

DRIVING SAFE WITH UNCLE BOB
70 RULES OF DEFENSIVE DRIVING

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Contents

Rule 1: Pay Attention!	5
Rule 2: Don't Trust Nobody!.....	5
Rule 3: Yield Anyway!	7
Rule 4: Don't speed!.....	7
Rule 5: Don't Drive Impaired.....	8
Rule 6: Wear your seat belt!	9
Rule 7: Buy and use safety devices.	10
Rule 8: Motorcyclist—Protect Thyself!	11
Rule 9: Don't Run Red!.....	12
Rule 10: Drive Precisely!	13
Rule 11: Chill Out!	14
Rule 12: Look Down the Road!	15
Rule 13: Create Space: Use the "Two-Second-Plus Rule"	16
Rule 14: Drive to Communicate	17
Rule 15: Drive Predictably.....	18
Rule 16: Always Signal Your Intentions.....	19
Rule 17: Know Your Blind Spots!.....	20
Rule 18: Avoid Distractions!.....	21
Rule 19: Avoid Backing Up!	22
Rule 20: Beware of Intersections!.....	23
Rule 21: Be a Freeway Pro!	24
Rule 22: Know How to Stop!	25
Rule 23: Know When to Use Your Headlights!	26

Rule 24: Slow Down in Rain and Snow!	27
Rule 25: Maintain Your Vehicle's Tires.....	28
Rule 26: Take Care of Your Vehicle	29
Rule 27: Get Rid of Tailgaters.....	30
Rule 28: Maintain an Even, Measured Pace	31
Rule 29: Check for Hydroplaning!	32
Rule 30: Know How To Recover from a Skid.....	33
Rule 31: Avoid Head-On Collisions.....	35
Rule 32: Be a Safe Passer	36
Rule 33: Avoid the Single-Vehicle Collision.....	37
Rule 34: Deal with Light Glare.....	38
Rule 35: Never Play Chicken with a Train!	39
Rule 36: Beware of Stopped or Slow-Moving Vehicles.....	40
Rule 37: Practice Animal Avoidance!	41
Rule 38: Don't Prevent Others from Passing	42
Rule 39: Drive Your Van Safely.....	43
Rule 40: Practice Smart Bicycling	44
Rule 41: Share the Road With Bicyclists	45
Rule 42: Exercise Prudent Courtesy	46
Rule 43: Recognize the Futility of Rushing.....	47
Rule 44: Make Allowances for Your Physical Limitations	48
Rule 45: Start Rested -- Keep Fresh!	49
Rule 46: Share the Road With Trucks	50
Rule 47: Make Space for Parked Vehicles on a Roadway	51
Rule 48: Give Way on Mountain Roads	51

Rule 49: Make Safe and Sane Left Turns.....	52
Rule 50: Connect Your Mind To Your Eyes!	53
Rule 51: Make Defensive Stops!	54
Rule 52: Slow Down When Approaching Intersections!	55
Rule 53: Beware of Traffic Holes!	56
Rule 54: Turn Right, LOOK Right!	57
Rule 55: Avoid Changing Lanes in Intersections	58
Rule 56: Don't Abuse the Two-Way Left Turn Lane	59
Rule 57: Avoid "Reverse Traffic" Lanes	60
Rule 58: Move Right When Approaching Intersections.....	61
Rule 59: Beware of Stopped Vehicles at Crosswalks	61
Rule 60: Use the Center Lane for Safety	62
Rule 61: Never Stop on a Freeway!.....	63
Rule 62: Don't Cross a Freeway Median!.....	64
Rule 63: Seat Belts and Air Bags Go Together!	65
Rule 64: Avoid Head Injuries.....	66
Rule 65: Don't Ride in Pick-Up Truck Beds!	67
Rule 66: Secure Loose Objects!.....	67
Rule 67: Keep Your Child Safe in the Center	68
Rule 68: Don't "Pump" ABS Brakes!.....	69
Rule 69: Choose Your Route for Safety!.....	70
Rule 70: Use Uncle Bob's Defensive Driving System.....	71

Rule 1: Pay Attention!



"I never saw him!" is the most common excuse heard after a collision. Was the other vehicle invisible? Virtually all collisions involve inattention on the part of one or both drivers. Inattention can involve many things, some of which are daydreaming, distractions, sleepiness, fatigue, "highway hypnosis," talking, etc.

A moving vehicle develops thousands of foot-pounds of energy. YOU as a driver have the responsibility not to use that energy to injure or kill others, or damage their property. Paying attention makes it possible for you to see, recognize and avoid the hazards lurking on the road; these are the three basic elements of defensive driving. The primary attribute necessary for a safe driver is alertness, and paying attention is the most important driving task because it helps create the time you need to recognize hazards and avoid a collision.

One statistic often quoted is that most collisions happen within a short distance from home. Why is this true? Since we mostly drive in our own neighborhoods, the odds are we'll have most of our mishaps there. Close to home we get more comfortable and perhaps let our guard down (and the other guy does the same thing); you've heard that "familiarity breeds contempt?" Better yet, familiarity breeds inattention. We don't often consider that serious or fatal injuries can occur in low speed collisions.

I have a challenge for you. While it is important for you to be alert and aware, it isn't an easy task. The next time you drive, try concentrating solely on the driving task. Think of nothing else. Then see how far you get before your mind wanders. Many drivers won't even get out of the parking lot! Seasoned drivers don't HAVE to think about driving much. It's something we do automatically, and our minds are free to wander. And our minds WANT to wander. Have you ever driven somewhere and been so lost in thought that you couldn't remember anything about the trip itself? Is this a problem?

Is this a curable problem? Paying attention can become a habit, but you have to work at it. Make conscious, persistent choices NOT to eat while driving, or whatever you do that takes your attention off where your moving vehicle is pointed. Connect your mind to your eyes and work at consciously analyzing what you see while you drive. We call this "situational awareness." Driving is the most dangerous thing most of us ever do. It deserves your full attention. Mastery of this one habit can almost make you bullet-proof. Not quite, but almost.

Rule 2: Don't Trust Nobody!

We have met the enemy and he is us. You can never rely on what the other driver will do. Think back to all the mistakes you've made while driving over the years. Think ahead to the ones you know you will make in the future. All the other drivers are just like us! *Don't trust them!* While you are driving, keep a wary eye on the other guy and leave yourself plenty of room. Anticipate the mistakes he might make and be ready for them. Eventually, he will! Because he's just like us! When you are driving on "autopilot," you have turned control of your vehicle over to those other drivers - you are at their mercy. Their fate is your fate.



If you are too trusting, you are relying on that other driver for your safety. Is he worthy of that trust? Every few seconds, some drivers in this country find out this is a poor bet. Maybe some of those other drivers are returning from a beer festival! Maybe they just lost a job, or worse, a loved one. The other driver might be an 11-year-old who found Dad's keys. Approach driving with the idea that every other driver is an unpredictable menace and out to get you. Most collisions occur when the "other guy" does something we don't expect, or when we do something they don't expect.

If you accept that everyone makes driving errors, the next step is to drive with a wary attitude. Be careful of approaching red lights, because you know a light by itself never stopped anyone. Watch out for folks getting ready to pull out from parking beside the road. Look for gaps in lines of traffic which might be the result of someone pausing to let another vehicle cross in front of them. (I've personally witnessed three or four collisions in the past ten years that happened just this way). There are others: failure to signal a lane change or turn, or tailgating someone when they are poking along because they need to make a turn—a turn they suddenly WILL make when they see it at the last second. You can think of dozens of others. Be alert to the possibilities and have a strategy in mind for dealing with them.

Rule 3: Yield Anyway!



outcome, that counts.

