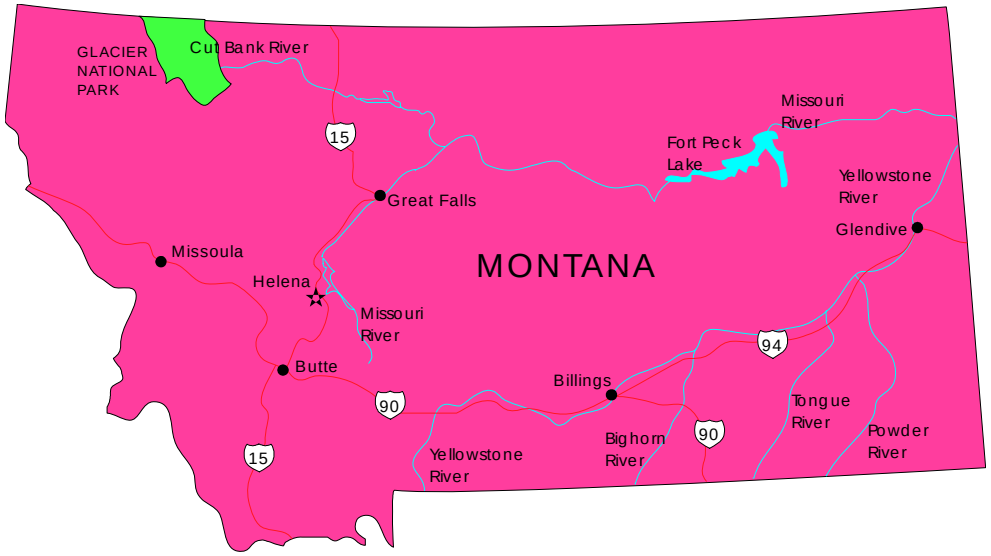
Montana Driver Education and Training

Strategies for Owning a Vehicle and Trip Planning Part III

Strategies for Trip Planning and Conserving Resources



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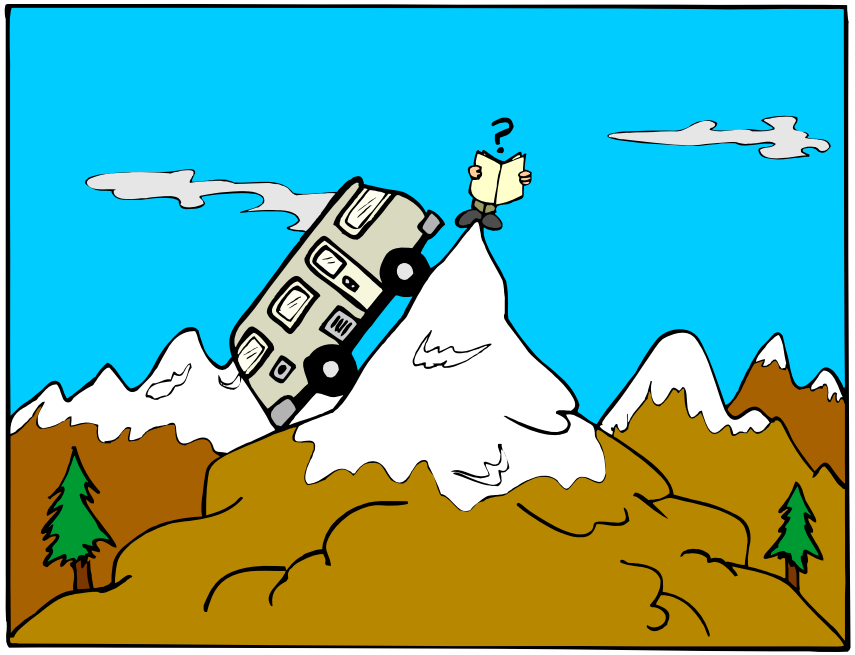
Standards and Benchmarks

