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Tactical Responses

The Next Level In Driver Training

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Inside this issue:

So What Does Speed Mean…….Really?

By Gary G. Miller

Speed.....

We talk about it all the time. How fast are we going? How slow are we going? If you travel faster than certain speeds - risks escalate. If you are going too slow then the speed differential may be dangerous. So what does this all really mean? Just how fast are you really going and what are the repercussions of it.

First of all let's talk about speed in the sense of just a normal passenger car and driver. The car itself is roughly 4,000 lbs and about 200 horsepower. It has an automatic transmission and a top speed of 122 mph. For the sake of argument let's say it is a front wheel drive and has a fully operational antilock braking system, but does not have an electronic stability system. The average driver perceives themselves as a skillful and defensive driver, with a somewhat normal perception/reaction time, of let's say about….. 1.5 seconds. It is a nice summer day and the vehicle is being operated on a standard asphalt, two-lane highway. The driver is traveling from Bend to Portland and is running a little late. The speed limit is 55 mph and it is common knowledge that there are few state troopers or county deputies on patrol, due to budget restraints. We also know that most police officers have a tolerance range of 10-15 mph depending on roadways and jurisdictions. The driver sets their cruise control at 64 mph assuming they will get there a lot quicker than at 55 or even 60. I suspect the odds are better than 100 to 1 that they will not even see a police officer, let alone be stopped by one.

Studies have shown that about eighty-five percent of the population has a perception/reaction time of about 1.5 seconds or less. This is the amount of time it takes to observe an event and begin taking evasive action. In other words how long it takes to hit your brake pedal. At 60 mph you would travel about 132 feet before you can hit the brakes. And this is on a good day!

This is an example of an approximately 40 mph impact with a tree. Going from 40 mph to 0 in about 1/20th of a second is usually fatal.

So again how fast is 64 mph…..I mean really?. When you drive very few critical events occur in miles or hours. Most of the time we are talking about seconds, even tenths of seconds. If we convert mph to feet per second (fps) we have a better idea of how fast we are going. To do this conversion you simply take 5,280 feet (feet in a mile) and divide it by 3,600 seconds (seconds in an hour). That gives you a constant of 1.467 of which we will just round off to 1.5. We now can take 1.5 and multiply it by 64 mph. That will give us 96 fps. We now know we will go 96 feet every second. So anytime you want to know how fast you are going in feet per second just multiply what your speedometer displays by 1.5. 30 mph would be 45 fps , 60 mph would be 90 fps and so on.

Speed? (Continued)

We know that most drivers have a perception/reaction time of usually 1.5 seconds or less in a clear cut situation. Therefore you can multiply 96 fps by the 1.5 second perception/ reaction time and calculate that it takes about 144 feet to just observe and begin to react to something at the speed of 64 mph.

Understanding these figures, 64 mph really means you are going 96 feet per second and will travel 144 feet before you can begin to take an evasive action. Again, what does this all really mean? What are the positive and negative effects of traveling this speed? The positive effect is that for the trip from Bend to Portland you are going to shave off about 25 minutes in time by going 9 mph over the speed limit. Really? Take into consideration the slower vehicles that cause you to slow down, passing at speeds higher than 64 mph, and following cars more closely than you are aware of. All these factors raising your blood pressure simply at drivers who are obeying speed limits in the first place. In the end your average speed will probably be closer to 55 mph than 64mph.

What are the negative aspects of traveling this speed?. Going from 55mph to 64mph (or 82 fps to 96 fps) is a 16 percent increase in speed so you could deduce a 16% increase in speed therefore a 16 percent increase in potentially getting into a crash or incident. Therefore, a 16 percent increase in getting injured or killed and a 16 percent increase in leaving your family behind. Gee, that doesn't sound too good, but it doesn't sound too bad. At least it is proportional—right! So here we go again. What does this 16% increase in speed really mean?

For a 4,000lb car it means a 35% increase in kinetic energy. Which if you remember back from your high school or college days is one-half of the mass of an object times its velocity (speed in feet per second) squared. The mass of an object is simply the weight (pounds) of an object divided by the earth's gravitational pull of 32.2 feet per second/ per second. The long and the short of it is that energy is not proportional like speed , but more exponential. So now you have a 35% increase in energy not a 16% increase in energy in that additional 9 mph. So what! Who cares? You Should.

Let's take it a step further. When you stop a car you are transferring that energy by braking. So now it takes an additional 50 feet to brake to a stop at 64 mph than at 55 mph. Think about it... a lot can happen in that additional 50 feet. And since you are going faster it takes you about 20 more feet to see and react to something. So now that 64mph takes you about 70 more feet to observe, react, and stop through braking to avoid an incident and crash. A lot can happened in 70 feet. And that is just avoiding a crash.

