

in "Two Billion Cargos"
Sperling & Gordon (2009)

Chapter 6

The Motivated Consumer

Two strategies dominate discussions about curbing greenhouse gas emissions and oil use: vehicle efficiency and low-carbon fuels. But there's a third strategy that's also very important: motivating better behavior. People, acting as consumers, travelers, voters, and investors, are central to all strategies to reduce oil use and carbon footprints. With the rest of the world following America's lead in mobility matters, it's especially important for Americans to adjust their behavior. The primary challenge is to awaken an American public largely ignorant of the energy and climate implications of their decisions, and to motivate American consumers to align their choices with the greater public good—what U.S. Senator John McCain has repeatedly called “a cause greater than self-interest.”

Consumers have a lot of say about the future of global mobility. If consumers demand more socially and environmentally responsible products, manufacturers must respond to these demands or risk market loss. Changes in consumers' purchasing preferences can fundamentally alter the marketplace, as demonstrated recently by the shrinking market share of big SUVs and the growing market share of hybrid vehicles. Consumers have the power to motivate market shifts and technological innovation.

They also have the power to force oil-producing nations and international corporations to behave more in the public interest. By reducing their demand for oil and choosing alternatives, consumers have the power to reduce the geopolitical value of oil resources. Consumers also have power as voters and shareholders to change government policy and industry investments.

Consumers play a central role in creating a world that can accommodate two billion cars.

But American consumers have been slow to exercise this power. How might we move from self-indulgent to socially conscious consumerism? The underlying problem is that the private desires of consumers aren't aligned with the greater good at any of the three choice points: buying, fueling, or driving.

American policies have long invited auto ownership and use. Cars and fuels are lightly taxed, roads and parking are mostly free, public transport services have been allowed to atrophy, and suburban and exurban sprawl continues unchecked. Markets aren't structured to send consumers full information. On top of that, consumers have been seduced by advertising that appeals to their egos and links their identity to the image of the car they drive. They've been conditioned to get what they want without regard for the broader public interest, an outgrowth of America's strong commitment to capitalism, consumerism, and fierce self-determination.

Americans' lives are built around 24/7 access to cars. Travelers expect their cars to be reliable and easy to use. They don't want to worry that they'll run out of biodiesel or electricity before they reach one of the few refueling stations that dispense their requisite fuel. They want more creature comforts and amenities, from cup holders to Global Positioning System devices to Bluetooth wireless hookups. They want plenty of power to tow their boat trailers and plenty of room to carry their golf clubs.

Consumer desires have helped create today's car culture. During the past hundred years, automakers, the oil industry, and lawmakers all have worked to keep consumers happy and motoring. They've been successful, perhaps too successful. They've fulfilled the personal desires of individuals at the expense of the public interest. In so doing, they've set the stage for dramatic change.

The Car-Centric American

Traveling alone by car is the American way. On any weekday at 6 p.m. headed out of any city, roads are packed. Rivers of cars creep slowly as millions of motorists head home during a "rush hour" that actually lasts for hours (and isn't a rush at all). From Washington, D.C., to Detroit to Denver to Los Angeles, hundreds of millions of people spend hours on "expressways." And it's not just residents of the country's major metropolitan areas who are

caught up in the rush. Even in once-rural areas like the Big Wood River Valley of Idaho, which links Hailey with Ketchum and Sun Valley, stop-and-go traffic will stretch for 20 miles on the two-lane road that runs parallel to an empty bike path.

Whether stuck in traffic or not, cars embody independence. They're the very symbol of personal freedom, a core value of American culture. Being American has come to mean embracing a car-centric lifestyle. But ironically, this lifestyle increasingly constricts rather than enhances our mobility. It's also expensive and contributes to climate change and America's oil addiction. Might consumers be open to change? If so, where are the leverage points? Before answering these questions, we need to understand current realities—including how Americans differ from others.

Increasing Car Ownership and Use

A hundred years ago, very few people traveled farther than 25 miles from their homes—during their entire lifetime. Today, many Americans own homes in distant suburbs, which can mean driving double that distance to work, to eat at a new restaurant, or to visit friends and family. Suburban and exurban enclaves cater to cars, which are the easiest and sometimes only way to get around these vast regions. The result is steady increases in vehicle miles traveled (VMT).¹ But this trend can't go on indefinitely. Americans already drive far more than almost anyone else on the planet. Growth in VMT is far outpacing population growth, economic growth, and additions to road capacity. The inevitable result is paralyzing traffic congestion—and increasing oil use and CO₂ emissions.

Virtually every American adult who wants a vehicle has one. Remarkably, there's more than one vehicle per licensed driver in the United States—about 1.15 at last count. More than 90 percent of all households now own a vehicle. For the most part, Americans without cars are very young, very old, disabled, or live in Manhattan.² And most driving is done solo. Carpooling has diminished over time—from 20 percent of work trips in 1980 to only 12 percent in 2000³—despite major investments in carpool lanes on freeways.

While the rest of the world is imitating America's embrace of cars, most lag far behind. People in Japan and Western Europe own 15 to 40 percent fewer cars than Americans, and on average drive them only half to two-thirds as much.⁴ History and policies play a role in these differences. U.S. cities are younger and were built around the car, while older Asian and European cities

were established long before cars were invented. Mass marketing of cars also began later elsewhere—30 years later in Europe and 50 years later in Asia. While cities everywhere sprawl after cars become widely available, American cities sprawled sooner and much more so. The end result is that European and Asian cities are still far denser than their American counterparts, making them more amenable to bus and rail transit, walking, and bicycling. Huge Asian cities such as Mumbai, Shanghai, and Tokyo are three to eight times denser than Manhattan, America's densest city.

In America, even low-income people own cars. More-affluent Americans, roughly those in the top third of income earners, typically purchase new vehicles. Those with less income buy used cars. In 2005, just over 44 million used vehicles were sold—nearly three times the number of new cars.⁵ The flourishing used-car market allows all Americans to gain access to a car; the average price is \$8,000.⁶ But even with less than \$1,000 in their pocket, consumers can purchase and register a car. Not so elsewhere, where taxes alone can be as high as \$50,000 to register a new car and over \$5,000 a year to keep it in circulation, as they are in Denmark.⁷ And in Singapore, car licenses must be obtained through a high-priced bidding system.

Even recent immigrants to the United States, who often arrive without any car-driving experience, quickly become car users.⁸ Many start out on transit and carpooling. After five years in America, about 15 percent use transit and 30 percent carpool to work—far more than the national averages of 4 percent and 12 percent, respectively. But 10 years later, transit use by immigrants is down to 12 percent and carpooling to 20 percent. By the time immigrants have been in the United States for 10 to 15 years, fully 60 percent are driving to work alone.

The trickling down of cars to immigrants and poorer citizens enables their personal mobility. But there's an unfortunate wrinkle. Those gas guzzlers and SUVs purchased by wealthier individuals during times of cheap gas don't disappear as gas prices at the pump soar. They're passed down over time to less-affluent individuals who have to pay the higher costs. They stay on the road for years to come.

