

OBJECTIVE 2.11 Identify common environmental factors that contribute to law enforcement collisions.

## INTRODUCTION

1. An officer is more likely to be exposed to all types of environmental factors due to the nature of the job. During inclement weather, when other drivers are normally not driving, the officer may have no other option than to operate their vehicle.
2. Reduced control of the vehicle as a result of a diminished driving environment can result from:
  - a. weather conditions
  - b. night driving
  - c. traffic density
  - d. road conditions

## CONTENT

### WEATHER CONDITIONS

Ice, snow, fog, sleet, rain, wind, heat, humidity, cold, smoke, and hazy conditions may reduce visibility as well as alter an officer's ability to effectively operate the vehicle.

1. Snow and ice considerations:
  - a. The edge of the road, lane markings, or even traffic signs may not be visible
  - b. Stopping distance on ice and snow increases exponentially with increased speed
  - c. Have snow tires on the vehicle, and a shovel and chains available. Make certain that the vehicle's heater and defroster are in good working order. Brakes should be properly adjusted so they pull evenly
  - d. Stay aware of the temperature. Wet roads with ice and freezing rain are the most treacherous of all driving conditions

- e. Remember that bridges and roadway shaded areas freeze first
  - f. Do not make any sudden moves with the steering wheel, brakes, or accelerator
  - g. Slow down in advance of intersections, curves, and down-grades sooner than normally. Keep at least a four-second following distance
  - h. If using chains on rear wheels, drive with them until the road surface is appreciably clear of ice and snow
  - i. Straighten the front wheels when starting the car on a snow-covered or slippery surface
  - j. When driving through deep snow, shift into lower gear before entering the snow and attempt to keep the car moving through the snow
  - k. When stopped or stuck in deep snow or in a snow drift, be aware that carbon monoxide may seep back into the vehicle
2. Rain considerations:
- a. During rainy conditions, tires may start hydroplaning, which will affect steering and braking
  - b. Driving through large areas of water can affect brake performance and the vehicle's electrical system
    - (1) Precautions:
      - (a) Slow down before hitting water
      - (b) Turn wipers on before hitting water
      - (c) Tap brakes as you exit
  - c. Use caution in checking outside mirrors. Rain can distort or obliterate images
  - d. Turn headlights on during the daytime

3. Wind Considerations:
  - a. Be alert where windy conditions prevail. Crosswinds can blow the vehicle off the road or across the center line, particularly in curves and corners, and especially in rainy and windy conditions. Adjust when entering or exiting curves
  - b. Be alert when passing buildings, traveling through an underpass, when the road is wet with water, ice or snow, and when near other vehicles, especially large trucks
4. Visibility Considerations:
  - a. Fog, haze, smoke, and mist can affect visibility greatly
    - (1) Turn on low-beam headlights and the wipers if needed. Never drive with only parking lights on
    - (2) Watch for slow-moving and stopped vehicles. Also, watch rear-view mirrors frequently for vehicles approaching quickly from the rear
    - (3) Be alert for patches of fog in valleys and low-lying areas
    - (4) Drive slowly, but keep moving
    - (5) If conditions are too bad, pull over as far as possible, stop, leave lights on, and activate hazard lights.

## NIGHT DRIVING

1. In addition to reducing detail, darkness conceals hazards, i.e., pedestrians, two-wheeled vehicles, stalled cars, curves, and other objects or conditions. The driver makes a decision on the basis of a sketchy and incomplete picture
2. It is more difficult to judge the speed and position of another vehicle
3. Drivers must depend largely on their headlights, which illuminate only a relatively short and narrow path ahead. Light does not bend around corners
4. Adequate highway lighting may be limited

5. Glare from roadside lighting and the headlights of oncoming vehicles impair visibility

6. Keep panel lights dim for better vision, but always have enough panel light to read the speedometer
7. Reduce speed so that you can stop within the visible distance
8. Increase sight distance by keeping the headlights clean and properly aimed, and the windshield clean
9. Watch beyond the headlights on or near the roadway for slow-moving or unlighted vehicles, curves, T-intersections, road obstructions or defects, trains, pedestrians, and animals
10. Avoid looking directly into glaring headlights of oncoming vehicles
11. Keep at least a four-second following distance
12. Allow a greater margin of safety when overtaking and passing
13. Do not wear sunglasses or motorcycle-tinted face shields at night
14. Avoid staring at bright lights. Headlight glare is a particular hazard. The human eye takes about seven seconds to fully recover from being blinded by a bright light. At 60 mph the car would travel 616 feet in seven seconds

#### TRAFFIC DENSITY

1. Rural Areas - Be alert for loose livestock, pets, bicyclists, school buses, children waiting for buses, and slow-moving vehicles such as tractors, farm implements, trucks, horses and buggies
2. Urban Areas - Be alert for traffic entering the roadway from alleys, parking lots, driveways, and intersections, children playing in the streets, people exiting delivery vehicles, drivers opening doors to exit parked vehicles, pedestrians at school crossings and crosswalks
3. Drive with the flow of traffic - Don't "lane hop." An officer is justified to drive differently from the flow of traffic only if on an emergency run and not driving in such a manner as to endanger other drivers

**ROAD CONDITIONS**

1. Officers need to learn how to "read the road," since so much time is spent on various roadways
  - a. From time-to-time the driver will notice a clear path in the center of the roadway followed by a dark spot. This particular pattern is caused by a bump in the road surface
    - (1) As vehicles travel over the bump, oil is knocked off that might not otherwise land on the road surface for several miles
    - (2) A concentration of various fluids causes the darker area
    - (3) The bump itself is in the clear area, since the bump is hit before the droplet is knocked loose
  - b. Another indicator of changes in the elevation of the road surface is seen when the sun is low in the sky. Note that:
    - (1) in the early morning or late afternoon, a greater portion of the roadway can be seen as a shadow
    - (2) The density and size of shadow will give an indication as to the amount of change up or down in the road surface
2. At night, there are a number of signs that can help tell if the road is changing:
  - a. Light travels in a straight line
  - b. Drivers can learn a lesson at night about the road from the headlights: if the roadway in front appears dark with headlights on, the road is dropping or curving out of this line of the headlights. If the road appears brighter as you approach an area, the road is rising.
3. Basic rules for reading the road:
  - a. Drive according to what you can see. If you cannot see over a crest of the hill, slow down. If you are rounding a crest of the hill, slow down. If you are rounding a bend and cannot see in front of you, slow down
  - b. Do not travel any faster than your ability to stop in the distance you can see

4. Road conditions to be aware of:
  - a. Water
    - (1) As little as 1/16th of an inch of water could cause hydroplaning
    - (2) If the water is concentrated on one portion of the road and only one side the vehicle goes through the water, the vehicle will tend to pull in that direction. The force of the pull is dependent on the depth of the water and the speed of the vehicle
  - b. Mud - Two basic problems can occur:
    - (1) The mud can fill in the tread pattern of the tire, making the reaction ability of the tire very slow
    - (2) Sliding sideways in the mud - the mud can build up against the side of the tire until there is sufficient resistance to cause the vehicle to roll
  - c. Potholes - Potholes create a great danger to patrol vehicles. It is best to drive around the pothole. Use the following procedure if you cannot avoid hitting a pothole:
    - (1) Just as you get to the pothole, release the brakes. If you fail to do so, your front tire can actually stop as you cross the leading edge of the pothole. By the time the vehicle gets to the other side, the wheel is no longer turning and the impact can tear the tire apart
    - (2) Hit the pothole squarely, rather than on the side of the tire. The face of the tire can take considerably more impact than the sidewall
  - d. Animals, tree limbs and miscellaneous objects - The size of the object will determine the correct action.
    - (1) If it is a small object and you don't have the time to check for other traffic do not cause a larger collision by swerving into another lane or oncoming traffic. Hit the object head on.

- (2) If it is a large animal or large object hit it with a glancing blow. Hitting an object squarely with the front of the vehicle increases the collision impact; it may increase the amount of damage and the potential loss of vehicle control.

**6. Road Surfaces**

- a. Gravel - Because of the irregular shape, size, and weight of the stones on an uneven surface, gravel moves about easily. This movement can cause a vehicle to go out of control with only slight action by the driver. Braking on gravel can cause a vehicle to slide easily. When following another vehicle, especially at high speed, stay back to increase visibility and avoid flying stones
  
- b. Blacktop
  - (1) Will bleed oil to the surface during hot, humid days causing slick conditions
  
  - (2) Can also roll up into a washboard effect with heavy use during extremely hot days.
  
- c. Concrete
  - (1) This surface may explode at joints during hot weather
  
  - (2) Can develop severe dips as earth settles under it. Concrete is heavy and settles more than other surfaces
  
  - (3) Concrete can glaze over very quickly in freezing conditions

**SUMMARY**

The content of this section can be selectively used to meet the needs of any driver training course. The officer has a high exposure rate to adverse environmental driving conditions created by weather conditions, night driving, traffic density, and road conditions. Awareness of these environmental conditions can help the student overcome the negative impact they may have upon driving performance

**SUGGESTED INSTRUCTIONAL METHODOLOGY****LECTURE WITH SLIDES**

With slides of various environmental factors, have students identify how the factors create a situation which is more demanding of the driver's skills and attention

**LECTURE WITH SLIDES OR SMALL GROUPS**

After students evaluate slides of various environmental factors, ask them to write down or discuss in small groups the driver actions that should be taken because of the reduced control factors

**LECTURE WITH VIDEO**

Show a videotape with various environmental factors depicted and ask the students to identify a particular reduced-control factor such as bright sun, and let them state what actions they are able to take to minimize the problem

**SMALL GROUPS WITH CASE STUDIES**

In groups of 3-6, present each group with collision reports from individual law enforcement agencies. Have each group identify environmental factors which contributed to the collision

**RESOURCES AND AIDS**

1. Accepted driver education textbooks
2. "How to Drive After Dark," National Safety Council
3. National Safety Council filmstrips
4. "A Drive at Night" - AAA
5. "Night Driving" - Safety Industries, Inc.

**SUGGESTED EVALUATION METHODOLOGY**

**STUDENTS**

1. Written or verbal response to questions regarding environmental factors that contribute to collisions
2. Observation of strategies, decisions, or methods used by a driver when exposed to various driving conditions affected by environmental factors

**COURSE**

1. Observe the driving of officers during the presence of adverse driving conditions
2. Review agency collision reports for environmental conditions that contributed to collisions



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# Systems of Driving

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## The Zone Control System

- **Step A**
  - See the zone change to the path of travel or line of sight
- **Step B**
  - Evaluate other zones to determine what the options are
- **Step C**
  - Get the best speed control, lane positioning, and communications available

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# Environmental Factors

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- Weather Considerations
- Night Driving
- Traffic Density
- Road Conditions