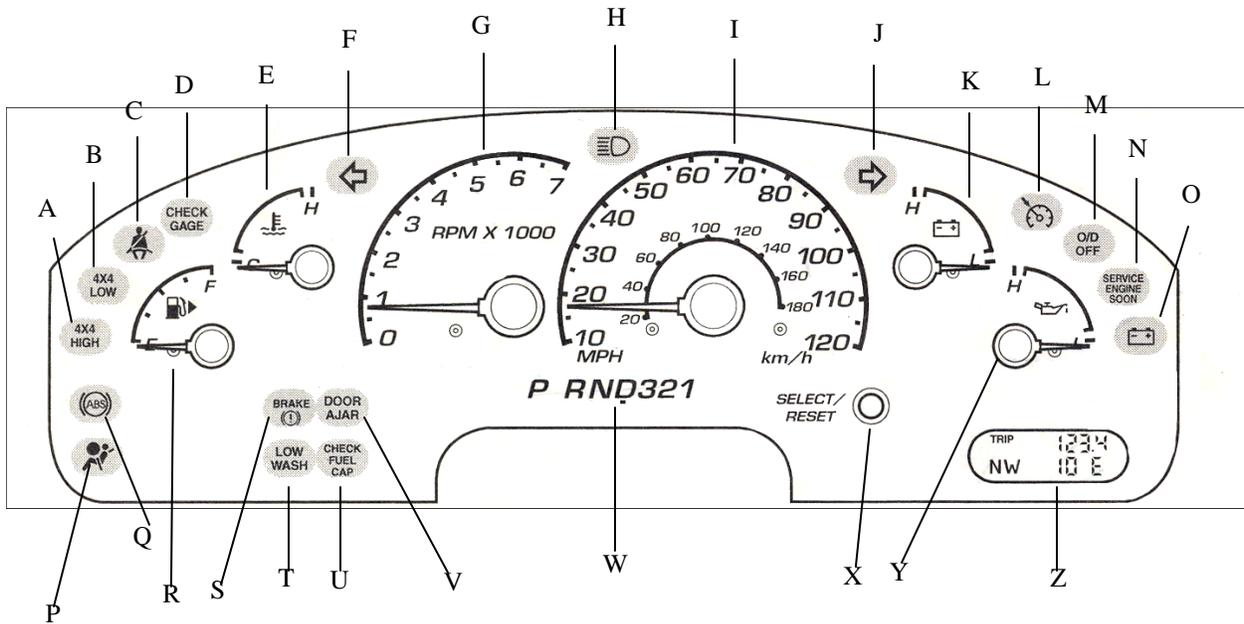


Worksheet 2-10

Instrument Cluster

Instrument panel gauges labeling guide

Identify instruments and gauges on the instrument panel of your family car or that of a friend and list below.



A		J		S	
B		K		T	
C		L		U	
D		M		V	
E		N		W	
F		O		X	
G		P		Y	
H		Q		Z	
I		R			

## 0.45 g stopping distances for normal driving

speed	thinking distance	braking distance	overall stopping distance	size of safe braking zone in seconds
20mph	22 feet	30 feet	52 feet	1.8 secs
30mph	33 feet	67 feet	100 feet	2.3 secs
40mph	44 feet	120 feet	164 feet	2.8 secs
50mph	55 feet	187 feet	242 feet	3.3 secs
60mph	66 feet	269 feet	335 feet	3.8 secs
70mph	77 feet	366 feet	443 feet	4.3 secs
80mph	88 feet	478 feet	566 feet	4.8 secs
90mph	99 feet	605 feet	704 feet	5.3 secs
100mph	110 feet	747 feet	857 feet	5.8 secs

### Notes for the table:

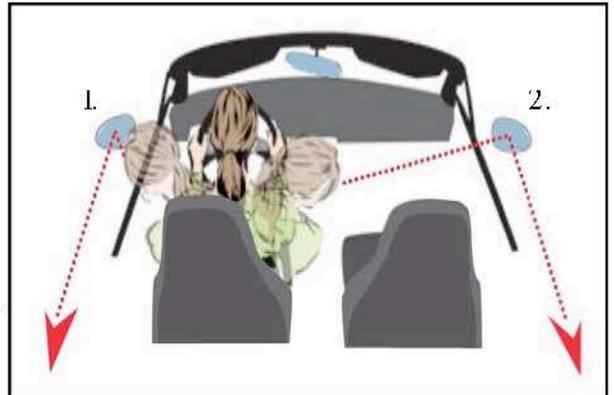
The Highway Code braking distance figures are different from these in two important respects. The Highway Code assumes about 0.68 seconds reaction time and 0.67g braking. Modern cars braking in the dry and on the flat brake at about 0.9g. We recommend never planning to use more than half your maximum braking effort in normal driving which leads us base the above table on 0.45g. The slight difference in the reaction time allowed is simply because we consider 0.75 seconds to be a little more realistic.

