



chapter 15

DRIVING IN RURAL AREAS

- 15.1 Characteristics of Rural Driving
- 15.2 Using Basic Skills in Rural Areas
- 15.3 Passing and Being Passed on Rural Roads
- 15.4 Rural Situations You Might Encounter
- 15.5 Special Driving Environments

KEY IDEA

What knowledge and skills are necessary to drive safely and responsibly in rural areas?



YOU'RE THE DRIVER

Even if you live in the city, you will probably drive on rural roads at some point. Driving in rural environments presents some unique and challenging situations. How does this road differ from a city street? What's unique about the roads, terrain, hazards and vehicles that you'll encounter on rural roads?

Lesson 15.1

CHARACTERISTICS OF RURAL DRIVING



OBJECTIVES

Identify rural roadway factors to consider when selecting a safe speed. Analyze traffic control factors to show how they help warn and guide drivers on rural roads.

KEY VOCABULARY

Identify

Rural roads comprise nearly 80 percent of all the roadway mileage in our country. They also account for 40 percent of the vehicle miles traveled and nearly 61 percent of our nation's traffic fatalities. Wide-open spaces and less traffic are common characteristics of rural roads, but don't assume that conflicts won't occur. As statistics show, rural driving has its challenges.

Rural Roadways

Rural roads are constructed of many different types of materials. Some are paved and others are not. Shoulders can be wide or narrow, paved or gravel. Road surfaces may be smooth or in very poor condition.

Lack of adequate lighting can make visibility difficult at night. Trees and other foliage can also restrict one's line of sight on sunny days or during evenings, casting deceptive shadows.

Safe Speed

Determining a safe speed is critical for safe rural driving. Speed affects your line of sight, stopping distance, and vehicle control, and the amount of damage and injury suffered in the event of a collision.

Many rural roads have a speed limit of 55 mph or more. Depending on conditions, lower speeds may be posted. There is a difference between safe speeds and posted speeds. Posted speeds are the maximum legal speeds allowed under ideal conditions. When conditions are not ideal, a slower speed is safer. Other roadway users, inclement weather, hills, and the surface conditions of the roadway determine safe speeds. Never drive faster than conditions allow.

Side roads, and entrances to fields may be difficult to identify. **Identify** Did you see the vehicle that pulled out onto the road?



Traffic Controls

Traffic controls—signs, signals, and lane markings—direct, regulate, inform, and warn drivers. Traffic controls provide advance information and warning of hazards that you cannot yet identify, major intersections ahead, passing conditions, unusual or hazardous conditions (curves, shoulders, animal crossings), and traffic channeled into reduced space.

Most warning signs use **graphics** or pictures. They alert drivers of hazardous conditions. In **FIGURE 2**, why do you think the warning sign is placed where it is? Hills can block your line of sight, your view of the situation ahead, and your path of travel. Paying attention to warning signs will help you reduce your speed well in advance.

Traffic controls can be complex, especially at intersections where rural highways cross. Identify them early to avoid conflicts.

Roadside Hazards

Use the road conditions to determine a safe driving speed. Older, less-traveled rural roads are often narrow and not maintained as well as more-traveled rural roads. Roads may have potholes or other damage that affect your ability to control your vehicle.

Shoulders may be soft, narrow, and uneven with the edge of the roadway. Deep ditches may be present just inches from the shoulder.

Trees, shrubs, or snow piles created by plows can restrict your line of sight. These conditions also make it difficult for drivers trying to enter the roadway to see you and other traffic. Be alert; drivers could turn into your path of travel without warning.

review it 15.1

1. What are three roadway conditions commonly found in rural driving?
2. What factors should you use to help select a safe speed when driving on rural roads?
3. List three examples of common rural roadside hazards.

Critical Thinking

4. **Decide** The road ahead is wet with standing water in the left tire track of your lane. A tractor

just pulled into traffic and is picking up speed; mud is flying off its rear tires. You are closing in and cannot see around the tractor. What should you do, and why?

IN THE PASSENGER SEAT

Observe Rural Roadway Surfaces

While traveling on some of the different rural roads in your area, take note of the different types of materials that the roads are made of. Report your findings to your class.

FIGURE 2

Many drivers assume that they are less likely to crash on a rural road. **Identify** Can you see the intersection ahead?



Lesson 15.2

USING BASIC SKILLS IN RURAL AREAS

OBJECTIVES

Explain how IPDE and Zone Control should be applied in rural driving. Explain the appropriate steps to use to safely handle curves, hills, and intersections. Identify rural situations that require greater following distances. Describe characteristics of multilane rural highways and explain how to safely enter a curve.

VOCABULARY

advisory speed sign
 median

Don't be fooled by a seemingly quiet rural scene. It can quickly change with little warning. Remember, whenever and wherever you drive, you will encounter risks. However, as you learned in Chapter 5, by properly applying IPDE and Zone Control driving techniques, you empower yourself to better manage the level of risk.

Applying IPDE and Zone Control

Rural driving typically involves driving at higher speeds than in urban driving situations. The faster you drive, the less time you have to identify and respond to sudden hazards in your path of travel. At higher speeds, you increase the risk of losing control in situations that demand quick responses.

While traveling on rural roads, there are many ways your zones can become closed. To best apply IPDE and Zone Control, you must control your speed. The slower your speed, the more time you have to solve problems. One or two additional seconds can make a great difference in your ability to successfully apply the IPDE Process and manage space.

Maintaining vehicle control at higher speeds is more difficult than at lower speeds. It takes longer to stop, and excessive braking or steering can result in a skid and loss of vehicle control. Assess road conditions and the amount of traction available, and adjust your speed accordingly. Drive at a speed at which you know you will be able to brake and steer your vehicle without losing control.

