

YOU
can reduce
CO₂
NOW

The EcoDriver's[™] manual

A Guide to Increasing Your Mileage &
Reducing Your Carbon Footprint



Dear EcoDriver

If everyone nationwide practiced EcoDriving™, it would be equivalent to heating and powering nearly 8 cities the size of Los Angeles.



Saving money at the pump while reducing your carbon dioxide emissions go hand-in-hand. And you may already have much of what you'll need to do both, right now.

Even if you haven't had a chance to buy a new vehicle—which today are cleaner and more fuel efficient than ever before—you can still be an "EcoDriver." EcoDrivers—no matter what they drive—use simple driving practices and basic maintenance steps to save money and protect the environment at the same time. A typical EcoDriver can increase fuel efficiency by 15 percent or more.

Every day, cities and states are among the many doing their part to promote ecofriendly programs and practices. As an EcoDriver you can make a difference too. If everyone nationwide practiced EcoDriving, it would be equivalent to heating and powering nearly 8 cities the size of Los Angeles. Take a look at our EcoDriver's Guide to learn the safest and most effective practices for improving your fuel economy...you can start right now.

**Sincerely,
The Auto Alliance**

AUTO ALLIANCE
DRIVING INNOVATION®

BMW Group



PORSCHE

TOYOTA

VOLKSWAGEN
GROUP OF AMERICA

EcoDriving Practices

Subtle changes in driving habits can produce significant benefits, such as saving money at the gas pump and reducing CO₂ emissions.

Believe You Can Reduce Fuel Use and Emissions

TIP #1

Many of the best practices for green driving are subtle, but they can add up over a year.

Making small changes in your driving can be the most effective way to reduce fuel use and carbon dioxide emissions, and the best part is you can do it today, with whatever vehicle you are currently driving. What you monitor, you manage...so start adapting a “lead foot” to a “feather foot” and keep track of the savings over several tanks of gas. Typically, practicing moderate levels of EcoDriving can reduce fuel use by an average of 15%.

Avoid Rapid Starts and Stops

TIP #2

Rapid starts and stops, often called “jack rabbit” starts and stops, use fuel and costs

money at the gas pump. Gentle acceleration and braking can save more than \$1 per gallon, according to the U.S. EPA, because smart driving can improve fuel economy by up to 33%. A few seconds of high-powered driving can use as much gas as driving for several minutes at more measured speeds. Ease into accelerations and brake smoothly, especially around corners, to raise your mileage the most. Avoid tailgating. When EcoDrivers avoid rapid starts and stops, they are not only practicing safe driving habits, but they’re also reducing the energy required to get the vehicle moving again.

Keep on Rolling in Traffic

Smart Driving Can Improve Fuel Efficiency by Up To 33%

(According to the U.S. EPA)

HIGH-POWERED DRIVING

301 miles

SMART DRIVING

up to 400 miles

◀ miles driven per tank of fuel ▶

TIP #3

Slow-and-go always is better than stop-and-go, and not just to reduce traffic congestion woes. Maintaining a constant speed in your commute increases fuel economy, because it takes much more energy to move a stopped vehicle than to keep a vehicle moving. In fact, it can take 20 percent more fuel to accelerate from a full stop than from 5 miles per hour. Many truckers practice this approach to reduce shifting ten-speed truck transmissions. Drivers who try to achieve the highest mileage possible, often called “hypermilers”, practice looking ahead down the road to anticipate stops and to coast as much as possible.

Ride the “Green Wave”

TIP #4

Traffic lights are often synchronized so that a motorist driving at a specific speed will pass through a series of green lights without stopping. Driving more quickly means you arrive sooner at a light and need to stop. Engineers optimize the traffic light timing to reduce congestion and improve traffic slowly. A steady speed often can help drivers avoid red lights, therefore keeping the car moving more efficiently.



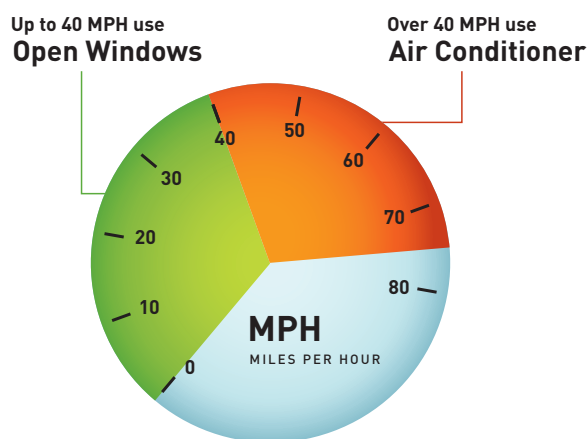
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EcoDriving Practices



