

Texas Driver Education Classroom and In-car Instruction Model Curriculum

Module Five

Information Processing:

Moderate Risk Environment

- **PROCESSING INFORMATION**
- **INTERSECTIONS, CURVES, AND HILLS**
- **PASSING**

FACT SHEETS

To be effective, a space management system must be easy to use and apply to all highway situations. The system described in the following pages consists of three basic steps and entitled the SEET System (Searching, Evaluating, and Executing in Texas)

Search for objects or conditions - For instance other roadway users or conditions in or adjacent to the projected path of travel that could increase risk. Included are vehicles, pedestrians, animals, restricted visual field, limited space to the front, sides and/or rear, potential conflict points such as curves, long and/or steep downgrades, hill crests, railroad crossings and interchanges.

Evaluate the projected path ahead for alternate paths of travel. Check to sides and rear for speed and lane position options. Maintain open space on at least one side into which the vehicle can be steered. Identify best speed and position options for existing conditions.

Execute appropriate adjustment(s). The driver can change speed, change direction, or communicate.

A driver's options relative to speed control are:

- Projected path clear - maintain speed
- Projected path clear - increase speed
- Projected path threatened - off accelerator/decrease speed
- Projected path closing -no alternate path/decrease speed
- Projected path closed - controlled braking/decrease speed

Considerations relative to communication including adjustment of position, speed and use of signal devices are:

- Circumstances under which a driver should communicate
- Timing of the communication
- Method used to communicate

Communication is an exchange of information. To be effective communication must be clear and take place early enough for others to receive and act upon the information that was sent. Drivers can communicate with other highway users in several ways: through the use of turn and emergency flasher signal lights, brake lights and headlights; by lane selection and position of the vehicle within a lane; the use of hand signals, the horn and speed of the vehicle; the actions of the driver such as the use of a cell phone. Depending on circumstances one method may be more effective than another and at other times more than one method may be needed.

Few drivers realize that signal lights flash only one to three times per second and as a result the signal should be activated several seconds in advance of any planned move so that other highway users have enough time to see and interpret your intentions. This time/distance is typically well beyond the minimum distances required by the motor vehicle code.

Visual Search Process. The first space management skill a driver must develop is an effective visual search. They need to know where, when, how, and what to search for.

Where to search involves moving the eyes from near, as close as the dashboard and mirrors, to 20 to 30 seconds ahead of the vehicle to identify objects or conditions that could increase the level of risk. [If environmental conditions limit one's line of sight to less than 20 seconds, adjust speed as appropriate and look to the furthest point possible]. Determine an appropriate speed and position and identify an alternate path 12 to 15 seconds ahead if the planned path of travel should become closed or threatened. Searching also involves monitoring the immediate path of travel, four to eight seconds ahead, the instrument panel, and timely mirror usage to monitor traffic to the sides and rear.

When to search involves timing and direction of the search pattern. When to search requires consciously looking to determine conditions all around the vehicle before initiating any maneuver.

How to search involves looking in a systematic pattern of far ahead to near, as well as to the left, right and rear of the vehicle and making efficient use of both central and fringe vision.

Searching 20 - 30 seconds ahead - Rockwell's research demonstrated that the typical driver search is only four to five seconds ahead of their vehicle. While adequate to avoid stumbling when walking, this short visual search leads to excessive braking, and adjustments of speed and position when driving. Development of an adequate visual search is difficult to master. However, it is the only way an individual can effectively assess a safe travel path, identify possible sightline changes well in advance and determine appropriate speed or position adjustments. By searching ahead 20 to 30 seconds and identifying an intended path of travel and possible alternative paths 12 to 15 seconds in advance, the driver has more time and space to exercise options. By looking as far ahead as possible and adjusting speed to the visual field, the driver has more time to identify potential problems. Early identification and assessment of objects and / or conditions provides time to adjust speed and/or position with awareness of adjacent, oncoming, and/or following vehicles. Depending on the driver's level of attention to driving and where that attention is directed at a specific point in time, four to eight seconds should provide sufficient time to bring most passenger cars to a stop on a dry paved road or improved shoulder. It is essential to remember, however, that a loaded tractor-trailer rig may require 10 to 15 seconds to stop under the same conditions.

