

Vehicle Operation and Control

Objective:

Student will integrate visual tracking, steering control, and braking and acceleration control to improve vehicle control and operation.

They say practice makes perfect. However, no one is ever perfect at driving. It is a constant process of preparation, readiness, and requires the driver to constantly problem solve in different driving situations and scenarios. As a beginner driver it is important for you to start with a good foundation and develop good habits and techniques from the start. This occurs through repetition and practice. You must strike a balance between controlling your own vehicle, managing the risk between you and other driver's on the road, and cooperating with the other people on the roadway. Each situation will present itself with different options and choices that you as driver will have to make quickly, confidently, and precisely. Failure to do so may be fatal.

After you have completed your pre-drive checks as discussed earlier in this module, you are now ready to start your vehicle. The engine in your car is a very complicated and sophisticated machine. You must handle it with care because repairs are costly. When starting your engine:

1. Place your foot on the brake pedal before starting the engine.
2. Check that the parking brake is set.
3. Check that the gear selector lever is in Park.
4. Start the engine.
5. As soon as the engine starts, release the key.
6. Idle for at least 15 to 20 seconds before you start driving.
7. Make sure all gauges indicate normal functioning of vehicle systems.
8. Turn on the low-beam headlights.
9. Drive at moderate speed to allow the engine and fluids to warm up.

Steering and Watching the Road

Your steering wheel is one of the most important parts of controlling the vehicle. Remember, your hands should be firmly on the wheel with your grip at 9 o'clock and 3 o'clock. Thumbs are up, not wrapped around the wheel. Your eyes should be looking down the roadway at the center of the lane you are traveling in. Your hands will be making constant corrections to the path of travel even on very straight roads. Whenever you are moving the steering wheel try to have the car in either backward or forward motion to avoid what we call dry steering. Dry steering, or turning the wheel with the car at a stand still, will cause undue wear on your tires and steering mechanism. Beginning drivers tend to focus on the middle of the hood, the edge of the road, the center line or the fender on each side of the car to guide their steering. This type of narrow focus leads to incorrect steering and improper positioning of the vehicle in the lane. We typically drive where we look. Try to keep your eyes down the intended path of travel.

There are different methods of steering used in different situations.

Hand Over Hand

Hand to hand /Push Pull Steering/ Milking the Cow

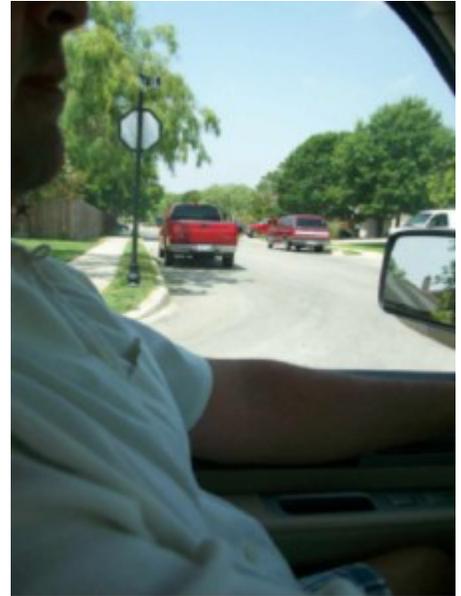
One-Hand Steering/ Wiping the Dishes

Things to Know When you are Making a Turn

Reference points are useful when driving because they help you, as a new driver, to know when you and your vehicle are in the correct position to make a maneuver. Also, where your eyes are looking also determines how well you will maneuver through a turn.

Left Turn

When making a left hand turn, start your turn when the curb matches up to the driver. Begin your turn with the right hand.



Right Turn

When making a right hand turn, start your turn when your right side mirror intersects with the curb. Begin your turn with the left hand.



Accelerating

To make your car go or increase its speed you use the accelerator pedal. It is important that you get used to using the accelerator for a smooth, gradual increase in speed. You will develop a feel for how easily the gas pedal increases the speed of the car you drive. Not all cars have the same feel and if you switch cars it may take a few minutes to get the “feel” of a different vehicle.

Progressive Acceleration: Use the gas pedal gradually and smoothly. Adjust the pressure on the gas pedal by sensing the vehicle's reaction and as the speed increases. This gradual use of the gas pedal will save you fuel and wear and tear on the engine. Once you have gotten to the speed you wanted, adjust the pressure on the gas pedal. If your car slows down too much then add pressure and take it away as the speed once again gets to your target speed. This is a process of constant adjustment as the roadway changes (uphill or downhill), types of pavement change, and driving conditions change (traffic, weather, etc.)

Thrust Acceleration: This type of acceleration occurs when you need to make a sudden and fast change in speed. There might be a hazard in the roadway, the terrain may have become steep, you might need/want to pass another car, or when entering the highway. This is not something you want to make a habit of. It causes a severe weight transfer in your vehicle toward the back, wastes gas, makes your car work harder than it needs to, and can be very dangerous when mixed with a sudden change in steering.

Braking and Decelerating

Braking seems like a relatively easy concept. You need your car to slow down or stop, use the brake. However, knowing when to start pushing the brake, knowing how hard to push the brake, and doing it all smoothly takes a lot of practice. The key to braking is using a motion that is smooth, gradual and firm, not sudden and hard or drastic. When braking, keep your heel on the floor so that you use more of your ankle and toes rather than your thigh muscles. Again, practice is the key to knowing your vehicle and how the brake and car react with each other. Speed is also another huge factor when braking and it takes time to understand how much brake and how soon you must start braking at various speeds to bring a car to a complete stop.

Coasting: Simply by taking your foot off the accelerator will begin to slow down the vehicle. The car will still be moving forward but no engine is involved and speed will gradually decrease.

Controlled or "squeeze" braking: This occurs when you give the brake pedal enough downward pressure to slow down the car without a sudden change that might cause the car to skid or lose traction. Press the brake pedal down gradually and then release it just a bit as you come to a complete stop.

Threshold braking: Used mostly in emergency situations where you are forced to slow down drastically and quickly. The brake pressure is just to the point where the brakes will lock up giving you maximum braking ability. Sometimes, if you apply too much pressure, the anti-lock brake system will override your pressure to avoid lock up. Not all cars are equipped with this feature. Check your owner manual for the car you will be driving to determine if this is a feature your car has.

A proper sequence of events should occur each time you are going to use the brake pedal. Practice and habit will ensure safe braking each time you drive.

1. Tap the brake pedal to signal other drivers behind you that you intend to slow down.
2. Check your rear view mirror. Know that at least one other vehicle behind you has stopped safely.
3. Position your vehicle and grasp the wheel firmly as you once again press down on the brake pedal to slow the vehicle.
4. Plan ahead and stop smoothly at least one car length from the stop line or the car in front of you. A good rule to follow is to stop back far enough where you can see the rear tires of the car in front of you.

Braking Time and Total Stopping Distance

PERCEPTION TIME + REACTION TIME + BRAKING TIME = TOTAL STOPPING DISTANCE

Perception Time

The time it takes you to spot danger and how quickly you realize there is a problem and decide what to do about it.