Use Air Conditioning at Higher Speeds

TIP #5 Air conditioning can reduce mileage significantly, by as much as 20%. In fact, your air conditioner can consume up to one gallon of gas per tank to cool the vehicle. But driving with your windows open can produce aerodynamic drag, which reduces fuel economy. What's a driver to do? When driving at slower speeds (less than 40 mph), such as driving in urban areas, open windows are better. At higher speeds (over 40 mph), open windows use more fuel than the air conditioner, so close the windows and turn on the air conditioner. Another good idea is to take advantage of the "recycle inside air" feature. The air that is already cooled in the car is reused by the air conditioning system, instead of drawing hot air from the outside to be cooled.



Maintain an Optimum Highway Speed for Good Mileage

TIP #6 Highway driving that exceeds 60 miles per hour uses more fuel. According to the U.S. EPA, every 5 miles over the 60 mph level is equivalent to paying an extra 20 cents per gallon for gas. Observing the speed limit and not exceeding 60 mph (where legally allowed) can improve mileage by 7-23%.

Use Cruise Control

TIP #7 During highway driving, cruise control helps maintain a steady speed. According to a test conducted by Edmunds.com, cruise control can provide a 7% average fuel savings, compared to driving without the device operating. These benefits come largely from driving on flat terrains, according to Edmunds. Cruise control maintains a constant vehicle speed. If you are driving on hilly roads, cruise control may cause your engine to speed up on climbing hills and slow down on the other side, reducing mileage, so use cruise control selectively. Using cruise control on 10,000 of the miles driven in a year could save you nearly \$200 and save more than 60 gallons of fuel, according to the Department of Transportation (assuming \$3 a gallon for fuel, 20 MPG, and 15,000 miles driven annually).

Navigate to Reduce Carbon Dioxide

TIP #8 Planning driving trips, even Saturday shopping, can help reduce fuel use and CO₂ emissions. One of the easiest ways to plan trips is to purchase a navigation system to find the shortest distance to your destination. And, it can make the Saturday shopping trip more relaxing, too.

Avoid Idling

TIP #9 Idling uses gas, but because the car is going nowhere, it translates into 0 mpg. An automobile may burn more than half a gallon of fuel for every hour spent idling, so turn your engine off for long stops. How long is long? As a rule, shutting off your engine for any stop anticipated to be longer than 30-60 seconds saves gas and reduces carbon dioxide emissions. But make safety your highest priority, and only shut off your engine in situations where you are not in traffic, such as waiting to pick up the kids or when you're making a quick drop off or pick up.

EcoDriving Practices



Buy an Automated Pass for Toll Roads

TIP #10

Computers make our lives easier in many ways, including reducing fuel use. By purchasing an "E-Z" pass for a toll road or bridge, a driver avoids stopping and starting the vehicle and idling in lines. Special lanes allow drivers to maintain a cruising speed through the toll. This saves time and money at the pump.

Use the Highest Gear Possible

TIP #11

Automobiles are designed to start in the lowest gear possible, because that's where they have the most power, however, power means fuel consumption, according to Edmunds.com. By using overdrive gearing where possible, such as on the highway, your vehicle's engine speed goes down, saving fuel and engine wear while reducing CO₂ emissions.

Drive Your Vehicle to Warm It Up

TIP #12

Today's automobile does not need a warm-up period before driving it. Even on the coldest morning, running your engine for 30 seconds is all you need before your vehicle is ready to drive, according to J.D. Power. This is enough time for the oil to circulate throughout the engine. Your vehicle will reach its optimum operating temperature much faster when you are driving, rather than idling. Today's engines are designed to run most efficiently when warmed up, so you want to warm up the vehicle by driving it. During the first few minutes of driving when an engine is cold, try to avoid sudden or severe acceleration. Also, you don't need to step on the gas pedal before starting the engine. Take advantage of a warm engine by "trip chaining", or grouping your trips together. For more information, visit www.DriveLessSaveMore.com.

Keep Your Cool

TIP #13

The inside of a vehicle heats up quickly in summer sun, reaching 120 - 130 degrees Fahrenheit in just 10 minutes. That can mean more air conditioning use, and that means more fuel use. Now, keeping your cool reduces carbon dioxide emissions too. So, always roll down the windows when getting into a hot car to blow out the hot air. Try to park in the shade. And consider investing in a heat reflector or window shades to shield your vehicle's interior from the sun. Parking in your garage instead of outdoors can help keep your vehicle cooler in the summer.