Searching 4-8 seconds ahead - Searching 20 to 30 seconds ahead and identifying an alternate path 12 to 15 seconds ahead into which the vehicle can be steered, can assist in avoiding most threatening situations. The driver must also monitor the immediate path, 4 to 8 seconds ahead. The 4 seconds ahead represents the following interval and the 8 seconds provide a safe stopping zone under most conditions. In heavy traffic, the old 2 second following interval provided time to steer, assuming the driver was monitoring the actions of the vehicle five units ahead, but was rarely sufficient time to safely brake to a stop.

What to search for requires forethought and planning - To be effective when searching the highway and traffic scene, the driver must be looking for specific kinds of information. Simply stated, "The eyes don't tell the brain what it sees—the brain tells the eyes what to look for." If the brain is not programmed to look for specific information, the eyes simply scan the scene and primarily respond to the more colorful and/or moving objects. Since the brain is limited in the amount of information it can process at any one time, a more effective method is to search for and classify information by category. Traffic elements can be classified into one of four groups:

- **Roadway features:** Road and lane width, lane markings, roadway surface, shoulder condition and slope, curb type and height, hills and curves, intersections and interchanges, areas of limited visibility, location and type of structures adjacent to the roadway.
- **Signs, signals, and markings:** Warning, regulatory, directional, and informational.
- **Motorized vehicles:** Cars, trucks, tractor-trailer rigs, buses, motor homes, motorcycles, construction/farm tractors, and other slow moving equipment and horse drawn equipment.
- **Non-motorized highway users:** Pedestrians, bicyclists, and animals.

Fact Sheet
Module 5

F-5.2 Lane Selection and Positioning

There are five choices for lane position without making a lane change. Most cars are less than six feet wide while highway lanes are 10 to 12 feet wide. This leaves four to six feet of space to the side without having to change lanes.

Lane Positions:

- Lane positions 1, 2, and 3 are positions within a given travel lane.
- Lane positions 4 and 5 involve moving the vehicle so that the left or right wheels are straddling the lane line markers.
- Other options involve changing lanes or moving to the shoulder of the road.

Controlling space to the front - There are three ways to control space to the front. The driver can time arrival at a given point by adjusting speed, placement of the vehicle when stopping, and controlling speed while in motion.

The purpose of an aggressive visual search is to better enable the driver to identify safe projected and alternate paths of travel. The vehicle must be positioned properly so that the driver has an adequate sight path. Maintaining an adequate sight path requires a following interval of at least four seconds. [The two second following distance rule was intended to provide time to steer, not stop]. At highway speeds even a four second interval is inadequate when braking to a stop to avoid striking a fixed object if the vehicle following behind is a tractor trailer rig. In such instances a stopping zone of 10 to 15 seconds may be required. Therefore one of the goals of the decision making process is to always attempt to identify an alternate path, an open area to at least one side, 12 to 15 seconds ahead into which the vehicle can be steered and safely brake to a stop. Under conditions where there is no alternate path into which the vehicle can be steered, the only option is to reduce speed to increase following interval. Anytime a driver moves into an area of reduced space with a vehicle tailgating, it is essential that the driver start reducing speed earlier. Slowing earlier and tapping the brakes to alert the following driver provides greater control over the vehicle to the rear.

To improve following interval under heavy, but free flowing traffic conditions, take advantage of the tendency of drivers to travel in platoons or packs. Rather than driving in a pack, position the vehicle in the first or second lane from the right, behind the last vehicle in the pack and establish four second following interval. Now reduce speed by two to three miles per hour. Within a matter of seconds traffic will clear. True, faster moving vehicles in the next platoon will overtake and pass, but basically there will be many fewer vehicles to deal with at any one time.

In the past, on multiple lane higher speed highways, faster moving traffic tended to travel in lane one, the lane furthest to the left. However, over the past few years there appears to have been a move away from such lane discipline, and weaving has increased between all lanes. This behavior obviously calls for increased vigilance of traffic to the sides and rear regardless of the lane selected.

Basis for lane adjustment. Using the SEET system approach, lane adjustments are based on restrictions to the line of sight or to the intended path of travel. Assigning lane position numbers or colors to the basic positions within a lane allows the new driver to move to the position quickly and can be communicated more easily than asking the student to move over a little. Each lane position has a reference guide to make it easily used. LP 1 is 2-3 feet from left and right sides of lane, while LP 2 is within 6 inches of the left line, and LP 3 is within 6 inches of the right line. Straddle positions are to the left or right lines or edges of roadway. Other adjustments are lane changes and should be considered to the left or to the right.