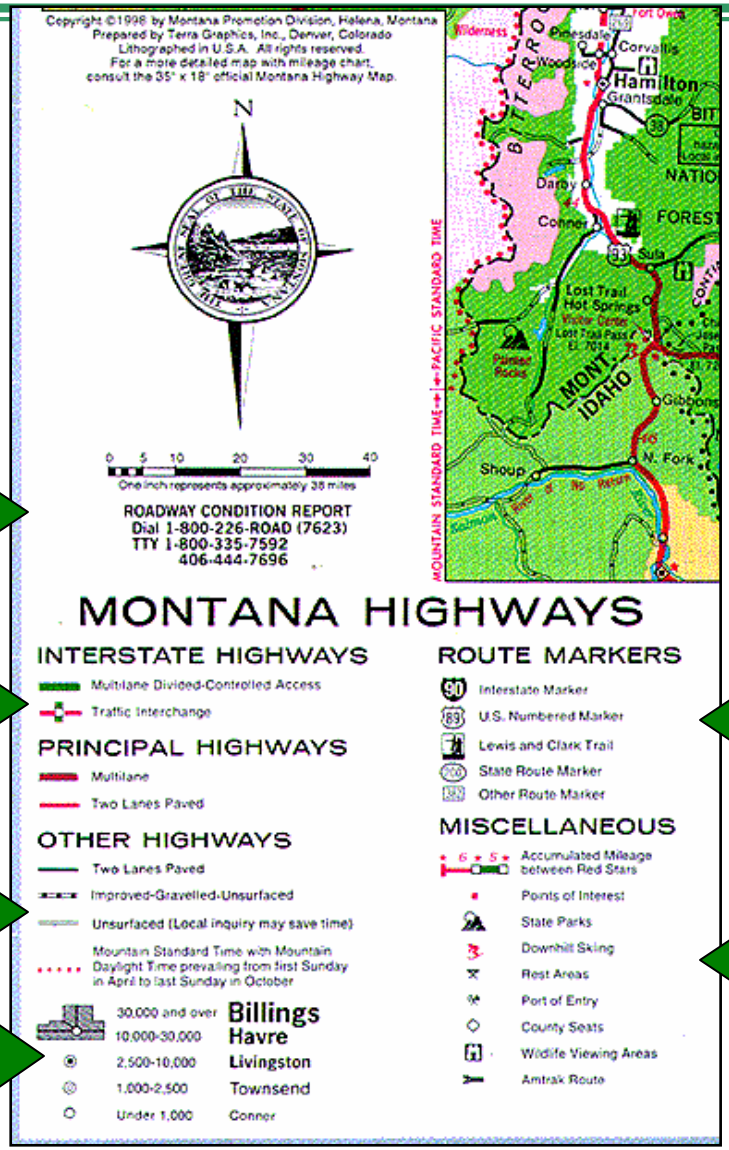
1. **Laws and Highway System**
   a. know the laws outlined in the Montana Driver's manual
   b. understand the laws outlined in the Montana Driver's manual
   c. consistently demonstrate knowledge and understanding by responsible adherence to highway transportation system traffic laws and control devices
2. **Responsibility**
   a. recognize the importance of making safe and responsible decisions for owning and operating a vehicle
   d. develop habits and attitudes with regard to responsible driving
4. **Vehicle Control**
   a. demonstrate smooth, safe and efficient operation of a motor vehicle
   b. develop habits and attitudes relative to safe, efficient and smooth vehicle operation
6. **Risk Management**
   a. understand driver risk-management principles
   b. demonstrate driver risk-management strategies
   c. develop driver risk-management habits and attitudes
7. **Lifelong Learning**
   b. describe past, present and future motor vehicle laws
   e. identify opportunities for lifelong education in driving

PLANNING A TRIP

- A trip can be a routine trip or be an extended road trip requiring preparation and planning
- The routes must be determined
- The basic costs for fuel, lodging, meals, and perhaps entertainment must be determined



Reading a Map Legend



Mileage Scale

Classes of Roads

Symbols for Roads

Symbols for Towns

Junctions

Points of Interest

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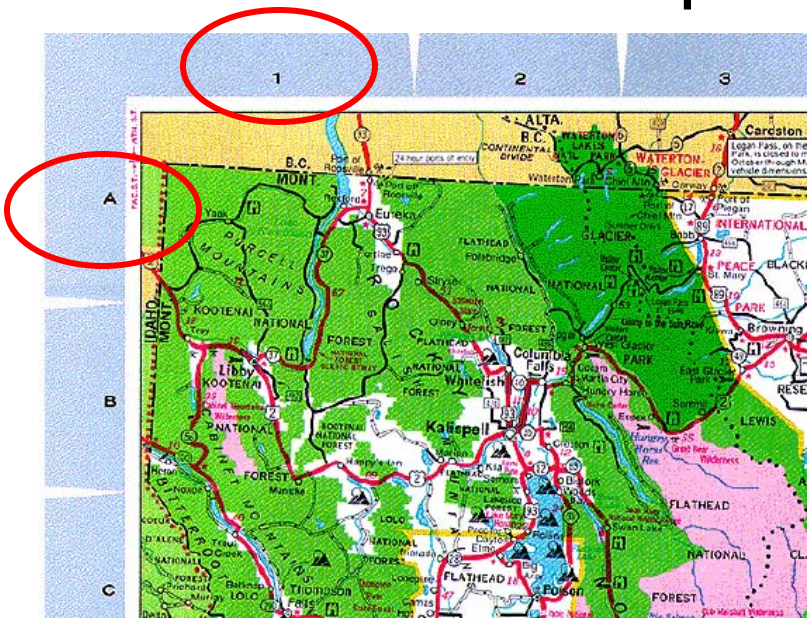
Reading a Map