The size of the safe braking zone is NOT the time it takes to stop. In fact actually stopping takes around twice as long. However if you look (for example) 3.8 seconds ahead at 60mph you are looking at precisely the point where you will stop if you suddenly decide to brake.

# Enhanced Mirror Settings

There is a simple yet powerful technique to reduce the size of your vehicle's blind spots. It involves only a couple of adjustments to your vehicle's side mirrors. From a parked position, follow these steps:

1. To adjust the left side mirror, rest your head against the closed window and set the mirror to barely show the edge of your vehicle.
2. To set the right mirror, lean to the right so that your head is directly below the rearview mirror or above the center console. Adjust this mirror the same way, so you can just barely see the edge of the right side of your vehicle.

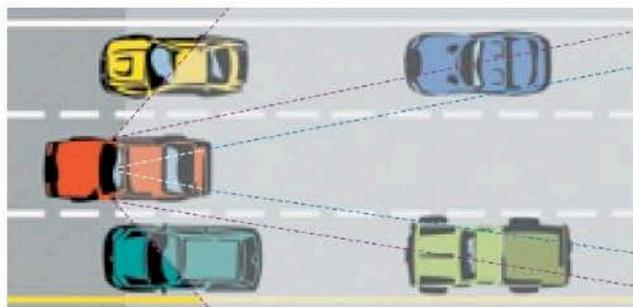


With the side mirrors now angled outward slightly more, you'll gain increased visual coverage of your blind spots. You should still perform a quick head check before changing lanes, but you'll now have almost seamless visual contact with all areas behind your vehicle.



Another way to enhance your vision to the rear is to install special mirrors to reduce your blind areas:

- Consider installing larger side mirrors - right and left.
- Use a panoramic (curved) rearview mirror inside.
- You may also want to attach a small convex (curved) mirror on a side view mirror. Although convex mirrors make objects seem farther away, they can help you detect movement more easily. However, don't depend solely on a convex side mirror, which might make you think you have more room than you really do.



The Area Around the Vehicle

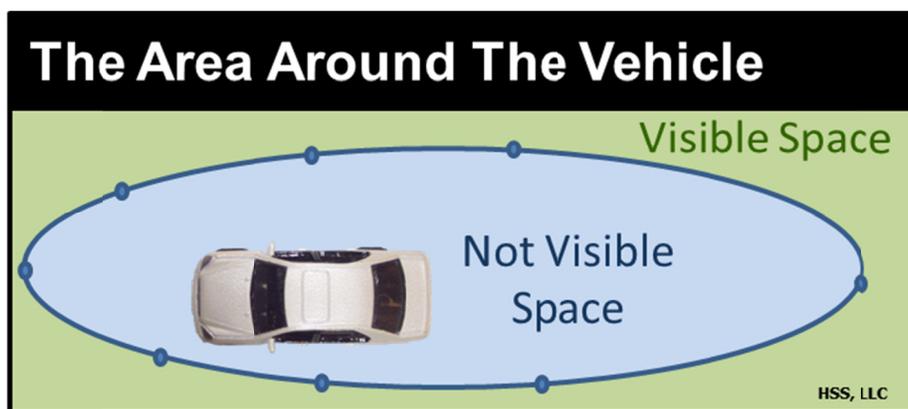
Because of the structural design of the vehicle, the driver is not able to see the spaces immediately around the vehicle. This unnoticeable space consists of the area between the vehicle and the nearest point where the driver can see the ground when seated properly in the driver's seat. This is sometimes referred to as the blind zone.

The blind zone may hide a small child or a retaining wall that is not visible to the driver because of vehicle door height. A driver's field of vision stops where glass and metal meet. Because of these sight limitations drivers may back into an area and strike an object such as a bike, pet, stump or a concrete block.

