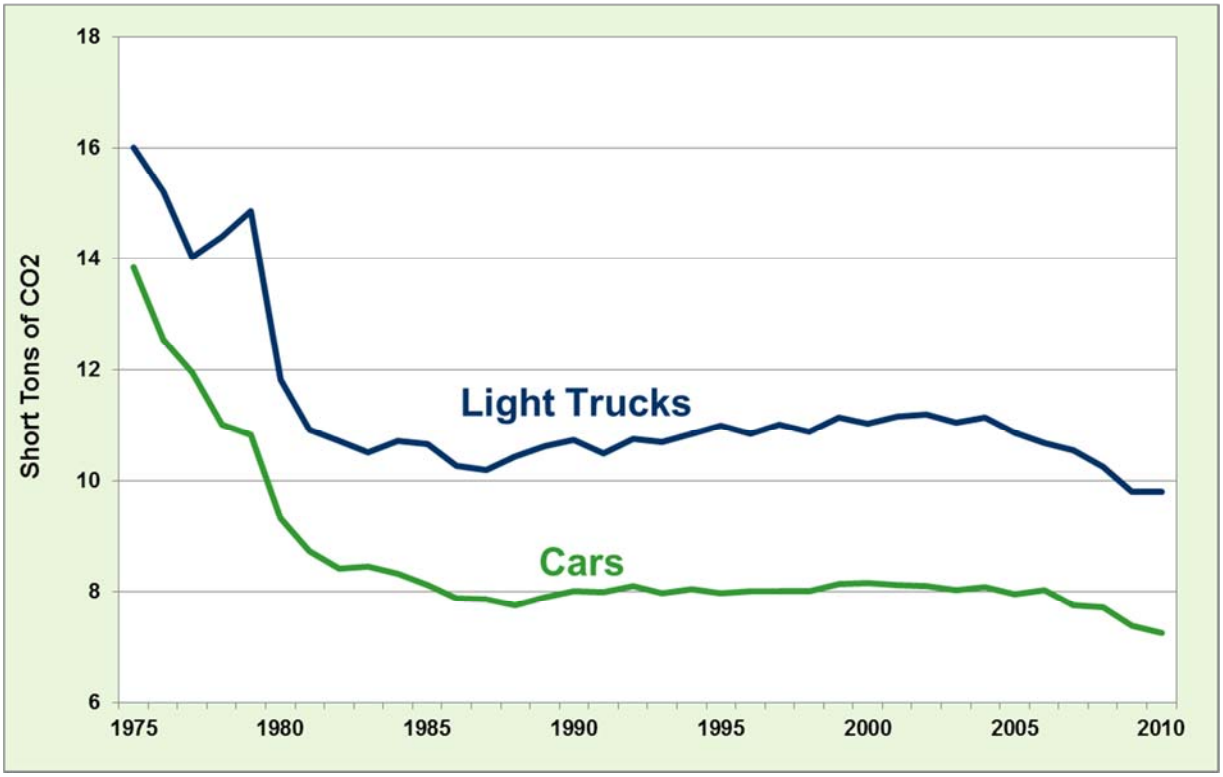


FIGURE 6. Average Carbon Footprint for Cars and Light Trucks Sold, 1980-2010

Note: Light trucks include pickups, sport utility vehicles, and vans.
Carbon footprint is calculated using results from Argonne National Laboratory's GREET model.

Carbon footprint = $\left(CO_2 \times LHV \times \frac{AnnualMiles}{CombinedMPG}\right) + \left(CH_4 + N_2O\right) \times AnnualMiles$

CO_2 = (Tailpipe CO_2 + Upstream Greenhouse Gases) in grams per million Btu
LHV = Lower (or net) Heating Value in million Btu per gallon
CH_4 = Tailpipe CO_2 equivalent methane in grams per mile
N_2O = Tailpipe CO_2 equivalent nitrous oxide in grams per mile

Source:
U.S. Environmental Protection Agency, *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2010*, EPA420-R-10-023, November 2010. http://www.epa.gov/otaq/fetrends.htm

Total Transportation Pollutants Decline over Last Two Decades

Due to improvements in fuels and vehicle technologies, the total amount of pollutants emitted from the transportation sector has declined. Over the last two decades transportation sector emissions declined for each of the criteria pollutants tracked by the Environmental Protection Agency despite the increased number of highway and nonhighway vehicles and their miles of travel. From 1990 to 2011, carbon monoxide (CO) emissions declined by 71%; volatile organic compound (VOC) emissions declined by 70%; particulate matter emissions less than 10 microns (PM-10) declined 68%; and nitrogen oxide (NOx) emissions declined by 54%.

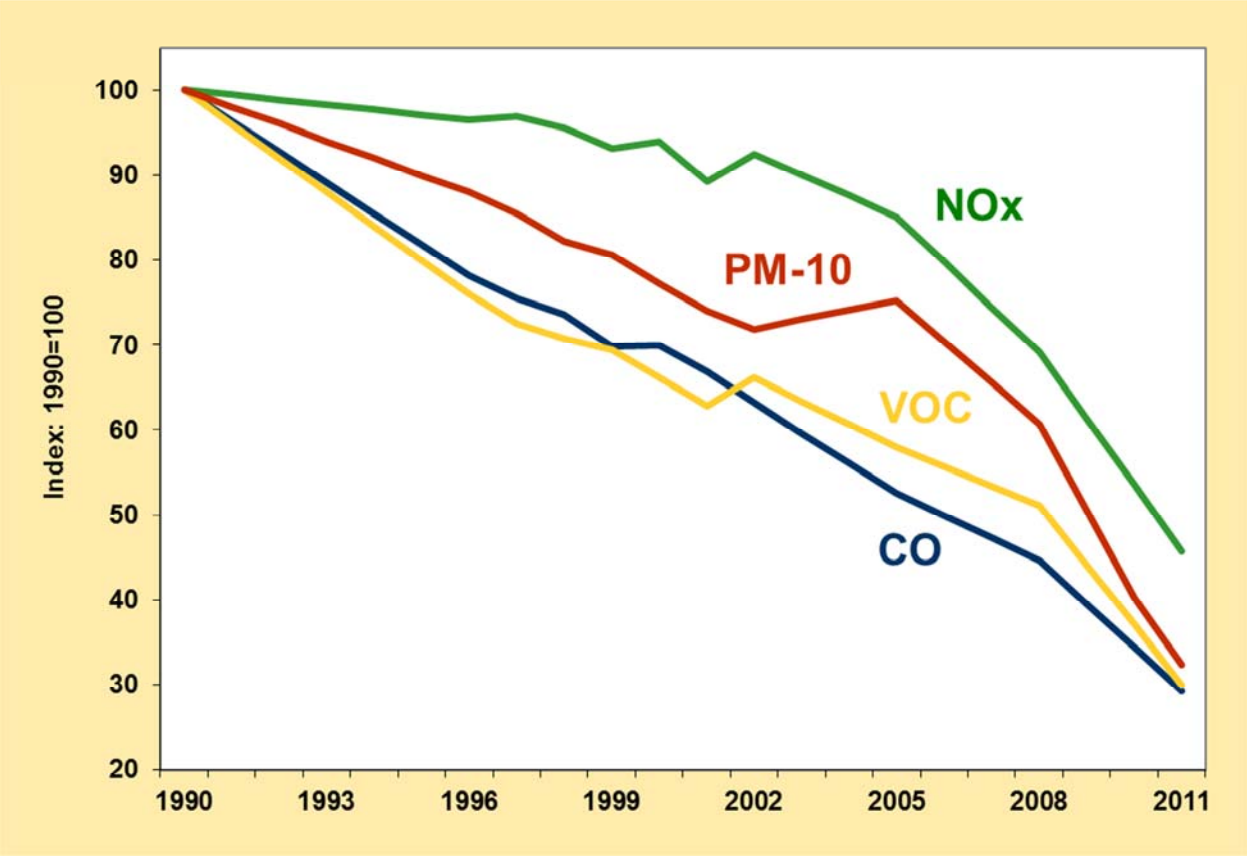


FIGURE 7. Total Transportation Pollutant Emissions, 1990-2011

Note: Includes highway, air, water, rail, and other nonroad vehicles and equipment.

Source:
U.S. Environmental Protection Agency, National Emissions Inventory Air Pollutant Emissions Trends Data. http://www.epa.gov/ttn/chief/trends/index.html

Highway Vehicles Responsible for Declining Share of Pollutants

Over 70% of carbon monoxide (CO) emissions from the transportation sector in 1990 were from highway vehicles; by 2011 that fell to 53%. The share of transportation's nitrogen oxide (NOx) emissions from highway vehicles experienced a gradual decline from 38% in 1990 to 31% in 2011. The highway share of volatile organic compound (VOC) emissions declined by 15% during this same period. Nonhighway vehicles, such as planes, ships and locomotives, are responsible for the majority of the particulate matter emissions.