When space to the front is clear. When traveling in lane position one, search 20 to 30 seconds ahead along the planned path of travel and 12 to 15 seconds to the left and right frontal areas to identify planned and alternate paths of travel. Continually reassess the immediate path four to eight seconds ahead. If an object or condition adjacent to the projected path of travel reduces space to either side, check to the rear and side and move to position two or three as appropriate.

When more than one object or condition adjacent to path of travel poses a possible threat - Having identified that the planned path of travel is open, determine which object or condition poses the greater risk and decide on change of speed and/or position appropriate to the situation. Depending on which object represents the more serious consequences, a reduction in speed and movement to lane position two or three is typically sufficient.

When the planned path of travel is closed, but alternate paths are open - Having identified alternate paths of travel 12 to 15 seconds ahead and maintained an area into which the vehicle can be steered on at least one side, more time is provided to reassess traffic to the side(s) and rear and communicate intentions prior to adjusting position and speed.

When the planned path of travel is closed and there is no alternate path - Having determined when searching 20 to 30 seconds ahead that there is no alternate path available 12 to 15 seconds ahead, the driver should immediately check to the side(s) and rear to detect the presence, location, size, and speed of any following vehicles. If present, flash brake lights to alert the following driver and begin to apply the brakes. Attempt to maintain forward motion while opening up the space ahead. If the distance ahead cannot be increased, brake to a stop while maintaining a gap to the rear.

When the planned path of travel is open, but threatening objects or conditions exist on both sides - When there are threatening objects or conditions to both sides of the path of travel, reduce speed, cover brake while in the area of reduced space, and maintain lane position one.

When there is no following traffic - The absence of traffic to the rear provides the maximum level of control to the rear. It permits quicker and more abrupt changes of speed and/or direction in response to changes in ongoing and oncoming traffic or other roadway users.

Fact Sheet
Module 5 F-5.4 Techniques for Hills and Curves

Searching into a curve. Seeing the curve and/or downgrade 12 seconds ahead as a front zone change or a limitation in the path of travel will cause less stress and give the driver more control because he/she will now test the braking capabilities and get the best speed and lane position to negotiate the curve.

If a driver notices that the front is closed to your POT due to the red light and the stopped car. You can save fuel if you stop accelerating and use the energy of the car's momentum. You should also apply the brake with light pressure. Looking 12 seconds ahead would enable you to see the right zone change created by the traffic that is pulling out of parking spaces and by the bus that is stopped or stopping in the right lane. The control you have of the front zone will be changed by the curve of the entrance ramp and by the traffic flow that will be coming from your left. Trees can cause a LOS limitation.

Curves and hills reduce a LOS. You are unable to see what you are driving into; therefore, you cannot know how your POT is. Looking 12 seconds ahead into curves means to direct your eyes through the curve, trying to see to the end of the curve as soon as you possibly can. By looking through hills and curves, you are consciously looking to see if your POT is open or closed to your vehicle's movement.

If you were looking ahead, you would see the zone change to your LOS-POT created by the curve. Your LOS is closed. As you get closer to the curve, by looking into the curve you would be able to see the condition of your POT as early as possible. While looking into the curve you will be using your central vision to see any changes to your POT, and your fringe vision should keep account of your tracking path. As you are more confident in the use of reference points, your fringe vision will be more comfortably and efficiently used.

By searching into the curve you are able to immediately evaluate any problem to your LOS-POT at a time when you may need to avoid a surprise crash situation.

1. After seeing a curve in the roadway, make a mirror check for rear zone awareness.
2. Check the left, front and right zones to know what your options are.
3. To evaluate your POT, search into the curve before you turn the steering wheel.
4. Search 12 seconds ahead for new LOS-POT changes.

Looking for Problems. The problem most drivers have is that most often they don't have problems. Think about that for a while. I mean, who really expects a problem over the hill crest or around the curve? For the previous 9,000 times going into the curve, there wasn't a problem. Drivers feel comfortable going a little faster than they perhaps should, but still there is no problem. When the problem does occur, we get surprised. For example: a car stalls while backing out of a driveway into our POT. So what's the solution? We must see the curve and hill crest as a LOS change, then aggressively look for the actual POT available or not available to you.

Imagine that you are the driver in the photos at the left. While searching into the curve, you see the circled parked car as a left zone change, then check the related zones such as the left front zone to see if there is or will be an oncoming vehicle. Check the right zone to see if you have an escape path or if you have a closed right zone.

-- Mottola, F. R. 1997. Empower Yourself with Zone Control Driving, Interactive Driving Systems, Inc. Chesire CT.

