

# CHAPTER 11 OBJECTIVES

## LESSON ONE



### Driving Safely in Low Light and at Night

1. Describe how visibility is affected by low light conditions.
2. Explain how to drive safely in low light and at night.

## LESSON TWO



### Visibility, Bright Light, and Glare

3. Describe the conditions that create glare from the sun.
4. Explain how you can drive safely in the glare of the sun.

## LESSON THREE



### Minimizing Risk in Rain and Snow

5. Explain how to manage visibility, time, and space in rain and snow.
6. Explain how to minimize risk in snow and rain.

## LESSON FOUR



### Other Hazardous Weather Conditions

7. Describe five hazardous weather conditions other than snow and rain and the risks involved in driving in each.

Visibility on the roadway is decreased at night and just before sunrise or after sunset. As visibility decreases, your risk of being in a collision increases. To lessen risk, you must understand how reduced light limits visibility and how to manage the driving task in low light conditions.

ans have difficulty seeing your car, particularly if you don't have your headlights on.

Night driving presents special challenges. At night, darkness limits your view of the road ahead and the surrounding area. Even with your headlights on, your ability to see ahead when turning or driving around a curve is severely reduced. Also, the glare of other vehicles' headlights can be distracting—or blinding.

### How Do Low Light Conditions Affect Visibility?

Your ability to see and to be seen diminishes when the amount of available light is lessened.

Reduced sunlight during dusk and dawn hours makes it difficult to see the roadway and vehicles traveling on it. Other drivers as well as pedestri-

### How Can You Drive Safely When the Amount of Light Is Low?

To drive safely in low light conditions, you must maximize visibility and manage time and space wisely.



**Fifty percent of all teenage motor vehicle fatalities occur between 9 P.M. and 6 A.M.**



### *Tips for New Drivers*

#### More Suggestions for Dealing with Visibility Problems at Night

Slow down. Remember that your visibility is limited.

Avoid looking directly into the headlights of oncoming cars. When necessary to maintain your bearings, glance down at the right edge of your traffic lane beyond the oncoming car.

To remind an approaching driver that his or her high beams are on, quickly switch your own headlights from low to high and back again.

If you can adjust your rearview mirror for night driving, do so to cut glare from the headlights of vehicles behind you.

If you must stop along the road, use your emergency flashers to enable other drivers to see you.

Watch for animals, joggers, bicyclists, and obstacles in the road.

Always remove sunglasses once the sun sets.

When your view of the road is limited, slow down. Maximize your ability to see and maneuver. Always keep your low-beam headlights on, day and night. Your headlights and taillights help to illuminate your car, making it easier for others to see you in all kinds of light.

### During Dusk and Dawn Hours

All states require that you use your headlights either from sunset to sunrise or between a half hour after sunset and a half hour before sunrise. Using your headlights makes it easier to see and be seen in the dim light of dusk and dawn. Do *not* use your parking lights. They are not designed to light the road ahead but to indicate your status when you are parked safely off the roadway.

At dawn or dusk, increase the distance between your car and the one ahead, and use your turn signals well in advance.

### At Night

Night driving requires extra concentration and a greater level of awareness. With darkness limiting visibility, it is wise to drive more slowly at night than you do during the day and to leave more distance between your car and the car ahead.

**Use low beams and high beams correctly.** On very dark roads with no other cars around, use your high beams to increase visibility. Be sure to switch back to low beams as soon as you spot the headlights or taillights of a car ahead of you. The glare of your high beams can momentarily blind another driver.

### Don't overdrive your headlights.

At night, drive at a speed that will allow you to stop within the range of your lights—that is, within the distance you can see. Driving faster than that is called *overdriving your headlights*, and makes you vulnerable to unseen hazards.

Use the 3- or 4-second rules you have already learned to help you judge a safe following distance.

### Look beyond your headlights.

Get into the habit of looking for objects just beyond your headlight beams to see possible threatening conditions. Looking beyond your headlights is essential when making turns or rounding curves.

### CHECKPOINT

1. Describe how visibility is affected by low light conditions.
2. What can you do to minimize risk when driving at night?



### WHAT WOULD YOU DO?

*What kinds of visibility problems do you face in this situation? How can you manage time and space to reduce the risk of collision?*



**S**AFETY TIPS

When the sun is directly behind you, it may shine on your rearview mirror and make seeing behind you impossible. Be aware that this is happening to the driver in front of you as well, and increase your following distance.

