

Save Gas, Save the Planet



Ride Clean. Ride Together. Ride Less.

John Addison

Save Gas, Save the Planet

"Electric vehicles, plug-in hybrids and next generation fuels are all part of the clean tech revolution. John Addison delivers the fascinating details of today and tomorrow."

Clint Wilder, Co-Author of The Clean Tech Revolution
Contributing Editor at Clean Edge

"Read this book if you care about the future of our children. John Addison details the transportation solutions that will bring clear skies and reduce dangerous greenhouse gas emissions. It is fascinating to read about everything from smiles per gallon to electric vehicles, from people-oriented development to high speed rail, and from driving less to enjoying life more."

Assemblywoman Fiona Ma,
California State Assembly Majority Whip

"This is the best book that I have seen describing practical solutions for driving less and buying the right vehicle. John Addison offers accurate insights into the latest electric vehicles, plug-in hybrids, biofuels, and flexible work strategies. As someone responsible for the air quality for 7.5 million people, I recommend this book."

Jack Broadbent, Chief Executive Officer
Bay Area Air Quality Management District

"John's practical and comprehensive insights provide a must read for anyone who has not yet implemented lifestyle changes."

Athol Foden, President
Brighter Naming

"This book is a winner. As a home office worker who commutes only one day a week I can attest that by following your suggestions I am saving over \$10,000 per year on clothing, laundry, gasoline and maintenance, insurance - even food. Everyone who commutes will want to read this book."

Jerald A. Cole, Chief Technology Officer
Hydrogen Ventures

"Save Gas, Save the Planet is full of insights about how people now move about and how they will choose their transportation of the future. I gained many insights about real people solving real problems, even though I have years of experience with transportation systems and with hybrid vehicle design."

Tom Bartley, Vice Chairman, Transportation Committee
San Diego Chamber of Commerce

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Contents

| | |
|--|-----|
| Prologue | 11 |
| 1 Smiles per Gallon | 21 |
| 2 The Promise of Electric Vehicles | 33 |
| 3 Plug-in Drivers Get Charged | 49 |
| 4 Lighter than Air | 59 |
| 5 Riding on Sunlight | 79 |
| 6 The Temptation of Biofuels | 95 |
| 7 Flexible Work and Flying Less | 113 |
| 8 Cool Commutes | 129 |
| 9 Yours, Mine and Ours | 143 |
| 10 The Car-free Option | 153 |
| 11 New Diet for Oil Addicts | 171 |
| 12 Energy Security | 189 |
| 13 Climate Solutions | 211 |
| 14 Living in a Sustainable City | 229 |
| 15 What Choices Should You Make? | 239 |
| Appendix 1. Driving Smart | 247 |
| Appendix 2. Ways to Save Gas and Save the Planet | 249 |
| Appendix 3. Websites | 255 |
| Acknowledgements | 257 |
| Notes | 259 |
| Index | 265 |
| About the Author | 275 |

Prologue

Our vacation in Italy was an abundance of delicious meals, made savory because the food was fresh from local farms. We enjoyed leisurely walks along flowered hillsides that extended down to the Mediterranean. We listened to cathedral bells that echoed in narrow streets. We contemplated the grace of carved marble and painted ceilings. Tuscan villages towered like castles as we hiked through fragrant vineyards shaded by green cypress and poplar. By day, children's laughter reverberated through the piazzas. By night, couples kissed in the glow of dancing fountains.

The vacation was deeply relaxing, in part, because it was car free. Instead of being insulated from people inside a vehicle, we were connected with others as we traveled by train and bus and pleasant walks.

Life has been better for my wife, Marcia, and me since we returned from that vacation. The magic of having everything nearby in a city stayed in our memories. Inspired, we moved from suburbia to the city.

We also improved our lives by deciding to be carbon neutral. Annually we take a few minutes to calculate all of our carbon emissions, and then donate to the nonprofit Carbonfund.org which offsets our emissions by funding wind power, energy conservation, and reforestation. The simple calculation was jolting - over 80 percent of our emissions have been from burning petroleum. Yes, we have been addicted to oil.

