Virginia Department of Education

Module Three Transparencies

Basic Maneuvering Tasks:

Low Risk Environment

Topic 1 -- Basic Maneuvers

Topic 2 -- Vision and Perception

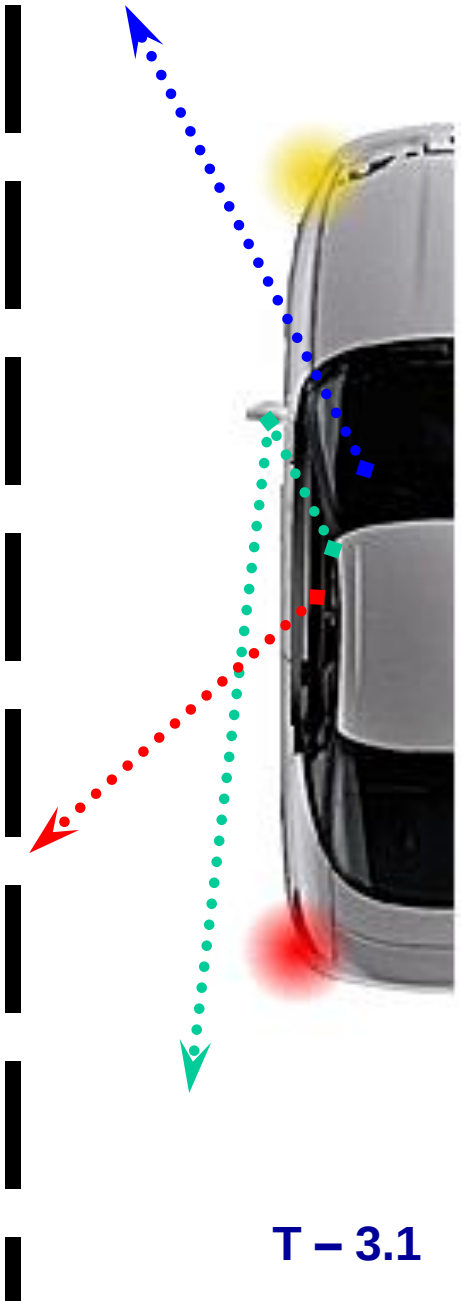
Topic 3 -- Controlling Risk Using a Space Management System

Topic 4 -- Developing Good Driving Habits

Provided in cooperation with the Virginia Department of Motor Vehicles

Entering Roadway Tasks

1. **Place Foot Firmly on Service Brake**
2. **Select Proper Gear**
   - Overdrive, Drive, or Reverse
3. **Perform Traffic Checks**
   - Forward, Rear, and Sides
4. **Apply Proper Signal**
   - Communicate Intentions

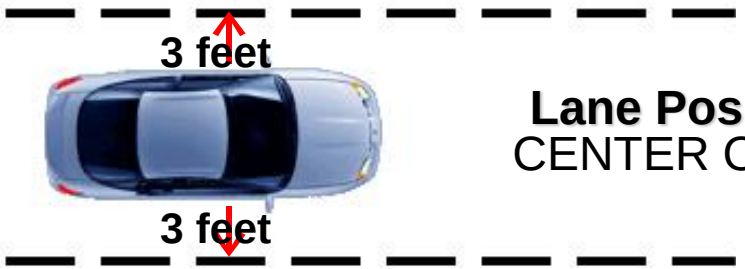


Entering Roadway Tasks

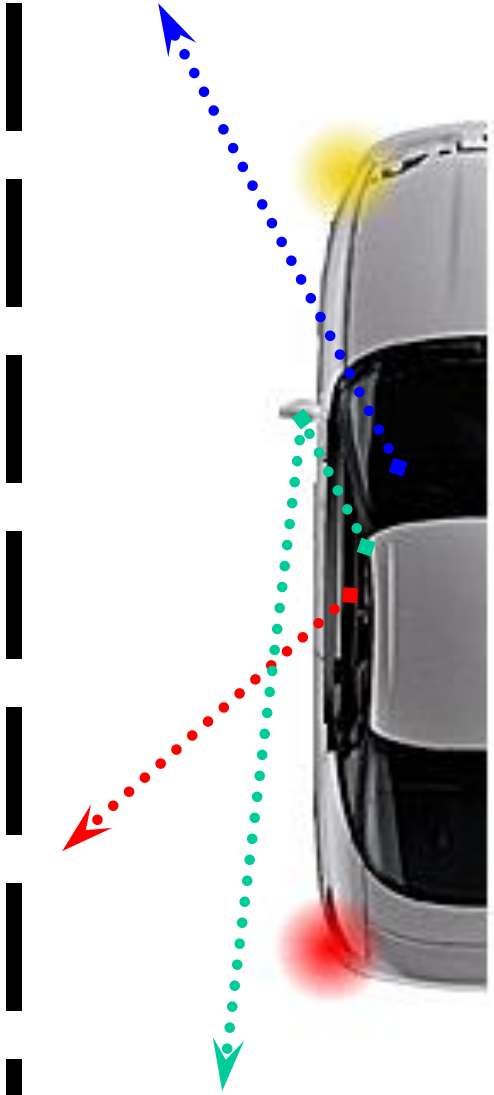
5. **Release Parking Brake**

6. **Select Gap in Traffic Flow**

7. **Move to Lane**
   - Target Lane Position #1
   - Release Service Brake
   - Accelerate Gradually
   - Steer to Center of Lane



Lane Position #1
CENTER OF LANE



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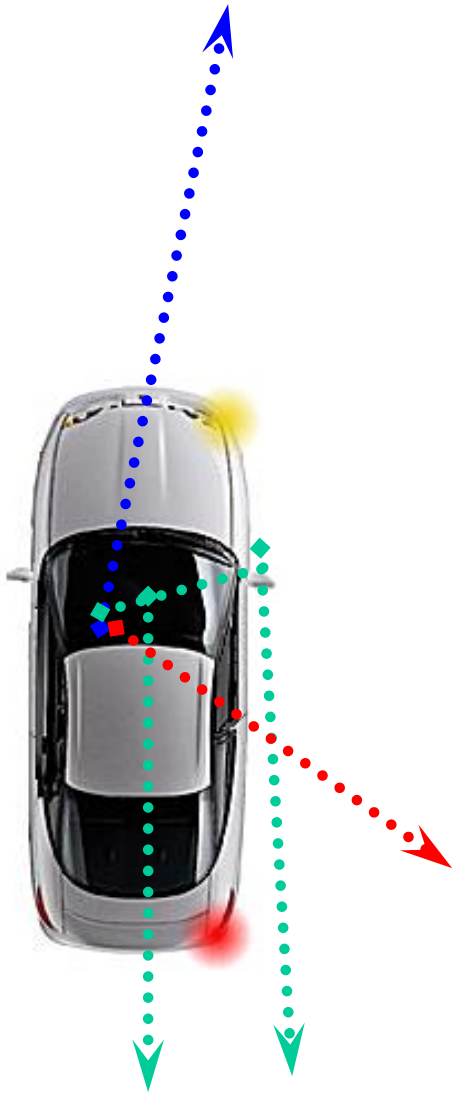
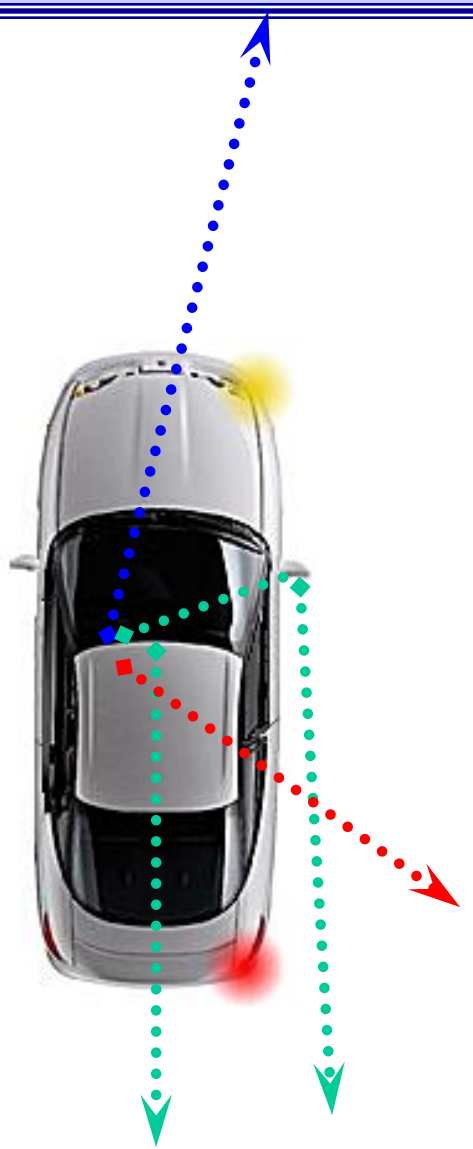
Moving to Curb/Side of Road