Reaction Time

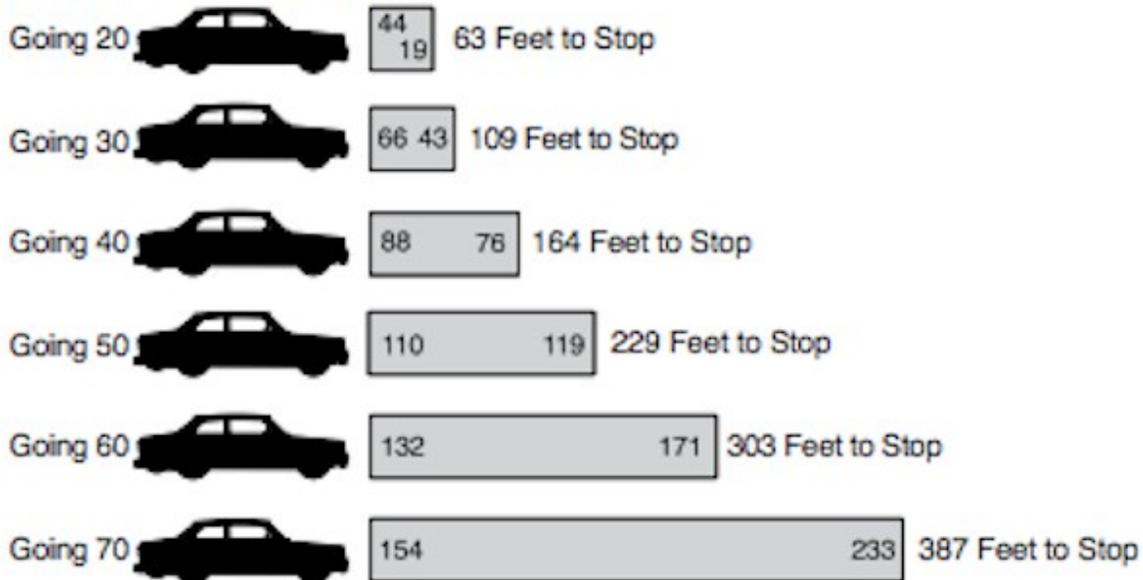
The time it takes you to act on your decision.

Braking time

The time it takes your vehicle to come to a stop once you apply the brakes.

Approximate Stopping Distances

It takes the average person 1-1/2 seconds to think, react and apply the brakes. The following table shows how far you travel in that 1-1/2 seconds, plus how many feet you travel while skidding to stop.



And this is with good brakes and tires on dry level pavement

In this chart, you can calculate how far it will take your car to stop including time to think, react and then actually step on the brakes. The first number is how far, in feet, your car will go in the time it takes you to think, react and actually step on the brake. The second number shows how many feet your car will travel until your car actually skids to a complete stop. **Notice it also says that your car is on dry pavement and not going downhill. If it is rainy or you are traveling down a steep hill, the distance increases dramatically.**

Example: If you are traveling at 20 miles per hour, and you see a ball bounce in front of your car. Your car will travel 44 feet in the time it takes you to realize there is a ball in the street and you need to brake. Then your car will travel an additional 19 feet while you are braking to a full stop. The total number of feet including time to think, react, and actually make your car stop is 63 feet. If you do not stop your car in that distance you will hit or run over whatever it is in the road. This example might help you understand why in most neighborhoods where there are often children and pets playing and people out walking the speed limit is 20 mph.

You try. Read the following scenarios and use the chart to determine the stopping distance.

Looking at the chart, how many **total** feet will you travel before your car stops if you are going 40 mph?

How about if you are going 50 mph? What is the **TOTAL** time it takes you to stop completely?

How much time does it take you simply to react and realize that there is a problem and that you must apply the brake? If you said 110 feet you would be correct. You would travel 110 feet and then another 119 feet before you would stop. Think about if you were in a neighborhood traveling at 50mph? If a child ran into the road after his ball could you stop in time??

Look at how far it would take you to stop when you are traveling at 70mph. This will help you understand how dangerous high speeds are.

Answers: 164ft, 229ft, 387ft

Vision & the Driving Task

Objectives:

The student will apply the SIPDE concepts to manage space around their vehicle to drive defensively and reduce risk.

Vision and the Driving Task

It is a proven fact that you tend to drive in the direction you are looking. This is great as long as your eyes are focused on the road, with your vision scanning and looking ahead down your path of travel. This sounds easy enough, however, many beginner drivers have a hard time with knowing where to look, how to search for problems, keeping a safe distance from other vehicles, and keeping your car in the roadway all at the same time. There is a lot going on all at once in this scenario and developing good visual skills is an important part of becoming a proficient and defensive driver.

Here are some questions to keep in mind as we continue through this topic.

- How far should drivers look ahead of their vehicle?
- Why is it important to look ahead?
- What could happen if drivers do not look far enough ahead?
- Why do many drivers not look far enough ahead?

You probably do not often think about your vision. It is a sense that we often take for granted and assume it will always be there and work for us. In this section the focus is to think about what and how your eyes see and work. Your eyes work in three ways to see different things.

Focus Vision—also called Foveal or Focal vision

This is the part of your vision that focuses on a narrow view. This part of your eye sees color, can read and identify distinct objects. It covers about 3-5 degrees of your visual field.

Central Vision—also called inner fringe vision

This part of your eye is used to determine the depth and placement of what you see. It covers about 30-36 degrees of your visual field. It helps you to see position and movement as they relate to other objects.

Peripheral Vision—also called outer fringe vision

This part of your eye works to help you see movement, shapes, and position of objects but does not offer any detail. It can help you to sense the speed or presence of objects around you that you can not fully see in your straight-ahead vision. This is a very important part of driving as it allows you to get information and predict things that may happen in your direct path of travel.

These three visual sources all work together when you drive. Your peripheral vision helps you constantly search the area around your vehicle for possible problems or dangers. As objects come closer into view your central vision will gather more data such as what the object is, how fast it is going, size, and then your focus vision will help you identify the details about the object such as its color.

As a new driver it is difficult to take in everything that is happening around you when you drive. New drivers tend to have tunnel vision and focus on only what is directly ahead of them. Observing what is happening all around your vehicle is an important skill that must be learned and practiced for a long time before it becomes second nature and automatic. The best drivers make a conscious effort to notice and look around the entire time they are in the vehicle. In this section we are going to examine a technique to help you deliberately and purposefully notice things going on around you when you drive.

SIPDE (sip-dee)

These letters stand for five strategies for gathering, interpreting, and acting on information you get from the driving environment. As the driver of a motorized vehicle you will be forced to respond quickly to events in traffic involving you and other road users. If you can get into the habit of using these five skills every time you drive, you will be a safer and better driver that can avoid trouble.

Scan/Search

Experts recommend that your eyes should be scanning 20-30 seconds ahead looking for signs, signals, markings, and any possible problems that may enter your driving path. Your scan should include your dash, gauges, mirrors, as well as the roadway from one side to the other and to the rear of your vehicle. It is also important to notice what is going on behind you. It is especially important to scan ahead at intersections so that you can see all possible cross traffic that may enter the roadway ahead of you.