*Glare decreases visibility and causes you to become more easily fatigued.*



Think of a bright summer morning. The sky is cloudless and everything is bathed in sunlight. That's a pretty picture for a day at the beach, but it's not always so pretty when you're behind the wheel of a car. The glow of that sunlight can turn to dangerous glare.

### What Conditions Create Glare from the Sun?

Sunshine increases visibility, but the glare caused when the sun hits your windshield can act in the opposite way—it can diminish visibility. The sun's glare is most dangerous at certain times.

In the morning or late afternoon,

for example, when the sun is low on the horizon, glare can make it hard to see the road ahead. Glare can also reduce your ability to see the brake lights of other vehicles, especially if you're driving toward the sun and its rays shine directly in your eyes.

### How Can You Drive Safely in the Glare of the Sun?

As in all driving situations, advance preparation can help you minimize the risk of glare. As part of your predriving check, you should always make sure that your car's windshield is clean. As part of your overall car maintenance, you should replace the windshield if it is badly scratched. Glare is worse through a dirty or scratched windshield.

Have sunglasses handy. As soon as you begin to squint, slip them on to shield your eyes. Reduce speed, increase your following distance, and adjust your sun visor to block out the sun. However, be careful that the visor does not hinder your view in any way.

Use the SIPDE process to help you manage risk in glare situations. Give yourself an extra margin of safety by leaving more distance between your car and other vehicles. Check carefully for pedestrians—remember, they are having trouble seeing too. Even if you have your sunglasses on and can see road signs and signals, keep in mind that others on the road-



◀ The reflection of sunlight off snow and ice causes wide areas of glare.

way may not be able to see as clearly. Always be alert for the sudden, careless, or unsafe actions of other drivers and pedestrians.

Keep in mind that if you are having trouble seeing, so are the drivers around you. The sun shining on the back of your car may make it very difficult for the driver behind you to see your brake lights or directional signals. For this reason, it's wise to tap the brake pedal to flash your taillights, to use your turn signals well in advance, *and* to use hand or arm signals as well to communicate your intentions.

Keep in mind, too, that when the sun is behind you, oncoming drivers have the sun's glare in *their* eyes and may have trouble seeing you. Drive with your low-beam headlights on to make your car more visible, and signal well in advance your intention to turn or change lanes.

#### CHECKPOINT

3. Describe the circumstances in which the sun's light can create dangerous glare.
4. What steps would you take to minimize risk in a glare situation?



#### WHAT WOULD YOU DO?

*The sun is shining behind you. What can you do to minimize risk for both yourself and the driver behind you?*





Even though they may be necessary during winter months, snow tires reduce fuel economy. Remove them as soon as winter is over.

It might be pleasant if you could just stay indoors when it is raining or snowing outside. However, most of the time you can't. If you have to drive somewhere in rainy or snowy weather, you must understand and manage the risk that driving in such weather presents.

### How Can You Manage Visibility, Time, and Space in Rain and Snow?

Rain and snow decrease your ability to see not only ahead of you but all around you as well. Decreased visibility, in turn, makes it difficult for you to judge distances and to manage time and space well. Bad weather conditions also make it much harder for other drivers and pedestrians to see your car.

Heavy rain or snow can limit your view so much that you can't see very far ahead or even the edges of the roadway. Snow and sleet collecting on your windshield can produce blind areas that your windshield wipers can't reach. Snowy or rainy weather can also make the roadway slick, reducing the ability of your tires to grip the road, and increasing your risk of collision. Here are some steps you can take to minimize risk.

**Prepare in advance.** Start by cleaning your car's windows and lights. Check the tread and pressure of your tires. Check the headlights, windshield wipers, defroster, and other equipment to make sure they are in good working condition.

**Allow for extra margin of safety.** Drive more slowly and leave extra space between your car and other vehicles.



In some regions you may see a roadway sign that says "Bridge Freezes Before Roadway" posted on the approach to a bridge or overpass. In winter, the temperature of the ground beneath a road is often higher than the air temperature. The roadway on a bridge or overpass, however, has no ground directly beneath it. As a result, cold air circulates freely both above and below the bridge, which can cause it to freeze before the roads on either side of it. Bridges and overpasses also tend to remain frozen longer than the connecting roads.