When properly seated, the driver should be able to see the ground within:

- 12-15 feet or one length of the vehicle to the front,
- 1-1/2-2 car widths to the right side
- 1/2-1 car width to the left side
- 2 lengths of vehicle to the rear (may be nearly 40 feet)

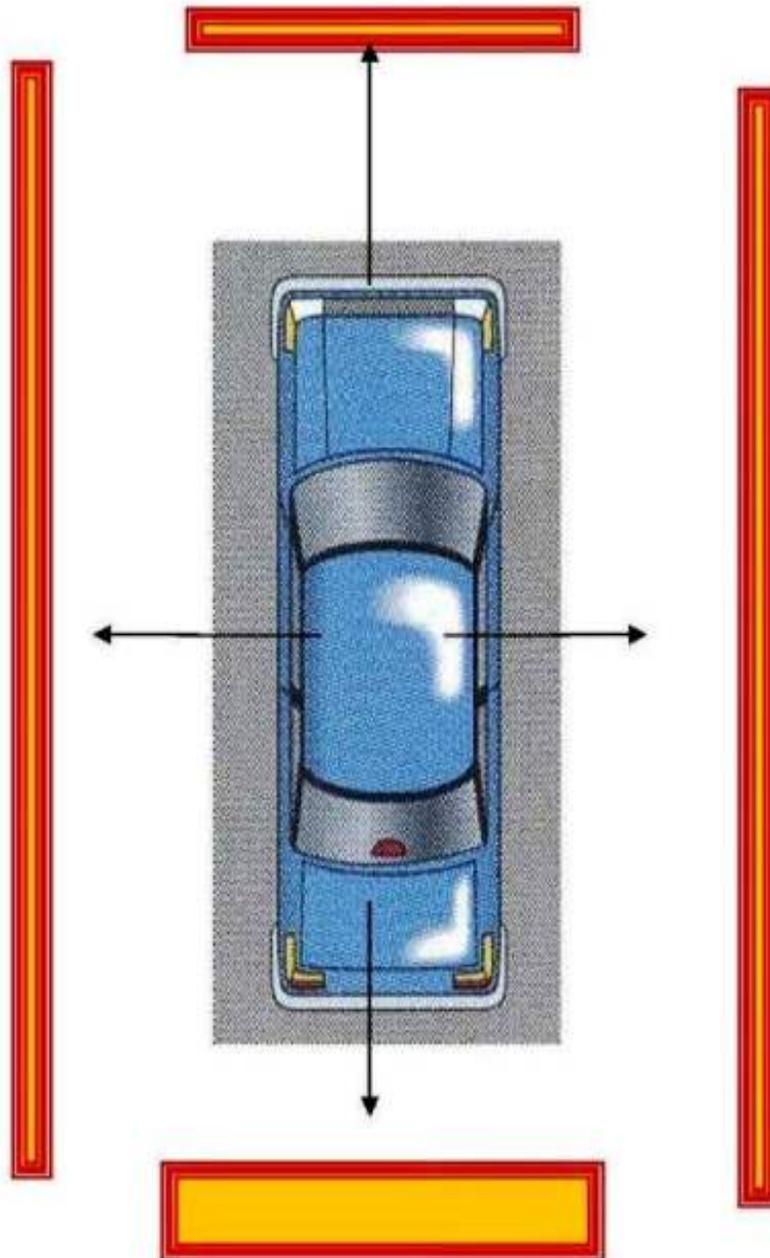
To compensate for this space, it is important to learn where the vehicle's unseen boundaries are, how large they can be, and techniques to help prevent collisions. Proper adjustment of the vehicle's features (mirrors, seat, and head restraint) should help to maximize the drivers view from inside the vehicle in all directions.



## The Blind Area around Your Vehicle:

To determine the area that the driver cannot see when seated in the drivers seat, a helper is needed. With the helper, perform the following distances from the vehicle:

1. Have the helper walk forward toward the vehicle observing the feet. With the sight lost of the feet STOP the helper and determine the distance from the vehicle. Record the distance from the front of the vehicle.
2. Repeat the same for each side and the rear viewing through the 'rearview' mirror.



Student Name:

Vehicle Type:

*Keeping is simple: In an open level parking lot with your qualified person. You in the drivers seat determine where you lose site if the ground. This will help in the better understanding of upcoming Units.*

Vehicle Reference Points

You cannot see the actual position of the vehicle in relation to the roadway because the driver's view of the road is blocked by the dashboard and the hood of the vehicle. You can use reference points to serve as guides in determining the position of the vehicle in the roadway.