Now, we have eliminated 90 percent of air travel, cut car use, and saved gas by following the three themes of *Save Gas, Save the Planet*. We ride clean, ride together, and ride less. Our two cars are no longer his and hers. We share the hybrid and keep the other parked, except when I am out of town for interviews or to teach workshops. Now we can walk two

blocks and hop on a bus powered with renewable energy, or walk four blocks to shop and carry the groceries home.

We are walking more, driving less, enjoying life, and living more in touch with our values.

In writing *Save Gas, Save the Planet*, I have learned from the research of experts and the practical wisdom of hundreds who have shared their stories. Every month, I become a smaller part of the problem and a bigger part of the solution.

When gas prices soared and a recession hit, Americans drove 100 billion fewer miles in 2008 than in 2007.¹ They used employer flexwork programs to get more work done at home and close to home. Many gained free hours for family and fun. Others doubled up trips. Millions joined commute and transportation programs that put them in the fast lane, not the lane that left them fuming and sucking up fumes.

When fuel prices rocket; then fuel demand tanks. People are getting clever about getting around. They are rethinking their relationship with their cars, trucks, and SUVs. When gasoline prices dropped, people continued to drive fewer miles and burn less gas due to several factors: an economic recession, an expectation that fuel prices would again ultimately soar past \$4 per gallon, and the discovery that life is better with less solo driving miles.

It is not just about money. People are also changing their lifestyles because they see the warnings of a climate crisis. As glaciers disappear and deserts widen, clean water has disappeared for a billion people. Without water and rich soil, food is tragically beyond the reach of millions. As we lose forests that produce oxygen, we lose our breath of life.

Like a human body with billions of differentiated cells each responding uniquely to a cancer, billions of people are responding uniquely to the spreading climate crisis. Many are now taking a more healthy approach to transportation. *Save Gas, Save the Planet* captures their stories and solutions.

Whenever gasoline prices soar, United States citizens hear a tired lecture that conservation might make you feel good, but it will make little difference. We are told that decisive action (at desperate cost) is needed:

convert coal into fuel, use more food crops for fuel, drill the Alaskan Wildlife Refuge, strip mine Canada for tar sand, and beg the Middle East to pump more oil. Some of these proposed responses would take years to produce results; all would accelerate a climate crisis.

Americans are joining their employers' flexwork and commute programs. They replace city driving with public transit. Families and friends link trips together and rarely drive solo. Everyday heroes keep their gas guzzlers parked most of the time and put miles on their other car that gets 40 miles per gallon. Ordinary people are starting to make an extraordinary difference.

Conventional wisdom has been that American's demand for petroleum is inelastic in relation to price. It now looks like the solution is Economics 101. Price goes up and demand goes down. In fact, Americans are eager for fuel efficient vehicles, corporate commute programs, and effective public transportation. Now that we are economically stretched, demand for gasoline is suddenly elastic.

For most, it has not been one big change, but a few incremental changes that save thousands of dollars per year, reduce the nation's addiction to oil, and reduce emissions. Many went beyond modest changes. They traded their old car for one of the new fuel-efficient wonders described in *Save Gas, Save the Planet*.

You will read about the Eubank family who need two vehicles to care for active children and an aging parent, and run a couple of businesses in between. They replaced one of their two SUVs with a car that gets over 50 miles per gallon. That hybrid is now their primary car; the SUV stays parked most of the time. They are eagerly anticipating the new electric vehicles, plug-in hybrids, and other clean vehicles that automakers will soon bring to market.

Christian and his wife convinced a car dealer to take their two SUVs as trade-in for one more fuel-efficient SUV. Living and working in a city, only one vehicle was needed because both use public transportation and carpool with friends. They now save over \$5,000 per year by sharing one vehicle. You will read about Patrick Gonzalez and his wife who save over \$10,000 annually by traveling almost everywhere using the high speed Metro, with some walking and bike riding covering the rest. He and his wife live car-free.

Kacey Childers did not wait for freeway-speed, zero-emission vehicles. She drives an electric vehicle everywhere in her college town. It costs only a few dollars per month for the added electricity to charge the electric vehicle and zero dollars for gasoline.