When you see a sign like the one just described, reduce speed and proceed with care. An unexpected patch of ice could cause your car to skid.

When the temperature is near freezing and roads are wet, exercise similar caution when driving on shady sections of any sunlit roadway. The sun's warmth may have kept most of the road ice-free, but ice may have formed in the lower temperatures of the shade.

**Drive in the tracks of the vehicle ahead of you.** Those tracks are drier than the surrounding surface and offer better traction.

**Give other drivers plenty of advance notice.** When you intend to slow down or turn, communicate your intentions early so that other drivers have time to react accordingly.

**Be alert.** Be on the watch for pedestrians dashing for shelter.

**Keep your low-beam headlights on.** Increase the distance you can see and make your car more visible to other drivers and pedestrians.

**Ease your way into turns and curves.** Avoid sudden acceleration, starts, or stops.

If rain becomes so heavy that not even your windshield wipers' highest speed can keep up with the downpour, signal, then pull well off the road in a protected area and wait for the storm to lessen in intensity. Remember to switch on your emergency flashers so that other drivers can see your car.

You may also need to pull over if, in snow or sleet, your windshield wipers become crusted with ice, or if accumulating snow or sleet creates blind areas on your windshield. Use a scraper and brush to remove all of the buildup, and run your defroster before you resume driving. If you can, aim the heat at the windshield.

### **How Can You Minimize Risk in Snow and Rain?**

If you've ever gone sledding, skiing, or ice-skating, you know just how slippery a snow- or ice-covered surface can be. Imagine trying to ma-



## *Tips for New Drivers*

### **Stuck in the Snow?**

If you get stuck in snow, you may be able to free your car by "rocking" it. Follow the steps below.

1. Keep your front wheels pointed straight ahead, if possible. The car will move more easily in a straight line.
2. Shift back and forth between Drive (or First gear) and Reverse. Accelerate forward slowly and steadily. When the car will move forward no farther, press firmly on the brake to stop and hold the car while you quickly shift to Reverse.
3. Release the brake and accelerate with gentle pressure as far back as the car will go until the wheels start to spin. Step on the brake again and hold it while shifting to Drive or First gear.
4. Repeat as necessary. Do *not* spin your wheels: You'll only dig yourself in more deeply.

Repeat these shifts as quickly and smoothly as possible, but be sure to use the brake to hold the car at a stop while shifting gears. Each forward-and-backward movement should take the car a little farther in one direction or the other.

When rocking a car, proceed cautiously. If the tires do suddenly grip, the car may lurch forward, backward, or sideways. Warn bystanders to keep their distance, and take care not to strike nearby cars or objects.

neuver a heavy, fast-moving car on such a surface. One way to avoid risk entirely is to postpone driving until the weather clears. Whenever possible, wait until the roads are plowed and sanded or salted before venturing out on them.

Sometimes, of course, you cannot postpone a trip. If you do have to drive under snowy or icy conditions, be aware that there is a great danger of skidding. Drive slowly and extremely cautiously. Allow yourself an extra large margin of safety. When you do want to slow down, stop, or turn, maneuver the car gently and gradually.



**If you are approaching a large vehicle on a slush-covered roadway, turn on your windshield washers and wipers about 2 to 3 seconds before you meet. This gets the glass wet and will help to clean the glass quickly after you pass.**

## SAFETY TIPS

Avoid using your high beams in heavy rain, sleet, or snow. Under such conditions, light is reflected back into your eyes, decreasing your ability to see.



### WHAT WOULD YOU DO?

How would you get your car out of the snowdrift?



Keep on hand the cold-weather items you may need, such as a windshield scraper and brush, a shovel, jumper cables, emergency flares, and gloves.

### Anticipate and Prevent Skids

If you change speed or direction gradually and smoothly rather than abruptly, you will minimize the risk of skidding. In Chapter 13 you will learn what to do if your car does go into a skid.

Anticipate situations in which skids are likely, and take steps to maintain control of your car. For example, when driving on a wet road when the temperature is near freezing, allow yourself extra time and space to brake and steer. If you're approaching a sharp curve or steep hill, slow down well in advance and keep a firm grip on the steering wheel. When you have to turn the

wheel, do so slowly and only as much as necessary.

When you know that you'll have to stop for a stop sign or red signal light on an ice- or snow-packed roadway, shift to Neutral and press the brake pedal down gently. Shifting to Neutral helps you to brake and to prevent skidding by eliminating the thrust effect of the wheels.