**A reference point** is some part of the outside or inside of the vehicle, viewed from the driver's seat, which relates to some part of the roadway. Reference points can be developed for the front, side or rear to help you know where the vehicle is located on the roadway.

**A standard reference point** is the point on the vehicle that is similar for most drivers. This could be a side view mirror, a hood ornament, or the center of the hood. Once drivers learn standard reference points, they can develop their own personal reference points.

**A personal reference point** is a variation of a standard reference point for a driver's personal vehicle. Drivers will learn to use different parts of the vehicle, such as wiper blades, door handles, or rearview mirrors as guides. When a driver begins to practice parking maneuvers, they will learn which parts of the vehicle to use as personal reference points. Drivers will be able to line up these points with parts of other vehicles to help execute the maneuvers.

When attempting to discover a reference point, drivers should first use the "standard" reference point. If the "standard" reference point was accurate, continue to use it. If any "standard" reference point does not work, drivers should make note of "personal" reference points. These personal reference points will not be more than a few inches away from the "standard" reference point. Once a personal reference point is determined the driver needs to remember the correct picture for future use.

Reference Points *Continued*

**Standard Side Position Reference Points**



**Fig. 1**



**Fig. 2**



**Fig. 3**



**Fig. 4**

**Figure 1**

**Where the car is:**

The car is 3–6 inches away from a line to the left.

**How the driver sees it:**

The line appears to run into a point on the hood that is about 1 foot from the left edge of the car.

**Common applications:**

- To tell precisely where the left tires are *tracking*.
- To tell when the car is in *lane position 2*.
- It's the *side position* for preparing to turn left.

**Figure 2**

**Where the car is:**

The car is 3–6 inches away from a line to the right.

**How the driver sees it:**

The line appears to run into a point near the center of the hood.

**Common applications:**

- To tell precisely where the right tires are *tracking*.
- To tell when the car is in *lane position 3*.
- To *park the car* 3–6 inches away from a curb.

**Figure 3**

**Where the car is:**

The car is 3 feet away from a line to the right.

**How the driver sees it:**

The line appears to run through the middle of the right half of the hood.

**Common applications:**

- It's the *side position* for preparing to turn right.
- It's the *side position* for preparing to back into a perpendicular or parallel parking space.
- When there is no lane line to the right edge of the road, it is *lane position 3*.

**Figure 4**

**Where the car is:**

The car is 6 feet away from a line to the right.

**How the driver sees it:**

The line appears to run through the right headlight.

**Common applications:**

- It's the *side position* for preparing to turn right into a driveway or narrow alley.
- It's the minimum *side position* for preparing to pull forward into an angled or perpendicular parking space.

Reference Points *Continued*

**Standard Forward Position Reference Points**

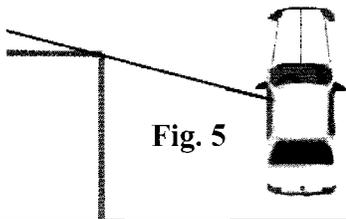


Fig. 5

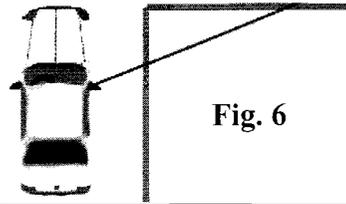


Fig. 6

**Figure 5**

**Where the car is:**

The car is a few feet beyond the curb line.

**How the driver sees it:**

The driver can see the target without his or her vision cutting across the curb line.

**Common applications:**

- It's the *forward position*, for making a left turn, at which the steering wheel should begin to be turned.

**Figure 6**

**Where the car is:**

The front bumper is even with the curb line.

**How the driver sees it:**

The curb line appears near the passenger's side mirror—even with the dashboard.

**Common applications:**

- To tell where the front bumper of the car is positioned relative to the environment.
- It's the *forward position* for making a right turn, at which the steering wheel should begin to be turned.
- It's the *safety stop* position—if necessary—from which to get a clear view of the intersection before entering it.

**Standard Rear Position Reference Points**

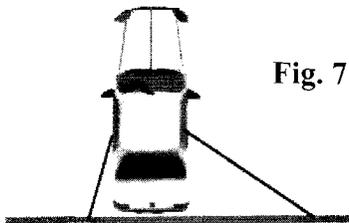


Fig. 7

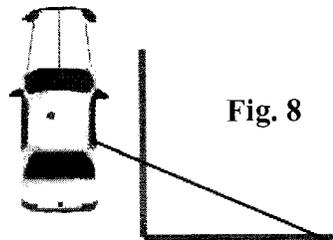


Fig. 8

**Figure 7**

**Where the car is:**

The rear bumper is 3–6 inches away from a line.

