



Chapter 10

Driving in Rural Areas

10.1

Characteristics of Rural Traffic

10.2

Using Basic Skills in Rural Areas

10.3

Passing and Being Passed on Rural Roads

10.4

Rural Situations You Might Encounter

10.5

Special Driving Environments

You Are the Driver!

About 82 percent of all miles of roadways in the United States are rural roads. Rural roads can be two-lane or multilane. What problems might occur along this rural road? How does it differ from a city street? How has the vehicle ahead affected your line of sight? What lane position would provide a greater margin of safety and better view ahead?

Even if you live in an urban area, you will likely drive in rural areas. This chapter discusses characteristics and problems you might encounter in rural and other environments. It explains how you can apply the IPDE Process to deal with various hazards.



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10.1

Characteristics of Rural Traffic

Objectives

1. Describe rural roadways.
2. Describe factors to consider when selecting a safe speed.
3. Identify traffic controls and how they help inform, warn, and regulate drivers on rural roads.

Wide open spaces and less traffic are common in rural areas. After driving for long periods of time, you might mistakenly assume that conflicts will not occur. However, collisions in rural areas account for nearly twice as many highway deaths as collisions in urban areas.

Roadways

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

At night, the lack of adequate lighting causes difficulty in seeing. Be alert to potential changes that could arise. Conditions in rural areas can change suddenly with little warning.

Speed

Determining a safe speed is critical for safe rural driving. Speed affects

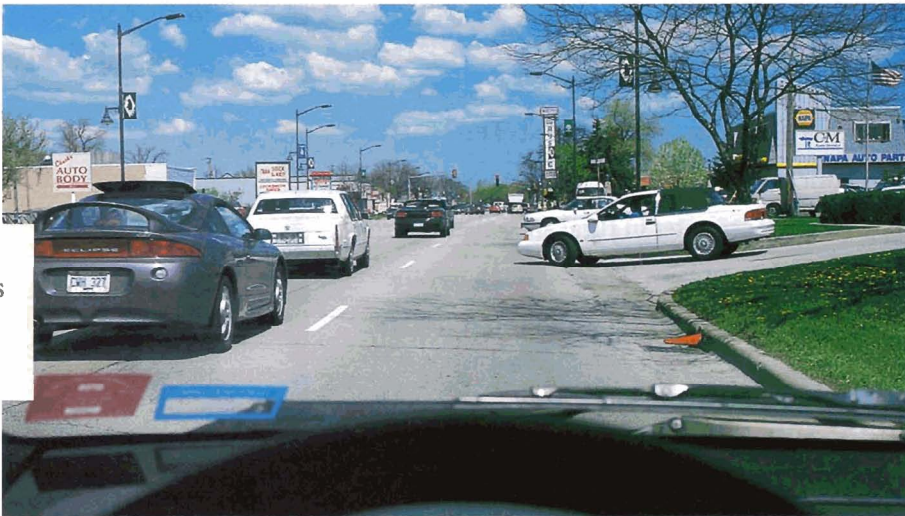
- your line of sight
- your stopping distance
- your vehicle control
- the amount of damage and injury in the event of a collision

Many rural roads have a speed limit of 55 mph. Some states allow speeds greater than 55 mph. Where conditions require, lower speeds are posted.

There is a difference between safe speeds and posted speeds. Posted speeds are the maximum speeds allowed under ideal conditions. When conditions are not ideal, safe speeds should be used. These are slower speeds. Factors that affect safe speed selection include other highway users, inclement weather, hills, curves, intersections and very nar-

You Are the Driver!

How many traffic hazards can you identify in this picture?





Be prepared to stop as you near the crest of the hill.

row roads or lanes. *Always use your common sense and never drive faster than conditions permit.*

Traffic Controls

Traffic controls—signs, signals, and markings—direct, regulate, inform, and warn drivers. Traffic controls provide advance information and warning of

- hazards that you cannot yet identify
- major intersections ahead
- unusual or hazardous conditions (curves, animal crossings)
- traffic channeled into reduced space

Many warning signs use graphics to warn of a hazardous condition ahead. Note the sign shown above. The hill blocks your line of sight and view of the hazard.

Traffic controls can be complex, especially at intersections where rural highways cross. Identify them early and know their meanings so you can avoid conflicts.

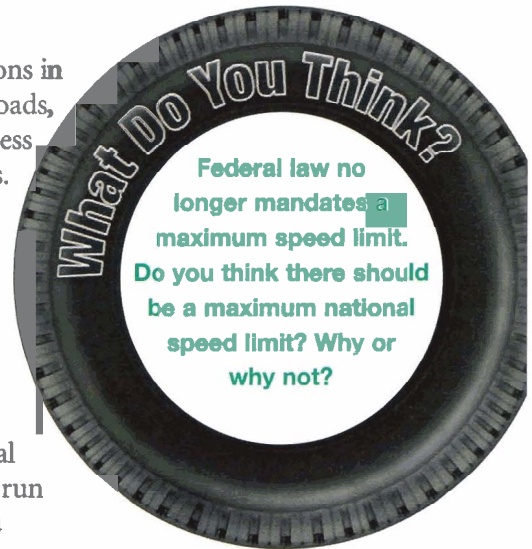
Roadside Hazards

Consider the existing conditions in selecting a safe speed. Rural roads, especially older, narrow, and less traveled ones, present hazards.

Shoulders may be uneven with the edge of the roadway, soft, or narrow. Danger may be only a few feet away. Bridges, guardrails, bushes or trees may be near the road's edge. Sign posts may only be a few feet away from the actual roadway. A steep slope might run from the shoulder down to a drainage ditch.

Entrances to businesses, homes, or fields are always points of possible conflict. Be alert for these areas. Drivers ahead of you could decide at the last moment to turn right or left.

Trees, shrubs, or piles of plowed or drifted snow create line-of-sight restrictions. Drivers trying to enter the roadway may not be able to adequately see traffic. They may turn out into, or across, your path of travel.



Review It

1. What roadway conditions are common to rural driving?
2. What factors need to be considered in selecting a safe speed?
3. What advance information do traffic controls provide?

10.2

Using Basic Skills in Rural Areas

Objectives

1. Explain how the IPDE Process should be used in rural driving.
2. Know the steps to safely handle a curve.
3. List rural situations that require increased following distance.
4. Explain how to enter a multilane rural highway.

A seemingly quiet rural traffic scene can change quickly with little or no warning. Risk is present whenever and wherever you drive, but you can manage the level of risk by applying the IPDE Process.

Applying the IPDE Process

Rural driving typically involves driving at higher speeds. The faster you drive, the greater your chance of having a severe collision. You have less time to identify and respond to a situation or hazard. You may be forced to make an emergency response. Sudden responses at higher speeds increase the risk of losing control of your vehicle.

While traveling on rural roads, there are many ways your zones can become closed. To best apply the

IPDE Process, you must manage your speed control. 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. Apply the IPDE Process whenever you drive.

Maintaining vehicle control at higher speeds is more difficult than at lower speeds. It takes longer to stop. Excessive braking or steering can result in a skid and loss of vehicle control.

Drive at a speed where you know you will be able to brake and steer your vehicle without losing control. Assess road conditions and the amount of traction available. Adjust your speed to conditions. Always



Where on this road might conflicts occur?



What do the signs indicate about the curve ahead?

drive at a speed that allows you to stop or swerve to avoid a collision.

Visual Search Pattern

Remember the orderly visual search pattern described in Chapter 4? Apply those same techniques in rural areas. In your 12–15 second search range look for clues of hazards that have the potential of closing your front zone. Higher rural speeds extend the actual distance covered by your 12–15 second search area compared to lower speeds.

Strive to maintain a 12–15 second visual lead. This is the distance your vehicle will travel in the next 12 to 15 seconds. The higher the speed, the greater that distance will be. Maintaining a 12–15 second visual lead will help you to identify hazards early. It also gives you time to predict and execute an appropriate response.

Driving on Two-Lane Roads

Knowing about some common, but important, characteristics of rural roads will help you handle them safely. Some of these characteristics include curves, warning and advisory signs, hills, and intersections.

Curves Rural roads typically have many curves. Collisions occur at curves because speed on the approach is too great. Before approaching a curve, you likely will notice a yellow warning sign that warns of a potential hazard (a curve) ahead. Warning signs are usually placed anywhere from 250 to 700 feet before the actual hazard. A warning sign for a curve has a curved black arrow on it. The sharper the curve of the arrow, the sharper the roadway curve ahead.

Curve warning signs often have **advisory speed signs** posted below



SAFE DRIVING

Driving and using a cellular phone or reading a map can be dangerous. Get out of traffic, stop, and then make the call or read the map.



What type of restriction do the shrubs create? Are there any other hazards?

them on the sign post. These indicate suggested travel speeds when conditions are ideal. Follow the recommended speeds, and when conditions are not ideal, use a slower speed. Natural forces work to push you to the outside of the curve when you travel at higher speeds.

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 lane position 1.
6. If the curve is sharp, lightly apply your brakes 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 going to be open.

8. Once you are beyond the midpoint of the curve, begin to accelerate gently if conditions permit.
9. Evaluate your new target area and search for zone changes.

Hills Unless they have very steep slopes, hills are usually not marked. Hills restrict your line of sight. Slow as you approach the crest of the hill. Take lane position 1 as you crest the hill. Look for oncoming traffic and an escape path to the right.

Intersections In Chapter 7 you learned about how to handle intersections. Follow the same procedures for rural intersections.

Rural intersections can vary a great deal. Some intersections may have traffic lights; others may just have STOP signs. Early identification of traffic controls will help you predict potential conflicts.

A typical rural intersection is one where a side road crosses a main road. The side road will usually have the STOP sign. Tall crops, trees, or shrubs create line-of-sight restrictions that can block the vision of drivers at the edge of, or across from, an intersection.

Treat driveways like intersections. Look well in advance for clues of driveways, such as:

- loose gravel projecting into the main road
- electrical, phone, and other utility lines crossing the road
- reflectors marking a driveway
- mailboxes, typically located at the edge of, or across from, a driveway

Following Traffic

Establishing and maintaining at least a 3-second following distance is very important in rural areas. At high speeds, a hazard can quickly develop into a conflict. A 3-second following distance provides you space and time to prevent conflicts under normal conditions.

In special situations, you should increase your following distance to four seconds or more. A longer following distance gives you more control when you are

- being tailgated
- driving on a steep downhill slope
- following a motorcycle
- following a snowplow
- pulling a loaded trailer
- following a large vehicle (truck, motorhome, or bus)
- driving on wet or icy roads

Keeping at least three seconds gives you an open front zone. This helps to give you control over the actions of other drivers. When other

drivers do dangerous things, it is less likely to affect you if you are following at a distance of three seconds or more.

Driving on Multilane Roads

Many rural roads have four or more lanes of traffic. Posted speed limits usually are higher on two-lane rural roads. Unlike interstate highways, multilane roads may have intersections rather than exit and entrance ramps. Some intersections may have a two-lane road crossing a large four-lane road; others may involve two major multilane roads that cross.

Multilane Roadways with Center Lines Some multilane roadways may only have a yellow line (dashed or solid) separating high-speed traffic moving in opposite directions. Drivers should never cross a solid yellow line or double yellow lines except to make a left turn or clear an obstacle blocking their lane. Whenever you cross a yellow line, you are responsible to do so safely.



You Are the Driver!

You are driving behind this car. Is your following distance adequate?

Divided Roadways Divided roads always have lanes of traffic moving in opposite directions separated in some way. The division may be simply a guardrail or a **median**. A median is an area of ground separating traffic that moves in opposite directions. A median can be a few inches to several feet wide, as seen here.

If you need to cross a multilane highway, cross each half of the multilane road as though it were a one-way street. If a large enough crossover area exists, move into it after you cross the first lanes of traffic. Stop, look for a large enough gap. You will be turning into the fastest lane of traffic, so you may need to look for a gap of six seconds or greater.

Lane Choice Whenever possible, drive in the right lane on a multilane highway, unless signs indicate otherwise. The left lane is usually for passing or preparing to turn left.

Turning at an Intersection When leaving a multilane roadway, turn right from the right lane. When

making a left turn, turn from the lane nearest the center line or median strip.

Some intersections may have special turn lanes for right and left turns. To turn, check your rearview mirrors for any possible conflicts in your rear zone. Signal your intention to turn at least five seconds before the actual turn because speeds are much higher on rural multilane roads.

Signaling well in advance gives traffic behind a chance to adjust speed and position to avoid any conflicts. If turning left, keep your wheels straight until you start your turn. If you are hit from behind, you will not be pushed into oncoming traffic.

If you see a vehicle approaching at a high speed from behind, forget your turn, accelerate quickly, and proceed straight ahead across the intersection to avoid being hit from behind. To do this safely, you must be aware of the conditions in the intersection.

Entering a Multilane Road Follow these procedures if you are on a side



A median strip safely separates high-speed traffic that moves in opposite directions.



To make a left turn from a side road onto a multilane highway, a median strip provides a safe place to wait for a gap.

road and wish to enter a multilane roadway:

- To turn right, check to the left and right of where your target area is located. Make sure the left, front and right zones will be open. Enter the nearest right lane as you turn. Steer toward your target and accelerate quickly to the prevailing speed. Change lanes only after you clear the intersection and reach the prevailing speed.
- Left turns require larger gaps than right turns. First, cross the lanes on your side of the roadway. Choose a time when no traffic is approaching in the lane just across from the center line. 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 presents problems similar to entering from a side road. Oncoming drivers may not see you due

to a line-of-sight restriction. Though drivers on multilane roadways may have advance warning signs of intersections ahead, there rarely are such signs for driveways.

Review It

1. How should you apply the IPDE Process when driving on rural roads?
2. What steps should you take to safely handle a curve?
3. List five situations that require more than a 3-second following distance.
4. What is the procedure for entering a multilane rural highway?

Objectives

1. List the checks to make before passing another vehicle.
2. List the steps for passing on a two-lane rural road.
3. List situations where passing should never be attempted.

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 parts of the IPDE Process to help lower your risk when passing.

Passing

Passing another vehicle is really a three-stage procedure. You decide to pass, prepare to pass, and execute the maneuver.

Deciding to Pass

Before you pass a vehicle, assess your situation. Ask yourself these questions:

- Is it worth it to pass?
- Is it legal to pass?
- Is it safe to pass?

Consider passing only if you can answer “yes” to all of these questions. The major responsibility for passing safely belongs to the driver who is passing.

Preparing to Pass

Take these actions when preparing to pass:

- When you find your front zone closing to less than three seconds, identify the reasons. Is the vehicle ahead going slower than the posted speed limit? Is it likely to be making a turn? If so, hold back and eliminate passing. If conditions indicate you should

pass, continue the steps in preparing to pass.

- Check roadway markings and signs ahead. Make certain that passing is legal.
- Look ahead to your target area. Is your line of sight adequate? You may have to move to lane position 2 to get the best view ahead. Is it safe to pass?
- Check the roadway conditions. If traction is limited, you probably should not pass. If you must pass under poor conditions, you will need to accelerate gently and gradually while passing.
- Check the roadway shoulders and sides ahead that might cause the vehicle you are passing to swerve to the left.
- Check your rearview mirrors for any potential conflicts to your rear zone. If a vehicle is rapidly closing in behind you, delay your pass.
- Glance quickly over your left shoulder. Make sure there are no vehicles in your blind spot.
- Check the oncoming traffic lane again. Make sure no vehicles are approaching and there is enough space for you to pass safely. Any approaching vehicles must be at least 20–30 seconds away. You will need 10–15 seconds to complete the pass. *If in doubt, do not pass.*
- Check ahead for driveways and side roads. Make sure no traffic will be entering the roadway.



SAFE DRIVING

Although some states allow passing drivers to exceed the speed limit, it is safer to pass within the posted speed limit.

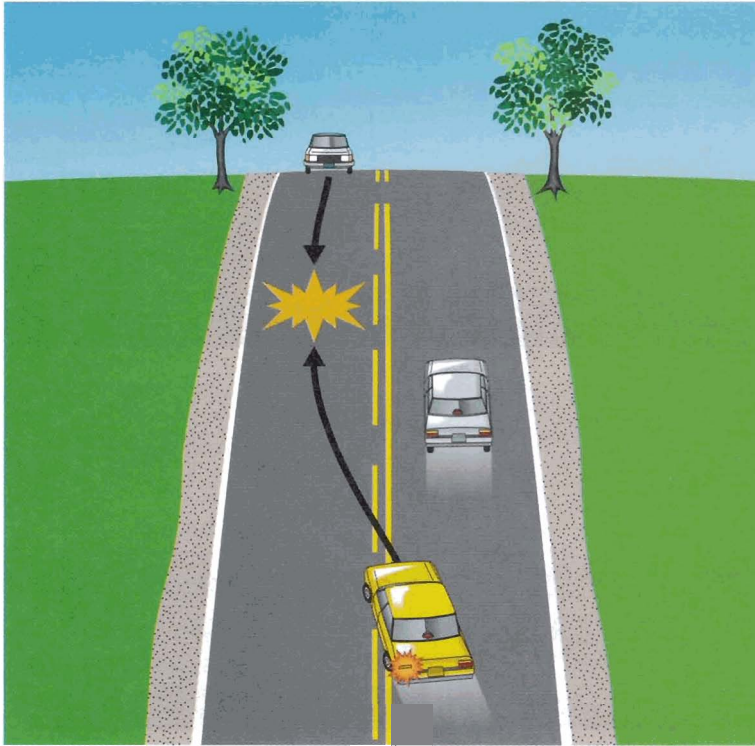
After you have determined that your left-front zone (the path to be taken) is clear, you are **ready to pass**. If you identify a problem, slow down and establish at least a 3-second following distance. Repeat the steps to prepare to pass again. In time these steps will become part of your normal driving behavior.

Executing a Pass on Two-Lane Roads

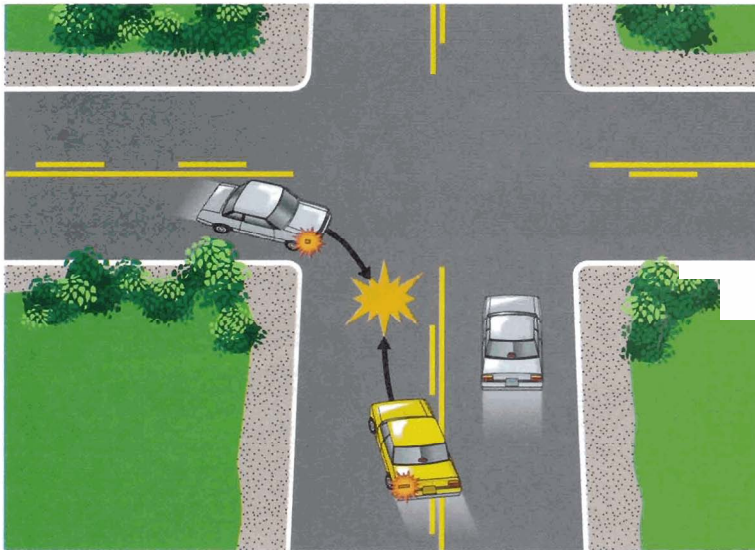
Follow these steps when passing on a two-lane road:

