

Appendix E: Fuel Economy Messaging Audit

Fuel Economy

Fuel economy is about more than just saving fuel costs and helping the environment – it's also about maintaining and improving the overall performance of your vehicle. You don't need to buy a whole new vehicle to increase your fuel economy – one of the best ways to improve your vehicle's fuel economy is to simply be a smarter vehicle owner. Subtle changes in driving habits and simple maintenance techniques can produce significant benefits and improved overall vehicle performance, saving you money and reducing carbon dioxide (CO₂) emissions in the process.

Message: Smart driving habits can improve your vehicle's fuel economy by up to 33%¹. These simple driving behavior tips can help you save money and reduce carbon dioxide emissions.

Content:

- **Avoid sudden starts and stops.** Gentle acceleration and braking can save more than \$1 per gallon, according to the Environmental Protection Agency (EPA). A few seconds of high-powered driving can use as much gas as driving for several minutes at more measured speeds.²
- **Maintain a constant speed.** Maintaining a constant speed 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% more fuel to accelerate from a full stop than from 5 mph. This can also make your commute smoother, since traffic lights are often synchronized so that a motorist driving at a specific speed will pass through a series of green lights without stopping.³
- **Open the windows at slow speeds and turn on the A/C at higher speeds.** Air conditioning can reduce fuel 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. So, when driving at speeds of less than 40 mph, open your windows. At speeds over 40 mph, turn on the air conditioner instead.⁴
- **Maintain an optimum highway speed.** Highway driving that exceeds 60 mph uses more fuel. According to the EPA, every 5 miles over the 60 mph level is equivalent to paying 20 extra cents per gallon for gas. Observing the speed limit and not exceeding 60 mph (where legally allowed) can improve mileage by 7-23%. Using cruise control can also help maintain a steady speed.⁵
- **Avoid idling and turn off the engine.** An automobile may burn more than half a gallon of fuel for every hour spent idling. Make it a habit to turn your engine off when waiting at the curb – even if it's just for a short period.⁶

¹ FuelEconomy.gov: [Driving More Efficiently](#)

² US Forest Service: [The EcoDriver's Manuel](#)

³ North Carolina Department of Transportation: [Drive More Efficiently](#)

⁴ US Forest Service: [The EcoDriver's Manuel](#)

⁵ New Hampshire Department of Environmental Services: [Environmental Fact Sheet](#)

- **Shift into high gear to save fuel.** Vehicles are designed to start in the lowest gear possible, because that's where they have the most power; however, power means fuel consumption. 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.⁷
- **Drive your vehicle to warm it up.** Even on the coldest morning, running your engine for 30 seconds is all today's vehicles need before they are ready to drive. Additionally, your vehicle will reach its optimum operating temperature much faster when you are driving, rather than idling.⁸
- **Keep your vehicle cool on hot days.** The inside of a vehicle heats up quickly in the summer sun, reaching 120 - 130 degrees Fahrenheit in just 10 minutes. That can mean more air conditioning use, which means more fuel use and CO2 emissions. 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 also help keep your vehicle cooler in the summer.⁹

Message: Simple vehicle maintenance tips and technologies can improve overall vehicle performance, while helping to save money and reduce carbon dioxide emission.

Content:

- **Use the recommended motor oil.** According to the EPA, you can improve your fuel economy by 1-2% by using the manufacturer's recommended grade of motor oil. Additionally, motor oil that says "energy conserving" contains friction-reducing additives that can provide additional benefits.¹⁰
- **Follow the manufacturer recommended maintenance schedule.** To keep your vehicle running at peak performance, visit your local dealership or auto shop on a regular basis.¹¹ Manufacturers recommend different maintenance schedules based on how you drive and use your vehicle – make sure you follow the correct schedule based on your usage to prevent changing your oil too early and wasting good oil or potential damage from driving too far.
- **For modern cars, replacing an air filter will improve performance but not fuel economy.** For modern computer-controlled, fuel-injected engines, changing a clogged air filter has no measurable effect on fuel economy but does affect ultimate performance. In a study conducted by the Department of Energy, average acceleration times for vehicles improved by 6-11% when running on a clean filter.¹²

⁶ North Carolina Department of Transportation: [Drive More Efficiently](#)

