



Visual Search

8

OBJECTIVES

Upon completion of this chapter, you will be able to:

- Explain the importance of continuously scanning your surroundings
- Discuss how to perform a proper visual scan in front of, to the sides, and behind your vehicle
- Recognize potential hazards you must be aware of and react to while driving
- Identify signs of a distracted driver and pedestrian
- Describe the different types of mirrors and what each is designed for
- Explain how to properly adjust your mirrors and use them while driving

Training Requirement (Unit Objective)

Unit A1.2.1 Visual Search

This unit must teach driver-trainees to visually search the road for potential hazards and critical objects, including instruction on recognizing distracted pedestrians or distracted drivers.



CLASSROOM RECOMMENDATIONS

Introduction

This is the first of a series of chapters designed to get your students ready to operate on the road. Discuss the importance of mastering the skills that will be covered when it comes to safe operations.



LAB/RANGE RECOMMENDATIONS

This lesson is intended to help the student understand proper mirror adjustment.

Prior to beginning the lesson, position the tractor-trailer in a straight line with an unobstructed view to the rear. Also place the mirrors out of adjustment.

Divide your students into groups of three or four. One student should sit behind the wheel. Two other students should act as reference objects for proper mirror adjustment:

- One should stand 100 feet to the rear and 15 feet to the left side of the trailer
- One should stand 100 feet to the rear and 15 feet to the right side of the trailer

Each student should take at least two turns behind the wheel adjusting the mirrors and making judgments about the distance of the objects in each mirror's field of view.

At the conclusion of this exercise, ask your students to share any challenges or issues they may have had in properly adjusting the mirrors.



ROAD RECOMMENDATIONS

Below is the outline for a commentary driving exercise. In commentary driving, the student should be able to identify (out loud) obstacles and potential obstacles while driving. The following are general rules:

1. Identify obstacles by using short phrases such as:
 - Stop sign
 - Upcoming stop light, or
 - Vehicle passing ahead
2. Identify only the most important/critical obstacles. It's impossible to point out all obstacles without becoming distracted.
3. Students shouldn't look at the instructor while talking.
4. Identify, don't explain.

Visual search exercise

The purpose of this session is to allow students to practice visual search under highway conditions.

As with other exercises, break your class into groups of three students per instructor. Each student should have two to three hours behind the wheel.

The route you select for this session should expose the student to a broad range of roadways under low density traffic conditions. When selecting a route, keep in mind that this may be the student's first experience driving a tractor-trailer on a public roadway. That alone could cause anxiety for the student and could pose a distraction. It isn't necessary to select a route with a large volume of traffic. The route you select should include the following:

- Path obstructions that force a change in speed or direction that are observable from a distance
- Intersections at which left and right turns may be made
- Blind intersections at which the student must yield the right-of-way
- Multi-lane streets that permit lane changes
- Freeway interchanges, including weave-type interchanges that are used to enter, exit, and traverse
- Lane control signs and signals
- Tight turns (alleys, driveways, etc.)

Follow these procedures during the session:

1. Each student should spend a maximum of 20 minutes behind the wheel. As this is probably the student's first on-the-road experience, the intensity and stress of the activity can cause fatigue within a short period of time.
2. The student should use commentary driving techniques for up to one-half of the time he or she is behind the wheel. If this seems to be too distracting to the student at first, discontinue the use of commentary driving until the student is more confident.
3. As the instructor, you should give directions involving changes in speed or direction well in advance.
4. Make sure your students perform the following maneuvers at some point during the session: lane changes, right and left turns, and entering, exiting, and traveling through a freeway interchange.

When you are confident that the students have had sufficient practice under low-density traffic conditions, additional practice should be taken in moderate traffic conditions, but avoid high density traffic situations.



VIDEOS (see *Trainer Tools USB*)

8.1 — Distance Scanning

8.2 — Turning at Intersections

8.3 — Roundabouts

8.4 — Mirrors



Introduction

A safe driver is aware of what is going on around his or her vehicle. In this chapter you will be introduced to the skills required to conduct an effective visual search.

