

# A U-Turn on Transportation

**A**mericans have unparalleled freedom to go where they want when they want, quickly and directly, thanks to an incomparable highway system built through a century of public investment. They make good use of this freedom. The average American household drives over 58 miles per day, totaling nearly 25,000 miles per year.<sup>1</sup> We are, without question, an automobile society.

But we pay dearly for the convenience of driving. American households spent an average of \$9,520 to own and drive a car in 2010.<sup>2</sup> The costs don't stop there. In 2010, US highways were responsible for just under 33,000 deaths,<sup>3</sup> and 2.3 million people went to the emergency room after highway crashes.<sup>4</sup> Pollutants from cars impact health: 36 metropolitan areas, home to a total of 85 million people, still fail to officially meet the national standards for ozone, contributing to a variety of respiratory problems.<sup>5</sup> Our driving is major factor in climate change: The US transportation sector is responsible for more than one-third of carbon dioxide emissions and 60 percent of domestic oil consumption.<sup>6</sup>

• Susan Handy  
• Sustainable Transportation Center  
• University of California Davis

**The average American household drives over 58 miles per day, totaling nearly 25,000 miles per year.**



It doesn't have to be this way. Imagine a future in which you can get to work and the store and all the other places you need or want to go to—but spend less time in your car to get there. Imagine a future in which your car, for those times when you still need it, does not pollute our air or hasten global climate change. Such a future is possible, but it will take both technological advances and policies that enable us to drive less.

## Technological Advances

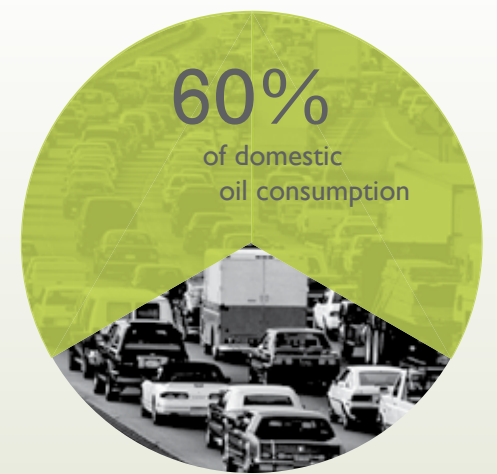
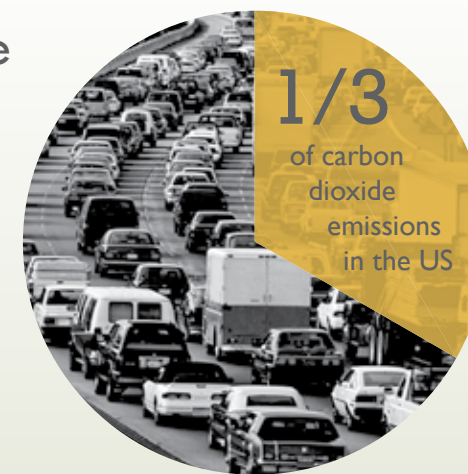
**R**educing the environmental impacts of driving on a per-mile basis is largely a question of technology. US fuel-economy standards require all new vehicles, for each manufacturer, to average 34.1 miles per gallon (mpg) by 2016, up from 27.5 mpg for cars and 23.5 mpg for trucks. According to the White House, the new standard will reduce oil consumption by 1.8 billion barrels and reduce greenhouse gas emissions by 900 million metric tons.<sup>7</sup> While this is certainly an improvement, it doesn't

yet match European Union and Japan standards, the most stringent in the world, at approximately 45 mpg and 43 mpg respectively.<sup>8</sup>

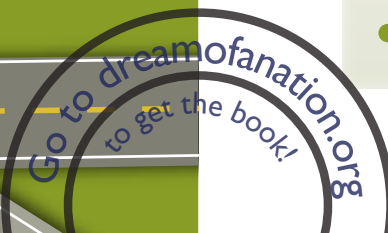
Reducing the use of petroleum fuels to propel our cars is also important. The next generation of plug-in hybrids and battery-electric vehicles are now coming into the market. Some plug-in hybrids can travel up to 100 miles on a fully charged battery, and new battery-electric cars can go more than 40 miles on a single charge before the gasoline engine takes over.<sup>9</sup> Hydrogen fuel cells, another way to provide electricity, are possible in 10 to 15 years,<sup>10</sup> though it may take a considerable investment of resources<sup>11</sup> before they would have meaningful impact on gasoline consumption and climate change.<sup>12</sup> Use of second-generation biofuels, derived from grasses, biomass waste and other sources like algae, could also be widespread within 10 to 15 years.<sup>13</sup> We don't yet know which technology, or which combination of technologies, will win out in the long run, but we do know that technology is going to change.