Basic Cornering. As you approach a curve, do your braking in a straight line. Remember the bit about the tire patches. If you're braking at 1.05 Gs, and that is the limit of the tires, if you start to turn, something's going to happen you don't want to happen. As the driver turns to the apex, he should release pressure on the brake. If the driver is still braking as steering is feed to the vehicle, he should release pressure in the same manner as he steers. This is called trailing brake and will allow the driver to control motion of vehicle into curve.

The apex of the corner is the point at which your car is closest to the inside edge of the usable roadway surface. With most cars, the driver should use a late apex so that they can use the power sooner on the exit of the curve.

-- Rich, C. 1998. MBI Publishing Company. Osceola, WI.

What does the law require of a highway user in reference to:

Overtaking and Passing

Passing:

On the Left

Safe

Return to lane when safe

Return to lane 200 feet from oncoming vehicle

Being Passed on the Left

Give way to right

Must not increase speed

Passing On the Right

Vehicles turning left

Two or more lanes same direction

Safe

May not drive on shoulder

Passing Forbidden

Two Lane Roadways

Approaching crest of hill

Curve where view is obstructed

Within 100 feet of intersection or railroad crossing

If View is Obstructed, Within 100 Feet of a Bridge, Viaduct or Tunnel

**Fact Sheet
Module 5****F-5.6 Related Passing Laws****Driving on Roadways with Lanes****Vehicle to be Driven Within a Single Lane****Center Lane of Three Lane Roadway**

Passing when safe to do so

Preparing for left turn

Where center lane is allocated to traffic moving In one direction

Obedience to Traffic Control Devices

Designates lanes to be used by traffic moving In a particular direction [Reversible Lanes]

Two-way Left Turn Lanes

**To be used only to make left or “U” turns to or from roadway
May enter only if clear of opposing traffic**

Travel is Restricted to Shortest Distance Practicable Prior to or After Making Left or “U” Turn

Where Such Lanes Exist, Left and “U” Turns Must be Made to or from that Lane

Following Too Closely

**Must Maintain Reasonable and Prudent Interval with Regard to Other Vehicle Condition of
Highway and Speed of Traffic**

**Where Two or More Vehicles are Traveling in a Caravan, They Must Allow Enough Space
Between Each Two Vehicles so that Passing Vehicles Can Enter Safely
[Does Not Apply to Funeral Processions].**

Drivers to Reduce Speed**Intersections**

Approaching and Crossing Intersections Where Cross Traffic is Not Required to Stop by
Traffic Control Devices

Approaching and Crossing Railroad Grade Crossings

Approaching and Going Around Curves or Cresting Hills

Traveling on Narrow or Winding Roads

Due to Danger to Pedestrians, Other Traffic, Weather or Highway Conditions.

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Module Five

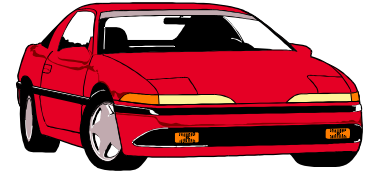
Information Processing:

Moderate Risk Environment

- **PROCESSING INFORMATION**
- **CONTROLLING SPACE**
- **APPROACHING INTERSECTIONS**

WORKSHEETS

W-5.1, Using Information to Manage Space and Time



Name _____

List the basic requirements for driving.

1. The driver needs: A. _____ B. _____ C. _____
2. The vehicle needs: A. _____ B. _____ C. _____

List the components of a space management system.

1. _____
2. _____
3. _____

List eight basic ways to communicate.

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

List four visual search areas for drivers.

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 4. _____ |

What is the length of the following interval that allows a driver to stop in the space provided?

_____ seconds.

List four elements to search for when driving.

- | | |
|----------|----------|
| 1. _____ | 3. _____ |
| 2. _____ | 4. _____ |

List three ways to control space to the front.

1. _____
2. _____
3. _____

What is the purpose of a staggered stop?

W-5.2, Approaching Hills and Curves

Name: _____

Explain a basic search pattern used when approaching high speed intersections.

List two special lane markings used for special traffic lanes.

- 1.
- 2.