EXERCISE 3
 How do you identify points of conflict in this situation?



FIGURE 4
 You should search 12–15 seconds ahead in this situation. **Identify** What four warning signs were you able to identify?

Visual Search Pattern

You should apply the orderly visual search pattern technique in rural areas where your 12–15-second visual lead covers more area because of the higher speeds.

Whenever possible, in open areas, extend your visual lead. You may find that in some situations you are able to establish a visual lead of up to 30 seconds. The greater your visual lead, the more time you will have to identify and safely respond to hazards and unexpected situations.

Curves, Hills, and Intersections

Rural roads have some common characteristics such as hills, curves, and intersections. Knowing these characteristics beforehand can help you handle them safely while driving.

Curves Rural roads typically have many curves. When a driver has difficulty handling a curve, it is typically the result of having too much speed on the approach to the curve. Before approaching a curve, you likely will notice a yellow warning sign that warns of the potential hazard ahead. These signs often are located 250 to 700 feet before the curve, depending on the posted speed limit. A warning sign for a curve is yellow with a black arrow showing the direction of the curve. The sharper the curve of the arrow, the sharper the actual curve ahead.

- 5 You are approaching this curve.
 te What should you do to safely handle the curve?



Curve warning signs often have smaller yellow rectangular **advisory speed signs** just below the main sign. Advisory speed signs provide suggested maximum travel speeds under ideal conditions for the curve ahead. Advisory speeds are usually lower than the posted speed limit for other sections of the roadway.

Follow the recommended speeds, and when conditions are less than ideal, use a slower speed. Remember that natural forces work to push your vehicle to the outside of the curve. At higher speeds, these forces are even greater.

When you approach a curve, follow these steps:

1. See the curve in your target area.
2. Check your rear zone.
3. Check your left-front zone for oncoming traffic.
4. Check your right-front zone to determine if it is open or closed to your line of sight and path of travel.
5. Stay in or get into lane position 1.
6. If the curve is sharp, lightly apply your brakes and hold until the midpoint of the curve before you turn the steering wheel.
7. As you get closer to the curve, look in the direction the road curves. See if your path of travel is open.
8. Once you are beyond the midpoint of the curve, begin to accelerate gently if conditions allow.
9. Identify and evaluate your new target area, steer toward that target area, and search ahead for possible zone changes.

Hills Hills are not normally marked, unless they have steep slopes. Hills restrict your line of sight because you cannot see what is on the other side. As you approach the crest of a hill, slow down and use lane position 1. At night, look at the crest of the hill for light, since this can indicate an approaching vehicle. If needed, use lane position 3 to provide more space between you and any oncoming vehicle.

Intersections Rural intersections can vary. Some may have traffic lights; others just STOP signs. Identifying intersections early will help you anticipate possible problems and give you extra time to deal with them.

Most rural intersections have a side road intersecting a main road. The side road usually has a STOP sign. Often, tall crops, trees, or bushes create line-of-sight restrictions.

Driveways should be treated like intersections but may be very difficult to identify, especially at night. Look well in advance to identify signs of driveways ahead such as loose gravel spilling onto the main road; reflectors marking a driveway; or mailboxes at the edge of, or immediately across from, a driveway.

Following Traffic

Although traffic is usually not very heavy on rural roads, you will come upon other vehicles. Since speeds are greater, always maintain a safe following distance of three or more seconds. When conditions are less than ideal, increase your following distance.

Maintaining a following distance of more than three seconds gives you a better view of traffic and conditions ahead and allows you to keep a more open front zone. This extra cushion of space gives you more time to use IPDE and Zone Control. Use greater following distances when being tailgated, driving on a steep downhill slope, or following a motorcycle.

Driving on Multilane Roads

Some rural roads have multiple lanes that travel in the same direction and higher posted speed limits. However, unlike interstate roads, they may have intersections instead of exit and entrance ramps. Some intersections may have a two-lane road crossing a four-lane road; others may involve two major multilane roads that cross.

Multilane Roadways with Center Lines Many multilane rural roads have only a yellow line (dashed or solid) separating high-speed traffic moving in opposite directions. You should never cross a solid yellow line except

FIGURE 6 You are driving behind this car and closing in. **Decide** Will you pass or not?



7. A median safely separates lanes of traffic that move in opposite directions.



to make a left turn or clear an obstacle blocking your lane because the danger of a head-on crash is very high.

Divided Roadways All divided roads have traffic moving in opposite directions separated in some way. The division may be a guardrail, fence, or a **median**, as shown in **FIGURE 7**. A median is an area of ground or concrete separating traffic moving in opposite directions. A median can be from a few inches wide to several feet wide.

When you have to cross a multiple-lane road, cross each half as if you were crossing a one-way street. If a large enough median crossover area exists, move into it and if traffic from the right dictates that you stop, stop in your own lane, just to the right of the center of the median crossover area. If you need to turn left after stopping,

remember you'll be entering the nearest lane, which is the fastest lane of traffic moving in the direction you want to go. You will need to look for a large enough gap to enter this lane safely. Look for at least a 6–8 second gap.

Lane Selection When driving on a multilane roadway, always try to drive in the right-hand lane, unless signs indicate otherwise. The left lane is usually for passing or for preparing for a left turn. In some states, it is even illegal to drive in the left lane unless you are passing.

Turning at Intersections When leaving a multilane roadway, turn right from the right lane. When making a left turn, turn from the left lane nearest the center line or median strip.

Some multilane roads have special turn lanes. When preparing to turn, check your rearview mirror for possible conflicts in the rear zone. Signal your intention to turn early, at least five seconds before the actual turn.