"Nobody ever yielded their way into a collision." Think about it. If you are in doubt about who has the right of way, give it away. The other guy may be wrong, but you can end up hurt or dead. We often say no one HAS the right-of-way until it is yielded to them. (Keep in mind I'm talking defensive driving practices, not traffic law.) Right of way rules are often misunderstood, and there are situations where the rules may not be clear to everyone. If there is uncertainty about which vehicle should have the right of way, give the other guy the road. When it comes to driving safely, it's not the principle, but the

Rule 4: Don't speed!



Driving at a higher than reasonable speed increases your risk in two ways: it cuts your reaction time and results in more "stored" energy (that must be dissipated in any collision). You should consider if the risks are worth the gain.

This is the science of math and physics—you cannot bend these rules. Each incremental increase in speed reduces your ability to react in time to hazards, because you may be covering distance in less time than it takes to react. Normal reaction time is between .75 second and 1.5 seconds, on average. Average reaction time distance at 50 mph would be approximately 83 feet. At 70 mph, it is over 115 feet (over 7 modern car lengths). These numbers do not include braking distance, just reaction time. The average difference in reaction-time distance from 50 mph to 70 mph is about 32 feet. If you were relying solely on braking, any hazard you encounter within the reaction distance is already a problem; you can't react quickly enough to miss it. This is particularly important at night, when darkness restricts your visibility. Do you know at what distance your headlights will illuminate a hazard? How is your night vision these days? When headlights finally light up a road hazard, it is often too late to avoid it. Many experts would tell you that even 50 mph is too fast for conditions at night, on any dark roadway.

If you could choose the speed at which to hit a brick wall, assuming that it was a sure thing you were going to hit one, would you choose to hit the wall at 10 mph or at 100 mph? Not hard to decide, is it? Higher speeds also bring additional accumulated, or stored, energy. More stored energy means increased crash forces if you hit something. Here's a real-world example; a loaded semi traveling at 60 mph develops about 6.5

MILLION foot-pounds of force. Or, your body, unrestrained in the vehicle, could hit the windshield with about 16,000 foot-pounds of force, should your vehicle hit some immovable object - like a tree.

A defensive driver chooses a speed matching traffic as closely as possible without exceeding speed limits. If traffic is moving at higher speed than you should go, keep to the right and out of the way. This is often a legal requirement as well, if you are traveling at a speed less than the flow of traffic. Also, don't neglect to maintain the correct following distance.

Consider that speeding often doesn't save much time. How many times have you reached a red light, only to find a "jackrabbit" waiting there that passed you a half mile back like you were standing still? Ever wonder why? Around most urban areas, signals limit overall speeds to what the system can handle (in terms of numbers of vehicles). In Phoenix, for example, that's approximately 40 to 45 mph. Drive faster than that and you'll simply spend more time waiting at red lights, wasting fuel, wearing down brake pads, and accumulating just a little more stress in your life for no good reason or gain. Even on the highway, you don't often gain much. Frequently, once you pass someone, you find them on your back bumper as you slow down to enter the next town. So you gained what, exactly? On an Interstate, where you truly can save some time by speeding (provided you don't get pulled over), the difference between 65 mph and 80 mph over 50 miles is only 8.7 minutes. *Big deal.*

Rule 5: Don't Drive Impaired.



First, let's define "impairment." Webster's *New World Dictionary* defines impairment as "making something worse, less, weaker, or damaged." Applied to driving, impairment means there is a factor present that decreases your ability to operate your vehicle safely.

The first thing that comes to most folks' minds is impairment through alcohol or other drugs. There are others as well: impairment through fatigue, or as a result of disabling injuries or illness. There was a case a few years ago where a man attempted to drive with some broken limbs. He used a stick to operate the gas pedal, and ended up losing control, overran a sidewalk, and killed a person who was using a pay phone.

Alcohol is a prime cause of impairment. Since it acts as a depressant, it begins to diminish a person's abilities with the first sip. Many people do not realize that even at very low blood alcohol levels, way before reaching any "legal limit," impairment of physical and mental abilities is occurring. In the USA, all states now have a .08% presumptive level -- the alcohol concentration at which a driver is presumed to be impaired, with no other evidence required. But impairment often begins at AC levels as low as .04%—less than half the "legal limit." What's worse, it acts on the very skills and abilities you need most as a driver: judgment, vision, and the ability to do several things at once. Since alcohol slows your mind and your motor skills, it has a dramatic effect on your reaction time and distance. If impairment causes your reaction time to double, for example, at 70 mph that can result

in an additional 103 feet traveled. Obviously, this could mean the difference between a miss and a collision. Driving with other impairments could have similar results.

One of my common themes in teaching this topic is personal responsibility. We all have the obligation to make sure we are able to drive safely whenever we operate our vehicle. Ask yourself, "Am I safe to drive? Am I rested? Am I ill? Have I taken medications that might affect my abilities? Are my limbs available for use? Has it been long enough since I had that drink for the alcohol to have worked its way through my system?" (Generally, the body can eliminate one drink per hour, and, contrary to popular beliefs, nothing can speed up that process.) Do I have my glasses on, if needed?" Only if you can answer yes to all these questions should you exercise your privilege to drive.

I am convinced that if everyone would (1) not speed; (2) pay attention; (3) not drive impaired; and (4), wear seat belts (and use other safety systems such as air bags and ABS brakes), no one would ever get killed in a traffic collision. Just these four things, practiced habitually, would eliminate most serious collisions and save 50,000 lives each year. In the real world, though, we're human, and because we are, there will always be mistakes that lead to collisions. Since we do subject ourselves to hostile environments and physical forces that are incompatible with life, we should do everything possible to minimize the risks, yes? So, again, practice [paying 100% attention to your driving](#), [drive at a reasonable speed](#), never drive impaired, and buy and learn how to use safety systems correctly. These ideas are the foundation of any defensive driving "system." **Keep the shiny side up!**

Rule 6: Wear your seat belt!



Without a doubt, seat belts are the most significant safety device ever invented. Seat belts do several things for you. They provide impact protection, they absorb crash forces, and they keep you from being thrown out of the vehicle. Modern vehicles are built with "crumple zones," and seat belts are an integral part of the system. The belts hold you in place while the vehicle collapses around your "safe" zone. Belts help keep you in your place, in control, and better able to avoid a crash. Yet for all these benefits, folks have lots of "reasons" why they don't wear them.

- 1. "They wrinkle my clothes."** Absolutely, they do.
- 2. "They're uncomfortable."** Maybe so, but you can adjust them so they fit better. If you need to have your belts adjusted to fit, see your dealer.
- 3. "I want to be thrown clear of the vehicle in a crash."** Oh yes, *PLEASE*, on my *head!* By the way, that's the number one cause of death in vehicle crashes.
- 4. "I don't want to be trapped if there's a collision, or my vehicle ends up in the water, or on fire."** Wearing belts increases the likelihood you will be conscious after impact, less injured, and more able to get out. Seat belt failure or jamming isn't common.

5. "The government can't tell *ME* what to do! It's a free country!" Yes, it is. But what about other people's rights? When you don't wear belts and get injured, what happens when your insurance runs out? The public pays your medical bills, that's what. In my state, this costs taxpayers around *\$35 million a year*.

6. "I've heard of people who were in crashes who would have been killed if they'd been wearing belts." Who says so? Not any safety expert with whom I've ever spoken. If a collision can kill you with a belt on, then you're out of luck without the belt also, unless by a fluke. What I want is good odds. The statistics show that seat belts would prevent roughly 50% of deaths and injuries.

What about others who ride with you—what if they won't wear belts? I would say *no ride for them*. In any collision, unbelted passengers become flying objects—you can be injured if you are struck from behind by an unbelted passenger, even with your belt on.

Here's one last argument. If you are involved in a crash without belts, you may be held partially responsible for your own injuries, even if the other guy is mostly at fault in the crash. The insurance company or a court may rule that X% of your injuries were caused by your failure to protect yourself, and reduce any award by that amount. If your injuries are severe, that can cost you millions.

Rule 7: Buy and use safety devices.



In addition to seat belts, we also recommend size-appropriate child safety restraints, ABS brakes, and air bags.