Scanning your Entire Sight Area

A tractor-trailer covers more distance than your car or truck when stopping, changing lanes, or reacting to problems on the road. Because of this, it's important that you continually scan your entire sight area. This includes focusing on:

- The road, vehicles, and other hazards straight ahead
- Vehicles and other hazards to the left and right
- Vehicles behind you



Distance Scanning

Distance scanning helps you identify hazards early, providing adequate time to react/respond to avoid a potentially dangerous situation. Distance scanning also helps you avoid abrupt stops and radical speed changes caused by the driving behaviors of other motorists.

Effective scanning can help reduce fatigue since your eyes are continually moving and not fixed on a single object.

It's not enough to keep your eyes on the vehicle in front of you. If you're not scanning at least five cars ahead, you may not be able to anticipate and react to changes in traffic. Watch road signs that warn of curves in the road, changes in traffic patterns, or construction zones.

As a general rule, look about **12 to 15 seconds** ahead of your vehicle. In the city, 12 to 15 seconds is equal to about two to three blocks. On the highway, 12 to 15 seconds is equal to just over one quarter of a mile. If you can't see that far ahead because of weather conditions or low-visibility, reduce your speed. If there is a problem up ahead, slowing down gives you time to:

- Spot the problem
- Decide on the best way to avoid the problem
- Maneuver safely away from the problem

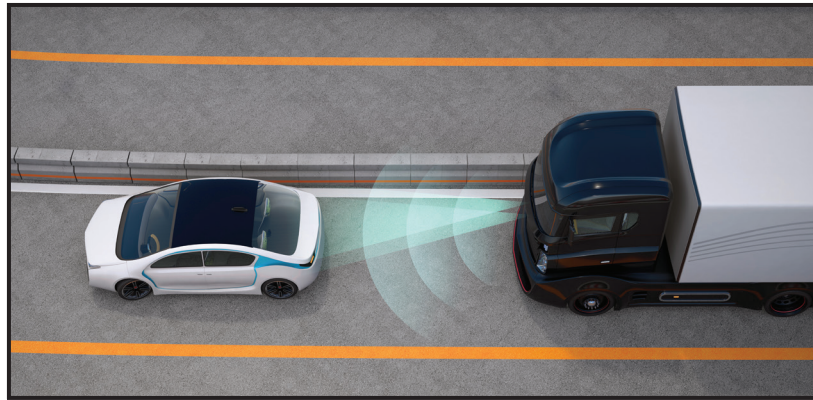
*For additional information addressing extreme driving conditions, see **chapter 14**.*

*For additional information addressing night driving, see **chapter 13**.*



When scanning ahead, pay special attention to anything that could affect your path of travel including:

- Other vehicles
- Distracted or aggressive drivers
- Pedestrians
- Road signs and traffic signals
- Debris
- Animals
- Weather-related hazards (ice, rain, snow)
- Intersections
- Work/construction zones
- Stopped vehicles
- Emergency vehicles
- Accidents



Scanning to the Sides

As well as looking ahead, you should be periodically scanning to the sides of your vehicle. Use your mirrors to check for vehicles in your blind spot and beside your tractor and trailer. Be alert. Know what is going on at all times.

There are certain situations where scanning to the sides is critical including crosswalks, intersections, roundabouts, school zones, and railroad crossings.

At **crosswalks** you should use extra caution. Watch the entire area, but pay additional attention to what is happening to your right. Pedestrians, bicycles, etc. are often hidden from your line of sight when closest to your vehicle. Also, remember to always yield the right of way to pedestrians when turning on green.

At **intersections**, you may not have a clear view of traffic and may pull into the intersection or roadway. Always be prepared to stop. When approaching an intersection, move your vehicle forward slowly. Look left, right, and left again. Start to pull into the intersection, continuing to scan as you pull through. Be ready to yield, stop, or take evasive action.



Additional caution must be used when turning at an intersection. When making a *right turn*, continue to scan the road ahead and to the sides, and pay special attention to your right-side mirrors. Doing so will help you avoid troublesome situations, like when an impatient driver tries to move into the right lane before you complete your turn.

When making a *left turn*, scan the road ahead and to the sides, and pay special attention to your left-side mirrors as you turn. Be sure to look over your left shoulder—this might help you see things before your mirrors do.



When driving in a **roundabout**, watch your mirrors, keep your eyes on traffic around you, and take it slow to ensure you come out of the roundabout safely.