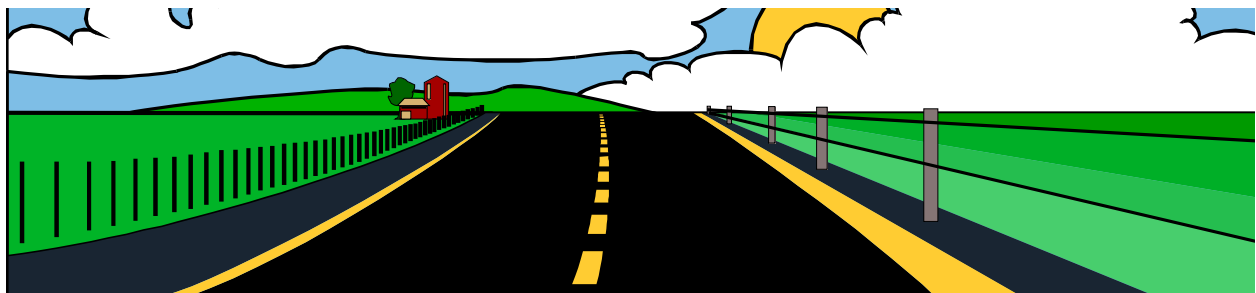
Draw the pathway through the curves below:



Mark the entry, apex, and exit points above.

Mark the squeeze brake point, trail brake point, and the acceleration point.

Draw the pathway to the approach of the hill below.



W-5.3 Passing Concepts

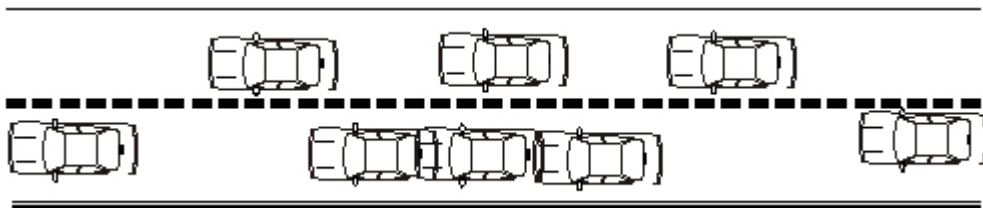
Name: _____

How long does it take to make a pass when starting at 40 mph and accelerating to 50 mph? Explain.

List three considerations when passing another vehicle.

1. _____ 2. _____ 3. _____

Draw and explain the procedures to pass another vehicle.



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EVALUATION AND ASSESSMENT

MA-5.1, Module Five Assessment

Multiple choice questions

1. You are traveling 45 mph and approaching a curve posted for 30 mph. When should you reduce speed?
 - a. As you enter the curve.
 - b. At the apex of the curve.
 - c. Before entering the curve.
 - d. Gradually through the curve.

2. What is the best lane position when driving on a two-lane road with lines of vehicles parked on both sides?
 - a. Lane position 1.
 - b. Lane position 2.
 - c. Lane position 3.
 - d. Lane position 4.

3. What is an item that a driver should search for after stopping at an intersection?
 - a. Open space or gap.
 - b. Radio controls.
 - c. Cars to the rear.
 - d. Signs and lane markings.

4. When nearing the crest of a hill on a two lane roadway you should _____.
 - a. slow, sound your horn, and maintain lane position 1.
 - b. slow and position your vehicle in lane position 3.
 - c. slow, sound horn, and maintain lane position 2.
 - d. slow, but maintain lane position 1.

5. Before changing lanes the most important thing for you to do is to _____.
 - a. increase your speed.
 - b. signal direction of movement.
 - c. make sure the space areas are open.
 - d. check rear and side mirror.

6. If your vehicle is not equipped with daytime running lights (DRL's), why is it important that you drive with headlights on during the day?
 - a. To see better on cloudy days.
 - b. Because it is required by the vehicle code.
 - c. It helps reduce sun glare.
 - d. It improves the chances that other highway users will see my vehicle.

Evaluation and Assessment

7. A driver has the least amount of control over space to the _____.
- front of their vehicle.
 - right side of their vehicle.
 - rear of their vehicle.
 - left side of their vehicle.
8. When another driver is tailgating your vehicle, it is best to allow a greater space area to the _____.
- right side of your vehicle.
 - front of your vehicle.
 - left side of your vehicle.
 - rear of your vehicle.
9. Communicating should be thought of as _____.
- exchanging information.
 - receiving a message.
 - sending a message.
 - providing feedback.
10. When stopped for a red signal at an intersection you should:
- begin moving immediately when the light turns green.
 - touch the horn to alert any pedestrian in the intersection when the light turns green.
 - check traffic and count 1, 2, 3 before moving after the light turns green.
 - check for bicycles before moving after the light turns green.
11. Managing space when you drive means managing the distance between your vehicle and the vehicle _____.
- ahead of you.
 - behind you.
 - to the sides of you.
 - all of the above.
12. When another vehicle is passing you on the left, _____.
- it is illegal to increase your speed.
 - it is illegal to decrease your speed.
 - keep your vehicle in lane position 2.
 - flash your headlights when he is past.