**How the driver sees it:**

When the driver turns his or her head over his or her left shoulder, he or she will see the line appear near the middle of the rear left-side window.

**Common applications:**

- To know where the rear bumper is positioned
- When backing into a perpendicular parking space, the driver can make accurate judgments to prevent entry into the rear parking space.

**Figure 8**

**Where the car is:**

The rear bumper is 3 feet away from a line.

**How the driver sees it:**

When the driver turns his or her head over his or her right shoulder, he or she will see the line disappear in the rear window corner post.

**Common applications:**

- This is the *pivot point*; i.e., the precise point at which the driver should begin turning the steering wheel when backing around the corner.

## Reference Points *Continued*

### Advantages of Using Reference Points

1. The first and foremost advantage you will gain from the use of reference points is the ability to be consistently successful.
2. Once the method of reference points is learned for one vehicle, the techniques can be applied to any vehicle. There is rapid transfer of learning to new situations.
3. You can get into a larger vehicle than you are accustomed to, such as a sport utility vehicle, van, truck, or motor home, and within 5 minutes be comfortable and confident maneuvering it in tight spaces and in traffic situations.
4. You can feel very comfortable getting into and out of tight parking spaces with any vehicle. You will also be able to back into parking spaces with confidence.
5. While driving in the right lane, you'll know exactly how far your car is positioned from the parked cars. Knowing that your position is more than six feet away from the parked cars will reduce the frequency of swerves when drivers suddenly open their doors.
6. With the use of reference points, you can make tight right turns into drive-ways, alleys, and narrow streets, without the need to swerve to the left before turning; nor will you hit the curb with the right rear tire.
7. You can feel comfortable driving in confined areas such as: municipal parking garages with spiral ramps, tunnels with fast moving traffic, a narrow bridge with a bus or truck approaching from the opposite direction, and a highway lane narrowed by concrete construction barriers.
8. You can feel confident and operate efficiently while passing a jogger, bicyclist, or pedestrian on narrow roads. Reference points will aid you in passing a double parked vehicle, or a construction site, with the least amount of movement into oncoming traffic.
9. While going into a curve, you will be able to select the best travel path to minimize the chances of a head-on collision. During slippery roadway conditions, you will be able to get the best drive line to help reduce the chances of going into a skid.
10. You can make the best decisions for using the various lane positions to get maximum control of the zones to either side of the vehicle.
11. You will be able to get reliable feedback to tell exactly where your vehicle is within the lane and increase your awareness for what is an okay or a not okay lane position.
12. If you use reference points to overcome optical illusions, rather than using what "feels right," then you can make accurate decisions when you are not feeling right, such as when you are tired, ill, or after taking medication.

**Fact Sheet**

**Define “risk” when driving. Risk is the chance of injury, damage or loss. Driver inattention is a major contributor to increased risk.**

- Drivers should question events/actions.
- Drivers should evaluate actions and consequences.
- Drivers do not perceive they are at risk when driving.

**Characteristics of risk**

- Always present - other highway users, the roadway and the vehicle you are driving
- Perceived differs from actual - people do not identify risk when it is actually there
- Is shared - it is shared by all drivers, pedestrians, bicyclists
- Can be changed - based on our perception of risk, what we see and the decisions we make on what to do with our vehicle
- Can be analyzed - by making the best choice available based on the clues we have
- Can be altered - some situations present more risk than others. Drivers must evaluate risk and consequences

**Risk perception**

- Space needs of the vehicle and/or the maneuver to be made
- Speed and time intervals - to reduce the current risk
- Roadway conditions - flat or crowned, type of surface, good shoulders, etc.
- Other roadway user actions - hardest to evaluate
- Evaluation of risk present at the time the maneuver is made

**Risk management**

- Increase time to respond to threats through position and speed adjustments
- Increase vehicle control through position and speed adjustments
- Separate the elements involved through speed and/or position adjustment
- Realize that combinations can influence the level of risk
- Alter risk by adjusting to these elements

## Fact Sheet

**Vision and Perception Requirements**

The instructor will emphasize the importance of directing attention, maintaining an open line of sight, using searching skills and targeting a line to maintain a safe path of travel.