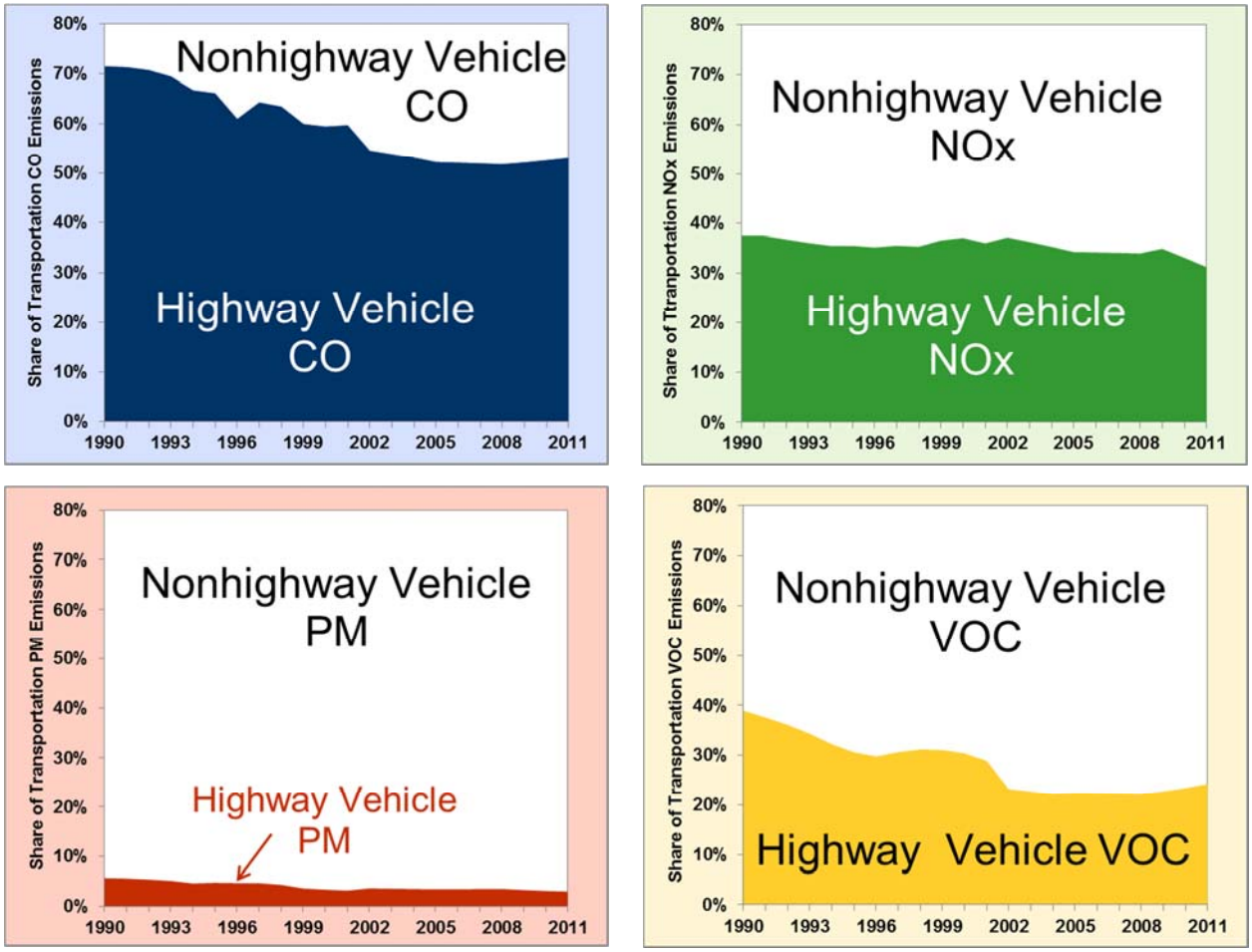


FIGURE 8. Highway and Nonhighway Share of Transportation Pollutant Emissions, 1990-2011

Source:
U.S. Environmental Protection Agency, National Emissions Inventory Air Pollutant Emissions Trends Data. http://www.epa.gov/ttn/chief/trends/index.html

Highway Transportation is More Efficient

The number of miles driven on our nation's highways has generally been growing during the past three decades, and energy use has grown with it. However, due to advances in engines, materials, and other vehicle technologies, the amount of fuel used per mile has declined from 1970. The gallons per mile held steady from the early 1990's to 2008, showing that the fuel economy for new vehicles was fairly stagnant during that period. Data for the year 2009 shows a decline in fuel use per mile indicating that the vehicle population is improving in efficiency.

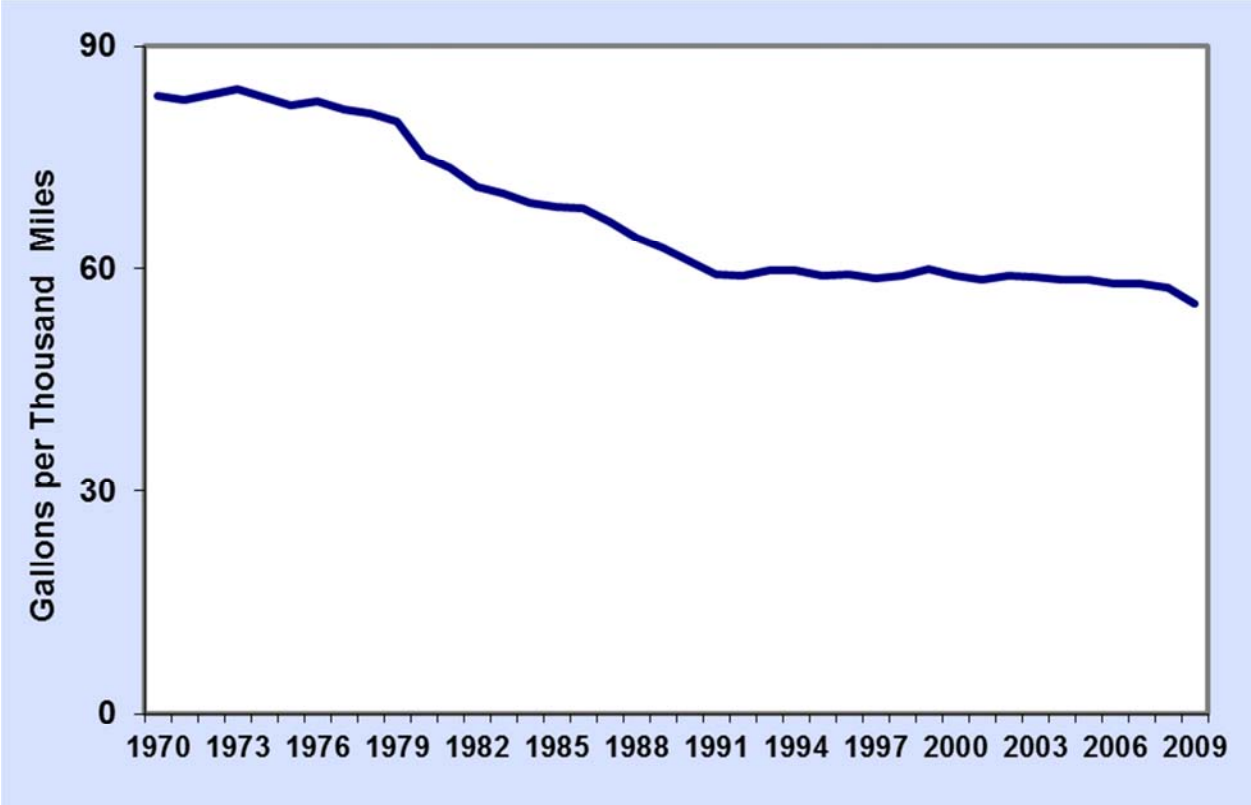


FIGURE 9. Fuel Use per Thousand Miles on the Highways, 1970-2009

Sources:
Federal Highway Administration, *Highway Statistics 2009*, Table VM-1 and previous annual editions.
http://www.fhwa.dot.gov/policyinformation/statistics/2009

Vehicle Miles are Increasingly Disconnected from the Economy

From 1960 to 1998, the growth in vehicle miles of travel (VMT) closely followed the growth in the U.S. Gross Domestic Product. Since 1998, however, the growth in VMT has slowed and not kept up with the growth in GDP. Though the distance between the two series has widened in recent years, they continue to follow the same trend showing that there continues to be a relationship between the U.S. economy and the transportation sector.

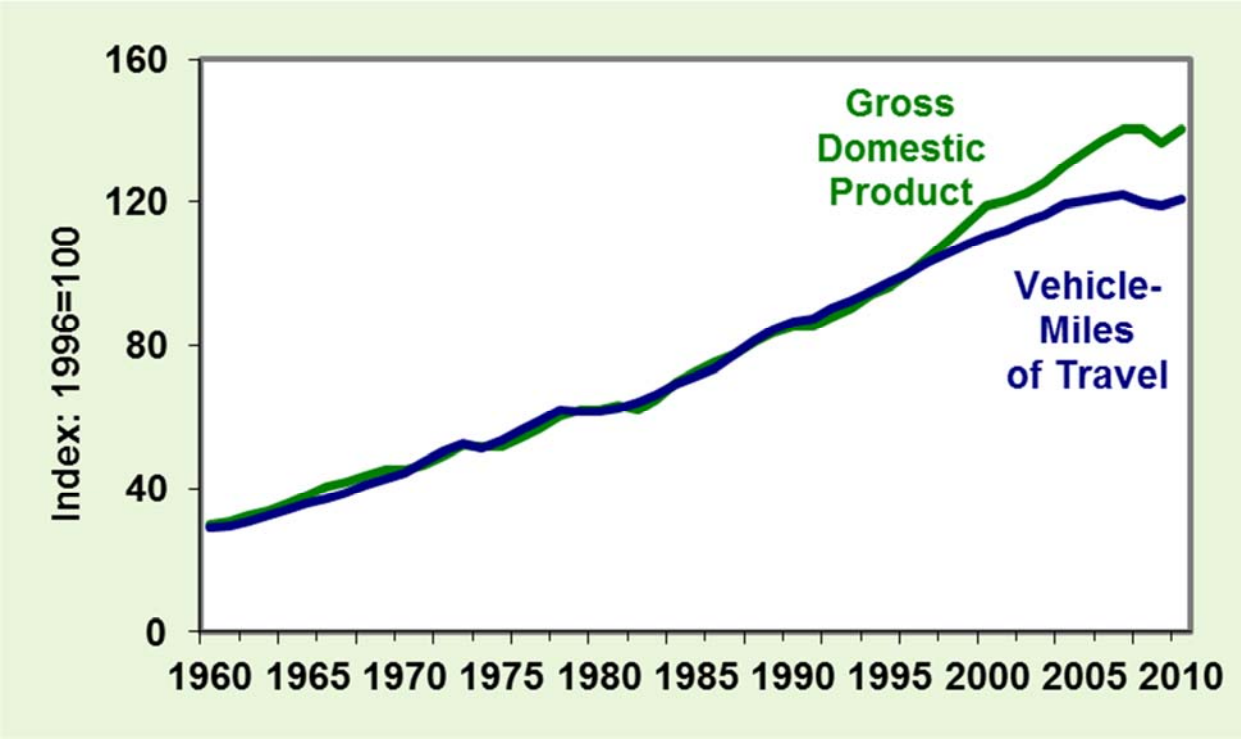


FIGURE 10. Relationship of VMT and GDP

Sources:

Bureau of Economic Analysis, "Current Dollar and Real Gross Domestic Product."
http://www.bea.gov/national/xls/gdplev.xls

Federal Highway Administration, *Highway Statistics 2009*, Table VM-1 and previous annual editions.
http://www.fhwa.dot.gov/policyinformation/statistics/2009

Price of Crude Oil is Affected by World Political and Economic Events

Crude oil prices have been extremely volatile over the past few decades. World events can disrupt the flow of oil to the market or cause uncertainty about future supply or demand for oil, leading to volatility in prices. Supply disruptions caused by political events, such as the Arab Oil Embargo of 1973-74, the Iranian revolution in the late 1970's, and the Persian Gulf War in 1990, were accompanied by major oil price shocks. Recently, uprisings in Egypt and Libya have caused uncertainty in the oil markets and the price of oil has been affected.

