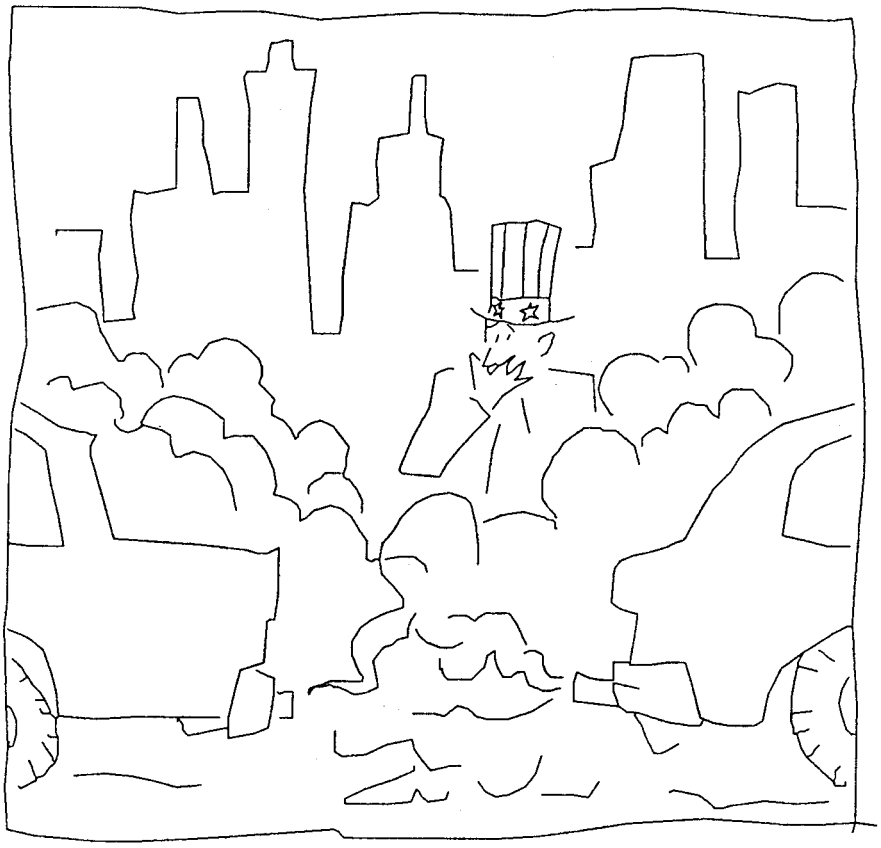
You . . .
Your Automobile . . .
and . . .
Your Environment

Environmental Citizenship on the Road . . .



Florida Department of Environmental Protection - 1996

You, Your Automobile and Your Environment

Produced by

The Florida Department of Environmental Protection
Virginia B. Wetherell, Secretary

Office of Environmental Education

3900 Commonwealth Blvd.

Tallahassee, Florida 32399-3000

(904) 488-9334

1996

What is Environmental Citizenship?

The term Environmental Citizenship is a convenient way to describe our responsibility to the natural world around us. Environmental citizenship means knowing our place in Florida's environment, and then taking appropriate action. An environmental citizen knows that we are a *part* of our environment.

Here is information that will help you as a driver become a better environmental citizen in Florida.

Introduction

How Do Autos Affect Our Environment?

Autos and oil: The combination damages Florida's land, air and water--and the health and safety of its citizens and visitors. Our love affair with the automobile hurts our environment and us. Still, many of us need our automobiles. As an Environmental Citizen of Florida, you should do what you can to see that your car operates as cleanly and as efficiently as possible.

Burning gasoline emits pollutants into the air we breathe. Chlorofluorocarbons (CFCs) from leaky auto air conditioners deplete the stratospheric ozone layer. Oil and other wasted and spilled auto fluids contaminate water and soil. And a huge amount of land is covered with asphalt to make roads and parking lots. Despite these problems, more people are driving today, and they are driving farther than ever. We Floridians drove 210,000,000 miles each day in 1993. This was up from 157,000,000 miles per day in 1985.

> Did you know? *Americans drive over 2 trillion miles every year--enough to take us to the sun and back more than 10,000 times!*

Automobiles burn about half of all the oil used in the United States. To meet this demand, oil companies explore and drill in sensitive natural areas, such as in offshore waters of the Gulf of Mexico and in the wilderness of Alaska. And as U.S. oil supplies dwindle, more oil will be imported from foreign sources, increasing the likelihood of oil spills from supertankers.

