Virginia Department of Education

Module Six Transparencies

Information Processing:

Complex Risk Environments

Topic 1 -- Characteristics of Expressways

Topic 2 -- Entering, Changing Lanes, and Exiting

Topic 3 -- High Speed Considerations

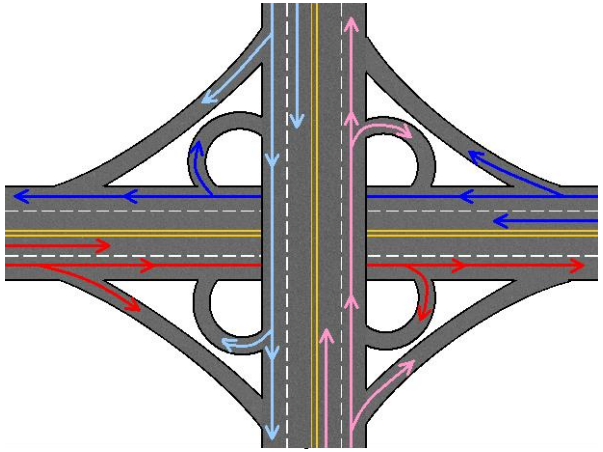
Provided in cooperation with the Virginia Department of Motor Vehicles

Characteristics of an Expressway

- ✓ Controlled access (limited entry and exit)
- ✓ High speed (up to 70 mph in VA)
- ✓ Divided by a barrier or median
- ✓ Multiple lanes (usually 2 or more)
- ✓ May have minimum speed limit
- ✓ Only for motorized vehicles
- ✓ Designed for low risk, high speed driving

Cloverleaf Interchange

- **Interchanges take the place of intersections on expressways**

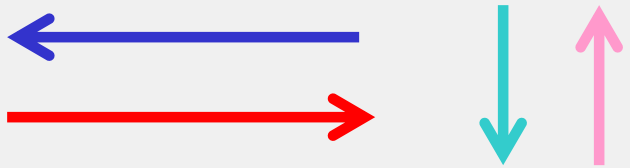


A cloverleaf interchange has a series of entrance and exit ramps that resemble the outline of a four leaf clover.

This design

- allows for the interchange of two expressways or major roadways.
- has shared entrance and exit weave lanes.

Traffic is permitted to move ONLY in the direction indicated by the arrows.

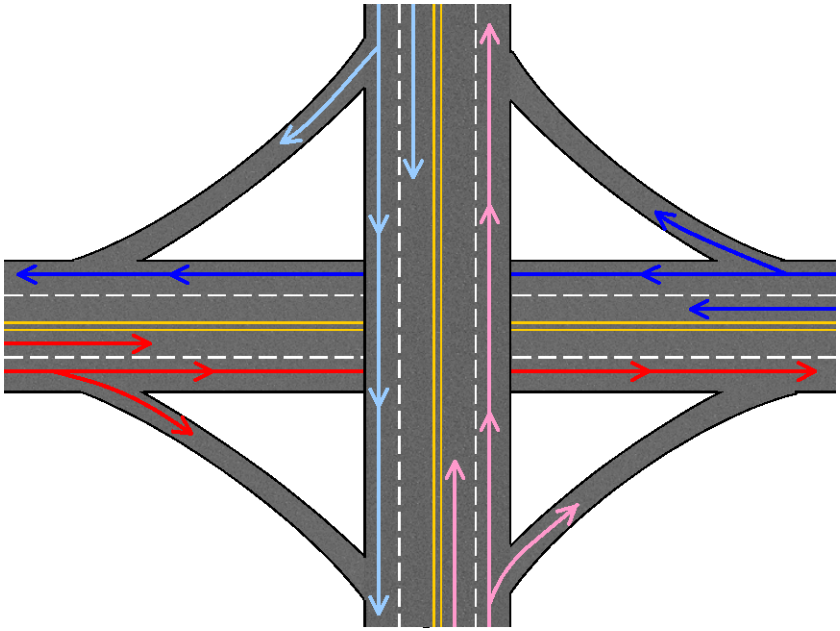


Diamond Interchange

A diamond interchange is designed to be used when a road with slower speeds crosses a busy expressway.

This design allows:

- for the interchange of a major roadway with a secondary dual or multiple lane roadway.



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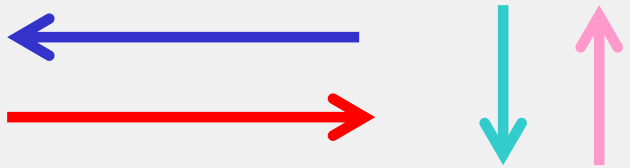
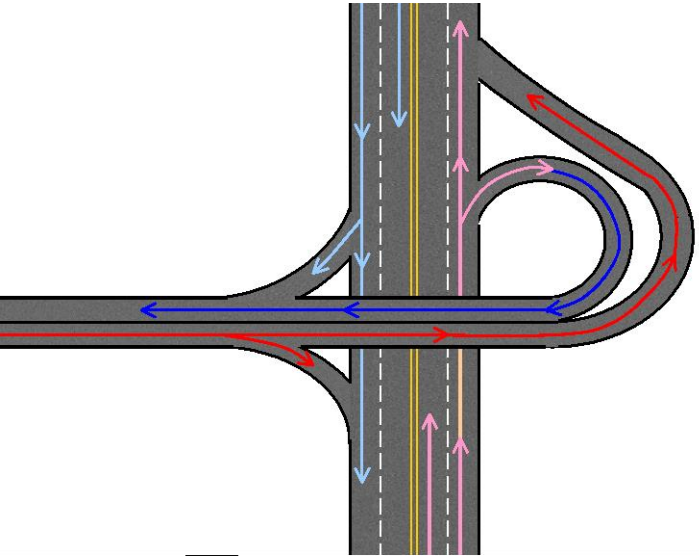


Trumpet Interchange

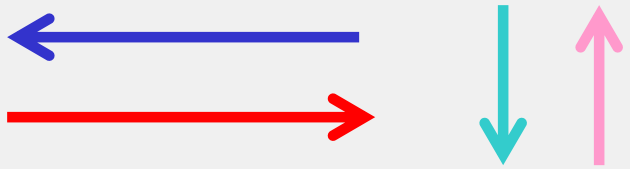


A trumpet interchange is used when an intersecting side road forms a T intersection with the expressway.

This design:

- accommodates the T-intersection flow of traffic at the junction of two roadways.
- allows for traffic on a secondary two-way street to merge onto a multiple lane roadway.

Traffic is permitted to move ONLY in the direction indicated by the arrows.

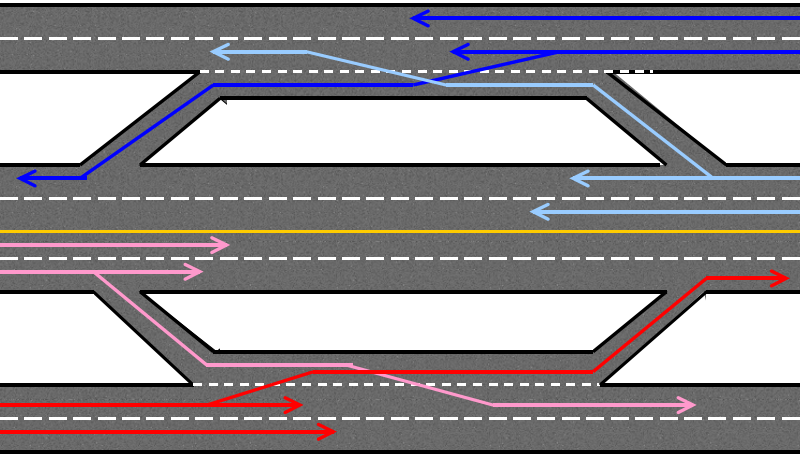


Frontage Road Interchange

Frontage Road Interchanges allow vehicles using parallel secondary two-way or one-way roadways to merge onto a major multiple lane roadway.

This design allows:

- drivers to exit a multiple lane roadway and use the parallel frontage road.
- secondary road traffic flows to mix efficiently with higher speed traffic flows on the multiple lane roadway.



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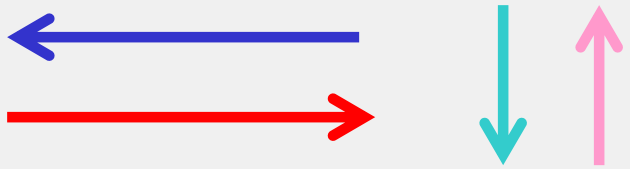


Common Expressway Signs

Interstate signs

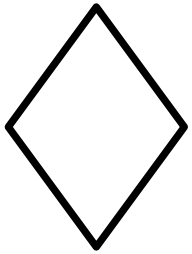
Are shaped like a shield and are red, white and blue

Guide signs

Warning signs

Speed limit signs

HOV Lanes

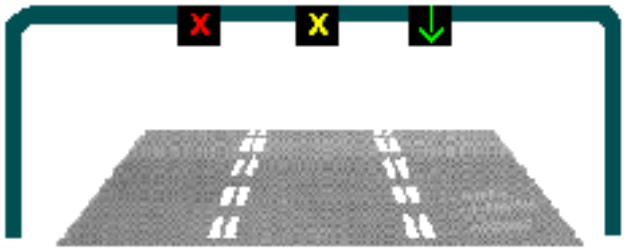


Marked with a diamond

A major contributor to your decision as to how you will maintain a safe path of travel, proper lane position, and your lane choice, is based on the information provided by the road signs and lane markings.

Common Expressway Signals

Lane Signals



Reversible lane signals

A GREEN arrow over a lane — the lane is open for travel.

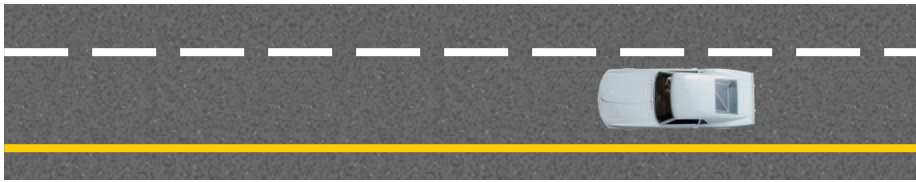
A RED "X" over a lane — travel in that lane is closed or prohibited.

A YELLOW "X" over a lane — travel in that lane is about to change or close.

Expressway Lane Markings

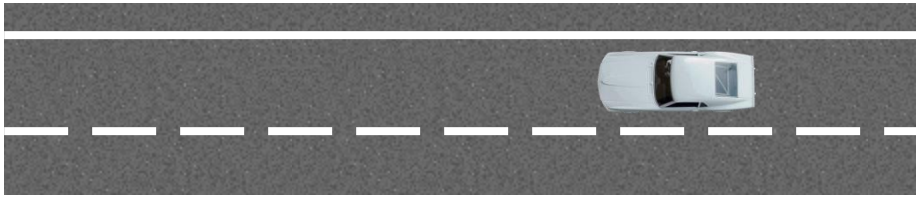
Solid YELLOW line

Traffic Flow



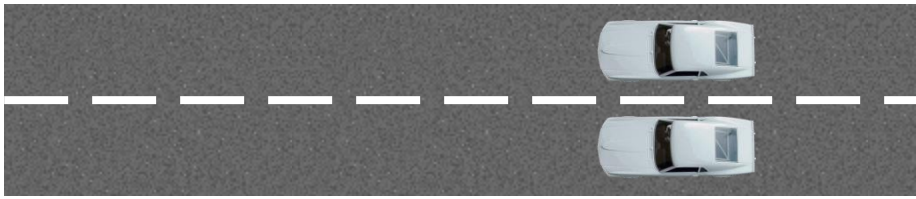
- ✓ marks the left edge of the roadway.
- ✓ should always be on the driver's left side.

Solid WHITE line



- ✓ marks the right edge of the roadway, or entrance and exit lanes.

Broken WHITE line



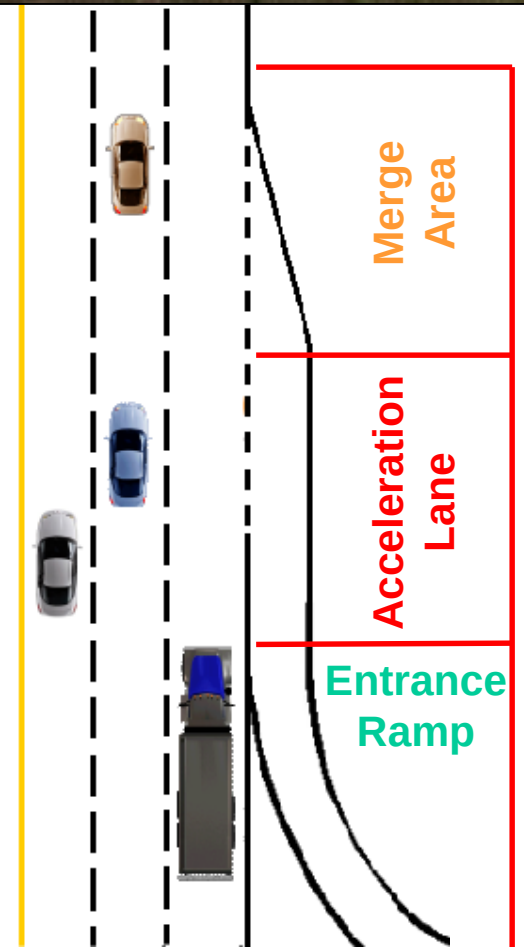
- ✓ separates lanes of traffic going in the same direction.

HOV lanes (high occupancy vehicle)

- ✓ are marked with a white diamond.
- ✓ require a minimum number of passengers in the vehicle.

Entrance Ramps

Entrance ramps provide one-way directional access to an expressway.



The ramp is divided into three sections:

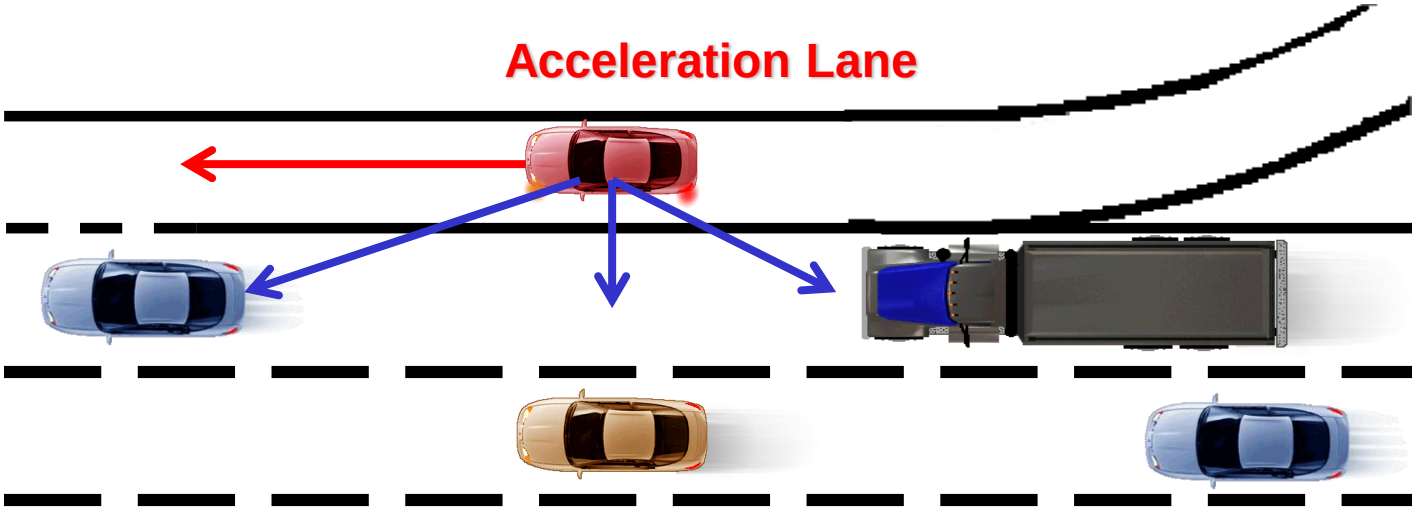
1. **The Entrance or Access Ramp** — gives the driver time to begin evaluating traffic conditions.
2. **The Acceleration Lane** — allows a driver to adjust vehicle speed to the speed of traffic on the expressway.
3. **The Merging Area** — allows the driver to merge onto the expressway. *You should try to enter traffic at the speed that the traffic is already traveling.

Entering the Entrance Ramp

- Enter the Entrance Ramp
- Begin Searching for a Gap / Open Space
- Identify Gap / Space