Child Safety Seats: As a defensive driving practice, children under age five should be restrained in approved child safety seats, buckled properly into the vehicle, even when they seem "big" enough to use regular belts. Keep in mind your state may have different *legal* requirements, and if so, you should

comply with them.

There are different types of seats to use depending on the age, weight and size of the child. Be aware and use the correct type for your child. Buckle the seat into the center, rear seat position where there is increased protection from side impacts. A child seat should not be in the front seat, especially if there is an air bag system installed; an air bag impact can injure or kill a child in an incorrectly installed safety seat.

ABS Brakes: ABS brakes prevent uncontrolled skids during hard braking, by sensing wheel lock-up and releasing brake pressure (many times per minute), and just long enough to prevent a skid. As a result, you can still steer the vehicle, since the wheels can't lock up. Experts say that steering is faster than braking, but with ABS you can do both. You might say, "I was taught to do this with regular brakes; I pump the brakes to avoid skids." The reality is, when faced with a panic situation, you will NOT likely be able to stop or steer around a hazard using "threshold braking" (or pumping the brake). Average drivers don't practice those skills, and they **MUST** be practiced repeatedly to be mastered. Note: ABS

brakes don't usually stop you **FASTER** than you can with the correct use of standard brakes, but for most of us, the advantage is in the ability to avoid a skid and still steer. If you have ABS brakes, it is very important that you read the information about how to use them in your owner's manual—and even practice in an empty parking lot somewhere so you know how they work and feel.

Air Bags: There are some things you need to know about air bags. First of all, the opening of an air bag is not a gentle event; they open with a certain amount of violence. They are timed so as you are thrown forward, they expand to fill the intervening space to prevent your impact on harder surfaces. You can be injured by an air bag - but the injuries will usually be minor compared to those you'd incur otherwise. You do not want to be too close when one triggers, either. Sit as far back from the steering wheel as you can while still comfortably reaching all the necessary controls, and grip the wheel correctly (your vehicle's owners manual has more specific information about this). This is especially important for smaller people. These systems are being improved every year, but even the problems with earlier versions don't change the fact their positive contribution to occupant safety far outweighs their shortcomings. Many people are still walking around today because they had air bags when they needed them. One last thing, be sure to wear your seat belts too; the bags can't help you if you're not in the right place!

Rule 8: Motorcyclist—Protect Thyself!

Talk about helmets always incites vehement disagreement between folks that believe in their value and those that don't. My opinion? I haven't heard any arguments from the no-helmet crowd that make any sense, and my personal experience tells me differently.

At about age 16, I was thrown off a motorcycle at 45 mph and, after an absolutely *graceful*, parabolic trajectory, I landed on my head. I had a good helmet on and I was able to limp away (gashed leg, and I had back pain for ten years).



"Uncle Bob" Schaller dressed to ride
(and live to tell about it)

My father was broadsided at an intersection in Bakersfield, CA back about 1973. He was thrown from his motorcycle, about fifty feet or so, and landed on *his* head. His helmet (a Bell Shorty) saved his life, but he got a concussion that laid him up for a few weeks.

An acquaintance of mine, "Eric", was *sitting* in his driveway, on his shiny new Harley, polishing the gas tank. He lost his balance, fell over, and hit his head on the cement driveway (no helmet, as he wasn't going anywhere). He died 3 or 4 days later. *You can suffer fatal head injuries in an impact as low as*

4 mph.

A helmet is not a cure-all—no safety device is. I know that in any collision with a four-wheeler, I on my motorcycle am going to be the loser. What would be a "fender bender" for an auto is often death for a biker. We can easily lose a leg, have our organs destroyed, and/or suffer paralysis. We slide across asphalt grinding rocks, glass and who-knows-what-else into our flesh, all of which must then be scraped out by a big strong medical professional who uses sharp pointy objects and no anesthesia to dull the pain.

Since I love to ride, and *cannot* quit, I have a *responsibility* to protect myself as much as possible—I wear a good helmet (with both Federal Department of Transportation and Snell Foundation certification), eye protection, protective clothing, and good boots. Knowing what I know, *not* doing this just doesn't make sense.

Rule 9: Don't Run Red!



In my home town, drivers reportedly run red lights 120,000+ times each day!

First, there are two basic types of red light runners—there's the daydreamer or distracted driver who just doesn't see it, and then there's the driver who's impatient and accelerates on the yellow signal instead of stopping and waiting the average 45 seconds of a signal cycle! Some of us are guilty of both offenses. Are we really in that much of a hurry? Running red lights kills hundreds of us every year.

What constitutes running a red light? It means your vehicle entered the intersection after the signal turned red. In order to know whether you've entered an intersection, you must know where the intersection begins. The boundary is farther out than you might think, and that causes part of the problem. Here's the definition in my state: the intersection boundary (in Arizona) is the extension of the lateral curb lines (of two or more cross streets). The lateral curb line is an unpainted line drawn from corner to corner—just imagine a line drawn from the "point" of each corner (where the outer edge of the sidewalk meets the outer edge of the cross street sidewalk) across the street to the next one. The painted stop line and crosswalk are typically several feet nearer to you than the boundary, and many drivers erroneously believe the last crosswalk line marks the edge of the intersection. This error can result in an extra bit of time for the light to turn red before you actually enter the intersection, resulting in a violation. **PLEASE NOTE:** The definition of intersection varies from state to state and the



Don't be fooled by painted lines: "The box" starts at the "lateral curb line," indicated here by the dotted black line.

Bob Schaller
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differences can be significant—you need to know what the law and definition is in YOUR state.

In my state, if you entered the intersection legally (on a green or yellow signal), you have the right to clear the intersection even after it turns red. You will find that most states have similar provisions so that left turning traffic doesn't get bogged. In all of this, though, the legalities are not the most important issue.

In the defensive driving world, we say, "the green light anticipator met the red light procrastinator." The collision of these two is usually a "T-bone" - where the two vehicles meet at a 90 degree angle. It's not a "nice" collision. The typical speed through an intersection is over 50 mph! You'd find this is one of the most commonly fatal collisions - one in which seat belts and normal rear-firing air bags won't help you much.

Be careful around intersections. If you get a yellow light, stop. You can anticipate when the light is about to change, so it is no excuse to say it was too late. If you have the green light, watch for the red-light runner—look left, right, then left AGAIN to make sure the intersection is going to be safe before you enter it, even on one-way streets (because somebody might be going the wrong way AND running red lights). Red light runners are often speeding as well, so make sure you look down the road far enough to see them coming.

Running red lights is too dangerous, both for you and for others, no matter how pressured or late you are. [Slow down](#), grow some patience! [Pay attention](#) to your driving so you aren't one of the oblivious red-light runners.

Rule 10: Drive Precisely!

Sloppy driving breeds mishaps! Most everyone knows the basics of the traffic laws; signaling, proper lane position for turns, turning into the proper lanes, complying with traffic signs (like "No U-Turns," "No right turn on red," etc.), driving to the right except when passing, passing across double yellow stripes, really STOPPING for stop signs, and many others. Drivers ignore them for the sake of expediency every day. We are so impatient to get about the details of our lives that we don't take the time to do it "right." One estimate I've seen is that average drivers commit 2.5 traffic violations every mile they drive! But, those pesky, nit-picky driving rules ARE important!



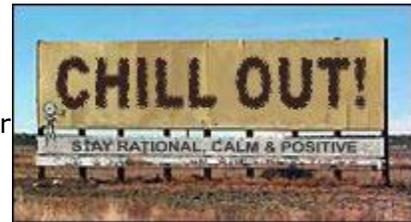
Here's an illustration of the concept applied to a different realm: the airport "traffic pattern." Occasionally in the news, a reporter will say that an aircraft crash happened because the airport had no air traffic controller, implying that it is simply chaos without one. But the fact is, uncontrolled airports are common in the aviation world and this isn't normally dangerous. ALL pilots learn basic rules for operating around airports - we enter and depart the area at set altitudes and at specific angles. We communicate our intentions

to each other on special dedicated radio frequencies. We make turns in standard directions, either left or right, depending on the dictates of the airport's neighborhood. We learn where the dangers lie and how to avoid them. We keep a vigilant eye out for other air traffic, and we KNOW where to look for them because they are following the same rules we are. This process works because everyone learns the same rules and we all have a stake in doing it right. The result when someone doesn't do it right is often a smoking hole stuffed with twisted, scorched metal.

