

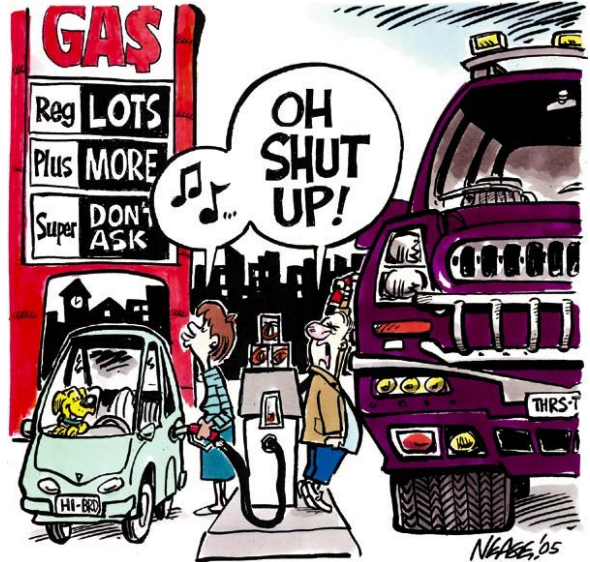
# Convert Your Existing Car to a Hybrid

Save \$450 on your gas bill without buying a new vehicle

by Jim Leidel, Energy Manager  
Oakland University, May 2006

As in most things in life, a little bit of knowledge, some patience, and some hard work will go a long way. Although there are many high tech improvements and advanced engineering features available on new vehicle models, there many low and no cost items that you can, AND SHOULD, do today.

OK, I have to apologize for my headline. I am not actually proposing to convert your car to a gas-electric hybrid. I am proposing to change your existing car/driver to a **gas / "smart driver" hybrid**. If some web sites are allowed to claim some magical effect of a mysterious enzymatic fuel pill to do what 100 years of automotive engineering progress has failed to do, please forgive my eye-catching caption.



Below is a list of items which are guaranteed to reduce you fuel consumption by 5 to 40%. How much you will save will depend on how many items you actually carry out and how efficiently you already drive. There are three categories including: Driving More Efficiently, Keeping Your Car in Shape, and Planning & Combining Trips.

## The only costs associated with these ideas are:

- ✓ **Good quality tire pressure gauge:** \$5 to \$15
- ✓ **New air filter (if needed):** \$20 to \$50
- ✓ **Oil change (seriously consider a synthetic):** \$20 to \$50

How much can you save? If the average motorized drives 15,000 miles per year in an average car getting 25 miles per gallon, and the prevailing fuel cost is \$3.00 per gallon, this motorist would spend \$1,800 each year on fuel (60% of which comes from some foreign land). If this motorist aggressively incorporates many of the below suggestions into their driving and vehicle maintenance habits, they would certainly reduce their fuel consumption by 25%, or \$450 each year. Recall that your investment is approximately \$100. If you have any stock tips that can "guarantee" a 450% annual return on your investment, please email them to me at [leidel@oakland.edu](mailto:leidel@oakland.edu) immediately.

Sorry folks, there is no magic pill to throw in your gas tank. Common sense and a little bit of work on your part and you can save hundreds of dollars each year on fuel, not to mention reducing your use of foreign oil and contribution to pollution and climate changes (from carbon dioxide emissions).

If you are in the market for a new vehicle, first and foremost, consider a smaller car. Smaller engines are obviously more fuel efficient, diesel engines are inherently 30% more efficient, and hybrid electric vehicles are also worth serious consideration. Try looking at [www.greencar.com](http://www.greencar.com).

Lastly, don't forget to look into alternative fuels such as E85 flex fueled cars, biodiesel, and compressed natural gas.

I understand that these things aren't new, nor high-tech, but consider how many of them have you actually done on a regular basis over the past year. **Now, let's save some money !!!**

## Driving More Efficiently

### ***Drive Sensibly***

Aggressive driving (speeding, rapid acceleration and braking) wastes gas. It can lower your gas mileage by 5-30%. Sensible driving is also safer for you and others, so you may save more than gas money.

### ***Avoid Unnecessary Braking***

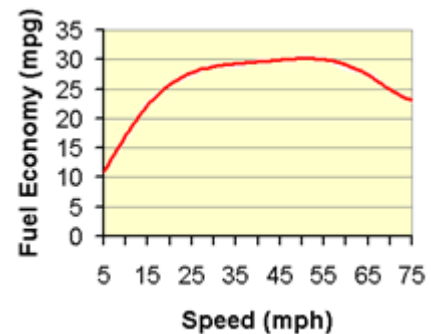
Every time your foot touches the brakes, the energy & dollars in your gas tank turns directly into HEAT energy in your break pads. Acceleration uses significantly more fuel than cruising at constant speed. Anticipate stoplights, avoid tail-gating, and try to drive at a constant speed.

### ***Don't Drive 85 !!!***

While each vehicle reaches its optimal fuel economy at a different speed (or range of speeds), gas mileage usually decreases rapidly at speeds above 60 mph.