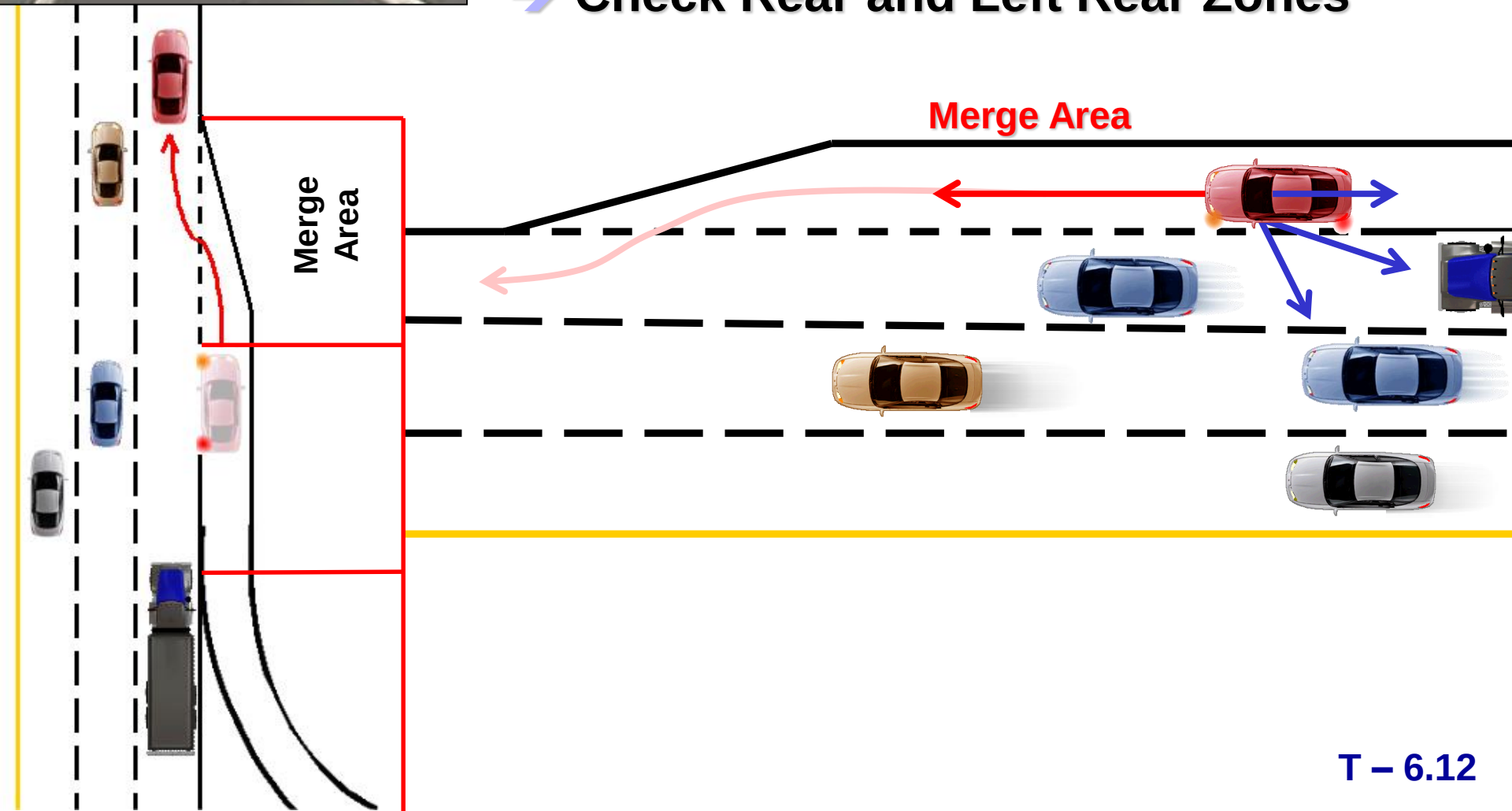
Acceleration Lane

- Use the left-lane signal indicator
- Adjust speed to match the speed of the traffic on the expressway
- Monitor gap on expressway



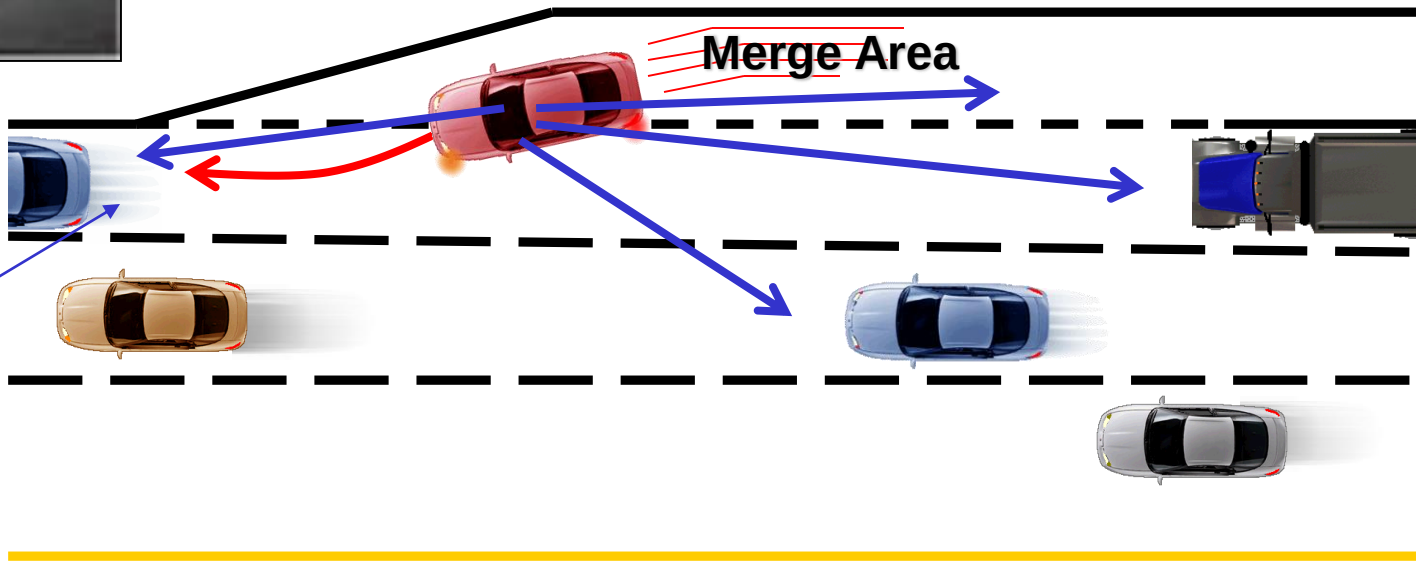
Entering Merge Area

- Accelerate to blend with the speed of traffic on the expressway
- Check Rear and Left Rear Zones

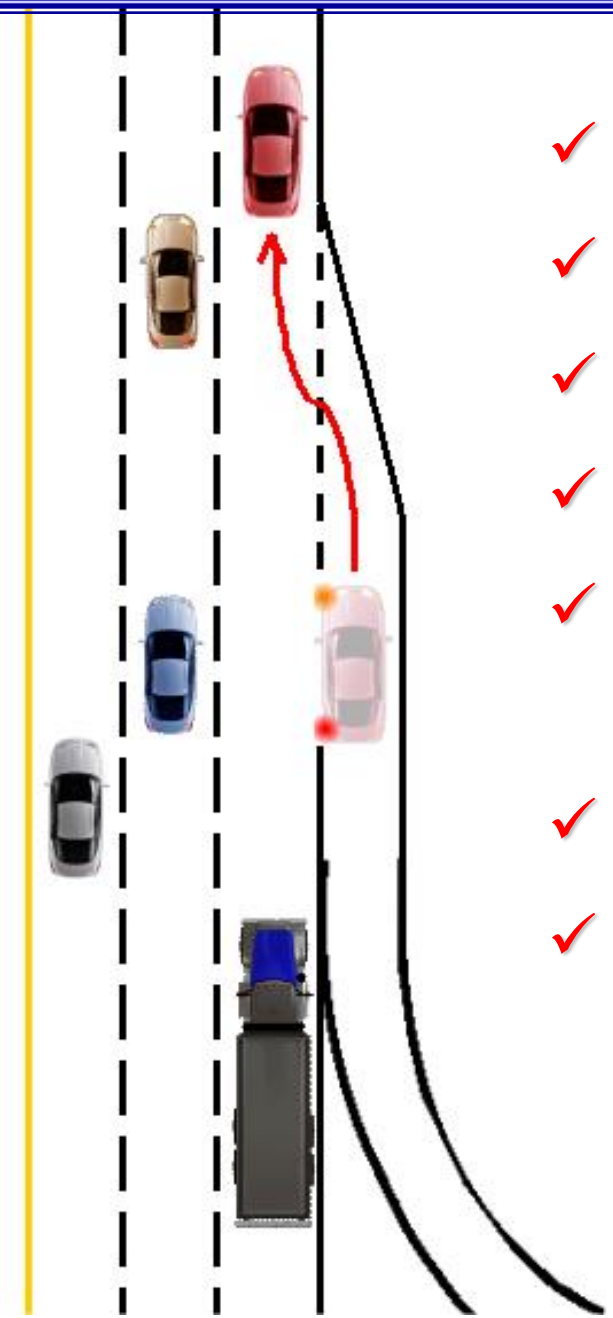


Selecting a Gap in Traffic

- ✓Check Front Zone
- ✓Check Rear and Left Rear Zones
- ✓Select Gap
- ✓Identify a Target Area in the Open Space

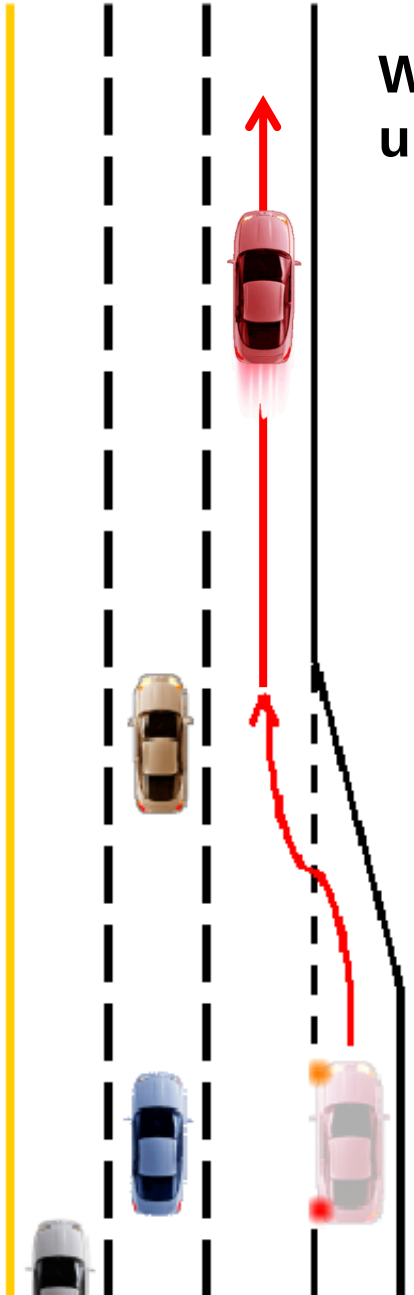


Merging into the Traffic Flow



- ✓ Continue searching for adequate gap
- ✓ Search for potential conflicts
- ✓ Prepare to adjust speed
- ✓ Avoid stopping on the ramp
- ✓ Be prepared to drive onto the shoulder if necessary
- ✓ Merge smoothly
- ✓ Create space around your vehicle once you have entered the lane

Selecting the Appropriate Lane

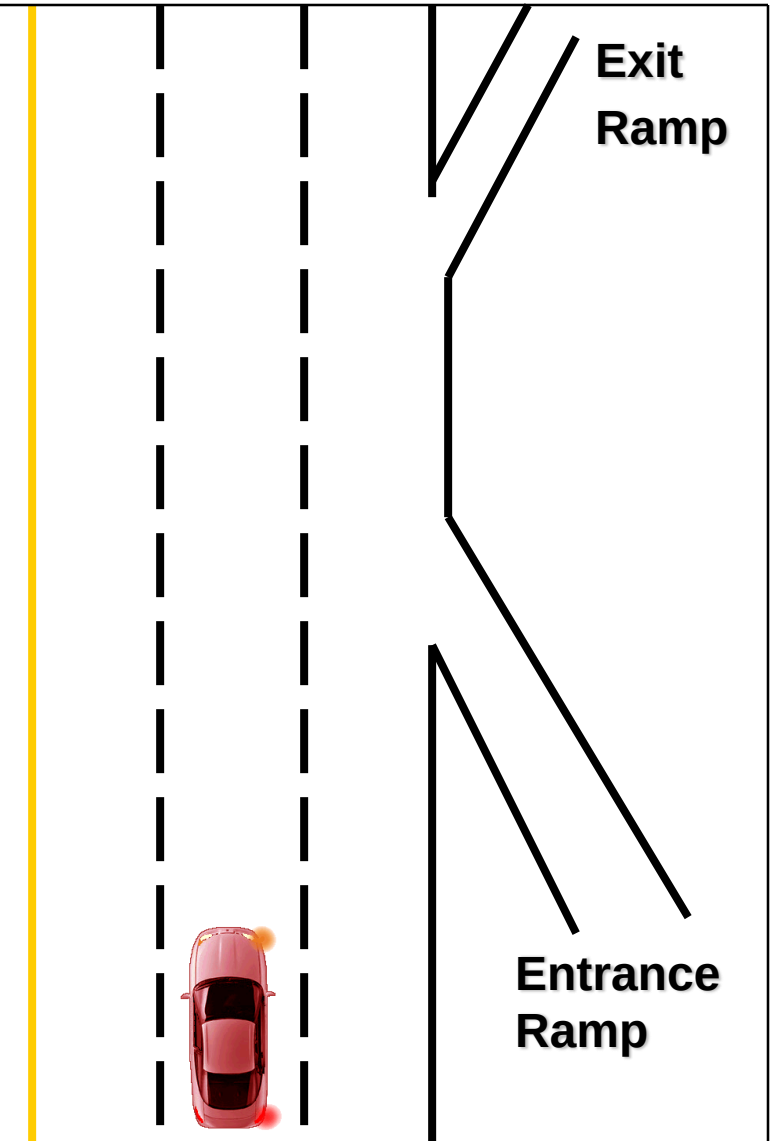


When merging onto an expressway, stay in the right lane until you become accustomed to the faster traffic flow.

- ✓ **Center Vehicle in Proper Lane**
- ✓ **Adjust Speed to Traffic Flow and Legal Limit**

Reduced Risk Lane Changes

Reasons for changing lanes include:

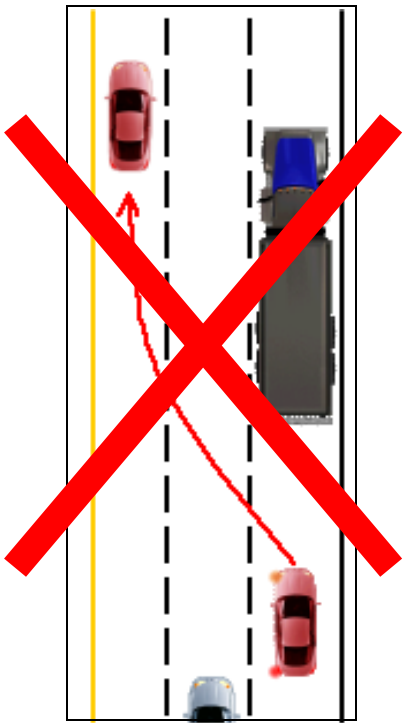


- ✓ Entering or exiting
- ✓ Allowing another driver to enter
- ✓ Following large or slow-moving vehicles
- ✓ Lane ahead becomes blocked
- ✓ Being tailgated
- ✓ Animals
- ✓ Passing

Reduced Risk Lane Changes

Steps to safely change lanes:

- ✓Maintain a safe following distance from the vehicles in front of you.
- ✓Check traffic ahead, behind and to the sides (mirrors and head check).
- ✓Signal your intention to change lanes.
- ✓Select a safe gap in traffic.
- ✓Re-check blind spots in the direction of the lane change.
- ✓Adjust your speed — if clear, steer smoothly to the new lane, if not, wait and cancel your turn signal.
- ✓Move one lane at a time.

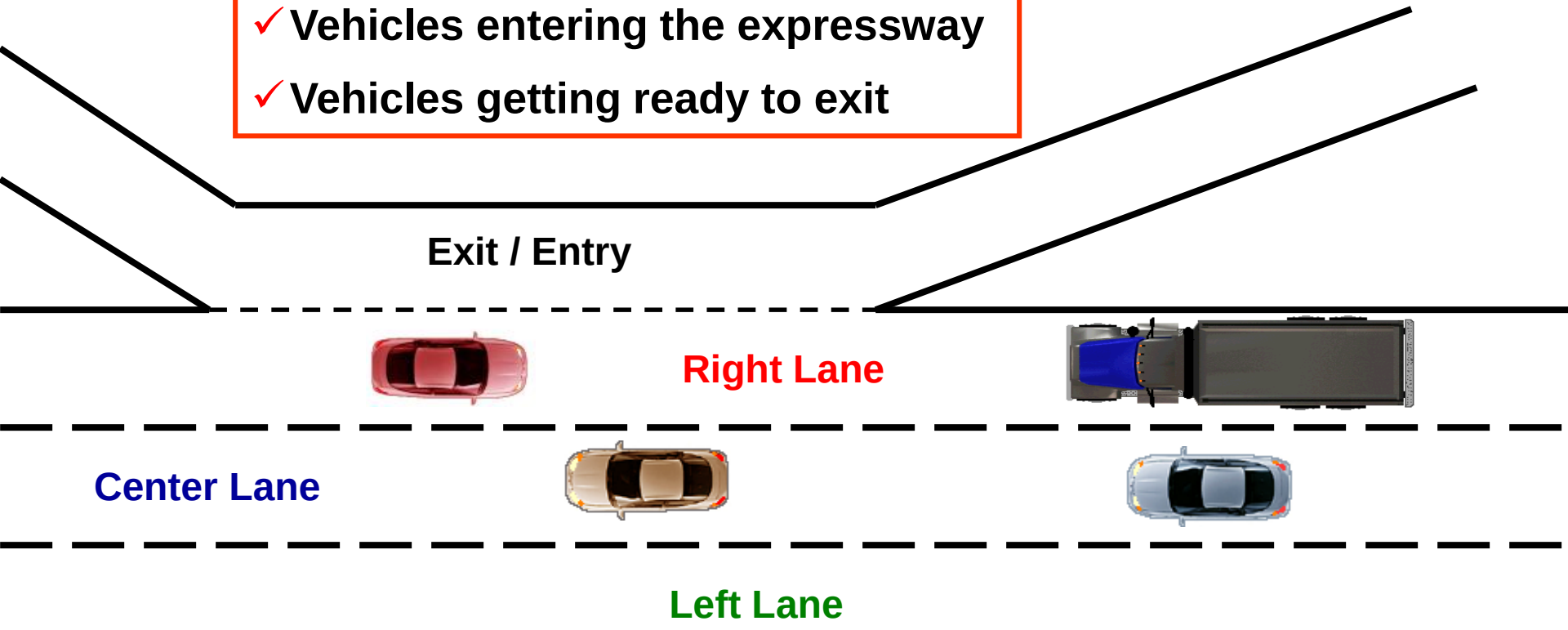


Scan in direction of the **BLUE** arrows

Choosing Lanes at Exit or Entrance

Right Lane:

- ✓Heavier and slower vehicles
- ✓Vehicles entering the expressway
- ✓Vehicles getting ready to exit



Center Lane:

- ✓Long distance or passing

Left Lane:

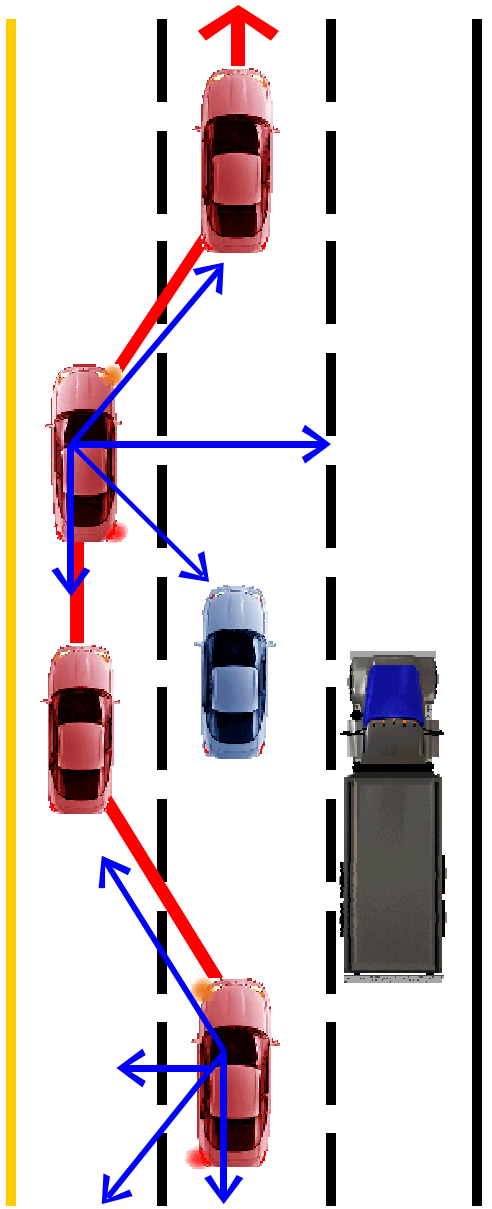
- ✓Higher speed and passing traffic

Passing on Multi-Lane Roads

- Check traffic ahead, to the sides, and behind
- Signal
- Make a head check
- Accelerate smoothly
- Change lanes smoothly
- Cancel signal
- Pass and signal to return
- Check mirrors
- When both sets of headlights of the vehicle being passed are visible, return to the lane
- Cancel signal
- Adjust speed and/or vehicle position to create space all around your vehicle

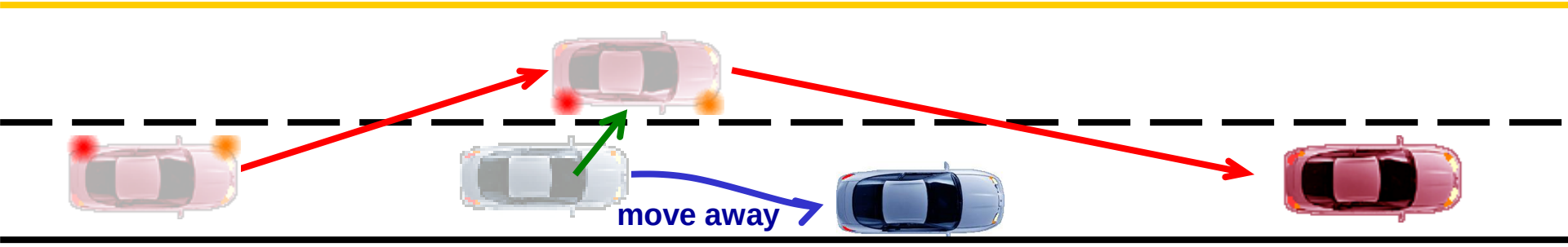
The RED line shows path of the red car.

The BLUE arrows show where the driver's eyes are searching.

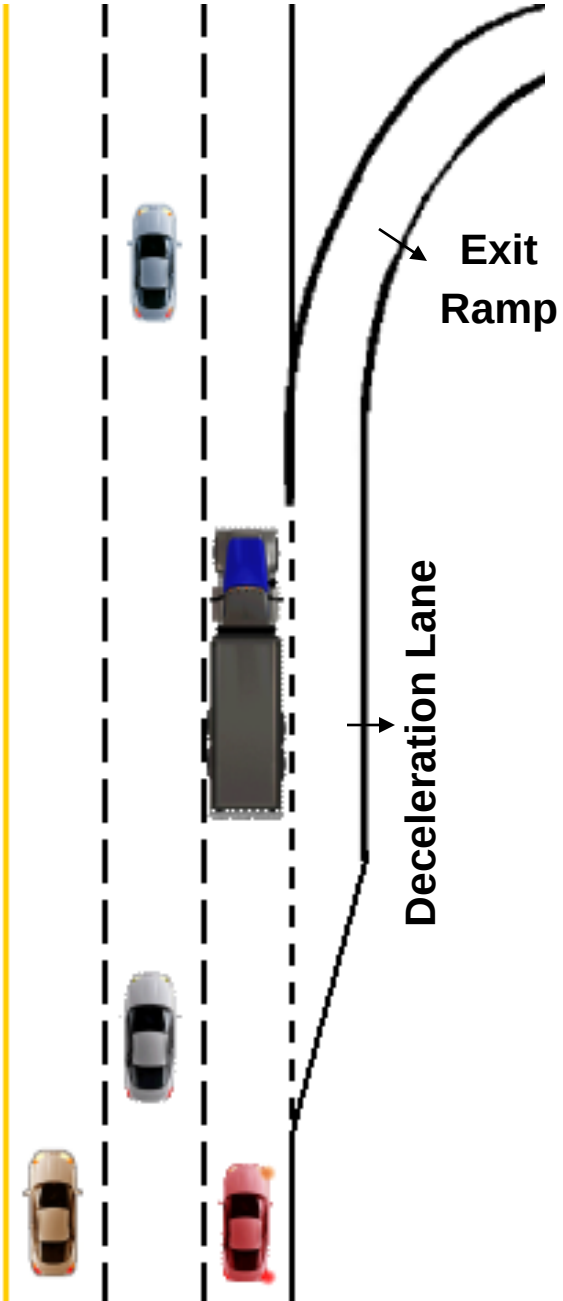


When Being Passed

- Monitor passing vehicle's position
- Move to lane position 3 to increase space cushion
- Do not increase speed—decelerate if necessary
- Once passed, create space ahead and behind



Multiple Lane Roadway Exit



An expressway exit has two components:

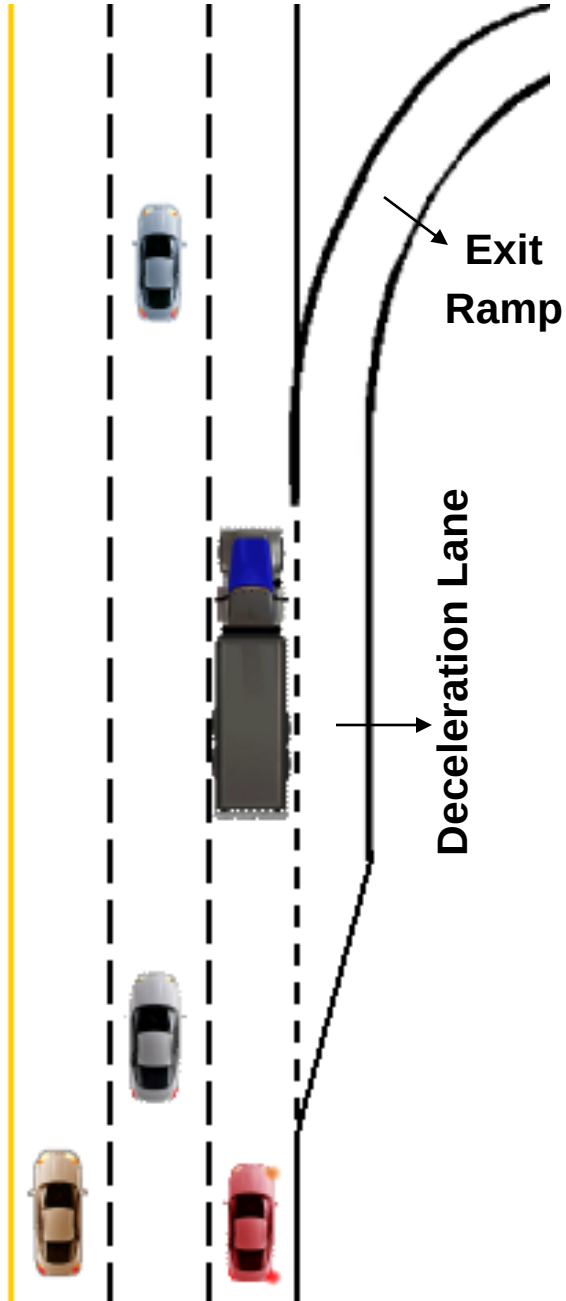
1. **The Deceleration Lane —** gives the driver the time and space needed to adjust his/her vehicle's speed to the slower posted ramp speed without disrupting the flow of traffic on the expressway.

2. **The Exit Ramp —** allows traffic to enter an adjoining roadway.

