



FACT SHEET

Module 3.1 Developing Good Habits and Judgment

HABITS

Habits are defined as a behavior pattern acquired as a result of frequent repetition. Due to the frequent repetition and competence of performance, the behavior becomes involuntary. This is the basis of vehicle operation and why procedures are used to perform basic operational tasks.

Behavior patterns must be practiced correctly at least 28 times before the behavior becomes a habit. To establish a good habit, you must practice the behavior correctly, know what is correct and incorrect, and have a desire to establish the habit.

Six steps to Positive Habit Development:

1. Identify the behavior and desire to do it.
2. Demonstrate ability to perform the behavior.
3. Overcome resistance of "this is the way I do it".
4. Understand and identify when the behavior is performed correctly or incorrectly.
5. Practice the behavior correctly at least 28 times.
6. Perform the behavior correctly without thought.

JUDGMENT

Judgment is defined as the process of forming an evaluation based on identifying situations and comparing risks of performance. While habits are the foundation of vehicle operational skills, judgment is the foundation of decision-making skills. Judgments are formed by the combination of learned responses and positive as well as negative experiences.

Driver behavior is based on operational skills combined with decision-making skills influenced by guided experiences. The driver must have consistent practice to form habits and a system for driving designed to develop responsive decision-making skills. When good operational skills and good decision-making skills are combined with a courteous attitude, drivers will exhibit competent roadway behaviors.

Drivers must develop a system to develop good habits and good judgment levels. It has been observed that drivers perform at four levels.

1. The appropriate action is taken without consciously thinking about it, (good habit)
2. The correct action is taken after thinking about it, (learning)
3. An incorrect action is taken, even knowing it was wrong, and (learning)
4. An incorrect action is taken without consciousness of the behavior, (bad habit)

Good Driving on a Habit Level

A driver will be an efficient operator of the vehicle if a well-thought-out system for operational tasks based on controls, size, weight, and balance of a motor vehicle within operating spaces is developed. Unfortunately, many drivers never attain this level of driving but assume they are capable because they can efficiently maneuver the vehicle.

Good Driving on a Judgment Level

A well-thought-out system of the action to take based upon the condition of the areas around one's car can make one an efficient and precise user of time and space. Like the professional athlete or driver, one will seem to instinctively know what to do without hesitation and often on a judgment level of awareness. All drivers can learn how to become efficient and precise. The more often the appropriate experiences take place, the more likely a correct response will be initiated with the least amount of evaluation time used for assessment. Driving does not need to rely upon luck, fate, or maneuvering skill.

Which of these levels would most likely lead to a crash?

- Habit level of awareness with an acceptable performance;
- Judgment level of awareness with an acceptable performance;
- Judgment level of awareness with an unacceptable performance; and
- Habit level of awareness with an unacceptable performance.

You are correct if you said the habit level of awareness with an unacceptable performance; but why is this the most dangerous level? How many drivers may operate on this level and feel that there is nothing wrong with their performance? Many driver actions are made on a habit level of performance. They could be at fourth level with an unacceptable performance, or they could be at first level with an acceptable level of performance.

You may ask, "What is considered an acceptable performance?" That is what procedural tasks are all about. When the driver can manipulate the vehicle within the procedural standards, the acceptable level of habit with acceptable performance is met. Most driver actions are made on a judgment level of performance. They could be at third level with an unacceptable performance or they could be at second level with an acceptable level of performance.

You may ask, again, "What is considered an acceptable performance?" What system gives standards for very specific moments that can be assessed as being either acceptable or not acceptable. That is what levels 2 and 3 are used for; they are the levels at which we learn. In order to learn, it is necessary for us to receive feedback of what we do well or what we do that is not done well.

Getting Feedback for Acceptable/Unacceptable Performances

Use an example of a driver driving into a hillcrest situation or a curvature which creates a **sightline and travel path** area change, at approximately 15 mph over the speed limit with the radio playing loudly, having fun with a few friends. What level of performance feedback did the driver receive? Did the driver **feel anything was wrong?**

We often get acceptable performance feedback for unacceptable performance situations. For the previous situation, what would have happened if a sudden stop was required while coming over the hillcrest? What would have happened to the passengers? The vehicle security should have been improved by the securing of the occupants of the car. The area closed due to the sightline problem created by the hillcrest should have been improved by the proper management of speed.

The driver who is habitually programmed to maintain a set speed or position may not be mentally prepared to make a judgmental adjustment until the potential hazard develops to a point where it cannot be ignored. With a **forced action** created by ignoring the early developments of the situation, the driver is placed into a surprise situation that becomes less controllable and certainly more stressful than it needs to be.

Some of the options available in this hillcrest or curvature situation are:

1. to alter the intended travel path (lane position),
2. make an adjustment in speed control, or
3. establish some form of communication with others at a time prior to that which would demand an action be taken.

Coping with area changes is rarely difficult when a response is initiated early enough. Failing to recognize the area changes or closures, therefore delaying a corrective response, could place greater stress on the driver and the vehicle, making it more likely to exceed the limitations, which could result in a failure.

Suppose a driver does something that the Space Management System and he/she identifies as being unacceptable — that is that person's judgment! That person is cursed with the plague of bad decision-making. How can that poor judgment be changed? How long does it take to change habits or judgment? How can that internal resistance to change be overcome? **Practice! Practice!**

Practice! In order to become the best driver an individual is capable of becoming, it will take practice. Driver Education allows a driver to have **meaningful and appropriate practice** which enhances experiences and creates acceptable habits and judgments.

The novice driver will need to understand that two levels of driver performance are intended to be developed. Habit levels of performance are skills and techniques used to perform tasks in sequence without thinking about which to do first. The reason for training procedural tasks is to perform these tasks without thinking about each step as the driver becomes experienced. An example would be starting the car or keeping it in lane position 1.

Judgment levels of performance are tasks that need decision-making to change speed and position of the vehicle based on changing circumstances. Developing a driver process or system allows the driver to become efficient in making timely decisions affecting speed and position, and reduces the risk of collision with another vehicle, person, or object.

For more information refer to Mottola, F. R. 1999. "Empower Yourself with Zone Control Driving." Interactive Driving Systems, Inc. Cheshire, CT.



FACT SHEET

Module 3.1

10 Good Driving Habits

Living With 10 Good Driving Habits

1. Get driver and vehicle readiness to drive;
2. See a clear path before moving the vehicle;
3. Keep the vehicle in balance;
4. Use reference points to know where your vehicle is;
5. Search for line of sight and path of travel restrictions;
6. Develop strategies for decision-making and action;
7. Safely navigate intersections;
8. Control the rear zone;
9. Control the front zone; and
10. Drive with courtesy.



FACT SHEET

Module 3.1

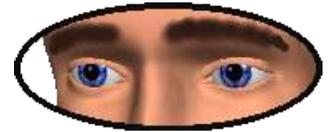
Effective Vision Control

STUDENT ACTIVITY 1

While you are reading this passage your partner will notice that your eyes are jumping from word to word. They are not smoothly moving over the text but stopping momentarily at each word or phrase to let your eyes detect what is on the page. Even if you try to read the passage with smooth eye movement your brain intervenes.

VISION IS A PROCESS

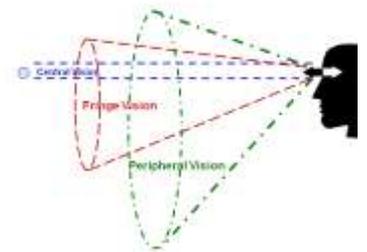
Seeing is not instantaneous. The eyes must first collect different kinds of information. Your eyes can see color, shapes, shadows, contrasts, textures, and things that are near or far. That information enters the eyes through the cornea and lens and strikes the retina, which is in the back of the eye. The retina is full of cells that, when light strikes them, send signals to the brain through the optic nerve.



The information from the eyes needs to be processed by the brain in order to complete the seeing process. You can collect all the visual data in the world but if it doesn't have meaning it is worthless. The brain processes what you see and compares that information with your memories and personal experience to help you "perceive" what you are seeing. Since vision is a process it takes approximately 3 tenths of a second from "seeing to perception" to occur. That is why your eyes jumped from one place to another while you were reading and scanning the picture.

THE THREE PARTS OF VISION

In order to manage the tremendous amount of information that comes into our eyes the brain breaks up the seeing process into three areas. The first part is **central vision**. It is the part of the eye that has the sharpest part of vision with the greatest amount of detail. Remember in the first activity how your eyes jumped from word to word as you were reading the passage? That was your eyes using your central vision to lock onto the word to see it with the greatest detail and clarity. When driving we use our central vision to see to the target and target area to search for problems that we need to solve.



The second part of vision is **fringe vision**. When we look at our target with our central vision we see the roadway and sides of the roads with our fringe vision. It is not as clear as our central vision but it still gives us vital information about where the car is on the road and whether there are pedestrians, cyclists, or animals near the road.

The third part of vision is your **peripheral vision**. This is the vision that is often referred to as seeing something out of the corner of your eye. This visual field detects movement and changes in contrast. When we do see these changes we want to turn our head to use our central vision to get enough information about what we saw with our peripheral vision to determine what just happened.

VEHICLE CONTROL SEQUENCE: FIND • SOLVE • CONTROL

Driving is about decision making and critical thinking. Ninety percent of the decisions we make are based on what we “see.” We first have to see what is in our path, then we have to decide what we are going to do with it, and then we have to do it. The Mottola Zone Control System helps us with this task. The steps are very simple and need to be done every time, every drive.