Why is it important to follow all the little rules that don't seem to make much difference? Because it works the same way in the motoring world. Traffic rules are in place to create the consistency and uniformity that allow us to predict with some degree of confidence what the other guy is going to do, thereby avoiding conflicts and collisions. Ignoring the rules of the road helps create the chaos you see every day. So, drive precisely, follow the rules, and watch out for the other guy!

Rule 11: Chill Out!

Driving safely is all about attitude. In fact, all I can really teach you is attitude. Think about it—if you've been driving for a while, you know most all the rules—OK, so maybe you do need a refresher occasionally—and you know how to drive "defensively." You may not think you do—but you do. You learn by surviving to drive another day. What we often lose sight of are the dangers of driving—it is such a normal part of our lives that we don't consciously think about how dangerous it really is. Thinking about this occasionally is a good thing.



Driving conflicts have been with us since the beginning. "In Ohio in 1895, there were only TWO motorcars. Guess what happened?" An old photo actually showed the two horseless carriages on a collision course to a "T" intersection, both (male) drivers jabbering merrily to a carload of female passengers, and neither one looking anywhere close to the direction they were speeding! I'm not sure if that very old joke is based in truth or not, but if you have driven in this country you KNOW it could be! If you drive, you will be involved in conflicts. You can't totally control them, but you can control how you react to them. What makes the difference, and what you need to remain safe in today's traffic circus, is to keep a calm, positive, and detached attitude. This is something you can LEARN to do.

I can tell you from experience, most of the tickets or mishaps I've ever had happened when I was angry or upset (there've been a few). When your emotions are running high, your judgment can fail you, and you may not notice otherwise apparent, even obvious, dangers. If you find yourself driving while emotionally stressed or upset, it is important that you pull over, take a few deep breaths and calm down, before something happens that would be a cause for further regret.

Since we all make mistakes in our driving, it goes without saying that at any given moment, other drivers are doing exactly that—making mistakes, not intentionally malicious moves. When other drivers do something wrong, shouldn't our reaction be to let it slide, chalk it up to unintentional human error, the same as we hope they'd do for us?

Remember these words: "It doesn't matter." When other drivers make mistakes, or are rude (even intentionally), what do you gain by letting it affect your attitude or behavior? It doesn't matter. In ten minutes, you won't even remember that it happened. Since we are all human, we can't be perfect all the time. Don't let the error the other driver commits be the reason you lose control (one way or another) and have a collision, or worse. Many collisions occur when a driver is mad, upset, stressed, or distracted in some way. **Try to keep your attitude rational, calm and positive.**

Rule 12: Look Down the Road!

This means keep your eyes UP and looking down the road. Many drivers focus on the road only 5 or 8 seconds ahead. You should be looking about 15-20 seconds ahead of your vehicle, farther if you can. This gives you the time to recognize and avoid most potential hazards before they become a problem. You'll see lane restrictions or construction areas, traffic congestion, truck entrances, mishaps, etc. This technique is also useful for new drivers when learning how to steer. Keeping your eyes focused far down the road (instead of just past the end of the hood) creates stability in the roadway. In other words, it helps eliminate the unsteady weaving that is one characteristic of a novice driver.



There are other important ways to use your vision as a key tool for safe driving. Drivers should see, and be mindful of, everything around them on both sides and for several hundred feet ahead (about two blocks) and also to the rear. Do this and you'll be able to see and avoid the immediate hazards others don't notice: balls rolling into the street followed by children, cars about to pull out from parallel parking, pedestrians hidden between vehicles, runaway trucks bearing down on you from behind, etc.

Here's another tip. Don't concentrate on any one thing in your field of view for more than a second. Your focused field of vision is very narrow, less than 5 feet wide at 100 feet. Everything else you see is first picked up by your peripheral vision, which is effective at picking up motion but doesn't provide a clear view. If you don't believe this, hold your watch arm out to its full extension, and bend your wrist so you can look directly at your knuckles. Now, while staring at your knuckles, try to see what time it is without moving your eyes. While your watch is within your field of view, your view of it is unfocused. For the purposes of driving, you therefore need to keep your focused vision moving in a scanning "pattern" so that you clearly see everything that may affect your progress.

The importance of your peripheral vision is that while it is not clear or focused, it detects movement—it is your "early warning" vision. If you allow your eyes to remain fixed on any one thing, your peripheral vision immediately begins to narrow down into "tunnel" vision—and you lose your ability to detect movement to the sides. Keeping your eyes moving prevents this from occurring.

Your vision is perhaps the most important tool you have while driving. Use it effectively! Look as far down the road as possible, and use a scanning motion to take in and analyze everything that is happening around you or close enough to be a hazard.

Rule 13: Create Space: Use the "Two-Second-Plus Rule"



Guard your safety by actively creating space around your vehicle, never allowing yourself to get "boxed in." Adequate space creates time and helps you avoid collisions. Maintain at LEAST two seconds of following distance, more if you can. Adjust your position in traffic as necessary to avoid driving in others' blind areas. Don't allow yourself to be tailgated—change lanes or adjust your speed to encourage tailgaters to pass you.

Many of us were taught to use the car-length rule for following distance (one car length for every ten mph). That rule is no longer recommended because car lengths are difficult to visualize, impossible to visualize when moving, and the rule didn't provide enough space in the first place. For example, 6 car lengths at 60 mph provide roughly 108 feet of space. At 60 mph, the average alert reaction time eats 60 to 130 feet (and in the real world, closer to 135 feet for many), leaving little or no time to act. Two seconds of following distance at 60 mph, on the other hand, gives you over 176 feet of pavement to react and respond. Even at two seconds of following distance, you must respond quickly, but it can be done under normal circumstances.

How do you apply the two-second rule? Watch as the vehicle ahead passes some object—I often use shadows or marks on the road surface—then count "one-thousand-one, one thousand two." If you pass that same spot before getting to "two," you're too close—*back off!*

There ARE times when two seconds isn't enough. Leave more space when you can, and leave additional space if following a vehicle with different characteristics than yours—motorcycles or trucks, for example—or if the road surface is slippery. Motorcycles can often stop faster than you, and trucks (or trailers) impede your vision, which can cause you not to see hazards until too late. Ice can increase your stopping distance many times over, so leave lots of extra space if it might be present. Eight or ten seconds is not unreasonable around ice.

It is an error to think you cannot leave the appropriate space in heavy traffic. Some don't try, because they think other vehicles will change lanes in front of them and fill the space. It is not as common a problem as you probably think, and heavy traffic is one time when you really need the space! If someone cuts into your space, simply back off a little and get it back! Lose the ego—*"It doesn't matter"*—what counts is your safety. I once counted the

number of times other drivers cut in front of me over about fifteen miles of city freeway during rush hour traffic. Over fifteen miles, it only occurred three or four times. I have found that typical, and I use the two-second rule every day with no problems.

Here's a tip—drive a mile or two per hour slower than traffic flow. This doesn't cost any appreciable time, and traffic will be slowly pulling away from you, helping you to maintain the space. If you do this, keep to the right and out of the way for courtesy's sake. In many states, this is a legal requirement when you're driving slower than other traffic.

Pay attention to anyone driving next to your vehicle in other lanes. Adjust your speed to keep your vehicle "in the open," with no vehicles to the left or right, as much as you can. Be very uncomfortable if vehicles are "packed" around you. Traffic tends to move in packs, so watch out and try to occupy the spaces between the packs, so you have clear lanes on both sides. (This is an absolute necessity for motorcyclists!)

It is important to leave space even when stopped for a light. Leave room in front so you can pull away if the car ahead stalls or doesn't move, or if you need to move because of danger approaching from behind. You also don't want to be boxed in and unable to move for personal safety reasons. Stop far enough back so you can see the rear tires of the vehicle in front of you where they touch the pavement—this will give you room to pull out and around when necessary.

Remember, leave yourself an "out!" May all your roads be new, smooth, rubberized asphalt!

Rule 14: Drive to Communicate

You want to know the other driver sees you, and this rule will provide you with some ways to make sure they do. Use your lights and horn when necessary to let others know you are there. If you make eye contact with another driver, there is perhaps less chance he will pull out in front of you or make some other error that infringes on your space (although you cannot count on that.) Even more likely, if you are looking at the other driver, and he is NOT looking at you, then you know there is an increased possibility he might not be aware of your presence. But WAIT, there's MORE!



Back in the "olden" days, it was customary when you wanted to pass someone to quickly flash your lights to let them know you were coming around. In fact, that practice is still memorialized in law in many states: if a driver approaching from the rear flashes his lights or uses the horn to communicate his intention to pass, the driver of the vehicle being overtaken is often required by law to give way to the right, and not increase the speed of his vehicle until the other driver's pass is complete. I think it's funny how things change over the years. If you do that same thing today, the other driver will likely think you're a

jerk, and often times go out of his way NOT to "give way." About the only folks that practice that kind of courtesy today are the truck drivers; they routinely signal each other when passing, and they even flash their lights—often in unique or "signature" ways—to say thanks.

While you are driving, there are other ways to "communicate." Position yourself in a lane (left or right) so others can see you. Don't drive in other drivers' blind spots. When approaching a signal light, for example, move to the right side of your lane so that oncoming left turners can see you even if traffic ahead and in the lane to your left partially blocks the view.

Make sure to signal ALL turns. Despite what you might think, signaling is not always required by law. In my state, for example, a signal is required whenever your turn or lane change might affect other traffic. If no one is around, you don't have to signal, legally. Of course, as a defensive driving practice, you should always signal. You want to create the habit so when you DO need to signal, you don't forget.

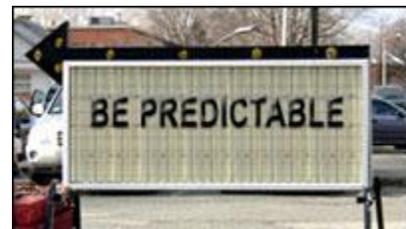
Make certain that your brake lights are functioning properly (and all your other lights, for that matter). Much of another driver's reaction time might be consumed if your brake lights don't alert them to the fact you are slowing or stopping—and they may not be left with enough space to avoid hitting you once they see you are stopping. I often tap my brakes once or twice before I apply them, so that the flashing brake lights alert the following driver that I am about to slow. Any time I see someone coming up quickly behind me, I'll flash my brake lights a few times to grab their attention. Remember that many folks are not looking much farther than the end of their hood.

Turn on your headlights in the daytime when you are driving on two-lane highways—this has been shown to increase your visibility to oncoming traffic. Turn on your lights in tunnels. Do this not so you can see (since most tunnels are well-lighted), but so everyone can see YOU. Think of the results if there were 100 cars in a tunnel, and the lights go out suddenly! If you already have your lights ON, then those other 99 drivers can see you well enough not to make you into a steel sandwich. Turn on your lights any time visibility is reduced.

With all of these tips, you communicate your presence and intentions to other drivers, and help them avoid colliding with you. And that's ALWAYS a good thing!

Rule 15: Drive Predictably

One of the best ways to create a safe environment for yourself and others while driving is to be predictable. Plainly stated, you don't want to surprise anyone. This is similar to [Rule #14](#) (Drive to Communicate), but slightly different in practice.



Have you ever seen a driver fly down the left lane of an expressway, then at the very last second, veer across all the lanes and onto an off-ramp (usually cutting off a number of

other vehicles in the process)? Driving instructors call that a "kamikaze." It's probably the most extreme example of unpredictability, the kind of unexpected sudden movement that results in many traffic deaths each year.

Be predictable! If you find that you are too close to your intended off-ramp (or turn) to be able to signal normally and slow down gradually, then forget making any sudden corrective moves and go on to the next exit, or to the next block. Turn back, or go around the block to get back where you wanted to be.

Being predictable is part of planning ahead and paying attention -- for the freeway exit, you should change lanes long before your exit ramp, getting yourself into position early so that others have plenty of time and space to react and adjust.

If you are confused about where to turn, or looking for an address, be careful not to stop dead in the road when others aren't expecting your sudden stop. Instead, pull off to the side or into a parking lot until you figure out what to do. Pay attention to your turn signals. It is not unusual to see a driver whose signal doesn't auto-cancel happily motoring along, unaware, for many blocks. No one knows WHAT they are going to do. Are they looking for a turn and unfamiliar with the area, or did they just forget that the signal was "on?"

Another trouble area is maintaining proper position during turns. Do you often see others turning wide into an incorrect lane, either left or right? If you turn from right lane to right lane, left lane to left lane, you are being predictable, and traffic flows smoother.

One of the intents (and benefits) of traffic laws is to make our movements on the road predictable. If we adhere to them, then our roads are safer for all. Next week: Always signal your intentions.

Rule 16: Always Signal Your Intentions



As a driving instructor, I often ask people what are their "pet peeves" about other drivers; a common reply is that other drivers don't signal turns and lane changes. How many times do you see drivers who do not signal? Or worse, drivers who signal a right turn but turn left? Other times, especially with vehicles whose signals do not self-cancel (trucks and motorcycles in particular), you'll see the oblivious driver cruising down the road with a signal still blinking when the turn was perhaps miles back down the road! It is important to [pay attention!](#)

Sometimes, drivers deliberately don't use turn signals. They think that if they signal a lane change before they start it, on a freeway for example, that other drivers will prevent their lane change by closing the "gap." That happens sometimes, but remember that courtesy is contagious too. Just as often, other drivers WILL make room for you if they know you want to make the change, and quite often (especially in freeway merge

situations) they may want to change lanes to the right for an exit at the same time you are merging left into the lane. If both of you are signaling, it is very easy to coordinate the movement safely. NOT signaling in situations like that is exceptionally dangerous, and the resulting wreck often includes several vehicles -- not just the ones that didn't signal.

Most of us believe that traffic law says signals are always required, but that is not always true. In some states, the law requires a signal only if your change in movement will affect another nearby driver. If you are on a lonely highway at 3:00 AM, and there is no one else around for 50 miles, it may not be required for you to signal a turn! However, the reality is that most of us drive in places and times when our changes and turns do affect others, and from a defensive driving point of view, I recommend you always signal turns and lane changes -- and doing so creates a habit. This is one area where being on auto-pilot can be a good thing! If you always signal, then you are one step closer to [being predictable](#) which is a benefit to the other drivers on the road with you. And everyone gets to feel all warm and fuzzy!

Be careful not to send the wrong message when you signal. Make sure you send clear information. For example, if you are approaching an intersection, and you intend to turn right immediately after the intersection into a service station, be careful not to signal too soon. Other oncoming drivers may interpret your signal that you intend to turn AT the intersection rather than beyond it, and they may turn left in front of you. Finally, use your signal before you start the turn or a lane change! It's not of much use if you wait until you're halfway through the turn before you use the signal!

Rule 17: Know Your Blind Spots!



It should make you uncomfortable if you are driving in other drivers' blind spots! Virtually all vehicles have blind areas—even motorcycles. (Motorcyclists are sometimes limited in how far they can twist their head to look behind them.) Yet, some drivers habitually change lanes without checking their blind areas for other vehicles. It's a good idea to adjust your position relative to other traffic to stay out of other drivers' blind spots whenever you can.