Preference for Big Gas Guzzlers

American consumers buy the least fuel-efficient autos in the world. In October 2007 the top-selling autos in the United States were overwhelmingly gas guzzlers, averaging 20 miles per gallon. The 10 most popular vehicles purchased

by consumers had fuel economies ranging from a low of 14 mpg (the Dodge Ram 1500 pickup) to a high of only 29 mpg (Toyota Corolla and Honda Civic).⁹ By June 2008, the new car market was changing for the first time in over two decades (see table 6.1). But with only 10 percent of the cars being replaced each year, it will take over a decade to rid the roads of high carbon,

TABLE 6.1 The ten best-selling new vehicles in the United States, 2007 and June 2008

Rank	Vehicle model	Fuel economy (mpg)	2007 sales (thousands)	2008 June sales (thousands)
1	Ford F-series pickup	15	707	25
2	Chevrolet Silverado pickup	15	632	25
3	Toyota Camry*	24	479	36
4	Honda Accord*	25	400	40
5	Toyota Corolla	29	382	36
6	Honda Civic*	29	335	37
7	Chevrolet Impala	22	325	**
8	Nissan Altima*	26	288	23
9	Dodge Ram 1500 series pickup	14	258	**
10	Honda CR-V	22	221	**
2007 sales of top 10 vehicles: 4 million Sales weighted average: 20 miles per gallon				

MPG = miles per gallon based on U.S. EPA combined city-highway tests; and pickup trucks include those models weighing less than 10,000 pounds.

*Hybrid version available: Camry (34 mpg), Accord (27), Civic (42), Altima (34) but not included in sales weighted average fuel economy.

**Chevrolet Impala, Dodge Ram 1500 series pickup, and Honda CR-V dropped off the top-ten list in June 2008 and were replaced by Chevrolet Cobalt, Ford Focus, and Hyundai Sonata.

Sources: Bengt Halvorson, "Best and Worst Selling Vehicles of 2007," *Forbes*, November 30, 2007; *Auto Observer*, "June Car Sales: U.S. Buyers Almost Veer Off the Road," July 1, 2008; and U.S. Department of Energy, www.fueleconomy.gov.

inefficient autos. If the price of gasoline ebbs, the preference for big gas guzzlers may well return.

How does this compare with other countries? Others have vehicle fleets with far better fuel economy. Until the 1970s, the gap was huge. The gap shrank from the mid-1970s through the mid-1980s, under the influence of high oil prices and binding fuel economy regulations, but then began to widen again. By the turn of the century, U.S. light passenger vehicles on the road were averaging 21 miles per gallon in real-world driving, compared to Japanese vehicles at 28 mpg, and Western European nations at 26 to 34 miles per gallon.¹⁰

The gap has expanded since the mid-1980s for two reasons: fuel economy standards and fuel prices. The United States has the weakest fuel economy standards of all the rich, industrialized nations in the world and also the lowest fuel taxes. Europeans have historically paid two to four times more than Americans for fuel.

There's also the fact that in America, the Detroit automakers successfully exploited the truck segment of the auto market starting in the 1980s, bailing themselves out financially but at the expense of fuel economy, safety, and emissions, as elaborated on in chapter 3. In 1971, trucks made up just 15 percent of the light-duty vehicle market. Farmers and contractors drove them, using their towing capacity and cargo space to do their jobs. Trucks were driven for short distances and often only during the workday on farms and construction sites. By the turn of the century, trucks (including SUVs) made up more than 50 percent of U.S. new vehicle sales. In 2004, the sale of large SUVs and trucks outnumbered small cars for the first time ever (see figure 6.1).

American consumers began gravitating to these trucklike vehicles for several reasons. Not only did historically low gasoline prices in the late 1980s and the 1990s make them affordable, but these larger vehicles suited the expanding Baby Boomer families of that era. To further increase their appeal, automakers loaded them with plenty of options and priced them cheaper than large, luxury cars. And then they used savvy marketing to appeal to consumers' emotional needs, as detailed later in this chapter.

Resistance to Alternative Fuels

For the past century, gasoline and diesel derived from oil have been the "least-cost" option for consumers. As documented in chapters 4 and 5, other fuels can't even get a toehold in the marketplace. By 2006, alternative fuels made

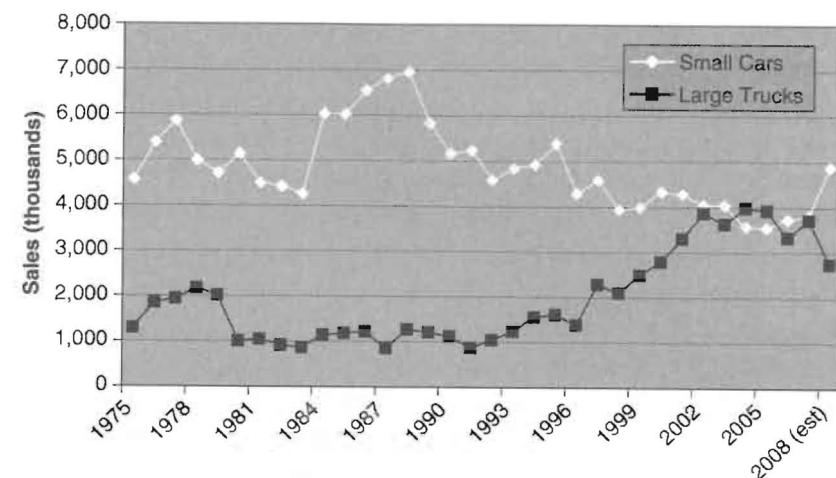


FIGURE 6.1 U.S. purchases of small cars versus large trucks, 1975–2008. Source: U.S. Environmental Protection Agency, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2007," Appendix E, September 2007. (Washington, DC, U.S. EPA). Note: Small cars include minicompact, subcompact, compact, and small station wagons; large passenger trucks include large vans, large SUVs, and large pickups. 2008 projections based on authors' estimates.

up less than 4 percent of total fuel consumption in the United States. And even that is deceptively high. Most of that 4 percent was ethanol blended in small amounts (usually 5 to 10 percent) into gasoline. The consumer never noticed that ethanol was in the gasoline.

Consumers are extravagant in their use of petroleum fuels because they have few incentives to do otherwise, and for the most part they haven't been asked to do otherwise. Since the 1980s, U.S. consumers have shrugged off methanol, natural gas, and electricity as alternatives. Methanol was ignored as the price of oil fell following the second oil crisis, and ethanol has thrived only as a gasoline-blended component. Biodiesel and hydrogen are the newest entrants and they still have microscopic market shares.

Even diesel, a preferred fuel in other parts of the world because it's more energy efficient and tends to be taxed at lower rates elsewhere, has largely failed to grab the fancy of U.S. consumers (though it dominates in large commercial trucks). Diesel's failure in the car market is due in part to long-held beliefs that diesel is dirty and smelly. It's also the residue of diesel "lemons" produced long ago by GM.¹¹ At their peak in 1981, diesel cars made up about 1 in 15 new cars purchased, but by 1985 sales were near zero. Another

factor behind diesel's failure in the American marketplace is the price of diesel fuel. It rose relative to gasoline prices during the early 1980s and today is still higher.

Familiarity definitely plays a big role in gasoline's staying power. Consumers have no real incentive to learn the vagaries of new fuels—how to refuel, maintain, or drive an alternative-fuel car—nor do they have the incentive to risk trying something different when buying a new car. Finances—how much more consumers are willing to pay for gasoline alternatives—also play a central role.