School zones are another place where you need to be especially careful. Children aren't always aware of their environment. They may run into the road or between parked vehicles to retrieve a ball or chase another child. Pay extra attention when traveling near parks, trails, school zones, and at bus stops.

In cities, scanning to the sides is especially crucial to your safety and the safety of others. Cars parked along the shoulder create increased hazards that may not be seen if you are not constantly scanning. Often, people will walk between cars or will open their door into traffic without even looking. By scanning you can avoid a possible accident or injury caused by the inattentiveness of others.

As you approach a **railroad crossing**, slow down and look as far down the tracks as you can in both directions. If your visibility is limited for any reason, slow down enough that you could make a complete stop before reaching the tracks if you needed to.

Finally, always keep an eye out for **pedestrians** and **animals**.

People walking or riding bikes wearing low-visibility clothing can be difficult to see until they are very close, so be extra vigilant in urban and suburban areas.

Some may also be wearing headphones. They may be completely unaware of your presence and dart out into your path unexpectedly. Or they may underestimate your speed and try to cross before you reach them. Noticing them early and being prepared to stop is your best defense.

In many parts of the country, animals may be on the move at night so there's a chance you'll see some of them on the road. When driving in wooded areas or areas near tall grass, be sure not to overdrive your visibility and keep an eye on both shoulders ahead. As part of your visual scan, look for reflections of animals' eyes or movement along the sides of the road.

For additional information on types of vehicles that are required to stop at railroad crossings, see **chapter 16**.

Distracted Drivers

An effective visual search includes being able to recognize the signs of a distracted driver. This includes observing a driver taking part in a distracting activity (like talking on a cell phone, texting, eating, or drinking). Other driver behaviors that can signal a lack of attention include:

- Not being able to remain within a single lane of travel
- Unexplained slowing or speeding up of the vehicle
- Not driving with the flow of traffic
- Cutting off other drivers
- Tailgating
- Breaking traffic rules (running a red light/stop sign, passing in a no passing zone, etc.)

Pay attention to where other drivers are looking. If their eyes are on something other than the road, they may not see you.

*For additional information addressing distracted driving, see **chapter 10**.*

Seeing to the Rear

Scan your mirrors (and gauges) every four seconds.

Check load and cargo security. Watch for loose or falling cargo. If operating a flatbed, watch for loose straps, ropes, chains, or tarps.

Keep an eye on your tires. Look for potential problems including flat or damaged tires or tire fires.

Use your mirrors when changing lanes. Check your mirrors:

- Before you change lanes (making sure there's room to change lanes)
- After you signal (making sure no one/nothing moved into your blind spot)
- Right after you begin the lane change (making sure your path is still clear)
- After you complete the lane change

Also check your mirrors when you slow down, merge, or turn. Use of mirrors is also important when approaching alleys and intersections. Mirrors must be used more frequently when in traffic tie-ups and when approaching or driving alongside parked or stopped vehicles.





Types of Mirrors

Mirrors provide your only view of the rear of your vehicle. You should check your mirrors about every four seconds, and always use them before changing speeds or your position in traffic. Also, use mirrors to assist in checking your vehicle's blind spots. Tractors are equipped with the following types of mirrors:

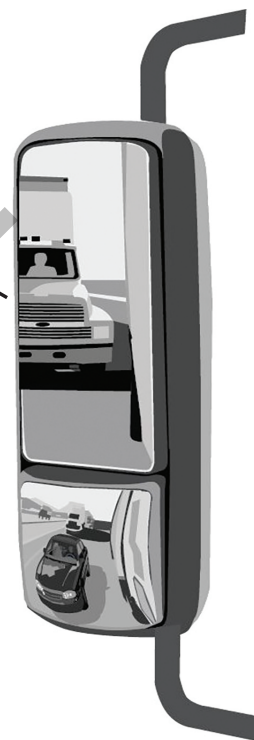
- Plane (west coast)
- Convex
- Fender

Plane (West Coast) Mirrors

A **plane mirror** enables you in seeing down the sides and toward the rear of your trailer and the roadway behind. It doesn't give as wide a view as the convex mirror does, but it does allow for better visibility down the length of the trailer. The left mirror is closer and reflects a larger image, which means you have a greater field of view from that mirror.