## Costs of Convenience

- The US transportation sector is responsible for 1/3 of CO2 emission in the US and 60% of domestic oil consumption.



- American households spent an average of \$9,520 to own and drive a car in 2010.
- In 2010, US highways were responsible for about 33,000 deaths & 2.3 million injuries.



**A 100 mpg fleet would eliminate the need to import foreign oil and drop domestic production by 800 million barrels/year, while saving every household \$2,700 a year on gas.**



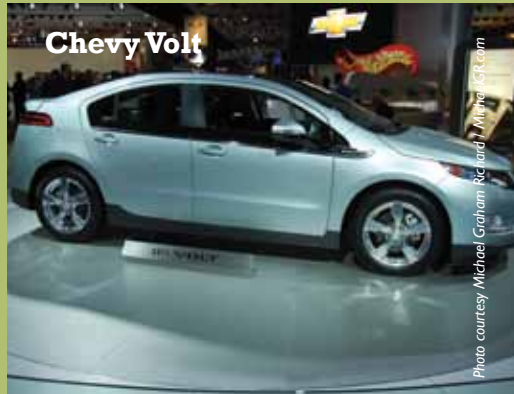
Hypercar

Photo courtesy The Rocky Mountain Inst.



Nissan Leaf

Photo courtesy Boykov



Chevy Volt

Photo courtesy Michael Graham Ricard / Flickr.com

### The 100-MPG Car

The Rocky Mountain Institute, a national non-profit, has been working to accelerate electric vehicle technology for about two decades. Conceived of in 1991, the Hypercar vehicle concept combines ultra-light materials, a low-drag design and electric-drive architecture to create an efficient and financially viable vehicle.<sup>1</sup> With help from GM, Bright Automotive is turning the concept into reality with the Idea—a 100-mpg equivalent plug-in hybrid. The Idea will operate in all-electric mode for the first 30 miles before switching to hybrid mode for up to 400 miles.<sup>2</sup>

No longer a far-fetched dream, the all-electric car is a reality. The Nissan Leaf and the CODA sedan are the first two pure electric cars offered in the US. Neither requires gas to run although both use gas as the back up fuel and both claim to have a range of 100 miles from a full charge.<sup>3</sup> Although, it's not a pure electric vehicle, the Chevy Volt was named Car of the Year at the January 2011 Detroit Auto Show.<sup>4</sup> For the first time, consumers have viable options for kicking the oil habit.

from the editor

**If every passenger vehicle in the US got 100 miles per gallon, the need to import oil would be eliminated.**

### Community Change

We must also find ways to reduce the amount of driving we do.<sup>14</sup> It is not easy for Americans to drive less, even when they want to. US communities are de-

signed for driving, not for transit, walking or bicycling, and most Americans thus legitimately feel they need their cars. Reducing this need requires a comprehensive approach to community design and transportation policy that gives people the option to drive less and puts this option on more equal footing with driving.

Europe is much closer to achieving a reduction in driving. For example, Copenhagen has invested in major expansions of on- and off-street bicycle paths coupled with intersection improvements, protected bicycle parking and educational programs, resulting in a 70 percent increase in bicycle trips from 1970 to 2006.<sup>15</sup>



Minneapolis, which recently topped Bicycling magazine's list of the 50 most bike-friendly cities in America, launched the largest bike sharing program in the nation in 2010. It's called Nice Ride Minnesota. This is one of 60 kiosks and 1,000 rental bikes sprouting up in high-traffic locations all around the Twin Cities.

London implemented a congestion charging scheme in 2003 that requires drivers to pay a fee to enter the central area, with revenues used to improve transit service and bicycle infrastructure in the area. The scheme has reduced driving along with greenhouse gas emissions;<sup>16</sup> vehicle traffic in the charging area declined 16 percent in the first year,<sup>17</sup> while bicycle trips have grown by 17 percent per year.<sup>18</sup>

Models of reduced car use can be found outside of Europe as well. In Curitiba, Brazil, implementation of a well-planned bus system and an extensive network of bicycle routes transformed the city, producing a 30 percent reduction in car traffic, despite a doubling of population.<sup>19</sup> Bogota, Columbia, has followed a similar approach. Nearly 217 miles of bicycle lanes plus restrictions on motor vehicles at certain times and places generated an increase in the share of trips by bicycle.<sup>20</sup>