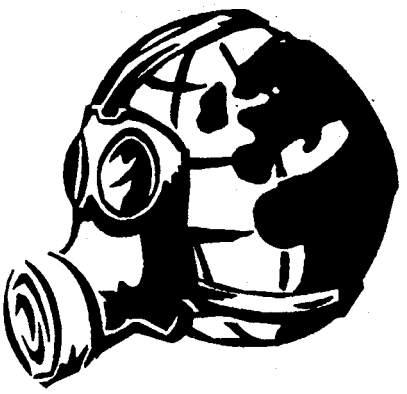
Sources of Auto Air Pollution

Air pollution is the major environmental problem tied to the automobile. Your car's exhaust emissions are a threat to human health. In cities and towns across Florida, the personal automobile is the single greatest polluter of the air.

The pollution from your automobile

Carbon Monoxide (CO) . . . a colorless, odorless, poisonous gas, is a product of incomplete burning of fuel. Incomplete burning usually occurs as you start the engine, or when cars are not tuned properly.

> Did You Know? *Driving a private car is probably a typical citizen's most polluting daily activity.*



In Florida's cities, almost 90 percent of all carbon monoxide comes from cars.

Why is Carbon Monoxide a Public Health Problem? Carbon monoxide affects the blood's ability to carry oxygen. Persons with heart disease may have chest pain if they breathe the gas while exercising (sidewalk joggers take note!). Infants, the elderly, and those with respiratory diseases are also at risk. Carbon monoxide also affects healthy individuals, impairing stamina, visual perception, manual dexterity, learning functions, and the ability to perform complex tasks.

Ozone . . . at ground level is the major contributor to smog, and is Florida's most stubborn urban air quality problem. Ozone forms in the atmosphere by complex chemical reactions involving hydrocarbons, nitrogen oxides, and sunlight. Because of this, dangerous levels of ozone occur most frequently on hot summer afternoons. Hydrocarbons and nitrogen oxides come from a number of sources, but in Florida's urban areas, at least half are from cars, buses, trucks, construction vehicles, and boats.

> Did You Know? *At ground level, ozone is harmful, but atmospheric ozone is a different matter. In the upper atmosphere, ozone (the "ozone layer") protects life on earth by filtering out harmful ultraviolet radiation from the sun.*

Why is Ozone a Public Health Problem? Ozone is a severe irritant. and is the cause of the choking, coughing, and stinging eyes associated with smog. Ozone damages the lungs, worsens respiratory disease, and makes people more sensitive to respiratory infections. Children are especially open to ozone's harmful effects,

as are adults who are ill. Ozone also is blamed for damage to crops and forests worldwide.

Toxic Air Pollutants . . . the U.S. Environmental Protection Agency (EPA) focuses its air toxics efforts on compounds that cause cancer. Some air toxics, such as benzene, are added to gasoline to increase performance.

> Did you Know? *The U.S. EPA estimates that as many as 60 % of all cancers caused by any hazardous air pollutant can be blamed on motor vehicle emissions.*

Toxic Air Pollutants and Public Health -- Almost everyone is exposed to auto emissions. The U.S. EPA estimates that toxic emissions from cars, trucks, and buses could cause up to 1,500 cases of cancer each year.

Carbon dioxide, climate change, and global warming . . . Burning oil (or gasoline) releases large amounts of carbon dioxide (CO_2) a greenhouse gas. Greenhouse gases trap the sun's heat in the Earth's lower atmosphere and may cause temperatures to rise, a process called global warming. Each gallon of gasoline we burn releases 20 pounds of CO_2 into the air, so autos are a major source of CO_2 emissions.

> Did You Know? *Even relatively fuel-efficient cars emit carbon dioxide. An auto that gets 27.5 miles per gallon will emit 35 tons of carbon dioxide in its lifetime (100,000 miles).*

CO_2 emissions may cause average temperatures to increase in some areas --and may melt the polar ice caps and cause a gradual rise in global sea levels, with potentially disastrous consequences for Florida. (Over the past 100 years, scientists have documented a two- to three-inch rise in sea levels.)