- **Traffic Checks**
  Front/Rear/Sides
- **Proper Signal**
- **Target Visual Reference Point**
  - for 6” from Curb
- **Side Mirror and/or Blind Area Check**

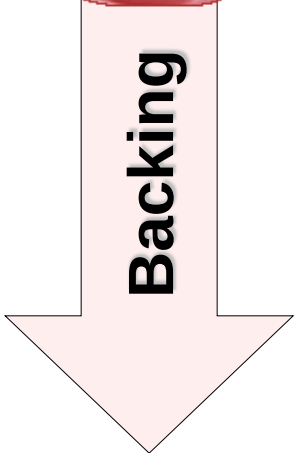


Moving to Curb/Side of Road

- **Adjust Speed Using Controlled Braking**
  - To help prevent jerky stops
- **Use Gradual Steering**
  - Make Adjustments to Align Visual Reference Points
- **Re-check Traffic**
- **Cancel Signal Indicator**



Backing



- Proper Seating and Hand Positions
  - Left hand at 12 oclock
- Adjust Restraints if Necessary
- Check Traffic to Front, Sides and Rear
- Place Foot on the Brake
- Shift to Reverse

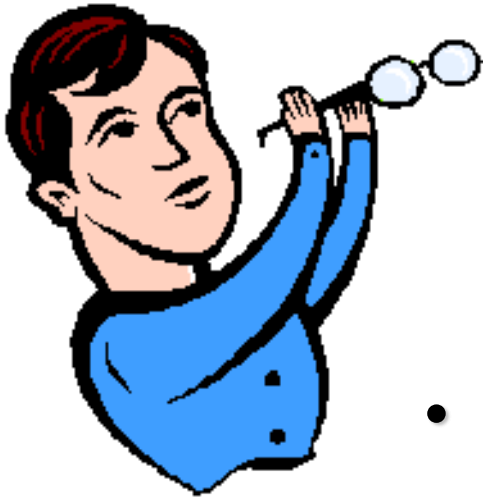
Backing

- The proper signal for backing is white lights
- Release Parking Brake
- Readjust Seat Position
- Visually Target Position- 3 car lengths back (2 are not visible)
- You should be looking at your target area
- Maintain Reference Points
- Turn the wheel in the direction you want to go!

Backing

- **Control Rear Movement**
  Gradually Release Brake Pressure
- **Move as Slowly as Possible**
- **Accelerate Gradually**
- **Cover the Brake when Needed**
- **Steer in the Direction You Want to Go Using Reference Points to Establish Position**

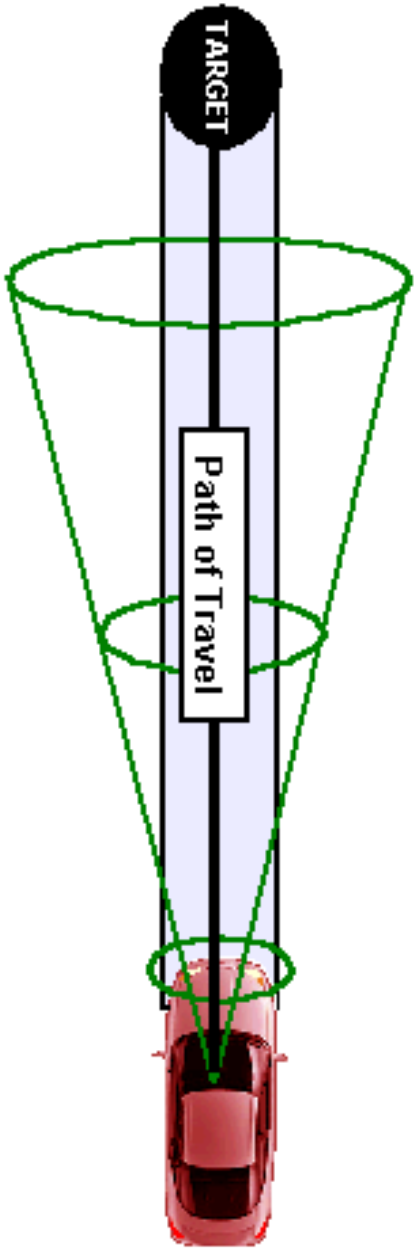
Vision and Perception Requirements



- **Gaining Visual Information**
  - **Focus Vision (Focal/Foveal)**
  - **Central Vision (Limited Fringe Area)**
  - **Peripheral Vision**
- **Maintaining an Open Line of Sight**
- **Developing Searching Skills**

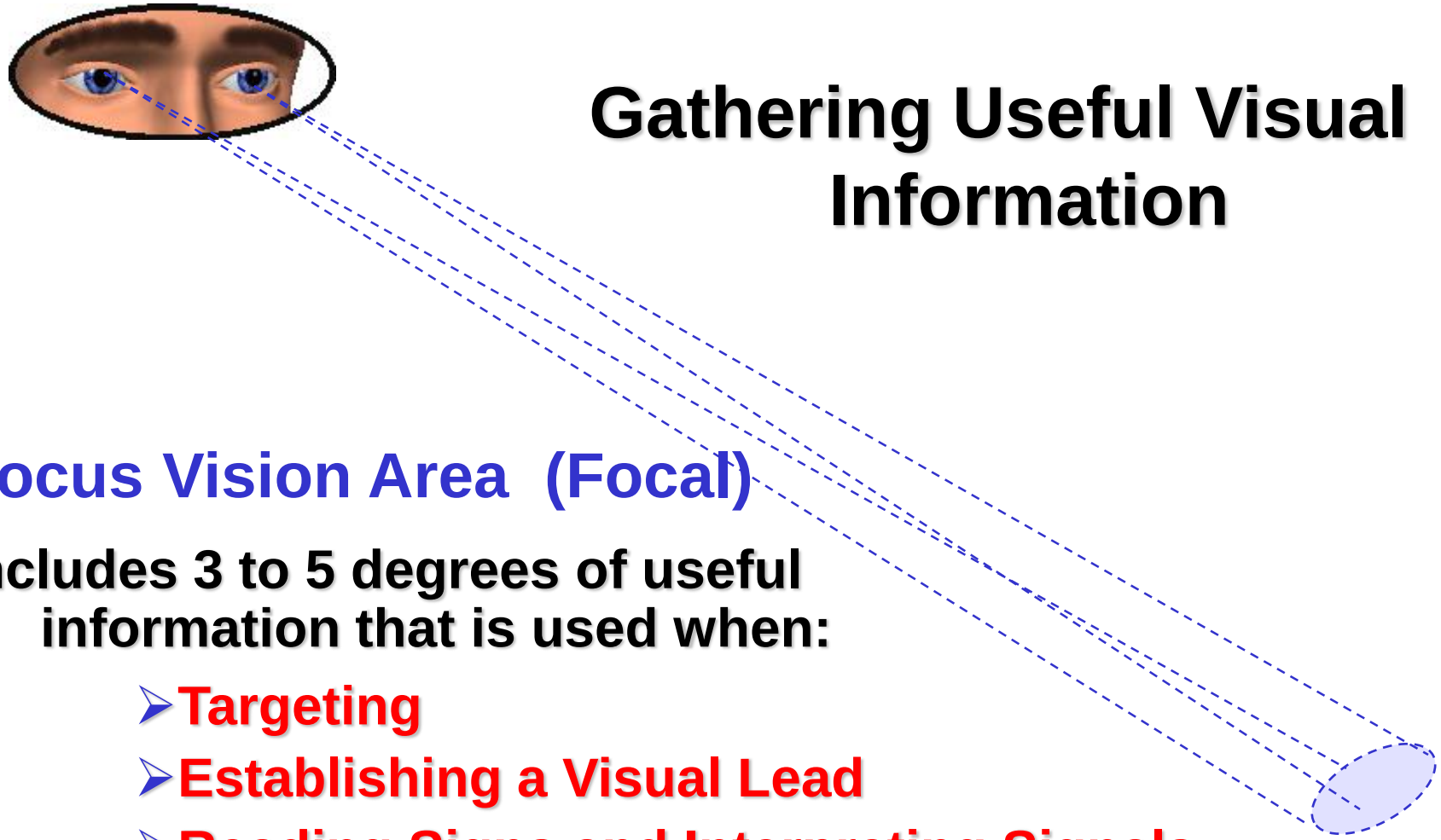
Note: 90% of the driving task is visual!

Vision and Perception Requirements



- Targeting, Line of Sight, Path of Travel
- Referencing Vehicle to Path of Travel
- Using Visual References
- Using Turning Points to Start the Turning Process
  - Forward visual turning points
  - Rear visual turning points

Driver's Useful Vision Areas



Gathering Useful Visual Information

Focus Vision Area (Focal)

Includes 3 to 5 degrees of useful information that is used when:

- **Targeting**
- **Establishing a Visual Lead**
- **Reading Signs and Interpreting Signals**

Driver's Useful Vision Areas

Gathering Useful Visual Information

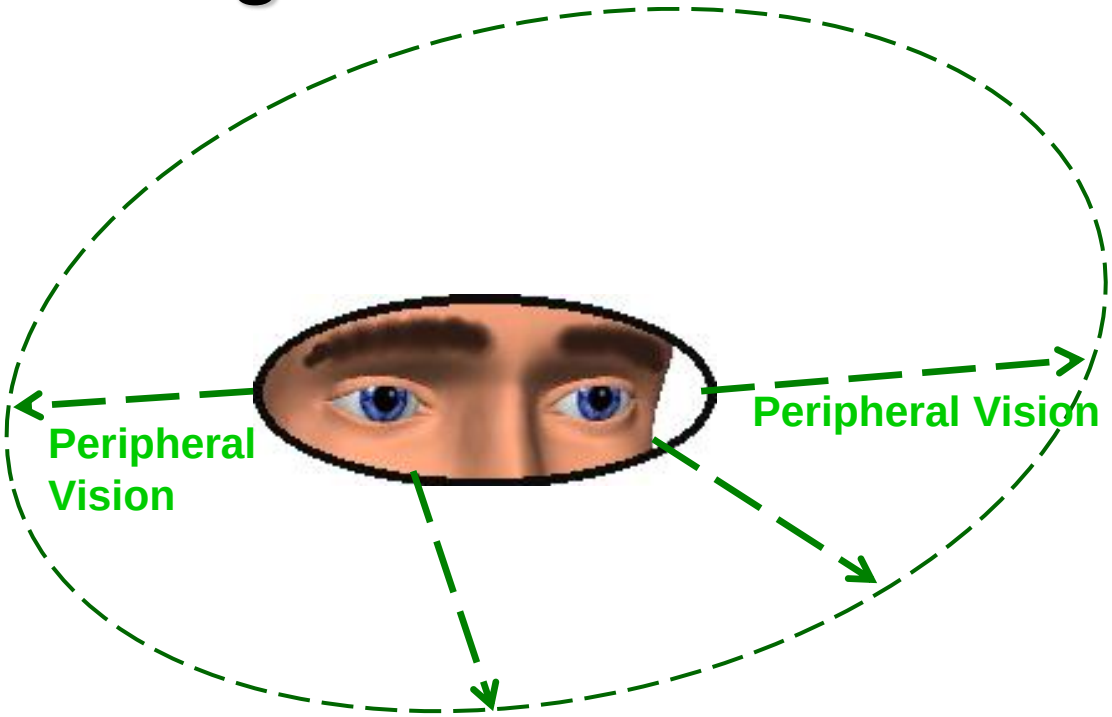
Central Vision Area (Inner Fringe)

30 to 36 degrees of useful information that includes:

- **Referencing Vehicle Position to Roadway**
- **Viewing Path of Travel**
- **Viewing Line of Sight to Target Area**

Driver's Useful Vision Areas

Gathering Useful Visual Information

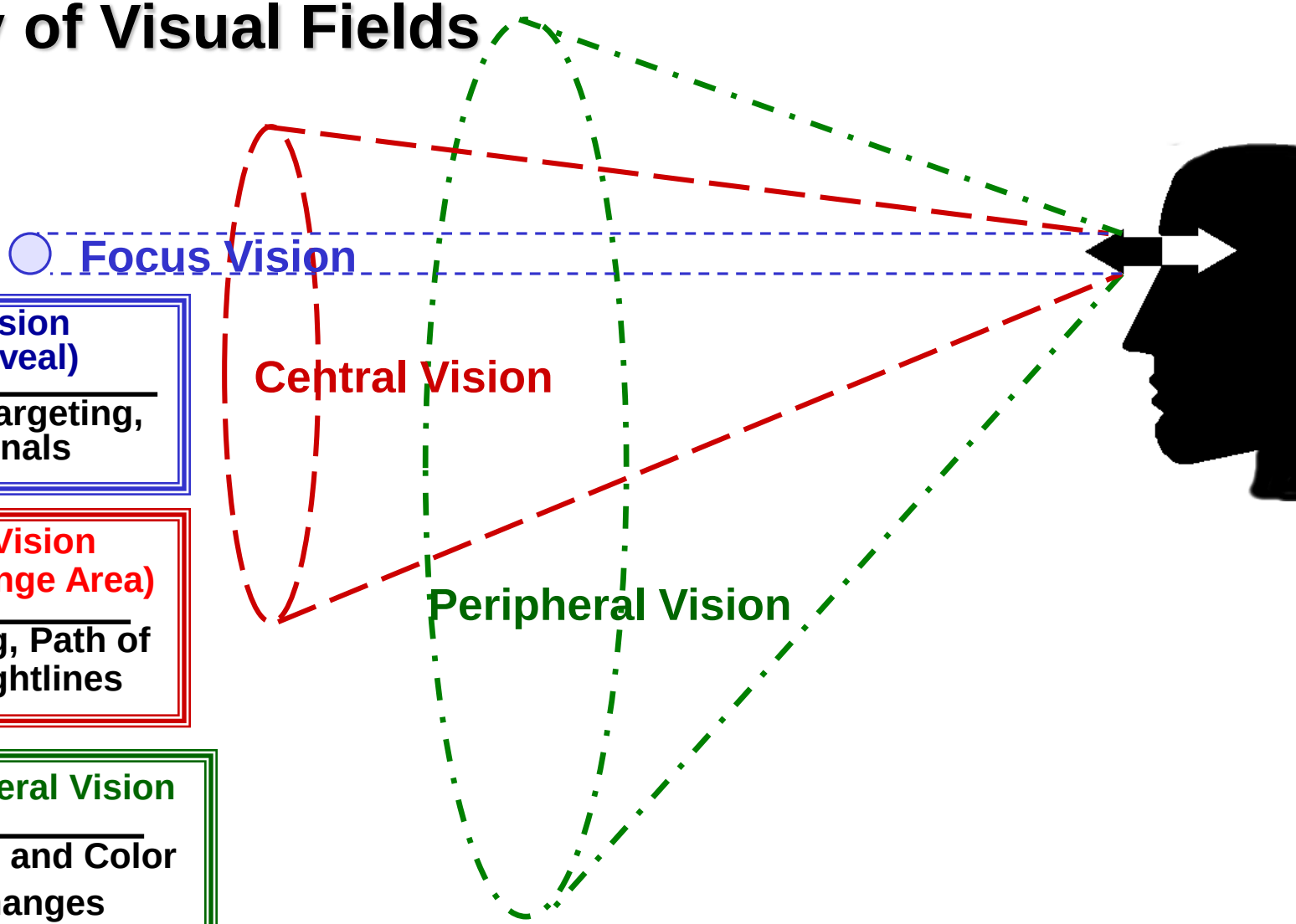


Peripheral Vision (Outer Fringe Area)

- 175-180 degrees of useful information that detects:
  - Motion Changes (detecting movement)
  - Color Changes

Visual Fields in Operation

Capacity of Visual Fields



Focus Vision (Focal/Foveal)

Visual Lead, Targeting, Signs, Signals

Central Vision (Limited Fringe Area)

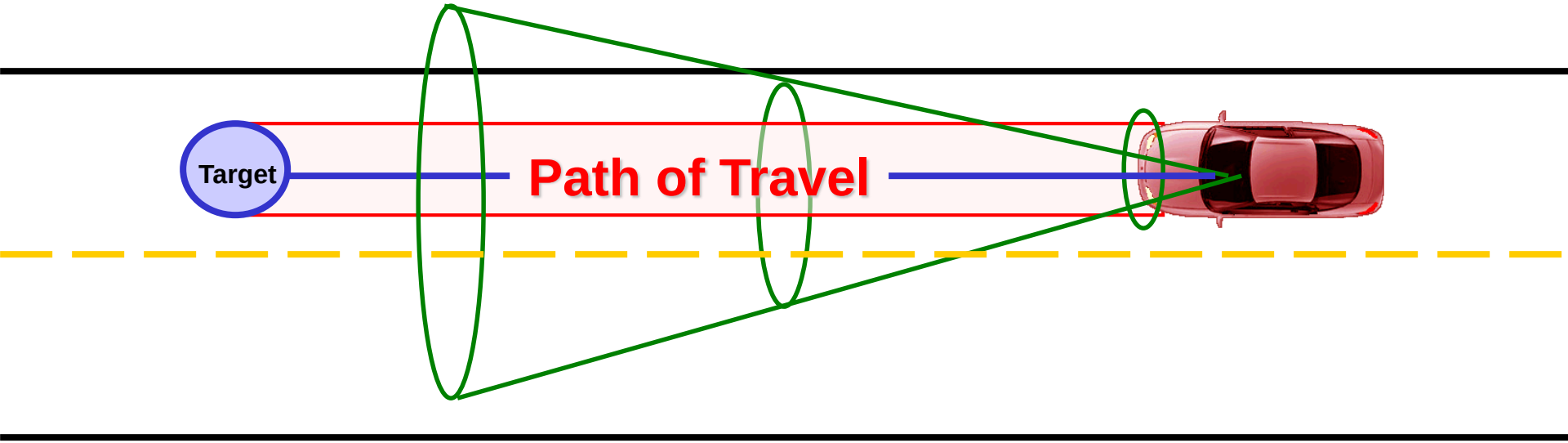
Referencing, Path of Travel, Sightlines

Peripheral Vision

Motion and Color Changes

Visual Fields in Operation

Standard Visual Target and Reference Fields for Lane Position 1



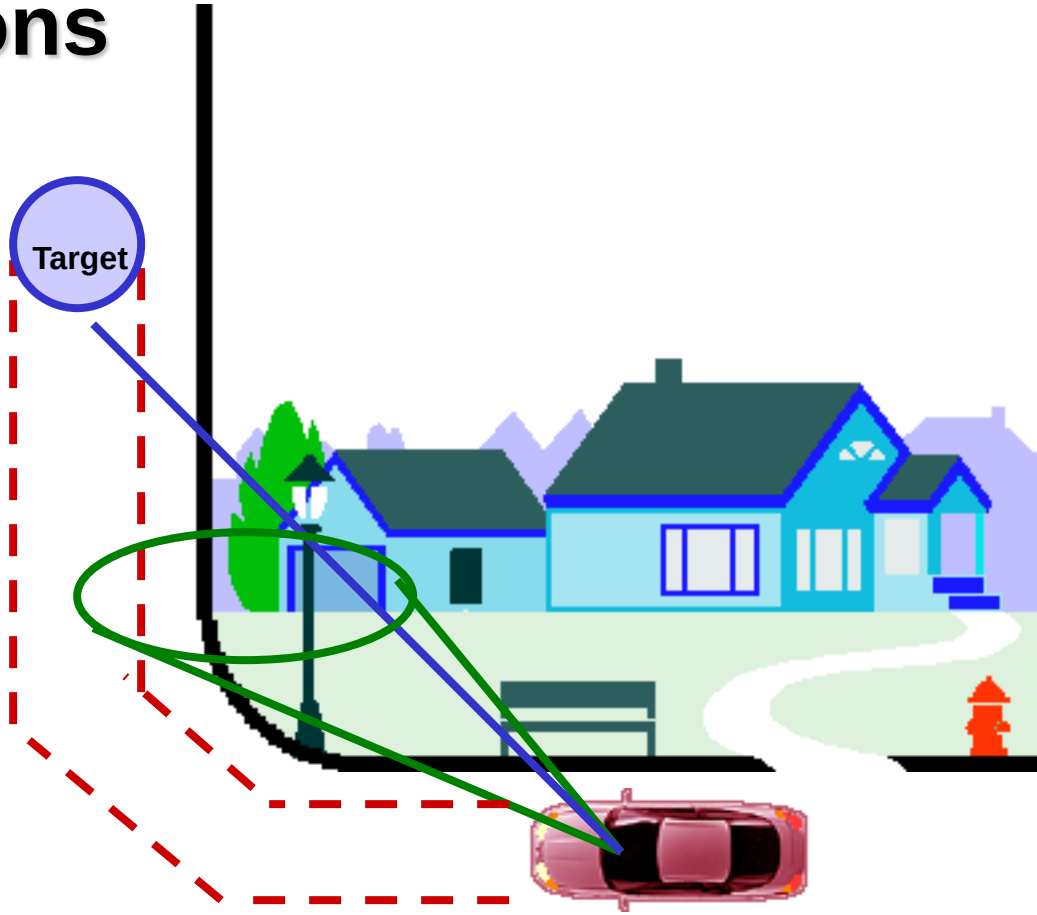
When **focus vision** is on the selected target in the center of the path of travel, the **central or inner fringe vision** allows the driver to visually place the vehicle in a specific location within the lane.

Line of Sight/Path of Travel

Line of Sight Limitations or Restrictions

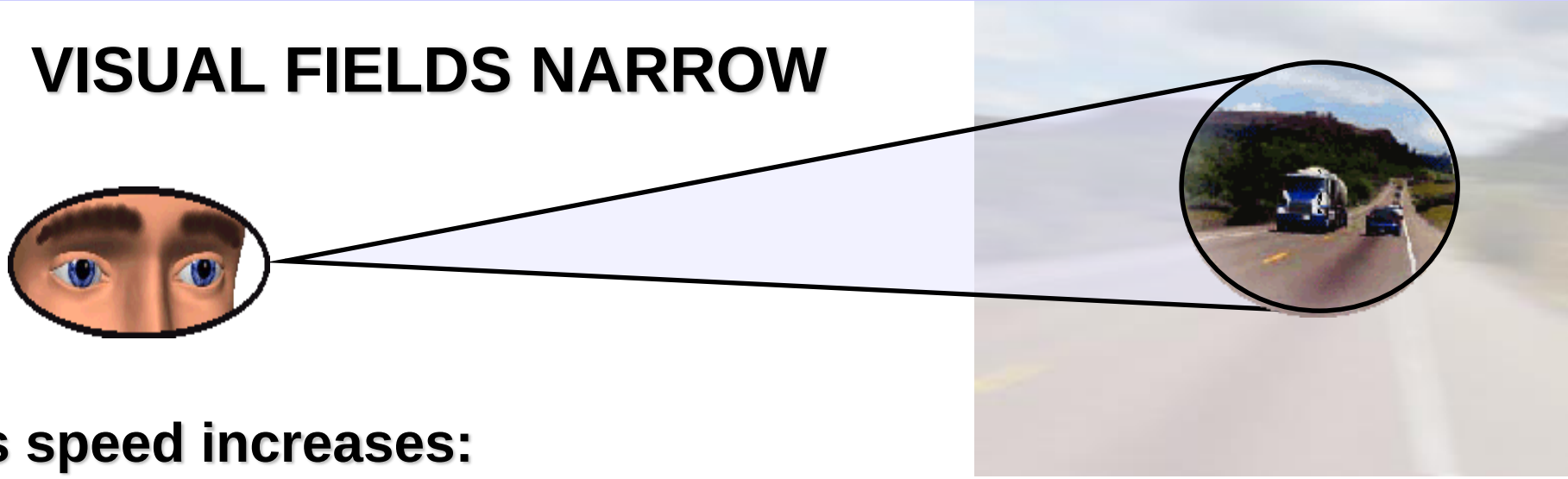
When line of sight is restricted or blocked, adjust speed until visual lead, target area, and the line of sight are restored.

- **Your visual lead should be 20-30 seconds from the front of your vehicle**



Effect of Speed on Vision and Steering

VISUAL FIELDS NARROW



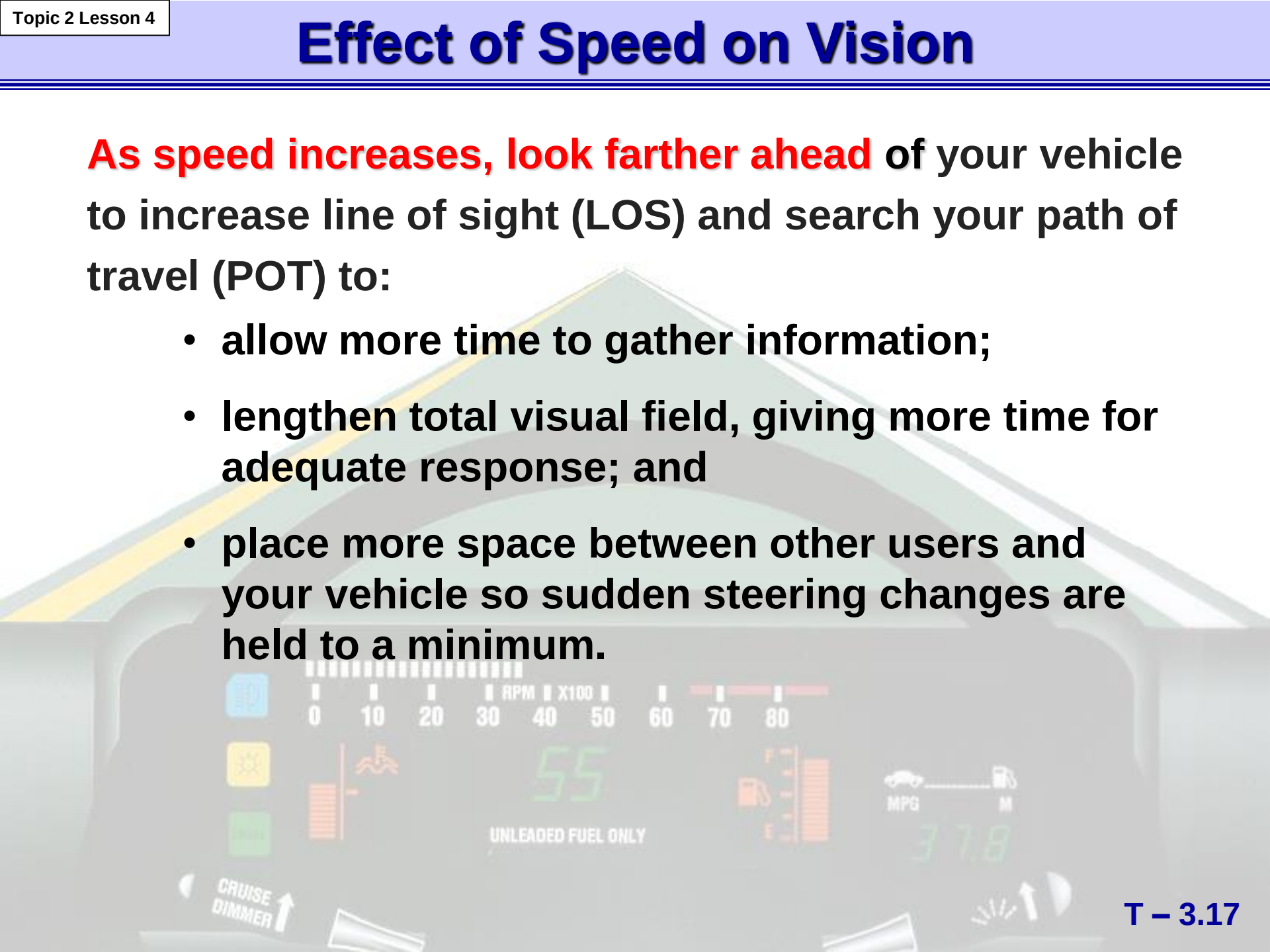
As speed increases:

- central vision narrows and blurs
- peripheral vision decreases
- changes in steering will cause exaggerated vehicle movements
- Amount of information needed to maintain car position increases

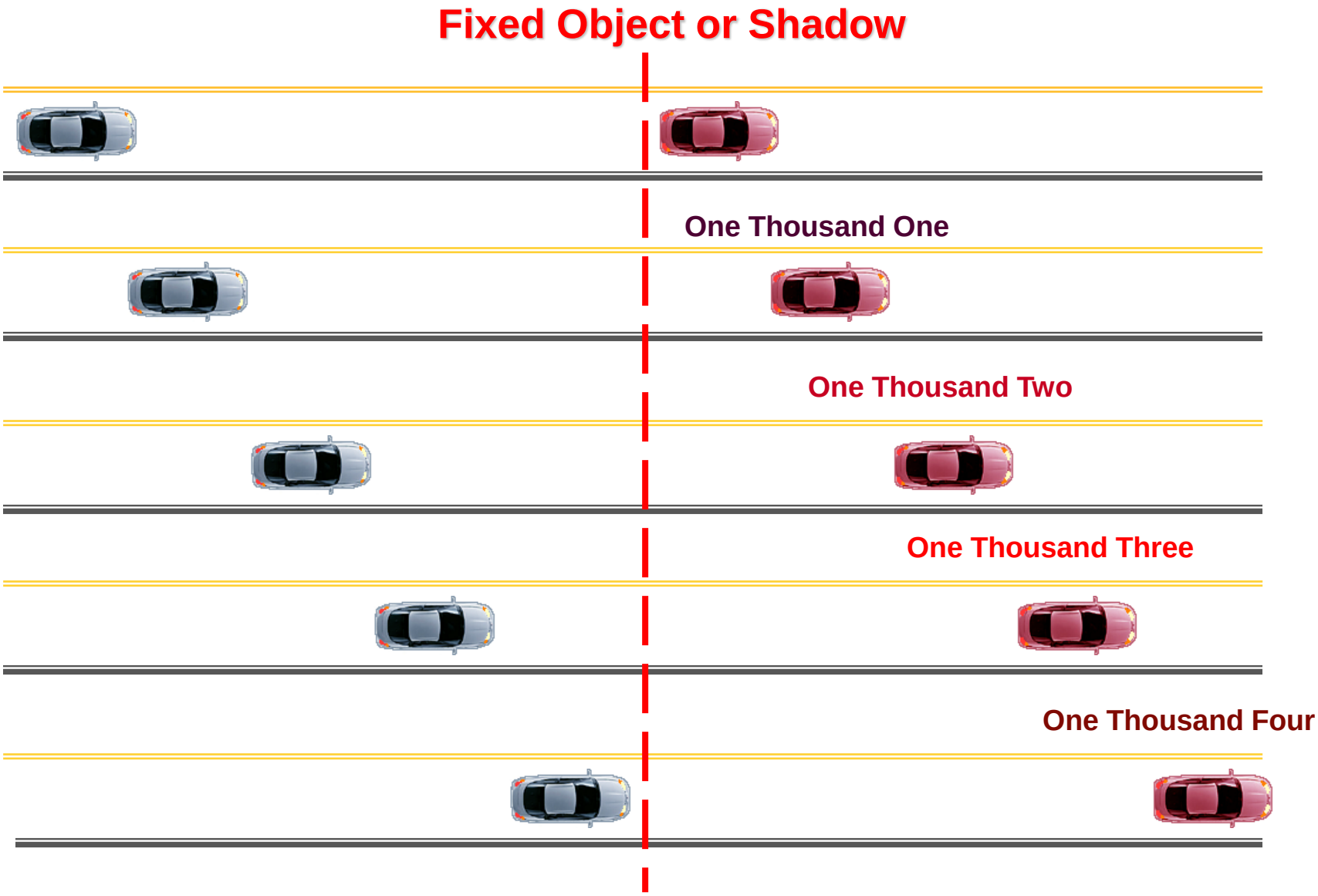
Effect of Speed on Vision

As speed increases, look farther ahead of your vehicle to increase line of sight (LOS) and search your path of travel (POT) to:

- **allow more time to gather information;**
- **lengthen total visual field, giving more time for adequate response; and**
- **place more space between other users and your vehicle so sudden steering changes are held to a minimum.**



Determining Following Intervals



Time, Speed, and Distance

Time, Speed and Distance on Dry Pavement

Vehicle Speed	Ft./Sec. Travel	Following Interval 2 Sec.	3 Sec.	4 Sec.	1/2 sec Steer Dist.	3/4 sec Brake Dist.	Total Brake Dist.
30 mph	44 f/s	88 ft.	132 ft.	176 ft.	22 ft.	33 ft.	80 ft.
40 mph	58 f/s	116 ft.	174 ft.	232 ft.	29 ft.	44 ft.	125 ft.
50 mph	74 f/s	148 ft.	222 ft.	296 ft.	37 ft.	56 ft.	190 ft.
60 mph	88 f/s	176 ft.	264 ft.	352 ft.	44 ft.	66 ft.	275 ft.
70 mph	104 f/s	208 ft.	312 ft.	416 ft.	52 ft.	78 ft.	385 ft.

Formula for *approximate* feet per second traveled:

Speed + ½ speed = FPS traveled

Following Intervals

- **2 Seconds…** Allows driver time to steer out of problem areas at all listed speeds on a dry surface and stop before problem areas at speeds under 35 mph.
- **3 Seconds…** Allows driver time to steer out of problem areas at all listed speeds on dry surface and stop before problem areas at speeds to 45 mph.
- **4 Seconds…** Allows driver to steer out of problem areas at speeds up to 70 mph on dry surface and stop before problem areas at speeds to the legal limit of 70 mph.

❖ Most factory equipped passenger car tires are not designed to steer out of problem areas at speeds beyond 75 mph. At such speeds, speed rated tires are required due to increased tire heat and reduced traction caused by excessive sidewall flexion--especially on curves or when turning.

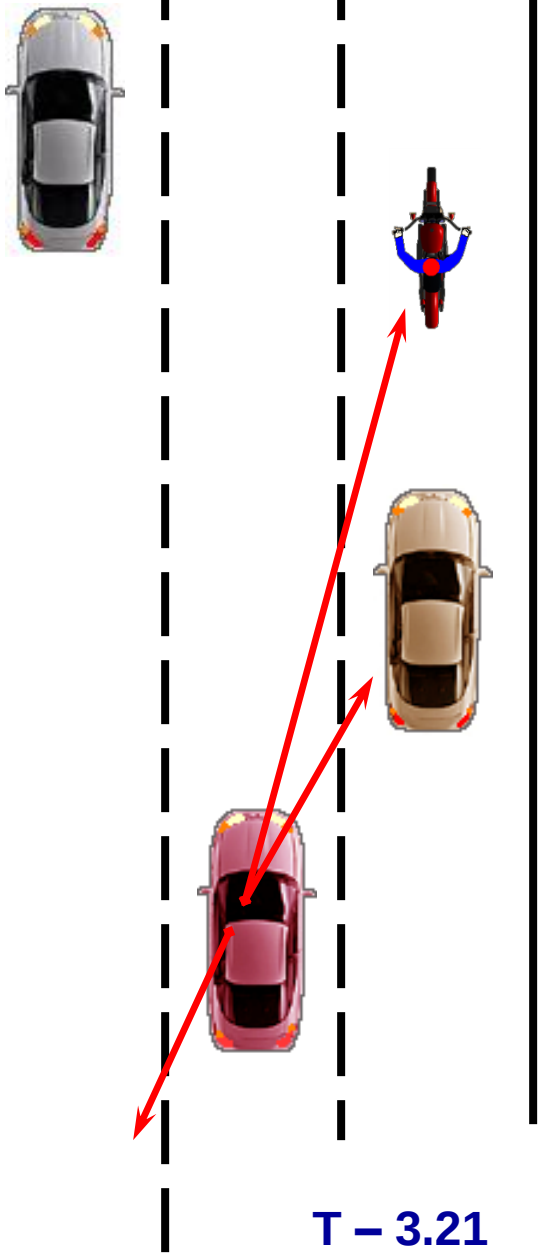
Space Management System

Good Drivers Develop a Space Management System

- It helps you: use space to reduce risk
- Use visual skills more effectively
- Make effective speed and position changes
  - S earch
  - E valuate
  - E xecute
  - i n
  - T ime

Searching

- **Identifying high risk situations**
  - Effective searching techniques
  - Having time to identify hazards
  - Keeping stable scanning eye movements- looking for anything that might come into your path
  - Getting a large view of the roadway
  - Establishing a line of sight and path of travel position
- **Gaining information**
  - Effectively managing space
  - Looking for changing areas
  - Looking for open areas
  - Looking for closed areas



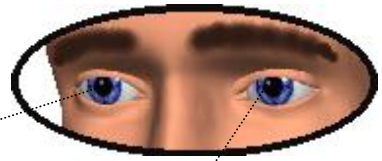
Evaluating

RECOGNIZING high risk situations

- Potential and Critical Hazards
- Collision Potential
- Intersections
- Curves
- Position Adjustments
- Speed Adjustments
- Reduced Line of Sight

Makes you watch your space management and looking for open and closed spaces

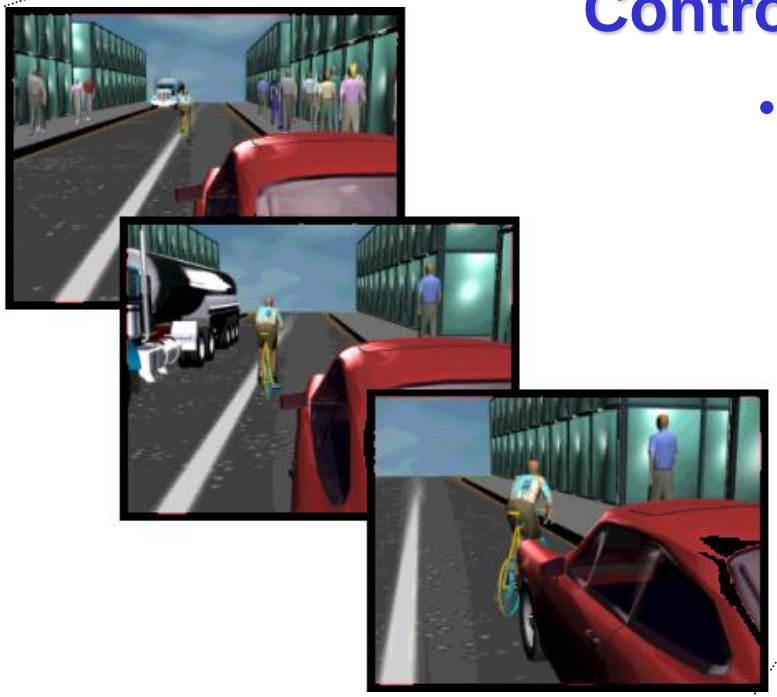
Evaluating



Decision-making

Preventing high risk situations

- Maintain open LOS and POT & proper lane position
- Manage time and space



Controlling high risk situations

- Maintain an open line of sight (LOS) and path of travel (POT)

Motion control

- ✓ Controlled/threshold braking
- ✓ Progressive acceleration

Steering control

- ✓ Hand-to-hand
- ✓ Evasive action

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Executing

- Speed changes
- Lane position changes
- Space control

in response to

- risk or danger
- traffic conditions
- roadway conditions
- vehicle balance

Evaluate/Execute

4

Second Space Provides More Options

Indecision

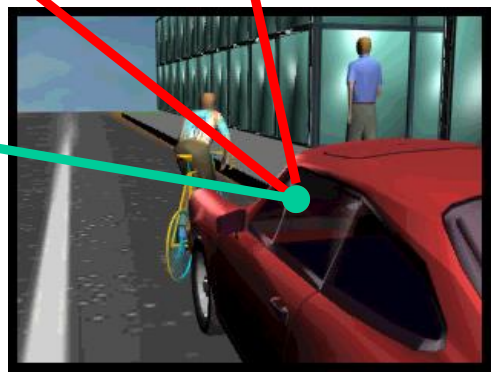
Steer Right

Wrong Decision

Steer left to open space

Correct Decision

LP 4



Basic Lane Positions to Center, Left & Right

Lane Position One

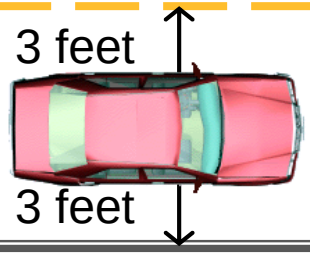
- allows for 3 feet on each side when vehicle is centered in the lane.

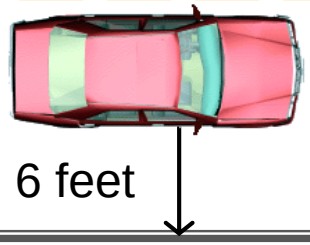
Lane Position Two

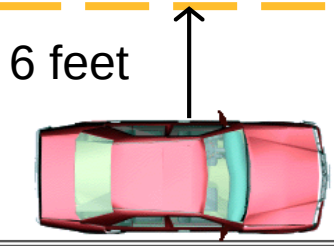
- allows for 6 feet of space to the right of the vehicle to avoid a potential problem in the area to the right or to prepare for a left turn.

Lane Position Three

- allows for 6 feet of space to the left of the vehicle for the avoidance of a potential problem to the left or to prepare for right turn.







12' wide traffic lane.

Approach to Intersection

Step 1 (Search)

- Identify Intersection
- Identify Controls
- Check Rear Areas
- Search for Intersection Risks

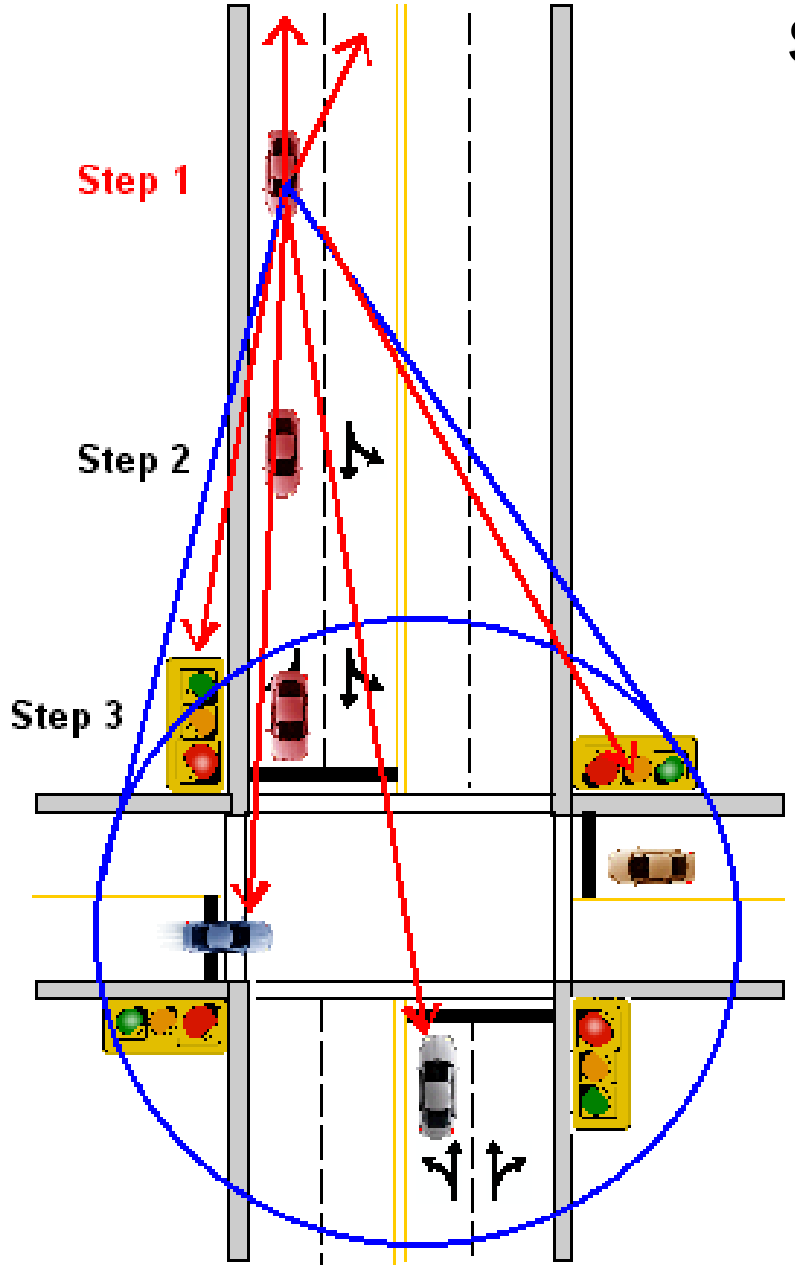
Step 2 (Evaluate)

- Scan Open Side Areas First
- Scan Closed Side Areas
- Look for Closed or Changing Frontal Areas

Step 3 (Execute)

- Adjust Speed
- Maintain Lane Position or Stop Behind Crosswalk
- Proceed Through Open Space Area or Stop Behind the Crosswalk

Approach to Intersection



Step 1 (Search)

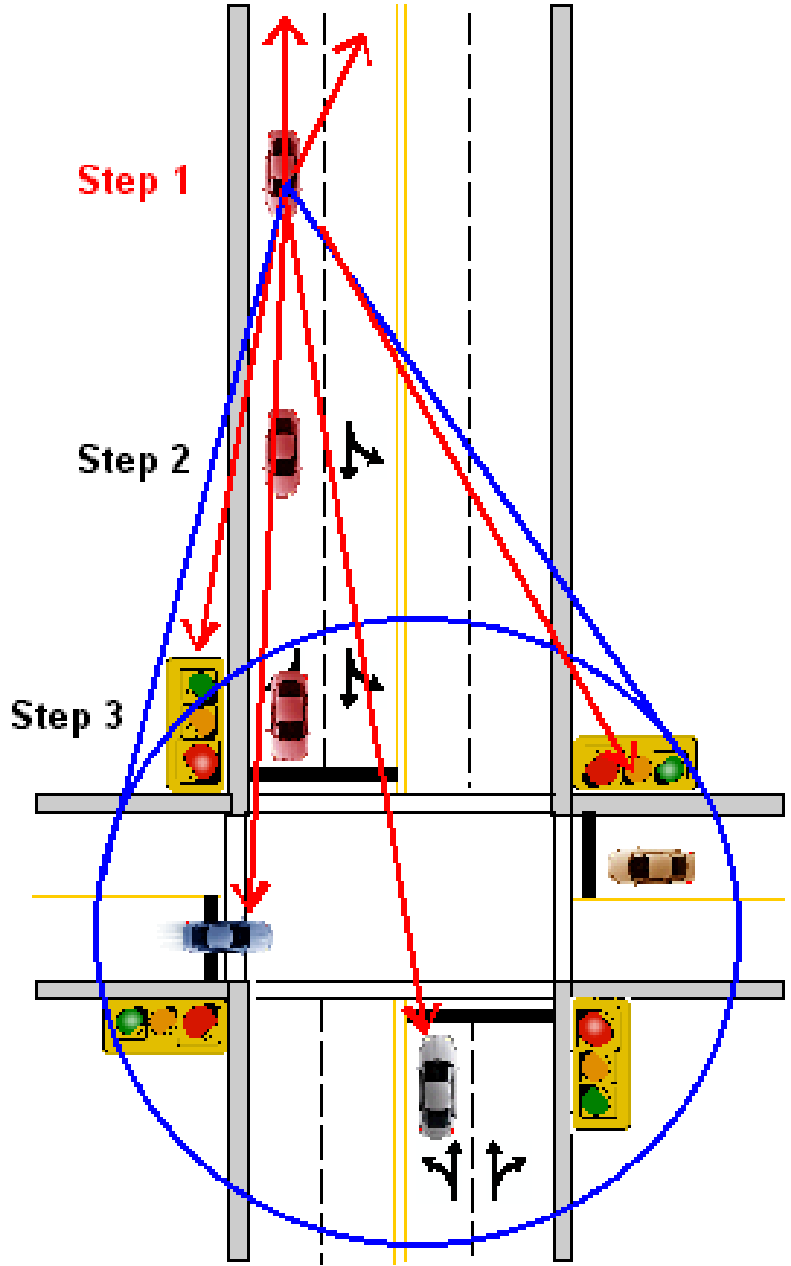
- **Identify the intersection.**
  - Determine the type of intersection and number of intersecting roadways.

  - Determine your lane position (right turn/left turn/straight) prior to the intersection.

- **Identify any controls--**signal lights, stop or yield signs and information signs. This will provide you with the information you need to adjust speed or position.

- **Check rear areas.** Check if rear zones are open or closed. If the rear zone is closed, tap your brakes a few times before stopping— the brake lights will flash and communicate to the driver to the rear that you are slowing or stopping.

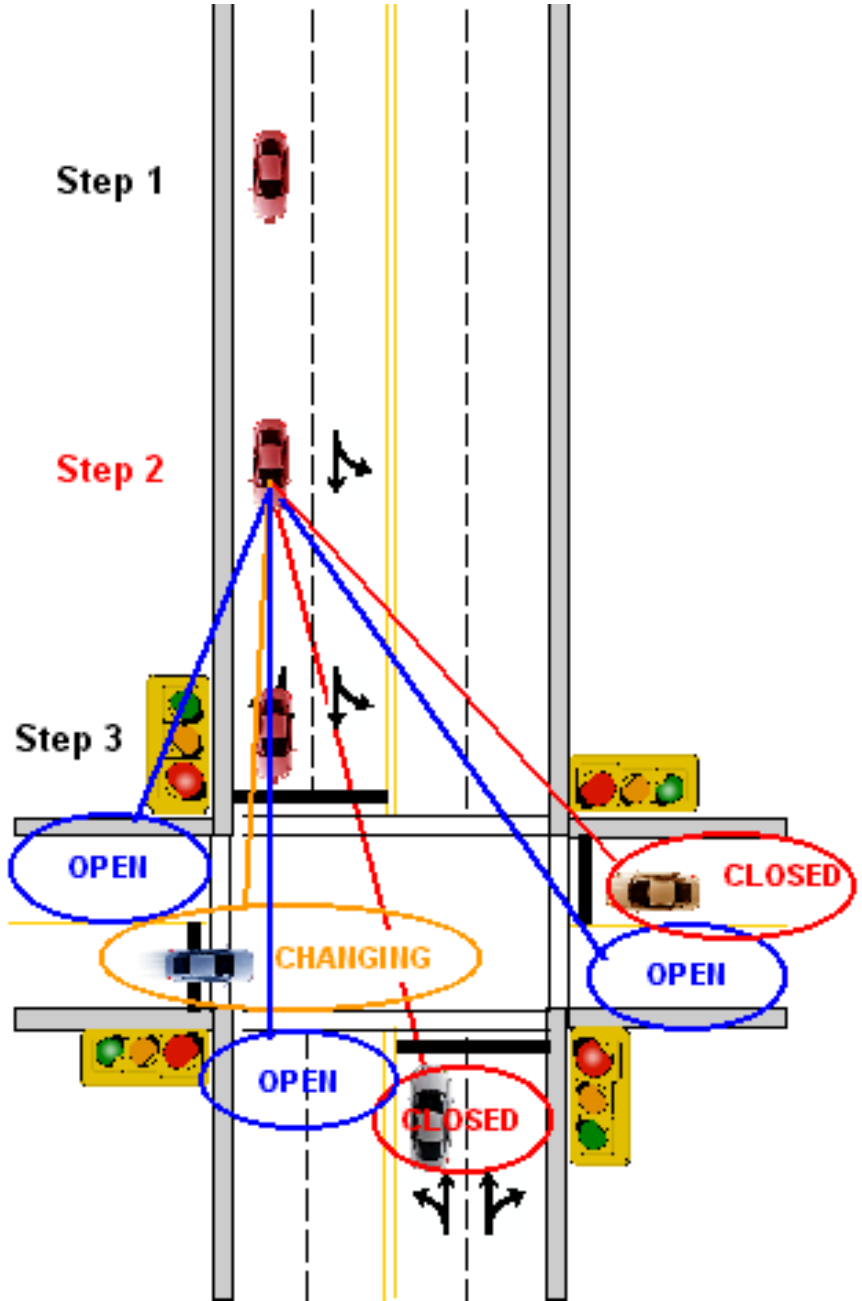
Approach to Intersection



Step 1 (Search) continued

- **Search for possible intersection problems.** Look for problem areas, such as construction or road maintenance, pedestrians on or near the intersection, or obstructions to your line of sight that may include buildings, parked vehicles, trees, fences, etc.
- **Adjust speed.** Intersections are unpredictable and you may have to stop. Be prepared. The closer you get to an intersection, the more important it is to adjust vehicle speed.
- **Adjust lane position.** Choosing the proper position (LP 1, 2, or 3) will lower the risk of possible conflicts by providing you the maximum amount of space between your vehicle and other vehicles.