Identify

In your car you are a moving object, coming always closer to potential hazards. You must scan ahead, down the road far enough so that you have time to determine which objects may pose a problem in your path of travel. Pedestrians, other cars, animals, signs, road conditions, and signals all may require you to make a decision on how to act. Not all will become a threat but you must figure out and isolate those that might. Try to avoid surprises. Be alert to pedestrians, animals, bicyclists and observe the behavior of other drivers. If they are making poor choices such as weaving in and out of traffic, avoid them and increase space. Watch out for areas or objects that impede your line of sight. Trees, parked cars, bridges, sharp curves, and buildings can all hinder what you can see down the road. They also keep other cars from seeing you.

Predict

As a driver you must expect the worst and be prepared to react. You cannot control what other roadway users will do but you can be prepared for sudden and unexpected movements they may make. Try to communicate your intentions with your horn or lights or with eye contact. In most cases an accident can be avoided if you are observant and plan ahead for the possibility of danger. For example, a parked car with its wheels turned toward the roadway may indicate

that he is about to pull into your path of travel. In addition, flashing tail lights and a slight roll in the tires may help you to predict that they may not see you coming. Being aware and trying to predict what others will do is very important to reducing risk.

Decide

Once you are aware that there is a possible hazard, you must decide what you are going to do to avoid it. How fast your vehicle is traveling and your path of travel are all that you can control. You cannot control what the other driver is going to do or when he/she might do it. Reducing your speed will give you more time and allow the hazard to hopefully change its course. Less speed also will minimize impact in the event of a collision. You might also be able to change your path of travel and avoid the hazard by changing lanes. Here are some questions to ask yourself when deciding on a path of travel:

1. Which path gives me the most visibility?
2. Which path gives me the most clear space to the sides of my car?
3. Which path gives me the smoothest flow of traffic?
4. Which path gives me the best roadway surface?
5. What traffic laws am I following or breaking if I choose this path?

Execute

The idea is to increase the amount of time and space between you and the hazard. Reducing your speed, changing lanes, or simply moving over in your existing lane can help accomplish this goal. Act on what you have decided is your best course of action to avoid harm's way.

By implementing the steps in SIPDE, you will become a more confident, smoother, and less stressed driver. It will help you to maneuver situations that could become potentially dangerous. You will learn to be proactive and plan ahead and predict possible problems well in advance. As a new driver, these steps will need practice and time to become automatic. Many people refer to using these steps as "defensive driving". Giving yourself extra time and space in the event of a possible problem will help you reduce risk when driving. Let's have a look at the space around your vehicle as you drive, how it is always changing, and how you can make it work for you as you learn to minimize risk.

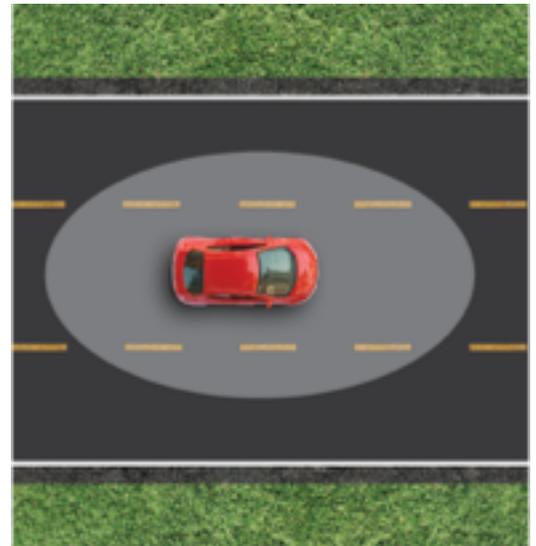
Space Areas

When driving a car, there are areas all around your vehicle the number of which is often dependent on how many lanes are in the roadway you are traveling on. The more lanes, the more complex the traffic environment and possibly the less space. At times, with less traffic, you might have more space than say on a two-way roadway where each direction has only one lane. When driving it is important to note where all other objects are around you such as other vehicles, construction barricades, pedestrians, cones, traffic signs, etc. You must also be aware of hazards that you cannot see. Move over to the left lane if you can when your sight is limited so that if a car were to pull out in front of you or into your path of travel you would have the space to escape the hazard.

OPEN areas: The areas where there is space to operate your vehicle without any restrictions to your path of travel or line of sight are called open areas. You will want to always know where these areas are in case you need to make an evasive maneuver to avoid a hazard.

CLOSED areas: The areas around your car called closed areas. They are closed because this space is not available to you to maneuver your vehicle or your line of sight is blocked for some reason. Stay out of groups of cars that tend to travel all in one area. They all tend to go the same speed and travel in one or two lanes of traffic. Try to separate yourself from this by changing lanes or reducing your speed one or two miles per hour.

CHANGING areas: The areas of space are constantly changing and you must adjust and respond to the ever-changing driving environment. Other drivers will constantly take up an area that was open to you just a second ago. You must constantly monitor your driving areas and process how they have changed.



As a driver you will pay a lot of attention to the area directly to the front of your vehicle. To manage and control this area, you must pay attention to how closely you are driving behind the vehicle in front of you. We call this following distance and this can be your number one safety tip for avoiding an accident. Leave plenty of space between you and the car in front of you in case there is the need for a sudden stop.

Don't be a tailgater!!



It is recommended that you travel 2-3 seconds behind the vehicle in front of you at all times. This will mean you have to constantly adjust your rate of speed to adjust to that interval of distance. You must give yourself enough time and space to stop safely. As a beginning driver the more space the better. Try to leave 3 seconds between you and the car ahead of you.

How do you know when you have it right?



Use a stationary object such as a sign or tree as a fixed reference point. Choose a fixed object ahead down the road. Look at when the rear of the car in front of you clears the object. Begin counting...one thousand one...one thousand two...one thousand three...The front of your vehicle should not reach the object any sooner than 2-3 seconds.

Following distance intervals should be chosen based on several different factors:

*At speeds less than 35mph, a 2 second interval will usually be enough

*At speeds up to 45mph, a 3 second interval is appropriate

*At speeds up to 70 mph, choose a 4 second following distance

*When there are adverse conditions, maintain a 6 second or more interval. Rain, ice, gravel, fog, and night driving all require an increased safe following distance. Beginner drivers should add at least one second to all of these times.

It is also important to try and maintain a safe distance between you and the car behind you. This is harder to do because you do not control other drivers. However, there are several things you can do to keep this distance between you and vehicles behind you.

First, you can try to change lanes and let the person behind you go by you. Second, take your foot off the accelerator and increase your following distance between you and the car in front of you. This has two effects. One, should you need to stop you have more space to brake gently and hopefully the car behind you does too. Two, your slower speed may encourage the tailgater to change lanes and go around you.

We have addressed vehicles to your front and rear but what about the ones next to you? They present another challenge as a driver. Never travel in their blind spots as they cannot see you should they need to make sudden move. Do not travel right beside another car as they will be taking up your escape space should you need to make a sudden move. You can make more space around you by changing lanes, changing your speed, or by moving lane positions. Be aware of all of your surroundings and remain in control as you

decide which is the best choice. Your goal should always be to reduce your risk and the risk of other roadway users. Decide early, re-evaluate often, and execute the chosen alternative to meet this goal.

Controlling Space Areas

Minimize: reduce risk from a possible hazard by increasing your time to react and execute, reduce your speed to give yourself the added time, and increase the space between you and other roadway users. Focus on one task at a time. In the middle of a turn or when trying to pass another car is not the time to adjust the radio or the wipers or shift gears. Plan those actions before or after your driving maneuver.

Separate: Take on one hazard at a time, focusing on the most immediate. If there are multiple hazards take them on one at a time if at all possible. For example, when meeting multiple vehicles at a narrow bridge.

Compromise: When you are faced with multiple hazards, try to give yourself the most time and space to separate the worst of the hazards. This will not be easy and will require skill and confidence as a driver. A cyclist on the side of a narrow, two lane roadway presents you with multiple hazards and you must decide which one is most immediate and deal with them one at a time if at all possible.

Let's look at some examples of managing risk through these three decision making possibilities.

Scenario 1: You are traveling down a road with two lanes in your direction. You see ahead of you that there is a car broken down on the side of the road. What should you do?

1. Speed up to get by them faster.
2. Slow down, watch for people around the vehicle, and change lanes when it is safe to do.
3. Honk so they get out of your way.



If you chose #2, you are correct. It is best in this situation to slow down, increase the space between you and the hazard and minimize the risk.

Scenario 2: You are traveling down a two-lane road and encounter a person on a bicycle and oncoming traffic. How do you react?

1. Slow down and give the cyclist space until you can pass him safely once the oncoming traffic clears.
2. Honk at the cyclist to hurry up and get off the road.
3. Speed up and get in front of the cyclist before the oncoming cars get there.



If you chose #1 you are correct. The idea is to separate the hazards and deal with one at a time. The safest choice is to reduce your speed and increase the space between you and the cyclist. Then, when it is safe to do so, you can go around the bicycle when there are no cars coming at you. There are times when it will be safer for you to increase or decrease your speed to arrive at a hazard before or after other roadway users.

Scenario 3: It seems like no matter where or when you drive, there is always some part of the roadway that is under construction. These areas take special care when driving. Look at these two pictures:



Depending on your position in the lane and your speed, you will have to decide if it is better to speed up or slow down to make room for another driver to merge lanes.

Looking Behind

One area often forgotten when driving is awareness of what is going on behind you. You should develop skills that include checking the driving environment behind your car. Using your mirrors is essential for noticing changes going on behind you. Is someone following you too closely? Are they coming up to your car too fast? Are they wanting to pass? Traffic will dictate how often you make rear view checks. It is especially important to notice what type of vehicle is behind you...is it a regular passenger car or an 18-wheeler? Is it raining or sunny? Is there loose gravel on the road that might affect stopping ability? Be sure to check your rear view before stopping abruptly, on a long steep hill, before backing and before changing lanes. In the next section we will also discuss the importance of using your rear-view mirror when approaching an intersection.

Inspecting and Classifying Information

As a road way user, it is your responsibility to not only take care in the actions and decisions you make but you are also required to be aware of things going on outside your vehicle. It is important to notice the condition of the road you are traveling on and changes that occur as you travel. You should be aware of lane markings, road width, surface and possible traction problems, ie: gravel, intersections, interchanges on the highway and any roads in need of or under repair. Similarly, you must be aware of light poles, road signs, curbs, and trees and bushes that may affect your travel. In addition, you must also take note of off road conditions such as shoulders, ditches, culverts, guardrails and bridge structures that may cause damage or limit your ability to maneuver in case of an emergency.

There are many different kinds of vehicles on the roadway today. Passenger cars, RV's, tractor trailers, Sport Utility Vehicles (SUV), motorcycles, buses, trucks and others all have different sizes and limitations. As you driver there are some clues that you can look out for to help you predict possible movements and decisions by other drivers:

++Are they using turn signals or flashing their headlights or are their hazards on indicating a change of direction?

++Are the tail lights flashing or are they steady? Is the front end dipped down indicating deceleration?

++Is there an emergency? Hazards flashing? Siren or horn? Trunk lifted or hood raised indicating an emergency?

++Talking to other passengers? On the cell phone? Eating, drinking, smoking? All indicating distraction.

++Use or non-use of signals? Following distance or speed? Lane control? Weaving in and out of lanes? Sudden lane changes indicating aggressive or reckless driving.

These are just a few examples of SIPDE.

Scan/Search---visual examination of all space areas around your car

Identify---possible hazards in your path of travel

Predict---possible outcomes

Decide---decide on which course of action you want to take

Execute---take action on what you decide to do

The steps involved in SIPDE are applied every time you get behind the wheel and they should be happening the whole time you are driving. They will become more automatic the more experienced you become but we should never become so comfortable and take things for granted when we drive. We should remain engaged and focused and adjust the application to the driving environment. Some situations are more complex than others and will require a different level of application. No matter what the driving environment, good visual searching, thinking ahead, and making good choices will help you reduce your risk in the car.

Intersections

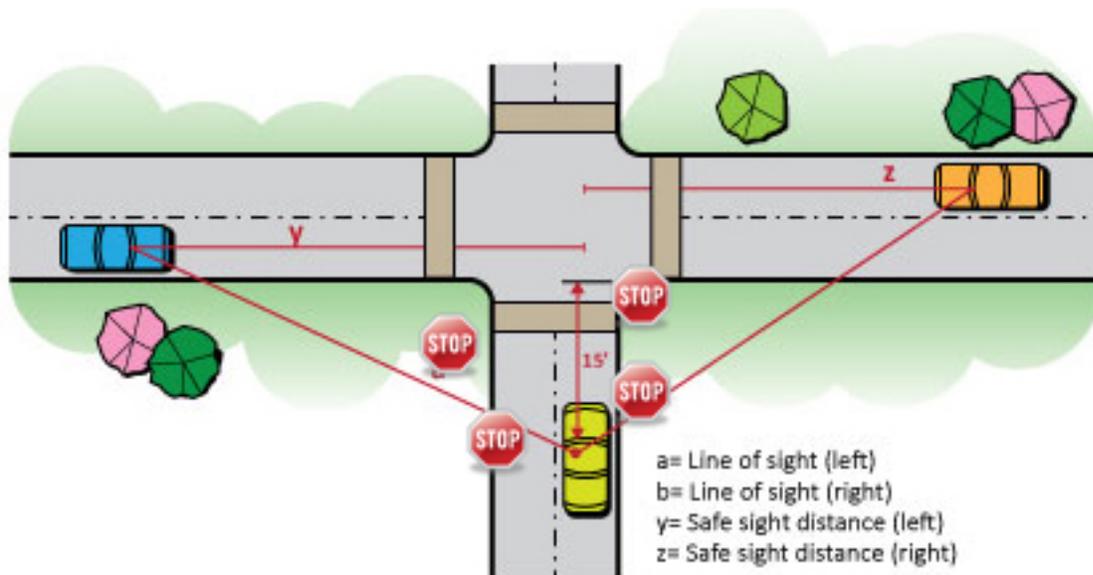
Intersections are some of the most dangerous driving environments you will encounter. They often involve many vehicles and drivers all wanting to change directions and involve traffic control devices and signals that must be adhered to by all drivers. When a driver chooses to either deliberately or accidentally ignore these signs and signals, danger is imminent. Many intersections will require you to stop. There are steps you must take when stopping in an intersection.



As you approach the stop sign or red light, tap your brake to let driver's behind you know that your intention is to slow down and stop. Check your rearview mirror and then press the brake pedal firmly when you are sure the driver behind you knows that you are stopping. If not, try to communicate again by tapping the pedal to flash your brake lights. Plan ahead and stop before the stop line, crosswalk, or at the edge of the cross road. Ease off the brake pedal slightly just as you come to a smooth and complete stop. If there is a car ahead of you, maintain a safe stopping distance from the rear end of the car in front of you. A good reference point when stopped behind another car, is to make sure you can see both rear tires of the car on front of you when you are completely stopped.

While stopped, keep your foot firmly on the brake pedal and check for vehicles behind you.

Observation is key at intersections. After stopping completely at an intersection with a traffic light, wait until you have a "fresh" green light. This means one that has just turned green and not a green light that has been green already for some time. This is what is called a "stale" green light which means it will most likely turn to yellow very soon. This requires you to look down the road and observe the traffic signals ahead of you. As you approach the intersection, look left, then center, then right, and then left again. Check for late crossers...people who have chosen to run the red light. Even though they were wrong, it is your job to always yield to vehicles already on the intersection no matter what the lights are indicating.



Intersections controlled by stop signs are similar. As you approach the intersection, check left, check center, check right, and then check left again. Ease off the brake and enter the intersection carefully. Repeat observation checks as needed and proceed when it is safe to do so. It cannot be said enough...LOOK! LOOK! LOOK again! You must be vigilant and manage the risk of an intersection carefully. Most accidents can be avoided if you pay attention and anticipate what other drivers are going to do.

Many intersections will not be as clear of trees, buildings, parked cars, and other objects as the one pictured above. Many times your line of sight will be blocked and you will have more decisions to make. When faced with this limited visibility, stop at the correct location (behind stop line, at edge of crossroad, or at a crosswalk). Then “inch” your car forward slowly making the front of your car visible to other vehicles in the crossroad. Stop again and listen for other cars approaching who may honk at you if you are in danger of pulling in front of them. Continue moving forward slowly until you can see clearly and have enough space to maneuver into the cross street. Then, and only then, proceed when it is safe for you to join the other traffic.



Intersections with railroad crossings offer more challenges to drivers. Some crossings are controlled with flashing signals, crossing gates, and or stop signs. Other are uncontrolled and it is up to you to make sure there is no train before crossing the tracks. In Texas, most railroad crossings are uncontrolled and are only marked with the sign indicating there are tracks. Intersections with railroad tracks whether controlled or uncontrolled are extremely dangerous with a high proportion of crashes and deaths occurring here. Every time you approach a railroad crossing you should be ready to slow down or stop regardless of signals present. There may not be a bell, flashing lights, or train whistles indicating a train is approaching. STOP! LOOK! And LISTEN! Be prepared to stop...a train cannot!



Visual Reference Points

A visual reference point is a way for you to relate some part of the roadway to some part of your vehicle to help you make a correct maneuver. Not all reference points are the same for all people or all vehicles, but once you learn to do it in one vehicle you can transfer that knowledge to other vehicles you might drive. Reference points are especially useful when turning and parking. They will help you judge and be confident in deciding when to start your turns, remove anxiety, and judge how your car moves in relation to objects around you.

Reference Points for Stopping

You can use the mirrors on your vehicle to help you reference parts of the roadway. When approaching a stop sign and stop line, you can judge how close you are to the stop line and stop sign by looking at your driver side mirror.



It should appear to be lined up on top of the stop line. In the next picture you can see that when your mirror is lined up on top of the stop line, your vehicle's front end is stopped just before the line and in line with the stop sign.

Look at these pictures. Is the driver stopped in the correct location? Did this driver use a reference point?



This driver stopped when they could see the stop line lined up with the front of the vehicle. This would seem the right way to do it since you are stopped before the line. If you were to get out of the vehicle and have a look this is what you would see.



When you look down the front of your vehicle, it seems like you are in the right place in relation to the stop line. If you were to get out of your car and take a look around as in the second picture, you would actually be very far away from the line and too far away from the stop sign and intersection.

Parking

Parking a car is not a high-risk action because of the slow speed at which you are traveling but you must be able to command control of your vehicle in terms of speed and steering. You must also be very aware of the space areas around your vehicle and your vehicle's space in relation to other cars that are already parked.

There are three different ways to park: diagonal, perpendicular, and parallel. When parking perpendicular into a space that is to your right, it is often easier to back into the space. Conversely, a space to your left is easier to drive into forward. Whenever you can it is best to choose a space that will allow you to pull all the way through and exit the space by driving forward.

Entering a parking space

Evaluate:

Locate a space and check traffic.

Check for vehicles on both sides of the space you have chosen.

Watch for movement of other vehicle or pedestrians who may be walking to or from their car.

Check for vehicles both left and right of you and be sure no one is backing out of a space nearby.

Prepare:

Activate your turn signal.

Tap the brake pedal to signal your intentions.

Reduce your speed and recheck your mirrors.

Execute:

Position your car at least 5 feet (8-9 feet for a perpendicular parking space) away from the rear of the car parked next to you. Target the center of the space and steer sharply while rolling slowly.

Glance to check on both sides of your car.

Counter steer to straighten your car in the space, reduce speed.

Stop when you are aligned in the space.

Turn your signal off.

Exiting a parking space

Evaluate:

Check carefully for pedestrians, other vehicles and remember you must be the one to yield when leaving a parking space when either driving forwards or by backing up out of the space.

Signal left or right depending on the direction you plan to go after you have left the space.

With your foot on the brake and covering it all times, shift to drive or reverse and begin rolling slowly backwards out of the space until your windshield is in line with the rear of the cars parked next to you.

Continue backing and turning in the direction you wish to travel, continually checking for traffic and people that may have entered your path of travel.

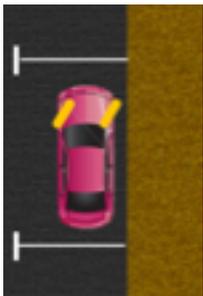
Once your car has cleared the rear bumper of the vehicle parked beside you, turn your steering wheel quickly in whatever direction is appropriate. Continue to move backwards until your wheel are straight and in line with the direction you wish to go. Stop. Shift to drive and then cancel your signal.

Parking on hills

There will be situations where you will be parking along a curb or roadway that is located either on a hill and you will either be facing uphill or downhill. There are specific things to keep in mind when parking in these situations.



Parking downhill with a curb: If your car were to begin to roll when you were parked on a roadway facing downhill, the momentum and weight of your car would cause it to roll downhill. When parking downhill, roll slowly forward and turn your front tires sharply toward the curb until the right front tire touches the curb. By doing so, your car would simply roll into the curb should it begin to move for any reason.

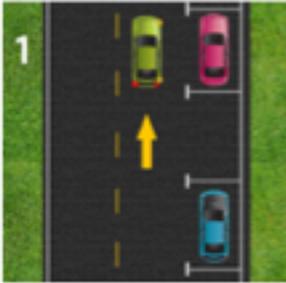


Parking uphill or downhill without a curb: When parking uphill or downhill without a curb, turn your wheels so that if the car began to roll the car would roll off the roadway.



Parking uphill with a curb: When parking uphill with a curb, turn your wheels so that if the car were to roll, the car would hit the curb and stop.