Did you Know? *According to U.N. scientists, 1995 was the warmest year on record.*

Global warming may cause rainfall patterns to change, bringing drought and flood to areas that seldom had them before. The severity of storms--including hurricanes--may be increased.

Other Environmental Problems Related to the Use of the Automobile

Land use . . . more than 60,000 square miles of land in the lower 48 states are paved to accommodate America's 135 million cars. Close to half of the land in most cities goes to roads, highways and parking lots. (Two-thirds of Los Angeles is paved.) Huge automobile junkyards, and piles of waste tires gobble up more land.

Did You Know? *Two percent of the nation's land--an area about the size of Georgia--is paved to accommodate the automobile.*

Water quality . . . stormwater runoff carries oils and greases from roads and parking lots (and agricultural wastes from farms and fields). It accounts for more than half of the water pollution in Florida's lakes, rivers, and estuaries. Leaking above- and below-ground fuel tanks pollute ground water in more than 1,000 sites in Florida. Spills, such as the 1993 spill at the mouth of Tampa Bay, add to the contamination. Lead from used auto batteries and other heavy metals pollute ground water in many areas.

The personal toll . . . the automobile, like other tools, can make our lives easier or harder. While we benefit from convenience and (sometimes) speed, the traffic jams, smog, noise, and delay associated with the automobile increase stress and tension. These in turn contribute to health problems and absenteeism at work or school. And, the auto is responsible for a large number of deaths (46,000 in 1993) from accidents.

Some solutions to these environmental problems

We know what needs to be done--beginning with the fact that we should drive less than we do. Other solutions:

- ✓ Improved fuel efficiency standards so less gasoline is burned for every mile driven. (A few cars already get 50 miles per gallon or more.)
- ✓ Converting some of our transportation fleet to alternative fuels: electricity, natural gas, liquefied petroleum gas, methanol and ethanol. Electric cars may someday give us cars with zero emissions.

> Did You Know? *Mass transit cuts smog-producing hydrocarbon emissions by 90%, carbon monoxide by more than 75%, and nitrogen oxide emissions by up to 75%. A single highway lane can accommodate 2,500 people an hour in automobiles, or 9,000 per hour in buses. About 15,000 people can ride on a light rail line each hour, and 34,000 people hourly on a heavy rail line.*

- ✓ Improved public transportation, and the use of car pooling, biking, walking, and telecommuting--working at home via a computer and modem.

What YOU Can Do to Reduce Pollution . . . and Even Save Money

The Department of Environmental Protection's Environmental Citizen-ship Initiative urges Floridians to learn about their place in Florida's environment and then to act responsibly. We have explained the importance of reducing emissions from private vehicles. Now we will show you how, through a few simple actions, you can be a good environmental citizen.

Our driving habits make a big difference in the amount of pollution a car produces. So, to keep emissions as low as possible and to reduce other adverse environmental effects:

- ✓ Avoid unnecessary driving
- ✓ Maintain your car properly
- ✓ Drive your car wisely

By combining these strategies, you can effectively reduce the amount your car pollutes. And there are additional benefits -your car will last longer and you often will save money!

Avoid Unnecessary Driving

The best way to reduce emissions from your vehicle is to use it less.

You have several options: planning errands and consolidating trips, carpools, public transit, and choosing clean alternatives such as biking or walking.

By planning errands, you get the most out of the time you spend behind the wheel. For example:

- ✓ Use the telephone and call ahead to confirm that the store has what you need before you drive.
- ✓ Plan several tasks for each trip.
- ✓ Drive to a central location and park. Then walk between nearby destinations.
- ✓ At the office, use conference calls in lieu of meetings. If face-to-face meetings are unavoidable, share rides with coworkers.

Ridesharing reduces your personal contribution to pollution. Pair up for trips to work--even an occasional car pool or ride on public transportation helps. Employers might provide incentives for carpoolers, such as special parking.

Biking or walking to your destination creates no pollution at all and increases fitness. Employers might offer racks for bicycles, and lockers and showers where cyclists can change from biking to business or work clothes.

> Did You Know? *Vehicle travel doubles every 20 years. More and more cars driving more and more miles will soon outpace our progress in controlling emissions.*

- ✓ And finally, although it probably is not an option open to many, consider taking a job closer to home--or move closer to your job.