1. Get in your ready position by keeping at least 3 seconds of following distance.
2. When it is safe to pass, signal for a left-lane change and glance over your left shoulder to check your blindspot.
3. Change lanes smoothly.
4. Accelerate at least 10 mph faster than the vehicle you are passing. *All passing should be done within the speed limit.*
5. Make your final evaluations. If you notice a problem that is within 20–30 seconds ahead, you can still change your mind—provided you have not gone beyond the vehicle you are trying to pass. If it is clear, continue to accelerate to the proper speed.
6. Maintain your speed. Remain in the left lane until you can see two headlights of the vehicle you are passing in your inside rearview mirror.
7. Signal for a right-lane change.
8. Return smoothly to the right lane. Do not slow down.





The solid yellow line means that drivers in the right lane must not pass. They would be unable to see vehicles coming over the hill.



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

9. Cancel the signal. Adjust your speed and vehicle's lane position.

If you are passing a large truck, you will need more time and space. It is a good idea to make sure that you have at least 30 seconds of clear space when passing a large truck.

No-Passing Situations

No-passing situations are marked by solid yellow lines, as shown in the pictures. 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 NO PASSING ZONE. Passing is illegal and unsafe when

- your line of sight is restricted
- space is narrow, and your front zones are closed
- cross-traffic is present, even if no warning signs or lines are present

How do these conditions apply to the following situations?

No Passing on Roads Going Uphill

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

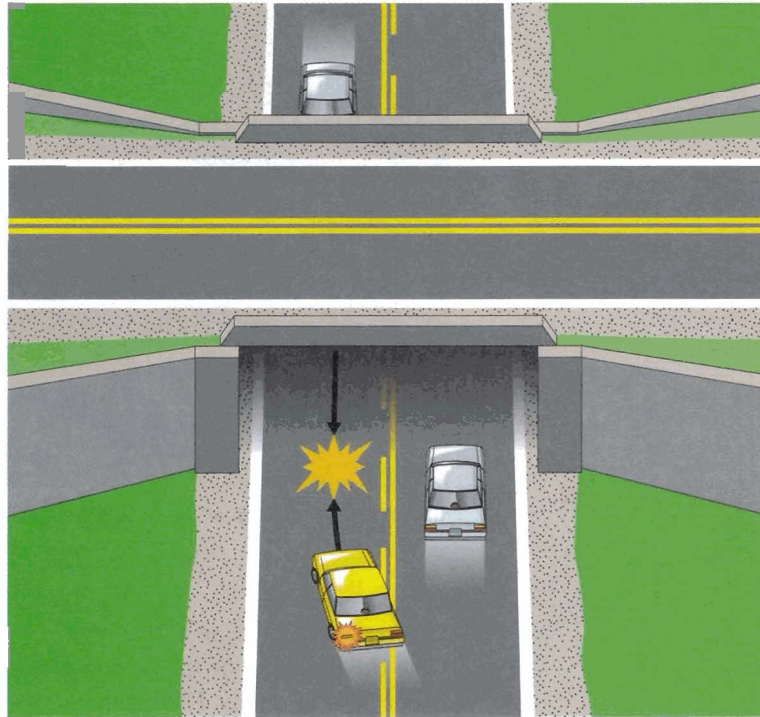
No Passing at Intersections Passing is illegal within 100 feet of an intersection. Slow down when approaching an intersection.

Other No-Passing Situations

There are other situations where passing is prohibited or should not be attempted. Examples include:

- 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 can not see around the curve.
- When the vehicle ahead is traveling at or near the speed limit. Remember, *most passing should not require a driver to exceed the posted speed limit.* When your line of sight is limited by fog, snow, or rain.
- When several vehicles are ahead of you, 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.
- When you will be stopping or turning soon.

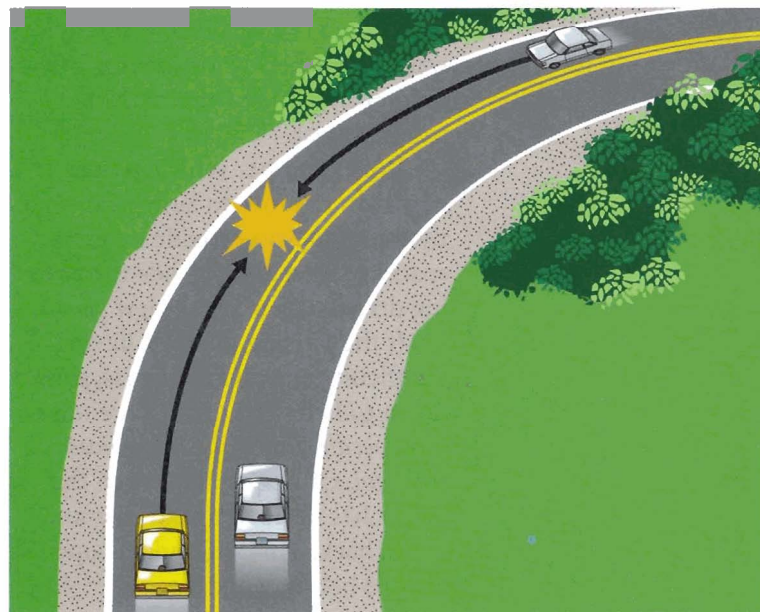


Do not pass on bridges and near underpasses, since they might not have shoulders to provide escape areas.