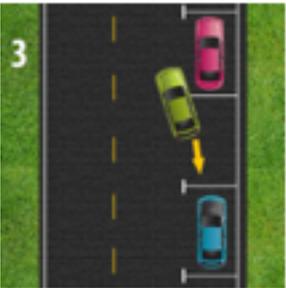
Parallel Parking



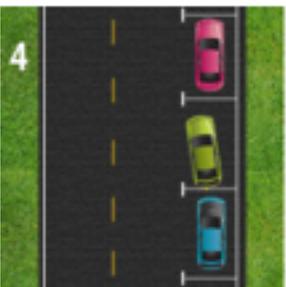
Parallel parking can be the most intimidating type of parking for new drivers. You will need this essential skill when parking in crowded urban, or city environments. Try to locate a space that is parallel to the curb or roadway that is one and one-half times the length of your car. You can make it into smaller spaces but this is the recommended space. Follow the steps below and remember...practice makes perfect.



Pull forward and align your car with the car you are going to park behind. If cars are about the same size, align your mirror or door with the mirror or door of the car you will park behind. Stop and put your car into reverse.



While stopped, turn your steering wheel all the way to the right. Let your car move back until you are 45 degrees to the curb you are parking by. Stop.



While stopped and in reverse, straighten your steering wheel. Hold your steering and continue to back up until your front bumper clears the rear bumper of the car you are parking behind. If you do not back up far enough you will end up too far away from the curb. If you back up too far you will end up hitting the curb. Stop.



While stopped and in reverse, turn your steering all the way to the left and back up until you are in the parking spot. Stop.

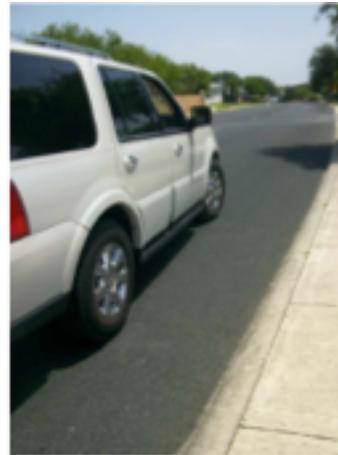
Pull forward and align your car into the parking spot. Remember your wheels should be between 6-18 inches away from the curb. If you are not within this distance, repeat all steps.

Reference Points for Parking Along a Curb

When parking along a curb on a street it is necessary to get your wheels 6"-18" from the curb. It is often difficult to tell if you have accomplished this without getting out of your vehicle to check. Using a reference point here will help you position your vehicle properly. Use an imaginary line from the center of the hood to the curb. When the center of your hood is in line with the curb in front of you, your vehicle will be in the proper distance from the curb.



In the following pictures below, you can see how the hood and the curb are not aligned properly which results in the car being too far away from the curb.



Reference Points for Angle Parking



When parking in a parking space that slightly angled, it is helpful to use a reference point to help you know when to start your turn into the space. As you approach an open parking spot, align your right front tire with the pavement marking of the spot you wish to enter. When the pavement marking points at your right front tire, you should begin your turn into the space.

Reference Points for Parking to the Left

As you approach a parking space to your left, use your left driver side mirror to help you know when to begin your turn into the parking space. When the white pavement marking is under your mirror, start your turn into the parking space.



Start your turn when the mirror is in line with the white line marking the parking space.

Reference Points for Parking to the Right

As you approach a parking space to your right, use your right passenger side mirror to help you know when to begin your turn into the parking space.



When the white pavement marking is under your mirror, start your turn into the parking space.

Vehicle Maneuvers

Objectives: The student demonstrate and connect the basic maneuvers of vehicle movement.

If you and your car were the only ones on the roadway, driving would not be nearly as complicated. You would have the road all to yourself, it wouldn't matter if you drifted a little to one side or the other. It wouldn't matter if you didn't stay in your lane or used a turn signal, or parked in the middle of the road instead of on the side by the curb. Unfortunately, this is not the case and now that you have a basic foundation of tasks related to getting in your car and getting ready to drive, it is time to build on that knowledge and get on the road. Sounds easy enough but driving is a complicated series of tasks that must be performed simultaneously. The good news is that with practice it will get easier and you will become more and more confident as a driver.

The first thing you must do when you leave your driveway or parking spot is enter the flow of traffic. This requires that you assess the environment, determine if it safe to perform each maneuver, communicate your intentions to others, decide on the best course of action and then act on it skillfully and decisively. Fear and hesitation when driving can be a real problem if they cause you to act abruptly or erratically. You can help your confidence by following a basic sequence of steps each time you begin a driving maneuver.

Vehicle Balance and Weight Transfer

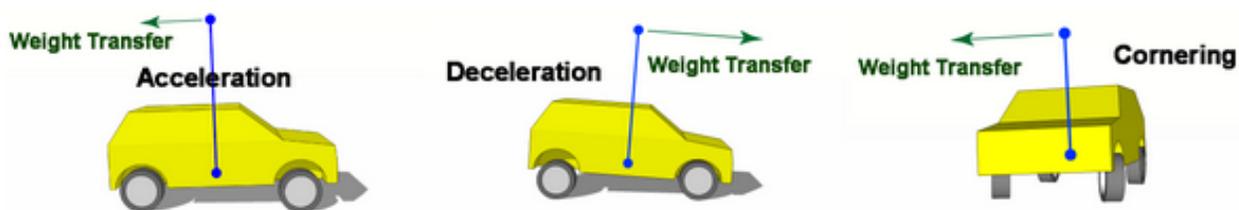
This is a topic that new, inexperienced drivers do not often think about. You probably have felt these shifts and movements as a passenger but may not have related them to driving or may have never considered their importance when driving a car.

As a driver, the way you accelerate, brake and turn the steering wheel have a profound impact on the vehicle. Cars are heavy, and depending on the make and model may be top heavy and sudden movements can have a negative impact.

Acceleration: When you accelerate suddenly, the weight of your vehicle is shifted toward the rear and there is a noticeable drop of the rear end of the vehicle. You and your passengers can feel yourselves being pushed backward into the back of your seats. The front of your vehicle becomes lighter and traction on the front wheels is diminished.

Braking: Similarly, if you brake suddenly and too firmly, the weight of your vehicle is shifted toward the front end of your car. The hood drops, the rear end rises and you and your passengers feel like you are being flung forward toward the windshield. Traction on the rear wheels is diminished as all of the weight of the car is at the front.

Steering: When you steer in one direction or the other, the weight of your vehicle “rolls” in the opposite direction. When you steer to the right, the vehicle rolls to the left. When you steer to the left, the vehicle rolls to the right. The shift is related to how fast you are going, the traction available on the roadway and the amount of steering input, or how hard and sudden you steer. It is important for you to make smooth, precise turning movements, controlled braking and progressive accelerating to avoid loss of control in the form of a rollover.



Entering Traffic

1. Evaluate: This happens before you ever make a move with your car. You must notice signs and other markings, check your mirrors and blind spots around your vehicle for hazards and make an informed decision about the safety of your upcoming maneuver. Make sure you have enough space to enter the traffic flow ahead of you. You will need to judge a gap in traffic large enough for you to enter into the flow. The gap is the distance or time between the back of one vehicle and the front of another vehicle. The size of the gap depends on the speed of traffic, the time it will take you to make the turn, and the sharpness of the turn or the number of lanes you must cross.
2. Prepare: Once you have decided it is safe to go, signal so other roadway users will know what you are going to do, recheck mirrors, etc., and begin to make your move.
3. Execute: Make your move and be ready for changes in the environment. Part of driving is adjusting to what other drivers do or do not do. Using the controls in your vehicle, release the brake, target your path of travel, turn the steering wheel smoothly and press the gas pedal to move your car. Try to steer smoothly and position your vehicle into the lane of travel and adjust your speed to match that of the vehicles already on the roadway.

Driving in Traffic

As we stated before, you are not the only driver and car on the road. When you drive you must interact and be aware of others sharing the road with you. Keep these things in mind as you drive:

Following distance: remember--keep a 2-3 second interval between you and other cars...longer if conditions require it.

If you need to slow down or stop, tap your brake pedal to communicate with drivers behind you that you intend to make a change in speed. Before braking always check your rear-view mirror.

Create space to avoid hazards. Use SIPDE to scan, search, and avoid.

Exiting Traffic

When you reach your destination, you will exit the flow of traffic by parking either in a parking lot, driveway, or along the roadway in a parking space.

Evaluate: You must signal your intentions to other drivers and check your mirrors and blind spots often. Make sure the space you pick to park is safe and legal.

Prepare: Use your turn signal to communicate to others what you intend to do. Avoid confusing other drivers by signaling too early especially near an intersection. Tap the brake pedal, check your mirrors again, and apply the brake to reduce your speed.

Execute: When you have reached the place you wish to park, turn your wheels and steer into the spot. Turn your signal off and center your car in the parking space.

Backing

Backing up a vehicle presents its own unique challenges and requires practice. The difficulty in backing up lies in what happens when you turn the steering wheel. When you back up, you must look backward to see where you are going and to control your vehicle. When you turn to back up to the right, you turn the steering wheel to the right, however, the front end of your vehicle will swing in the opposite direction. You will need to steer less when backing up as the car will respond more quickly than when moving forward. You must maintain a slow rate of speed when backing up. Be vigilant--check around your space areas throughout any backing up maneuver.

Evaluate: Is it safe to back up? Check your space areas and mirrors.

Prepare: Adjust your seat belt and headrest to give you the best view. Apply the brake, put your turn signal on in the direction you are backing/turning and recheck mirrors. The direction and placement of your body depends on if you are backing up straight, to the left or to the right.



Execute: Ease up on the brake pedal to start moving your vehicle backwards. Many cars will idle at a high enough speed to not require you to press the gas pedal at all. Use the brake pedal to keep a constant safe speed. Glance at your surroundings often and keep the brake covered in case you need to stop quickly.

Lane Changes using the OSMOG technique

There are several reasons you may need or want to change to a different lane when driving. You might need to pass another car, prepare to make a turn, leave the roadway, avoid an object in the road, or maybe just to increase the space between you and other vehicles. Whatever the reason you want to make a lane change, lane changes require careful observation of your driving environment and clear views of all of the space areas around you. A good technique for making a safe lane change incorporates the following:

OSMOG (O-smog)

Over the Shoulder--check the lane you wish to enter

Signal--Use your turn signal to communicate your intentions

Mirrors--Check your side mirror for the direction you want to go

Over the shoulder--Check the lane you wish to enter again

Go--If clear, go ahead and change lanes, turn off your turn signal

Following this sequence of steps each time you make a lane change will help you to make sure your path of travel is clear and safe before you make a maneuver into another lane. Be sure you get in the habit of using your turn signal to alert other drivers that you intend to make a lane change. It is equally important to make sure the turn signal goes off after you finish making a lane change. Failure to do so can confuse drivers behind you and cause problems. Also try to maintain your speed through the lane change unless there is a reason to slow down or speed up. Be extra careful when you are on a roadway with 3 or more lanes. If you are in the right lane wanting to move into the center, there may be a vehicle in the left lane who also wants to move into the center at the same time. It is easy to miss them coming and you may both start your lane change at the same time.

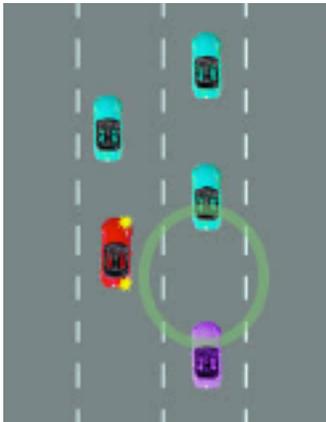
Some questions to help guide your decision making when changing lanes:

1. Will other vehicles ahead of me or behind me want to make the same move I am about to make?
2. Is there anyone in the lane I want to move into?
3. Are there other cars around me or in another lane that might want to move into the same gap?
4. Is there a fast-approaching vehicle from the rear that I might impede if I move?

Scenario 1: You are traveling on a 4-lane divided highway and you want to pass a slow vehicle in the right lane. For example, in the picture below, you are the blue pick-up truck and want to pass the large 18-wheeler. What should you do?



Check your driver look over your shoulder, signal, check your side mirror, look over your shoulder again. In this example the left lane is not clear. There are multiple vehicles approaching from the rear that you must yield to. Continue to check your mirror and over your shoulder. Once all vehicles have passed and the lane is clear, initiate your left turn signal. Look in your mirror and over the shoulder again and be extra aware of any other fast approaching vehicles already in the left lane. Also make sure you take note of any vehicle directly behind you (note the silver car in the bottom right-hand corner) that may have already started a lane change into the left lane that you also want to move into. Lane changes take patience and awareness of what is going on around you.



Scenario 2: Look at the picture below. You are the red car trying to change lanes to the left, perhaps preparing to exit the freeway. What steps should you take to change lanes to the right?

You must be aware of the purple car. It is approaching from the rear and you may need to wait until it passes. Notice the red car has its signal on. You must check your passenger side mirror and look over your shoulder to check the blind spot. Once you have signaled, the purple car may slow a bit to allow you to make a lane change. DO NOT assume that the purple car will slow down and let you in. If he does not slow down and increase the gap between him and the car in front, you must wait until he passes and then repeat the process of looking in your mirror and over your shoulder to make sure it is now clear. You must also be aware of the speed of the green car in front of the purple car. If his speed changes you must also adjust.

Scenario 3: Roadways with more than 2 lanes in one direction pose particular problems for passing and changing lanes. In the picture below, You are the grey car in the right lane. You have just entered the roadway and wish to move into the center lane. What should you be aware of?