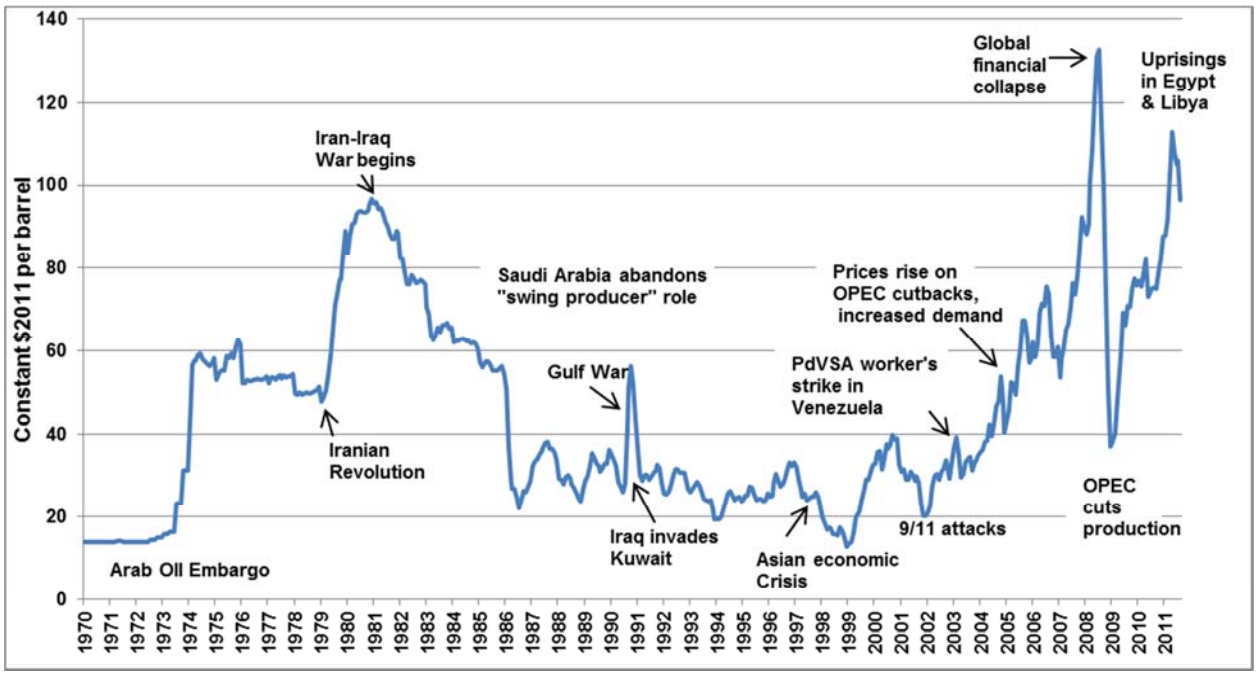


FIGURE 11. World Crude Oil Price and Associated Events, 1970-2011

Note: Refiner acquisition cost of imported crude oil.

Sources:

Energy Information Administration, "What Drives Crude Oil Prices?" September 2011. http://www.eia.gov/finance/markets/spot_prices.cfm

Pew Center on Global Climate Change, *Reducing Greenhouse Gas Emissions from U.S. Transportation*, January 2011.

Oil Price Shocks are Often Followed by an Economic Recession

Major oil price shocks have disrupted world energy markets five times in the past 30 years (1973-74, 1979-80, 1990-91, 1999-2000, 2008). Most of the oil price shocks were followed by an economic recession in the United States.

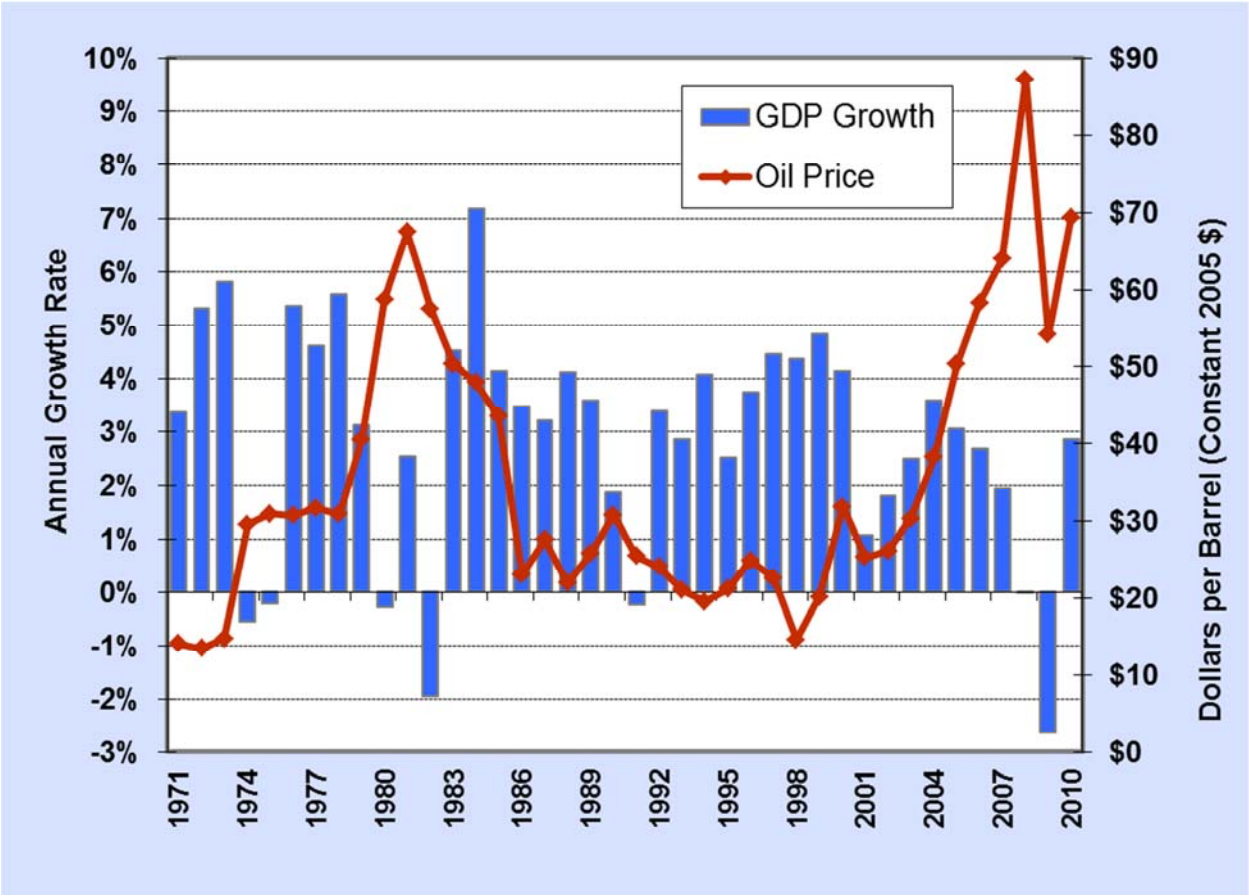


FIGURE 12. The Price of Crude Oil and Economic Growth

Source:

Greene, D.L. and N. I. Tishchishyna, *Costs of Oil Dependence: A 2000 Update*, Oak Ridge National Laboratory, ORNL/TM-2000/152, Oak Ridge, TN, 2000, and data updates, 2011. http://cta.ornl.gov/data

Dependence on Oil Costs the U.S. Economy $300 Billion in 2010

The United States has long recognized the problem of oil dependence and the economic problems that arise from it. Greene et al. define oil dependence as a combination of four factors: (1) a noncompetitive world oil market strongly influenced by the OPEC cartel, (2) high levels of U.S. imports, (3) the importance of oil to the U.S. economy, and (4) the lack of economical and readily available substitutes for oil. The most recent study shows that the U.S. economy suffered the greatest losses in 2008 when wealth transfer and GDP losses (combined) amounted to approximately half a trillion dollars. However, when comparing oil dependence to the size of the economy, the year 1980 is the highest. Oil dependence costs were almost 4.5% of GDP in 1980, but were under 3.5% in 2008. In 2009, the average oil price fell to about $60 per barrel and oil dependence costs fell to about $300 billion for 2009 and 2010.

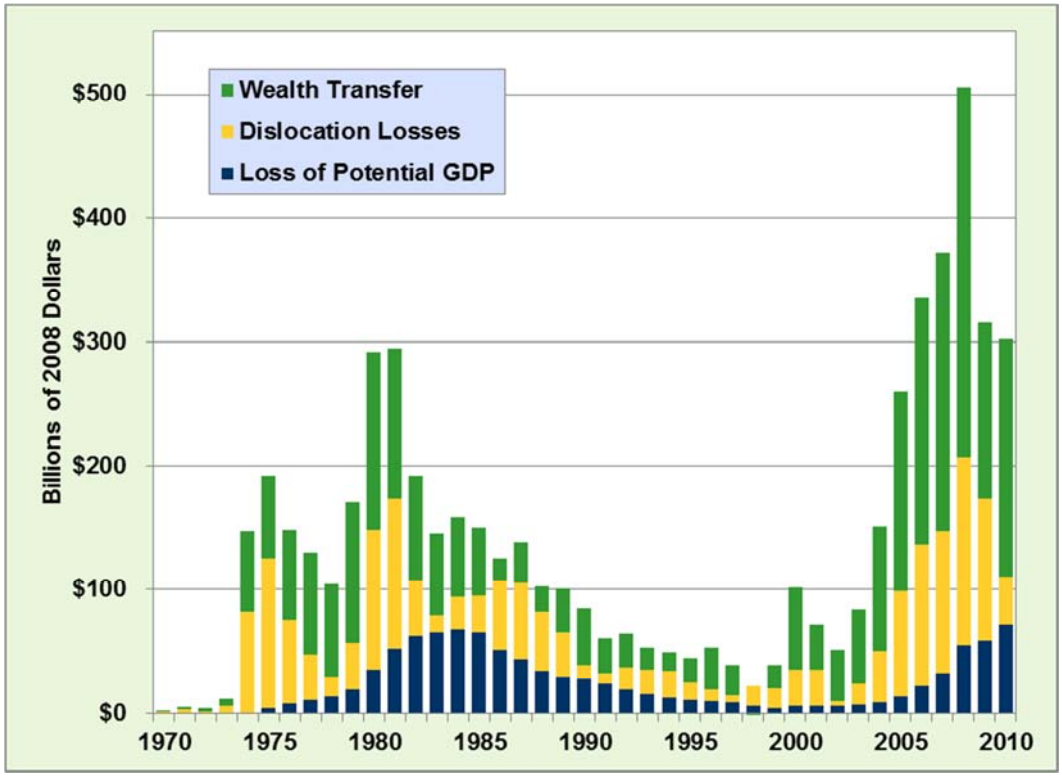


FIGURE 13. Costs of Oil Dependence to the U.S. Economy

Notes: ***Wealth Transfer*** is the product of total U.S. oil imports and the difference between the actual market price of oil (influenced by market power) and what the price would have been in a competitive market. ***Dislocation Losses*** are temporary reductions in Gross Domestic Product (GDP) as a result of oil price shocks. ***Loss of Potential GDP*** results because a basic resource used by the economy to produce output has become more expensive. As a consequence, with the same endowment of labor, capital, and other resources, our economy cannot produce quite as much as it could have at a lower oil price.