Consumers aren't the principal culprit in the failure of alternative fuels, however. The oil industry's huge sunk costs in the gasoline market have played an even bigger role. Witness the proliferation of gasoline stations. The willingness of politicians to continue backing oil industry interests, even providing subsidies as oil prices zoomed past \$100, hasn't helped either.

Consumer Responsiveness to Higher Gasoline Prices

A bedrock belief of economists and environmentalists alike is that increases in fuel prices (and gasoline taxes) influence consumer demand and are therefore the silver-bullet solution to oil and global warming problems. The facts don't support their belief. Contrary to media hyperbole, the evidence is overwhelming that car drivers are increasingly less responsive to moderate increases in fuel prices. Dramatic fuel price increases, however, might be another story.

When U.S. gasoline prices began rising around 2003, doubling in real terms by 2008, the immediate effect on gasoline consumption was small. Growth in gasoline sales slowed from historic annual increases of 1.8 percent between 1995 and 2005, to 1 percent between 2005 and 2006 and 0.4 percent from 2006 to 2007. Finally, for the first time in 30 years, gasoline sales were on track to *decline* in 2008, by nearly 1 percent (see figure 6.2).¹² With most consumer products, such large price increases would result in a much sharper and more immediate reduction in sales.

A number of factors explain this slower than usual price responsiveness. Consider someone who already owns an SUV. He might live far from work, and buses might be inconvenient, running only once an hour and not stopping nearby. What can this person do when gas goes from \$3.04 a gallon to \$4.17—over a \$1.00 increase in a few months—as it did in the first half of 2008?¹³ He might complain about high gasoline prices—but because he's so

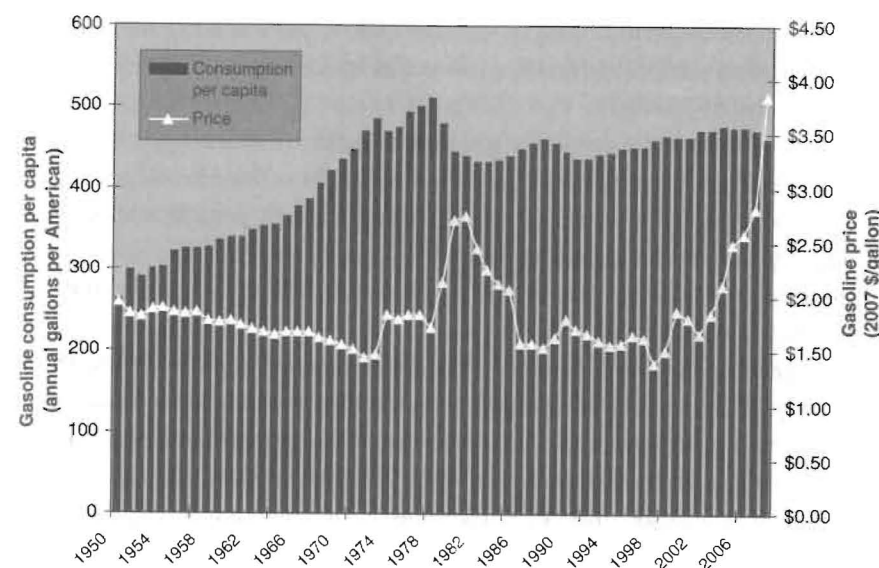


FIGURE 6.2 U.S. gasoline prices and per capita gasoline consumption, 1950–2007. Sources: Energy Information Administration, “Short-Term Energy Outlook” (U.S. Department of Energy: Washington, D.C.), July 8, 2008, and Oak Ridge National Laboratory, *Transportation Energy Databook: Edition 27* (U.S. Department of Energy: Washington, D.C.), 2008.

dependent on his vehicle, he has few options to do much about it, at least in the near term. And even if he sells his gas-guzzling SUV and buys a new fuel efficient car, someone else will buy his used SUV, creating yet another gas-guzzling consumer.

Another factor explaining U.S. consumers' surprising lack of responsiveness to high gasoline prices is years of volatility. As a result of yo-yoing prices, consumers adopted a wait-and-see attitude. Not until price increases had continued over five years and finally tripled by 2008 did significant changes in behavior begin to be observed. It takes years of sustained high gasoline prices to induce a major responsiveness to gasoline prices.

Consumer responsiveness to prices is measured by a concept called price elasticity of demand. If the price of gasoline increases 10 percent and consumers respond by reducing consumption by 10 percent, the elasticity of demand is -1.0 . According to various studies, the short-term price elasticity of demand for gasoline in the United States has historically been about -0.3 .¹⁴ In other words, consumers would be expected to reduce fuel consumption

30 percent for every doubling of gasoline prices. This is what happened in the 1970s and early 1980s, when oil prices spiked twice in succession, in 1973–74 and 1979–80.

The 30 percent response for gasoline is rather modest but is similar to what's observed for products considered necessities. For luxury goods and discretionary activities—say, eating out, foreign travel, private schooling, or buying opera tickets—consumers are much more responsive to price hikes. Gasoline is seen as more necessity than luxury. Without it, everyday life comes to a standstill.

As unresponsive as U.S. consumers were to gasoline prices in the 1970s and early 1980s, new evidence suggests that they became even less responsive during the Reagan and Clinton years, when gas prices remained low. Those gasoline price elasticities of -0.30 from the 1970s and early 1980s dropped to as little as -0.04 by early 2000.¹⁵

According to theory, consumers become more responsive when high prices are sustained over a long time. In the short run, in the year or two after prices rise, consumers can most easily respond by carpooling, telecommuting occasionally, making fewer trips to the mall, inflating tires to proper pressure, tuning engines more frequently, driving less aggressively, and speeding less. These small actions, taken together, can generate considerable oil savings, but the evidence suggests that few pursue them very enthusiastically. Ignorance is part of the problem—few are aware of the dramatic savings that result from reducing speeds on highways to 65 miles per hour (or less) and keeping tires inflated—along with riding in carpools and buses.

With more time, though, consumers become more responsive to higher prices. According to theory, in the long run consumers would be more likely to acquire a more fuel-efficient vehicle or find a job closer to home or a home closer to work—resulting in major reductions in fuel use. But in reality, the long-run behavior seems to be muted when it comes to gasoline. That is, prices never seem to plateau at high levels—or at least they haven't since the early 1980s. Instead, they fluctuate, spiking and then plummeting. As a result, drivers have been slow to internalize the notion that gas prices are going to stay high.

When gas prices rose above \$4.00 a gallon in 2008, consumers finally began to make major changes. After five years of increasing gasoline prices, the reality began to settle in that perhaps the era of cheap gas was over and high prices were here to stay. Significant changes in consumer

behavior were beginning to be observed. For the first time in 30 years, VMT stopped increasing in 2008 and a distinct shift to smaller vehicles was now under way.¹⁶ Some of that long-run behavior was starting to emerge. By June 2008, there were signs that a radical upheaval might be under way. For the first time in decades, Ford and Chevrolet's large gas-guzzling pickup trucks (F-series and Silverado) lost their spots as the top-selling vehicles in the U.S. market, sliding all the way to fifth and sixth place, outsold by the Honda Accord and Civic and the Toyota Corolla and Camry.