Passing on Multilane Roads

You need to be cautious on a multi-lane highway with only a center line to separate traffic. Check all lanes going in your direction before you pass on a multilane roadway. Make sure that no one will move into your front zones taking away your path of travel. The vehicle you intend to pass should be going several miles per hour slower than you.

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



Passing is illegal in both lanes around this curve.



Glance regularly into your mirror to see if a car is about to pass you.

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.

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.

Review It

1. What are the checks you should make when preparing to pass?
2. What are the steps for passing on a two-lane rural road?
3. In what situations should you never pass?

10.4

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 as 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 a large truck or bus in the city. Applying the IPDE Process whenever you drive will maximize your ability to more easily recognize conflicts and solve problems.

Slow-Moving Vehicles

A **slow-moving vehicle** is one that is unable to travel at highway speed. Most tractors and other large farm machinery can only travel at lower speeds. They are not designed, nor intended, as means for personal transportation.

Identify slow-moving vehicles as early as possible. The sooner you do, the more time you have to respond. Apply the IPDE Process. Most slow-

moving vehicles have an orange and red triangular sign like the one in the picture.

When driving at a higher speed, you will rapidly close in on a slow-moving vehicle. If you find yourself closing to less than three seconds, be aware that you may have a problem. Slow down and prepare to pass when it is safe to do so. Stay far enough behind and in a lane position that gives you the ability to check for oncoming traffic.

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.

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

Objectives

1. Explain how to pass a slow-moving vehicle.
2. Explain the steps to take to deal with animals on or along the roadway.
3. Explain how you can allow hazards to separate when meeting traffic.



The vehicle has closed your front zone. Is it safe to pass in this situation?

You Are the Driver!
How should you handle
this situation?



a much wider area than usual. If you see one animal, anticipate the presence of more.

You may see warning signs where large animals are common. If you see an animal warning sign, let it serve as a clue, and do the following:

- Evaluate your left- and right-front zones for line-of-sight restrictions from which animals could enter.
- Check your rear zone to determine if you will be able to slow or stop quickly.
- Check your left-front zone to see if it will be open for an escape path.

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. Follow the same procedures

as above. 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 to have the oncoming vehicle approach you when you have the least problem in your right-front zone.

Use these guidelines for selecting a place to meet oncoming traffic.

- 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 action. Imagine the hazard is a narrow bridge as in the picture. You judge that you might meet the



approaching vehicle just about the time you approach the hazard. 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. Examples include:

- a blowout, hitting or swerving to avoid a pothole or other debris on the road
- an unexpected loss of traction due to ice, snow, rain, or mud
- a distraction



ANIMAL COLLISIONS More than 4 percent of all collisions reported in the United States involve animals, and that percentage is rising. Most of these collisions occur with deer—about 500,000 a year. Collisions with animals are more likely to occur at dawn or dusk. Most of these collisions occur in October and November during the deer mating season.

- an impairment due to alcohol, other drugs, or medications
- an impairment due to illness or fatigue
- a vehicle failure

Meeting Slow-Moving Vehicles

When you see a slow-moving vehicle or stopped vehicle in your left-front zone, check to the rear of the vehicle for a passing vehicle. The passing



Adjust your speed and position to allow the hazards to separate.



Not all railroad crossings have lights and gates.

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. Always know where you have an open zone into which you can move. If you do not have an open zone, brake 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 the approaching vehicle; you could be temporarily blinded, especially if their headlights are on high beam. 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*.

Review It

1. Identify the steps in safely passing a slow-moving vehicle.
2. List the steps to take to deal with animals on or along the roadway.
3. Explain two examples of how you can allow hazards to separate when meeting traffic.

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. Particularly be 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 the picture, the sign warns that a switchback is ahead.

Driving Up a Mountain

Accelerate steadily when driving uphill to maintain speed because gravity is pulling 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

1. Describe special safety precautions for mountain driving.
2. Describe special safety precautions for desert driving.



At the switchback this road reverses direction.

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 areas, it allows faster-moving vehicles an opportunity to safely pass and proceed.