13. When driving in moderate traffic, on a multi-lane roadway, traveling at about 55 m.p.h., it is best to _____.
 - a. drive more slowly than usual.
 - b. drive in lane position 2 of your lane to improve visibility.
 - c. drive as close to the speed of traffic as is safe.
 - d. drive in lane position 3 of your lane.

14. When can a left or right turn be made from a lane other than the far left or right lane?
 - a. When turns are controlled by a left or right turn arrow.
 - b. When there is no traffic in the adjacent lanes.
 - c. When there is no oncoming traffic or pedestrians
 - d. When pavement markings and signs permit such movement.

15. You approach an intersection where you plan to turn right. The signal light is red. Before turning you must _____.
 - a. maintain speed to keep up with traffic flow, slowing just enough to make the turn.
 - b. come to stop and yield to pedestrians and vehicles in your path of travel.
 - c. slow for the turn as you would for a yellow light.
 - d. come to a stop only if someone is in your way.

Completion Questions

16. Drivers can communicate their presence or intended action by **[list at least 4 ways]**

17. When driving, elements can be grouped in four categories for more efficient gathering of information. The groups are identified as:

18. Describe the process of entering a curve or approaching a hill with a limited line of sight or a restricted path of travel.

19. When stopping as the first vehicle in the inside lane, at an intersection of multi-laned streets, controlled by either stop signs or a traffic signal, you can reduce the chance of being struck by a driver who while turning left cuts the corner short, by employing a staggered stop. Describe a staggered stop.

20. The major difficulties to be expected when making a left turn in a shared left turn lane are:

Module Five Assessment Answer Sheet

Name _____ Date _____

Multiple Choice Questions

- | | | |
|------------|-------------|-------------|
| 1. a b c d | 6. a b c d | 11. a b c d |
| 2. a b c d | 7. a b c d | 12. a b c d |
| 3. a b c d | 8. a b c d | 13. a b c d |
| 4. a b c d | 9. a b c d | 14. a b c d |
| 5. a b c d | 10. a b c d | 15. a b c d |

Completion Questions

16. _____

17. _____

18. _____

19. _____

20. _____

Module Five Answer Sheet

Name MODULE 5 ANSWER SHEET

Date N/A

Multiple Choice Questions

1. a b **(c)** d

6. a b c **(d)**

11. a b c **(d)**

2. a **(b)** c d

7. a b **(c)** d

12. **(a)** b c d

3. **(a)** b c d

8. a **(b)** c d

13. a b **(c)** d

4. a **(b)** c d

9. **(a)** b c d

14. a b c **(d)**

5. a b **(c)** d

10. a b **(c)** d

15. a **(b)** c d

Completion Questions

16. Horn, Turn Signals, Lane Position, Hand Signals, Reverse Lights, Braking, Speed of vehicle, Stopping Position, Eye Contact, Waiting for Others, etc.

17. Roadway conditions; Signs, signals, and markings; Vehicles; and Other users

18. Slow down until the exit of the curve is visible, stay to the outside of the curve on entry to see better through the curve, steer to apex in a curve, stay to the right side until visibility is available over the apex of hill, switch to accelerator when apex is identified, progressively accelerate to speed again.

19. Open ended question which allows for a group of any of these answers... A staggered stop is about 15 additional feet back from the intersection which allows a larger vehicle to make a left turn more easily and reduces the chance of having a driver making a short turn at the intersection crashing into the vehicle. A staggered stop is about one car length back or the midpoint of the car to your right.

20. Open ended question which allows for a group of any of these answers.... Check the shared left turn lane for vehicles already stopped waiting to turn from or onto the highway. Check ahead on the right to see if anyone wanting to make a left turn onto the highway will be entering the shared left turn lane where you expect to turn or stop. Check oncoming traffic for vehicles signaling a left turn. Check the driveway to the left for any vehicle signaling a left turn with intentions of moving into the lane while waiting for a gap in traffic to the right, Check traffic to the rear and signal your intention to turn left, Adjust speed and enter lane, If an adequate gap is not available, brake to a stop. When oncoming traffic is clear, complete the turn.

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TRANSPARENCIES