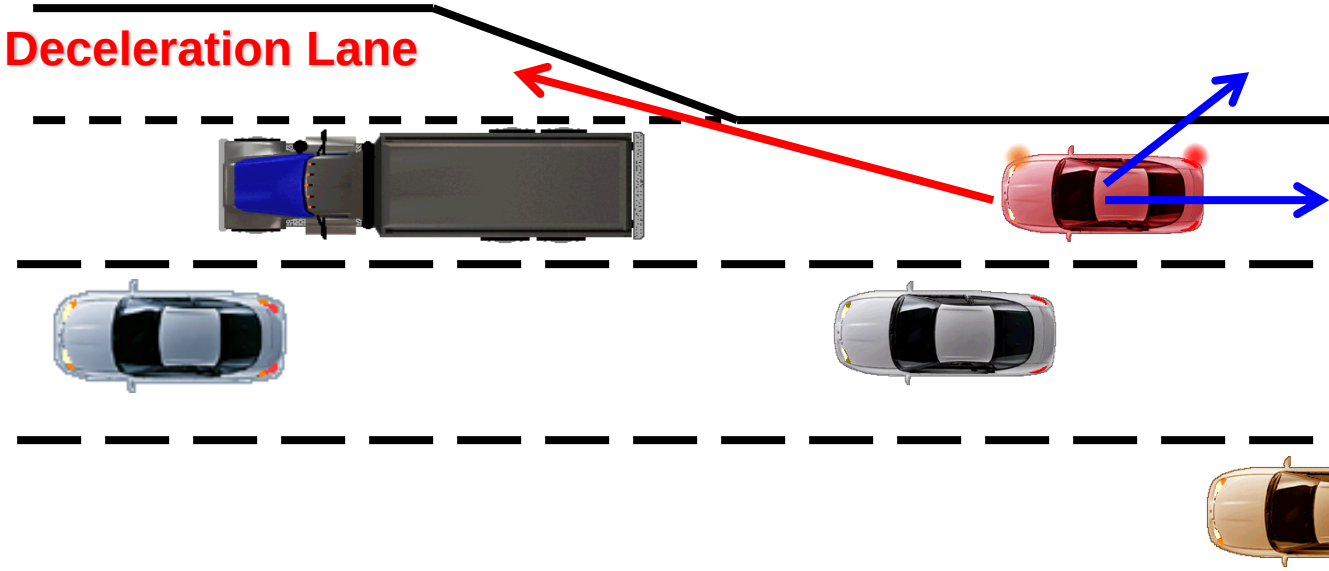
Identify the Exit Early

- Interstates with Even numbers (460) run East to West and Odd numbers (81) run North to South
- Exits are marked with guide signs, usually one to two miles before the exit.
- You can determine if an exit is a right exit or a left exit by the position of the exit number on the sign. So, Exit 45A is a right exit, because in this picture the exit number on the upper right-hand side of the sign.
- In Virginia, exit numbers correspond with mile marker numbers so there is No need to make sudden lane changes to reach an exit!
- About one-half mile (20- to 30- seconds) before the exit, signal and move to the lane closest to the deceleration lane.
- If you miss your exit continue on to the next one and then turn around

Exiting the Expressway

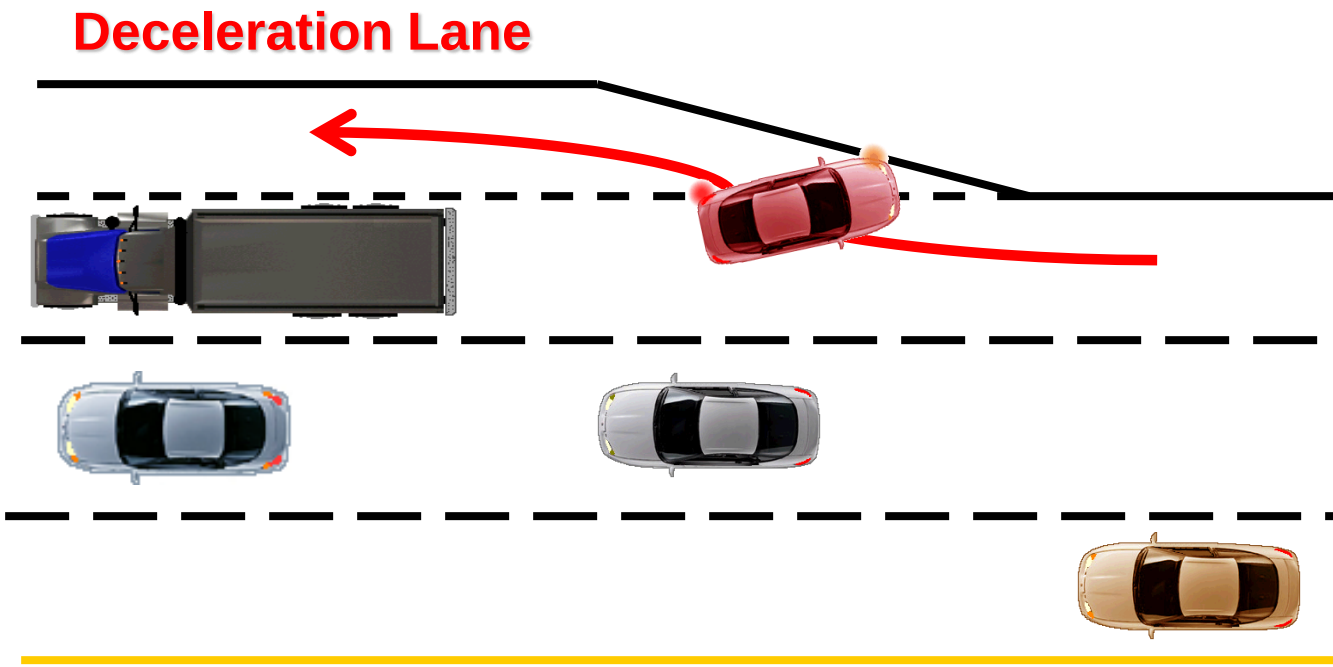


- ✓ Signal
- ✓ Maintain speed while on the expressway
- ✓ Use mirrors to check behind and to the sides
- ✓ Check mirror blindzones
- ✓ Move into deceleration lane
- ✓ Prepare to decelerate quickly



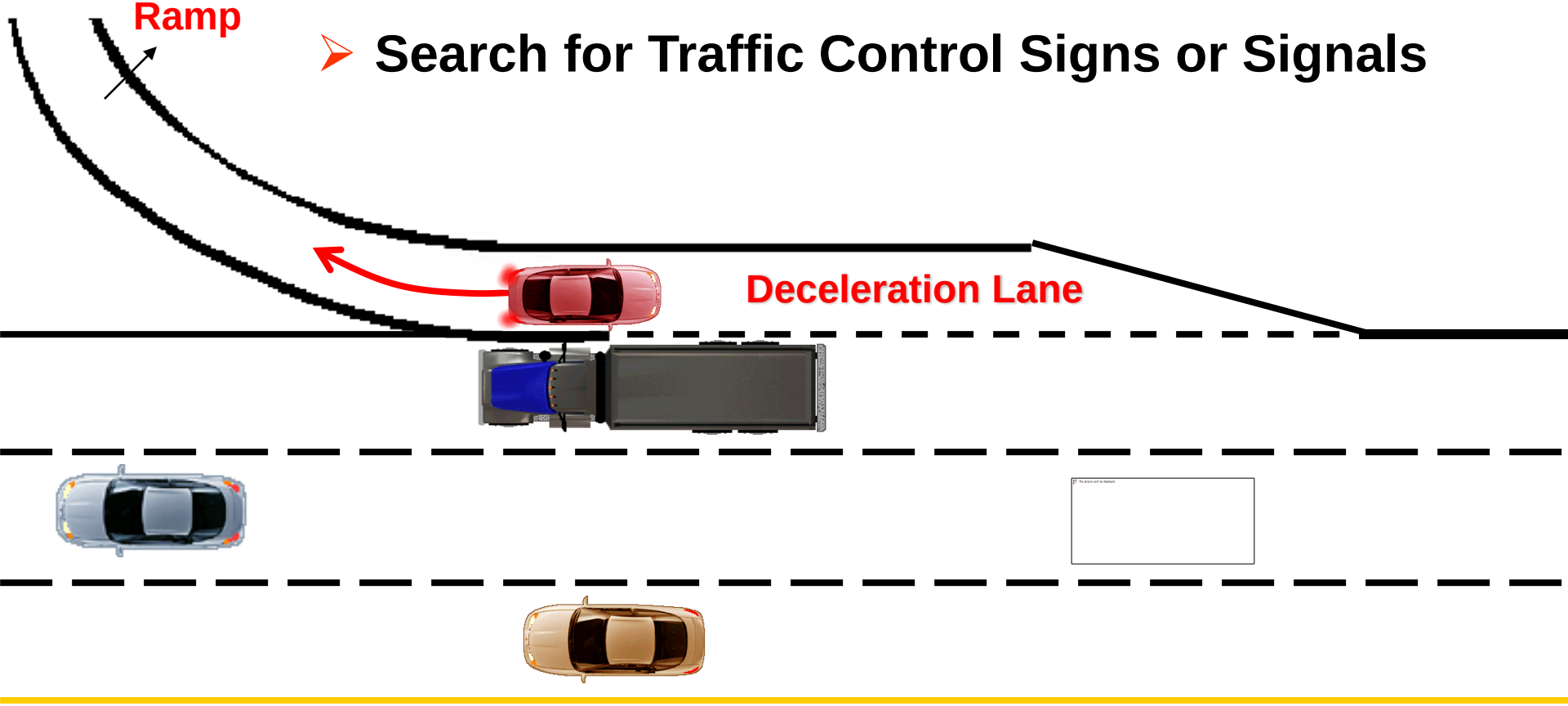
Deceleration Lane

- Enter Deceleration Lane by easing over several of the broken lines
- Release Accelerator and Cancel Signal
- Check Rear and Begin Braking