Source:

Greene, David L., Roderick Lee, and Janet L. Hopson, "OPEC and the Costs to the U.S. Economy of Oil Dependence: 1970-2010," Oak Ridge National Laboratory Memorandum, 2011.

Changes in Energy Prices and Vehicle-Miles of Travel Mirror Each Other

The prices of gasoline and diesel fuel affect the transportation sector in many ways. For example, fuel prices can impact the number of miles driven and affect the choices consumers make when purchasing vehicles. The graph below shows a three-month moving average of the percentage change of monthly data from one year to the next (i.e., February 2001 data were compared with February 2000 data). The vehicle travel mirrors the price of gasoline – when the price of gasoline rises, the vehicle travel declines and when the price of gasoline declines, the vehicle travel rises. Still, the price of gasoline is just one of the many factors influencing vehicle travel.

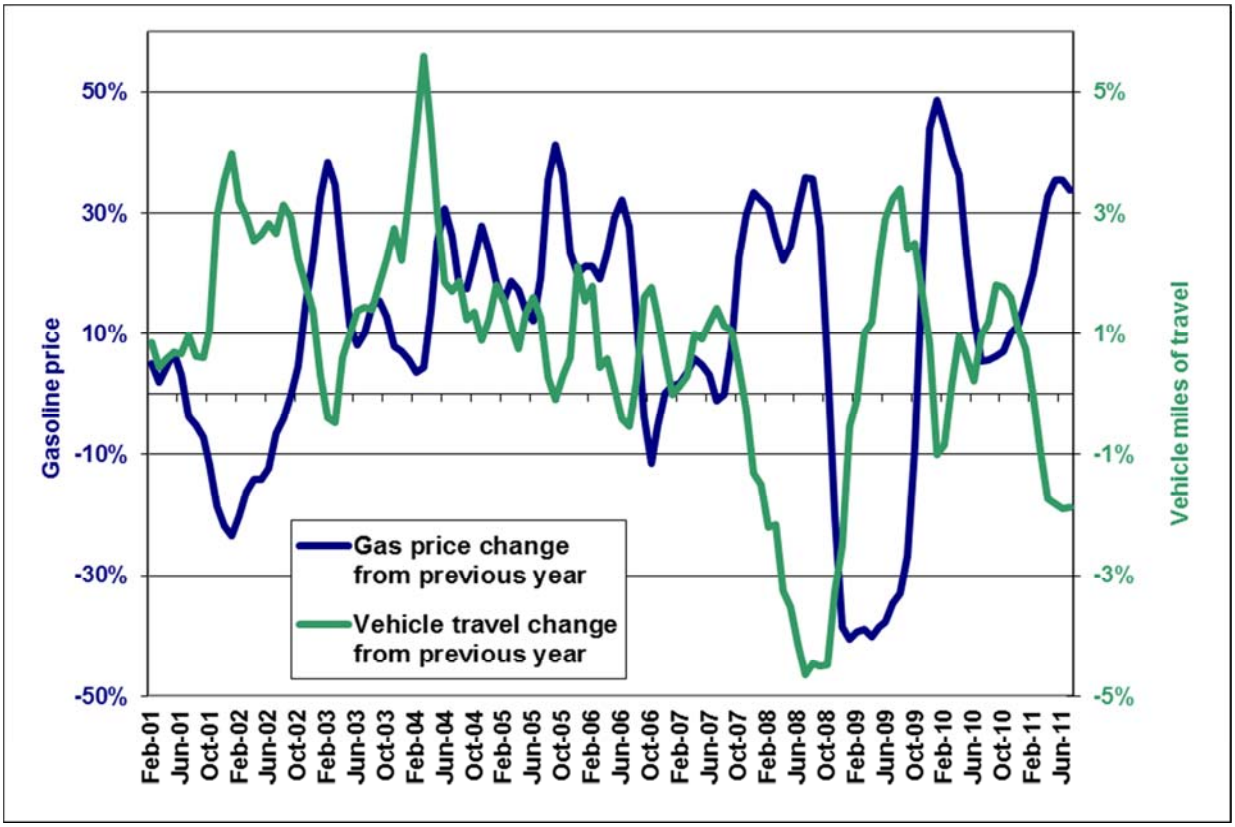


FIGURE 14. Relationship of Vehicle Miles of Travel and the Price of Gasoline

Sources:

Federal Highway Administration, *August 2011 Traffic Volume Trends,* and previous monthly editions.
http://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm

Energy Information Administration, *Monthly Energy Review, October 2011*, Table 9.4.
http://www.eia.gov/totalenergy/data/monthly

The Average Price of a New Car is just under $25,000

The average price of a car in 2010 was $24,296, up slightly from the averages for 2008 and 2009 (constant 2010 dollars). That price is down, however, from a high of $27, 242 in 1998, mainly driven by the high price of import cars. The price of imports peaked in 1998 at $39,049. Until 1982, domestic cars were more expensive than imports.

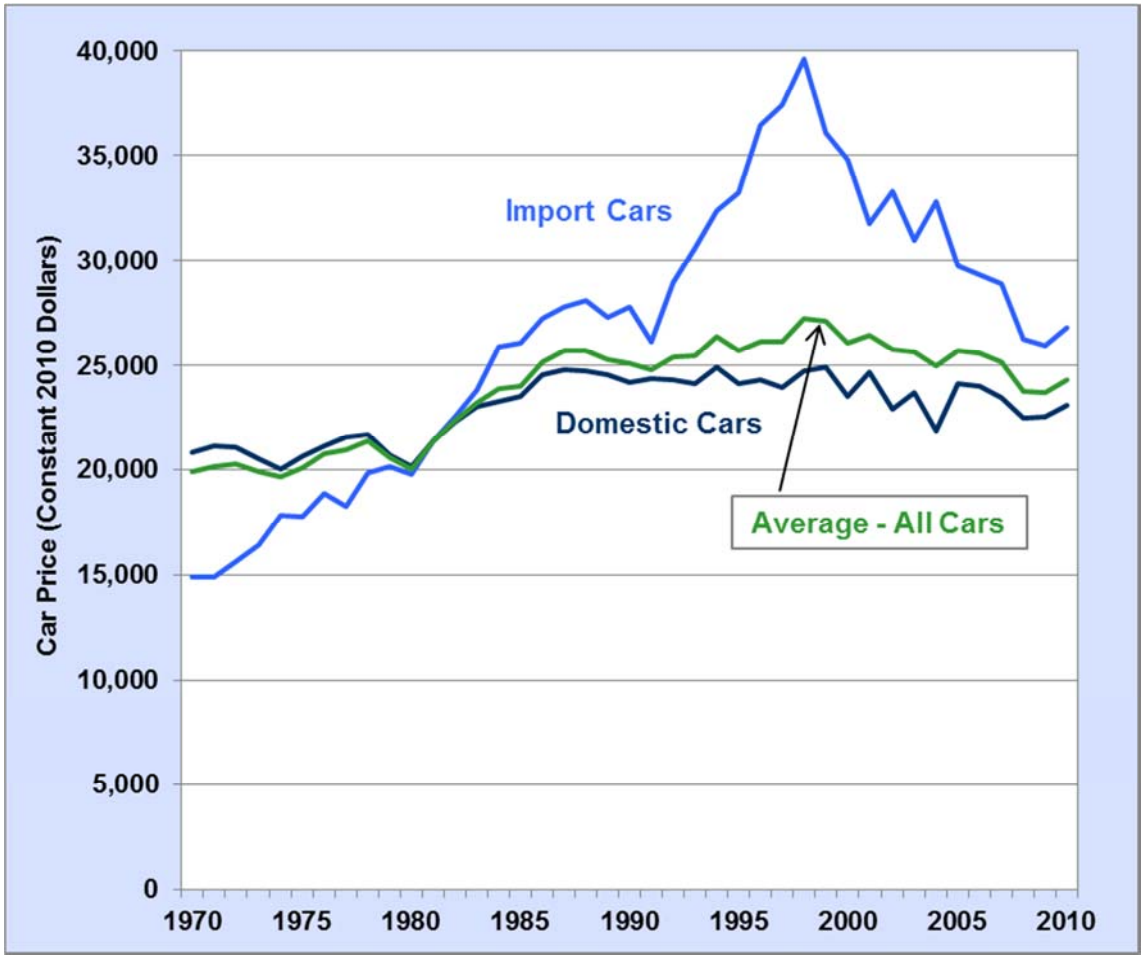


FIGURE 15. Average Price of a New Car, 1970-2009

Sources:

U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Accounts*, underlying detail estimates for Motor Vehicle Output, Washington, DC 2011.

Thirty Percent of Survey Respondents Consider Fuel Economy Most Important When Purchasing a Vehicle

A 2011 survey asked the question "Which one of the following attributes would be MOST important to you in your choice of your next vehicle?" The choices were fuel economy, dependability, low price, quality, and safety. This same question was asked in previous surveys and the results are compared in the graph below. Dependability was chosen most often in nearly every survey, but fuel economy surpassed it in 2011. Thirty percent of the survey respondents indicated that fuel economy would be the most important vehicle attribute, while only 22% of respondents chose dependability.