- State maps have town and city indexes with number/letter coordinates
- City maps have street and major points of interest indexes with number/letter coordinates to find a location such as a street or major point
- On both city and state maps, the letters and numbers correspond to the letters and numbers located on the top/bottom and sides of the map



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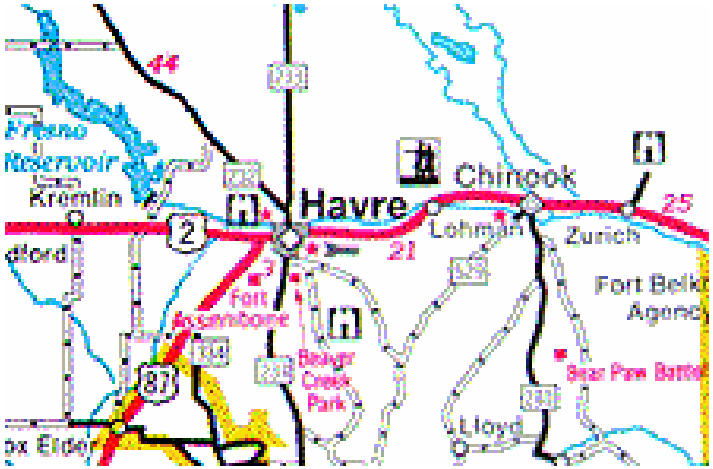
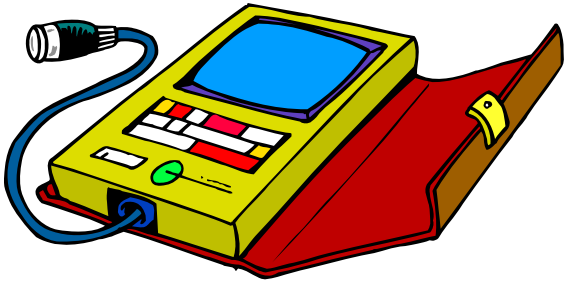
Reading a Map

- The distance numbers help determine distance between two places
- Distance in miles between towns, junctions or interchanges can be determined
- Driving time can be estimated using the distance numbers
- Distance numbers will not include road and weather conditions that could influence driving time



Technology Resources for Trip Planning

- Travelers today can receive directions to their destinations in their vehicles on handheld computers or by using devices incorporated into their dashboards



Technology Resources for Trip Planning

- Locate a suitable Web site for your needs such as

  www.mapquest.com

  http://maps.yahoo.com

- Montana encourages tourism with destination and map information at

  http://mt.gov/discover/statemap.asp

- Montana maps can be displayed or downloaded

  http://www.nris.state.mt

- Download maps of the United States

  www.50states.com

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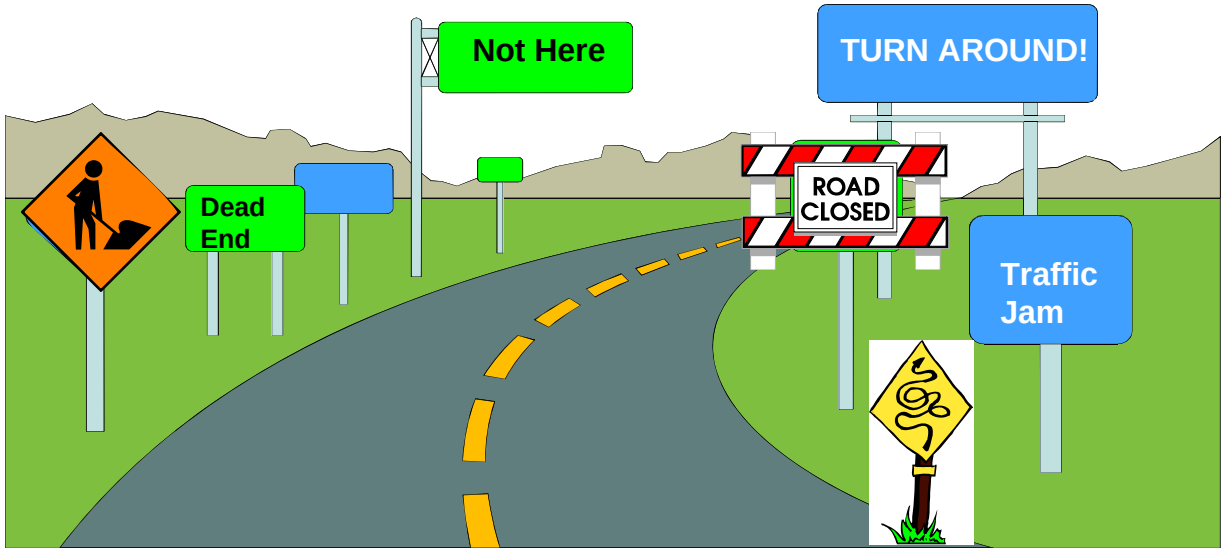
Technology Resources for Trip Planning