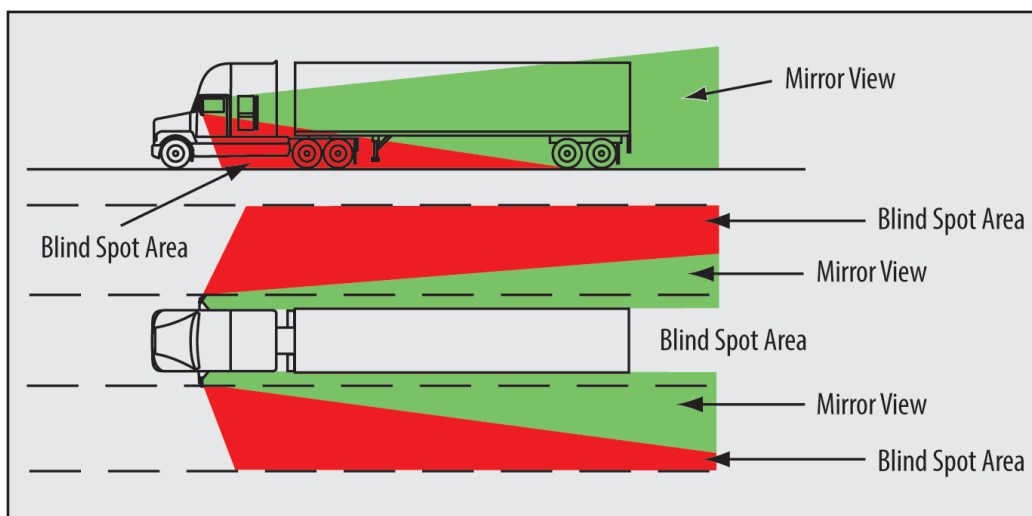
Remember that mirrors do not allow you to see everything. There are blind spots on both sides of your vehicle. This makes lane changes, passing, and other maneuvers challenging. Tight turns can also pose a problem. You can't see smaller vehicles or pedestrians that are next to the vehicle. Along with using your mirrors, signal and wait a moment before changing direction or lanes.

Plane



Plane (west coast) mirror

Flat-surfaced side mirrors positioned on both sides of a truck tractor so the driver can see both sides of the rig and its immediate environment from the cab.



Images in your side mirror will appear to be similar to those when you are driving your car or truck. When using your plane mirror in this situation, you should be able to judge the speed and distance of overtaking vehicles.

Convex Mirrors

Convex mirrors are designed with an outward curvature to provide a wide-angle view. They give a broader view than plane mirrors and, if adjusted correctly, eliminate much of the blind area. Convex mirrors provide the best close-up view of the sides of your vehicle.

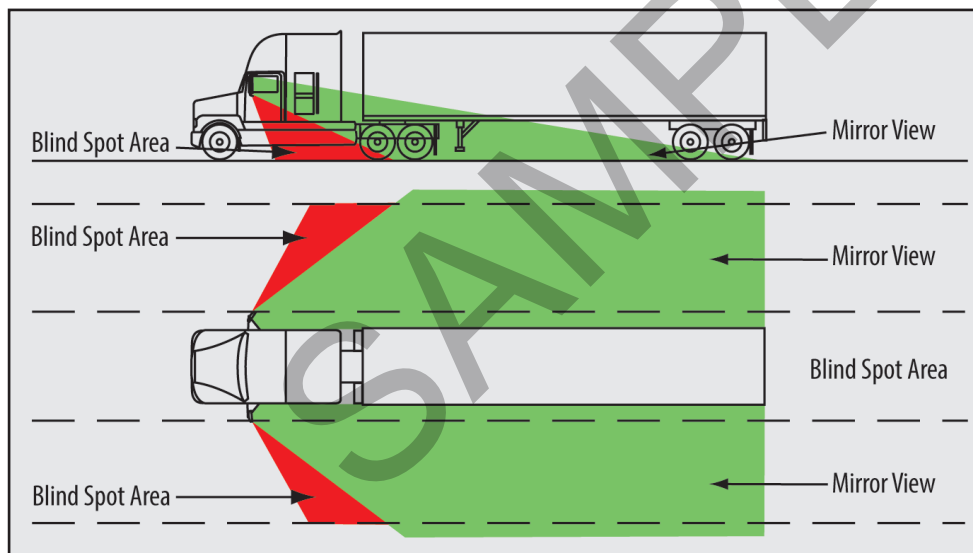
One negative aspect of convex mirrors is that they show a distorted image. Overtaking vehicles appear smaller and farther away than they really are. When using this mirror, you need to gain a solid understanding of what you are looking at. This will take practice as this view is not something you are used to in your personal vehicle.