Signaling early gives vehicles behind you a chance to adjust their speed and position to minimize conflict. If turning left, wait with your wheels straight until you start your turn. If you are hit from behind, you will not be forced into oncoming traffic.

If you see a vehicle approaching you from behind very fast and believe it may not be able to stop in time, do not make your turn. Instead, accelerate quickly and go straight ahead if the conditions of the intersection allow you to. If you are hit from behind, it is better to be moving in the same direction as the vehicle striking you than to be stopped.

Entering a Multilane Road Follow these procedures if you are on a side road and wish to enter a multilane roadway:

- To turn right, check traffic to the left, ahead, and to the right of your target area. Make certain the left, front, and right zones are open. Enter the nearest right lane as you turn. Look and steer toward your target and accelerate to the prevailing speed. If a lane change left is needed, do so only after you complete your turn, clear the intersection, and attain the prevailing speed.
- Left turns require larger gaps than right turns. First, make certain you have checked left, front, and right zones. When it is safe, cross the lanes on your side of the roadway. Choose a time when no traffic is approaching from your right in the far left lane of the road you will be turning into. Then turn into the nearest lane. Accelerate more quickly to the prevailing speed than you would for a right turn.

Entering the roadway from a driveway is similar to entering from a side road and presents similar problems. Oncoming drivers may not see you because of line-of-sight restrictions. Although drivers may have advanced warnings of intersections ahead, driveways rarely have warning signs.

review it 15.2

1. How should IPDE and Zone Control be applied in rural driving?
2. List the steps you should take in handling a curve.
3. What are two situations that would require you to establish a greater following distance when driving in a rural area?
4. What are the steps to take for making a left turn onto a multilane rural highway?
5. **Apply Concepts** You are at a STOP sign on a side road that intersects a multiple-lane highway. You want to continue going straight. The median has a large enough crossover area to accommodate two vehicles side-by-side. Where should you position yourself in the median?
6. **Compare and Contrast** How is crossing a multilane roadway without a median area large enough for cars to pull into similar to crossing a multilane highway with a large median? How is it different?

IN YOUR COMMUNITY

Research Choose a rural area, near where you live. Find out what law enforcement agencies are responsible for this area. Arrange an interview with a representative from each agency, and find out what factors cause most crashes in the rural area. Write a brief report summarizing your findings and be prepared to report your findings to your class.



Lesson 15.3

PASSING AND BEING PASSED ON RURAL ROADS

OBJECTIVES

Identify the steps for passing on two-lane rural roads and multilane roads. Describe situations where passing should never be attempted. Describe the actions to take when being passed.

VOYABULARY

being passed

WHAT SHOULD YOU SAY?

Safe Passing You are driving in the center lane of a three-lane highway. There are slower vehicles ahead in both the left and center lanes. What would you say to your driver and if she wanted to pass?



Passing on a two-lane road carries a higher level of risk than passing on a multilane road. When you pass on a two-lane rural road, you will be in the same lane as oncoming traffic for a short period of time. Use the IPDE Process and the Zone Control System to help lower your risk when passing.

Passing

Passing is a three-stage process. The three stages are the decision stage, the preparation stage, and the execution stage.

Deciding to Pass In situations where you want to pass a vehicle, you should scan ahead to see if there are any turns. Before you start a passing maneuver, you must first assess the situation and then decide when to pass. You must ask yourself: Is it worthwhile? Is it legal? and Is it safe?

Consider passing only if you can answer yes to all three questions. Remember, the major responsibility for passing safely rests with the driver who is passing.

Preparing to Pass If you believe the vehicle ahead of you will be turning, delay passing and maintain a minimum following distance of three or more seconds. If you've answered yes to all three questions above, follow these steps in preparing to pass:

1. Check all roadway signs and markings to be sure it is legal to pass.
2. While maintaining a following distance of three seconds or more, look ahead to your target area to make certain it is safe to pass.
3. If there are no conflicts ahead, get into the ready position (a two-second following distance), and then get into lane position 2.
4. Check roadway conditions. Is there anything that might cause the vehicle ahead to swerve left?
5. Check your rearview mirror for possible conflicts in your rear zone. Delay passing if your rear zone is closing because of another vehicle rapidly approaching from behind.

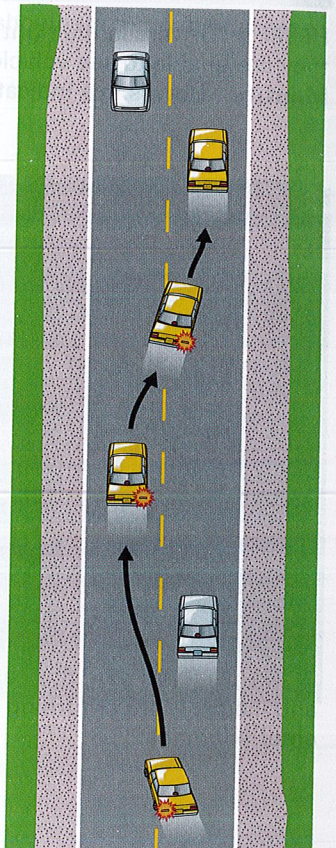
6. Glance over your left shoulder to make certain no vehicles are in your blind spot.
7. Check the oncoming traffic lane again to be sure there are no vehicles approaching and that you have enough space to safely pass. Oncoming vehicles must be at least 30 seconds away. You will need 10–15 seconds to complete your pass. **If in doubt, do not pass.**
8. Check ahead for driveways and side roads. Make sure no traffic will be entering the roadway ahead.

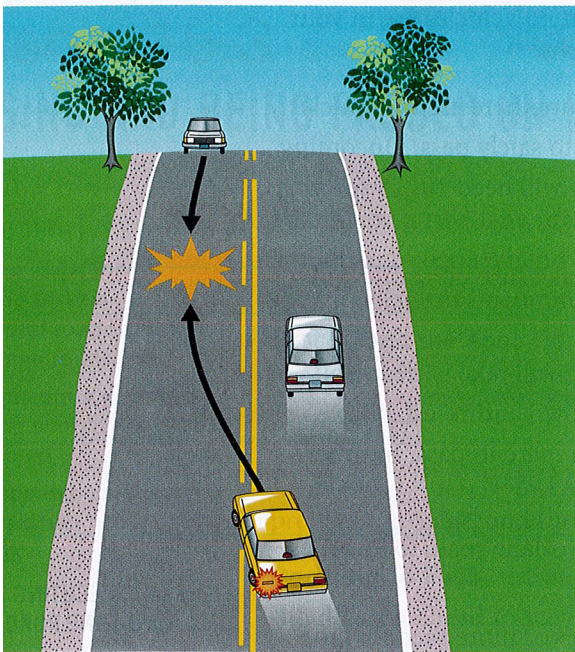
After you have made certain that the path you will take is clear, you are ready to pass. If you identify a problem, slow down and re-establish a safe following distance. Repeat the steps again to prepare to pass. In time, these steps will become a habit.

Executing a Pass When executing a pass on a two-lane road, follow these steps:

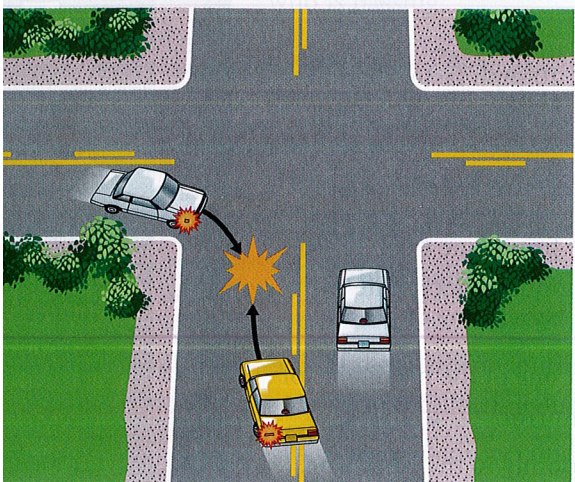
1. Move from your following distance position (3 or more seconds) to your ready position, which is 2 seconds behind the vehicle you intend to pass.
2. When it is safe to pass, signal left to prepare for your lane change, and check over your left shoulder to make sure no vehicles are in your blind spot.
3. Change lanes smoothly and accelerate at least 10 mph faster than the vehicle you are passing. However, all passing should be done within the speed limit.
4. Make a final evaluation. Provided you have not passed the vehicle, you can change your mind if any conflicts to your front zone exist 20–30 seconds ahead. If your front zone is clear, continue to accelerate to proper speed.
5. Maintain your speed until you can see at least one of the headlights of the vehicle you are passing in your rearview mirror.
6. Signal for a right lane change, and return smoothly to the right lane. Do not slow down.
7. Cancel your turn signal and adjust your speed and lane position.

FIGURE 8 EXECUTING A PASS ON A TWO-LANE ROADWAY





9 Drivers in the right lane must not pass, as they are unable to see vehicles coming over the hill. How is this indicated by the road markings?



10 Passing at or near an intersection is dangerous and illegal. A driver turning from the crossroad might enter your lane.

Passing on Multilane Roads You need to be cautious on a multilane highway with only a center line to separate traffic. Check all lanes going in your direction before you pass on a multilane roadway to make sure your path of travel is clear.

Generally, all passing should be done in the left lane. Passing on the right is illegal in many states. However, it sometimes becomes necessary to use the right lane to pass a vehicle. Remember the procedures for passing and follow them every time you pass.

No-Passing Situations

No-passing situations are marked by solid yellow lines, as shown in **FIGURES 9 AND 10**. Signs can also mark no-passing zones. Rectangular white signs on the right side of the road will indicate **DO NOT PASS**; yellow pennant-shaped signs are on the left side of the road and indicate a **NO PASSING ZONE**. Passing is illegal and unsafe when your line of sight is restricted, your front zone is closed, or cross-traffic is present, even if no warning signs or lines are present.

No Passing on Uphill Roads

Passing is not allowed within 700 to 1,000 feet of the top of a hill. Notice that the driver of the yellow car in **FIGURE 9** has too great a restricted line of sight to pass safely.

No Passing at Intersections

Passing is illegal within 100 feet of an intersection. Slow down when approaching an intersection.

Other No-Passing Situations There are other situations where passing is **prohibited**, or illegal, in some states or should not be attempted. For example, you shouldn't pass

- within 100 feet before a railroad crossing;
- on a two-lane bridge or underpass; on curves, where your line of sight is so restricted you cannot see around the curve;
- when the vehicle ahead is traveling at or near the speed limit;
- in fog, rain, snow, or anytime your line of sight is restricted;
- when several vehicles are ahead of you. You should pass only one vehicle at a time.
- when you cannot complete a pass before the start of a no-passing zone;
- any time oncoming traffic is too close; and
- when you will be stopping or turning soon.

Being Passed

If you are the passing driver, you have the majority of the responsibility for passing safely. However, you also have responsibilities when being passed.

You must be aware that another vehicle is passing, even when the driver of the vehicle fails to properly warn you. Check your mirrors often to identify vehicles approaching from the rear.

When another vehicle passes, it may help to move to lane position 3. By doing so, you provide an extra space cushion and provide the passing driver with a better view ahead.

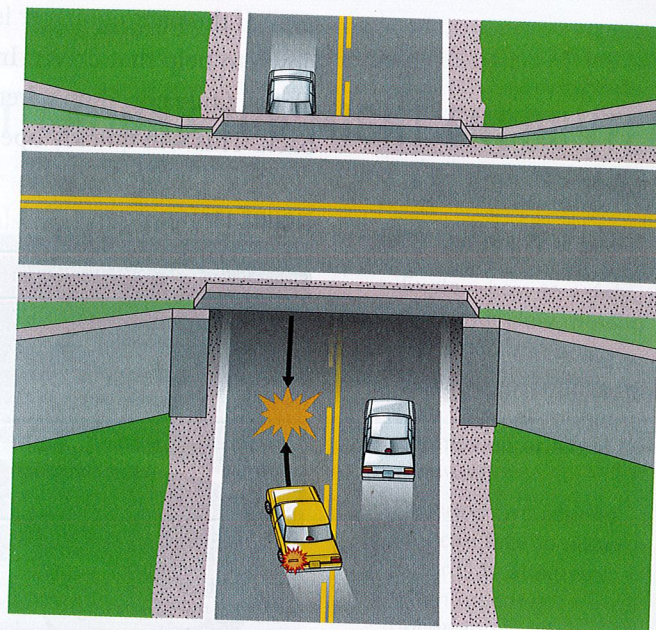


FIGURE 11 Do not pass on bridges and near underpasses, since they might not have shoulders to provide escape areas.

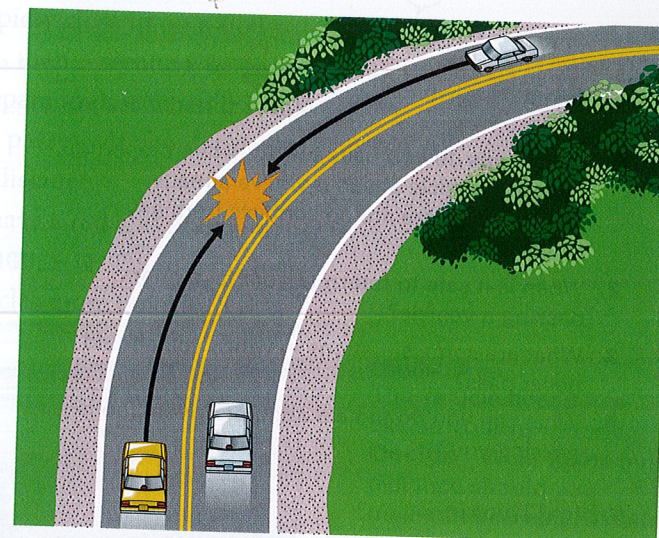


FIGURE 12 Evaluate Why is passing illegal in both lanes around this curve?

If the passing driver is having a difficult time trying to pass, slow down to help that driver. Intentionally speeding up while being passed is illegal. Only speed up when the driver has decided not to pass and drops back. This will quickly open a space behind you.

FIGURE 13



Review it 15.3

- What steps do you need to take when preparing to pass a vehicle ahead if you've already determined there are no conflicts from any vehicle behind?
- When is it safe to return to your lane after passing a vehicle?
- What are some situations in which you should never pass?
- What can you do to help another driver who is passing you?

Critical Thinking

Decide You notice that a large tractor pulling a hay wagon has pulled out of a field and into your lane about 20 seconds ahead. You are driving 55 mph and closing fast. What actions should you take? Why might passing

- in this situation be more difficult than passing just a car?
- 6. Evaluate** Accelerating when being passed to prevent someone from passing you is rude as well as illegal. However, in what type of situation might rapid acceleration be an appropriate response when a vehicle is attempting to pass? Explain why.

IN THE PASSENGER SEAT

Observe Passing Situations As a passenger, observe other vehicles passing over the course of a week. For each situation, determine if the pass was safe or unsafe and the reasons why. Create a chart summarizing the passes you observed. What percentage of passes did you determine were safe and prudent passes? Report and discuss your findings with your class.



Lesson 15.4 RURAL SITUATIONS YOU MIGHT ENCOUNTER

In rural areas, you may encounter vehicles, animals, and situations that you do not encounter on city streets. Apply the same driving techniques in rural areas that you would in urban areas. For example, in a rural area you would respond to a tractor pulling a plow the same way you would respond to a large truck or bus in the city. By applying IPDE and Zone Control techniques whenever you drive, you will maximize your ability to predict and identify conflicts and solve problems.

Slow-Moving Vehicles

A **slow-moving vehicle** is one that is unable to travel at highway speed, such as tractors and other large farm machinery.

The sooner you can identify such vehicles ahead of you, the more time you have to respond. The vast difference in speeds between an approaching vehicle and a slow-moving vehicle ahead of it often causes conflicts between vehicles in rural areas.

When driving at a higher speed, you will rapidly close in on a slow-moving vehicle. If you find yourself closing to less than 3 seconds, be aware that you may have a problem. Slow down and prepare to pass when it is safe to do so. Get into the 2-second ready position for passing. If you decide not to pass, re-establish at least a 3-second following distance.

Most slow-moving vehicles are required to have a red and orange triangle sign mounted on them, such as the one in **FIGURE 14**. These signs help other vehicle operators identify slow-moving vehicles more quickly.



OBJECTIVES

- Explain how to safely deal with slow-moving vehicles.
- Explain precautions to take when encountering animals on or along the roadway.
- Describe two actions you can take to allow hazards to separate when meeting oncoming traffic.
- Explain steps to take to safely deal with hazards posed by railroad crossings.



VOCABULARY

- slow-moving vehicle

FIGURE 14

The vehicle ahead has closed your front zone. **Decide** What following distance should you maintain and why? What lane position should you get into and why?

Animals

Animals can be a problem on rural roads. They can easily become frightened and dart out into your path. Each year, millions of dollars in property damage occur when animals and motor vehicles collide. In some areas, livestock such as cattle occasionally wander onto roadways. In other areas of the United States, wild animals such as deer, elk, and moose present the biggest hazard for vehicle collisions.

Hitting a large animal can result in damage to your vehicle and serious injury or death to you, your passengers, and the animal. In areas where large wild animals are common, reduce your speed and search a much wider area than usual. If you see one animal, anticipate the presence of more. In addition, many animals are most active in the evening and at night when it is more difficult to see them.

If you happen to observe one or more animals crossing the road, stop well in advance. Be patient and wait until it is clear to proceed. Do not get out and attempt to hurry any stragglers across the road. You are much safer in your vehicle.

When a smaller animal suddenly appears in your front zone, you may be tempted to brake hard or swerve. Be careful not to risk a more serious collision by trying to avoid the animal.

Meeting Oncoming Traffic

Meeting traffic on two-way roads can be dangerous. Very little space separates you from oncoming traffic. With traffic moving at higher speeds, a head-on collision can cause serious damage, injury, or death.

If you identify an oncoming vehicle, check your right-front zone for an alternate path of travel and for line-of-sight restrictions. Try to adjust your timing so that the oncoming vehicle will approach you when you have the fewest hazards in your right-front zone.

Separate the hazards in or next to your path of travel. Adjust your speed to deal with only one hazard at a time. In most situations slowing down is your best option. Imagine the hazard is a narrow bridge, as in **FIGURE 15**. By slowing down and letting the approaching vehicle clear the hazard first, you separate the hazards.

Meet where the most space is available. When you must meet oncoming traffic, try to select a location where you have an open right-front zone to move into if you need to swerve to avoid conflict.

If you are meeting a line of vehicles, slow down and move into lane position 3 to provide a little more space between you and the approaching vehicles.

Oncoming drivers may cross into your lane on rural roads for several reasons such as a blowout or hitting or swerving to avoid a pothole, animal, or other debris on the road.

Meeting Slow-Moving Vehicles When you see a slow-moving or stopped vehicle in your left-front zone, check to the rear of the vehicle for a passing vehicle. The passing driver may not see you. If you are applying the IPDE Process, you will check your right-front zone and move into lane position 3, or onto the road shoulder if necessary. If you do not have an open zone, slow enough to create space for yourself or the passing driver.

Meeting at Night Be alert when driving at night. You need to be aware of vehicles in the distance. Keep your windshield clean.

At night, headlights shining over the crest of a hill can warn you of an approaching vehicle. If you have your high beams on, switch them to low beam anytime you are within 500 feet of an approaching vehicle. Do not look directly into the headlights of approaching vehicles; you could be temporarily blinded, especially if their high beams are on. Glance instead to the right edge of the road. There is often a white line to help you maintain position in your lane.

Railroad Crossings

Many railroad crossings do not have complete controls (flashing lights and gates). In rural areas, trains travel at high speeds. Be alert for railroad-crossing warning signs. Slow and check left and right before crossing. Never cross a railroad crossing until you know it is absolutely safe to do so. Remember, when a vehicle and a train collide, the train always wins.

FIGURE 15

You've run into two hazards in your path of travel.

Execute What actions should you take in order to let the hazards separate?



Analyzing data

Road Crossing Crash Data

In any year, thousands of vehicle-train incidents are reported. The table shows numbers of reported incidents, injuries, and deaths reported to both the Federal Railroad Administration (FRA) and the Federal Transit Administration (FTA).

Reading the Table What are the six different categories of data the table displays?

Analyze the Data What year was the worst in terms of number of events? What year was the worst in terms of people killed?

- 3. Calculate** Based on the data in the table, what is the annual average of total events, fatalities, and injuries?
- 4. Infer** Why might the FRA report so many more incidents than the FTA?
- 5. Execute** What actions can you take to better ensure that you, as a driver, never become a statistic that gets reported on a table like this?

Highway-Rail at Grade Crossing Incidents per Year									
Year	FRA events	FRA killed	FRA injured	FTA events	FTA killed	FTA injured	Total events	Total killed	Total injured
2006	2,918	368	1,010	95	7	154	3,013	375	1,164
2005	3,053	358	1,015	95	8	160	3,148	366	1,175
2004	3,076	372	1,091	107	9	76	3,183	381	1,167
2003	2,977	334	1,035	66	4	68	3,043	338	1,103
2002	3,077	357	999	112	1	76	3,189	358	1,075

review it 15.4

1. As a driver, what do you need to do to safely pass a slow-moving vehicle?
2. What actions can you take to avoid conflict with an animal you spot ahead along the roadway?
3. Describe two actions you can take to separate hazards when meeting traffic.
4. What can you do to avoid conflicts at rural railroad crossings?

part of the oncoming lane. There are wheat fields on both sides of the roadway. What should you be anticipating?

6. Compare and Contrast How might dealing with a coyote in the road ahead be different from dealing with a rabbit? How might your actions be similar?

IN YOUR COMMUNITY **Research** Deer-vehicle crashes are common in many states. However, deer are only one type of animal involved in crashes with motor vehicles. What agency or organization is responsible for removing animal carcasses along the rural roads where you live?

Critical Thinking

5. **Evaluate** You scan ahead and notice that there is a large, very slow-moving combine ahead with its flashers on. It takes up all of your lane and



Lesson 15.5

SPECIAL DRIVING ENVIRONMENTS

Driving through mountains and deserts can challenge your patience, energy, and skills. Make certain your vehicle is in good working condition. Adhere to the speed limits and warning signs. Be particularly aware of your vehicle's gauges while driving.

Mountain Driving

Mountain driving presents more problems and special situations than driving in flatter areas. The effects of gravity are constantly at work. Gravity will make your vehicle go faster when going downhill and slow your vehicle when going uphill.

Mountain roads often zigzag across a mountain with a series of sharp turns called **switchbacks**. A switchback bends sharply in the opposite direction. In **FIGURE 16**, the sign warns of a switchback ahead.

Driving Up a Mountain You should accelerate steadily when driving uphill to maintain speed because gravity pulls your vehicle downhill. If the slope is steep, you might need to downshift to a lower gear. An automatic transmission vehicle will downshift by itself. On extremely steep inclines, when extra power is needed, you may need to manually shift an automatic transmission vehicle into a lower gear (LOW 1 or LOW 2).

When you can't see around a curve, reduce your speed, move into lane position 1, and tap your horn. Evaluate your path of travel through the curve. An oncoming vehicle could cross into your lane because it has built up too much downhill speed before the curve. Driving too fast is a leading cause of collisions in the mountains.

OBJECTIVES

- Describe special safety precautions for mountain driving.
- Describe special safety precautions for desert driving.

VOCABULARY

- switchbacks
- pull-out areas
- runaway vehicle ramps

FIGURE 16

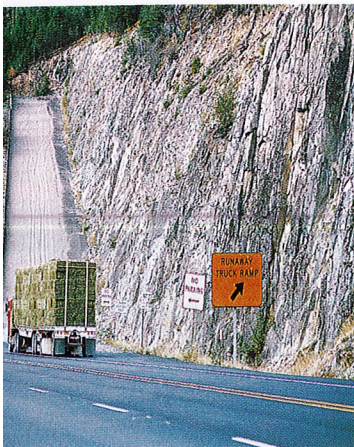
At the switchback ahead the road reverses direction. **Identify and Decide** What actions should you take?



17 mountain roads have areas on the side of the road for vehicles to pull over and stop.



18 runaway vehicle ramp helps large vehicles to get out of traffic safely when their brakes fail. What are two safety features of this ramp?



Loaded trucks, recreational vehicles (RVs), and vehicles pulling trailers move more slowly up mountain roads. Follow these vehicles at their speeds and maintain at least a 4-second following distance. Some mountain roads have locations called **pull-out areas** where an additional right lane is provided for slower-moving vehicles. When slower-moving vehicles move into such lanes, faster-moving vehicles can safely pass and proceed.

Driving Down a Mountain When driving down a mountain road, downshift before you start traveling downhill. Never coast downhill; the vehicle will speed up and you might lose control.

Adjust your speed with an occasional use of the brakes. Do not ride your brakes. Doing so can overheat them and make them fade. If you are braking often, shift to a lower gear; your transmission can help slow you down and reduce the need to brake. Finally, keep your speed low enough to maintain control and stay in your lane.

Large vehicles can experience serious brake problems going downhill, especially on long, steep grades. Some mountain roadways have **runaway vehicle ramps**, as **FIGURE 18** shows. These provide a place for vehicles, especially large trucks, to safely get out of traffic and stop when their brakes are no longer effective.

Weather in the Mountains Fog, snow, and ice can make mountain driving even more difficult. Some mountain roads become blocked with excessive snow. Weather conditions can change suddenly in the mountains. Before driving, call the highway department or state police hotline or tune your radio to frequencies that update travelers on weather and road conditions. These frequencies are often identified on blue driver-service signs along the side of the road.

To drive in some mountain areas in winter, vehicles should be equipped with snow tires and/or tire chains. Know the conditions and requirements before driving in the mountains in winter.

Effects of Altitude on Drivers High altitudes can affect drivers, causing shortness of breath, faster heartbeat, and headache, especially if they are not accustomed to living at high elevations.

Lower amounts of oxygen at higher altitudes can reduce concentration and cause drowsiness. These effects can be worse for tired drivers. Do not drive if you feel these effects or are tired.

Effects of Altitude on Vehicles The thin mountain air can affect your vehicle's engine. Climbing power is reduced. Acceleration can become sluggish. The temperature of the water in your radiator may increase significantly and could cause overheating. If your air conditioner is on, turn it off.

Check your gauges and warning lights often. If the engine temperature light comes on, safely pull over and stop to let the engine cool. Turning on your heater may help remove some of the heat built up in the engine.

Engines can get extremely hot during mountain driving. When you shut off your engine, vapor lock occurs. The engine will not start because the fuel cannot be pumped in a gaseous state. Allow the engine to cool. Then try restarting it.

If you do a lot of mountain driving, have your vehicle serviced regularly for maximum performance.

Desert Driving

Desert driving is hard on the driver, the car, and the roadway. Always prepare yourself and your vehicle for driving in desert climates.

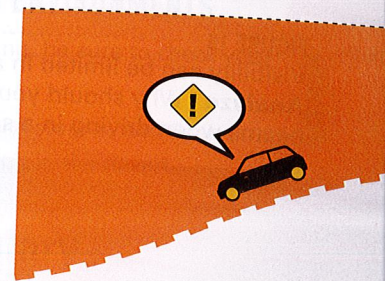
Effects of Heat on Drivers Intense daytime heat can cause great stress on you when driving long distances. The sameness of the scenery can lull you into a false sense of security. Intense glare from the sun can reduce your vision.

To help reduce the effects of driving in a hot desert, you should wear good quality sunglasses to help reduce the effects of sun glare, plan more frequent stops, change drivers often, and carry plenty of water.

Effects of Heat on Vehicles Extensive desert driving requires more frequent vehicle service. Battery fluids should be checked daily if the battery is not self-contained. Radiator fluids should be checked at every fuel stop.

CAUTION: *Never remove a radiator cap from a hot radiator.* The steam and hot fluid could burn you. Check the fluid level in your radiator recovery tank. If you must check the level in the radiator, wait until your engine cools.

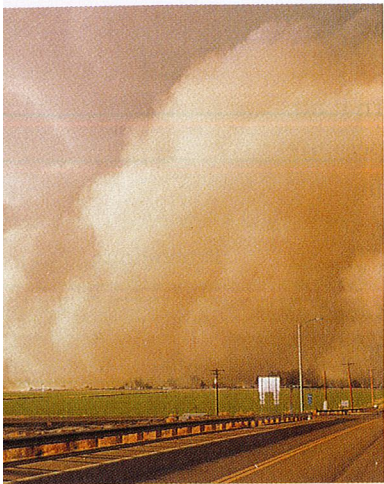
Check tire pressure regularly; it will increase as you drive. Do not reduce the tire pressure below the lowest recommended pressure. A tire with low air pressure will run hotter, which could result in tire failure.



safe driving tip

Rockslides Mountains often have falling rock zones. Be especially alert for falling rock or boulders in the road in these zones. Be prepared to stop suddenly or swerve.

19
ity can be limited in a sandstorm.
ze Why should you use low
s when driving in a sandstorm?



The Desert Roadway Well-designed highways with gentle curves on flat terrain invite higher speeds. Some desert roadways have speed limits of 75 or 80 mph. Be careful of sandy roadside shoulders; your wheels could sink quickly into the sand if it is not firm and compacted. If you need to pull over, make sure the location you select is firm and out of traffic.

Sandstorms and Dust Storms Windy conditions in deserts often create visibility problems. Avoid driving in sandstorms or dust storms. If you encounter such a storm, slow immediately and find a safe place to pull over. Turn off your headlights and turn on your hazard flashers. Wait in your vehicle until the storm passes.

If you must drive, go slowly. Use your low-beam headlights to help see and be seen. As soon as possible after the storm, have your oil, oil filter, and air filter changed. Dirt particles from the storm that remain in your fuel injection system and engine oil can cause excessive engine wear and damage.

Flash Floods A flash flood is a sudden, unexpected rush of water from heavy rain. A flash flood can develop very quickly. This condition is especially dangerous in the desert because the ground washes away easily and there is no soil to absorb runoff. If you encounter a flash flood, seek higher ground immediately and wait for the water to recede. Stay away from creeks or natural drainage areas.

Review it 15.5

What safety precautions should you take when driving in mountains?

What safety precautions should you take when driving in deserts?

Critical Thinking

Apply Concepts Why is it safer for a downhill driver to yield to an uphill driver in narrow mountain roadway situations?

4. Relate Cause and Effect Why should you remain in your vehicle if forced to stop in a dust storm?

IN YOUR COMMUNITY

Use Technology Use the Internet to find current road conditions on mountain roads (either in your state or another state). Discuss the conditions and the precautions or special actions you would take if you were driving in those conditions.

CHAPTER 15 REVIEW

Lesson Summaries

15.1 CHARACTERISTICS OF RURAL DRIVING

- Rural roads are constructed of many different materials. Shoulders are often made of gravel and can be quite narrow.
- Rural roads may have hazards such as potholes and uneven or soft shoulders.

15.2 USING BASIC SKILLS IN RURAL AREAS

- Drivers should use IPDE and Zone Control techniques in rural situations.
- Before a curve, slow down and make all traffic checks behind and ahead.
- Some situations require more than a 3-second following distance.

15.3 PASSING AND BEING PASSED ON RURAL ROADS

- There are three major stages in passing: deciding to pass, preparing to pass, and executing the pass.
- Drivers should never attempt to pass when approaching a hill, while in a curve, or when in an intersection.
- When being passed, maintain or reduce your speed. Never accelerate to keep a person from completing a pass.

15.4 RURAL SITUATIONS YOU MIGHT ENCOUNTER

- Follow the same rules as you would in the city for passing slow-moving vehicles.
- Be aware of the hazards posed by animals near roadways. To separate hazards, adjust your vehicle speed and position.

15.5 SPECIAL DRIVING ENVIRONMENTS

- In mountain or desert driving, be sure to check your brakes and cooling system.
- Extreme heat, sun glare, dust storms, and flash floods are hazards for driving in the desert.

Chapter Vocabulary

- advisory speed sign
- pull-out areas
- graphics
- slow-moving vehicle
- median
- switchbacks
- prohibited
- runaway vehicle ramps

Select the word or phrase from the list above that correctly completes the sentence.

- A(n) _____ is a place on a mountain road for vehicles to safely get out of traffic when their brakes are not effective.
- The warning signs posted on a curve with suggested speeds for ideal conditions are called _____.
- _____ are usually additional lanes on a mountain road for slower-moving vehicles.
- The strip of ground separating traffic moving in opposite directions on a roadway is called a(n) _____.
- A vehicle unable to travel at highway speeds is referred to as a(n) _____.
- A(n) _____ is a location in the mountains where the road bends sharply in the opposite direction.

STUDY TIP

Make color flashcards of different warning signs common to rural driving. Work with a partner to test each other on the meaning of each sign.