Maintain Your Car

First, though, buy autos that get high gas mileage--at least 35 mpg (50 mpg--and electric--cars are available).

You will cut emissions and improve performance by following the manufacturer's recommended maintenance schedule. Your car also will last longer, have greater resale value, and get better gas mileage. Proper maintenance involves:

- ✓ Keeping your car tuned and changing the oil.
- ✓ Replacing air filters, spark plugs, oxygen sensors, hoses, and other expendable parts regularly.
- ✓ Keeping wheels aligned and tires inflated to recommended pressure to minimize tire wear and help your car get the best possible fuel economy.

> Did You Know? *Fuel economy drops 1% for every pound of tire pressure below the recommended inflation level.*

Other auto maintenance tips:

✓If you wash your car at home, park it on the lawn, so the runoff does some good. To save water, wash a section at a time, then rinse it quickly with a high-pressure, low-volume hose with a shut off valve.

✓Very few vehicles require high-octane ("premium" or "super" grade) fuel. Check your owner's manual. Unless your car needs high-octane fuel, using it will not improve performance or emissions--but it *will* cost you more.

✓Each oil change, refill with an oil designed to improve gas mileage. The best oils are labeled *ECII* or *Energy Conserving II*.

✓Trade in old tires.

✓Take your old car battery in for a trade when you buy a new one.

✓Recycle used oil. If you change your own oil, take the used oil to a local collection center. In Florida, call *1-800-741-4337* for a location near you. Never dispose of used oil on the ground or down storm drains. Before disposing of the used oil filter, puncture the closed end and thoroughly drain the oil.

✓Have your auto air conditioning system checked for leaks by technicians certified to manage Chlorofluorocarbons (CFCs). Be sure the repair shop captures and recycles the CFCs. If you suspect or see a violation of the laws, call the federal Stratospheric Ozone Information Hotline at 1-800-296-1996.

Drive Wisely

Even a perfectly maintained car will pollute more if it is driven carelessly. Your car's emissions will be lower if you apply common sense to driving and follow basic rules of the road.

Driving situations likely to *increase* pollution include:

- ✓ Idling for more than 30 seconds: You will save gas and reduce pollution by turning off the engine. *You certainly will create less pollution by parking your car and going into restaurants and banks rather than idling in drive-thru lanes.*
- ✓ Stop-and-Go Driving: You can't avoid driving in traffic. But plan trips outside of rush hour and peak traffic periods. Accelerate and decelerate gradually. Anticipate stops and starts for traffic lights and changing speed limits.
- ✓ Air Conditioning: Air conditioning boosts emissions and cuts fuel economy. In Florida, however, driving without it often is impossible. Try opening the window when driving at slow speeds, or the fresh air vent at highway speeds. Park in the shade to keep the car cooler; you also will reduce the pollution and waste that occurs when gasoline evaporates from the warm engine and gas tank.

> Did You Know? *You can improve gas mileage about 15 percent by driving 55 mph rather than 65 mph. You save fuel--and maybe lives! Use overdrive if you have it as soon as your speed is high enough. Cruise control also will help you maintain a reasonable, fuel-efficient, and safe speed.*

- ✓ High Engine Loads: Your car burns more gas and emits more pollution when the engine is working hard. Running the air conditioner, quick acceleration, high-speed driving, climbing grades, revving the engine, and carrying extra weight all create additional load.
- ✓ Cold Temperatures: Emission control systems take longer to warm up in cold weather. However, idling does not help and can cause engine wear Drive at low speeds for the first few miles while the engine warms up.
- ✓ Refueling: Spilled gasoline pollutes the air when it evaporates. Avoid "topping off," especially in hot weather. Also be careful when refueling outdoor power equipment such as lawn mowers and outboard motors.

How much do you know about automobiles and their use? Test

What YOU know about the car in your garage and how its used.

1. What percentage of trips are made by private car? ___ 40% ___ 60% ___ 80%

2. In the United States, what percentage of all car trips are for commuting--to work, to school, or on business? ___ 30% ___ 50% ___ 70%

3. How many miles each way do most U.S. commuters drive to and from work? ___ 5 miles ___ 10 miles ___ 25 miles

4. What percentage of U.S. commuters have free parking at work? ___ 15% ___ 50% ___ 90%

5. Most workers who commute to work drive from (check one): __ suburb to city __ city to city __ suburb to suburb

6. What percentage of workers in the U.S. commute to work by public transportation? ___ 5% ___ 20% ___ 60%

7. Since 1988, average fuel economy of new cars in the U.S. has: __ increased, __ decreased, __ stayed the same?

8. Automobiles account for what percentage of the oil consumed by the United States? ___ 25% ___ 50% ___ 75%

9. In the United States, gasoline is __ less expensive, __ more expensive, __ about the same compared with Europe and Japan.