Where are your blind spots? That depends on the vehicle. A car typically has blind areas at the sides near the rear of the vehicle, meaning you cannot see anything in these areas by looking in your correctly-adjusted mirrors. Other vehicles may be blind to anything that is directly behind. Vehicles in which the driver sits very high may have forward-quarter blind spots—they may not be able to see anything low to the ground in front or to the sides near the front.

It is important to check your mirrors every 5 to 8 seconds while driving. At the same time, it's not enough *just* to check the mirrors. If you've been driving long, you already know the blind areas on most vehicles are large enough to hide other vehicles. Mirrors also will not reveal a vehicle that is changing lanes from two lanes away. Example: You are driving in the right hand lane of a multi-lane roadway, and signal to change lanes to the

left. Another vehicle in the third lane changes lanes to the right. Both of you may be trying to occupy the same place in the second lane. And it is always possible that a lane that was clear of other traffic just a second ago may quickly be occupied—traffic is often fast-moving and fluid—and empty spaces tend to fill up. It is very important to turn your head and look before making a lane change.

Tractor-trailer rigs have their own particular blind spots. These trucks are "articulated"—they "bend" in the middle. If you can picture a turning semi from above, as it jackknifes around a corner, you'll see that the side mirrors are the only rearward vision the driver has. As the tractor heads into the turn, the side mirror on the side to which the truck is turning has a view only of the side of the truck's trailer. His other mirror (away from the turn direction) is pointing off to the side, into space. In this situation, the driver cannot see anything happening directly behind him unless he sticks his head out and looks. Also, it is possible to "hide" completely behind the trailer of a large truck. Some drivers do this in order to "draft," using the suction created behind the semi to save on gas. It is not a brilliant idea to drive so close to the rear of a vehicle you can't see around or over when the driver may not even know you are there. When driving near large trucks, always try to make sure you are visible to the driver. If you can see his face in his side-view mirrors, he can see you, too.

Finally, remember that even parked vehicles have blind areas. Kids often play around cars. Before you start up and back out of your driveway, take a quick turn around the vehicle to make sure nothing, living or inanimate, is under or behind your wheels.

Rule 18: Avoid Distractions!

When we assume our driving "duties," one of the most important is that we be responsible for our actions and the results of those actions. In almost every case, a driver involved in a collision had an opportunity to avoid the collision—even when the other driver was responsible for the errors that led to the collision. Officers will tell you that a very common "excuse" heard after a collision is, "I never saw him!" Why? Quite often, it's because they were not [paying attention](#) to their surroundings and situation - and many times, that inattention was because the driver was distracted. To be a safe and responsible driver, it's important to recognize this and make constant efforts to avoid getting distracted.



Some of the most common driving distractions are: eating, drinking, applying make-up, talking on cell phones, adjusting the radio or changing CD's, dealing with rambunctious or misbehaving kids, or even just talking to passengers. Some drivers focus on single tasks (looking for an address, for example) and neglect all others. One of the most important skills for a driver is the ability to multi-task. Think about how much distance your vehicle is covering during the time you are distracted—at about 1.47 feet per second for each mile-per-hour you are driving, you can easily see how important it is to keep your mind and eyes on the road and your hands on the wheel! At 60 miles per hour, for example, every second

that elapses you cover almost 90 feet ($60 \times 1.47 = 88.2$)—all while you might be fumbling for the CD you dropped!

You can help make the road much safer for yourself, your passengers, and the others around you if you make a habit of keeping the driving task as JOB ONE, and let someone else do the map reading or change the radio station! It's important to recognize your distractions—and make conscious efforts to minimize or avoid them. **Keep it between the fence-posts!**

Rule 19: Avoid Backing Up!



Many fender-benders occur when drivers back up. Several years ago, my state purchased a fleet of fifty full-size vans for the use of state agencies. Within a couple of years, all but ONE of those vans had backing damage of one kind or another—the only one that didn't was the one used by the driving instructors to TEACH employees how to drive the vans! I have heard that many other companies with fleet vehicles report the same problem, and it's not just vans.

Since the risks are higher for collisions while backing, take special care to make sure you don't back-up without visually clearing the area behind the vehicle first. Many times each year, children are run over in their own driveways because drivers didn't look behind their vehicles first. For this reason, many companies require their drivers to place an orange traffic cone behind their vehicles when they park, forcing them to look behind it again as they pick up the cone prior to driving away.

Once you've cleared the area behind you, turn and look to the rear while you back. In trucks, you may not be able to see directly to the rear, except in the side view mirrors. It's always a good idea to have a "spotter" behind you in these circumstances, a second person standing behind your vehicle where you can see them, giving you information about how you are doing. Keep your speed very low—down to a crawl.

There are a couple more ways to protect against parking lot mishaps. If you can, pick a parking spot you can pull straight into and on to the next row, so that when you depart, you are pulling forward out of your spot instead of backing up. In busier parking lots where this is not possible, try backing into your parking space to begin with instead of backing out when you leave. The advantage is you can visually clear the parking spot as you approach it, adding a bit of extra safety, and then exit it forward instead of backing into the driving lane as you leave.

Many folks think it is illegal to back up on a roadway. This is not always the case. In my state, for example, you can back up on a roadway as long as you do so safely—but that's the real issue, isn't it? It's not easy to be safe when trying to back up on a roadway you're sharing with many other vehicles and pedestrians. One situation where you shouldn't back up is when you overrun a "stop line" at an intersection while stopping for a red light

(or stop sign). If this happens, and you find yourself straddling the crosswalk, it is usually better to stay where you are, rather than backing up to the proper place. Backing up through a crosswalk can be much more dangerous for obvious reasons.

Another exception is on controlled access highways, where it is illegal to stop or back up anywhere on the right-of-way, including shoulders, gore areas, off-ramps and access roads. As always, you should check the law in YOUR state so you know what the law is where you drive, but also consider that just because something is legal doesn't always mean it is safe.

Rule 20: Beware of Intersections!

Intersections are one of the most dangerous areas for any driver. One oft-quoted statistic is that over 80% of all city collisions involving injury or death occur within signal-light (or "controlled") intersections. Adding to the severity of intersection collisions is the average speed through a city intersection is often above 50 mph, and the typical collision is usually a "t-bone," where you are hit on your vulnerable side door.



Here's how to lessen your risks. First, as you approach an intersection on a green light, slow down before entering it and make sure to look left-right-left; look left first, look left twice, because the first danger to you is the traffic approaching from your left. If the intersection is a "blind" one - where you can't see the traffic on the cross street until they (or you) are so close as to be an immediate hazard, slow down even more. Do not enter an intersection you have not visually cleared. Some drivers "cover" the brake by moving their foot for a few seconds from the accelerator to a position just above the brake pedal, which helps eliminate the reaction time needed to begin braking.

The majority of collisions at controlled intersections happen within 4 seconds of a light change. You don't want to be in the intersection during that 4 seconds. However, if you don't immediately go when the light turns green, people behind you get irritable, yes? Try this... The first thing is make sure you stopped in the right spot. Stop far enough behind the stop line that you can see it on the pavement in front of your car - this normally gives you 10-15 feet of space. When the light turns green, take your foot off the brake and let your vehicle start to creep toward the crosswalk (easy to do with an automatic transmission).

Look left-right-left, making sure no one is running the red light and the roadway is clear of pedestrians. By this time, you are in the middle of the crosswalk (if it was clear), or close to the intersection boundary and at least a couple of seconds have elapsed. If the intersection is clear, begin to accelerate. The person behind you knew you saw the light change to green because you started to roll, so they don't usually honk, and you stayed out of the kill zone long enough to make sure it's safe to go.