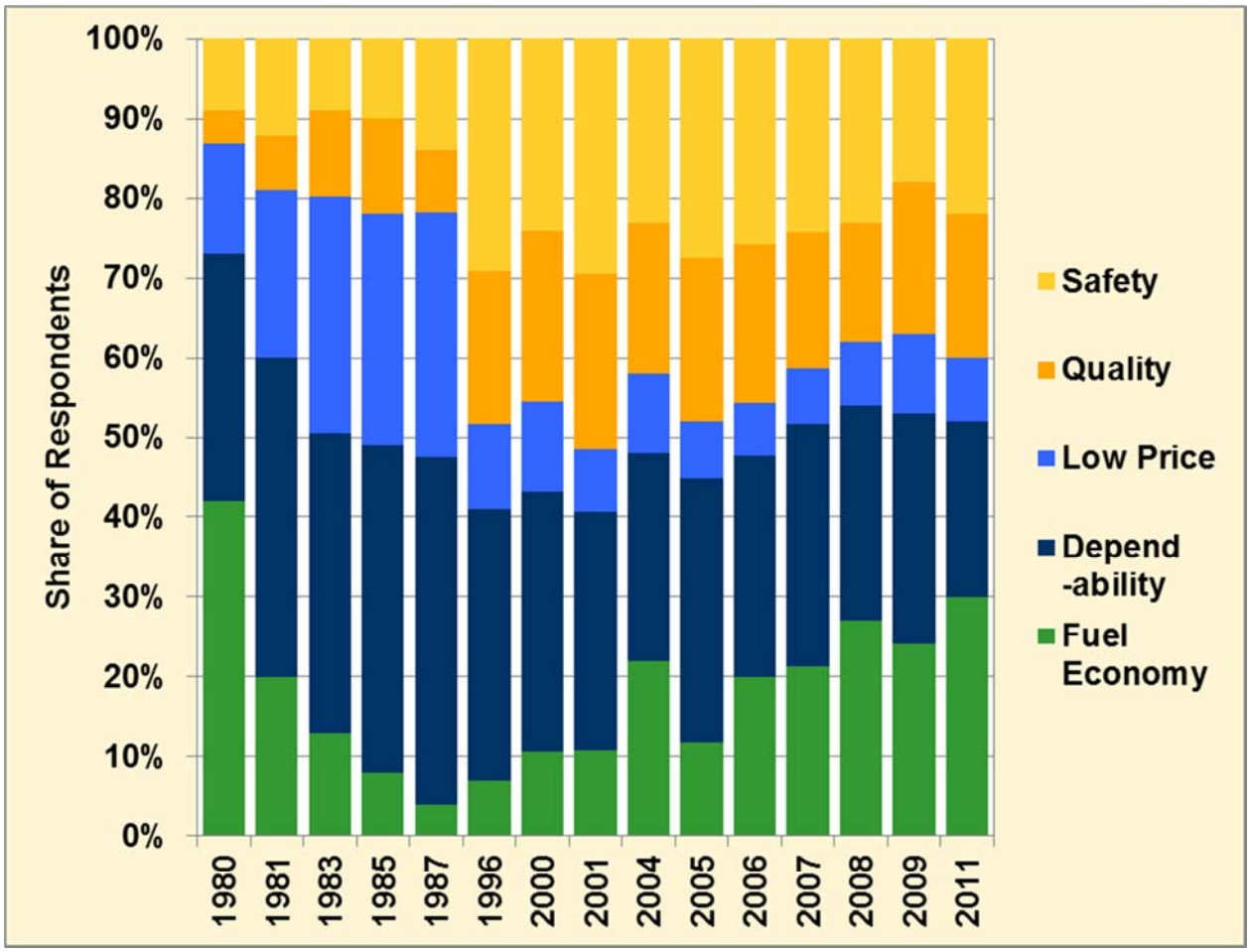


FIGURE 16. Most Important Vehicle Attribute

Sources:
1980-87: J. D. Power (based on new car buyers). 1998-2011: Opinion Research Corporation International for the National Renewable Energy Laboratory (Sample size ≈ 1,000).

Internet is Most Influential When Purchasing Vehicle

Autotrader.com and R. L. Polk and Company conducted a study of recent car buyers to find out which media influenced their vehicle purchases. About 4,000 U.S. consumers who had purchased a new or used vehicle from a dealership within the previous six months were asked*: Which media, if any, led you to the dealer you purchased from?* More than half of the respondents answered that the Internet led them to their final purchase site. The study also determined that researching vehicle price and comparing models were most often the reasons that the Internet was used.

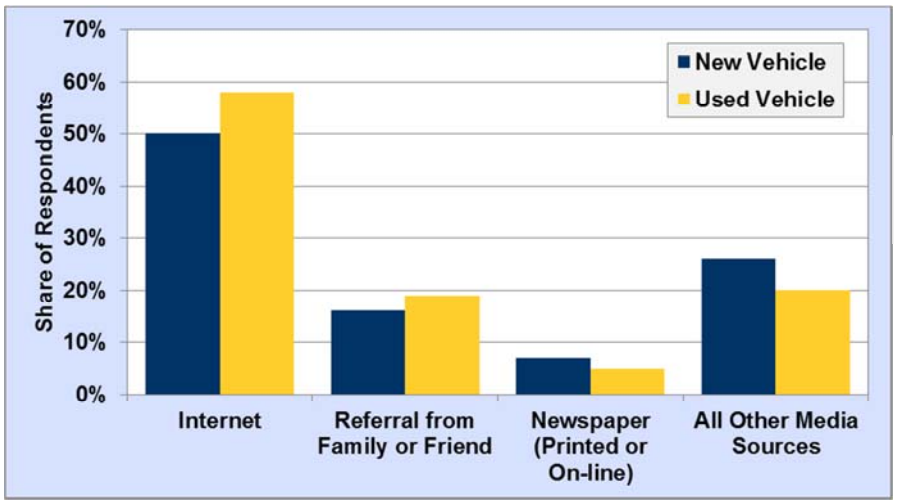


FIGURE 17. Media Which Led a Consumer to the Vehicle Dealer

FIGURE 18. Reasons for Using the Internet While Shopping for a Vehicle

Source:

R. L. Polk and Company, *Polk View*, "The Role of the Internet in the New and Used Vehicle Purchase Process," February 2011. https://www.polk.com/knowledge/polk_views

Sixteen Percent of Household Expenditures are for Transportation

Except for housing, transportation was the largest single expenditure for the average American household in 2010. Of the transportation expenditures, vehicle purchases and gas & oil were the largest expenditures. In 1984, transportation was closer to 20% of all household expenditures and the share has generally fluctuated between 17 and 20% over time. In 2009, however, the transportation share reached a low of 15.6%.

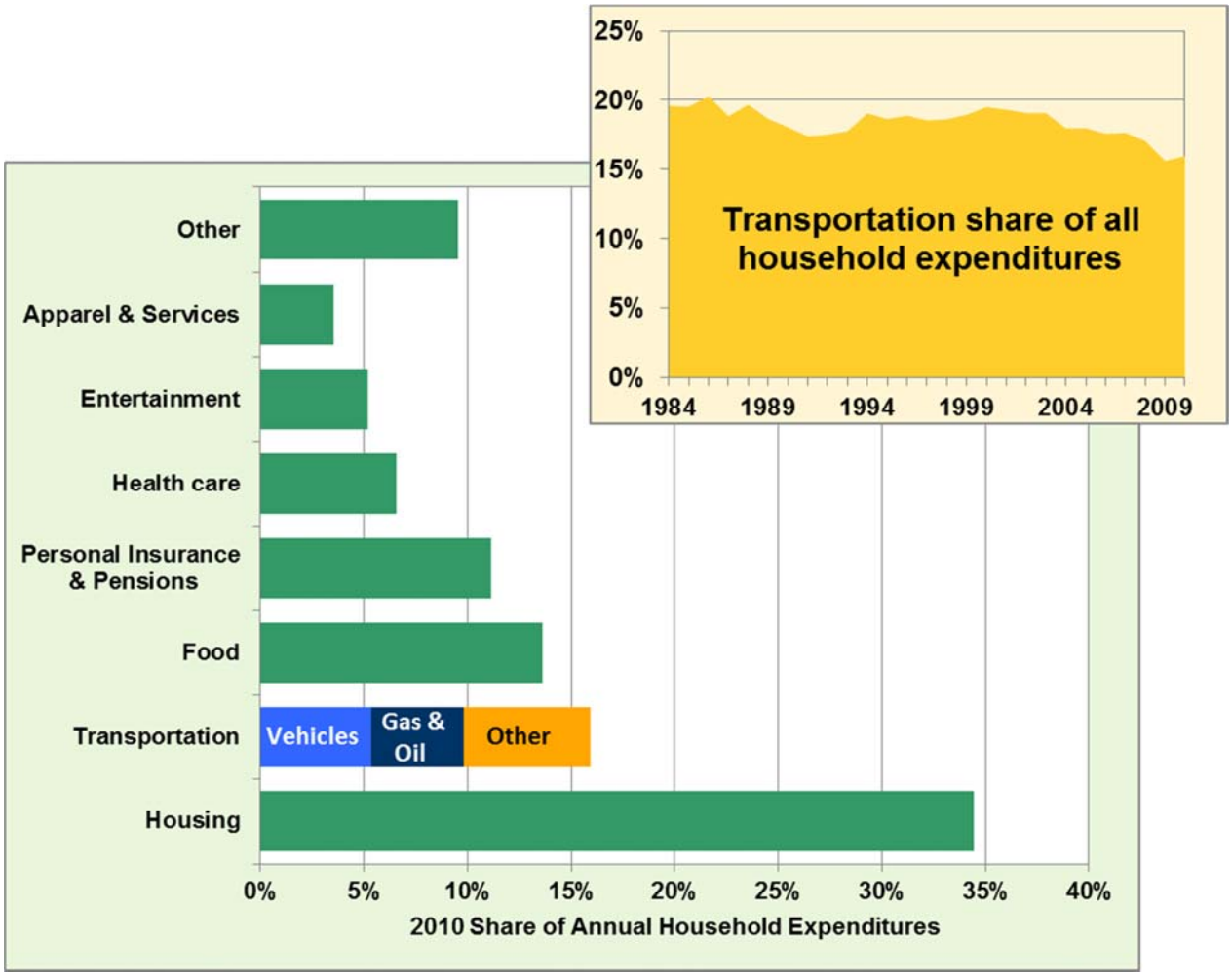


FIGURE 19. Share of Household Expenditures by Category, 2010, and Transportation Share of Household Expenditures, 1984-2010

Sources:

U.S. Department of Labor, *Consumer Expenditure Survey 2010*, Table 2, Washington, DC, 2011, and multiyear survey tables. http://www.bls.gov/cex/

Over 9 Million People are Employed in the Transportation Industry

The transportation industry employs a wide variety of people in many different fields. From the manufacture of vehicles and parts to travel reservation services, 9.2 million people are employed in transportation-related jobs. These transportation-related jobs account for 7.1% of the total non-farm employment. Retail sales of motor vehicles and parts, which include dealerships, retail parts stores, and more, accounts for the most employees. Truck transportation, which includes truck drivers, is the category with the second highest number of employees.