10. Older, poorly maintained cars make up about 10% of the cars in the U.S., but account for what percent of the emissions? ___ 10% ___ 50% ___ 60%

11. Since the 1973 oil embargo, the U.S. is __ less dependent, __ more dependent, __ equally dependent on oil from other countries?

12. Which human activity is the largest contributor to air pollution? __ Industry __ use of motor vehicles __ the worldwide burning of forests

13. More land in the U.S. is used for roads, driveways, parking lots, and garages than is used for housing. __ True __ False

14. The number of motor vehicles in the U.S. is increasing at: __ about the same rate as the population __ twice the rate of population growth __ three times the rate of population growth.

15. Per capita, U.S. residents are driving: __ more miles each year __ fewer miles each year __ same as always.

16. Compared with drivers in other industrialized countries, the average U.S. resident drives: __ twice as many miles each year __ three times as many per year __ the same number of miles per year

17. What percentage of all the automobiles in the world are in the U.S. (Tip: the U.S. has 5% of the world's population)? ___ 9% ___ 34% ___ 65%

DEPOEE/9-96/jkl

Answers to the How Much Do You Know Quiz

1. Eighty two percent of all trips are by car.

2. Over 70% of car trips are business related.

3. Half of all trips to work are 5 miles or less each way.

4. Ninety percent of U.S. commuters have free parking -- which encourages solo commuting.

5. Only 10 percent commute from suburb to city. About 40 percent all commutes are suburb to suburb; 33 percent are city to city.

6. Less than 5 percent of U.S. workers use public transportation to commute to work.

7. From 1988 to 1992, fuel economy declined by 4 percent because Americans were buying bigger, more powerful cars and choosing options that reduce fuel efficiency, such as air conditioning, power accessories, and four-wheel drive.

8. Two thirds of the oil used in the U.S. goes to transportation; half is used to power automobiles.

9. Gas costs about one third less in the U.S. than in Europe or Japan.

10. According to the U.S. Environmental Protection Agency, older, poorly maintained cars make up 10 percent of the autos in the U.S., but account for half of all auto emissions. Clean air regulations pertain mostly to new cars.

11. Since the oil embargo of 1973, the amount of oil imported from the Persian Gulf has more than doubled. The U.S. imports more than 40 percent of its oil from other countries, leaving it vulnerable to interruptions of supply and price increases and damaging oil spills.

12. Motor vehicles cause more air pollution than any other single activity. In its lifetime, a typical new car equipped with pollution-control devices will emit some 300 pounds of smog-forming compounds and 34 tons of carbon dioxide. Emissions of carbon dioxide, CFCs, hydrocarbons, nitrogen oxides, and carbon monoxide contribute to global warming and ozone depletion.

13. True. About 2 percent--60,000 square miles, an area larger than the state of Georgia-- of the total surface area of the U.S. has been paved over.

14. The numbers of motor vehicles is growing more than three times faster than the population in the U.S. Between 1970 and 1990, the U.S. population increased 23 percent, and motor vehicles on the road increased by 75 percent. Passenger cars alone increased by 61 percent.

15. More. In the 1980s, the number of miles driven per vehicle grew by 16 percent. Total miles rose by more than 40 percent.

16. Twice as many. The average U.S. resident drives or rides 12,500 miles per year in cars and light trucks--almost double the distance traveled in other industrialized countries.

17. Although the U.S. has only 5 percent of the population, it contains 34 percent of the world's motor vehicles and consumes 26% of the world's oil.

SOURCES for the Quiz & Did You Know: American Automobile Manufacturers Association (AAMA), *AAMA Motor Vehicle Facts and Figures '93* (AAMA, Detroit, MI, 1993; and Nadis, Steve and James J. MacKenzie, *Car Trouble* (World Resources Institute, Washington, D.C., 1993).


DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA