

Tape an Egg to Your Gas Pedal

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It can be a nice, thick-shelled brown egg from happy, pasture-raised hens on a New England farm. Use a few turns of blue painter's tape and fasten it to your gas pedal where you usually place the ball of your foot. Hold this mental image.

Driving usually comprises our largest individual contribution to greenhouse gas emissions and global climate change. I'm not about to tell you to buy an expensive electric or hybrid vehicle. Perhaps you can at some later date, but in the meantime, let's focus on things you can do the very next time you use your vehicle. We'll begin with some commonsense things that you probably already do then move on to some more scientifically based, rational ways to save fuel. Here are two important ways to reduce miles driven, fuel burned, and greenhouse gases emitted. Ultimately, our 2% savings (per year) is going to easily accrue from fewer miles driven, fewer RPMs demanded from our car's engine, and fewer gallons of fuel burned. If you drive 5,000 miles a year with a vehicle that averages 20 mpg ...that's 250 gallons of gasoline (about \$650). How difficult would it be to save 5 gallons per year (2%)? It's easy.

1. **Plan ahead, combine errands into one trip, and drive the shortest circular route** (think United Parcel Service or US Postal Service). If you find yourself running out to buy single items on separate trips, sit yourself down, think about whether that item is *really* necessary at that moment, and, if not, add it to a shopping list.
2. **Maintain your vehicle** ...especially tire pressure, oil changes, and anything else that will keep it running more efficiently and extend its useful service life. The total amount of energy, natural resources, and raw materials (e.g., steel, rubber, plastic, glass, etc.) it takes to manufacture any vehicle is enormous. So, if it runs more efficiently (even just 1 or 2 mpg) and lasts longer (especially if measured in years) that is all to the good ...another easy 2% win.

If you avoided a few wasted trips (say 100 miles out of 5,000 per year) and got a little bit better fuel economy (say 22 mpg) ...that's 27 gallons of gasoline you would not burn (11% and about \$68).

Before we get back to the egg, let me ask you to think about riding a bicycle. If the tires are soft and the chain is rusty your bike will be very difficult to pedal. You will need to expend much more energy (>> 2%) to cover any given distance than if the tires were properly inflated and the chain was clean, oiled and properly adjusted.

Do you remember how much energy and effort it would take to make a jack-rabbit start on a bicycle? You need to stand up on the pedals, lean forward, and push as hard as you can with your legs ...and as rapidly as you can too. Can you recall how much more energy and effort it took to go up a long, steep hill than to pedal at the same speed on the flat? Do you remember how much energy it took to coast down a hill? None ...unless you wanted to go faster than gravity would take you. In which case you may have some scars to remind you why that wasn't the best idea. Force = mass *times* acceleration. If you want to make a jack-rabbit starts or maintain a constant speed up a hill (let alone go faster) you better be prepared to sweat. If you want to save effort and energy, plan ahead and look for places to coast.

The last time most of us were on a 20 lb. bike we might have weighed 100 lbs. Although it seemed to be a lot of physical effort, the amount of force you had to generate to move 120 lbs. with your legs and the pedals was trivial compared to the amount of energy it takes to move you (now >100 lbs.) and your 2,000 lb. vehicle over the same distance.

But it takes no effort at all! All you have to do is step on the gas pedal and cause a few thousand vaporized gasoline explosions per minute (RPMs) to happen in the engine's cylinders. Push down, go faster. Let up on the pedal, go slower. We don't even think about it. Why not? We're thinking about other things and there isn't an egg taped to our gas pedal. If you had to clean up a broken egg several times a day, I'll bet you *would* think about how much force you apply to the pedal *and* how fast you really need to go. (Since Massachusetts drivers have the dubious distinction of being the worst in the nation, according to insurance companies and NSTB accident statistics, we're talking about a lot of eggs. Some people will need to buy two dozen every morning at the Dunkin Donuts drive-through and install a floor drain in their car.) *Force* [broken eggs, wasted fuel, greenhouse gases] = *mass times acceleration*. What we can consciously control is the acceleration term. Here's how:

- You're driving on the highway and approaching an entrance ramp. You can speed up to pass the car trying to enter the highway, or you can simply ease up on the gas and let them in.
- You're approaching a long hill with two lanes. You can mash down on the gas (and get about 5 mpg) or stay in the right lane, press down on gas slowly and steadily (about 15 mpg), and get to the top of hill a few seconds after Richard Petty, Danica Patrick, and Mario Andretti.
- You can drive on the interstate and be swept along with the tide at 70 or 75 mph (>2,000 rpm) or use a secondary road at 40 to 50 mph (<1,500 rpm) and arrive a little later *or* a little earlier (because it's a shorter route). You will see people, places, and things ...not just acres of asphalt and grass.
- If you find yourself braking hard at stop signs and red lights, you can keep wasting gas and wearing out your brakes or ease up on the gas sooner ...or much sooner.
- Ease off the gas and slow *before* you come to crest of a downhill stretch and coast (back up to the speed limit).
- One of my students said ...“Environmental conservation is how you drive when you are *really* afraid you will run out of gas.” This is the most nerve-wracking version of all of the above.

2% Per Year List

1. Reusable shopping bags
2. Drive rationally
- 3.

In summary, you can drive like a nut, break a lot of eggs, increase your blood pressure, produce unnecessary air pollution, and waste money—or you can consciously and consistently do the opposite. I have a long commute and my car has an EPA-rating of 30 mpg. I consistently get 35 to 37 mpg (+20%), save about \$150 per year, and have eggs for breakfast about twice a week.