Driving Down a Mountain

Unless you do something to resist it, gravity will pull your vehicle faster and faster downhill. Downshift *before* you start traveling downhill, regardless of the type of transmission in your vehicle. Never coast downhill in NEUTRAL, while depressing the clutch, or in OVERDRIVE because the vehicle will speed up and you might lose control.



Viewpoints provide a place for slower vehicles to move out of traffic so faster traffic can proceed.

Adjust your speed with an occasional use of the brakes. Do not ride your brakes, because 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 can reduce the need to brake as much. 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 downgrades. Some mountain roadways have **runaway vehicle ramps**, as the picture on the next page shows. Runaway ramps 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 suddenly change in the mountains. If weather conditions are poor, call the highway department or state police hotline. 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.

Effects of Altitude on Drivers

High altitudes can affect the driver, causing shortness of breath, faster heartbeat, and headache. Lower amounts of oxygen at higher altitudes can reduce concentration and

cause drowsiness. 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 temperature light comes on, safely pull over and stop to let the engine cool. Turning on your heater may help circulate some of the heat built up in the engine.

Engines can get extremely hot when driving in mountains. 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.

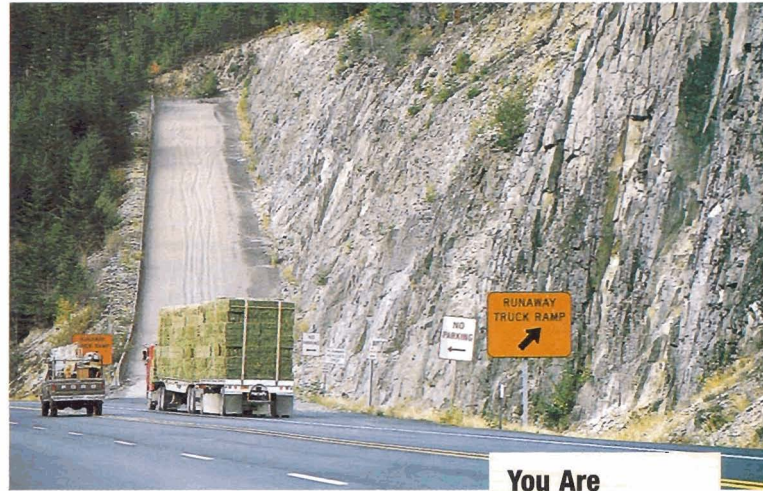
If you do a lot of mountain driving, have your vehicle serviced regularly for maximum performance.

Desert Driving

Deserts are often hotter and larger than most drivers realize. Desert driving is hard on the driver, the car, and the roadway. Always prepare yourself and your vehicle in advance.

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



You Are the Driver!

How would this ramp help a vehicle?

security. The glare from the intense sun can reduce your vision.

To help reduce the effects of hot desert driving, you should

- wear good quality sunglasses to help reduce the effects of sun glare
- plan more frequent stops and change drivers often
- carry an ample supply 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. Tire pressure will increase as you drive. Do not reduce the tire pres-



Visibility can be very limited in a sand storm.



SAFE DRIVING

Do not drive over water-covered roads or streams in the desert. The water may be deeper and running more swiftly than you think.

sure below the lowest recommended pressure. A tire with low air pressure will run hotter, which could result in tire failure.

The Desert Roadway

Well-designed highways with gentle curves invite higher speeds. Be careful of the sandy roadside shoulders, because 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, and

oil and air filters 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 quickly and unexpectedly. This condition is especially dangerous in the desert because the ground washes away easily. 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

1. What safety precautions should you take for driving in mountains?
2. What safety precautions should you take for desert driving?



Reviewing Chapter Objectives

1. Characteristics of Rural Traffic

1. What are rural roadways like? (196)
2. What factors should you consider when selecting a safe speed? (196)
3. How do traffic controls inform, warn, and regulate drivers on rural roads? (196–197)

2. Using Basic Skills in Rural Areas

4. How should you use the IPDE Process in rural driving? (198)
5. What steps should you take to safely handle a curve? (200)
6. What are some rural situations that require increased following distance? (201)
7. How do you enter a multilane rural highway? (203)

3. Passing and Being Passed on Rural Roads

8. What checks do you make before passing another vehicle? (204)
9. What steps should you take when passing on a two-lane rural road? (205–206)
10. In what situations should you never attempt passing? (206–207)

4. Rural Situations You Might Encounter

11. How do you pass a slow-moving vehicle? (209)
12. What steps should you take to deal with animals on or along the roadway? (209–210)
13. How can you allow hazards to separate when meeting traffic? (210)

5. Special Driving Environments

14. What special safety precautions should you take for mountain driving? (213–214)
15. What special safety precautions should you take for desert driving? (215–216)

Projects

Individuals

Investigate Research to find out which states have a 55 mph speed limit and which do not. Also examine the number of traffic fatalities that occur each year in each state. Is there a correlation between speed limit and number of fatalities?