Obey your Check Engine Light

TIP #14

Today's automobiles have sophisticated onboard diagnostics (OBD) systems that continually monitor the operation of your vehicle. When the OBD alert light comes on, there is the possibility that your emissions are increased and your fuel economy is going down. An example would be if the oxygen sensor has failed and the engine controller goes to a default setting - increasing fuel consumption. Replacing a faulty oxygen sensor could result in a fuel economy improvement of as much as 40%. When the OBD light goes on, see your auto dealer for more information.



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FUEL ECONOMY

Replacing a faulty oxygen sensor could result in a fuel economy improvement of as much as 40%.

Maintenance Practices

Today's automobile is a complex machine with more than 3,000 interactive parts. Regular maintenance can help your vehicle run longer, as well as reduce carbon dioxide (CO₂) emissions.

Read Your Owner's Manual

TIP #1 Your glove compartment holds one of the most important sources of fuel economy information, and it is customized for your model and engine. Your owner's manual may even have a special section on fuel economy. Typically your owner's manual will provide a recommended service schedule to keep your vehicle operating efficiently. Today's automobile is designed to operate for 120,000 miles, and many vehicles run much further with proper care.

Use the Recommended Motor Oil

TIP #2 Your vehicle's engine was designed to use a certain oil quality and viscosity, so check your owner's manual for the recommended type of motor oil. According to the U.S. EPA, you can improve your fuel economy by 1-2% by using the manufacturer's recommended grade of motor oil. Motor oil that says "Energy Conserving" contains friction-reducing additives that can provide additional benefits. Get more information from your service provider. Also, make sure you change the oil regularly according to the manufacturer's recommendation, because degraded motor oil will degrade fuel economy.

Schedule Periodic Engine Tune-ups

TIP #3 To keep your vehicle running at peak performance, visit your local dealership or auto shop on a regular schedule. Today's automobile has been called a computer on wheels, and auto mechanics use computer diagnostics to check motor timing, fuel injection, valves, spark plugs and more. Typically, a tune up can improve gas mileage by an average of 4%, but bigger gains could be seen.

Replace Air Filters Regularly

TIP #4 On today's automobiles, air flow sensors constantly monitor the amount of air ingested by the engine, and fuel is metered accordingly. An air filter that is clogged with dirt or debris can require more fuel to pump air through the filter. According to the U.S. Department of Energy, replacing a clogged air filter can increase your mileage by 10%. How often should you change your air filter? As a general rule, if you can see light through your air filter, you don't need a new one. But it is always best to consult your owner's manual to determine the replacement schedule that will produce optimum results for your model of vehicle.

Check Your Tire Pressure Monthly

TIP #5 The Department of Energy estimates that 1.2 billion gallons of fuel were wasted in 2005 as a result of driving on underinflated tires. Tires can deflate naturally, by as much as 1.5 PSI (pounds per square inch) a month. Experts estimate that 25% of automobiles are running on tires with lower than recommended pressure. Fuel efficiency is reduced by 1% for every 3 PSI that tires are under-inflated. So, keeping your tires properly inflated translates into a free tank of gas a year and reduces CO₂ emissions too. Check tire pressure at least once a month. The correct tire pressure in PSI can be found on the tire label, usually found on the edge of your door, the door frame or sill. If all Californians properly inflated and aligned their tires, we'd save 300 million gallons of gas a year, according to the California Energy Commission.

Check the Weather, then Check Your Tires

TIP #6 Tire pressure changes an average of 1 PSI for every 10 degrees Fahrenheit change in air temperature. So, a sudden cold snap or heat wave may mean it is time to check your tires. Properly inflated tires run cooler, last longer and improve fuel economy. The U.S. EPA estimates that gas mileage can improve by about 3% by keeping tires properly inflated.

1.2 BILLION

gallons of fuel were wasted in 2005 as a result of driving on underinflated tires *(Department of Energy estimate)*

Maintenance Practices



Invest in a Tire Pressure Gauge

TIP #7

New autos are now on sale with tire pressure monitoring systems, including a new warning light on your dashboard. These systems will indicate when your tires are under-inflated by 25%, but it is always advisable to check your tires with a tire pressure gauge before you see the warning light. Tire pressure increases when driving, so to get an accurate reading, check your pressure when you haven't driven for three or more hours.