What happens if you get in a crash at 64mph? That 35% increase in energy can be directly targeted to your body. Sure if the crash and forces occur and are properly distributed around the car as the engineers have designed you might walk away .....or you might not. For every 1 mph you increase speed from 50 to 70mph you increase your speed roughly 2 percent, but increase your energy and stopping distances nearly 4 percent. It adds up quickly. At 70 mph you have nearly doubled your energy capabilities.

Bottom Line—Just 1 mph may be the difference in not only avoiding a crash, but even surviving one. Think about it!

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Winter Driving Tips.....*by Gary G. Miller*

Well it is approaching that time of year again when the weather and road conditions can change in a heartbeat. TRA advises you to.....

1)**Be Prepared**—Give yourself a little extra time each morning to scrape that windshield completely. Let the defrost clear the window before driving, not after you start.

2) **Keep your gas tank half full or more -** You never know when you will be in a major road blockage. It also reduces condensation.

3) **Keep winter safety supplies in the trunk -** Keep a shovel, some type of traction material, traction devices, a blanket, water and a few power bars in your trunk. You should also have a first aid kit, fusees, and a flashlight (check your batteries).

4) **Watch for ice even when you don't see it -** On cold days watch for shaded curves, bridges and/or overpasses that may still be icy even though the sun is shining and the rest of the roads have no ice on them. Often times as a driver enters a shaded curve they see the ice and hit the brakes sending them in the opposing lane or off the roadway. Brake and slow down prior to the curve.

5) **Keep your speed either at or below the speed limit or designated speed.** Remember that Oregon has the Violation of Basic Rule statute, which means that if conditions warrant driving less than the designated speed or speed limit then you must do so.

6) **Make sure that your exhaust system is in good condition -** Watch for exhaust coming out from other than the tailpipe on cold mornings. That is a clear indication that you have holes in your system. On a cold day in a traffic tie up with a faulty exhaust system you may increase your chance of carbon monoxide poisoning.

8) **Have your brakes checked.**– Brakes and brake fluid are very important safety features of your car. Often times people put off getting brakes checked or serviced.

9) **Avoid hydroplaning.** Generally speaking you only need about two-tenths of an inch of water to cause hydroplaning. Proper tire pressure and sufficient tread depth make hydroplaning less likely. Keeping your speed down also reduces your chances of hydroplaning.

10) **Wipe off your exterior lights and interior windows.**—This will increase your ability to see on dark nights and help reduce glare.

11) **Avoid using cruise control on wet or icy days.—**A spinning tire provides no traction. If you are using cruise control on road surfaces that are potentially more slippery than normal and are on a slight incline there is a chance that your transmission may automatically shift to a higher gear. If this happens and the surface is slippery enough your drive train axle will spin. This spinning can cause control loss.

12) **Change your windshield wiper blades**—Fall is the ideal time to change blades. Summer heat hardens the old blades and makes them less effective. A fresh set of blades before the rains hit and darkness comes early just makes sense.

14) **Avoid medications/drugs/alcohol when driving. -** Even over the counter cold medicines can make you drowsy. Add to that rolling up the windows, turning on the heat, a little fatigue, and bad things are going to happen. Don't let them happen to you.

January 6, 2005—0744hrs.....Age 40, Career..... Lieutenant xxxxx was at home, off duty. Due to weather conditions and incident activity, his shift was paged to respond to the fire station for coverage. Lieutenant xxxxx was in uniform and driving his personal vehicle when he was involved in a single-vehicle crash. His vehicle lost traction on the snow-covered roadway, left the roadway, rolled over the guardrail, and collided with a sign pole and concrete base. The crash caused major intrusion into the passenger area of Lieutenant xxxxx Dodge Durango. The crash investigation indicated that Lieutenant xxxxx (who was wearing his seatbelt) was killed instantly as a result of severe head trauma. Unsafe speed for the road conditions was cited as the cause of the crash.

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Future Training Dates

TRA continues to provide on and off site driver training. In December TRA will be in the Tillamook and Astoria areas to provide Defensive Driving Classes and Simulator-based Emergency Vehicle Operations Training to various law enforcement and firefighter agencies.

December— Tillamook/Astoria

December—Salem—Student Driver Winter Skills Training

January 2007—Harbor/Brookings

February 2007—Salem/Keizer

If you are interested in setting up future training dates please call us.

Future Issues/Articles

<u>Next Issue</u>
Are all tires created equal?
More about following distances.

Gary G. Miller, Editor

We're on the web at www.tacticalresponseacademy.com

Tactical Responses is a quarterly public service newsletter that is freely available either by including yourself on the TRA email newsletter list or by reviewing it on the website www.tacticalresponseacademy.com.

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