Is this shift in vehicle-buying behavior permanent? If gasoline prices falter once again, as many industry analysts expect, how will consumers respond? Will consumers ratchet up their driving (for instance, moving to cheaper lots even further out) and revert to inefficient vehicles? Or will some of the vehicle-switching changes observed in 2008 stick?

In any case, the modest reduction in driving by Americans in the face of high fuel prices is largely a result of their increasing dependence on cars and the lack of alternatives. Increased suburbanization and sprawled development have led to longer distances to work, shopping, and other destinations and have reduced the viability of walking, transit, and biking. Children used to go to school by foot, bicycle, or bus. Now many are driven, or drive themselves as soon as they get a license. Greater car dependence and greater sprawl has reduced Americans' flexibility in responding to high fuel prices.¹⁷

Americans' Preferences and Attitudes about Energy and Environment

Americans won't take the initiative in response to rising fuel prices and evidence of global warming. Instead, they want government to do more about energy and the environment. A Harris Interactive poll in 2005 found that nearly three-quarters of U.S. adults agreed that "protecting the environment is important and standards can't be too high,"¹⁸ while another poll in 2004 found that 67 percent wanted the U.S. government to do more about the environment.¹⁹ But despite their concern, U.S. citizens indicate that they're reluctant to see the government use economic policies and taxation to achieve those goals. Backing this up, an ABC News/Washington Post/Stanford University poll released in April 2007 showed that a third of Americans, up

from 16 percent just a year before, consider global warming the world's biggest environmental problem, but they preferred the government to set emission standards over levying carbon taxes or imposing a cap-and-trade program.²⁰

It's paradoxical, even ironic, that America, champion of economic markets, is antagonistic to the use of market instruments to influence demand. While Americans claim they support "polluter-pay" principles, the reality is they mostly endorse pollution fees only when they apply to industry. When the polluter is the driving public, Americans do an about-face, shunning smog fees and increased gasoline taxes. When former president Bill Clinton proposed an energy (BTU) tax in 1993 primarily to reduce the budget deficit and secondarily to reduce global warming, he suffered a political backlash. The proposed tax on fossil fuels raised the ire of the nation's top energy producers, who were joined by farmers, electric utilities, and consumer groups. In the end, the tax was shrunk to only 4.3 cents per gallon of gasoline, with President Clinton suffering considerable political damage. No serious proposal to raise gas taxes has been put forth since then. Japan, Europe, and most other countries, by contrast, impose far larger vehicle and fuel taxes, which translates to less demand for SUVs and big cars in those countries (see figure 6.3).

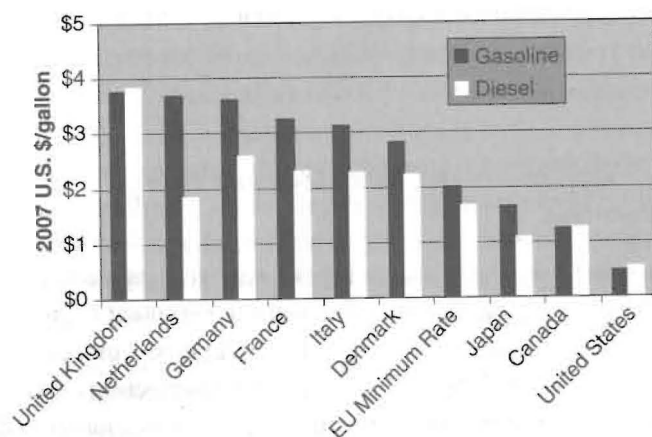


FIGURE 6.3 A comparison of gasoline taxes paid in various nations, 2006. Sources: Association of European Automobile Manufacturers (ACEA), 2007 Tax Guide; Japan Automobile Manufacturers Association (JAMA), The Motor Industry of Japan 2007; Canada Department of Finance, Oil and Gas Prices, Taxes and Consumers, 2006; American Petroleum Institute, Motor Fuel Taxes, 2007.

American policy largely ignores the profligate use of petroleum fuels, other than through fuel economy standards imposed on light-duty vehicle manufacturers. The federal gasoline tax is still only 18.4 cents per gallon, and most state gasoline taxes are about the same.²¹ States sometimes impose modest one-time vehicle sales taxes and annual registration taxes based on the value of the vehicle, but these are not tied to the vehicle's power, emissions, or fuel economy. The only tax that does so is an artifact of the 1970s—the federal gas-guzzler tax mentioned in chapter 3 that's imposed on a few sports cars and large luxury cars that get less than 22.5 miles per gallon—but minivans, pickup trucks, and SUVs are exempt from this tax. In most other countries, people pay high fees to purchase and drive the most inefficient, polluting cars, but not in the United States. Instead, Americans have preferred only a light tax on gasoline and diesel fuel, which is not even sufficient to maintain the highway network (thus requiring additional sales, excise, and property taxes by local and state governments to build and maintain roads and transit services). The low fuel taxes lead to greater oil consumption, which results in America exporting about \$1 billion a day to oil-exporting nations.²²

Taxes and market instruments are far more welcome on the supply side—that is, American voters and consumers are more accepting of taxes on companies than on themselves. The result is energy policy that embraces market forces to enhance supply but not to restrain demand. Massive subsidies to oil and gas industries have never concerned the American public as much as gasoline taxes. Even the 2006 controversy about the oil industry avoiding payment of billions of dollars in royalties to the U.S. government was shrugged off while gas taxes were not. In a fall 2006 vote on whether to impose a severance tax on oil production in California, voters accepted the argument—blasted out in a massive \$100 million campaign by the oil industry—that it was essentially a gasoline tax on motorists. It was decisively rejected. Americans are wedded to their cars. Given the lack of choices now available to them, Americans see efforts to increase vehicle and fuel costs as punishment.

Americans see technology and technical fixes as preferable to changing behavior. America, with its sunny outlook, has long been "a nation of inventors, innovators and experimenters,"²³ in the words of former secretary of labor and now UC Berkeley professor Robert Reich. As Harold Evans documents in *They Made America*, his massive book on the lives of American inventors, "The newness and vastness of the surroundings, the

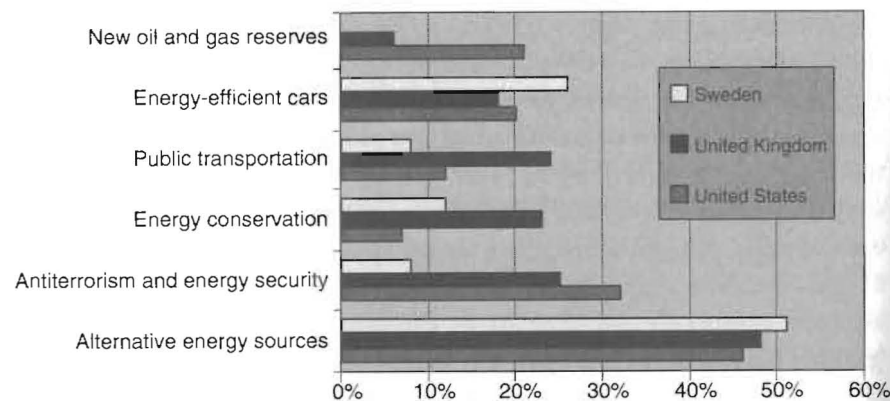


FIGURE 6.4 Citizens' stated priorities for their national energy agencies—U.S., U.K., and Sweden. Source: David M. Reiner, presented at Biennial Conference on Transportation and Energy, Asilomar Conference Center, Pacific Grove, CA, August 2005.

shock of unfamiliar environments, and the shortage of ready hands impelled an almost frantic drive by the early settlers for practical innovations that would make life less tenuous and more agreeable.²⁴ A core belief that science and technology will create a better future has endured in American consumerism since that time. This belief manifests itself in Americans looking to technology to solve energy and environmental problems, allowing them to resist loosening their connection to cars.