### Anticipate and Prevent Hydroplaning

During the first 10 to 15 minutes of a rainfall, the roads are at their slickest. This occurs because the rain's moisture mixes with surface dirt and oil to form a slippery film. This film greatly reduces the ability of your tires to grip the road.

At speeds as low as 35 mph, the tires of a vehicle will begin to skim along the wet surface of the road, much like a water-skier zipping across the surface of a lake. The car may completely lose contact with the road and be moving on a thin film of water. This is called *hydroplaning*. Hydroplaning is very dangerous because it severely limits your ability to control your car. To reduce the chance of hydroplaning, reduce speed by about one-third when driving on wet roadways.

### CHECKPOINT

5. What strategies can you use to manage visibility, time, and space in rainy or snowy weather?
6. What risks can you anticipate when driving in rain or snow? What steps can you take to minimize them?

Fog rolling in off the water, industrial smog, or a sudden dust or sand storm can diminish the light of a bright, clear day. Strong gusts of wind can blow your car off the road. You can learn to minimize risk under these conditions.

### How Can You Minimize Risk in Other Hazardous Weather Conditions?

Just as you must understand and learn how to manage the risks of driving in rain and snow, you must also understand and learn how to manage the risks posed by other weather hazards.

#### Fog or Smog

Dense fog poses unique hazards. Scattered patches of thick fog may occur so suddenly that your field of vision is cut without warning. If the humidity is high enough, moisture can accumulate both inside and outside your windshield, further reducing your already limited visibility. Turn on your windshield wipers and defogger as necessary.

Your low-beam headlights are essential when driving in fog, both to help you see and to enable others to see you. If the fog is thick, you may also want to switch on your emergency flashers, to further increase your ability to be seen.

Resist the temptation to put on

your high beams. The small droplets of water in fog reflect light back into your eyes, making visibility much poorer with high beams than with low beams.

To better manage time and space when driving in fog, reduce speed, increase your following distance, and remain alert for sudden movements.

If fog is very dense, the wisest thing to do is to signal and pull off the road—to a rest area, if you can—and wait for conditions to improve. Do *not* stop on the road. If you are not near a rest area, steer off the road, stop outside a guardrail if possible, and turn off all lights.

In some areas, industrial smoke and other kinds of air pollution create smog that decreases drivers' visibility as much as does fog. Methods described for driving in fog are equally useful for smog conditions.

#### Sand and Dust

In some parts of the country, sand and dust cause serious visibility problems. In desert areas, for example, sandstorms and dust storms can make it all but impossible to see. This severe decrease in visibility greatly increases the risk of a collision.

If possible, avoid driving in sandstorms and dust storms. If you're caught in such a storm, signal, pull off the road, turn on your flashers, and wait for the storm to pass.

If you must drive, use your low-beam headlights, and proceed slowly and very cautiously.



In ancient Babylonia more than 4,000 years ago, a 3,000 foot long tunnel was built under the Euphrates River. The tunnel connected the royal palace with the temple of the gods. The Babylonians were able to build the tunnel by re-routing the river during the dry season. The tunnel was lined with brick and was used only by pedestrians.

## Advice From the Experts

Gary Guzouskas, Administrator, New Hampshire Department of Education



Gary Guzouskas

As you drive you may encounter various conditions that affect your ability to see and operate your car safely. To reduce risk, use your headlights every time you drive and keep them clean and aligned. Be alert to changing environmental and roadway conditions. When buying a car, consider one whose design limits blind spots and whose color enhances its ability to be seen.

Whenever visibility becomes limited, adjust your speed and position to provide more space between your car and other highway users.



### WHAT WOULD YOU DO?

Explain how you would manage risk in this situation.

### Wind

Depending on the size and weight of the car you're driving, high winds can be a nuisance—or downright dangerous. Wind can buffet cars traveling on a highway like boats tossed in stormy seas. A strong enough gust of wind can actually push a light-weight car right out of its lane!

Under windy conditions, reduce speed and grip the steering wheel

firmly to maintain control of your car. Leave extra space between your car and nearby vehicles, especially those that are likely to be affected by the wind, such as vans, recreational vehicles, and cars pulling trailers.