- Satellites are now used to provide navigational assistance to anyone with a navigation Global Positioning System (GPS)
- Satellite radios with streaming real-time features can update the navigation screen in some major cities
- Rand McNally provides guides that can be downloaded to cell phones or laminated city maps covering a specific area that fold and last forever

Alternative Route Choice

- In cities large and small, from the east coast to the west coast, traffic congestion is steadily getting worse each year in America
- A large percentage of the nation's roadway network is congested, more severely and for longer portions of each day
- The impacts of traffic congestion are far-reaching – impacting individuals, families, businesses and communities



Alternative Route Choice

- The country's "congestion invoice" amounted to nearly $70 billion in 2001 – the byproduct of 3.5 billion hours of delay and 5.7 billion gallons of excess fuel consumed in congestion-related delays
- A study completed in 2000 shows for households earning between $12,000 and $23,000 per year, transportation expenses consume one in every four dollars spent
- Travelers are seeking alternatives to traditional transportation modes

Personal Preparation

- Let a family member or trusted friend know how to reach you in an emergency
- Be sure someone knows the departure time, destination, and expected return time
- Be prepared to pay any large repair bill in the event of a vehicle breakdown
- Determine approximate cost of fuel, meals, lodging, and entertainment
- Get a good night's sleep the night before starting the trip
- Know the route, check for construction locations
- Avoid traveling through congested areas during "rush hours"
- Determine the number of hours per day to travel
- Make overnight reservations in advance

Vehicle Preparation

Have the following items in the vehicle

- An extra set of keys in pocket or with a passenger
- Insurance information
- Money for expected and unexpected travel expenses
- Vehicle owner's manual
- Maps of local areas you plan to visit
- Water, snacks
- Have the vehicle serviced before leaving
- Start out with a full tank of gas
- Check the spare tire

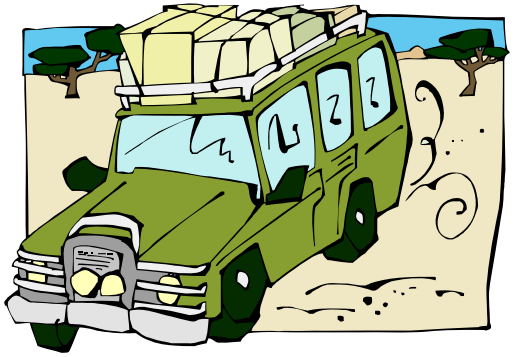
Calculate Trip Cost

- The basic costs to be anticipated for any trip include:
  - Fuel
  - Lodging
  - Meals
  - Tolls

- Be prepared to pay tolls by checking the information provided on state maps or checking with an automobile club
- Include cost for any planned admission to recreational activities

Safe Vehicle Loading

- Know the total load capacity of your vehicle
- Check the owner's manual for exact weight restrictions
- Distribute the weight evenly throughout the vehicle
- Store soft items only within passenger compartment, i.e., pillows and/or blankets
- Car-top carriers raise the center of gravity, adversely affecting braking and steering
- Just as lighter loads increase fuel efficiency, overloading creates excessive heat inside your tires and can cause tire failure that could result in vehicle damage and serious injury



Montana Litter and Recycling Laws

- 7-5-2109. County control of litter. (1) (a) Except as provided in 7-5-2112, a governing body of a county may regulate, control, and prohibit littering on any county road and on land within the county by the adoption of an ordinance that substantially complies with the provisions of 7-5-103 through 7-5-107. The ordinance may apply to portions of the county and may apply to persons other than the owners of the property on which littering occurs.

- 75-10-1101. Waste oil notice. (1) Each retailer and wholesaler offering motor oil for sale shall visibly display at an appropriate location within the retail store or wholesale outlet a sign indicating the location of the nearest waste oil recycling collection center if the center is within 25 miles of the retailer or wholesaler.
  (2) The department of environmental quality shall design an oil recycling sign to be used by retailers and wholesalers. The department may establish the specifications for the sign by rule.