These people are demonstrating solutions to gridlock, energy security, and global warming. In the United States we create four times the greenhouse gas emissions per capita of people living in China. We create 25 percent of all global warming. Historically, we have inspired nations with our Bill of Rights and brilliant innovations. We can now be the role model of transportation solutions. We can save gas and save the planet.

The transition to better transportation is happening just in time. “The Stone Age did not end for lack of stones, and the Oil Age will end long before the world runs out of oil,” observed Sheikh Yamani, the oil minister of Saudi Arabia. Now we can leave behind the black skies of the industrial revolution and live a better life.

Transportation 2.0

During the next 20 years we will witness a major shift from vehicles that are mostly mechanical to vehicles that are primarily electronic. The success of hybrids heralds this new era. Electric motors are replacing internal combustion engines. In the parlance of technology, we could call this Car 2.0.

The transition to Car 2.0 is complicated. Current batteries are not sufficient for all vehicle uses. Hybrids, plug-in hybrids, and hydrogen fuel cells will compete in extending the range and performance of vehicles with electric drive systems. The engines in these vehicles will be fueled with next generation biofuels blended with petroleum fuels.

Slowly but surely, electricity will replace most petroleum fuel. The source of the electricity is in transition as renewable energy replaces coal powered generation of electricity. A smart grid will increasingly deliver solar and wind power from remote locations to the hearts of our cities.

We are also witnessing more than Car 2.0; we see the beginnings of Transportation 2.0. In 2008, use of rail and public transit set records as Americans drove 100 billion less miles than in 2007. Modern cities use electric powered light-rail. In the future much of those cities will be

1

Smiles per Gallon

The Eubank family was interested in replacing one of their SUVs with a fuel-efficient car. They considered everything from vehicles running on biofuel, to turbodiesels, to hydrogen fuel cell vehicles, to plug-in hybrid conversion, to electric vehicles. Many of these vehicles had good fuel economy and range because they were lighter four-door sedans.

Safety and storage were major concerns in their decision. Like many families, the Eubanks wanted to do their part to help with energy independence from foreign oil. They also wanted to reduce greenhouse gas emissions.

Bob liked the safety of their two SUVs. His safety concerns were increasing as his daughter, Meili, approached driving age. As a protective father, his first instinct was to get a Hummer, or at least an armored-plated Volvo station wagon. Meili, an “A” student who had written papers about the environment, liked the idea of an electric car. Her brother Tai, who also cared about the environment, said his favorite vehicle was his bicycle.

Weihong, as a busy mother and business owner, weighed practical issues such as having room for several people, school stuff, sports equipment, storage boxes for the business and more. Everything had to fit in a trunk to meet their demanding schedule of school drop-offs, pick-ups, business meetings, golf, and swim lessons.

Because the family liked their hybrid Toyota Highlander SUV, they were interested in the Toyota Prius. They had talked to Prius owners who loved the hybrid car and achieved over 50 miles per gallon but they were concerned about safety and storage.

The Eubanks realized they could use the larger Highlander for longer trips to carry more people and large items like skis, surfboards, or bicycles. The Prius would meet their normal daily needs, including carrying up to five people. Weihong carefully measured the space needed for two backpacks loaded with school books, a storage box, two sets of golf clubs, two sets of sports bags, and a normal load of groceries. Yes, they would all fit in the Prius' trunk.

Bob and Weihong reviewed safety evaluations from sources such as Consumer Reports. Sedans, such as the Prius, scored high on safety due to dual front and side airbags, and a variety of other safety features. Yes, you can find adaptive air-bag systems, anti-lock breaks, adjustable seat belts and other safety features in big and heavy SUVs. You can also find them in fuel saving four-door sedans.

But aren't SUVs safer? "In stop and go commuter traffic, you're more likely to get in a rear-end collision than any other crash type," says David Zuby, Senior Vice President, Insurance Institute for Highway Safety Vehicle Research Center. The Institute determined that the designs of seats and head restraints in 21 current SUV, pickup, and minivan models are rated good for protecting people in rear impacts, but those in 54 other models are rated marginal or poor.⁷ Big vehicles are not necessarily safe, and some of the safest vehicles are cars with better maneuverability.