Be aware that nature is not the only source of wind. When a bus, truck, or tractor-trailer speeds by your car—in either direction—you'll feel a powerful blast as it passes. Always allow as much distance as possible to the side between your car and a passing large vehicle. In this way, you can minimize the force of the resulting wind gust. On a two-lane highway, for example, hug the right edge of the road.



### CHECKPOINT

7. What weather conditions other than snow and rain pose dangers for drivers? What risks would you anticipate in these conditions?

# CHAPTER 11 REVIEW

## KEY POINTS

### LESSON ONE

1. Reduced light during dusk and dawn and at night makes it harder for you to see and for other drivers and pedestrians to see you. At night, your view of the roadway and off-road areas is limited, and you have to cope with glare from the lights of oncoming vehicles.

2. When driving in low light, reduce speed, increase following distance, signal turns well in advance, and use your low or high beams as appropriate. At night, look beyond your headlights, but drive at a speed that will allow you to stop within their range.

### LESSON TWO

3. In the morning or late afternoon, when the sun is low on the horizon, glare makes it hard to see the road and the brake lights of other vehicles.

4. To minimize the risk from sun glare, wear sunglasses and use your sun visor. Reduce speed and increase your following distance.

### LESSON THREE

5. Steps you can take to manage visibility, time, and space in rain or snow are to prepare in

advance, leave an extra margin of safety, drive in the tracks of the vehicle ahead of you, signal other drivers early, keep your low-beam headlights on, and ease your way into turns and curves.

6. To minimize risk in rain or snow, postpone driving until the weather is clear, maneuver the car gently and gradually to prevent skids, allow extra time for braking and steering, and drive slowly to avoid hydroplaning.

### LESSON FOUR

7. Fog and smog decrease visibility. When driving in these conditions, keep on low-beam headlights, reduce speed, and increase following distance. If the fog or smog is very dense, pull off the road and wait for driving conditions to improve.

Sand and dust storms can make it impossible to see. During such storms it is best to pull off the road and use emergency flashers to alert other drivers of your presence. If you must drive, use low-beam headlights and proceed with caution.

In heavy winds, reduce speed and grip the steering wheel firmly to control the car; increase the distance between you and other vehicles, especially RVs, vans, and cars pulling trailers. When being passed by a large vehicle, allow as much distance between your car and it to minimize the force of the resulting wind gust.

## PROJECTS

1. The laws governing when and when not to use headlights and parking lights vary from state to state. Find out what the rules are in your state. Take an informal survey of drivers you know. How many are aware of your state's regulations?

2. Automotive stores sell various products designed to help drivers cope with winter driving. Visit an automotive store and evaluate the usefulness of several such products. Which would you buy? Which would you avoid? Why? Discuss your findings with the class.