In a survey conducted in the United States, Sweden, and the United Kingdom, Americans said technological solutions and use of military force to provide oil security should be far higher priorities for their national energy agency than public transportation and energy conservation (see figure 6.4).²⁵ The failure of President Bush to call for national sacrifice after the terrorist attacks in 2001 was apparently not an anomaly. American consumers seem less willing than their counterparts abroad to undertake meaningful behavioral changes to solve their nation's energy problems. As one commentator in the *Wall Street Journal* pointed out, "Most Americans aren't willing to change to conserve energy. Even lifestyle choices like driving a small car, carpooling and living in the vicinity of where we work are largely anathema."²⁶ And summing up recent polls in 2007, another commentator wrote, "Many Americans think global warming is a serious concern. But don't ask them to make personal sacrifices to help fight it."²⁷

The situation isn't as extreme or unchanging as it might seem. There's reason to believe that change in American preferences, attitudes, and behaviors with respect to vehicles, fuels, and driving is possible and even likely under the right circumstances. The reality of our planet's dire environmental straits does seem to be getting through to an increasing number of consumers who want to be seen as doing the right thing. We'll take a close look at this phenomenon of shifting consumer identities before exploring how various kinds of intervention might keep this trend going in the right direction.

From Mean to Green: Shifting Consumer Identities

It's axiomatic in marketing that people value identity over practical considerations in making purchases. They buy products that reinforce their self-image and symbolize who they want to be. Auto manufacturers know this and play to consumer identity in their sophisticated advertising campaigns. The SUV and truck crazes tell a lot about the consumer psyche—and the car business. So does the recent success of hybrid vehicles such as the Toyota Prius and other more environmentally friendly vehicles.

With SUVs and trucks, automakers appealed to consumers' desires for security, adventure, freedom, and control. With hybrids, they're appealing to a different set of ideas and feelings: social responsibility, green values, a little guilt, and concern about future generations. How strong are these latter values and feelings? Will they prevail even if gasoline prices drop? Will the environment continue to be a popular value, particularly if supported by the right incentives, and will some consumers continue making more socially conscious purchases—influencing with their dollars?

How Americans Learned to Love Trucks and SUVs—and What It Means

In 2006, automakers spent \$20 billion to advertise automobiles to U.S. consumers—13 percent of all advertising dollars.²⁸ Truck advertising accounted for a huge share of these resources, and the messages were seldom socially and environmentally conscious.

In a 2005 TV ad for Ford's F-series pickup trucks, for example, a threatening motorcycle gang pulls up to a roadhouse and stops. The lead rider puts his boots on the ground, removes his sunglasses, and glares toward the roadhouse. Then his expression changes. The burly riders shrink as

they size up several Ford F-150 and Super Duty truck grilles staring back at them menacingly. "I ain't goin' in there," says the leader. "Salad bar's better up the road," says another rider. The gang rides off. When the dust settles, viewers see a lineup of eight Ford trucks parked in front of the roadhouse as the voice-over says, "We don't just make our trucks tough—we make *you* tough."²⁹ Ford's message: meat-eating "real" men drive big, mean trucks.

Toyota, although a new contender in this market, is no different when it comes to playing off American stereotypes of the hardworking man who "needs" to drive a big truck. Forking out \$2.6 million for its 30-second TV ad during the 2007 Super Bowl, Toyota launched a campaign to convince Americans that the best new full-size pickup wears a Japanese name. "It's simple: You want to know whether Tundra has the guts—the size, strength, stamina, and sheer capability—to do the work you need done. The work of a true, full-size truck. Offered with an available 381-horsepower 5.7-liter V8 engine, the new Tundra is no ordinary half-ton."

Ford and Toyota (like other major automakers) were tapping into the more profligate impulses of Americans. They create stereotypes of American values and lifestyles. After all, they're in the business of cementing the love affair between consumers and their autos. In the case of trucks and SUVs, they were exploiting consumers' emotional needs in a way that served private interests at the expense of the larger public good.

Clotaire Rapaille, an influential consultant to the three Detroit companies during the 1990s, encouraged his clients to build bigger and more menacing SUVs.³⁰ He found in his innovative market research that these vehicles, if properly designed, could connect with American consumers' strong subconscious needs for personal security. Rapaille called these needs *cultural codes*. He argued that people bought SUVs not because they intended to drive the vehicles off-road or haul heavy goods—the commonsense rationale for buying such vehicles. Instead, they bought them because they wanted "to look as menacing as possible to allay their fears of crime and other violence."³¹ He explained to his clients that certain vehicle features were far more symbolic than necessary to SUV buyers. Bulky fenders, high ground clearance, oversized wheels, and darkened windows symbolized tough impermeability, an important message for consumers who were obsessed with violent crime. As one participant in Rapaille's focus group for the Chrysler PT Cruiser explained, "It's a mad world. People want to kill me, rape me.... Give me a big thing like a tank."³²

The growth of the SUV segment was fueled by the meanings people ascribed to these vehicles. A series of studies on vehicle symbolism conducted by Ken Kurani, Tom Turrentine, and Rusty Heffner of the University of California at Davis³³ found that twenty-first-century moms who chose SUVs reported that they didn't want to drive minivans like their mothers had. They bought SUVs to sustain images of themselves as skiers, outdoorswomen, boat owners, and cowboys, often without practicing the actual avocations. Even the meaning of "sports car" was altered in the push toward SUVs. What is a Porsche SUV? For one thing, it quickly became the vehicle that earned most of Porsche's profits in America.

Sales of SUVs were also motivated by consumer perceptions of SUVs as safer and more secure than other vehicles. Drivers of SUVs sit high and can survey traffic over the tops of other vehicles. SUVs offer the capability—whether drivers ever use it—to tackle any obstacle, be it a boulder or, more likely, a curb or median. These new vehicles gave drivers—especially women, who influence the majority of car purchases—a sense of personal control. In an interview, one woman said she bought "the biggest SUV with the most seats" because when it came to choosing drivers for field trips, her children's school gave preference to parents who could haul the most kids—and she didn't trust others to drive her kids. Unfortunately, these self-determined views of safety give no thought to the safety of others on the road when they come into contact with a much bigger and heavier SUV.

In sum, consumers who looked to vehicles for self-expression in the 1990s mostly chose bigger engines and bigger vehicles. The aura of personal and road safety around big vehicles reinforced these choices and in some cases played important roles. But these weren't just any big vehicles—minivans were large vehicles and were still around in the 1990s, but their sales remained static. The SUV segment grew far faster than the minivan segment as car companies created more versions of the SUV—from the luxurious Cadillac Escalade to the tough, military-inspired Hummer. By the early twenty-first century, SUVs accounted for almost half of all light truck sales and almost a fourth of all light-duty passenger vehicle sales. This wholesale shift to a completely new segment in less than a decade revealed just what could happen when car companies tapped into nascent, but as yet unrevealed, desires of consumers.