Find

The first step is to use your eyes to **FIND** the problem. Problems come in the form of something in your path of travel or something that prevents you from gathering critical information that will help you make a better driving decision. We call those problems *Path of Travel (POT)* or *Line of Sight (LOS)* blockages.



You saw some examples in the previous slides. Cars, pedestrians, buildings, curves, hills, and myriad other things cause POT or LOS blockages that you must deal with when you drive. *So where do you think you have to look to find blockages with your POT or LOS?* Remember, it takes time to see something and understand what it is, so you want to detect LOS or POT blockages as far out as possible and the best place to search for these is in your target area. For instance, if a van is parked on the right side of the street it blocks your LOS because you can't see around it and it also blocks your POT because you can't drive there without hitting it.

Solve

Once you've found it you need to do something with it. This is where your critical thinking comes into play. Based on the information you identified in the **FIND** stage you now have to decide what your best options are. The best option in any driving situation is to create space and time. You do that by changing your lane position, changing your speed and communicating your intentions. So, what would you do about the van we talked about in the Find stage? Because you have an open front and left front zone the best solution would be to slow down and move to lane position 2. That way if someone steps out in front of the van or opens a door you have space and can safely stop if you need to.

Control

Finally, you have to put your solution to the test. As you near the LOS or POT you have to evaluate the choices you made to make sure they still work. This happens at 4 seconds away from your LOS/POT. Here, you make any last second changes to your solution to deal with anything that wasn't obvious during your **FIND** and **SOLVE** stages. As you approach the van it appears that your choice of lane position 2 and slowing your speed were the right choices. You have space between the van and you are now set up to repeat the process all over again with a new LOS/POT blockage down the road.



Practice doing the Find • Solve • Control sequence on the next set of slides in the presentation.

DEALING WITH VISION PROBLEMS

Driving is about solving problems effectively. Since 90% of our decisions are based on what we see, anything that interferes with our vision needs to be dealt with. Here are some tips on how to improve your ability to see more effectively when conditions are not optimal.

- Clean windows inside and out
- Clean the lights and be sure they work
- Be sure the defroster and wiper blades are in good working order
- Remove any objects that interfere with vision
- Adjust mirrors properly
- Have on hand: sunglasses, flashlight, windshield scraper



Glare can be reduced if you:

- Wear sunglasses in the vehicle
- Use a greater following distance
- Avoid looking at headlights
- Adjust and use the sun visor
- Squint if you don't have sunglasses
- Slow down until vision improves

SPEED AND ITS EFFECT ON VISION

The faster you go the less you will see. Why is that? The answer is in the first activity we did. If you look at the first paragraph of this fact sheet remember that the way we see is by making momentary pauses with our eyes as we look at things. It takes time to see because our eyes have to stop briefly to allow information to be gathered and processed.



When you travel at 25 miles per hour you are going approximately 37.5 feet per second. If you pause for .3 seconds so you can perceive something, for every .3 seconds you look at something you will have traveled 10.5 feet. You can see a lot and scan the scene pretty well.



If, however, you are traveling at 70 mph you cover 105 feet per second. Now when you look at something for .3 seconds, you have gone approximately 34 feet before you move on to the next thing to look at. If you look at anything too long you risk missing something critical. However, if you try to keep up with all of visual stimuli with aggressive scanning you will quickly develop eye fatigue. You need to instinctively narrow your field of vision so you can cope with and process all the visual stimuli.



Module 3.2

FACT SHEET

Gap Selection

The typical sizes of gaps needed to perform the maneuver in a passenger vehicle

- Right turn: 7-9 second gap to the left
- Left Turn: 9 second gap to the right and 7 second gap to the left
- Crossing a Four Lane Road: 6-7 second gap in traffic from both directions
- Merging: 8-second gap in traffic
- Changing Lanes 4-second gap in traffic
- Passing You will need to accelerate 10-15 mph faster than the vehicle you are passing. At 50 mph it will take 6 seconds to pass a vehicle traveling at 40 mph.
- 3-Point Turnabout: 20-30 second gap in both directions

When stopped in traffic, wait 2 seconds before moving your vehicle – search the front zones.

When you are the first one stopped in line at a traffic light, wait 2 seconds before moving when the light turns green. Search the intersection for red light runners.

You will need to increase these times and distances for:

- Large trucks
- Campers
- Buses
- Heavy traffic
- Adverse road conditions
- Personal performance is below normal

Sample gaps based upon speed

Miles per hour	To cross Traffic 4-5 seconds	Turn Right and join traffic 6 seconds	Turn Left and join traffic 7 seconds
20mph	More than ½ block away	More than ½ block away	More than 2/3 block away
30mph	More than 2/3 block away	1 block away	More than 1 block away
45mph	More than 1 block away	More than 2 blocks away	More than 2 ½ blocks away
55mph	More than 1 ½ blocks away	More than 3 blocks away	More than 3 ½ blocks away



FACT SHEET

Module 3.2

Components of a Time & Space Management System

A space management system is like an insurance policy. It can provide substantial protection for a small investment. All that is required is involvement and understanding. To be effective, a space management system must be easy to use and apply to all roadway situations. A space management system helps drivers organize information into meaningful categories so decisions can be made easily and quickly. All the space management systems have an action step. Drivers must then evaluate the risk on the principles of probability (will it happen?) and consequence (what will be gained or lost?). The basis of any space management system requires good seeing habits. The goal is to make the system easy for the instructor and student to use and learn.

The following systems are used in driver education textbooks.

SIPDE Used in Responsible Driving

Search the roadway and the off-road areas for roadway, vehicle, and other user information that can help plan the path of travel at 20 to 30 seconds ahead of the vehicle.

Identify objects or conditions that could threaten the intended path of travel. Is the risk situation, a potential or immediate threat for an unwanted consequence?

Predict what threats or changes in conditions could increase or decrease the level of threat to the planned path of travel.

Decide what speed control or lane position action would reduce the threat of a collision consequence.

Execute the decision by appropriate communication, followed by a speed and/or position adjustment

IPDE Used in Drive Right

Identify problems to give meaning to what is seen. The sooner a potential or critical hazards in the roadway are identified, in the vehicle, or due to other users; the more time will be available to react safely to the critical hazard.

Predict how the potential or immediate hazard might affect the intended path of travel.

Decide upon a minimize, separate, or compromise maneuver to reduce the hazard critical to the path of travel.

Execute the decision with precision speed control, lane position and communication.

SAFE Used in License to Drive

Scan to gather as much information as possible about the complete driving scene around the vehicle.

Assess potential threats in the driving environment.

Find a way out of the situation.

Execute the decision to avoid upcoming conflict by changing speed and/or changing direction.

ABCs Used in *Drive Right* and *Mottola's Zone Control*

Alert switch is turned on by seeing a LOS POT blockage to your path of travel.

Before acting, check other zones for options.

Create time and space management, get the best speed, the best lane position, communicate.

An *open zone* is a space where the vehicle can be placed without a restriction to the line of sight or intended path of travel.

A *closed zone* is space is unavailable for vehicle placement due to a restriction in the line of sight or intended path of travel.

A *changing zone* is a worsening condition, an open zone changing to closed zone, or a closed zone with an additional restriction.

Reduced-risk decisions are performed by developing visual skills to make critical adjustments of speed and/or lane position into open space with adequate time for adjustments

SEE Used in the ADTSEA and some State Model Curriculum Guides

Some states have created their own acronym for a space management system. The most common is SEE.

Search the intended path of travel and space to the rear for problems and restrictions to the sightline or intended travel path.

Evaluate open spaces to front, side, and rear to determine reduced-risk adjustments for speed or lane position.

Execute reduced-risk adjustments by visually targeting new path of travel, visually check mirrors, give appropriate communication, adjust speed, then adjust lane position.

SMITH Experienced Driver System

The Smith System is a copyrighted program, developed in the 1950 time period for experienced drivers. The Smith System uses a defensive driving process to encourage visual skill redevelopment. The skills are based on the driver having basic operational skills. This organization is credited with creating the one car length for ten miles per hour following distance. But now stress a minimum of three seconds with additional time needed for weather and visibility issues.

- **Aim high** in the driver environment with the focus vision to allow more time for driver response
- **Keep you eyes moving** to search for hazards and vehicle movements around the vehicle.
- **Get the big picture** of where your vehicle is located in time and space.
- **Make sure others see you** by appropriate communication, lane position, and visibility.
- **Leave yourself an out** to reduce risk of collision from the front, sides, or rear.

VEHICLE CONTROL SKILLS

Vision

The ability to control a vehicle by using the accelerator and brake (motion control) is relatively easy for most drivers to learn. The skill of turning the steering wheel (steering control) is also quite easy to achieve for most drivers. However, 70-90% of the decisions drivers make are based upon what is seen when driving. Therefore, vision (vision control) is the most important vehicle control skill.

Driving skills should be used in the following order:

- **Vision Control**
- **Motion Control**
- **Steering Control**

When applying the skills to a maneuver such as making a right turn, the tasks would be:

- Use vision to determine speed, lane position and appropriate communication
- Use braking and acceleration as needed to maintain vehicle balance and control
- Turn the steering wheel to the new path of travel while maintaining vehicle balance.

When in a panic, drivers often reverse the procedures resulting in loss of control:

- Quickly steering in an effort to get away from the hazard
- Slamming on the brakes or accelerating hard to avoid the hazard
- Looking at the hazard rather than to the escape

Good habits for managing time and space require good visual skills. Visual functions used for driving include:

Central vision – covers about 3-5% of our visual field and is used to read and identify distinct objects. Central vision is used for targeting, reading, searching and interpreting.