Approach to Intersection



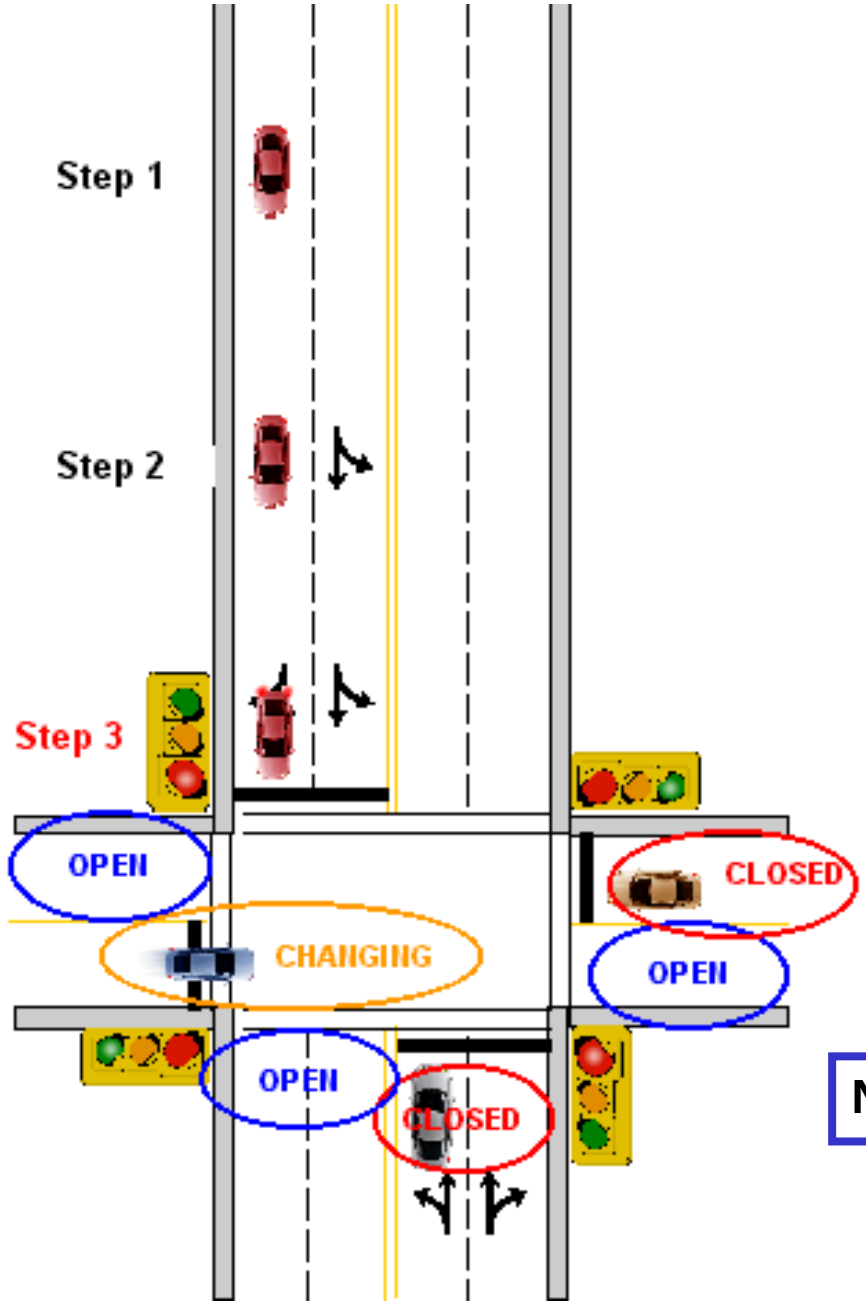
Step 2 (Evaluate)

- **Scan open side areas first.** Try to position your vehicle in an open zone with a clear line-of-sight to your path-of-travel. Be prepared to stop for a closed zone or line-of-sight restriction in your path-of-travel.

- **Scan closed or changing areas.** Identifying closed zones early will allow you to prepare. The greatest chance for conflict is in areas where vehicles may cross directly into your intended path-of-travel.

- **Look for closed or changing frontal areas.** A closed front zone occurs when there is a yellow or red traffic light, yield or stop sign, or anything moving into your intended path of travel.

Approach to Intersection



Step 3 (Execute)

- **Adjust speed.** If you have identified a closed zone, prepare to reduce speed or stop.
- **Maintain lane position.** Your lane position (LP 1, 2, or 3) will indicate your intentions to other drivers and provide you with the greatest distance between opposing vehicles and/or other objects.
- **Stop behind stop line, crosswalk, or before entry to intersections, when needed — proceed through open space area when traffic controls permit and your path-of travel is clear.**

Note: Most crashes occur in intersections!

Good Driving Habits

Habit Level

- Practice safe driving procedures that require little thought

Judgment Level

- Have a well thought out strategy for managing time and space
- Become efficient and precise
- Respond correctly with the least amount of time

Process Level

- Search for problems
- Evaluate options
- Execute decisions
- Modify speed and/or position
- Communicate to reduce the risk of collision

(Empower Yourself (1999) F.R. Mottola)

Good Driving Habits

- Maintain the 4 second following interval by adjusting your
  - Speed and
  - Lane position

- The distance to steer is shorter than the distance to stop
- Your hand response time is ½ second vs. foot response time of ¾ second

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- Always make sure zones are clear when pulling out of an intersection
  - Front
  - Left
  - Right

(Empower Yourself (1999) F.R. Mottola)

Levels of Performance

Driver Awareness Level	Driver Performance Level
1.Habit	Acceptable
2.Judgment	Acceptable
3.Habit	Unacceptable
4.Judgment	Unacceptable

Based on Mottola, F. R. (1999) Empower Yourself, p. 1

The Top Ten Errors

that resulted in crashes involving teen drivers are:

1.	23.9%	not attending to the path of travel (distractions – cell phone, sound system, passengers, etc.)
2.	13.7%	driving five or more mph too fast for conditions
3.	6.6%	driving too fast through a curve
4.	6.3%	inadequate search at an intersection and moving in front of cross traffic
5.	6.1%	lack of attention at an intersection and being struck by another driver

Preliminary TRB Report 1999

The Top Ten Errors

that resulted in crashes involving teen drivers are:

6.	6.5%	improper evasive action—quick turn not executed properly or braking instead of steering
7.	3.9%	failed to maintain visual lead
8.	3.9%	failed to see action developing at side of the roadway
9.	3.9%	following too closely
10.	3.3%	willfully taking right-of-way

Preliminary TRB Report 1999

Developing Good Driving Habits

- Preparing Driver and Vehicle
- Smooth, Gradual Starts and Stops
- Using Reference Points for Vehicle Placement
- Getting Visual Targets before Movement
  - Using a Vision Control, Motion Control, Targeting, and Steering Control Sequence
- Visually Targeting the End of the Path of Travel 20 to 30 seconds from the Vehicle

Based on concepts from Mottola, F. R. (1999). Empower Yourself. p. 5

Developing Good Driving Habits

- **Be Alert** to Changes to the Line of Sight (LOS) or the Path of Travel (POT)
- Adjust Speed and Lane Position to Increase Space to Front, Side, or Rear for Restricted LOS-POT
- When Approaching a Red Light, Adjust Speed to Time Your Arrival for a Green Light

Based on concepts from Mottola, F. R. (1999). Empower Yourself. p. 5

Developing Good Driving Habits

- **Prior to Intersection Entry, Check the Left, Front, and Right Zones or Areas**
  - **Check the area that can be viewed best first so that more time can be focused on the obstructed area**
- **Whenever Your Foot Goes to Brake or Accelerator, Check the Rear View Mirror**
- **Prior to Moving to the Left or Right, Check Side View Mirror and Mirror Blind Zone**

Based on concepts from Mottola, F. R. (1999). Empower Yourself. p. 5

Developing Good Driving Habits

- Make it a goal to maintain a four-second following interval from the vehicle in front and to the rear.
  - This protects you from the unexpected actions of other drivers to the front and rear.
- When stopped behind vehicle, leave space to move around the vehicle in case of an emergency.
- Reduce stress by being courteous rather than competitive while driving. Competitive drivers are not winners.

Based on concepts from Mottola, F. R. (1999). Empower Yourself. p. 5

Word Bank for 33-42 (Words are NOT in answer order!)

- Signal
- Parallel
- 8:00-4:00
- Right of Way
- Headlight
- Backing
- 3
- Stop
- Space Cushion
- Tap