The Eubanks' research and test drive of a Prius resolved their safety concerns. The car scored well on air bags and crash tests. They liked optional features which improved safety such as cruise control for driving at a safe speed, GPS for eyes-on-the road navigation, and a backup camera. They decided that the Prius was as safe as their SUV. In fact, when Meili starts driving, she may find it easier to maneuver than a large SUV.

The Eubanks now happily drive the Prius. In fact, they make every effort to put most of their miles on the hybrid car and leave their remaining SUV parked. Some weeks, this approach cuts their gas costs in half compared to their two-SUV approach. In two years, this family may replace their other SUV. As you will learn in the following chapters, their alternatives will be more exciting than ever.

Bob and Weihong are parents who want their children to have a great education, a childhood rich in opportunity, and positive experiences. They

also want their children to have a secure future. Without sacrificing safety or vehicle needs, the Eubanks now live in better harmony with their values about energy security and being environmentally friendly.

The Eubanks have doubled their miles per gallon and tripled their smiles per gallon.

Your Next Vehicle

Many Americans are going through decisions similar to the Eubanks. They are interested in ending the ridiculous amounts of money they spend at the pump. They do not know whether to get a new vehicle now, or wait for much better fuel economy with future cars such as plug-in hybrids. They want to save gas, but not at the expense of safety.

The decision is easier for those households with two or more vehicles. The vehicle with the best fuel economy can be used to put on the most miles. If all the vehicles are gas guzzlers, this is a great time to replace one.

If you're ready to buy now, first consider cars that get at least 30 miles per gallon. If you can afford it, don't settle for less than 40 miles per gallon. Too many people settle for half that mileage or worse, spending thousands of extra dollars each year. You do not need to wait for future technologies or even invest in a full-featured plug-in hybrid, hydrogen, or electric vehicle. Do not let your decision be clouded with claims about ethanol, biodiesel, and flexfuel. Thanks to new designs and materials, most car buyers can afford a car that offers over 30 miles per gallon (mpg).

When you have a few likely candidates, investigate safety ratings. Safercar.gov rates most cars with one to five stars in the following safety categories: frontal driver, frontal passenger, side driver, side rear passenger, and rollover. High mileage champions like the Toyota Prius score 4 stars, or better, in all categories. The larger Toyota Camry Hybrid scores higher with 5 stars in all categories, except a 4 in rollover. The smaller smart fortwo scores 3 in some categories. The Ford Escape Hybrid scores 5 in all categories except a 3 in rollover safety. The massive Chevrolet Suburban also scores 5 in all categories except a 3 in rollover safety.

After investigating your needs, fuel economy, and safety, it is highly beneficial to take test drives and even rent your top candidate for a couple of days.

5

Riding on Sunlight

TV stars Ed Begley and Rachelle Carson-Begley ride on sunlight. As a long-time champion of sustainability, Ed bought his first electric vehicle in 1970.

Since 2002, Ed has been driving a Toyota RAV4 Electric Vehicle, which he charges with the solar power collected on his home's roof. With over a 100-mile range, the RAV4 EV is perfect as the primary vehicle for Ed, his wife Rachelle, and their children. It is also large enough to carry all the home project materials and equipment used in their TV show. The couple also owns a Prius, which is handy for trips of hundreds of miles, and when he and his wife need a car at the same time. Ed also stays in shape with his other zero-emission vehicle – his bicycle.

Gene Coan does not worry about the price of gasoline, nor is he concerned with his gas and electric bill. Gene powers his home and car with solar photovoltaics (PV) and also uses solar hot water heating. With his Zenn electric vehicle (EV), Gene rides on sunlight. From PV to EV, Gene is following his beliefs. He is a Senior Advisor to Carl Pope, the Executive Director of the Sierra Club.

The Zenn is a stylish three-door hatchback, which makes it handy for hauling stuff from stores. Unlike Ed's freeway-speed Toyota RAV4 EV, Gene's much less expensive light electric vehicle has a range of 35 miles and a legal speed limit of 25 miles per hour. The Zenn meets most of Gene's daily needs as he travels on local streets and busy El Camino Real. The EV can take him to the train station for trips to San Jose or San Francisco. For long distance and freeways, Gene also has an SUV, which stays parked most days.