Convex



Convex mirror

A type of mirror having a convex shape in order to show a larger field of view than can be obtained from a flat mirror of the same size.



A combination of plane and convex mirrors works best. They provide maximum side and rear vision. The drawback is that the combination can be a bit confusing at first. In addition to making sure your mirrors are properly adjusted, it is important that you keep them clean. Dirty mirrors may not affect your visibility much in the daylight, but when they're lit up at night by another driver's headlights or by a setting or rising sun, even a little dirt can cause a distractingly dangerous glare.

Some trucks are equipped with hood-mounted convex tri-pod mirrors, which provide the most visibility down the side of the truck.



Fender Mirrors

Some vehicles also make use of **fender mirrors**, which are mounted on the right and left corners of the front fenders. Fender mirrors help you see areas behind and to the sides of your vehicle, including some blind spots around your vehicle. While not on every commercial motor vehicle, they do provide an additional level of sight around the vehicle which adds to safer driving operations in many instances.



Check mirror adjustment regularly. Your vehicle should be straight before making adjustments.

Adjusting Mirrors

Proper adjustment of your vehicle's mirrors is important. It ensures that you have the best view possible to the sides and rear of your vehicle.

Plane (West Coast) Mirrors

Left side. You should see the trailer body on the inside vertical edge of the mirror. The rest of the mirror should show what is next to and behind the trailer. You should be able to see a point on the ground about 30 feet away on the bottom, horizontal edge of the mirror.

Right side. You should see the trailer body on the inside vertical edge of the mirror. The rest of the mirror should show what is next to and behind the trailer. You should be able to see a point on the ground about 60 feet away on the bottom, horizontal edge of the mirror.

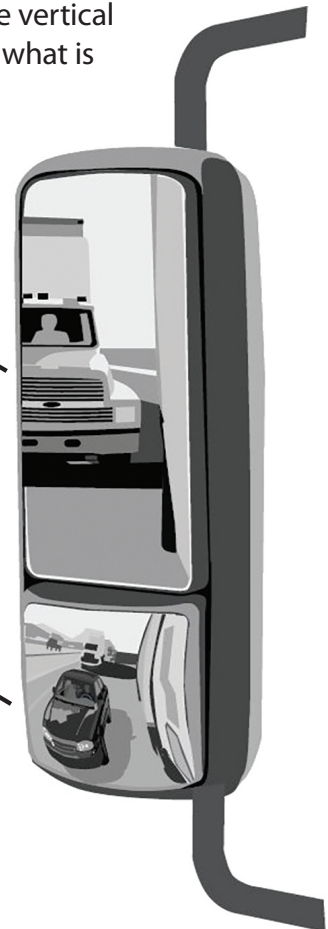
Convex Mirrors

Left side. You should see part of the trailer on the inside vertical edge of the mirror. The top, horizontal edge of the mirror should show a point on the ground that is about 35 feet away. The bottom, horizontal edge should show a point on the ground that is about seven feet away.

Right side. You should see part of the trailer on the inside vertical edge of the mirror. The top, horizontal edge of the mirror should show a point on the ground that is about 65 feet away. The bottom, horizontal edge of the mirror should show a point on the ground that is about eight feet away.

Plane

Convex



Chapter 8 Visual Search Key Learnings

Explain the importance of continuously scanning your surroundings

Distance scanning helps you identify hazards early, providing adequate time to react/respond to avoid a potentially dangerous situation. Distance scanning also helps you avoid abrupt stops and radical speed changes caused by the driving behaviors of other motorists.

Discuss how to perform a proper visual scan in front of, to the sides, and behind your vehicle

As a general rule, look about 12 to 15 seconds ahead of your vehicle. In the city, 12 to 15 seconds is equal to about two to three blocks. On the highway, 12 to 15 seconds is equal to just over one quarter of a mile.