Use Technology Use the Internet to find out current conditions on mountain roads (either in your state or another state). Discuss with the class what precautions you would take if you were driving in those conditions.

Groups

Debate Divide your group into two and debate the issue of mandatory speed limits. One side should argue for keeping a 55 mph speed limit; the other side should argue for allowing speeds greater than 55 mph.

Demonstrate Make a group poster that illustrates the hazards or other situations you might encounter while driving on a rural road. Present the poster to your class. Group members should take turns explaining what each illustration means and what to do if the hazard or situation is encountered while driving.

Chapter 10 Review

Chapter Test

Check Your Knowledge

Multiple Choice Copy the number of each sentence below on a sheet of paper. Choose the letter that best completes the sentence or answers the question.

1. Posted speed signs indicate
 - (a) the safest speeds possible in any conditions.
 - (b) minimum speeds under ideal conditions.
 - (c) maximum speeds under ideal conditions.
 - (d) suggested speeds that legally may be exceeded.
2. Which of the following provides advance information and warning about approaching driving situations?
 - (a) roadways
 - (b) road shoulder conditions
 - (c) posted speeds
 - (d) traffic controls
3. What effect does increased speed have on the time available to complete the IPDE Process?
 - (a) increases time available
 - (b) decreases time available
 - (c) varies with number of hazards present
 - (d) no effect
4. Solid yellow lines indicate
 - (a) no passing situations.
 - (b) conditions are favorable for passing.
 - (c) you must pass with caution.
 - (d) hazards in the roadway.

Completion Copy the number of each sentence below. After each number, write the word or words that complete the sentence correctly.

5. _____ roadways have separated lanes of traffic moving in opposite directions.
6. The force that makes your vehicle go slower when driving uphill is called _____.
7. A _____ is a sudden unexpected rush of water from heavy rain.

Review Vocabulary

Copy the number of each definition in List A. Match the definition in List A with the term it defines in List B.

List A

8. place on mountain roads for vehicles to safely get out of traffic when their brakes are not effective
9. sign posts on a curve with suggested speeds for ideal conditions
10. additional right lane on mountain roads for slower moving vehicles
11. area of ground separating traffic moving in opposite directions
12. vehicle unable to travel at highway speed
13. turns that bend sharply in the opposite direction

List B

- | | |
|-------------------------|-------------------------|
| a. pull-out area | d. switchbacks |
| b. slow-moving vehicle | e. runaway vehicle ramp |
| c. advisory speed signs | f. median |

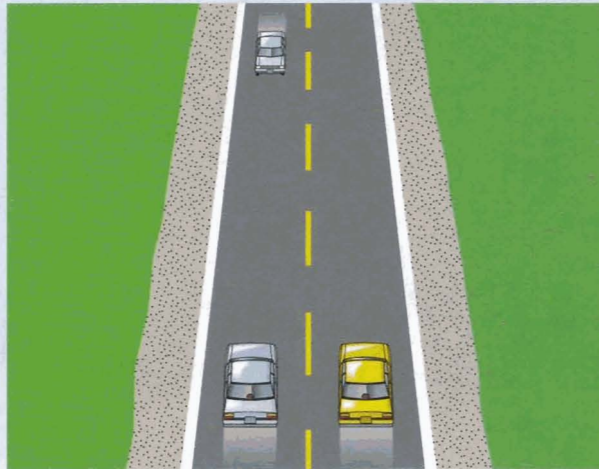
Think Critically

Write a paragraph to answer each question.

1. Why do you think that rural collisions account for a majority of highway deaths?
2. What types of animals might you expect to see in areas with animal-warning signs? What should you do if you pass an animal-warning sign while you are driving?



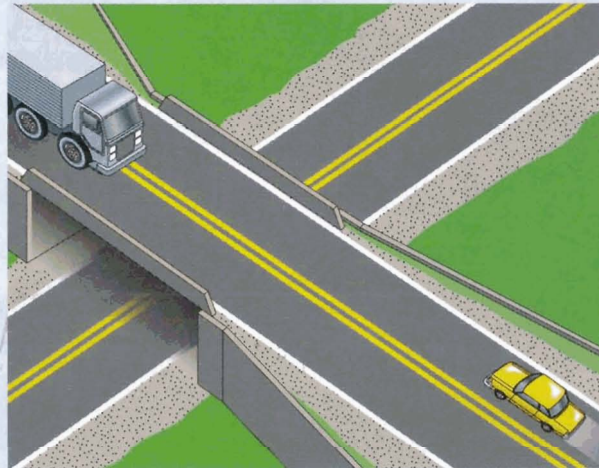
1. What hazards do you see? Which zones are open? How would you respond to avoid the hazards?



2. You are driving the yellow car, and a car is attempting to pass you. What should you do to help the passing driver?



3. You are approaching a curve. What do you identify and predict? What actions should you take to safely handle the situation ahead?



4. You are driving the yellow car. What possible conflicts do you identify? What should you do?