⁷ US Forest Service: [The EcoDriver's Manuel](#)

⁸ US Forest Service: [The EcoDriver's Manuel](#)

⁹ US Forest Service: [The EcoDriver's Manuel](#)

¹⁰ New Hampshire Department of Environmental Services: [Environmental Fact Sheet](#)

¹¹ US Forest Service: [The EcoDriver's Manuel](#)

¹² US Department of Energy: [Vehicle Technologies Program](#)

- **Check your tire pressure monthly.** Tire pressure increases when driving, so to get an accurate reading, check your pressure when you haven't driven for three or more hours. The Department of Energy estimates that 1.2 billion gallons of fuel were wasted in 2005 as a result of driving on underinflated tires. Even if your vehicle is equipped with an onboard Tire Pressure Monitoring System (TPMS), tires can still fall below their optimum pressure affecting fuel economy.
- **Consider purchasing fuel-efficient tires.** “Lower rolling resistance” 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.¹³
- **Reduce aerodynamic drag.** 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.¹⁴
- **Remove excess weight from your vehicle.** A vehicle's weight affects fuel economy and CO2 emissions. An extra 100 pounds in the trunk typically reduces fuel mileage by about 2%.¹⁵

Alternative Fuels

Almost all of the cars and trucks we drive run on non-renewable fuels derived from oil. While there is some debate as to how long this resource will last, we will eventually have to find new ways to power vehicles – renewable fuels can help offset oil use.¹⁶

Message: Alternative fuels have the potential to burn cleaner.

Content:

- One of the most distinct advantages is that alternative fuel has the potential to burn much cleaner than normal oil, potentially up to 90%.¹⁷

Message: Alternative fuels can improve environmental sustainability.

Content:

- Since they have the potential to burn cleaner, alternative fuel-powered vehicles can experience a reduction in chemical emissions such as carbon monoxide, nitrogen oxide, sulfur and other organic compounds, which can result in less environmental pollution.¹⁸

Message: Different alternative fuels have their own distinct advantages.

Content:

¹³ US Forest Service: [The EcoDriver's Manuel](#)

¹⁴ US Forest Service: [The EcoDriver's Manuel](#)

¹⁵ New Hampshire Department of Environmental Services: [Environmental Fact Sheet](#)

¹⁶ FuelEconomy.gov: [Increase Energy Sustainability](#)

¹⁷ Commonwealth of Massachusetts: [Community Strategies to Reduce Air Pollution and Climate Change](#)

¹⁸ Utah Clean Cities Coalition: [Alternative Fuels](#)

- There are a variety of different alternative fuels, each with its own distinct advantages, including methanol, liquefied petroleum gas, coal-derived liquid fuels, electricity, denatured ethanol and other forms of alcohol.¹⁹ Vehicles capable of running on ethanol, biodiesel, natural gas and electricity are available to consumers today.²⁰
 - **Ethanol** is most commonly produced domestically from corn. Pure ethanol has the potential to be renewable if production and distribution does not rely on any nonrenewable energy source or fossil fuel. Additionally, it provides economic development for most Mid-Western States in the US.
 - **Biodiesel** can be derived from recycled cooking oil or from natural oils in plants. It can be used in most diesel engines when blended with regular diesel fuel.
 - **Natural gas** is primarily sourced from fossil fuel reservoirs. It can also be derived from landfills, sewage treatment plants and animal waste. Additionally, natural gas vehicles have very thick and strong tanks.
 - **Electricity** can be generated from a wide range of sources including fossil fuels, nuclear power and renewable sources such as tidal, solar and wind power. Electricity is readily available. Additionally, most automobiles using electricity are very quiet.

Thermal-Management Technologies

Message: Thermal-management technologies, such as energy-efficient glass, can reduce your vehicle heating and cooling needs.

Content:

- In the winter months, if you have energy-efficient glass in your vehicle, much of the warmth inside the vehicle is bounced back in. In the summer, the same thing happens but in reverse. With energy-efficient glass, much of the heat outside of your vehicle bounces off the glass and stays outside.²¹

Message: Thermal-management technologies, such as energy-efficient air conditioning systems, can make your vehicle more efficient.