- 61-3-336. Recycling license plates. The department is authorized to promote the recycling of used or outdated license plates for the metal content and may enter into contractual agreements with nonprofit organizations for the collection of used or outdated license plates and for their transportation to a central recycling point.

Reduce Litter on Montana Roadways

Avoid Common Violations:

- Throwing litter out of a car or boat
- Rolling junked cars into a river
- Hauling trash for profit and dumping it in any place that is not a legal landfill
- Letting someone else dump tires or any waste on your property, regardless of whether you gain financially from the activity
- Pouring used motor oil or restaurant grease into storm drains or down manhole covers
- Pouring motor oil on the ground

Cost of Littering

- In 2001, Illinois spent more than $12 million picking up litter
- Litter is especially undesirable in a state whose economy is heavily dependent upon tourism
- Packaging and container waste studies show litter is:

  30% of our discards

  25% non-durables such as newspapers and old clothing

  20% yard waste

  14% durable goods such as appliances and tires

  9% food waste

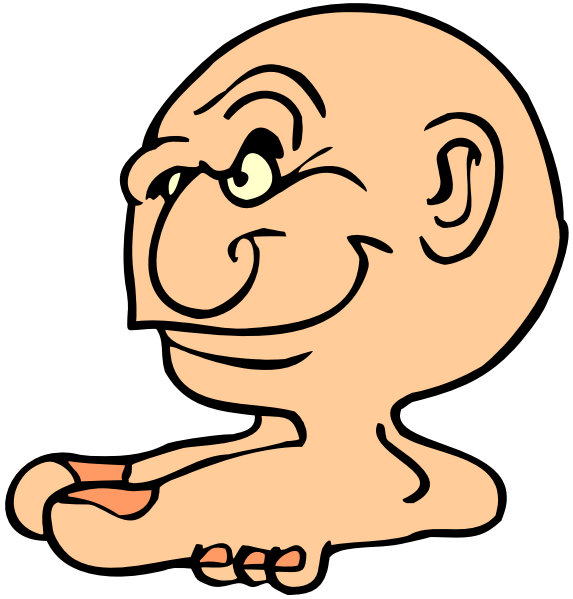
  2% miscellaneous inorganic wastes

Cost of Littering

- Some researchers have found that littering, like vandalism, is contagious, and that the presence of litter, trash and debris in an area encourages crime
- According to a 2005 *Keep America Beautiful* survey, 92 percent of Great American Cleanup organizers noted that their communities, neighborhoods and residents felt safer after volunteers united to clean and beautify the local environment

CONSERVING RESOURCES

- How big is your footprint? No, you don't need a ruler to figure it—we're talking about ecological footprints
- Your ecological footprint is a measurement of just what sort of impact you, personally, are having on your environment



Ecological Footprints

CONSERVING RESOURCES

- There isn't any way to go through life without having some impact on the Earth
- Americans are known around the world for living BIG - big cars, big meals, and big buildings
- Using the Earth's resources is not a bad thing, but wasting them is

CONSERVING RESOURCES

- All it takes from a person is a little thought and a willingness to exchange old, familiar habits for new ones
- We can make a world of difference if every single individual follows the R's of resource conservation

Reduce, Reuse, and Recycle

Practices that Conserve Fuel and Reduce Pollution

- Reduce the number of miles you drive by walking, biking, carpooling and taking mass transit wherever possible
- You can improve your gas mileage about 15% by driving at 55 mph rather than 65 mph
- Check your tires weekly to make sure they're properly inflated. Proper tire inflation can improve gas mileage by more than 3%.
- Your car burns more gas and emits more pollution when the engine is operating under high load. Avoid carrying unneeded items in the trunk
- Park in the shade - Air conditioners increase load on the engine and can increase emissions
- It's best to avoid "topping off," the gas tank especially in hot weather
- If you're in bumper-to-bumper traffic, improve your fuel economy by slipping the car into neutral instead of constantly riding the brake
- Emission test the vehicle
- Recycle old oil, fluids and tires

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Fluids and Parts for Recycling

