

# Alcohol + Driving = Dangerous Mix

When it comes to alcohol — impairment starts with the first drink. At any age, it is never safe for a motorist to drive impaired by alcohol.

In 2016, there were 10,256

alcohol-related crashes and 297 fatalities in Pennsylvania.

So what is it about alcohol that makes it so dangerous when it comes to driving? How does it effect the body? And how are

police officers able to detect a driver's level of intoxication through a breath test?

These topics will be examined in this month's edition of the "Road Trip" newsletter.

## Impairment Effects Brain, Muscle Functions

In Pennsylvania, drinking and driving remains a top safety issue. Particularly the involvement of drinking drivers under the age of 21. Of the driver fatalities in the 16 to 20 age group, 12 percent were drinking drivers. Of equal focus is the 21 to 25 age group, in which 29 percent of the driver fatalities were drinking drivers.

Overall, 74 percent of the drinking drivers in traffic crashes were males.

All drivers need to understand the effects alcohol has on a person's ability to safely control and navigate a motor vehicle.

Even with only one drink, a person increases the risk of being involved in a crash while driving. That's because alcohol is a central nervous system depressant. It is rapidly absorbed from the mouth, throat, stomach and small intestine into the bloodstream.

Alcohol affects every organ in the drinker's body, and can impair brain function and motor



skills, according to the Center for Disease Control.

After three drinks, a 160-pound person may have loss of small muscle control, impaired judgement, and reduced ability to focus their eyes.

*(Continued on page 2)*

### Covered in this issue:

**Embedded Tech and Science Topic — Breath Alcohol Concentration**

**Vocabulary Terms — Impairment, alveoli, milliliter**

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The newsletter is also available online at [www.penndot.gov/RegionalOffices/district-1](http://www.penndot.gov/RegionalOffices/district-1).

# Detecting Alcohol with Just a Breath

BAC	Predictable Effects on Driving
.02%	<ul style="list-style-type: none"> <li>• Decline in visual functions</li> <li>• Decline in ability to perform two tasks at the same time</li> </ul>
.05%	<ul style="list-style-type: none"> <li>• Reduced coordination</li> <li>• Reduced ability to track moving objects</li> <li>• Difficulty steering</li> <li>• Reduced responses to emergency driving situations</li> </ul>
.08%	<ul style="list-style-type: none"> <li>• Loss of concentration</li> <li>• Short-term memory loss</li> <li>• Trouble with speed control</li> <li>• Reduced information processing</li> <li>• Impaired perception</li> </ul>
.10%	<ul style="list-style-type: none"> <li>• Reduced ability to maintain lane position and brake appropriately</li> </ul>
.15%	<ul style="list-style-type: none"> <li>• Substantial impairment in vehicle control, attention to driving task, and in necessary visual auditory information processing</li> </ul>

Alcohol affects the body as it is absorbed from the mouth, throat, stomach, and intestines into the bloodstream. So how can police officers determine a person's Blood Alcohol Content (BAC) through a breath test?

Alcohol is not digested upon absorption or chemically changed in the bloodstream. As the blood goes through the lungs, some of the alcohol moves across the membranes of the lungs' air sacs (alveoli) into the air because alcohol will evaporate from a solution.

The concentration of the alcohol in the alveolar air is related to the concentration of the alcohol in the blood. As the alcohol in the alveolar air is exhaled, it can be detected by the breath alcohol testing device. So instead of having to draw a driver's blood to test his alcohol level, an officer can test the breath on the spot.

Because the alcohol concentration in the breath is related to that in the blood, the BAC can be measured through alcohol on the breath. The ratio of breath to blood alcohol is 2,100 to 1. This means that 2,100 milliliters of alveolar air will contain the same amount of alcohol as 1 milliliter of blood.

(Information provided by [www.breathalyzeralcoholtester.com](http://www.breathalyzeralcoholtester.com))

## On average each day in Pennsylvania...

- 28 alcohol-related crashes occur;
- 0.8 persons are fatally injured in alcohol-related crashes; and
- 18 people are injured in alcohol-related crashes.

*(Continued from page 1)*

If the person continues to drink alcohol, they can develop poor muscle coordination, loss of balance, slowed reaction times, and difficulty speaking, hearing, and seeing.

These negative effects on the body can cause even greater problems if the person attempts to drive a vehicle, as described in the table to the right.

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