As well as looking ahead, you should be periodically scanning to the sides of your vehicle. Use your mirrors to check for vehicles in your blind spot and beside your tractor and trailer.

Scan your mirrors (and gauges) every four seconds. Mirrors should be used when changing lanes, slowing down, merging, or turning.

Recognize potential hazards you must be aware of and react to while driving

When scanning ahead, pay special attention to anything that could affect your path of travel including:

- Other vehicles
- Distracted or aggressive drivers
- Pedestrians
- Road signs and traffic signals
- Debris
- Animals
- Weather-related hazards (ice, rain, snow)
- Intersections
- Work/construction zones
- Stopped vehicles
- Emergency vehicles
- Accidents

Identify signs of a distracted driver and pedestrian

Signs of a distracted driver includes observing a driver taking part in a distracting activity (like talking on a cell phone, texting, eating, or drinking). Other driver behaviors that can signal a lack of attention include:

- Not being able to remain within a single lane of travel
- Unexplained slowing or speeding up of the vehicle
- Not driving with the flow of traffic
- Cutting off other drivers
- Tailgating
- Breaking traffic rules (running a red light/stop sign, passing in a no passing zone, etc.)

Some pedestrians may be wearing headphones. They may be completely unaware of your presence and dart out into your path unexpectedly.

Describe the different types of mirrors and what each is designed for

A **plane mirror** enables you in seeing down the sides and toward the rear of your trailer and the roadway behind. It doesn't give as wide a view as the convex mirror does, but it does allow for better visibility down the length of the trailer. The left mirror is closer and reflects a larger image, which means you have a greater field of view from that mirror.

Convex mirrors are designed with an outward curvature to provide a wide-angle view. They give a broader view than plane mirrors and, if adjusted correctly, eliminate much of the blind area. Convex mirrors provide the best close-up view of the sides of your vehicle.

Some vehicles also make use of **fender mirrors**, which are mounted on the right and left corners of the front fenders. Fender mirrors help you see areas behind and to the sides of your vehicle, including some blind spots around your vehicle.

Explain how to properly adjust your mirrors and use them while driving

Plane (West Coast) Mirrors

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Chapter 8: Visual Search Quiz Answer Key

Directions: Read each statement carefully and mark the response that best answers the question. Correct answers are shown in **bold** below.

1. Distance scanning helps you:

- A. avoid abrupt stops.
- B. identify hazards early.
- C. avoid radical speed changes.
- D. all of the above.**

2. As a general rule, look about _____ ahead of your vehicle.

- A. 1-2 seconds
- B. 6-7 seconds
- C. 12-15 seconds**
- D. 20 seconds

3. How often should you check your mirrors while driving?

- A. Every 2 seconds
- B. Every 4 seconds**
- C. Every 10 seconds
- D. Every 20 seconds

4. Which of the following are potential hazards you must be aware of while driving?

- A. Stopped vehicles
- B. Pedestrians
- C. Accidents
- D. All of the above**

5. Which of the following scenarios could indicate a distracted pedestrian?

- A. Someone looking straight ahead at oncoming traffic
- B. Someone looking down while reading text on a cell phone**
- C. Someone looking both ways way before entering a crosswalk
- D. All of the above

6. What is a potential sign of a distracted driver?

- A. The car in front of you has its cruise control set and maintains a consistent speed
- B. The truck in front of you stays in its lane and maintains a consistent speed
- C. The SUV behind you cut off another driver and is now swerving and tailgating you**
- D. All of the above

7. Which type of mirror is designed to eliminate as much of your blind spot as possible?

A. Convex mirrors

- B. Plane (west coast) mirrors
- C. Fender mirrors
- D. Rear view mirrors

8. If you need to see down the sides and towards the rear of your trailer, what mirror should you use?

- A. Convex mirrors
- B. Plane (west coast) mirrors**
- C. Fender mirrors
- D. Any of the above would work equally

9. When adjusting your mirrors, what should you see in the inside vertical edge of your plane (west coast) mirrors?

A. The trailer body

- B. Part of the trailer
- C. A point on the ground 30 feet away
- D. A point on the ground 35 feet away

10. When changing lanes, check your mirrors:

- A. before you change lanes.
- B. after you signal and as you begin the lane change.
- C. after you complete the lane change.
- D. all of the above.**