There are two major reasons not to crowd the stop line (or the car in front of you) when stopping for a red light. First, as noted in the last section, it puts you in the right position to momentarily delay your entrance to the intersection when you get the green light. Second, even if you are not the first vehicle in line at the light, leave the same space in front—stop where you can see the rear tires of the next vehicle where they touch the road. If that vehicle stalls, you'll have room to pull out and around it. This also gives you added room in case a vehicle behind doesn't stop in time. If you are watchful, sometimes that few feet is enough for you to pull forward to avoid being rear-ended.

When making a left turn, don't turn your wheels in the direction you are turning until it is clear to go. If you are rear-ended while you are waiting, your already-turned wheels may cause your vehicle to veer into the oncoming traffic and a dangerous collision.

When you are waiting to make a left turn, your view of oncoming traffic can be restricted. The temptation can be great to go anyway - even though you may not be able to see all the oncoming traffic lanes. Don't do it, ever! It is never safe to make a blind left turn! Finally, if the left-turn lane is crowded, and it looks like it will take more than one light cycle to be able to make a left turn, consider continuing through and make three right turns instead. If you do this on city streets (not private property) it's legal and often quicker when traffic is congested.

Rule 21: Be a Freeway Pro!



The high speeds of controlled-access highways and the density of traffic on them require a special set of operating rules. Depending on your location, they may be called freeways, expressways, or "the super-slab," but no matter what you call them, the standard operating procedures are the same. For this rule, I'll call them "freeways" for the sake of simplicity.

First, there are forbidden actions. There is NO STOPPING on a freeway. This includes the roadway itself, the shoulder, the off and on-ramps, and the median—anywhere on freeway right-of-way. Emergency stops are permitted, but you must take extra care. The shoulder of a busy freeway is a very dangerous place. If you leave an unattended vehicle along a busy freeway, you can expect it to be towed by the authorities pretty quickly. If you are approaching a vehicle stopped along a freeway, or a pedestrian, PLEASE change lanes to the left as you pass by. Imagine yourself standing beside the freeway, with traffic less than 3 feet away passing you at 75 mph. Please give them a WIDE berth, for their safety.

It is illegal to back up on a freeway, and you may not cross a median. If you miss a ramp or need to go back for some reason, you have no choice but to proceed to the next exit and then double back. Crossover roads are for official use and emergency vehicles only. Using a crossover to turn back is an extremely dangerous move, because you must enter the high speed traffic in the left lane

A properly designed freeway on-ramp gives you the space to gain freeway speed before entering the traffic flow. Do not be tentative about accelerating to highway speed—the most

significant danger is that caused by disparate vehicle speeds. Do not drive to the end of the ramp and slow to a crawl or stop while waiting for a "break" in traffic. If you accelerate to a proper merge speed, you can merge safely, and the existing traffic will be more likely to accommodate your entry. Traffic merging onto a freeway must yield to traffic already on it, but at the same time, competent, courteous drivers will make room for others to merge. Be careful to always make a visual head-check (not just mirrors!) before changing lanes or merging.

Be aware that it is often illegal to cross a freeway "gore area." This is the triangular-shaped zone formed by the single or double white lines of an on or off-ramp as it connects with the through traffic lanes. In some states, signage prohibits crossing a gore area, in others special striping is used (double parallel white lines). In these states, you **MUST** use the lane until it ends; the end marks the beginning of the merging area. Understand that it is **NOT** illegal to cross a single, solid white line—only when they are doubled is crossing them a prohibited act (unless posted otherwise). These are federal rules, adopted by most states.

Generally, the right lane of a freeway is for entering and exiting the traffic flow. It's a "staging" lane, for use at the beginning and end of your freeway "run." The middle lanes are for through traffic, and the left lane is for passing. If you are not passing someone, you should not be driving in the left lane. Likewise, unless you are driving at a slower speed or preparing to enter or exit, you should move out of the right lane (this applies to a roadway with more than two lanes, of course).

If you encounter an emergency vehicle on a freeway, you should move to the right as much as necessary to let it pass you on the left. You are not expected to pull right and stop as you would on other roads—doing so would be dangerous. Keep in mind that emergency vehicle drivers are trained **NOT** to pass you on the right, so it's important for you to move that direction to allow them safe passage on your left.

Finally, drive at a safe speed. Excessive speeding (more than 10 mph faster than traffic flow) or traveling too slowly increases the dangers and difficulty for all. If you view the traffic on a freeway as a giant, single organism, then it becomes apparent that it is the exceptions and differences, especially in speeds, that cause problems. The freeway is one driving arena where it is important to "blend."

Rule 22: Know How to Stop!



Red light and stop sign "runners" account for a good portion of the traffic collision fatalities every year. It's important to know how to stop.

Driving is such a habit for us, and we are distracted by so many things, that it's easy to just "go through the motions," without really thinking about what we're doing. There's not a "traffic survival school" instructor anywhere that doesn't make jokes about "St. Louis" stops, or "California" stops. Others around the country probably have a different name for them. Perhaps the folks down in Florida call never quite coming

to a complete stop, but rolling through at 3 to 5 mph "Mississippi" stops. Whatever the name, they are one example of drivers just going through the motions.

Have you heard the statistic that most collisions happen close to home? It's true. There are at least a couple of reasons. First, we do most of our driving close to home, so we are more likely to be close when our number comes up. Second, when we get close to home, we let our guard down. We're almost there, so we relax, and we go on "autopilot." That's a very dangerous habit.

Here's the most important part of this rule: STOP, then YIELD. Stop means "cessation of movement," measured at your tires and wheels. Then, really look both ways and proceed only when it's safe to do so. Too many times, the driver who was supposed to stop and yield never connects his mind to his eyes to analyze what he is seeing, and then he pulls out right in front of someone. You've got to THINK about what you are seeing; collisions happen when we, or the other guy, doesn't.

I'm certain it's happened to most of us, probably more than once. I remember the first time it happened to me. I was on US-285 in central southern Colorado, driving southbound at about 3:00 in the afternoon. A rancher in an old pick-up truck on a county road pulled to the edge of the highway, stopped, watched as I approached, then pulled out when I was close enough he couldn't miss me. We did miss, but that was a miracle, I'm sure. It did make an impression on my 17-year-old mind. I am also certain he never saw me or my bright yellow Toyota until I was skidding sideways down the highway - but that's a lesson for another day.

Rolling through stop signs is a sure-fire way to get a citation. The reason is that most law enforcement officers have seen drivers and their passengers die when making this error, so they feel fairly strongly about it. Stop means STOP. Then make certain you really SEE what's out there before you roll again!

Rule 23: Know When to Use Your Headlights!

Headlights are for seeing and BEING seen! Be sure to recognize the circumstances where lights are necessary for safety. The sobering statistic is that while only 25% of the miles we drive are at night, about 50% of the fatalities occur in the darkness—25,000 people each year. What can you do about it?



Visibility is poor if you are driving away from a setting (or rising) sun. Turn on your lights so oncoming traffic can see you. At dusk, it is difficult to see in that shadowy time after sunset before it gets completely dark. Turn on your lights, and be careful to watch for hazards, bicyclists, pedestrians, or animals. Also turn your lights on when you encounter fog, dust, heavy rain or snow. Reflected light from air-suspended particulates or precipitation can blind you, so use your low beams or properly installed fog lamps. Fog lamps are mounted low, underneath your line of sight, and they can help you see when

regular headlamps cause difficulties. Without fog lamps, using low beams prevents light from being reflected back into your eyes much the same way.

If visibility is so reduced you cannot drive, pull off right as far as possible, stop, and turn OFF all lights—no 4-way flashers, no brake lights, no "parking" or marker lights. Why? Reduced depth perception caused by poor visibility and reflected light from particulate matter in the air may result in another driver following you, thinking you are still driving on the road. Investigations of major pile-up crashes suggest you are safer being invisible, as long as you can get off the road and out of the way. We realize this advice may be contrary to common thinking, but your greatest risk is that posed by drivers behind you who fail to slow—and the results are commonly fatal.