New Year's resolutions are easily made, but often not kept, especially when the price tag is \$45,000. In January 2002, Michael Mora convinced his wife that they should buy a Toyota RAV4 EV. Michael had to beg the dealer to sell his last RAV4 EV. Because this popular electric-vehicle is no longer sold, Michael could now sell his RAV4 EV as a used vehicle for more than he paid for it.

Michael is not selling. His commute energy is provided by “free-range” electrons from the solar power system installed on the roof of his employer, a California solar PV system integrator. The daily cost to drive the vehicle is zero. Freeway speeds are a piece of cake.

As Michael conducted solar home tours, and discussed the connection with solar power and his EV, his smiles were as constant as the California sunlight. Michael could no more hide his happiness than a dog disguise a wagging tail. Michael travels on sunlight.

At Camp Pendleton, in Oceanside, California, the United States Marines use 320 light electric vehicles with 25-mile-per-hour speed for maintenance work, goods hauling, and transportation on the vast military base. The vehicles are recharged at an eight-station solar carport. Just as two-car families may have one electric vehicle and a heavier vehicle for range, the Marines use different vehicles for different purposes. The United States Marine Corps has inspired other government agencies to recognize that they can meet many transportation needs by riding on renewable energy, not foreign oil.

The National Renewable Energy Labs turned to Envision Solar to cover a few parking spaces with solar-shaded vehicle charging. Envision founder Robert Noble is an award-winning United States Green Building LEED architect. His solar design follows the metaphor of trees and groves that convert ugly “heat island” parking lots into a beautiful landscape of solar-paneled shade structures. In the future, more parking lots will look better, be shaded, and convenient for people that need to recharge vehicles. People will be able to achieve greater range with their electric and plug-in hybrid vehicles. For example, someone could drive 40 miles with a plug-in hybrid, charge while working, and then drive home without needing a drop of gasoline.

- with an inexpensive city-speed electric car.
7. Be an early buyer of a freeway-speed electric vehicle.
 8. Consider making local trips with an e-scooter or an e-bike, not a car.
 9. Investigate plug-in hybrid kits and vehicles.
 10. Optional: Convert your hybrid to a plug-in hybrid.
 11. Get on your dealer's waiting list to buy a new plug-in hybrid.
 12. Research the number of available natural gas and hydrogen stations in your area.
 13. Test drive natural gas vehicles from Honda, Toyota and others.
 14. Ride on a hydrogen bus.
 15. Drive a hydrogen car at a public event or in your employer's fleet.
 16. Participate in a hydrogen vehicle pilot program.
 17. Investigate how you could power an EV or plug-in hybrid with your own solar or with purchased renewable energy.
 18. Install solar power and/or other renewable energy at home or work.
 19. Investigate tax credits for solar power and clean vehicles.
 20. Purchase renewable energy from your utility or other supplier.
 21. Buy your next car based on high miles per gallon; flexfuel vehicles with less than 30 miles per gallon are not part of the solution.
 22. Do not fill-up with E85 ethanol until cellulosic ethanol is widely available.
 23. When you purchase a diesel vehicle, read the warranty. The greater percentage of allowed biodiesel blend, the better.

Ride Together and Ride Less Action

24. Create a checklist of ways that you will reduce miles traveled.
25. Join your employer's flexible work program.
26. Work at home at least one day weekly, if possible.
27. If your employer has multiple locations, investigate a transfer to a location closer to your home.
28. When buying or renting a new home, move closer to work,