# CHAPTER 11 REVIEW

## BUILDING MAP SKILLS

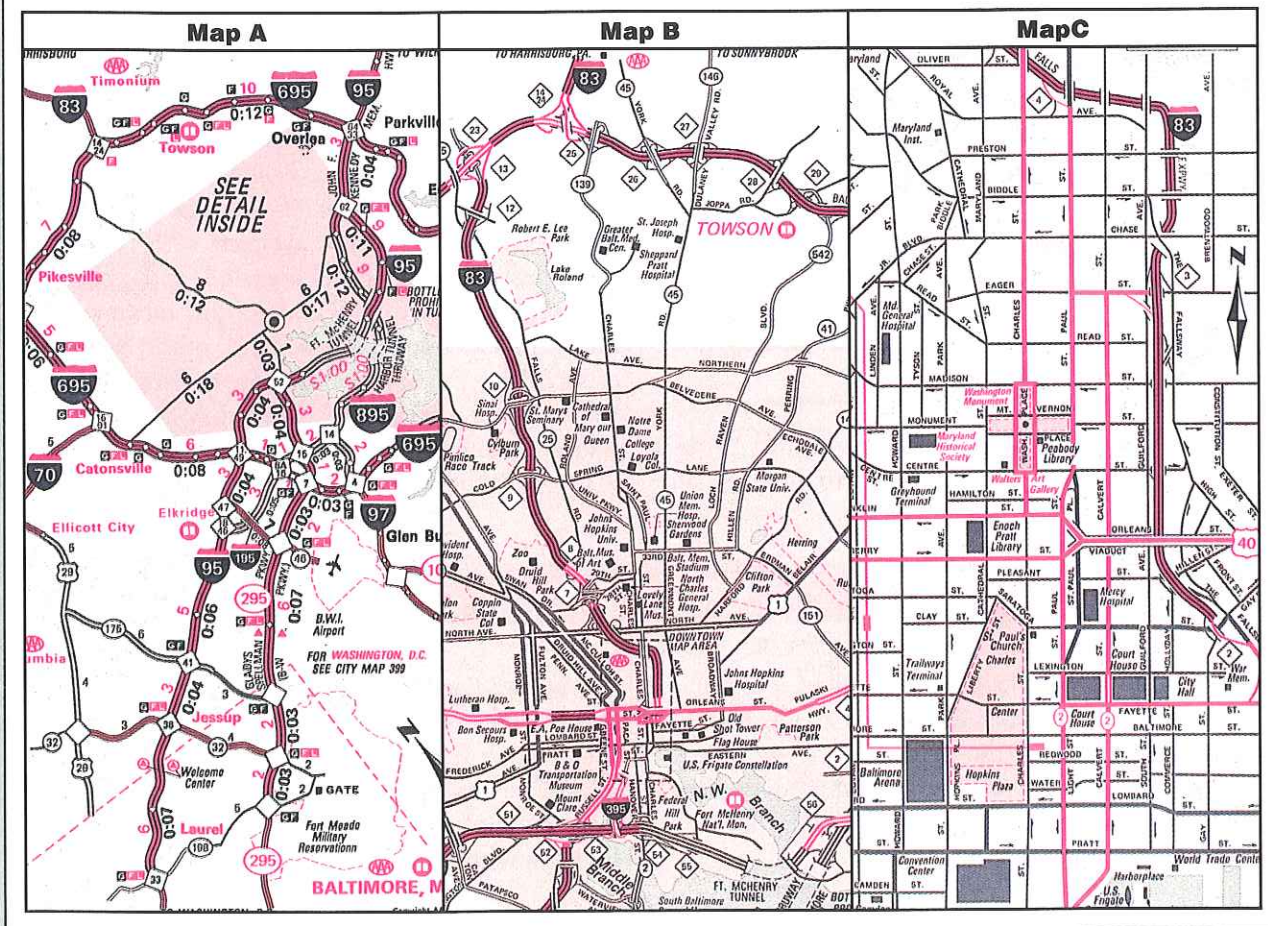
### Using a Triptik

A *Triptik* is a continuous series of strip maps in booklet form put out by the American Automobile Association (AAA). A *Triptik* provides detailed routing from the place you are traveling from to the place you want to go. All you have to do is flip the strips.

The front page of each strip map shows a section of a through, cross-country route and all necessary highway details (Map A). The center-fold contains an area map (Map B). It shows the area surrounding the major route, so that you can deviate from the marked route if you choose. The back page ordinarily shows detailed maps of cities along the marked route (Map C).

### Try It Yourself

1. On which map would you find the route highlighted for best travel through Baltimore? What route is this? What else does the map tell you about this route?
2. You are at the corner of Bentwood Avenue, heading west on Chase Street. Describe how you would get to the Baltimore Arena. Which map would you use?
3. Suppose you are north of Baltimore, traveling south on Route 83. You want to take Route 45 into the city. Which map would you use? How would you get to Route 45?



# CHAPTER 11 REVIEW

## CHAPTER TEST

Write the letter of the answer that best completes each sentence.

- You can lessen the risk created by the sun's glare by
  - opening your sunroof.
  - using your high beams.
  - wearing sunglasses.
- You should keep your low-beam headlights on
  - at all times, day or night.
  - from dusk until dawn.
  - only when you cannot see.
- As visibility decreases
  - your risk of being involved in a collision decreases.
  - your risk of being involved in a collision increases.
  - the barometer rises.
- Using your high beams in fog can
  - increase visibility by as much as 250 feet.
  - decrease your ability to see.
  - warn other drivers of your approach.
- A dirty or scratched windshield
  - can cause you to skid in bad weather.
  - can worsen the effects of glare.
  - has no effect on glare.
- During dusk and dawn hours, it is
  - more difficult for other drivers and pedestrians to see you.
  - easier to hydroplane.
  - easier to see the roadway.
- To brake safely on a snow-packed road,
  - quickly press the brake all the way to the floor.
  - shift to Neutral and press the brake gradually.
  - shift to Overdrive and press the brake.