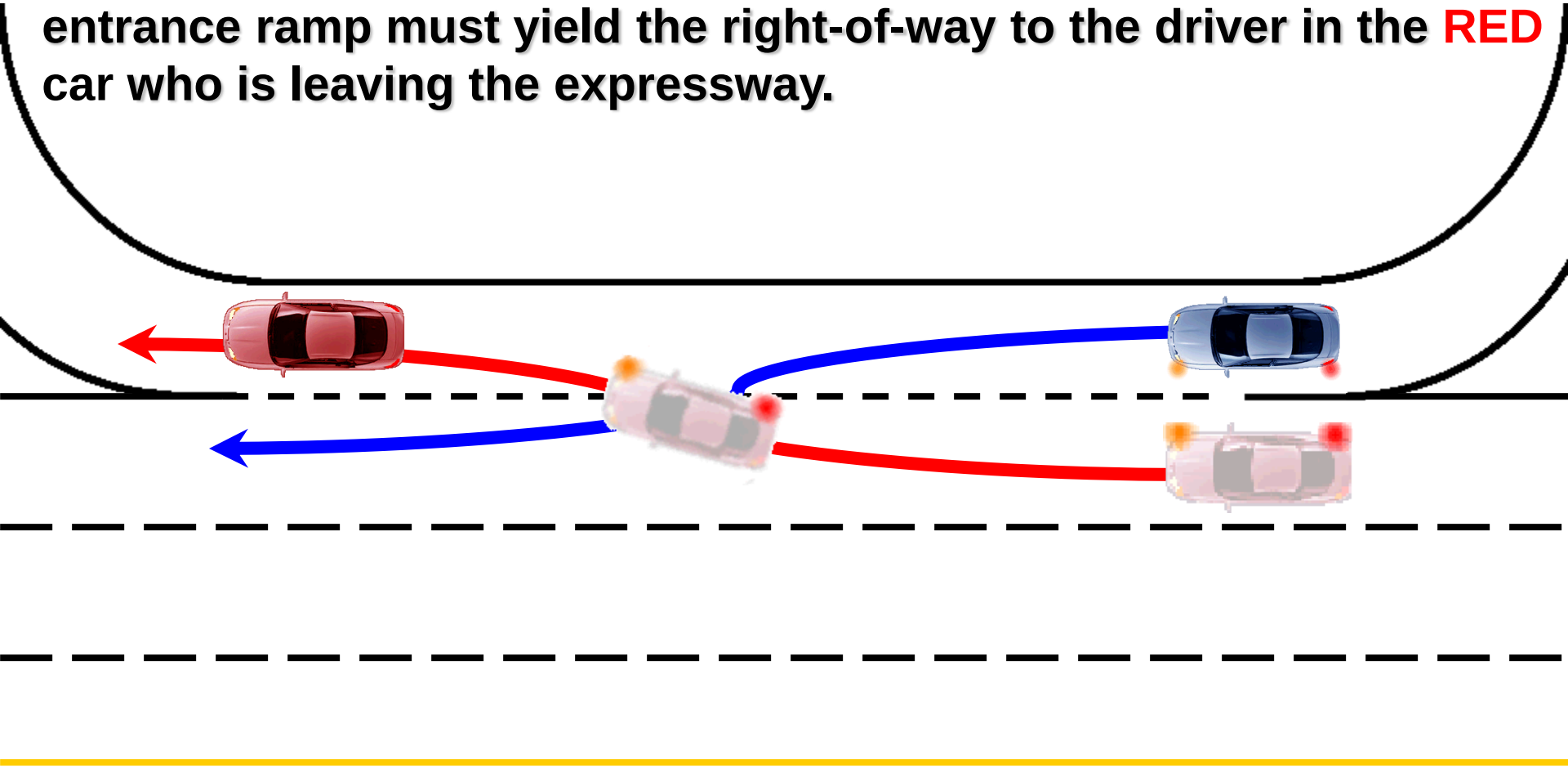
Adjusting Exit Speed

- Brake to Warning Sign Speed — Check Behind
- Scan New Path of Travel to the Front
- Search for Traffic Control Signs or Signals



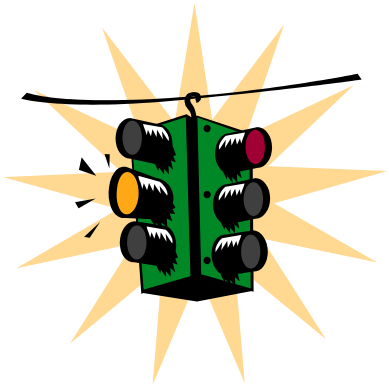
Weave Lane

- Traffic entering and exiting the expressway uses the same lane.
- To avoid a conflict, the driver in the BLUE car entering from the entrance ramp must yield the right-of-way to the driver in the RED car who is leaving the expressway.



Potential Exiting Problems

There may be a STOP sign or a traffic light at the end of the exit ramp. The driver must adjust from a fast speed to a STOP in a short distance.

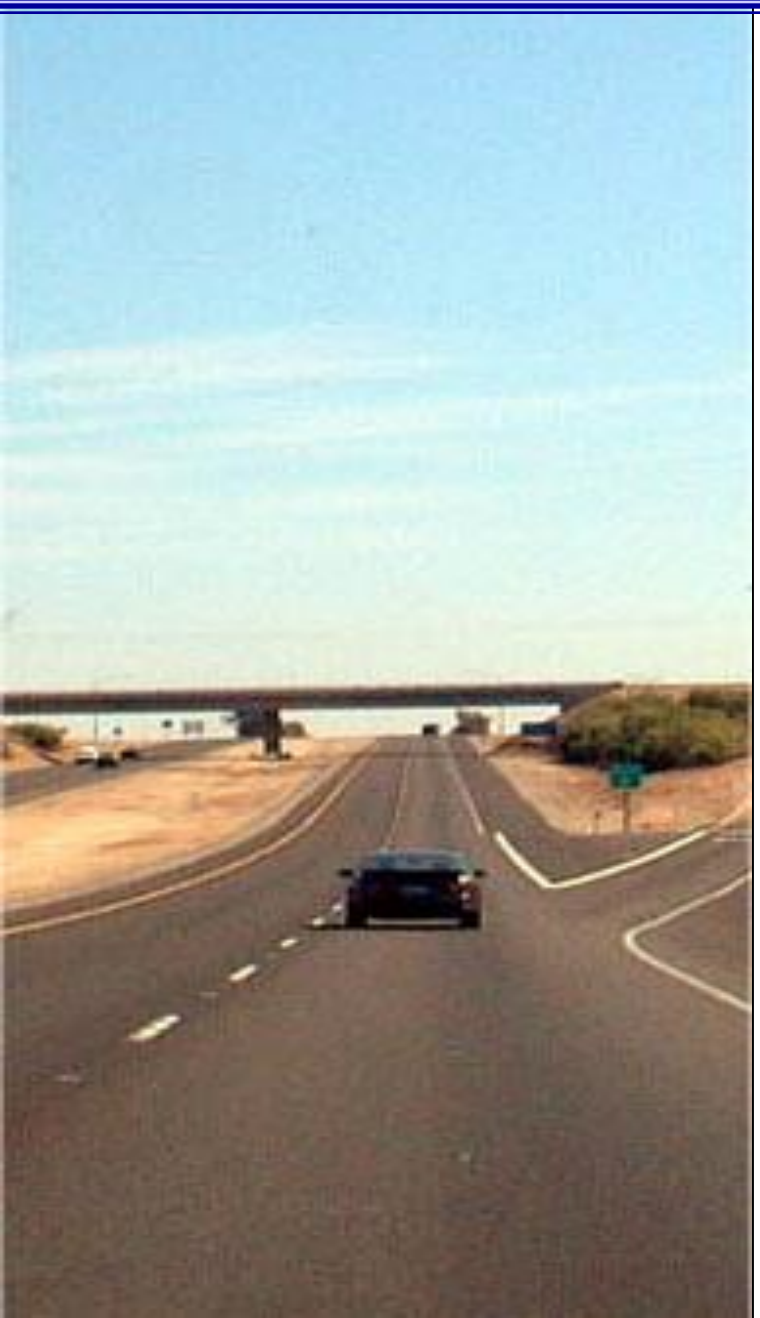


- **“Weave” lane conflicts**
- **Short deceleration lane**
- **Sharp curve on ramp**
- **Traffic stopped on the exit ramp**

Other Points to Remember

- If you mistakenly enter the wrong entrance ramp (i.e. entered the east ramp instead of west) you should continue in that direction until you come to the next exit
- The most dangerous mistake to make is entering an Exit Ramp
- The best way to be prepared for a blocked lane is to have an escape route to the side of your vehicle

On the Expressway…



Do Not:

- ✓ Drive over or across the median or yellow painted line.
- ✓ Make a left turn or a U-turn on crossovers (designed for emergency vehicles only).
- ✓ Use the left lane except for passing.
- ✓ Change lanes without signaling and checking for an adequate gap in traffic.

On the Expressway…

Do Not:

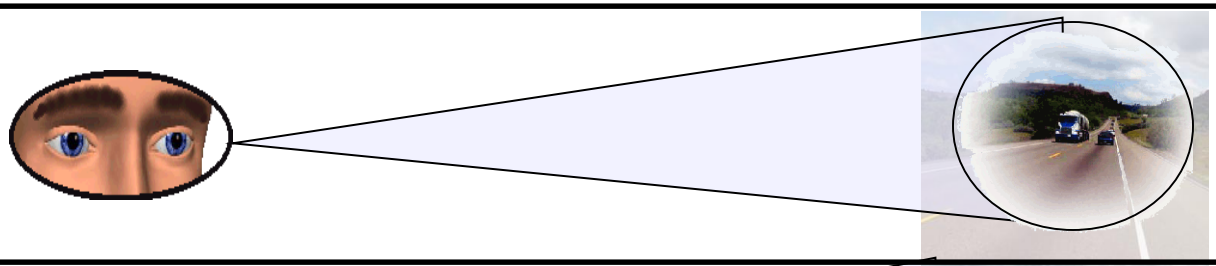
- ✓ Drive onto an expressway except from an on-ramp.
- ✓ Park or Stop on an expressway shoulder unless you have an emergency or mechanical difficulties.
- ✓ Backup.
- ✓ Walk or ride a bike.