Content:

- According to the National Renewable Energy Laboratory, 7 billion gallons of gasoline – a volume representing nearly 5% of total fuel consumption in the United States – are used annually to run the air conditioners of passenger vehicles alone²². By improving engine thermal efficiency and reducing overall energy use, vehicles will achieve better gas mileage and release fewer emissions.

¹⁹ [Title 49, United States Code, Subtitle VI. Motor Vehicle and Driver Programs, Part C. Information, Standards and Requirements, Chapter 329. Automobile Fuel Economy; Sec. 32901\(a\)\(1\)](#)

²⁰ NHTSA- Based on Product Plan information submitted to Department of Transportation

²¹ National Renewable Energy Laboratory (NREL): [Reduction in Vehicle Temperatures and Fuel Use from Cabin Ventilation, Solar-Reflective Paint, and a New Solar-Reflective Glazing](#)

²² EPA: [Secondary Loop Vehicle A/C Systems](#)

Greenhouse Gases

Message: There is a direct relationship between the fuel economy of your vehicle and its greenhouse gas (GHG) emissions.

Content:

- Every gallon of fuel burned produces GHG. In fact, the EPA actually measures vehicle GHG output during testing and converts it to the Fuel Economy number you see on the label. Improving your driving behavior and vehicle operation will result in the reduction of GHG and saving fuel.²³

Other Emissions

Message: In addition to CO₂, there are a variety of other emissions that your vehicle can produce when it burns gasoline.

Content:

- Other emissions produced when your vehicle burns gasoline can include: **methane, nitrous oxide, hydrofluorocarbons,²⁴ carbon monoxide, nitrogen oxide, sulfur and other organic compounds.²⁵**

²³ FuelEconomy.gov: [How Vehicles are Tested](#)

²⁴ EPA: [EPA and NHTSA Propose First-Ever National Program to Reduce Greenhouse Gas Emissions and Improve Fuel Economy For Cars and Trucks](#)

²⁵ U.S. Department of Energy: [Just the Basics](#)

Online Banner Ad Message Recommendations

Note:

We believe both the “smart driving habits” and the “vehicle maintenance tips” could be a series of online educational ads on their own. Each campaign would provide a new tip (or educational fact) on how drivers can be more fuel efficient. We could also tailor the messages to be timely to the season. For example, tips such as “there is no need to warm up your car” could run in winter months, and a tip relating to “running your AC” could be used during the summer months.

To help simplify the messages and enable audiences to more clearly understand the information, it would be beneficial in online ads to break out the money saving pointers and green driving tips into distinct categories. Below are three sample online ads using such messaging.

Energy Efficient Glass

| VISUAL | COPY/MESSAGE |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Wide shot of illustrative crossover vehicle. Camera pushes in to windshield. | Is your windshield smart enough |
| Red arrows circulating inside the vehicle, snowflakes falling around the outside | To keep warm air inside in the winter |
| Snow fades away and is replaced by a big sun sending red arrows outside the car. The arrows are deflected and bounce off the windshield | And prevent hot air from entering in the summer? |
| TEXT | It can be with energy efficient glass |
| TEXT with logo | Learn how your windshield can make your vehicle more fuel efficient at NHTSA.gov |

Driving Habits

| VISUAL | COPY/MESSAGE |
|--------------------------------------------|---------------------------------------------------------------------------------------------------|
| Vehicle making several sudden starts | Sudden |
| ... and | Starts |
| ... stops going across the frame of the ad | And stops |
| TEXT | Waste fuel |
| TEXT, logo and website TBD | Learn smart driving habits that can improve your vehicle’s fuel economy by up to 33% at NHTSA.gov |

Note: The Flash ad would be developed using an illustrative, non-descript crossover car that cannot be attributed to anyone make or model. An entire series could be developed, each featuring a new “smart driving habit” and featuring the same vehicle.

Car Maintenance - Series 1

| VISUAL | COPY/MESSAGE |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Close up of a car tire that isn't completely inflated | |
| The tire begins to be inflated | Regular vehicle maintenance |
| More inflation | Can save you money |
| Fully inflated tire rolls off to the side | And reduce CO2 emissions |
| TEXT with logo | Learn vehicle maintenance tips that can improve your fuel economy at NHTSA.gov |