As a rule of thumb, you can assume that each 5 mph you drive over 60 mph is like paying an additional \$0.20 per gallon for gas.

Observing the speed limit is also safer.



### ***Remove Excess Weight***

Not you, your other stuff in your car! Avoid keeping unnecessary items in your vehicle, especially heavy ones. An extra 100 pounds in your vehicle could reduce your city MPG by up to 2%. The reduction is based on the percentage of extra weight relative to the vehicle's weight and affects smaller vehicles more than larger ones.

### ***Avoid Excessive Idling***

Idling gets **zero** miles per gallon. Cars with larger engines typically waste more gas at idle than do cars with smaller engines.

### ***Use Cruise Control***

Using cruise control on the highway helps you maintain a constant speed and, in most cases, will save gas.

### ***Avoid Un-Needed Air Drag***

A roof rack additional cargo space and may allow you to meet your needs with a smaller car. However, a loaded roof rack can seriously decrease your fuel economy. Reduce aerodynamic drag and improve your fuel economy by placing items inside the trunk whenever possible.

Also, open windows also increase air drag. At highway speeds it is more efficient to use your air conditioner, than to open windows (this is especially true with smaller cars).

## Keeping Your Car In Shape



### Keep Your Engine Properly Tuned

Fixing a car that is noticeably out of tune or has failed an emissions test can improve its gas mileage by an average of 4 percent, though results vary based on the kind of repair and how well it is done.

Fixing a serious maintenance problem, such as a faulty oxygen sensor, can improve your mileage by as much as 40 percent. Keep in mind that all new electronically controlled fuel injection systems have very little requiring regular maintenance. Your engine light will inform you of an engine, transmission, or emissions system fault. Otherwise, consider new spark plug wires or other ignition system components per your owner's manual recommendations. Watch that engine light on the dashboard !!!

### Use the Recommended Grade of Motor Oil and/or Synthetic

You can improve your gas mileage by 1-2 percent by using the manufacturer's recommended grade of motor oil. For example, using 10W-30 motor oil in an engine designed to use 5W-30 can lower your gas mileage by 1-2 percent. Using 5W-30 in an engine designed for 5W-20 can lower your gas mileage by 1-1.5 percent.



Try, a good 100% synthetic oil. You can go much longer between oil changes, and it should improve your mileage by 1-2%. Lastly, look for motor oil that says "Energy Conserving" on the API performance symbol to be sure it contains friction-reducing additives.

RECOMMENDED		
	FRONT	REAR   SPARE TIRE
TIRE SIZE	P145/80R12	T105/80D13
COLD TIRE PRESSURE	32 PSI	60 PSI
AT MAX LOAD	220 KPA	420 KPA
VEHICLE CAPACITY		
MAX. LOAD (LBS)	688 (OCCUPANTS PLUS LUGGAGE)	
OCCUPANTS	FRONT 2	REAR 2
SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION		

### Keep Tires Properly Inflated

You can improve your gas mileage by several percent by keeping your tires inflated to the proper pressure. Under-inflated tires can lower gas mileage by about ½ percent for every 1 psi drop in pressure (of all four tires). Properly inflated tires are safer and last longer.

### Check & Replace Air Filters Regularly

Replacing a clogged air filter can improve your car's gas mileage by as much as 10 percent for a seriously clogged filter. Your car's air filter keeps impurities from damaging the inside of your engine. Not only will replacing a dirty air filter save gas, it will protect your engine.

## **Planning & Combining Trips**

**Combining errands** into one trip saves you time and money. Several short trips taken from a cold start can use twice as much fuel as a longer multipurpose trip covering the same distance when the engine is warm. Trip planning ensures that traveling is done when the engine is warmed-up and efficient.

With a little planning, you can avoid retracing your route and reduce the distance you travel as well. You'll not only save fuel, but also reduce wear and tear on your car.

### **Commuting**

If you can stagger your work hours to avoid peak rush hours, you'll spend less time sitting in traffic and consume less fuel.

If you own more than one vehicle, drive the one that gets the best gas mileage whenever possible.

**Consider telecommuting** (working from home) if your employer permits it.

If possible, take advantage of carpools and ride-share programs. You can cut your weekly fuel costs in half and save wear on your car if you take turns driving with other commuters. Although Detroit is lacking, many urban areas allow vehicles with multiple passengers to use special High Occupancy Vehicle.

### **Drive LESS**

Walk, bike, carpool, or just maybe, take the bus once and a while.

### **Data Sources**

Estimates for fuel savings from sensible driving are based on studies and literature reviews performed by Energy and Environmental Analysis, Inc., Washington, DC.

Estimates for the effect of speed on MPG are based on a study by West, B.H., R.N. McGill, J.W. Hodgson, S.S. Sluder, and D.E. Smith, *Development and Verification of Light-Duty Modal Emissions and Fuel Consumption Values for Traffic Models*, Oak Ridge National Laboratory, Oak Ridge, Tennessee, March 1999.