Might the auto industry be transformed by the emergence of a new set of symbols and messages—possibly ones that are diametrically opposed to consumers' preferences for SUVs? What if drivers' needs—both emotional

and rational—began to shift toward a desire for vehicles that are more agile, less obstructive, better on gas, and easier on the environment? What exactly will it take for such consciousness-raising consumerism to occur?

The answer lies largely with the consumer. But it also depends on the car industry. Automakers must be willing to break from the crowd to create cars that appeal not only to the socially conscious side of consumers but also to their car-obsessed psyches that require cars to do more than just move them from point A to point B. It means that the industry—especially Detroit automakers—must learn a lesson from how it created the SUV craze. One company—with others starting to follow—is doing just that.

How the Prius Became a Cultural Icon

At the turn of the twenty-first century, before the market for hybrids had developed, many automakers, including GM, publicly stated that consumers wouldn't see value in hybrid vehicles. Several years later almost all were building hybrid vehicles. What changed?

To understand how the phenomenon of the Prius and other hybrids could follow so closely upon the SUV craze, step back to 1990. That year, California mandated that carmakers create a zero-emission vehicle. This move signaled a new approach, for both consumers and automakers—though it would take a decade for the approach to begin paying off in any notable way. In the early 1990s, there was little opportunity or motivation for consumers to exercise their interest in “green” vehicles. The 1990 Iraqi invasion of Kuwait temporarily brought U.S. dependence on foreign oil to front stage and bumped up oil prices, but when prices quickly faded, so did oil concerns. Meanwhile, the zero-emission vehicle mandate in California was stymied by automaker opposition and slow progress on batteries. With little impetus for change and few choices to be “greener,” consumers continued to indulge their desires for SUVs. But the California initiative did spur some to rethink the gas-guzzling characteristics of vehicles.

As detailed in chapter 3, Toyota secretly launched the Prius development project in 1995, just two years after the three Detroit automakers and the Clinton administration launched the Partnership for a New Generation of Vehicles (PNGV) to build an 80-mpg car. Honda launched its own hybrid vehicle program shortly after Toyota. Ten years after California set in motion the market for green cars, Toyota and Honda brought their cars to America. The two cars would have far different impacts on consumers and the car

industry. Both offered higher fuel economy than virtually any other car on the market. They were priced similarly. But it was the Prius that in the end captured consumers' attention.

Honda introduced the Insight hybrid electric vehicle to the American market a month earlier than Toyota introduced the Prius. The Insight had a number of distinguishing characteristics—most notably its stunning 70-mpg fuel economy rating for highway driving. But it had a number of drawbacks. The two biggest were its tiny interior with just enough room for two people and an unusual, aerodynamic shape that virtually screamed, “I'm different.” The Insight had an immediate following among the hard-core environmental set. But it had little appeal for mainstream consumers and never sold more than a few thousand units a year. Honda perhaps learned the wrong lesson and turned its attention to selling hybrid versions of existing Civic and Accord models, with only moderate success. It shifted gears again in 2007, announcing plans to build a unique hybrid car, following Toyota's success with the more mainstream Prius.

When Toyota unveiled the Prius, it targeted a broader market. The Prius had seating for four, a fuel economy rating of 52 mpg city and 49 mpg highway, and a design that was quirky yet conventional enough to capture a wider market than the Honda Insight. That first year, Toyota executives worried that U.S. consumers wouldn't be drawn to the vehicle, which had been designed primarily for the Japanese market. Indeed, it was a strange time to be introducing a small, high-mileage vehicle with a novel powertrain technology. There wasn't much demand from consumers for such a vehicle—or so it seemed. The number of small cars sold had been sliding since the early 1980s. Large trucks, in contrast, were on a rapid ascent. General Motors launched the Hummer brand the same year that Toyota unveiled its Prius. With gasoline prices near historic lows, fuel economy was a low priority with consumers. The overall fuel economy of new vehicles had sunk back to levels of the early 1980s. Cup holders ranked higher than fuel efficiency in consumer surveys.

It surprised few people that Toyota sold only about 13,000 Prius cars in the United States in its first full year. But by three years later—when gas prices were still relatively low and truck sales were still strong—Prius sales had tripled. In late 2004, when a new enhanced version was launched with a more powerful engine, Prius sales tripled again to 100,000 and then climbed to 180,000 in 2007, making it the thirteenth-best-selling light-duty vehicle in

the United States. In late 2005, almost 40 percent of Americans who intended to buy a new vehicle said they would consider a hybrid.³⁴

There were a number of reasons for the growth in Prius sales. The 2004 model was larger and better equipped than its predecessor and provided brisker acceleration and higher fuel economy at about the same price. Rising gas prices had some influence on its success, although more conventional fuel-efficient vehicles that came close to the Prius's real-world fuel-economy performance had much less success in the market. Toyota's small Corolla sedan, for example, exhibited almost no change in unit sales from 2000 to 2005. Clearly, something more than the Prius's stellar fuel economy was drawing consumers to hybrid cars.

A comparison of consumer attitudes toward the Corolla and Prius is critical to understanding why the Prius captured consumers' hearts as well as their minds. Hybrid cars use less fuel, but so do smaller internal combustion engine vehicles. And hybrids come with a higher sticker price, so it's not a question of saving money. Indeed, the question of saving money was widely debated when hybrids were first introduced. Magazines like *Consumer Reports* published analyses of costs, comparing fuel savings against the higher vehicle purchase price. They compared hybrids to low-priced economy cars like the Toyota Echo and Corolla to determine whether hybrid technology actually saved drivers money. It rarely did, even as gas prices rose above \$2 per gallon in those early years.

If fuel economy wasn't the rationale for buying a hybrid, what was? One Toyota Prius owner—who once owned a Corolla—said it best during household interviews conducted by Kurani, Turrentine, and Heffner.³⁵ She had purchased her used Corolla after a divorce left her with severely strained finances. It was strictly a cost issue, she noted. She emphasized that her later purchase of the Prius was a very different experience. She was proud of the frugality of her Prius, but this time, saving money was a choice she had made rather than one imposed on her. The Prius had a different meaning to her and also sent a different signal to others.

Hybrid buyers interviewed by the three UC Davis researchers rarely compared their Prius purchase to buying an economy car. The reasons appear to lie in the meanings and symbols of economy cars, as explained by the woman just mentioned. Buyers of economy cars signal to the rest of the world that they're on a tight budget and have no choice but to save anywhere they can. That purchase tells the world they *have* to be frugal. The purchase of a Prius tells the world they *want* to be frugal—and much more.

The Symbolic Value of Hybrid Purchases

The success of the Prius is due to its unique and novel combination of new meanings, new and old functionalities, and emotional appeal. Hybrids collectively, but mostly the Prius, were the first commercially available cars that were thought of as “environmental” vehicles. Hybrids elevated high fuel economy from a trait of small cheap *econo-boxes* into high technology, smart engineering, and high quality. And it all had to do with symbolism.