Reduce Aerodynamic Drag

TIP #8

Remember the tail fins on circa 1950 vehicles? They were beautiful but not very aerodynamic. At highway speeds, about 50% of engine power goes to overcoming aerodynamic drag, according to Consumer Reports. Wind resistance can reduce mileage, so you can maximize your mileage by removing luggage racks, roof-top carriers, and ski racks when they are not needed. Experts at Edmunds.com say that even keeping your car washed and waxed improves aerodynamics.

Tighten Your Gas Cap

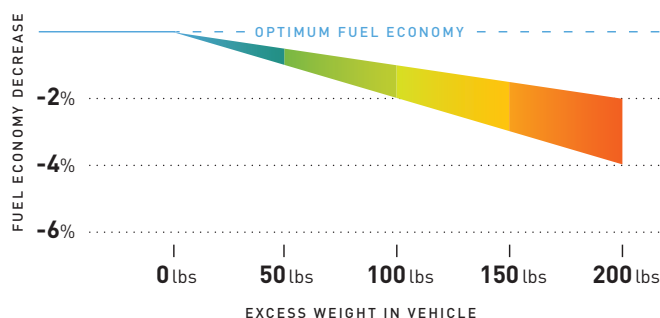
TIP #9

Gasoline evaporates relatively easily, so today's automobiles have been engineered to significantly reduce evaporative emissions compared to vehicles from the past. But a loose cap can be a quick escape route for gasoline. As much as 30 gallons of gasoline could be lost annually to evaporation when the fuel cap is not fully tightened. Loose, damaged or missing gas caps cause 147 million gallons of gas to evaporate each year, according to the Car Care Council. Your owner's manual may have good advice, because some manufacturers urge drivers to turn their gas caps until they click.

Remove Excess Weight from Your Vehicle

TIP #10

Pull those golf clubs out when not needed. Every pound of extra weight requires your automobile to work harder to move it, and that effort uses fuel. While it is convenient to leave items in your vehicle, weight affects fuel economy and CO₂ emissions. An extra 100 pounds in the trunk typically reduces mileage by about 2%.



Maintain Your Air Conditioning System - Professionally

TIP #11

Air conditioning refrigerants can have high global warming potential. Insist on professional service with recovery and recycling so that refrigerant can be reused and not released to the atmosphere. As the refrigerant level decreases, so does the efficiency of the air conditioner. Similarly, too much refrigerant decreases efficiency. Having a professional maintain your air conditioner will maintain optimum performance.

Consider Purchasing Fuel-Efficient Tires

TIP #12

Your tires can make a difference. "Lower rolling resistance" tires are now available, and these tires can improve mileage. However, tire traction and handling characteristics should be priorities when considering these tires, so talk to your dealer or a tire expert, and consult your vehicle's owner guide to see if these tires make sense for you.

WHAT CAN YOU DO AT EcoDrivingUSA.com?

Hit the Road



Once you're ready to try out these EcoDriving practices, check out the EcoDriving Virtual Road test on www.EcoDrivingUSA.com. Simply drive from points A to B and get rated on the EcoDriving measures you've learned in this guide. Go online now to take the test.

Calculate Your CO₂



When you become an EcoDriver the benefits really add up. Find out how much you can save by going to www.EcoDrivingUSA.com and using the individual EcoCalculator.

Join the Movement



Now that you've learned about the benefits of EcoDriving, you can spread "the word." Share the ecodriver's Guide with friends and family. You can also visit the EcoDriving site to write a letter to "your Governor, learn the latest news about EcoDriving, and sign up for EcoDriving updates. EcoDriving is an ideal way to increase your fuel efficiency and reduce your CO₂ emissions now. For "more resources on ecodriving, visit www.EcoDrivingUSA.com. To join the ecodriving movement contact us at 202.326.5559 or at info@EcoDrivingUSA.com.



VISIT

www.ecodrivingusa.com



AUTOMAKERS

Support EcoDriving

Automakers have a big stake in consumers becoming more CO₂-conscious. In 2007, Congress passed a new law to reduce gasoline use and carbon dioxide (CO₂) emissions. Automakers will need consumers to purchase their CO₂-efficient autos in large volumes in order to meet the new federal law, and consumers who are more concerned about reducing CO₂ are more likely to buy a new CO₂-efficient auto.

EcoDrivingUSA is sponsored by the Alliance of Automobile Manufacturers, which is a trade association representing 10 automakers: BMW Group, Chrysler LLC, Ford Motor Company, General Motors, Mazda, Mercedes-Benz, Mitsubishi Motors, Porsche, Toyota and Volkswagen.

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