Appendix 3

Websites

Ride Clean

Clean Fleet Report

<http://www.cleanfleetreport.com>

Alt-Fuel Station Locations

http://www.afdc.energy.gov/afdc/stations/find_station.php

Charging Stations

<http://www.RechargeIT.org>

Consumer Reports

<http://www.consumerreports.org>

Electric Auto Association

<http://www.eaaev.org>

Fuel Economy

<http://www.fueleconomy.gov>

Green Vehicles & Fuels

<http://www.greencarcongress.com>

Plug-in Hybrids

<http://www.Calcars.org>

Safer Car

<http://www.safercar.gov>

Safety

<http://www.iihs.org>

Smart Grid

<http://www.oe.energy.gov/smartgrid.htm>

Ride Together and Ride Less

American Public Transportation Association

<http://www.apta.com>

Bicycle

<http://www.bikelane.com>

Carpool

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Chapter 7

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Index

Symbols

9/11 113, 191

A

AAA. *See American Automobile Association*

Abengoa 83

Acciona 85

Acela. *See high-speed rail: Acela*

AC Transit 62, 64, 69

Agassi, Shai 45

Air Force use coal-to-liquid 201

air travel 120, 121, 125

Boeing 787 122

cellulosic blend 104

European Commission 121

hydrogen 122, 123, 124

light composite material 122

Los Angeles Airport (LAX) 123

Alcala, Nora 144

algae 74, 108, 109, 110, 111, 202, 226, 235

Al Gore 78, 85, 93, 154, 203, 213

Alternative Vehicles Conference 232

alt-fuel 180, 198, 206, 208

Alternative Motor Fuels Act 97

bio-methane 61

CNG 60, 62

LNG 60

natural gas 59, 60, 61, 62, 63, 65, 67, 70, 71, 72, 74, 76, 77

synthetic fuel 196, 201

American Automobile Association 28

American Wind Energy Association 87

America Public Transportation Association 225

Amory Lovins 24, 90

Amtrak 123, 126, 132, 231

Anne Lusk 163

Applied Materials 81, 115, 116

APU. *See auxiliary power units*

AQMD. *See South Coast Air Quality Management District*

Arbor Day Foundation 186

Argonne National Labs. *See lifecycle emissions: Argonne National Labs*

Arizona Public Service 83

Armstrong, Lance 165

Arnold Schwarzenegger 41, 64

Aronow, Louisa 95

Atlanta, Georgia 139

Atlantic County Utilities Authority 231

Austin Energy 54

automakers sue states 44

auxiliary power units 123, 181

Avel Villanueva 113

B

Baer, Robert 191

Bain, Addison 75

Balkenende, Jan Peter 192

BART 126

batteries 24, 26, 33, 35, 36, 37, 38, 39, 41, 42, 43, 46, 50, 51, 52, 53, 55, 57, 58, 65, 81, 93, 123, 200, 202, 230, 231, 234

A123 52, 54, 55

EV 33, 34, 35, 36, 37, 40, 45, 79, 80, 94, 198, 230, 242, 243

Japan's METI 42

lead-acid 38, 39, 51, 53

lithium 38, 39, 41, 42, 50, 52, 53, 55, 56, 66, 81, 123, 202

Lithium batteries 38, 39

lithium-ion 41, 42, 52, 66, 81

NEC 45

Nickel metal hydride 38

state of charge depletion window 57

subscription plan 46

battery-electric 35, 37, 39, 40, 53, 62, 65, 69, 70, 72, 74, 76, 77, 92, 198, 207, 235, 237, 242, 243, 244

BC Hydro 106

Begley, Ed 79

Bell, Alexander Graham 89

Best Places to Work. *See Fortune Magazine's "Best Places to Work,"*

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Be inspired by the strategies and stories in this book.

- Improve the quality of your life
- Save thousands each year in vehicle costs
- Help the country end its dependency on oil
- Stop the climate crisis
- Make the right decision when you buy a car

“Electric vehicles, plug-in hybrids and next generation fuels are all part of the clean tech revolution. John Addison delivers the fascinating details of today and tomorrow.”

Clint Wilder, Co-Author of *The Clean Tech Revolution*

“Read this book if you care about the future of our children. John Addison details the transportation solutions that will bring clear skies and reduce dangerous greenhouse gas emissions. It is fascinating to read about everything from smiles per gallon to electric vehicles, from people oriented development to high speed rail, and from driving less to enjoying life more.”

California State Assembly Majority Whip Fiona Ma



John Addison will speak at your meeting.

He will bring expertise and inspiring real life stories to your next meeting. He is the author of *Save Gas, Save the Planet*, publisher of the *Clean Fleet Report*, and a popular speaker in the United States and internationally.

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