HIGH PERFORMANCE DRIVING SECRETS

BY: TONY SCOTTI / *PHOTOS COURTESY OF TONY SCOTTI (www.vehicledynamics.com)*

A great deal of research has been done and data collected on the minimum standards that define driver capability and skill.

These studies are conducted by the Society of Automotive Engineers (SAE) and prestigious universities. The research defines driving skill as the driver's "ability" to use the vehicle's "capability." They express driving skill as the percentage of the vehicle a driver can use, prior to losing control of the vehicle. If a driver can use 50% of the vehicle, they define him/her as a 50% driver. If they can use 80% of the vehicle; they are an 80% driver.

Here is the bad news: studies have shown that the average driver can use only 40 to 55% of the vehicle's capability. This does not mean they lose control, it means they can no longer put the vehicle where they want to put the vehicle. Yet when confronted with an emergency scenario (accident or ambush), the same studies have shown that the driver will be required to use a minimum of 80% of the vehicle's capability to avoid the problem. Also, after 40 plus years of conducting driver training programs, I would say when looking at the "average driver" the 40% to 55% number is accurate and may be optimistic.

The question that needs to be answered is: *What percentage of using the vehicle to avoid an emergency can be labeled good, passable and minimum?* Again, we rely on research done by the automotive engineering community. They express skill levels as:

If a driver can use 50% of the vehicle's emergency maneuvering capability, they are considered an inexperienced driver. (IMHO, they should consider walking as their mode of transportation.)

If a driver can use 60% of the vehicle, they are considered an average driver. (IMHO, they could go a long while with no problems, but in a security environment, when bad things happen, you can't afford to be average.)

If a driver can use 80% of the vehicle, they are considered a good driver. (IMHO - 80% is the minimum requirement for any and all security driving scenarios.)

TRANSLATING THE NUMBERS

Expressing skill levels in numbers **is** OK, but how do these numbers translate to reality? What is the driver experiencing at each of these levels of skill?

If the driver is using 60% of the vehicle's capability, they will start to feel changes in the vehicle's feedback. The vehicle body will start to lean**.** If the driver is using 70% of the vehicle's capability, their pucker factor will start to increase. The feel of the steering wheel is changing. The driver can feel the energy pushing on his body.

Using 80% of the vehicle's capability and above requires complete attention to the driving task. Using 80% of the vehicle's capability is difficult and requires skill that can only come from training. If you can accomplish this, you are above average. To stay in control the driver needs to anticipate the vehicle response to their input.

WHAT MAKES AN 80% DRIVER?

When confronted with an emergency scenario, the 80% driver anticipates changes in the vehicle behavior and is ready to maximize the vehicle's capability. A 40% driver simply reacts to whatever the vehicle does. The 80% driver has an understanding of the factors that dictate a vehicle's operational limit and those factors that dictate a driver's individual limitations. They have been trained to recognize the indicators and warning signs that a vehicle is being operated at or near its limits and via that training have the skills to keep the vehicle within those limits and to do so within a very short time frame.

In the 90 to 100% area, this will be too fast for anyone but a trained driver with a great deal of experience. The driver will notice a big difference in how the car reacts to their inputs. The steering wheel and gas pedal become extremely sensitive. Small changes in steering or speed create big changes in the way the vehicle responds. At 100% the vehicle will more than likely be sliding sideways. What you were looking at through your windshield will now appear through one of the front door windows.

All data indicates that in an emergency scenario the transition from using 50% of the vehicle's capability to the 80 to 100% area is measured in tenths of a second, tenths of inches of steering wheel movement and/or 2 mph.

Can you measure how much of the vehicle you are using while driving? - Simple answer: Yes. At one time, measuring driving performance was a combination of difficult and expensive, but like everything else in the computer world, that paradigm has changed dramatically. The driver's skill level can be measured with a device called a G Meter. The G Meter makes measuring Vehicle/Driver performance easy and inexpensive. G Meters can be found as applications (Apps) in App stores on phones and tablets. In the App store search function, type in "G Meter." You will find many to choose from. They use the accelerometer in the phones/tablets to measure driver/vehicle capability. They range in price from free to about $100. The one that I use is called Dynolicious (www.dynolicious.com).

BRAKING SKILL

The automotive studies also point out that most accidents start off with inadequate braking on the part of the driver. The brakes are the most powerful control of the vehicle. Pressing on the brakes produces larger changes in speed than pressing on the gas pedal. The brakes can easily overwhelm the most powerful engine. It takes more time to go from 0 to 60 mph than it does to stop from 60 to 0 mph.