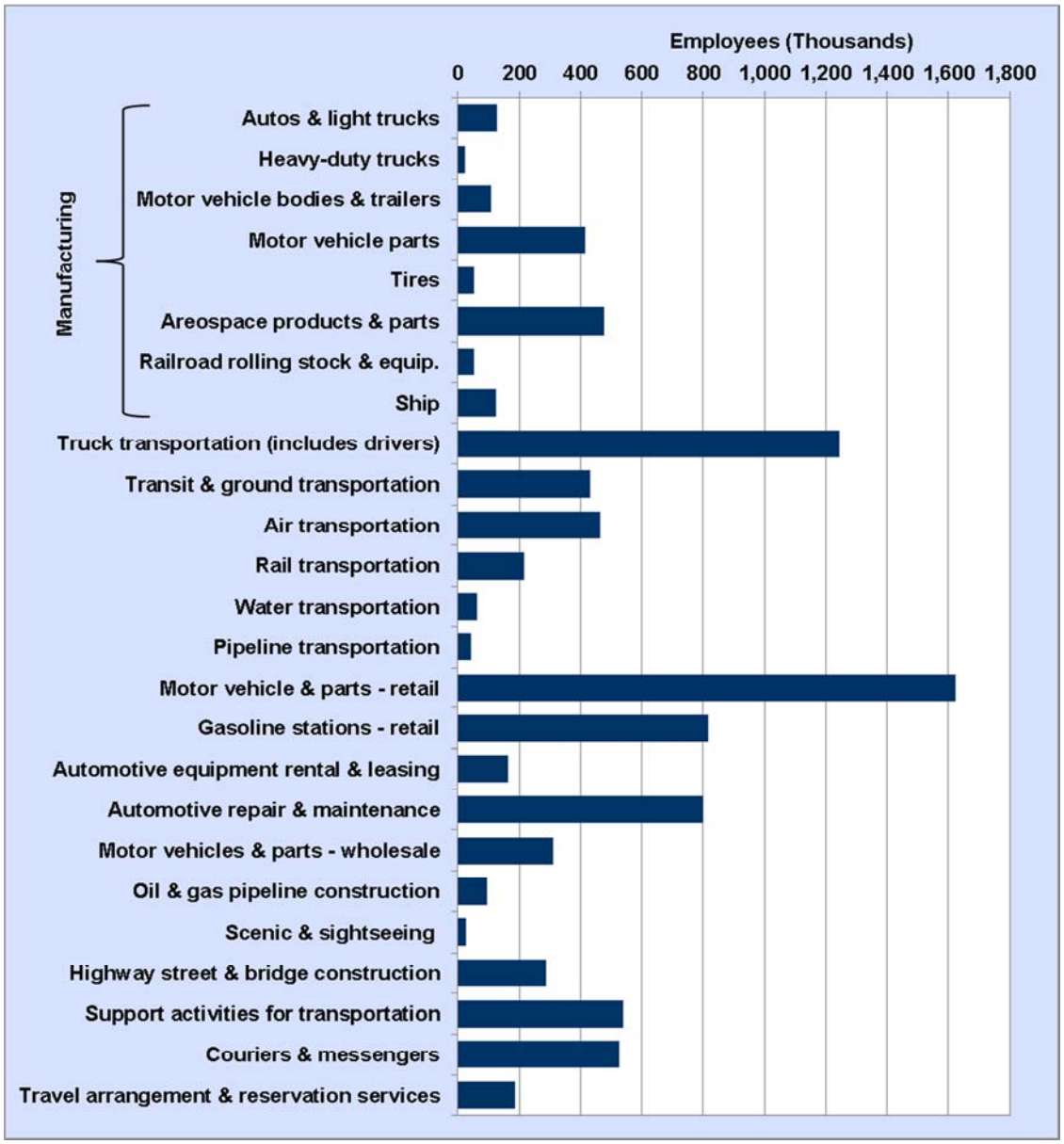
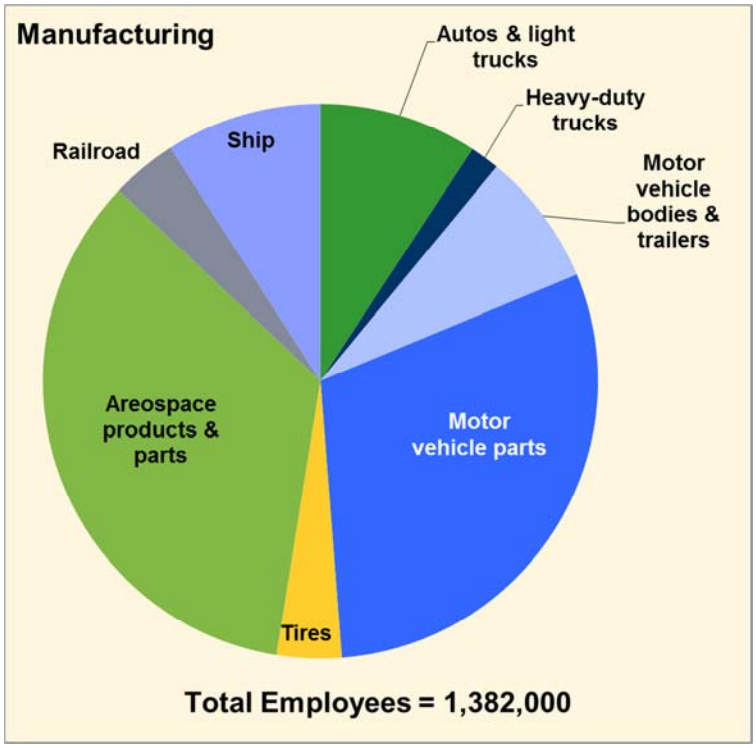


FIGURE 20. Transportation-related Employment, 2010

Source:

Bureau of Labor Statistics, Web Site Query System. http://www.bls.gov/ces/cesnaics.htm

Vehicle Manufacturing, Parts Manufacturing, and Truck Transportation Employs Many People



The manufacture of vehicles and parts (left) employs over a million people. The highway mode – vehicles, parts, and tires – accounts for just over half of all transportation manufacturing employees; aerospace products (e.g., airplanes) and their parts account for another third.

When looking at jobs related to the movement of people and goods (right), the trucking industry is responsible for about half of the 2.4 million employees. Transit and ground transportation, which includes bus drivers and other transit and ground transportation employees, makes up 19% of the total. Air transportation, which includes everything from pilots to airport workers, makes up 18% of the total.

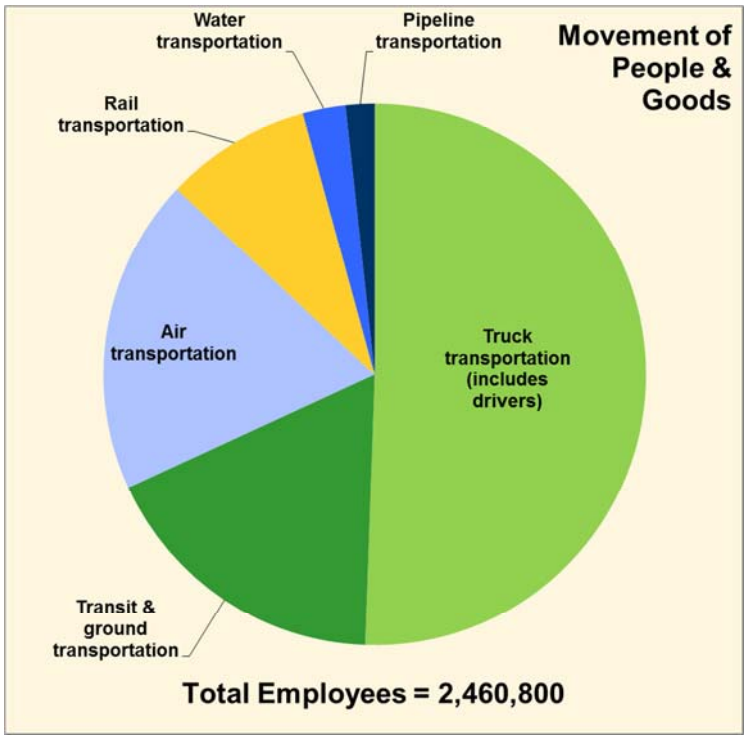


FIGURE 21. Transportation Manufacturing-related and Mode-related Employment, 2010

Source:

Bureau of Labor Statistics, Web Site Query System. http://www.bls.gov/ces/cesnaics.htm

Manufacturers Stock Prices Have Their Ups and Downs

Weekly stock prices are shown on the graph below. Nearly all of the manufacturers show a sharp decline in late 2008 as a result of the economic recession. While many manufacturers have recovered to near 2006-prices, stock prices for Toyota in 2011 are 40% lower than their 2006 level. Volkswagen stock experienced a "wild ride" of ups and downs in late October 2008 due to Porsche's increased holdings in VW. Chrysler stock is not currently traded and historical prices are not shown due to company changes from Daimler-Chrysler to Chrysler to Fiat-Chrysler. General Motors is shown twice – once before bankruptcy (GM-Old) and after the initial public stock offering in late 2010 (GM-New).

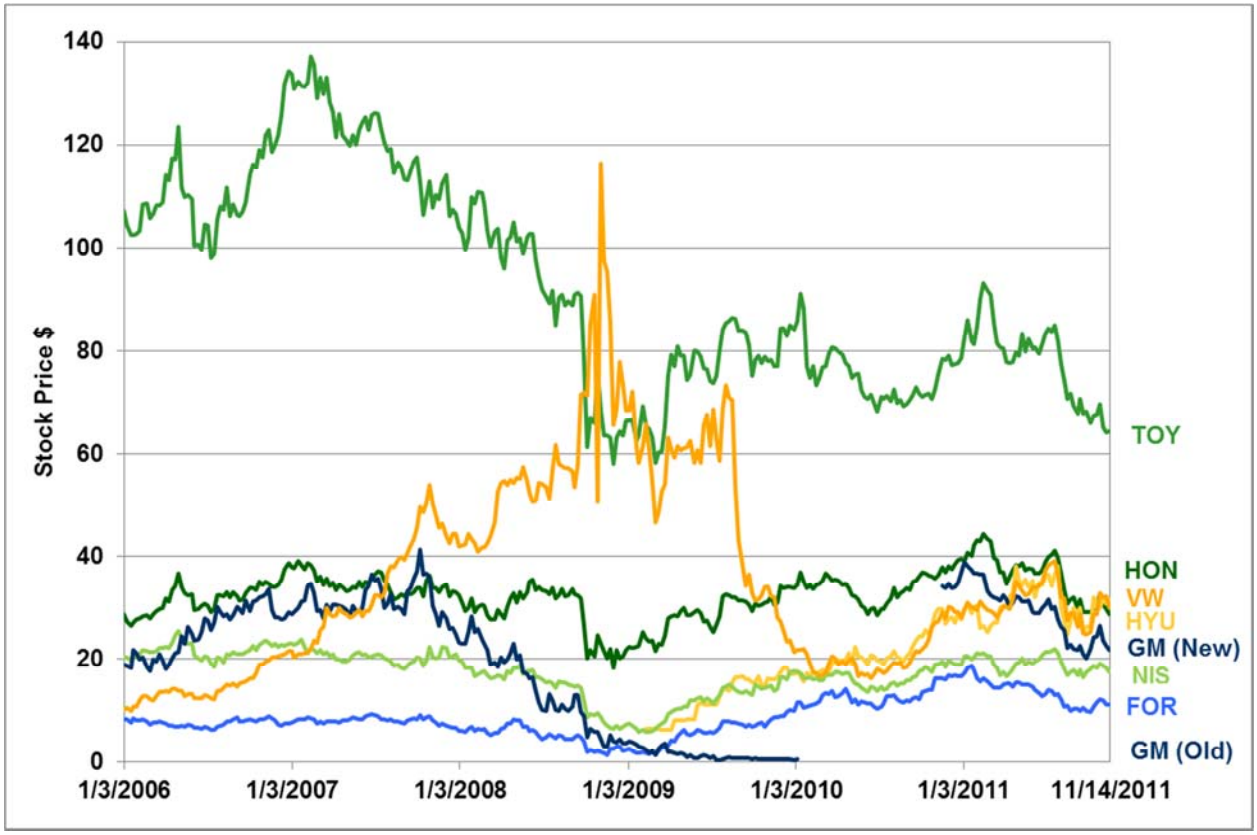


FIGURE 22. Stock Price by Manufacturer

Source:
Yahoo Finance. http://www.yahoofinance.com

American Full-Size Pickups Top the Most Profitable Vehicles List

Max Warburton and others at Bernstein Research in London have developed estimates for the vehicles which have made the most money for their companies from the 1990's to today. They discovered three categories of vehicles that topped the list: American full-size pickups; German luxury cars; and Japanese mid-size sedans. These vehicles combined high prices, large sales volume and long production periods that spread development costs over a long period.

TABLE 2. List of Twelve Most Profitable Vehicles since the 1990's

Rank	Vehicle Model
1	Ford F-Series
2	GM Full-Size Pickups
3	Dodge Ram
4	Mercedes S Class
5	BMW 5 Series/X5
6	BMW 3 Series
7	Mercedes E Class
8	Lexus RX SUV
9	Jeep Grand Cherokee
10	Honda Accord
11	Porsche 911
12	Toyota Camry

Source:

Crain Communications, *Automotive News,* "Cash cows: The most profitable vehicles ever," November 21, 2011. http://www.autonews.com/apps/pbcs.dll/article?AID=/20111121/RETAIL07/311219969/1254

Hybrid Vehicles Can Save Money over Time

Hybrid vehicles are typically very well equipped with standard amenities comparable to those found on the upper trim levels of their non-hybrid counterparts. Many consumers do not settle for the base model but rather opt for the higher trim levels offering features and amenities that come standard on the hybrid model. For these consumers, a hybrid vehicle can offer savings over time. The table below shows a selection of hybrid vehicles available for the 2011 model year paired with a comparably equipped non-hybrid vehicle from the same manufacturer. Of the selected vehicles below, the cost premiums for the hybrid models fall within a range of about $2,000 to $6,000. Accounting for the cost premium and fuel savings, the Cadillac Escalade hybrid and Toyota Prius have the shortest payback periods and offer the greatest savings over 10 years compared with their non-hybrid counterparts.

TABLE 3. Selected 2011 Model Year Hybrid Vehicles Paired with a Comparably Equipped Non-Hybrid Vehicle

Manufacturer	Model	Price Difference Comparably Equipped	Combined MPG	Years to Pay Back at $3.50/gal	Years to Pay Back at $4.00/gal	Years to Pay Back at $5.00/gal	10 Years of Fuel Savings at $4.00/gal minus Price Difference
Toyota	Prius hybrid	$2,180	50	2.2	2.0	1.6	$8,897
Toyota	Camry Automatic		26				
Toyota	Camry Hybrid	$2,360	33	5.5	4.8	3.9	$2,535
Toyota	Camry SE Automatic		26				
Honda	Insight hybrid	$2,300	41	5.6	4.9	3.9	$2,421
Honda	Fit Automatic		31				
Honda	Civic Hybrid	$1,995	41	3.8	3.3	2.6	$4,061
Honda	Civic EX-L Automatic		29				
Ford	Fusion Hybrid	$2,105	39	2.8	2.4	2.0	$6,510
Ford	Fusion SEL 4cyl		25				
Ford	Escape Hybrid	$5,710	32	8.9	7.8	6.2	$1,627
Ford	Escape XLT Fwd		23				
Hyundai	Sonata Hybrid	$3,000	37	5.0	4.4	3.5	$3,861
Hyundai	Sonata SE Automatic		26				
Toyota	Highlander Hybrid 4wd	$2,740	28	3.1	2.7	2.2	$7,410
Toyota	Highlander 4wd SE		19				
Lexus	RX 450h 2wd hybrid	$5,560	30	7.4	6.5	5.2	$3,011
Lexus	RX 350 2wd		21				
Lexus	RX 450h 4wd hybrid	$5,750	29	7.1	6.2	4.9	$3,560
Lexus	RX 350 4wd		20				
Porsche	Cayenne S Hybrid	$3,300	21	7.9	6.9	5.5	$1,462
Porsche	Cayenne S		18				
GMC	Yukon Denali Hybrid 4wd	$5,125	21	5.1	4.5	3.6	$6,304
GMC	Yukon Denali Awd		15				
GMC	Sierra 1500 Hybrid 4wd Crew Cab	$4,693	21	8.0	7.0	5.6	$2,030
GMC	Sierra 1500 4wd Crew Cab SLE		17				
Cadillac	Escalade Hybrid 4wd	$2,175	21	2.2	1.9	1.5	$9,254
Cadillac	Escalade Premium Awd		15				
Chevrolet	Silverado 1500 Hybrid 4wd Crew Cab	$4,973	21	8.5	7.4	5.9	$1,750
Chevrolet	Silverado 1500 4wd Crew Cab		17				
Chevrolet	Tahoe Hybrid 4wd	$5,495	21	9.3	8.2	6.5	$1,228
Chevrolet	Tahoe LT with Luxury Package 4wd		17				
Mercedes	ML 450 Hybrid 4matic	$5,920	22	8.4	7.4	5.9	$2,101
Mercedes	ML 350 4matic		17				

Note: Fuel saving and years to pay back are based on an assumption of 15,000 annual miles. Hybrid vehicles were matched to their most comparable non-hybrid counterpart in terms of vehicle content and performance within the same manufacturer. The Toyota Prius and Honda Insight are unique hybrid models without a direct non-hybrid counterpart for comparison. They were matched to the model that was deemed closest to offering the same utility and amenities.

Source:
Compiled from manufacturer websites and the *Fuel Economy Guide* by Robert Boundy, Roltek, Inc., Clinton, TN. Data accessed May 5, 2011.

Japan Earthquake and Tsunami Effects: North American Production Fell Drastically in April 2011

The earthquake and tsunami that hit Northern Japan on March 11, 2011 had a dramatic effect on the production of motor vehicles for Japanese manufacturers, even here in the United States, due to the lack of key parts that were sourced from Japan. Honda and Toyota, which had plants in the northern part of Japan, were the hardest hit by parts shortages. Honda vehicle production from April to July stayed near 40-45,000 vehicles – about half of what production was in March. Toyota's production fell to 20,000 vehicles in May, but rose to above 50,000 in June. Nissan's worst month was April, right after the event. The dotted red line on the graph shows the average monthly production of these three companies in 2010 when there was no weather-related crisis.

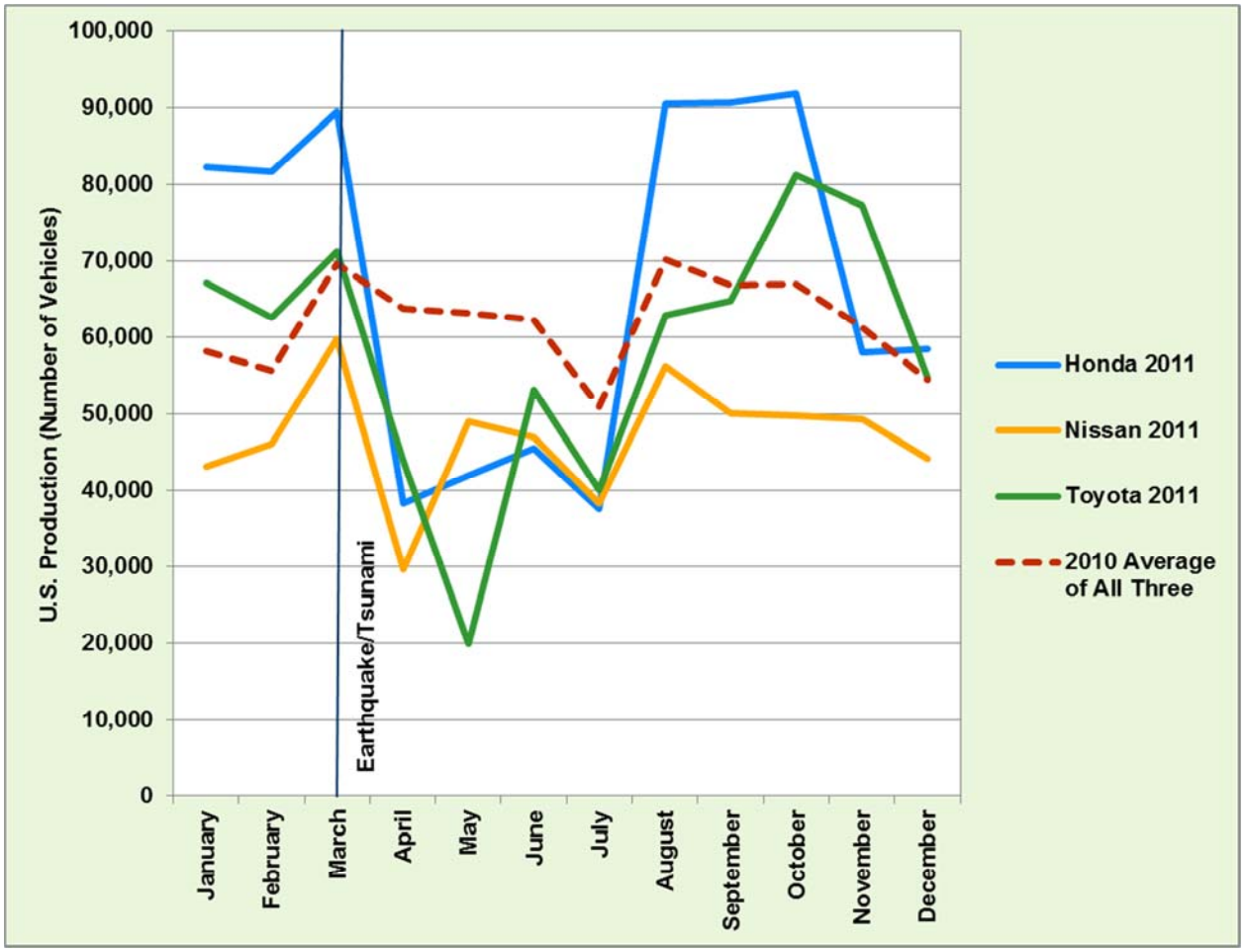


FIGURE 23. U.S. Production of Light Vehicles for Japanese Manufacturers by Month, 2011