Among those interviewed in the UC Davis studies, purchase of a Prius was based as much on symbolism and meaning and what it said about the buyer's identity as on any rational analysis—just like with SUVs. Few of those surveyed had done a detailed analysis of what the purchase of a Prius would mean to their pocketbooks.³⁶ One-fifth of the small sample interviewed by the UC Davis researchers said saving money was the main reason they bought a hybrid. But they didn't actually calculate the savings; instead they used simplifying heuristics and rules of thumb. And they used the validation of government incentives—not necessarily the value of the incentives but just the fact that they existed—to gauge governmental or societal commitment to the alternatives. Among those who had read stories presenting money-losing analyses, all based their final decision to buy a hybrid on something else.

The symbolism of hybrids includes environmentalism but also much more. The 2002–06 Ford Focus, for instance, polluted less than the early hybrids, earning a special emissions rating (PZEV). And a decade earlier, in 1992, Honda offered a conventional Civic (model VX) with the same low emissions as the hybrid, along with a respectable mileage of 36 mpg in the city and 44 mpg on the highway.³⁷ But car owners didn't see low-emitting vehicles like the conventional Civic and Ford Focus as being on par with hybrids, even when the fuel economy was similar. In all the interviews, rarely did consumers indicate that their choice had been between a hybrid car and a small, low-polluting, fuel-efficient car.

But traditional concepts of personal image aren't the point. Owning a hybrid, at least for the early buyers of hybrids, is about the symbolism of “doing the right thing,” even if the individual contribution is infinitesimally small. Hybrid ownership is about participating in something larger than the individual—a collective effort to clean up and preserve the natural environment so that it can continue to provide for and be enjoyed by others, including future generations. Hybrids convey to their owners and the world that

these are people who care about the planet and other people and are willing to make changes in their own lives to serve a greater good.

The question is whether environmentalism and the broader "do good" symbolism of hybrids are likely to gain wide acceptance. Certainly environmentalism has become a popular value—supported by more than the fringe. Baby Boomers, the bulk of car buyers today, having led every major automotive buying trend since the late 1970s—when many abandoned Detroit's gas guzzlers for boxy imports built by Honda and Toyota—seem on the verge of embracing environmentalism in car buying.

One small indication that change is coming to the car market is the advent of so-called hybridfests. For more than a hundred years, cars were raced against each other. Now for the first time, drivers are competing not on speed but for the title of Most Fuel-Efficient Driver in the World. One such event is a 20-mile race through the streets of Madison, Wisconsin.³⁸ Many Web sites are filled with tips on how to drive hybrids most efficiently, with eccentric entries about unshoeing the right foot so as to feather the accelerator pedal. A larger indication of change was that automakers couldn't keep up with customer demand, with some dealers out of stock as early as July for the rest of 2008.

An early indication of the strong symbolism of hybrids was found on the street. When they first came out, the Prius and Honda Insight looked so novel that they often attracted the attention of bystanders. Many owners were more than willing to extol their vehicle's advantages to strangers. A few early buyers became active promoters, handing out brochures, offering test-drives to strangers, delivering lengthy testimonials, and participating in political rallies. These genuine expressions of enthusiasm became as much a factor as automaker advertising in influencing potential purchasers' decisions.³⁹ So too did messages from other sources such as scientists, the popular press, political leaders, and celebrities.

As more voices, including the voices of consumers, confirmed the connection between hybrids and the environment, the linkage grew stronger, and hybrids became a symbol of ecological preservation. They also became a symbol of freedom and of independence from foreign oil. Even many religious and politically conservative groups embraced hybrids as a symbol of energy security.

Owners also saw their hybrids as a medium for communication with the automobile industry. Buying a hybrid, they explained, sent a message of support to Honda and Toyota, and a message of disapproval to those

automakers that were resistant to reinventing vehicles. More than one said in interviews that in buying a hybrid they were "voting with their dollars."

Interestingly, however, few early hybrid owners viewed themselves as activists—certainly not before they bought their hybrid. They cared about the environment, but few were expert on environmental issues or deeply involved in environmental groups or causes. Yet they did have genuine concern for the environment, their families, and their communities. Buying a hybrid allowed them to show these concerns in a way that no other—and no previous—vehicle could. These households could have reduced their environmental impact by driving less, making greater use of carpooling, bicycling, using public transit, or buying an "economy car" or one of the few very-low-emitting gasoline PZEVs. None did. These actions either aren't realistic options or aren't seen as effectively communicating the ideas of concern for the environment or caring about others.

By attaching the symbolism of environmental and social responsibility to vehicles, consumers have begun to make choices that are changing the marketplace. It took the initiative of automakers, beginning with Toyota and Honda, to create the kind of hybrid vehicle that would appeal to consumers. But it took consumers—at first a few but now over a million—to show the industry what they wanted and didn't want. Hybrids opened the door to firsthand consumer experience with electric-drive technology. Hybrids highlight the differences between new technology (electric-drive) and old technology (gasoline combustion vehicles). Buyers of hybrids are spawning social marketing that seems to be saying they've broken step with the past and don't want to go back.

Aligning Incentives with Socially and Environmentally Responsible Behavior

Consumers may not be able to drive the market toward cleaner vehicles all by themselves, but under the right conditions they can play a lead role. Smart policies are needed to help people realize and act on their social and environmental instincts. Unfortunately, American consumers have been given mixed signals about autos, oil, and vehicle travel.

Examples abound. One is the introduction of unleaded gasoline. In the United States, the government mandated the phase-out of leaded gasoline in the 1970s but at the same time allowed fuel suppliers to sell the more polluting leaded fuel at a lower price. The result: many people pumped the cheaper leaded gasoline into their tanks, destroying the catalysts in their engines and

increasing pollution.⁴⁰ In Europe, by contrast, the government altered taxes so that unleaded gasoline was cheaper. This gave consumers the right signal and the result was a more rapid and effective transition to unleaded gasoline.

Another example is the tax break Americans receive for buying hybrids. The starting amount varies by model, but the more hybrids an automaker sells, the smaller the tax break is, until it disappears. The Prius once garnered a \$3,150 credit, but the tax break quickly disappeared as the number of these vehicles sold mounted, even as such credits remained for less fuel-efficient hybrids. In Europe, by contrast, several countries offer significant tax breaks based on how much CO₂ a vehicle emits, and these tax breaks don't go away; many involve reducing the annual ownership fees charged in various European countries.⁴¹

When it comes to oil and autos in America, prices are often irrational. Oil company subsidies, vehicle fees not indexed to pollution or use, minuscule gasoline taxes that don't take fuel-cycle emissions into account, and the absence of carbon tailpipe standards, confound both consumers and manufacturers. Smarter U.S. public policies are needed. Politicians must enact laws that send consistent, informative signals to consumers, automakers, and fuel suppliers. Coordinated policies must simultaneously deal with technology, economics, and behavior. The United States could follow the lead of European nations and Japan, which tend to be more sophisticated and experienced in their use of policy instruments to influence consumers. Even the developing countries of Latin America and Asia are now becoming laboratories to learn from.