Most drivers realize that the higher the car's speed, the more distance is required to stop. What is surprising to many drivers is how much additional distance it takes to stop a vehicle with just a small increase in speed. The fact is that if you double your speed you increase your stopping distance by a factor of four.

If you increase your speed from 40 to 44 mph, speed has increased by 10%, but stopping distance has increased by 20%. If you increase your speed from 40 to 50 mph, speed has increased by 25 %, but stopping distance has increased by 50%.

FOR EVERY 10% INCREASE IN SPEED IT IS A 20% INCREASE IN STOPPING DISTANCE. WHEN CONFRONTED WITH AN EMERGENCY, PRESS THE BRAKE PEDAL AS HARD AS POSSIBLE.

The numbers listed above are not affected by the method of braking used. It makes no difference if a driver brakes with their left foot–threshold brakes–or uses a parachute to stop. If the speed is doubled, the stopping distance increases by a factor of four. Bottom line: you cannot arbitrarily increase your speed, it's literally deadly.

A major component of braking to avoid an emergency has nothing to do with braking; it's all about where you look while the emergency is unfolding. Car manufacturers have been studying this phenomenon for a while. Simply stated, your hands go where your eyes look. As soon as the emergency presents itself look for a place

AT THE SPEED YOU ARE MOVING WITH THE GIVEN SIGHT DISTANCE HOW MUCH TIME DO YOU HAVE - AND IN THAT TIME FRAME WHAT CAN YOU DO WITH THE VEHICLE?

to put the vehicle. Look where you want the vehicle to go and your hands will follow your eyes. Many times the driver's eyes fixate on the object they are trying to avoid and the result is they drive into it.

BRAKING SUMMARY:

Be careful about increasing speeds. For every 10% increase in speed it is a 20% increase in stopping distance. When confronted with an emergency, press the brake pedal as hard as possible. The sooner and harder the brake is pressed the more steering the driver will have available for driving out of the emergency. Look where you want to put the vehicle.

GIVING YOURSELF TIME AND DISTANCE.

An accident or an ambush is a time/distance relationship. No matter what level of skill the driver possesses, if there is not enough time and distance to use the skill, bad things will happen. The driver needs to have the correct amount of *Sight Distance.*

Here's an explanation and example: We have all had the experience of driving on a major highway and running into stop and go traffic. The first thought you have is that there must be an accident just over the hill or around the bend. But when you get to the top of the hill or around the bend the traffic starts to flow and there is no accident. What caused the slowdown? Two things did: traffic volume and "line of sight."

Line of Sight or Sight Distance is defined as the length of road surface a driver can see and have an acceptable reaction time. The people that are responsible for designing our highways have guidelines concerning "line of sight" and from those guidelines developed the all-important Decision Sight Distance (DSD).

DSD is the distance needed to recognize a problem and complete a maneuver safely and efficiently. According to the scientists who have done an enormous amount of research on driver reaction time, the "average" driver needs 2.5 seconds to complete the "recognize a problem" part of the DSD.

The question then becomes: How much distance do you use up before you get to the "maneuver safely and efficiently" part of the process? A good rule of thumb is that for every 10 mph a driver needs 40 feet of sight distance. If you are moving at a highway speed of 60 mph you would need 240 feet (40x6) of sight distance. At 75 mph you would need 300 Feet. Hence, if you are driving on a highway and for whatever reason–usually a hill or a series of bends in the road–and there is not 240 to 300 feet of sight distance, drivers will slow down. If the volume of traffic is sufficient it will cause an accordion effect. Please keep in mind that these distances are for the average driver.

Sight distance plays an important role in supplying safe and secure transportation. It is a major factor in determining if the event you drive into is winnable. No matter what the environment, driving to the mall with the family or driving in a high risk scenario, never drive faster than you can see—which means never drive at a speed that **will not** give you the time to react at the given sight distance.

If you are driving in a security mode and are conducting a "route survey" the question you need to ask yourself is: *At the speed I am moving with the given sight distance how much time do I have - and in that time frame what can I do with the vehicle?* It makes no difference what training you received and where you received it or what type of vehicle you are driving. No matter what the scenario, accident or vehicle violence, if you don't have enough sight distance at the speed you are moving, it is a no-win scenario. ✓

BIO

Tony Scotti created protective driving programs and has taught in over 30 countries. His client list includes the royal families of Kuwait and Jordan, the United States Secret Service, the United States Army Special Forces, the Canadian Department of External Affairs and numerous Fortune 500 companies. He has authored three books on security and driving including: Professional Driving Techniques. The author oversees the Vehicle Dynamics Institute Instructor Development Program (www.vehicledynamics.com).