Source:
Ward's AutoInfoBank. http://wardsauto.com

Japan Earthquake and Tsunami Effects: Days' Supply of Vehicles for Honda and Toyota Hit Low Point in July 2011

The earthquake and tsunami that hit Northern Japan on March 11, 2011 had a great effect on the supply of motor vehicles for Japanese manufacturers. Nissan's supply of vehicles in the United States was the lowest in the month of March, while Honda and Toyota's supplies continued to decline to a low at the end of July 2011. The dotted red line on the graph shows the average monthly vehicle supply of these three companies in 2010 when there was no weather-related crisis.

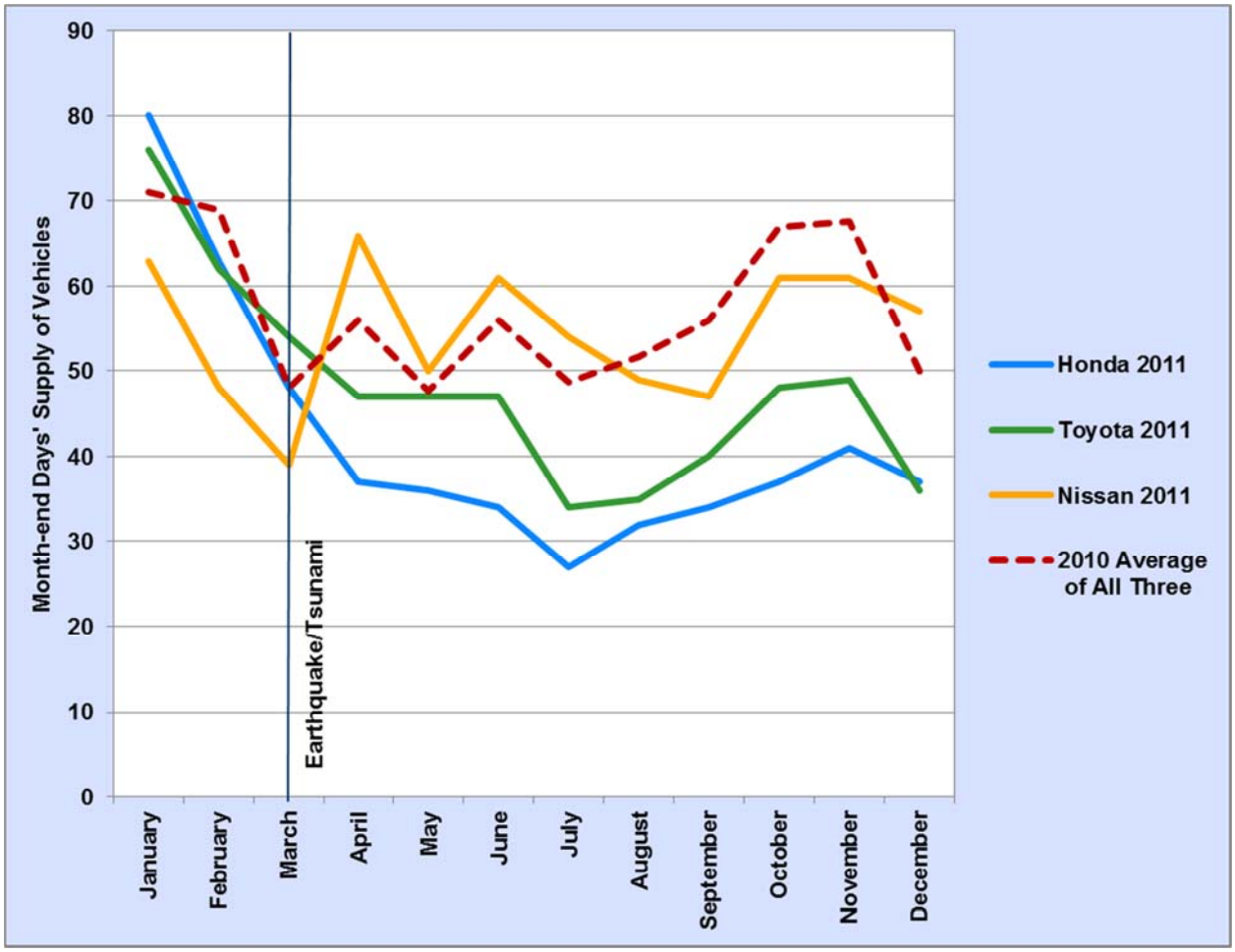


FIGURE 24. Light Vehicle Inventory Supply for Japanese Manufacturers by Month, 2011

Source:
Ward's AutoInfoBank. http://wardsauto.com

Japan Earthquake and Tsunami Effects: Dramatic U.S. Sales Decline in April and May 2011

Sales of motor vehicles from Japanese manufacturers were down in 2011 due to the earthquake and tsunami that hit Northern Japan on March 11, 2011. Due to good supplies, and vehicles and parts already on their way to the United States, the effect on light vehicles sales did not hit the U.S. market largely until May for Honda and Toyota. Nissan was affected in April due to low inventory supplies and high sales volume in March. The dotted red line shows the average monthly sales of all three companies in 2010, when there was no weather-related crisis.

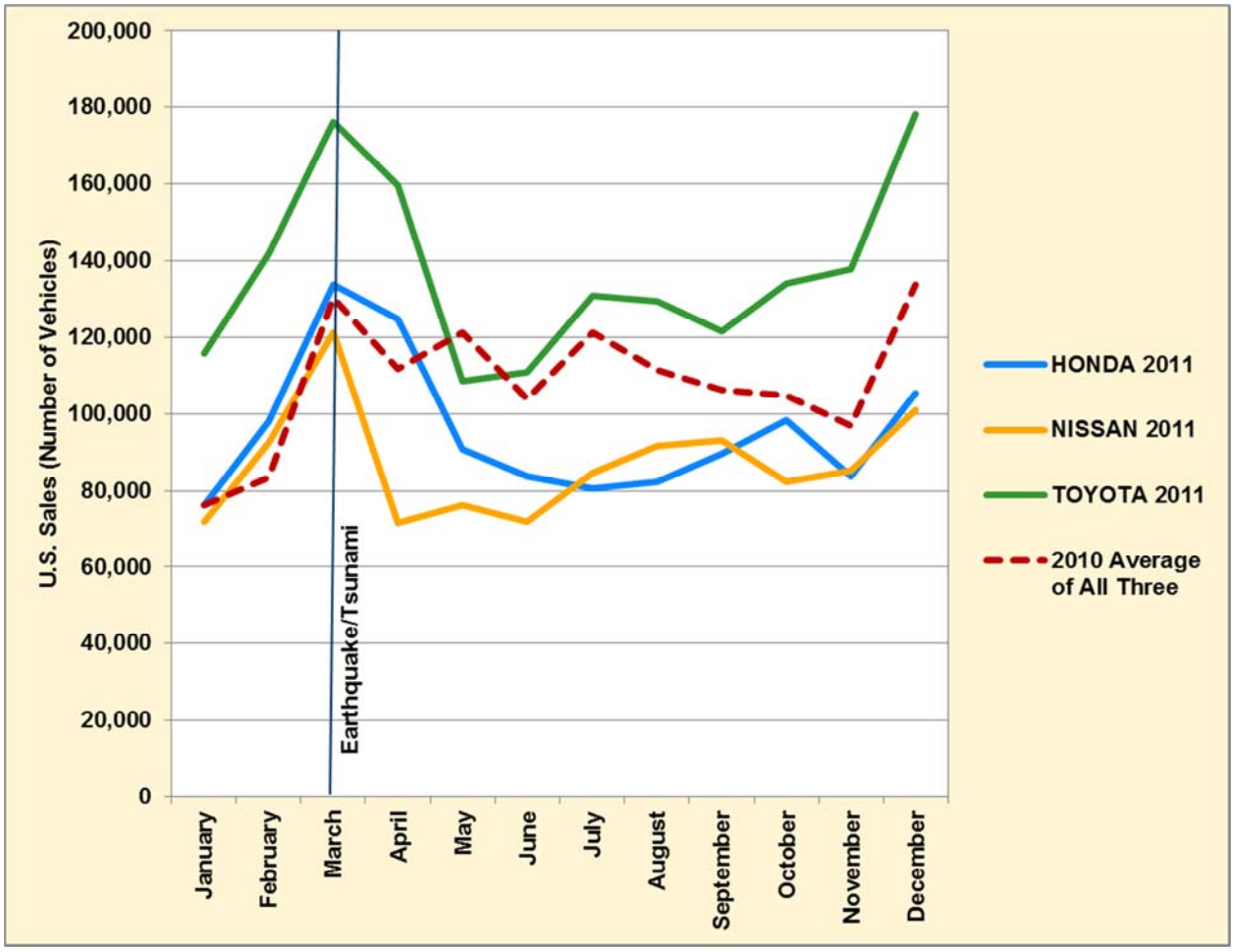


FIGURE 25. Light Vehicle Sales for Japanese Manufacturers by Month, 2011

Source:
Ward's AutoInfoBank. http://wardsauto.com

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