Measures the U.S. government might take to send clear and consistent messages to consumers might include public education and social marketing campaigns, incentives for buying and using low-carbon vehicles and fuels, and carbon budgets for individuals (and cities and companies). The government could also back new mobility options and create incentives to leave cars at home. Consumers must do their part by voting into office those candidates who promise to institute such measures and by also exercising their power as corporate investors and shareholders. These measures and more are discussed in detail in chapter 9. Here we'll make some general observations about government intervention to influence the purchase and use of vehicles.

Influencing the Type of Vehicle Purchased

The most important way the U.S. government has influenced vehicle purchase behavior is through fuel economy standards. The auto industry has historically been hostile to these standards because they feel like they've been

caught in the middle between regulations and market realities. They were forced to sell fuel-efficient vehicles to customers who didn't strongly value fuel economy. The result was a 20-year deadlock over fuel economy regulations, with fuel economy standards playing a diminishing role over time.

The central challenge for government policy is to overcome two automotive market failures: the tendency of consumers to ignore future energy and carbon savings in deciding whether to buy a vehicle with better fuel economy (or that uses low-carbon fuels), and the affluence of new car buyers who are relatively insensitive to fuel savings. Affluent people can afford to buy gas guzzlers that are eventually driven most of their miles by less-affluent people. For various reasons, buyers tend to undervalue the continuing stream of fuel savings from energy-efficient vehicles. The challenge for policy is to nudge car buyers to behave in a way that reflects broader social interest over the entire lifetime of the vehicle they decide to purchase.

Government can draw on a large array of incentives and disincentives to influence consumer behavior. Price floors can be placed under gasoline (and diesel) to moderate extreme fluctuations that confuse consumers. Rewards can be given to those who buy vehicles and fuels with better energy and environmental performance, and fees can be applied to those who don't. Incentive policies help consumers make better-informed choices and choices that are in the public interest. We'll say much more about these types of policies in chapter 9.

Influencing Travel Demand

Lastly, the amount of vehicle travel must also be reined in. How much people drive can be as important as what they drive. The challenge for government is to accommodate people's desire to access goods, services, and activities but to do so in a way that acknowledges the environmental footprint of travel. The goal of government shouldn't be to encourage unlimited travel. If it cost \$5 and took 15 minutes to get to Paris, some of us would be there for dinner every other night. That's infeasible as well as undesirable (from an energy and environmental perspective).

Unfortunately, travel choices have shrunk over time. Noncar modes of transport have languished, especially in the United States but increasingly elsewhere. Because the incremental cost of using one's already purchased car is still very small, even with higher gasoline prices, once we buy the car we often disregard other travel options (except for long distance). And because the perceived cost of operating a car is so low, we tend to use our cars more

than is socially optimal. When deciding whether to take a trip, most of us rarely consider any cost but gasoline and tolls. If we were more conscious of the full cost of driving—the cost of insurance, registration, maintenance, wear and tear on the vehicle, and tire replacement as well as the energy security, climate impacts, air pollution, and congestion we impose—we would drive far less. If all emissions embodied in our vehicles and fuels were reflected in taxes and fees, we would use cars much more rationally.

The challenge for policy is to expand and enhance the attractiveness of low-carbon travel alternatives that provide viable options to driving. But this needs to be a positive effort, not a punishment. Limiting travel demand (driving) has been a policy goal enshrined in legislation and government programs for decades. In the United States, requirements for travel demand management have been inserted in federal transportation and air quality legislation since the 1970s. Local, state, and federal governments have pursued a variety of programs to restrain vehicle travel.⁴²

Virtually all of these attempts to get Americans out of their cars have failed. They are viewed as punitive and incite retaliation. In the 1970s, Californians threw nails onto the newly opened Santa Monica freeway carpool lane to protest this pioneering effort to reduce solo driving. This disastrous experience under Governor Jerry Brown meant that the state would never again convert a mixed-use lane to carpool use; today all carpool lanes are the result of new construction. Despite many government initiatives to restrain travel, car ownership and car use have both continued to increase. Even carpooling has diminished—despite the construction of extensive networks of carpool lanes in metropolitan areas.

How can government send the right signals to consumers about travel demand, and how effective might such signals be? Some insight comes from an elaborate two-and-a-half-year effort by Sacramento, California, to develop a transportation and land use plan to reduce travel and enhance the region's quality of life. Careful modeling of this plan for the future found that in the most aggressive travel reduction scenario, vehicle travel dropped only 16 percent per household in 2050, not enough to offset population increases.⁴³ While this exercise didn't fully consider the new mobility services explored earlier in this book, it suggests the challenge ahead.

An analytical exercise by researchers at the World Bank and several universities arrived at a slightly more optimistic finding.⁴⁴ Based on a study of 114 urbanized areas in the United States, it found that vehicle travel could be reduced 25 percent by simultaneously altering land uses, improving the

balance of jobs and housing, and increasing the supply of transit—comparable to moving a household from a city with the characteristics of low-density Atlanta to a city with the characteristics of high-density Boston.

A real-world experiment of what's possible has been taking place in London. In 2002, a tax of £5 (\$10) was imposed on drivers who entered the center city. In 2008, the city increased the tax on normal-sized cars to £8 and on SUVs to £25—thereby motivating people not only to drive less but also to drive a smaller, more efficient vehicle. At the same time, transit service has been greatly increased, using revenue from the road tax. The net effect was to reduce vehicle travel about 20 percent in the city center in the first few years,⁴⁵ with estimates of an additional 15 percent when the higher charge kicks in. This effect is large. While the London experience is most relevant to a large, dense city, it suggests that a combination of aggressive pricing, land use management, and improved transit could significantly reduce driving on a broader scale.

But London makes it look easy. There's a lot of antipricing sentiment around, especially in America. New York's mayor Bloomberg proposed congestion pricing for the city in 2007 but it has drawn a heap of criticism. Although congestion pricing is a proven concept, details hung up the New York plan, like how to permit residents who live just outside the zone to park, how visitors will learn that they have to pay the congestion fee or face a fine, and old-hat criticisms about "Big Brother" (because of cameras that record drivers' entry). The U.S. government is planning to give Los Angeles and Chicago money for congestion pricing and other traffic mitigation strategies. But these also may well be blocked by skeptical voters.

The environmental footprint of transportation, as well as the performance and efficiency of transportation systems could be enhanced if government were to support innovative mobility services combined with enhanced conventional mass transit, rational pricing signals, and effective land use management. High-speed bus and rail services could be fed by small neighborhood vehicles and shared cars, complemented by smart paratransit vehicles and dynamic ridesharing that detour from set routes to pick up and deliver passengers on a moment's notice. The availability of such a system of seamless multilayered services, enabled by advanced telecommunication technologies, would send clear signals to consumers to do the right thing, ultimately providing us all with higher quality and less expensive travel. Our detailed suggestions on how to shift in this direction are presented in chapter 9.

In the end, it's not a question of whether consumer behavior will change. It must. Consumers must embrace more fuel-efficient vehicles that operate on lower-carbon fuels. They must embrace lifestyle choices and new ways of traveling that involve less wasteful vehicle practices. The question is, will consumers lead or will they have to be coerced? If the latter, workable solutions will take a long time to prove effective, backlash could ensue, and progress will be delayed. If consumers lead the way, the transition to a cleaner, better world will be much faster and smoother.