- Dense fog can
  - permanently affect the surface of your windshield.
  - cause moisture to accumulate on the inside of your windshield.
  - cause elevated roadways to freeze.
- If you are caught in a sand storm, you should
  - use your windshield wipers.
  - pull off the road and put on your emergency flashers.
  - use your high beams.
- A car traveling on a wet road at 35 mph can
  - get increased gas mileage.
  - lose contact with the road entirely.
  - develop engine trouble.

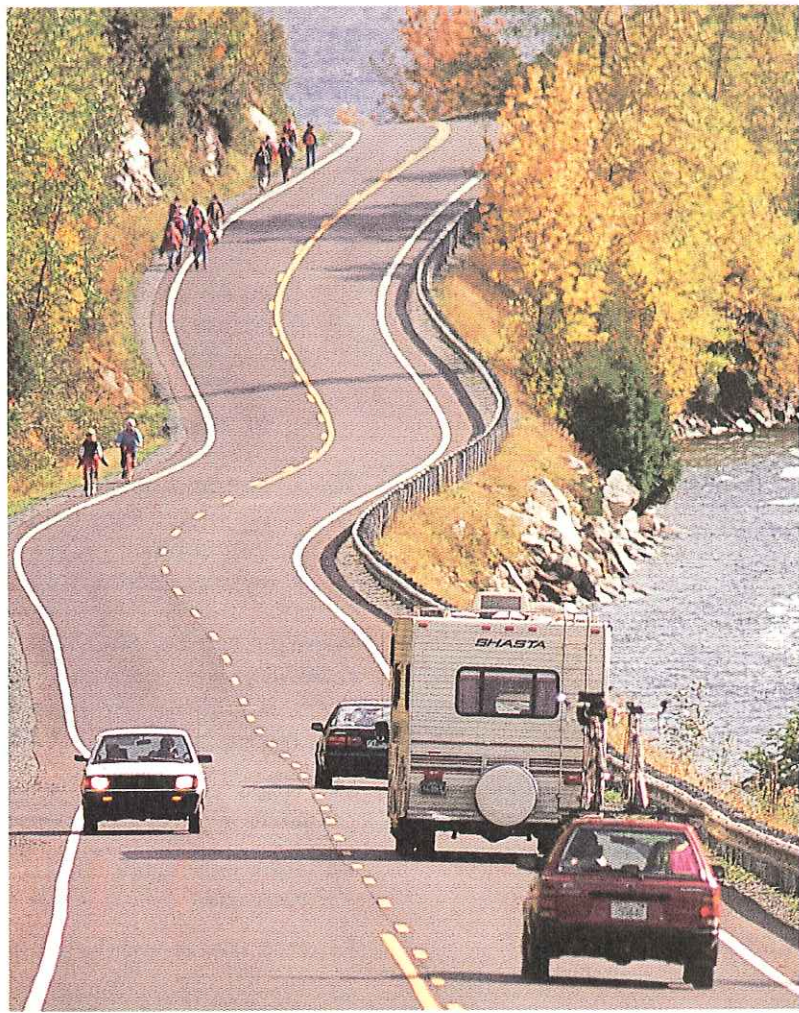
Write the word or phrase that best completes each sentence.

- |            |             |            |
|------------|-------------|------------|
| sun visor  | temperature | smog       |
| hydroplane | windshield  | taillights |
- When you \_\_\_\_\_, your car skims along the surface of water on the roadway.
  - Your headlights and \_\_\_\_\_ help to illuminate your car.
  - One way to avoid glare is to use your \_\_\_\_\_.
  - Air pollution and smoke can create \_\_\_\_\_ that decreases drivers' visibility as much as does fog.
  - Glare caused when the sun hits your \_\_\_\_\_ can diminish visibility.

## DRIVER'S LOG

In this chapter, you have learned how different light and weather conditions affect the driving task. Imagine the weather is between 25 and 35 degrees and it is beginning to rain. Write a weath-

er advisory for drivers that gives hints on driving safely in these conditions and what conditions drivers might expect later in the day.



## CHAPTER ♦ 12

# SHARING THE ROADWAY

The society of roadway users includes motorists, pedestrians, and cyclists. It is important to learn how to interact safely with others on the roadways. Good drivers do this by communicating with and anticipating the actions of others.