We can look to progress within the US too. Efforts in Portland, Oregon, to reduce auto dependence through expansions of light-rail and other transit service, investments

in bicycle facilities and land-use policies that favor central city development over sprawl are paying off. The share of commuters bicycling to work more than tripled from less than 2 percent in 2000 to more than 6 percent in 2008,<sup>21</sup> while transit ridership has shown steady increases. In March 2010, Portland City Council unanimously passed the 2030 Bike Plan. The plan intends to make bicycling a cornerstone of Portland's sustainable transportation system with the ambitious goal of 25 percent of trips in the city by bike in 20 years.<sup>22</sup>

Policies to promote bicycling, walking and transit use will only succeed if land-use policies simultaneously encourage more compact development in which different land uses—residential, retail, offices, schools and so on—are within close proximity of one another. People can only walk and bicycle if their destinations are within walking and bicycling distance; transit works best if both people and destinations are clustered around stations. A number of different planning movements work toward this end: New Urbanism, Transit-Oriented Development and Smart Growth. As a key part of



Photo courtesy Maricordo / Marco Robert Duran Ortiz

Photo courtesy Felix Kramer

### Carsharing: An Alternative to Owning a Vehicle

The carsharing concept can be traced back to 1948 in Switzerland.<sup>1</sup> The concept began gaining speed in the US in 2000 with the formation of Flexcar, which has since merged with Zipcar. Today small community-based, and even non-profit, carsharing programs are popping up across the US such as Boulder's eGo Carshare, Chicago's I-Go and San Francisco's City Carshare. Peer-to-peer carsharing services like RelayRides, Spride Share and WhipCar, which let you rent your car directly to strangers or share a single car among several friends are also becoming increasingly popular.<sup>2</sup> Carsharing works well in locales where public transit, walking, and cycling can be used most of the time and a car is only necessary for out-of-town trips, moving large items or special occasions. Today there are more than one thousand cities in the world where people can carshare.<sup>3</sup>

from the editor



Photo courtesy David Megen

Stapleton's smart design allows for plenty of green space for the community.

### An Urban Design Movement that Reduces Vehicle Usage

Developed on the site of Denver's former airport, Stapleton is one of the largest examples of New Urbanist design in the US. With nearly 10,000 residents, 6 schools, 500 acres of open space and 200 shops, restaurants and services, Stapleton is a mixed-use, walkable community with access to public transportation. Apartments and homes are priced for a wide range of incomes and are designed with street-facing front porches to encourage community interaction. The 25 miles of trails and bike paths promote a sense of community along with a reduced dependency on driving for day-to-day errands and activities.<sup>1</sup>

its effort to meet ambitious targets for reductions in greenhouse gas emissions, California is betting on such policies to help reduce driving, both by encouraging alternatives and by reducing distances when residents do drive.

### Making it Happen

But how do we make this u-turn? These examples and others point to several possible triggers: federal mandates backed by targeted funding programs, state legislation that pushes change, visionary thinking in

the private sector, farsighted leadership at the local level, strong advocacy from grassroots organizations, vocal demand from voters and consumers and individual commitment to action. It may take all of these forces to bring about a full reversal. While the US for the last century has been the model for building a car-dependent society, a model the rest of the world has been too eager to adopt, it can become a model for reversing this course in the century to come.

.....

## Drive Less, Save More

If everyone in the US were to:	We could:
• Use public transportation one day per week .....	Save 10.4 billion gallons of gas <sup>1</sup> & reduce CO2 emissions by 1,040 lbs/person/yr <sup>2</sup>
• Walk 5 miles a week instead of driving .....	Save 2.6 billion gallons of gas/year <sup>3</sup> & cut CO2 emissions by 240 lbs/yr <sup>4</sup>
• Bike 25 miles a week instead of driving .....	Save 13 billion gallons of gas per year <sup>5</sup> and reduce CO2 emissions by more than 1,200 lbs/yr <sup>6</sup> .

*Dr. Susan Handy is a professor in the Department of Environmental Science and Policy and the director of the Sustainable Transportation Center at the University of California Davis (<http://stc.ucdavis.edu>). Her research on the link between the built environment and travel behavior has produced over 100 academic articles and other publications. Her current studies aim to improve understanding of the factors that influence the choice of bicycling as a mode of transportation. In recent years, she has worked with the Transportation Research Board, the Institute of Medicine, the World Health Organization, the American Planning Association and the Active Living by Design program on the role of city planning in creating communities supportive of walking and bicycling. She and her family have been happily bicycling in Davis, a widely acclaimed bicycle-friendly city, for the last eight years.*