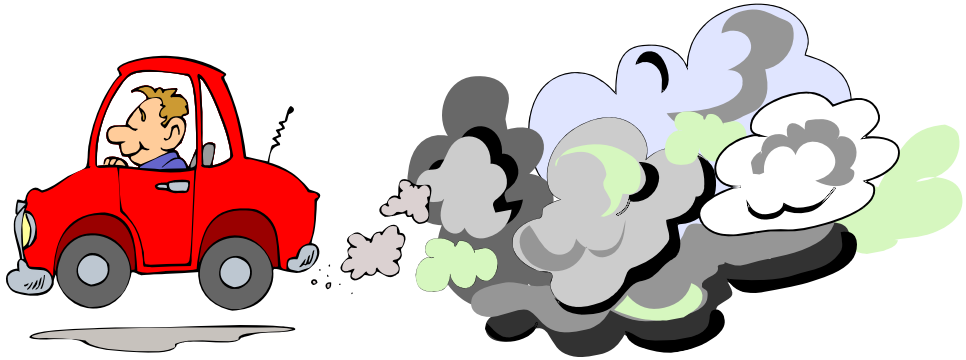
- Recycling saves resources and reduces pollution—many states require certain vehicle fluids and parts to be recycled
- Hazardous waste must be disposed of safely. Hazardous substances are contained in batteries, oil, gasoline, oil filters, brake fluid, antifreeze and transmission fluids
- Many communities have collection centers
- Many vehicle parts made of steel, aluminum, engines, car seats, tires, and plastics can be recycled; many can be reconditioned

Emissions and Pollutants Emitted by Motor Vehicles

- Cars, trucks and other mobile sources account for almost a third of the total air pollution in the United States
- Over the years, emission standards for cars and trucks have been strengthened to address this national air quality problem
- Emissions from an individual car are generally low, relative to the smokestack image many people associate with air pollution

Emissions and Pollutants Emitted by Motor Vehicles

- In numerous cities across the country, the personal automobile is the single greatest polluter, as emissions from millions of vehicles on the road add up
- Driving a private car is probably a typical citizen's most "polluting" daily activity
- The power to move a car comes from burning fuel in an engine
- Pollution from cars comes from by-products of this combustion process (exhaust) and from evaporation of the fuel itself



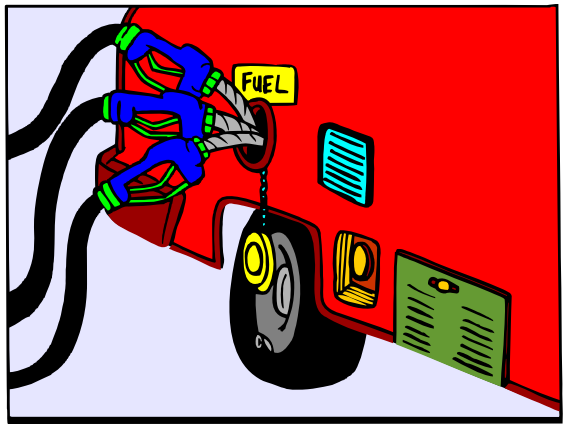
Emissions and Pollutants Emitted by Motor Vehicles

For every 100 miles driven, here is what is tossed into the air

- 5.5 pounds of carbon monoxide
- 80 pounds of carbon dioxide
- 67 pounds of hydrocarbons
- 4 pounds of nitrogen oxide
- Older cars generally pollute our environment more than newer cars—maintenance, not age, is the most important factor

Emissions and Pollutants Emitted by Motor Vehicles

- Gasoline evaporation increases as the temperature rises
- Gasoline vapors are always present in fuel tanks—these vapors are forced out when the tank is filled with liquid fuel
- The hot engine and exhaust system can vaporize gasoline when the car is running
- The engine remains hot for a period of time after the car is turned off, and gasoline evaporation continues when the car is parked



Keep Vehicles from Polluting

- A car's emissions can be reduced and performance can be enhanced if the manufacturer's recommended maintenance guidelines are followed
- By taking proper care of a vehicle it will also extend its life, increase its resale value, and optimize its "gas mileage" or fuel economy
- Check and replace the air filter, vacuum and coolant hoses, oil, oil filter, fluids, and belts
- It's also important to keep the tires inflated to the recommended pressure for the best possible fuel economy

Different Automotive Fuels

- Some fuels are inherently cleaner than gasoline; they emit less nitrogen oxides or hydrocarbons—the hydrocarbons they do emit are less likely to form ozone
- Methanol (made from natural gas, coal, or biomass) and ethanol (made from grains or sugar) are high-octane liquid fuels
- Cars designed to run on pure alcohol fuels have the potential to emit 80% to 90% less reactive hydrocarbons
- Battery-powered cars have the potential for zero tailpipe and evaporative hydrocarbon and nitrogen oxide emissions