**Visual functions** - 60% of the human brain is devoted to vision.

**The central vision area** describes the fringe area around the focal area that is used to judge depth and position. It is measured by testing object identification and depth perception fields. It also gives support information to the focus vision and is used for determining standard visual references in driving, relative position in space and time, and movement into space/time.

**The peripheral vision** is conical in shape around the other vision fields. It picks up lateral changes in color and object movement. Peripheral vision is strongly affected by fatigue, drugs, and speed. It often gives the driver an initial warning of a changing or closed space area. This concept can be demonstrated by using two flashlights and showing them on a screen or blackboard. If they are focused together, obvious rings will appear demonstrating the three visual field concepts. The three visual information fields are utilized by a driver when a problem comes toward their vehicle from the side. A driver will first recognize that something is moving toward the vehicle and possibly see the type of vehicle (large/small truck or large/small car). The driver will then focus on the vehicle to identify color, make, year, etc.

**Maintaining an open line of sight**

This is the ability to see the center of the driver's path of travel. An open sight line can be blocked by a curve, hill, bush, building, vehicle, etc. The driver's ability to have an unrestricted line of sight is a visual basis for speed and steering adjustments. An interrupted line of sight means changes in speed and position are necessary for reestablishing a clear line of sight to the driver's path of travel.

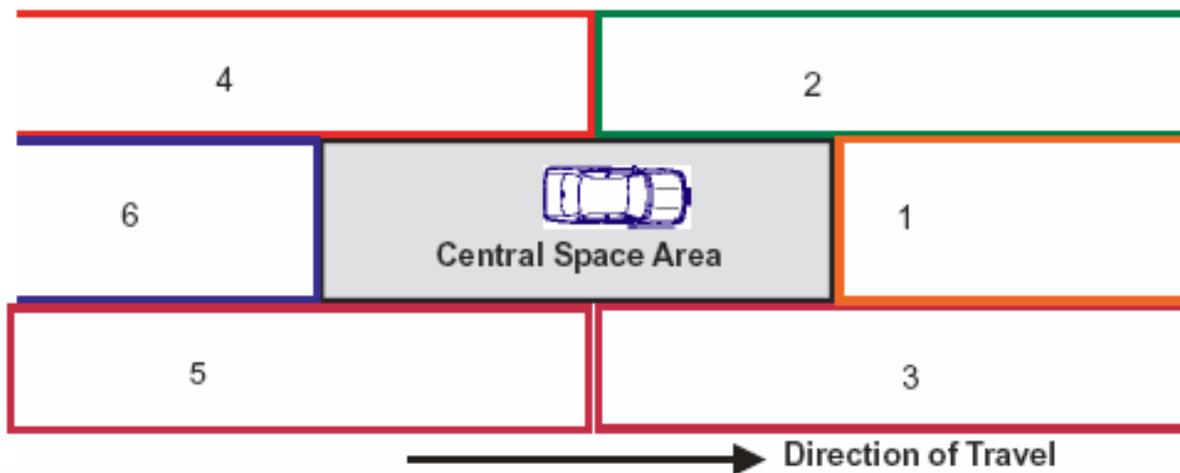
**Searching skills**

- Using visual skills to make turns
- Forward visual turning point
- Rear visual turning point
- Line of sight
- Paths of travel

## Fact Sheet

## Vehicle Operating Space

There are seven basic areas of operating space around a vehicle. The diagram below shows the six areas or spaces surrounding the car that are visible to the driver. The vehicle



occupies the central area, which includes the driver and the space occupied by the vehicle that is not visible to the driver.

The areas or spaces around the central space area may have the following conditions:

**Open:** There is a space or area to operate within that is without restrictions to the line of sight or path of travel.

**Closed:** The space or area is not available for the car's path of travel or there is a restriction to the driver's line of sight. An alternative path of travel must be identified.

**Changing:** A space or area condition in which the level of risk is increasing. It is often an open space or area that is changing to a closed line of sight or path of travel or a closed space or area with additional problems or changes.

The more driving experience people have, the more likely it is that they will become a victim of seeing what they expect to see. A typical driving expectancy is a mental set that makes a driver think things are not as threatening as they actually are.

As a result, the driver continues to maintain speed/path of travel when conditions dictate that an adjustment in time/space management is needed. This means that the driver should do something to the speed or path of travel of the vehicle to locate it in the most controllable space.