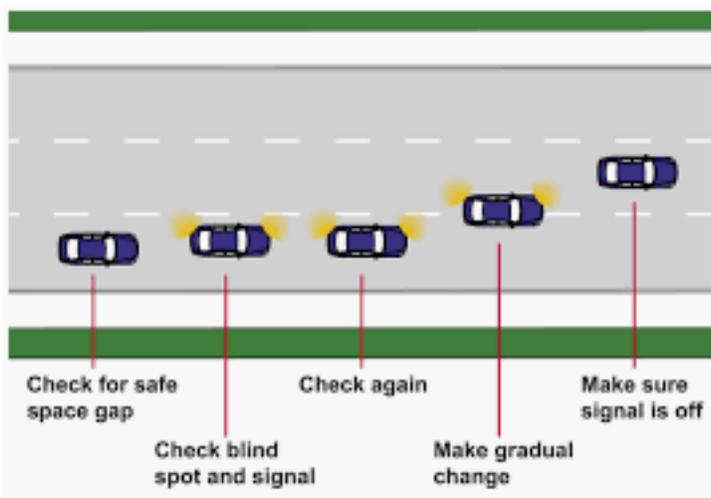
In this case, you must be aware of what is approaching from the rear in the center lane. In the picture it looks like the lane is clear but in real life there may be a fast-moving car coming up the lane that will impede your lane change. You must use your driver side mirror and also look over your shoulder to check the blind spot. Next, you must also watch the car in the far-left lane as he may suddenly decide to move in to the center lane

as well. This example shows the importance of using a turn signal to indicate to other vehicles your intention to change lanes. If the car in the far-left lane signals, you will be able to wait and make your lane change after he makes his. However, not everyone uses their turn signal as faithfully as they should. Notice the driver's body movements. If he is turning his head and looking behind him, this may indicate that he is about to change lanes. You must anticipate this event. Once you have made sure that it is clear you should look again, turn your turn signal on, look once more and then make your lane change.

Scenario 4: In this scenario, you're traveling on a very busy 4 lane highway. Changing lanes in this environment is very high risk because of the large number of vehicles also traveling around you. You are the white car in the left lane traveling at a rate of speed that is slower than the rest of traffic. You are impeding traffic flow and wish to change lanes to the left to allow other cars to continue down the highway. What should you do?



When you are on this type of highway, slower moving traffic should keep to the right. This is why a lane change is necessary for the white car. From the position it is in right now, a lane change is not possible for the white car. There are cars in the lane to the right that must pass before a lane change is safe. It is important to go ahead and signal so that the car behind you knows your intentions to move over and allow him to pass. Continue to check your passenger side mirror and watch for the grey pick-up truck to pass you. Once you have made sure that there are no other cars approaching in the lane to the right, turn on your right turn signal and move slowly into the lane to your right. Change only one lane at a time and make sure to turn off your signal. If you wish to make another lane change to the right, repeat the process of checking your mirror, looking over your shoulder to look for vehicles that may be in your blind spot, turn on your signal and make the lane change when it is clear and safe to do so. In this picture you can see a large truck approaching from the rear in the far-right lane. Be aware that he may begin to move into the left lane, the same one you are trying to move into as well. When making lane changes you must be aware of what is happening behind you at all times.

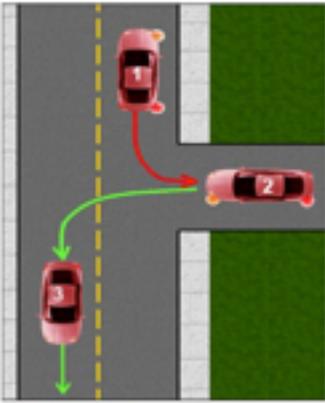


Scenario 5: In the following picture you can see an example of OSMOG as it would be applied during an actual lane change. When making a lane change, we cannot express the importance enough of looking, checking over the shoulder, looking and checking over the shoulder again to make sure it is clear before making a maneuver. Things change quickly on a crowded roadway and you must be prepared to abort a lane change at any time and react quickly to what other drivers are doing.

Turnabouts & U-turns

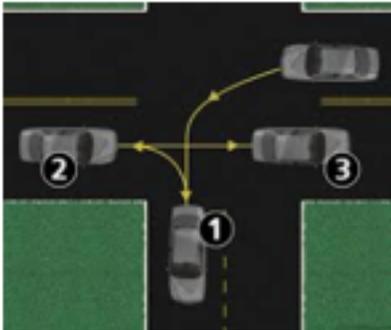
Turning around requires you to make what is called a two-point turn. It involves backing into or pulling into a driveway or street that does not have much traffic. There are several kinds of two point turns and each one requires you to determine the level of risk and make a good decision about which one is the safest to maneuver.

Two Point Turn by backing up



This method of turning around gives you the best view of both direction of traffic when you get ready to re-enter the roadway. It involves backing up into a driveway or less traveled roadway and then pulling forward to re-enter traffic.

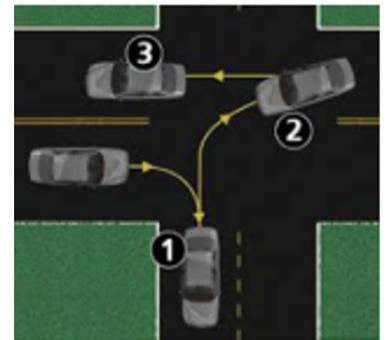
Two Point turn by turning left



This method of turning around is a bit riskier than the first in that it requires you to back out into the path of traffic. You drive your vehicle forward to the left onto a driveway or less traveled roadway and then back out into the street. Backing into traffic is always riskier than pulling forward because you may not be able to as well.

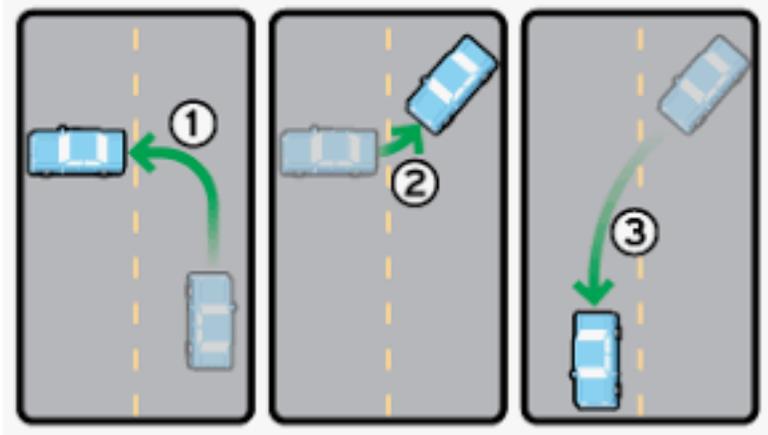
Two Point Turn by turning right

By far the most dangerous way to turn around, this involves the driver backing up across the lane of traffic to the left and requires you to stop in the opposite lane with severely limited visibility. This maneuver should only be done if there are no other alternatives. This is often necessary when pulling out of one's own driveway but it is not as dangerous in a residential area with low traffic and slow speeds.



Three Point Turnabout

This type of turn should be used sparingly and only in situations where you have no other means for turning around. It puts you at highest risk because you must stop in the middle of the roadway and block traffic. You should only use this method for turning around if you cannot go around the block, there are no driveways or side roads, traffic is very light and you have very good views of both directions of traffic. This maneuver involves three steps as illustrated below. First, pull forward across the opposing lane of traffic. Then, back up into your original lane. Finally, pull forward into the lane you wish to travel.



U-Turns

This type of turn is not hard to do but does require plenty of space and is most successful when the roadway is very wide. If the roadway is not wide enough for your

vehicle to make the turn, this turn can become a three point, highly risky turn very quickly. This type of turn is often illegal in many places and on certain roadways. You will see signs indicating to drivers if this type of turn is illegal at some intersections.



With all of these types of turns, you must consider the following:

Is it a legal maneuver?

Is it a safe maneuver?

Are there any other safer, lower risk options?

Could you go around the block instead?

Day 5 Make Up Quiz