Different Automotive Fuels

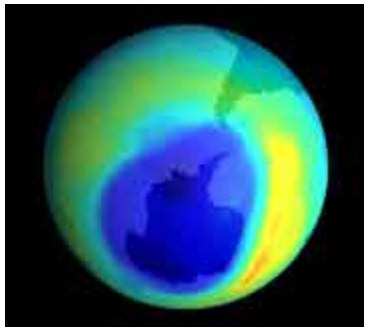
- Compressed natural gas is an excellent automotive fuel, particularly for fleet vehicles where long driving range is not important
- Natural gas vehicles have the potential to emit 85% to 95% less reactive hydrocarbons than advanced-technology gasoline vehicles.
- Propane vehicles emit considerably less ozone-forming hydrocarbons than do vehicles fueled with conventional gasoline
- Unless your car needs high-octane gasoline, use of “premium” will not improve performance or emissions—it will just cost you more

Practices that Conserve Fuel and Reduce Pollution

- Three easy things you can do to help keep emissions as low as possible
  - Avoid unnecessary driving
  - Maintain your car properly
  - Drive your car wisely
- Driving situations likely to increase pollution include:
  - ☞ Idling
  - ☞ Stop-and-go driving

Ozone – Good Up High Bad Nearby

- To help protect the earth from the sun's powerful ultraviolet radiation, a layer of gas exists about 30 miles above the earth known as the stratospheric ozone layer
- When certain gases and chemicals escape into the ozone layer, it starts a process that causes the ozone layer to break apart
- Without the protection from the ozone layer, radiation can cause harm to human, animal and plant life in many different ways



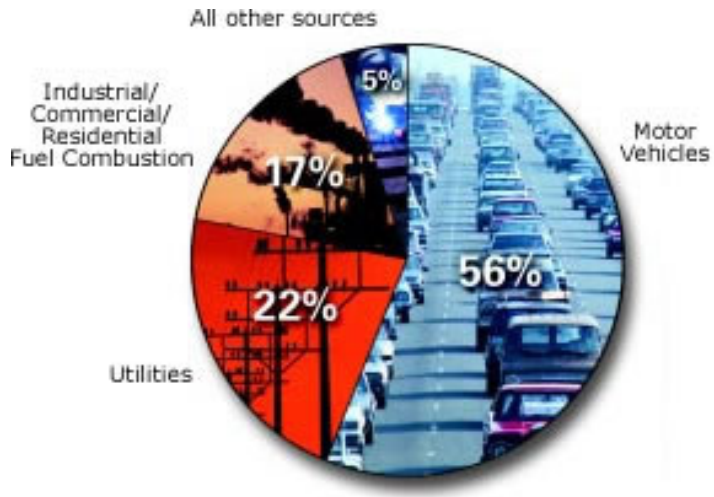
NASA Image - Ozone Layer Hole

- Ozone is a severe irritant causing the choking, coughing, and stinging eyes associated with smog
- Ozone damages lung tissue, aggravates respiratory disease, and makes people more susceptible to respiratory infections

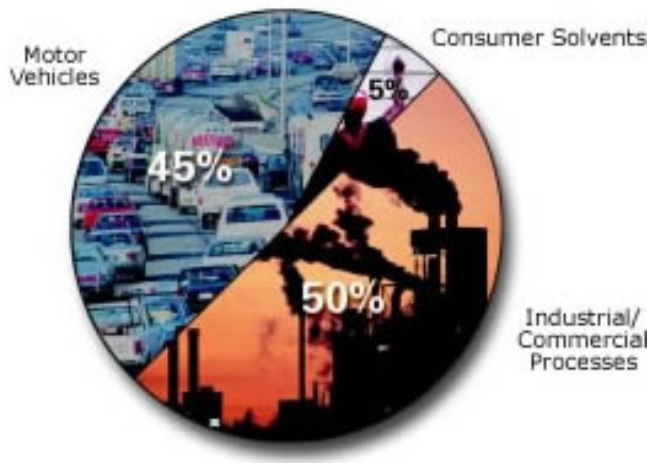
Ozone – Good Up High Bad Nearby

What Causes "Bad" Ozone?

- Ground-level or "bad" ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NOx) and volatile organic compounds (VOC) in the presence of sunlight.
- Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors and chemical solvents are some of the major sources of NOx and VOC.