Fringe vision is the area around our central vision that extends about 45 degrees. Fringe vision is used to judge depth and position and to identify reference points while driving.

Peripheral vision is conical shape around our vision fields that sees motion and color. It often gives the driver an initial warning of a changing or closed space area. Peripheral vision is strongly affected by fatigue, drugs, and speed.

LINE-OF-SIGHT

Created by Fred Mottola, Interactive Driving Systems and the National Driver Behavior Institute

The line of sight (sightline) is the unobstructed distance visible from the your driver's seat to the target area at the end of the path of travel.

The line-of-sight can be affected by:

- the vehicle's window space/obstructions
- other vehicles
- bushes/buildings
- hills, curves
- weather conditions

A clear line of sight is needed for the brain to determine speed and steering adjustments.

When the line of sight is interrupted by an obstruction, a change in speed and position are necessary to restore a clear line of sight to the target area.

The driver's goal is to maintain an open line of sight.

PATH-OF-TRAVEL

The **path-of-travel** is the space the vehicle will occupy from its present position to the targeting area. The intended path of travel is a combination of:

- targeting area
- line of sight (unobstructed view to target area)
- reference points

The path-of-travel can be affected by:

- objects in or near the roadway
- pedestrians/animals
- other vehicles
- signs, signals, and roadway markings
- traffic and road conditions
- visibility and weather conditions
- name others.....

The driver's goal is to maintain an open path-of-travel.

KNOW WHERE YOUR TIRES ARE TRACKING USING REFERENCE POINTS

Created by Fred Mottola, Interactive Driving Systems and the National Driver Behavior Institute

Experienced drivers typically have a developed sense of where their tires are tracking and how much space is available before denting a fender. New drivers lack this experience and benefit by knowing and using "reference points." Reference points tell the driver exactly where the tires are tracking. It works like this: from the driver's point of view, see some part of the vehicle as it relates to some part of the roadway. The arrow represents the driver's line of sight. It's where the driver is looking. Reference points are always seen from some point on the car to ground level.

Side Reference Points

Know when your tires are 3-6 inches from a curb or line to the right. When you look at the curb, pavement line, or edge of the road, it appears to line up near the center of the hood.

- This is lane position 3
- Used for parking





Know when your tires are 3 feet from a curb or line to the right.

When you look at the curb, pavement line, or edge of the road, it appears to line up with the middle of the right half of the hood.

- This is lane position 1
- Side position for preparing for a right turn



Know when your tires are 3-6 inches from a curb or line to the left.

When you look at the pavement line or curb, it appears to line up about one foot in from the left edge of the hood.

- This is lane position 2
- Side position for a left turn
- Used for parking

Forward Reference Point



Know when your front bumper is even with the curb line.

When you look at the curb line, it appears to line up with the passenger side mirror.

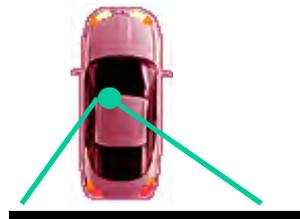
- The point when you start turning the steering wheel for a right turn
- Used as a safety stop to get a clear view of the intersection

Rear Reference Points

Know when your rear bumper is 0-6 inches from a left rear line.

When you look back, the curb or line, it appears to be in the middle of the left rear window.

- Used when backing to know where your rear bumper is



Know when your rear bumper is 0-6 inches from a right rear line.

When you look back, the curb, or line, it appears to be near the window corner post.

- Used as a pivot point to begin turning while backing around a corner

LANE POSITION OPTIONS

Created by Fred Mottola, Interactive Driving Systems and the National Driver Behavior Institute

"Move your car over a little." "Scoot over a bit." "Stay in your lane." What do these coaching words mean? By using specific coaching for lane position, new drivers will achieve success quicker.

With the use of lane positions, drivers will be able to use the total width of a travel lane. For a travel lane that is 12 feet wide, drivers will be able to have at least 6 feet of empty space to the side of your car -- extremely important space to avoid a crash. How drivers use this vacant space will be dependent upon what zone conditions exist. So, the first step is to learn how to position the vehicle to either side of a lane and how to position it in the center of the lane.

Use the lane position that gives the best line of sight and 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.

LANE POSITION 1

In the center of the lane
Allows 3 feet on each side

LANE POSITION 2

0-6 inches from a line to the left

- Used for left turns, parking on the left, and to increase your line of sight

LANE POSITION 3

0-6 inches from a line to the right

- Used for parking against a curb line, and to increase your line of sight

LANE POSITION 4

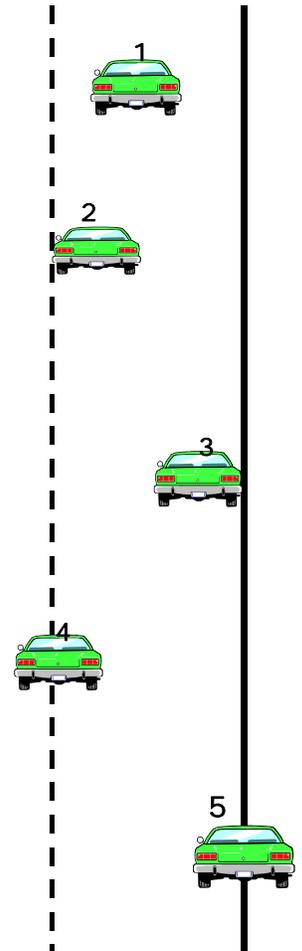
Straddling a line

- Used to move away from a hazard on the right

LANE POSITION 5

Straddling a line

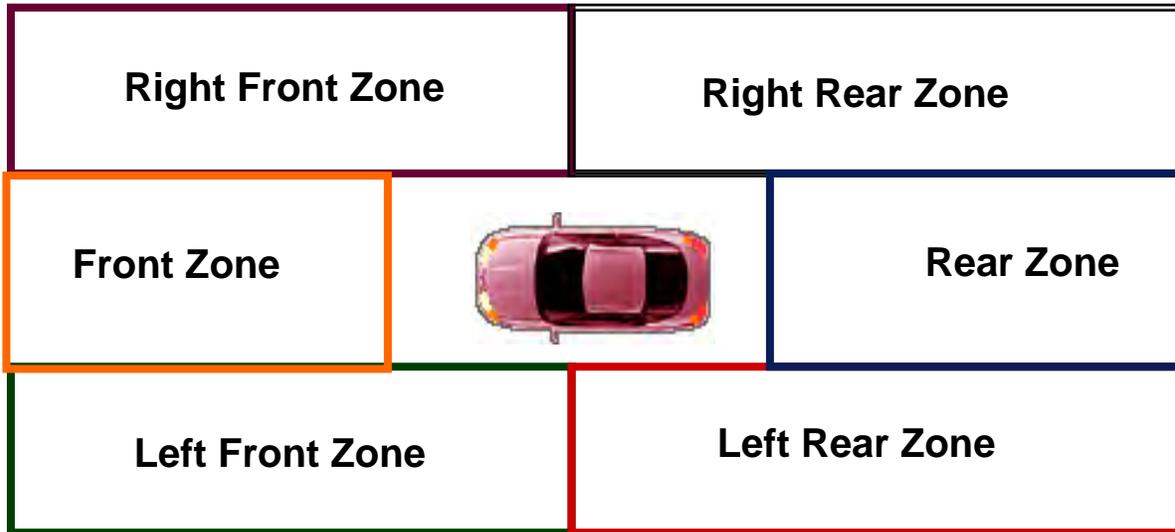
- Used to move away from a hazard on the left



MANAGING THE SIX AREAS AROUND THE VEHICLE

Created by Fred Mottola, Interactive Driving Systems, the National Institute of Driver Behavior

Managing the space around your vehicle is more effective when the space is organized into operating areas that a vehicle could occupy and the driver can control. This system, known as zones, is six areas of spaces around a vehicle that are the width of a lane and extends as far as the driver can see. These six areas represent locations and conditions that could affect a driver's path of travel, speed or communication.



These locations may be:

- **Open** (there is space in which to operate without restrictions to the line-of-sight and/or path-of-travel).
- **Closed** (the area is not available for your path of travel and/or you have a restriction to your line-of-sight)
- **Changing** (a worsening condition such as an open space changed to a closed line-of-sight and path-of-travel.)

When a space becomes closed, that should trigger the driver to check the other spaces to get all the information before making a decision. The most frequent other space to check after seeing a closed space is the rear zone. After seeing a change, the driver gets the information needed to get the best speed and path of travel control option.

A closed side zone exists when you the driver can't see at least 8 seconds of empty space to the side or there is not an available path of travel to the side.

- An oncoming car or truck is a closed left front travel path.
- A car traveling in the left mirror blind space area is a closed left rear travel path.
- A motorcycle in the right mirror blind space area is a closed right rear travel path.
- A truck following closely is a closed rear sightline and travel path.
- A bicyclist to the right is a closed front right travel path.

Set a goal to keep empty spaces around the vehicle as much as possible.

THE ORDERLY VISUAL SEARCH PROCESS

Don't Look Down!

Too often a driver is told "don't look down, look far ahead." To some drivers, especially novice drivers, 10 feet in front of the bumper is "far ahead."

The Visual Search Process

The first space management skill a driver must develop is an effective visual search. To search effectively, a new driver needs to know where to look, when, how, and what to look for, and how to evaluate if a potential problem could be a high risk or reduced risk situation. A visual search process is an organized pattern of focused eye movements scanning the path of travel and driving environment searching in a regular sequence for critical areas or conditions.

An organized searching process starts from the visual lead area, which is 20-30 seconds from the front of the vehicle. Keeping the eyes focused farther away from the vehicle will allow the driver more time to make decisions. Targeting in the center of the path of travel at least 20 to 30 seconds ahead is critical to gaining as much information as possible from the driving scene.

There are three forward search patterns that should continually be evaluated to gain control over the intended path of travel. To have effective control over the front zones drivers must also keep awareness over the rear zone which becomes the fourth search pattern. A systematic search can help drivers develop an effective searching pattern into habit. Such searching habits will provide opportunities to be mentally ahead of the vehicle and eliminate high stress, high risk situations.

One example of a search pattern is:

- Look to the target area
- Search and evaluate the front zones in the 12-15 second range
- Search driveways and intersections for possible changes to the line of sight/path of travel
- Check the rearview mirror
- Evaluate the 4-6 second range before entering that space
- Look again to the 12-15 second range
- Check the 4-6 second range
- Check the rearview mirror
- Check speedometer and gauges

Speed and Vision

As speed increases, the amount of information needed to maintain car position and detect movement also increases. The ability of peripheral vision to detect the motion of other objects is reduced when speed increases. Minor adjustments to the steering wheel occur in shorter time frames, causing significant or exaggerated vehicle movements. With higher speeds, the visual lead needs to increase to give:

- more time to gather information.
- increased the peripheral vision giving the driver time to detect motion and decide an adequate response.
- more space between other vehicles and your vehicle, so abrupt responses are held to a minimum.

WHERE AND HOW TO SEARCH

Where to search involves moving the eyes from near (inside and outside the vehicle - as close as the dashboard and mirrors) to 20 to 30 seconds into the target area to identify objects or conditions that could increase the level of risk.

Searching/Look To The Sides: When approach any place where other cars, people or animals may cross the intended path, look to both sides. Don't rely on traffic lights or stop signs. Always watch out for other drivers—they may run the light. Check to the sides for speed and lane position options. Identify the best speed and lane position options for existing conditions.

Searching/Look Behind: Check the traffic behind every time the foot goes to the brake. Know if somebody is tailgating, coming up too fast or trying to pass. Most rear-end collisions are caused by vehicles following too closely.

Searching/Blind Spots: These are areas of the vehicle that are not visible in the mirrors. Enhanced Mirror (BGE) Settings help reduce the blind spot areas. Before making any move to the side, quickly turn the head to see if the blind spot is clear. Also avoid driving in someone else's blind spot. It's as important for other drivers to see you as for you to see them.

Searching/Identify: Scan the road ahead for potential hazards such as a vehicle, pedestrian, animal or situation that could force you to slow down, speed up or turn. Make more aggressive searches when there are line-of-sight restrictions that may conceal a pedestrian or a bicyclist. A driver can look in, under and around parked cars for feet, wheels, shadows, and movement. When done at the proper distance, pedestrians and bicyclist can be seen before they create a surprise.

The immediate path is the space within 4-6 seconds of travel time. It is very important to acquire the skills to search all three ranges: the target area, the 12-15 second range, and the immediate path. The immediate path should only require an update of the conditions originally detected when evaluating the travel path. By looking only at the immediate path before searching to the target area, three or four seconds would be quickly consumed and the driver is not able to get mentally ahead of the vehicle.

Extended Visual Search Categories

- Highway
- Structure
- Surface
- Features
- Atmosphere
- Intersections
- Traffic controls
- Signs
- Signals
- Marking
- Intersections/interchanges
- Motor vehicles
- Type
- Characteristics
- Non-motorized Users
- Bicyclists
- Pedestrians
- Skaters, skateboarders
- Animals

SEARCHING RANGES

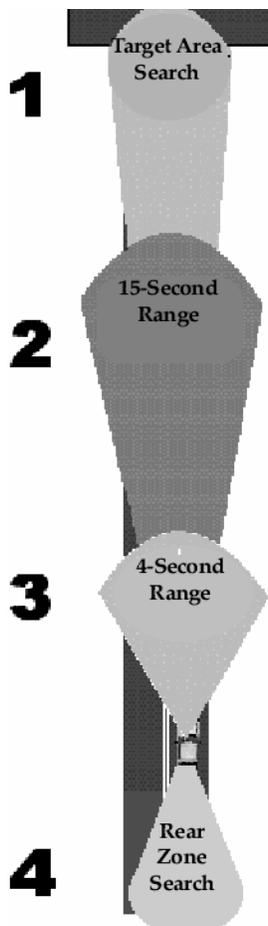
Created by Fred Mottola, Interactive Driving Systems and the National Driver Behavior Institute

Searching for Open Zones: A Zone is open if it has space to operate without restrictions to the Line-of-Sight and Path-of-Travel, or closed (not available for you to use), or changing (open zone that is closing, or closed zone changing for the worse). Maintain open space on at least one side into which the vehicle can be steered. A front zone is closed when you can't see at least 12 seconds ahead, you don't have at least 12 seconds of available path of travel; or you do not have at least 4 seconds of following time when traveling behind another vehicle.

Searching involves monitoring the immediate path of travel, four to eight seconds ahead, 12-15 seconds ahead, to the target area, the instrument panel, and timely mirror usage to monitor traffic to the sides and rear.

How and 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.

Searching 20 - 30 seconds ahead/ Target Area Range - Research has demonstrated that the typical driver's search is only four to five seconds ahead of their vehicle. However, the only way an individual can effectively assess a safe travel path is to identify possible line of sight changes well in advance and determine appropriate speed or position adjustments. By looking as far ahead (at least 20 to 30 seconds) as possible, identifying an intended path of travel/ target area and adjusting speed to the visual field, the driver has more time and space 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.



Searching 12-15 seconds ahead - Searching 12-15 seconds ahead of the vehicle is the minimum range that enables you to plan your actions to gain the best speed selection, lane positioning, and communications for the best control of your targeted path. Look for anything that will affect your speed, path of travel or need to communicate with other drivers.

Searching 4-6 Second ahead Immediate Range - Search 4 seconds ahead to the immediate path of travel to ensure you have an open line of sight and path of travel. Re-evaluate your 4-6 second path before entering it. The 4 seconds ahead represents the following interval and the 6 seconds provide a safe stopping zone under most conditions.

Searching Behind

Check your mirrors every time your foot goes to the brake. You'll know if somebody is tailgating, coming up too fast or trying to pass. Most rear-end collisions are caused by vehicles following too closely.

Searching Blind Spots

- These are areas of your vehicle that are not visible in your mirrors.
- Enhanced Mirror settings reduce the blind spot areas.
- Before you make any move to the side, quickly turn your head to see if your blind spot is clear.

- Avoid driving in someone else's blind spot. It's as important for other drivers to see you as for you to see them.

Searching into Turns

Turns and curves reduce your line of sight. Adjust speed before entering the turn. Before turning, turn your head and look into the turn. Turn before turning the steering wheel. Look through the turn to the exit. If you can't see the exit of the turn – Slow Down!

Searching Intersections

When approaching an intersection search 45 degrees to the front, left, right. While stopped, search 90 degrees – left/front/right. The sequence depends upon the conditions in the intersection. Search for line of sight and/or path of travel restrictions.

Determine the point of no return (you will continue into the intersection) when you are 2 seconds from the intersection. Your speed will determine the distance from the intersection. The slower you approach an intersection, the more time you will have to decide if you can enter the intersection or you must stop.

Where to Stop

The pavement will tell you where the legal stop must occur: the stop line, the crosswalk, or before entering the intersection. Use a staggered stop (15 feet from the legal or safety stop) to give space for turning traffic entering the lane beside you, as shown in the picture.



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. Searching can be made easier by classifying topics into one of four groups:

1. 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.

2. **Signs, signals, and markings:** Warning, regulatory, directional, and informational.

3. **Motorized vehicles:** Cars, trucks, tractor-trailer rigs, buses, motor homes, motorcycles, construction/farm tractors, and other slow moving equipment and horse drawn equipment.

4. **Non-motorized highway users:** Pedestrians, bicyclists, and animals.

CONTROLLING SPACE TO THE FRONT AND REAR

There are three ways to control space to the front. Time arrival to a given point by

1. adjusting speed
2. placement of the vehicle when stopping
3. controlling speed while in motion.

Following Time

Following too closely is a primary causation of traffic collisions among all drivers in Montana (and the nation). Time is needed to react to danger to avoid a collision. A reasonable following time may change as a result of road conditions, weather conditions, fatigue, drugs, inattention or traffic conditions and even vehicles of different weights affect the ability to stop.

All time and distance relationships are designed for the best driving conditions:

- **A 2-second following time** provides the driver time to steer out of problem areas at all posted speeds on a dry surface and brake out of problems at speeds under 35 mph.
- **A 3-second following time** provides the driver time to steer out of problem areas at all posted speeds on dry surfaces and brake out of problems at speeds to 45 mph. At highway speeds even a 3-second following time 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.)
- **A 4-second following time** provides the driver time to steer out of problems at all posted speeds on dry surfaces and brake out of problems at speeds up to 70 mph. It is important to note that many passenger car tires are not designed to steer out of problem areas at speeds beyond 75 mph. At speeds over 75 mph, high speed rated tires are required due to sidewall flexion at higher speeds and turning movements.

Three-Second Following Time

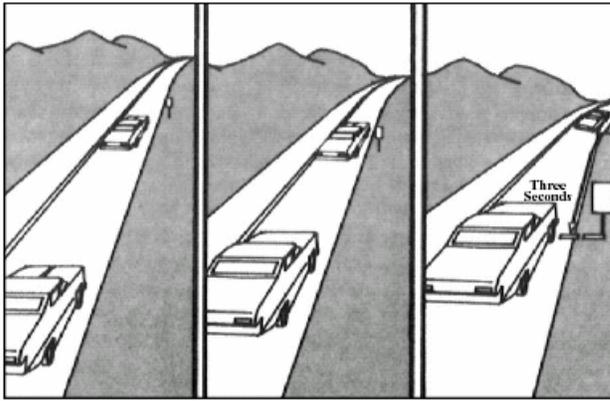
Gives the most control over the space directly in front of the vehicle. Reduce risk by creating as much space as possible. Adequate distance has many advantages:

- more time to adjust to traffic conditions
- reduced surprises
- more space in which to maneuver the vehicle
- control of the space ahead of the vehicle

The three-second following time is the minimum following time under good driving conditions.

It works like this:

- Choose a fixed object such as a sign or tree ahead of the car in front of you.
- As the car ahead passes the object, count off four seconds (one thousand- one, one-thousand-two, one- thousand-three).
- If it takes at least three seconds before you pass the object, you have enough distance for a sudden stop.
- In bad weather, the three seconds should be increased several times to give an extra margin of safety.



The larger the vehicle in front of you, the more following distance you will need.

Stopped at a Traffic Light

When you are the first driver at a red traffic light, take two seconds to ensure the intersection is open by delaying moving until after you have searched the left, front, and right zones.

Stopping Behind a Vehicle

When stopping behind another vehicle, a safe driving habit is to leave enough distance from the vehicle in front so that the rear tires are seen touching the pavement. This good habit may keep you from hitting the vehicle in front of you if someone crashes into the rear of your vehicle. It also allows room to go around a stalled vehicle without backing and causing a traffic hazard.

Controlling Space to the Rear

There are options for controlling your rear zones: Check the rear view mirror:

- after seeing a change to conditions ahead
- before and after braking action
- while stopped in traffic
- before and after making turns
- before and after making a lane change

MAKING LANE POSITION CHOICES

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 (4) to eight (8) 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 into 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, 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.

Selecting a Safe Gap

Knowing how much space there is between you and other vehicles is critical. The ability to judge a safe gap is necessary any time a driver is joining with traffic or passing through an intersection. Enough time is needed to make speed and steering adjustments.

The vehicle approaching from the left will be the most hazardous, since it will enter your path of travel before vehicles traveling from the right.

Different size gaps are needed for different maneuvers. To judge a gap, estimate the speed and closing rate of the on-coming vehicles. A larger gap is needed to turn right than to cross an intersection. A left turn is more dangerous than a right turn because the vehicle is in the intersection for a longer period of time.

From a stopped position, to pass through an intersection with traffic moving at 30 mph the gap needed is:

- 5-6 seconds to cross a two lane roadway without interfering with traffic flow (look for vehicles almost a block away)
- 7-8 seconds to cross a four lane intersection
- 7-8 seconds to turn left (look for vehicles more than a block away)
- 6-7 seconds to turn right (look for vehicles at least a block away)
- When changing lanes look for a 4-6 second gap
- For a 3 point turn look for a 20-30 second gap

VEHICLE DISTANCE TRAVELED PER SECOND

Vehicles travel at 1.467 feet per second. To determine how many feet a vehicle is traveling at a given speed two methods for calculating result in almost the same answer.

Formula #1

$$5,280 \text{ feet} \div 60 \text{ min} \div 60 \text{ Sec} = 1.467 \text{ feet traveled per second}$$
$$1.467 \times 50\text{mph} = 73.3 \text{ feet per second}$$

Formula #2 (For a more simplified calculation, but not precise, multiply speed by 1.5 feet per second)

$$1.50 \times 50\text{mph} = 75 \text{ feet per second}$$

Formula #3 (for the easier calculation)

Take the speed, divide by 2, add the result back to the original speed.

$$50\text{mph} \div 2 = 25$$
$$25 + 50 = 75 \text{ feet per second}$$

Knowing how fast the vehicle is traveling can help drivers understand the limits of their ability to react and the vehicle to respond.

DRIVER RESPONSE TIME

Drivers need sufficient time to see a hazard, determine a safe response and time to take the correct action.

Perception time is the amount of time it takes for you to see a hazard. **Reaction time** is the time it takes for you to act after you saw the hazard.

The average reaction time is 3/4 second. The hands can respond quicker than the feet.

- Simple reaction time: the average is .75—ranges from .5 to 2.0 seconds
- Complex reaction time: the average is 2.5—ranges from 2.0 to 7.0 seconds

Factors Affecting Response Time

Perception time can be affected by: distractions, inattention, poor visibility, line-of-sight restrictions, etc.

Reaction time can be affected by: fatigue, illness, medications, alcohol, age, etc.

Examples of response times:

2 seconds on dry surfaces

- steer out of problem areas at all speeds
- brake out of problem areas at speeds under 35 mph

3 seconds on dry surfaces

- steer out of problem areas at all speeds
- brake out of problem areas at speeds under 45 mph

4 seconds on dry surfaces

- steer out of problem areas at all speeds
- brake out of problem areas at speeds up to 70 mph

Cut reaction time by covering the brake when a possible conflict is seen. Covering the brake is accomplished by holding the foot over the brake pedal.

Most passenger car tires are not designed to steer out of problem areas at speeds over 75 mph. High speed rated tires are required because of sidewall flexion at high speeds and turning movements

REDUCED RISK DECISION MAKING

When driving, 50-60 decisions are made per mile. Those decisions are based upon the ability to see and identify potential hazards. As traffic conditions are evaluated, the driver must be able to accurately predict

- If the hazard is moving toward you or away from you?
- If the traffic light is a stale green?
- If the zone will be open or closed?
- What lane position should you be in?
- Where will the other driver go?
- Is there more than one possible action?
- Where would your escape route be?

- Where will the point of conflict occur?
- Will the pedestrian enter the roadway.
- Is there is sufficient traction?
- How fast is the vehicle traveling
- What other possible decisions could be made?

PRECISION DRIVER ACTIONS

Once a prediction is made, the decision must be made on the action you will take to avoid the hazard. Your goal is to perform the action with smooth precision. Drivers have three actions available and more than one action may be needed.

1. **Communicate**

To be effective, communication must be clear and early enough for others to perceive and react upon.

Communication techniques include:

- signals (turning, backing, hazards)
- brake light (flash, slowing, stopping)
- lane position (space management, turning intent)
- horn (a light tap to warn, increase eye contact)
- head lights (visibility, hazards)
- hand signals (never intentionally offend)
- other?

2. **Change Speed**

- path of travel is open—maintain, increase, or decrease speed
- path of travel is changing—cover brake, off accelerator
- path of travel is closing—off accelerator, squeeze brake
- path of travel is closed—controlled braking
- other?

3. **Change Direction**—some times the safest action is to take another route.

- move to a different lane position to gain more space
- change lanes
- turn onto another street
- other?

New conditions and situations are always present when driving. A driver must constantly question the present conditions. What speed selection feels most comfortable for each situation? What is the legal speed limit? What should the lane or lane position be? What is a good speed selection for this situation? What would be a high risk or poor speed selection, with little to gain? Each situation is different with changing conditions.

The speed and lane position selected are usually based upon the legal limitations, the destination, and what is comfortable for the driver. Whatever the choices for speed and position, the space management system relies on looking for conditions that could cause less control over **line of sight**, and/or **targeting area**, and/or **path of travel**. Watch for changes in the space areas around your vehicle.

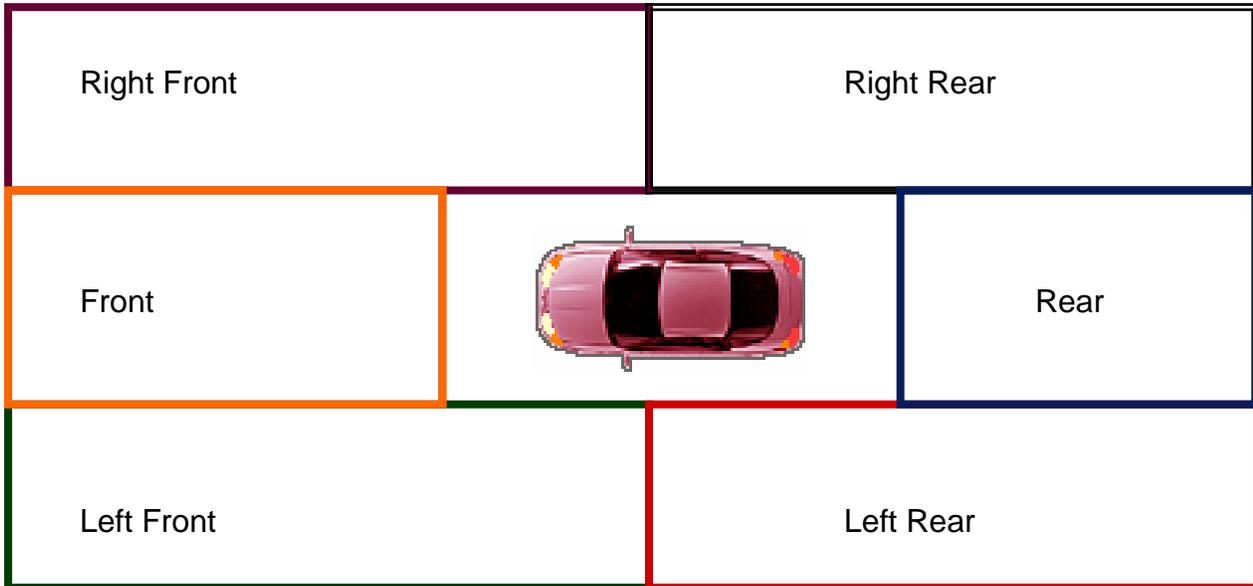
Watching for slight changes, making minor adjustments for the best speed control and lane position, and using effective communication enables a driver to be prepared for the actions of others.



FACT SHEET

Module 3.2 Using Zone Control to Manage Space

There are six areas around the vehicle which must be managed to reduce risk of collision.



The path of travel (POT) and the line of sight (LOS) are critical elements for vision control.

Risk reduction principles are based on gaining appropriate information. All systems have a specified method for **gaining information**. The risk must then be evaluated on principles of probability and consequence. All the current systems have an element of **decision-making** based on probability and consequence.

Risk is then reduced by allowing more space to develop between the risk and the vehicle being driven. This can be accomplished by:

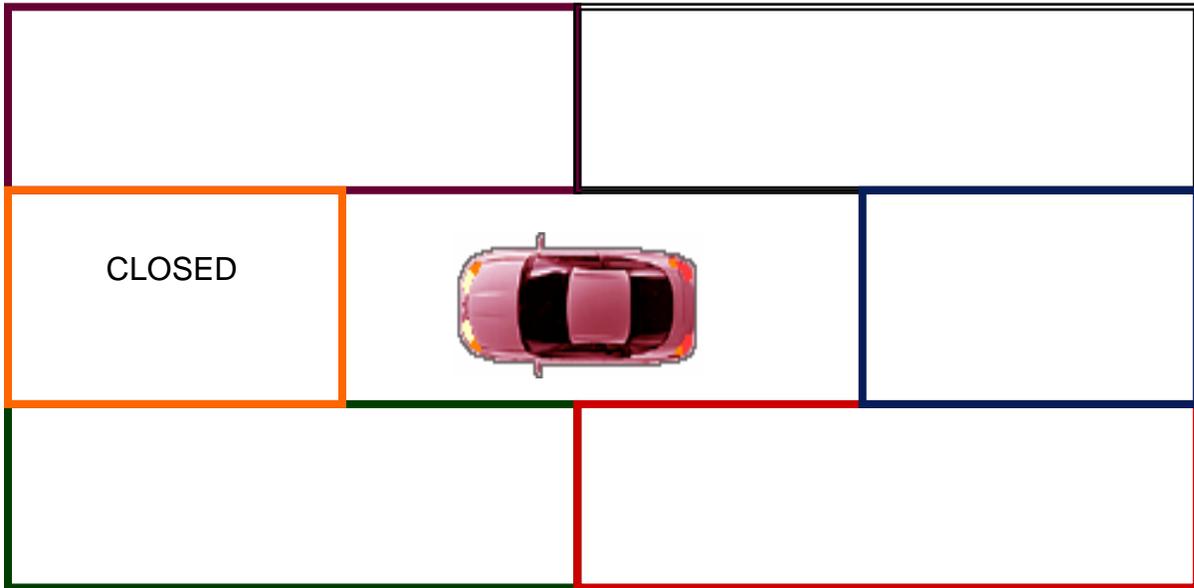
- adjusting speed,
- changing position, and
- communicating the intention to adjust.

All the current space management systems have an **element of action**. The system is designed to provide a foundation for using a space management system. The goal is to make the system easy for the instructor and student to use and learn.

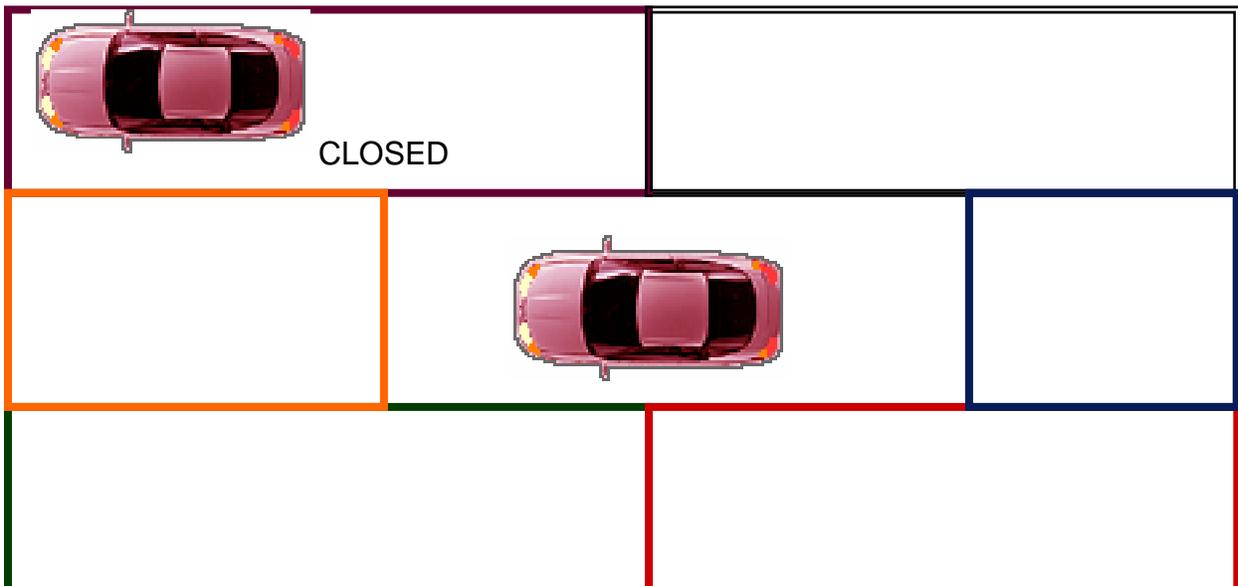
To search effectively, drivers need to know what to look for, where to look, and how to evaluate if a potential problem could be a good or poor situation. The structure of the space management system can give a rapid response to a number of variables. There are many ways a driver can be involved in a crash. Many crashes result from a change in the driver's ability to control the target area, sightline, or travel path before driving into a poor situation.

Examples of Changes:

- A red traffic light is a closed front travel path.
- A hillcrest is a closed front sightline.



- A parked car to the right is a closed right front sightline and travel path.
- A bicyclist to the right is a closed front right travel path.



- An oncoming car or truck is a closed left front travel path.
- A car traveling in the left mirror blind space area is a closed left rear travel path.
- A motorcycle in the right mirror blind space area is a closed right rear travel path.
- A truck following closely is a closed rear sightline and travel path.

After searching and seeing a changing or closed space area, evaluate the conditions of the opposite space areas before making a decision. After evaluating the related space areas, act in selecting the best speed, lane position, and communication tool.

New conditions are always presenting themselves when driving. A driver must constantly question the present conditions. What speed selection feels most comfortable for each situation? What is the legal speed limit? What should the lane or lane position be? What is a good speed selection for this situation? What would be a high risk or poor speed selection, with little to gain? Each situation has different and changing conditions.

These are some of the processing evaluations that a driver would make for any driving situation.

- The speed and lane position selected are usually based upon what the legal limitations are, what the destination is, and what is comfortable for the driver.
- Whatever the choices for speed and position, the space management system recommends looking for how the group of ongoing conditions could cause less control over **line of sight**, and/or **targeting area**, and/or **path of travel**. In other words, watch for changes in the space areas around your vehicle.

By watching for slight changes, making minor adjustments for best speed control and lane position, and using effective communication—a driver will very seldom be surprised by the actions of others that would require a critical high stress or evasive response.

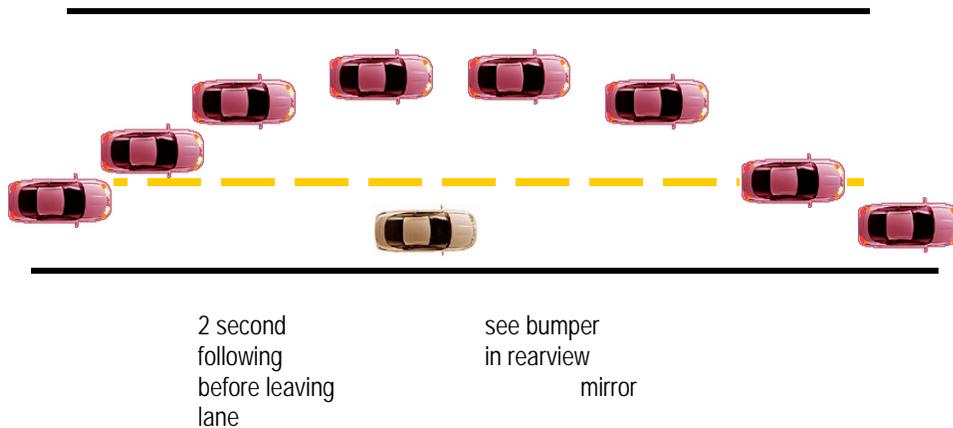


FACT SHEET

Module 3.3 Estimate Passing Gap Requirements

To estimate the time and distance of an oncoming vehicle, begin counting, 1,000, one; 1,000, two; 1,000, three, etc. When an oncoming vehicle is seen, continue the count until the approaching vehicle is opposite your vehicle.

A four-lane divided or undivided highway can also be used to practice identifying space gap needs when passing a vehicle on a two-lane roadway.



A driver traveling **40 mph** is going to make a flying pass of a vehicle traveling **30 mph**. After the driver makes all of the visual checks, signals intentions, and starts the pass from an interval two seconds behind the vehicle ahead, it will take about **13 seconds** to complete the pass.

A driver traveling **50 mph** is going to make a flying pass of a vehicle traveling **40 mph**. After the driver makes all of the visual checks, signals intentions, and starts the pass from an interval two seconds behind the vehicle ahead, it will take about **16 seconds** to complete the pass.

A driver traveling **60 mph** is going to make a flying pass of a vehicle traveling **50 mph**. After the driver makes all of the visual checks, signals intentions, and starts the pass from an interval two seconds behind the vehicle ahead, it will take about **19 seconds** to complete the pass.

If the passing maneuver is started from three seconds back with both vehicles traveling at the same speed, the passing driver will have to accelerate to a speed 15 mph faster than the vehicle to be passed to complete the pass in the same time limits.

Keep trying until accuracy at estimating necessary passing time is achieved.

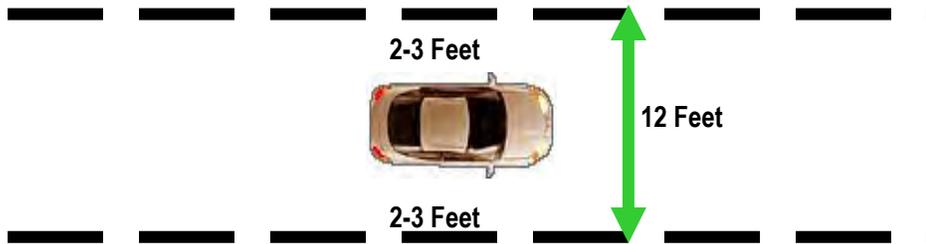


FACT SHEET

Module 3.3

Mixing With Traffic

Most lanes are twelve feet wide. Passenger vehicles are about six feet wide. If a vehicle was centered in the roadway, they would have three feet on either side. When mixing with traffic, be aware of the space available and have as a goal to keep empty space to your sides. Use space effectively and when other drivers need more space, be prepared to adjust your lane position to keep the vehicles as far away from your vehicle as possible.



Intersection Maneuvers

It is important that drivers understand the increased risk at intersections controlled either by stop signs or traffic signals when joining and/or crossing multi-lane traffic traveling at speeds up to 60 mph. While the procedures remain consistent, gap requirements increase substantially at higher speeds, whether crossing or turning left or right. New drivers must learn to be alert to multiple turn lanes with drivers cutting across lanes on multi-lane higher speed roadways.



Searching Intersections

Knowing when and where to search depends on many factors: Is traffic heavy? Are pedestrians in the area? Are children playing nearby? Are there line of sight or path of travel restrictions? Are lane markings visible? What is the speed of traffic? When approaching intersections, start your search in advance. Turn your head and eyes to look at a 45-degree angle left and right and look ahead through the intersection to your target area for oncoming traffic and conditions. The search needs enough time to identify the intersection type and make speed or lane position adjustments to keep an open zone.

As the intersection becomes more visible or when stopped, search 90 degrees to the left and right, by turning the head and eyes to search deep into the intersection. Search straight ahead into the target area.

Before moving from a stopped position, search again to the left, front, right. Look for the driver running a red light before you venture into the intersection.

Intersections Controlled by Traffic Signals

Before entering a signalized intersection, check again for oncoming vehicles signaling a left turn and look for pedestrians in the crosswalk, bicyclists, and cross traffic. Make sure that they are stopped before you start to move. Whether first in line or in a line of vehicles, develop the habit of checking traffic and counting three seconds before moving. This provides some protection against drivers who fail to stop for a red signal or drivers ahead who suddenly brake to a rapid, unexpected stop.

Turning Right

Do not move into the intersection until there is space in the next block. When turning right, yield right-of-way to pedestrians in the crosswalk. Where there is more than one turn lane, when exiting your lane, be sure to enter the corresponding lane in the new lane. Be alert for drivers crossing or drifting between lanes while making the turn. When turning right on red, stop and yield right-of-way to any vehicles, bicycles, or pedestrians in your intended path of travel.

Turning Left

While many signalized intersections on multi-lane streets with faster moving traffic provide special left turn lanes and/or delayed or advanced left turn signal lights, such protection is not always available. When the turn is not protected, the risk associated with a left turn increases significantly. In addition to the precautions listed for right turns, the driver must check :

- for oncoming drivers signaling for either left or right turns
- identify an adequate gap in oncoming through traffic
- determine whether there is space available in the lane to be entered
- and check for the presence of pedestrians in the crosswalk to the left.

Frequently, a driver wishing to turn left will signal left and move into the intersection on a green signal light, with wheels pointed straight ahead only to find that it is necessary to wait until the signal light turns red before it is safe to make the turn. In some states, that is a violation of traffic laws.

Prior to moving into a signalized intersection and stopping, the law requires that a driver wishing to make a left turn make certain there is space available in the street to be entered. Failure to do so frequently results in being unable to clear the intersection, creating what is commonly referred to as gridlock. This will certainly annoy other drivers and may lead to a traffic citation for blocking traffic. Montana laws require drivers to not block an intersection.

U-Turn with Median Strips

There are two major conditions with a U-turn at a roadway with a median separator. When there is a perpendicular intersecting roadway with the U-turn, and when there is only the U-turn.

With only the U-turn, and no side roads, "hugging" the median is the best behavior to allow traffic to turn from both directions without conflicting. This is much the same as two cars making a left turn at an intersection. They are turning in front of each other.

When there is a crossing intersection as well as the U-turn there should be signs or pavement markings to indicate where the car should be positioned to make the U-turn. A stop line and or a stop sign or yield sign positioned, along with yellow dividing pavement lines, would tell where the car should be positioned. Some of the intersections could have a special U-turn lane that would allow the driver to hug the median while at the same time allowing traffic from the crossing intersection to cross without conflicting with the vehicle making the U-turn.

In the absence of any traffic controls or pavement markings to tell a driver where to position for making the U-turn when there is a crossing intersection, the driver must be positioned to not block the path of the crossing traffic. This condition would require the driver to keep to the right of the intersection.

Intersections Controlled by Stop or Yield Signs

Entering or crossing a multi-lane street, with traffic traveling at higher speeds, at an intersection controlled by a stop or yield sign, requires critical time-space judgments. At a brisk rate of acceleration, crossing a two-lane roadway, 30 feet wide, requires a gap of about six or more seconds.

Right Turns

If turning right to merge into traffic traveling 30 mph, a gap of about eight or more seconds, 352 feet, is needed to accelerate to the speed of traffic. This will give the approaching driver from the left a following distance from you of four seconds. With traffic traveling toward the intersection at 55 mph, a gap of about 11 seconds is needed. That puts the car about 880 feet away from the intersection.

Left Turns

Similar, but more complex problems exist for left turns. Since it is necessary to first cross the lanes of traffic traveling from the left, the decision of when it is safe to go becomes more complex. Assuming the approaching car from the left is not required to stop at the intersection, a gap of three to four seconds from the approaching vehicle is needed. If traffic from the right is moving 30 mph, a gap of 11 or more seconds, (484 feet) is needed make a left turn and enter the new lane of traffic.

Give the approaching driver from the right a 4-second following distance from you by accelerating to the speed of traffic. With traffic from the right traveling at 55 mph, a driver needs a gap of 14 or more seconds, (about 1130 feet) to complete the turn. When crossing a divided highway, it may be necessary to yield right-of-way before crossing both sets of roadway.

When stopped at or in an intersection, drivers are vulnerable to being rear-ended. Keep the front wheels straight until you are able to initiate your turn. In the event of a rear end crash, the straight tires will help prevent your vehicle from being pushed left into the oncoming traffic.

When stopped behind another vehicle, stop where you can see the vehicle's tires touching the pavement. If the vehicle should stall, you will have about 15 feet of front space to move around the vehicle.

Move with the flow of traffic

Try to keep speed the same as that of the surrounding vehicles. Any speed more than five miles per hour slower or faster than the flow of traffic tends to cause disruption in the traffic flow.

Reversible Lanes

In some large cities during rush hours, existing lanes are actually reversed for travel during rush hour. This allows the movement of large volumes of traffic quicker. Identified as reversible lanes, these lanes are marked with special double yellow broken lane line markers. In addition, signs at the side of the road and overhead lane signals (green or red) tell the driver which lanes can be used.

Plan ahead for anticipated turns

In heavy traffic, know where to turn. Since it is frequently difficult to change lanes, plan to get into the proper lane at least two to three blocks in advance.

Yield to oncoming traffic and pedestrians in the crosswalk when turning left

Major intersections can be filled with distractions. The driver must locate a gap in oncoming traffic, while at the same time yielding to pedestrians in the crosswalk. Watch for other drivers ahead of you making the same turn – will they have to stop for pedestrians?

Anticipate lane blockages and select the lane that allows movement with the least conflict

A visual lead of one to one-and-a-half blocks (20 -30 seconds ahead) helps to identify the open lane. Identifying a closed front zone such as double-parked vehicles or turning vehicles backed up in a lane well in advance provides time to make a lane change if necessary.



Sometimes there is no gap in which to make a lane change

Do not force a gap. Ask other drivers for permission to make the lane change by turning on the turn signal, changing vehicle position to lane position 2 or 3 to let them know you need to make a lane change. Use courtesy when asking the other driver to cooperate by making a gap for you. Return the courtesy when someone else needs space to maneuver.

Predict traffic stoppages that could cause an intersection trap

Use time and space management techniques to position the vehicle to allow traffic searches 20 to 30 seconds ahead to identify conditions. Create time to determine if you will arrive at an open zone or closed zone. Adjust speed and have a goal to arrive at an open zone.

Identify streets as one-way or two-way

One-way streets are usually marked with arrows mounted on corner posts and close to the overhead signal light. One-way streets have only white lane markings - no yellow lane markings. A clue is parked cars on both sides of the street facing in the same direction.

Using a Shared Left Turn Lane

Shared left turn lanes are frequently found between intersections where a large number of vehicles turn left across a moderate to high volume of traffic that is traveling at higher rates of speed. Shared left turn lanes may be used by drivers turning from or onto a roadway. They are to be used only by drivers making a left turn.



Shared left turn lanes are marked with solid and broken yellow lines on both sides of the lane. White turn arrows indicate that drivers traveling in either direction can use the lane. Shared left turn lanes are intended only for vehicles making left turns. As a rule, drivers should not travel more than about 200 feet while slowing to stop or turn across traffic, or accelerating to enter traffic. When traffic is so heavy that a safe gap in oncoming traffic is not available, drivers can move out of the left travel lane, slow, or stop, if necessary, and then complete the left turn when there is a safe gap in traffic. Some jurisdictions specify a shorter distance than 200 feet. The city of Boise requires drivers to drive no more than 100 feet in a shared left turn lane.

Use Positive Communication

In today's society, what may have worked as a good communication sign 20 years ago, may now be interpreted as aggressive. Evaluate the situation to determine what type of communication, if any, is needed. Use your communication technique in time for other drivers to interpret and react to your intention. Communication techniques includes using turn signals, appropriate hand signals, flashing headlights or tapping the brake light, and adjusting lane position. Back-up lights communicate the vehicle will be moving in reverse.

The horn can be hazardous to others if used when attention is needed to avoid something. A loud blast of a horn can cause a pedestrian, bicyclist, runner or child to react instinctively and put them in greater danger. A quick tap of the horn may be the answer to alert others to your presence. Making eye contact may or may not work. Some drivers may see this behavior as aggressive. Recognize when a thumbs up or some other type of positive behavior indicating appreciation will be welcomed.

Be alert and prepared to accept and interpret communication from other drivers. Be alert to turn signals, speed, where a driver may be looking, front tire position, and brake lights. Some signals are used intentionally to let you know what action they may take. Others you may need to interpret based upon lane position, tire position, driver inattention to the road ahead.



FACT SHEET

Module 3.4

Sharing the Road

Student Activity 1

You will watch a series of slides and video and during that time you will begin to identify the unique characteristics of different HTS users—pedestrians, bicyclists, motorized vehicles and trucks. Your job is to understand how those unique characteristics affect the way you share the road with them.



Brainstorm Activity

Montana is a big state with many different climates and landscapes. Each of those influence how people use the roads and highways. ***Working in groups of two or three identify how each of the following conditions impacts how you share the road with others.***

**Snow | Rain | Hail | Fog
Thunderstorms | Wind Gusts
Sunglare | Dust | Sunset
Sunrise | Night Time
Nice Weather with Good Visibility**

Think in terms of your speed, space, communication, and time to make decisions. Also consider the effect these conditions have on the other vehicles and what they might do when you pass them from the opposite direction or when you are following them on a snowy or

rainy day. There are many things that can happen so try to identify as many as you can.

Sharing the Road

Remember Find, Solve, and Control from Module 3.2? We need to use it effectively to share the road with other HTS users. Driving is about decision making and critical thinking. Sharing the road is solving the problem by seeing it, formulating solutions, and then creating space and time to safely share the road.

Find We first need to FIND or see the changes ahead of us and respond to the HTS user's unique characteristics to help us build strategies for interacting courteously with other HTS users.

Knowing the unique characteristics of each HTS user will help us solve the space and time issue. We need to know what those characteristics are to help know what to do. For instance, a pedestrian takes up a lot less space than a semi-truck and trailer but the pedestrian is much more vulnerable to injury if we misjudge the space or time need. We may be in danger if we don't anticipate the space need of the semi-truck during a turn in tight spaces.

Solve

Control There are some underlying assumptions we need to make when we encounter different HTS users. For instance, when you pass a skateboarder who is using the bike lane are they riding "goofy" or normal? If they are riding "goofy" can they see you approaching from behind as easily as if they are riding normal? If not they may move into your path of travel and be in danger. The best option for both of you is to check to see if you have room to separate yourself from the skateboarder and to lower your risk. If you do, move into that space. If not, you need to slow down.

Resources

You may wonder what laws and support materials are out there that guide us on how to share the road. The following is a short list of places to look for information regarding driving laws.

Department of Justice Motor Vehicle Laws
<https://doj.mt.gov/driving/>

Department of Justice Driver Licensing
<https://doj.mt.gov/driving/driver-licensing/>

Trucks
<http://www.sharetheroadsafely.gov/>

Construction Zones
http://www.workzonesafety.org/public_awareness

Motorcycle Safety
<http://www.forcardrivers.com/>

Bicycle Safety
<http://www.mdt.mt.gov/travinfo/bikeped/>

Montana Share the Road Brochure
<http://www.mdt.mt.gov/travinfo/bikeped/sharetheroad.shtml>

This is not a complete list but will give you a start to finding the information.



FACT SHEET

Module 3.5

Parking Laws

Parking on Public Road

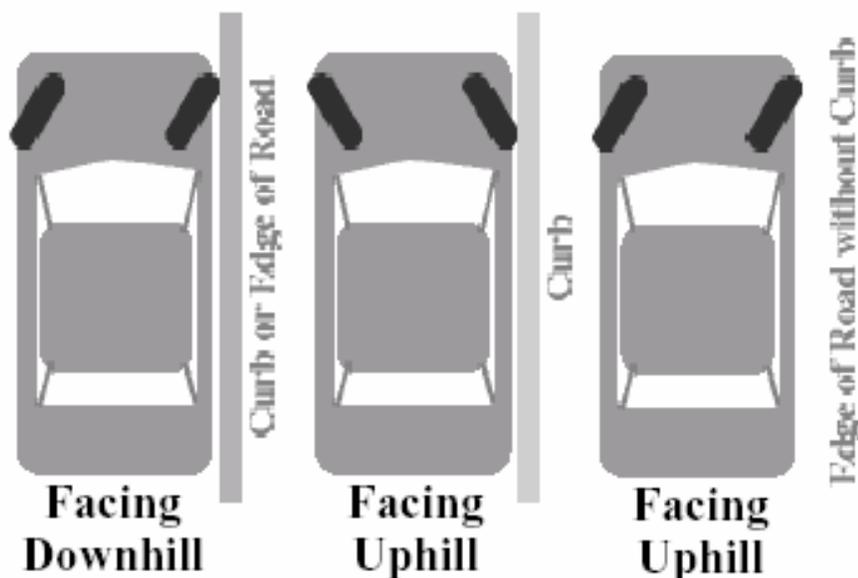
When parking on a public road, you must park parallel to and within 18 inches of the curb or edge of the roadway, facing in the same direction as traffic on your side of the road. When you leave your car, secure it. If you have an automatic transmission, shift to park and set the parking brake; if you have a manual transmission, leave the car in first gear or reverse and set the parking brake. Remove the keys and lock the door.

Parking on a Hill

If the parking brake fails, to keep your vehicle from rolling into traffic when parked on a hill, turn your front wheels (1) sharply toward and against the curb or edge of the road if you are facing downhill, or (2) if you are facing uphill, turn your wheels sharply away and against the curb (if there is no curb, turn the wheels sharply toward the edge of the road). Always turning the tires in a direction so that if the parking brake fails, your vehicle will not roll into traffic, but off the edge of the roadway.

The tires are a third way to help keep the car from moving after you have exited it. With no curb to catch the tires, turning the tires away from the street will help prevent the car from rolling into traffic.

Keeping the foot on the brake until the parking brake is set will allow the parking brake to be the primary holding force. The shift into Park position is a secondary holding system.



No-Parking Zones

Parking is not allowed

- On sidewalks
- On the street side of any parked vehicle. (This is known as “double parking.”)
- In intersections
- Within 50 feet of railroad tracks
- On bridges or overpasses
- In front of a driveway
- Within 15 feet of a fire hydrant
- Within 20 feet of a crosswalk
- Within 30 feet of a stop sign, yield sign, or traffic signal
- Within 20 feet of a fire station driveway
- On any controlled-access highway (freeway)
- Where prohibited by signs or a red, yellow, or white “no parking” curb

Handicapped Parking

The symbol shown here indicates parking spaces reserved for handicapped persons. Vehicles displaying this symbol on their license plate or a special card may park in handicapped spaces. Non-handicapped drivers are prohibited from parking in such spaces and may be fined for violations. A handicapped person may park automobiles displaying the handicapped symbol in public parking spaces without paying and for unlimited time.