Multiple Lane Roadway Dangers

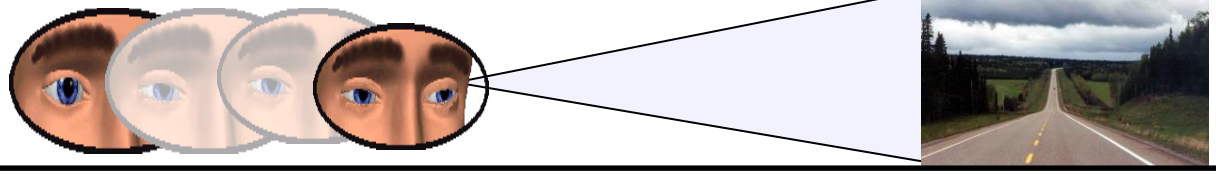
Brake

At higher speeds greater braking distances are needed to stop and…

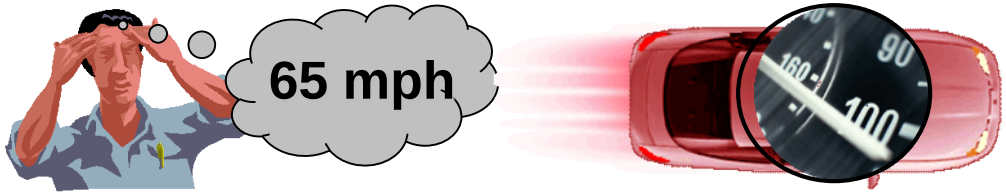
20 mph	20 ft.
40 mph	80 ft.
60 mph	180 ft.



Field of vision is narrowed



Highway hypnosis may occur



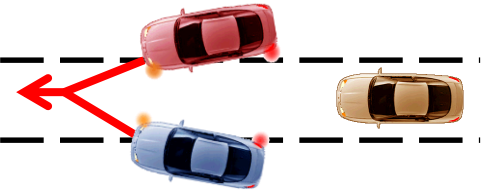
Velocitation may effect you ability to judge speed

Traffic may enter and/or exit on your left

Multiple Lane Roadway Dangers

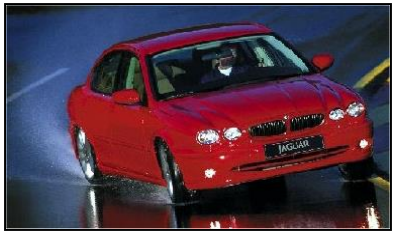
Vehicles moving onto the shoulder or re-entering the roadway

Windy and/or wet sections of the roadway



Two vehicles changing lanes at the same time into same lane

Slow moving vehicles ahead or “Pack Driving”- dangerous!



Tires losing traction and hydroplaning during wet weather conditions

Highway Hypnosis

Is a dulled or drowsy condition that can occur when driving long distances

Situation becomes worse when the driver's eyes focus on the center line.

Plan breaks and rest stops to combat highway hypnosis or go to a safe area for rest or sleep when tired.

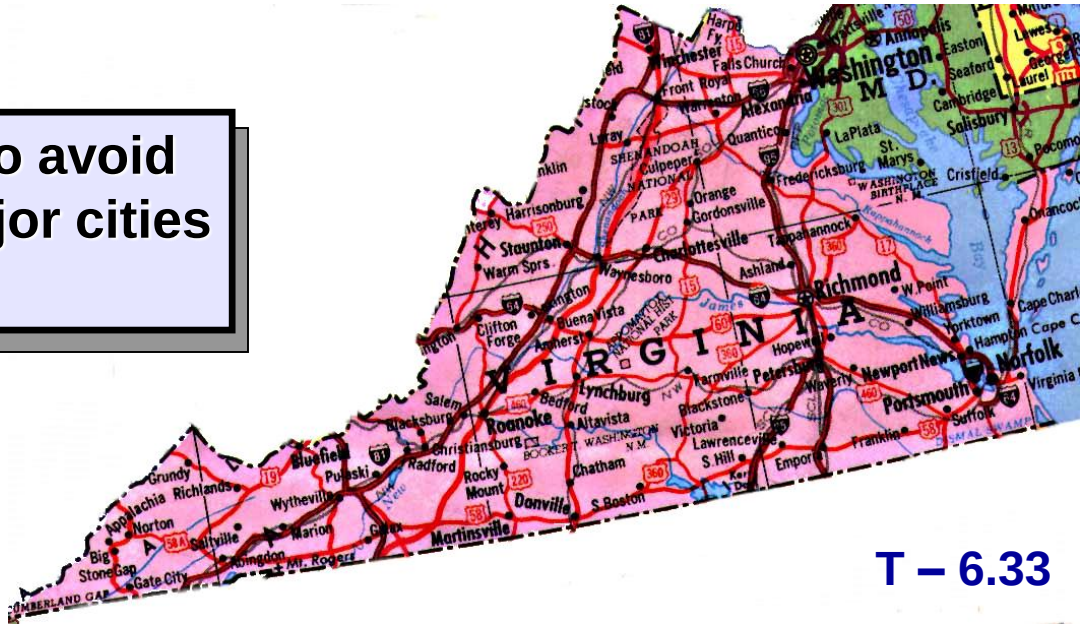
Ramp Metering

- ✓ Used to control large volumes of traffic entering expressways
- ✓ Uses a system of lights and sensors
- ✓ Allows only a few cars at a time to enter congested limited access highways

Short Trips on Expressways

- Know the name, route, and number of the entrance and exit to be used
- Check vehicle for maintenance problems
- Take a local map

Plan a time to travel to avoid congestion around major cities



Long Trips on Expressways

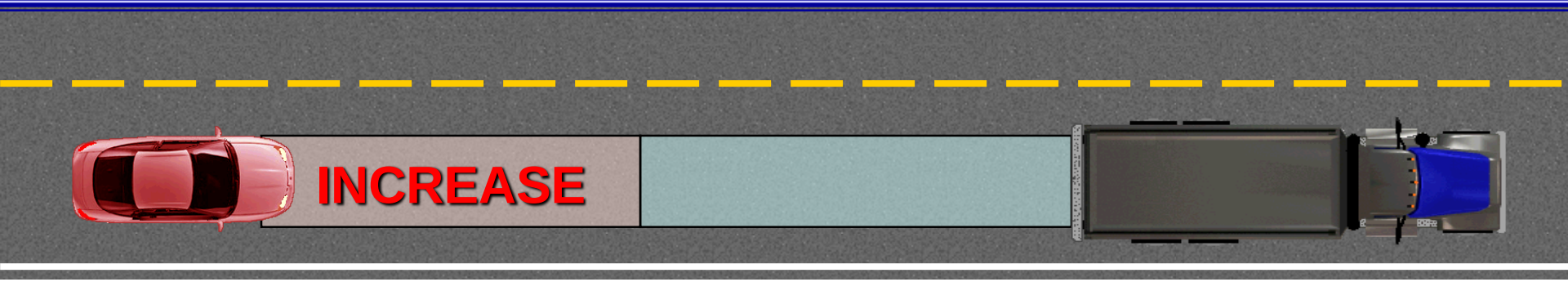
- ✓ Do vehicle maintenance checks
- ✓ Balance vehicle load
- ✓ Plan stops for:
  - Food
  - Rest
  - Fuel

- ✓ Know the route numbers you need to take
- ✓ Take a map of the planned route
- ✓ Check with police or VDOT for construction delays
- ✓ Carry money or credit cards

Reducing Risk Entering the Roadway

- ✓ Search for proper entrance
- ✓ Search for potential conflicts
- ✓ Prepare to adjust speed
- ✓ Avoid stopping on the ramp
- ✓ Be prepared to drive onto the shoulder
- ✓ Merge smoothly
- ✓ Create space around your vehicle

Increase Following Distance



- When following large trucks or buses
- When following motorcycles
- When driving in bad weather
- When being tailgated
- When driving with a heavy load or pulling a trailer
- When entering/exiting the expressway

Special Roadway Conditions

Expressways through cities

- Avoid driving in the right lane when vehicles are merging
- Search for signs, signals, and roadway markings
- Search for exits early and adjust position in adequate time to exit safely
- Don't make last minute lane changes to gain access to an exit
- Monitor the zones around your vehicle and adjust position to create space cushions

Disabled vehicles

- Don't be a "rubber necker"
- Give the disabled vehicle plenty of room
- Pull as far off the roadway as possible if your vehicle becomes disabled

Special Roadway Conditions

Construction areas

Use caution when approaching:

- ✓ **Search ahead for warning signs.**
- ✓ **Reduce your speed.**
- ✓ **Adjust position to maintain a space around your vehicle.**

Toll booths

- ✓ **Exact change booths — The driver deposits coins (exact change) into a machine.**
- ✓ **Attendant operated booths — For large vehicles or drivers without exact change.**
- ✓ **Electronically operated booths — For drivers with prepaid accounts (Smart Tag).**

When exiting a toll-booth plaza, search traffic to both sides for open space, accelerate smoothly, and adjust speed to blend with the flow of traffic.