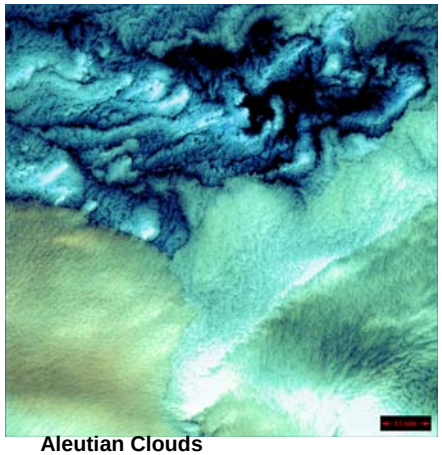
Sources of NOx



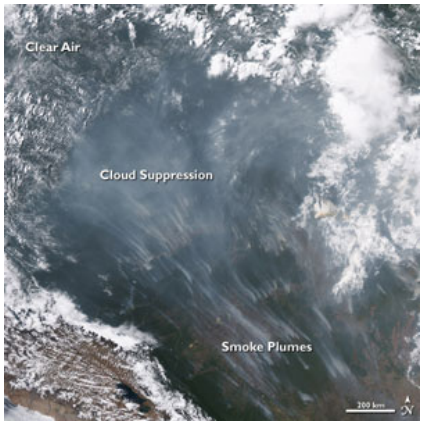
Sources of VOC

Your Carbon Emissions

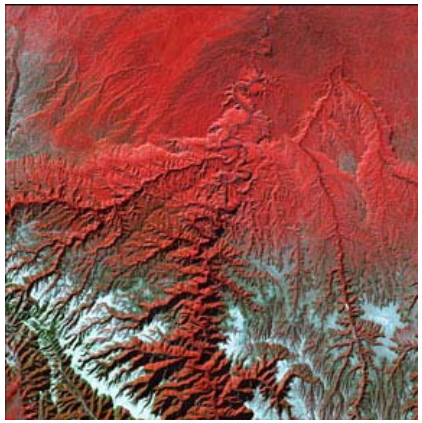
- Almost one third of the carbon dioxide produced in the United States comes from our cars, trucks and airplanes.
- Carbon dioxide and other gases warm the surface of the planet naturally by trapping solar heat in the atmosphere. This is a good thing because it keeps our planet habitable.
- However, by burning fossil fuels such as coal, gas and oil and clearing forests we have dramatically increased the amount of carbon dioxide in the Earth's atmosphere and temperatures are rising.



Aleutian Clouds
NASA Image taken 6/16/2000



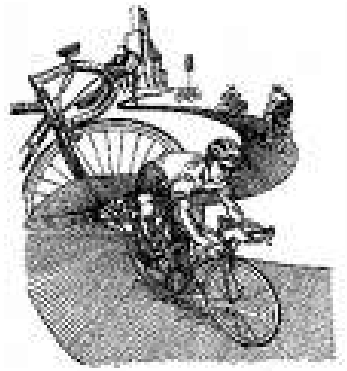
NASA 2005 Smoke "cloud killer"



Desolation Canyon
Image taken 12/31/2000 by Landsat 7

Reduce Your Carbon Emissions

- Avoiding just 10 miles of driving every week would eliminate about 500 pounds of carbon dioxide emissions a year!
- Sharing a ride with someone just 2 days a week will reduce your carbon dioxide emissions by 1,590 pounds a year.
- Every gallon of gasoline saved keeps 20 pounds of carbon dioxide out of the atmosphere, every increase in fuel efficiency makes a difference!



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Want to do something to help stop global warming?
Here are 10 simple things you can do and how much carbon dioxide you'll save doing them.

Change a light

Replacing one regular light bulb with a compact fluorescent light bulb will save 150 pounds of carbon dioxide a year.

Drive less

Walk, bike, carpool or take mass transit more often. You'll save one pound of carbon dioxide for every mile you don't drive!

Recycle more

You can save 2,400 pounds of carbon dioxide per year by recycling just half of your household waste.

Check your tires

Keeping your tires inflated properly can improve gas mileage by more than 3%.

Every gallon of gasoline saved keeps 20 pounds of carbon dioxide out of the atmosphere!

Use less hot water

It takes a lot of energy to heat water. Use less hot water by installing a low flow showerhead

(350 pounds of CO_2 saved per year) and washing your clothes in cold or warm water (500 pounds saved per year).

Avoid products with a lot of packaging

You can save 1,200 pounds of carbon dioxide if you cut down your garbage by 10%.

Adjust your thermostat

Moving your thermostat just 2 degrees in winter and up 2 degrees in summer

You could save about 2,000 pounds of carbon dioxide a year with this simple adjustment.

Plant a tree

A single tree will absorb one ton of carbon dioxide over its lifetime.

Turn off electronic devices

Simply turning off your television, DVD player, stereo, and computer when you're

not using them will save you thousands of pounds of carbon dioxide a year.

Spread the Word

Encourage your friends to make small changes which can add up to big differences

www.climatecrisis.net

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