There are situations where you want to grab the other driver's attention. Turning on your headlights can be the most effective way to do this. On two-lane roads for example, there's potential for head-on conflicts with other passing vehicles. Turn on your headlights, and you make it almost impossible for the oncoming vehicle NOT to see you.

At night, headlights are a given, but take a look at their limitations. The common practice of most drivers is to dim their headlamps when approaching within about 1,000 feet of an oncoming vehicle. Inside that range, it is uncomfortable for oncoming drivers and they will "remind" you to dim. Average high beam headlight range is about 350 feet, but on low beam only 160 feet. If you are traveling at 60 mph, you are covering about 90 feet per second. The average attentive person's reaction time is .75 to 1.50 seconds. A person's reaction distance at 60 mph would be somewhere between 67.5 and 135 feet; add braking distance to that and the total is over 300 feet. Put this all together, and on low beams, if something is in your path anywhere within up to 300 feet (the length of a football field), you can't stop in time to miss it. If you cannot steer around it, you're doomed; this is called "out-driving your headlights."

Experts say the maximum safe speed for dark roadways at night is 35 or 40 mph! You can increase your night vision by purchasing a vehicle with brighter halogen or the still newer High Intensity Discharge headlights, or convert your older tungsten lamps to these newer, brighter ones. Make sure your headlamps are CLEAN—dirty lenses can reduce your lighting effectiveness by 50%! Use your brights as much as possible, but be courteous about it. Refrain from smoking at night—tobacco products contain substances that decrease your ability to see in the dark! Slow down considerably; the closer you are to that maximum safe speed, the less likely you will get into trouble. As we age, glare recovery becomes more of a problem, and some of the newer, brighter headlamps may cause increased difficulties in this regard. If you encounter oncoming headlights that are too bright, look to the right and align your vehicle with the "fog line," while keeping an eye on the approaching vehicle out of the left corner of your field of vision.

Rule 24: Slow Down in Rain and Snow!



On a summer afternoon, on I-25 south of Raton, New Mexico, I was creeping along at a reduced speed in fog and mists after a thunderstorm. Visibility was about 100 feet, and hail covered the roadway like little marbles, making it very slippery. A man in a Cherokee passed me doing

about 70 mph. Not only was the road slippery, but we couldn't see anything beyond just a few feet. As a driver for over 30 years, I've seen the same insanity in different places across the country, in heavy rain, snow, hail, fog, dust, etc. I've seen amateur drivers do it; I've seen the pros do it. Wherever visibility is bad and the road surface is slippery, there's always someone flying through without slowing even one mile-per-hour.

Out here in the west, our roads get extremely slippery in the first few minutes of rain. This can happen anywhere after a long dry spell, but it is less likely in places where it rains all the time, like the Pacific Northwest. The cause is a film of oil that accumulates on the roadway and rises when the rain begins to fall. This creates a "Slip-N-Slide." It takes about thirty minutes of steady rain to wash the road clean. Around here, we rarely get that much rain at one time, so it happens almost every time we get rain—and it will be the same for you, if you live and drive in an arid area.

Remember that control rests on four little rubber "contact pads" where your tires touch the pavement. If rainwater builds up between tire and road, your traction is broken. This is hydroplaning, and it results when the tread "channels" on your tire cannot conduct all the water from between your tire and the road, and the tire is forced to ride on top of the water that's in between, like surfing. On a dry road, NO tread gives you the best traction, which could be defined as "all rubber against all road" (I'm not talking about bald tires—think of a "slick" racing tire). Put more water between rubber and road than your tread can expel and you might as well be on ice skates. Have you ever seen the tires advertised as "rain tires?" They generally have a very deep, voluminous tread pattern that channels large amounts of rain water out from between the tire and the road surface—deeper tread means more effective water expulsion.

To a 17 year-old blond kid, driving down a paved county road in a '53 Ford wagon with tires as bald as Uncle Fester, whipping the steering wheel back and forth and seeing absolutely ZERO response directionally, this was a remarkable thing. I'm not naming any names. When hydroplaning, you can turn your wheels in gleeful abandon, but the vehicle keeps moving in whatever direction it was originally headed. To those of you who are maybe a little smarter than this boy, sliding down the highway on a layer of water and oil without directional control might be a bit disconcerting. The risk of hydroplaning increases with speed, and it doesn't usually occur at lower speeds (below 35 mph).

The first thing to do when the rain (or snow) starts to fall is slow down. The standard "driving instructor rule of thumb" is slow down by a third in the rain, and by at least half in the snow. Slow more if ice may be present. Make sure your tires are in great shape and that they are inflated properly.

Rule 25: Maintain Your Vehicle's Tires



One element of driving defensively is driving to save money. Taking good care of your vehicle can pay cash dividends, and you'll be much less likely to get stranded out on the road where you'd be vulnerable to a variety of calamities. "The devil is in the details"—ever heard that phrase? Most often, what stops you cold is a simple thing. Before a road trip

or once a week (or whatever interval you choose), spend some time maintaining your vehicle—like your TIRES, for example.

Your tires should have plenty of tread. If they don't, replace them. Use the "Lincoln Test." Insert the head of a penny into the tread of your tire—the top of Mr. Lincoln's head, first. (He won't mind, he's been dead for awhile.) At least part of the top of Honest Abe's head should disappear into the tread—if it doesn't, your tires likely need to be replaced. Not only does worn tread affect your vehicle's handling and increase your risk of hydroplaning, but worn tires pick up road hazard damage much easier than good tread. Worn tires equal more flats—that's the rule. Many newer tires have "wear bars" that show up when tread is worn, so watch for those as well.

Correct inflation is extremely important for a couple of reasons. Your automaker designed the suspension and handling of your vehicle for a particular size tire, inflated to a specific pressure. Unless you are an engineer who's adept at understanding the physics of whatever changes you make, don't do it. Tire pressures should be set to the pressure specified by the manufacturer, NOT the maximum pressure embossed on the side of the tire. A tire is made for any number of vehicles and different pressures (up to the maximum) are required for different applications. Set them to what the maker says is correct. They've designed your vehicle for that pressure, and that's where it will handle best.

Want to save a load of change? You can waste one third of the tread life of your tires by running with them 10% low on air. Take four tires at \$130 each. If the correct pressure is 36 lbs., but you consistently run them 3.6 lbs. less than that, you stand to lose \$43 worth of tire to excessive wear, each tire. That's \$172 of your hard-earned cash you threw away for want of an air gauge and some initiative on a Saturday morning. Folks who know say most of us are running with lower pressure than we should be, often more than 10% low, because we don't check them often enough.

How does low tire pressure affect vehicle handling? It's not a pretty picture! Low pressures adversely affect braking performance. Low pressures also can affect your ability to steer and corner. You can do yourself a huge favor by simply spending five or ten minutes each week with your tires. Remember that all tires lose air over time, and temperature affects the pressure. The colder the weather, the lower the pressure in your tires. Be sure to check them once every week or two. Use a good air gauge, and check them when they are cold—first thing in the morning when you haven't driven more than a mile or two.

Rule 26: Take Care of Your Vehicle



If you are not mechanically inclined, there may not be much you can do to check the brakes. You can check your fluid reservoir (if you don't know where it is, have someone who does show you). Brake fluid levels don't usually change much so a sudden change in fluid level is a red flag. You should have your brakes checked regularly since preventive work can save you money in large quantities. Let your brake pads wear down too far, and they not only won't stop you when needed, but they'll carve trenches into

your rotors, and rotors are not cheap to replace.

Don't scrimp to save money on tires or brakes; buy quality tires you can count on and don't let anyone install cheap brake parts. Your life depends on them. Last weekend, I passed by the wreck of a vehicle on US93, near Wickiup, Arizona. The vehicle had suddenly left the road to the right, cart-wheeled and exploded. It literally burned to the ground. I don't know why the crash occurred, but it's certainly possible it could have been brake or tire related, or both. If you lose braking ability or traction, you are no longer in control.

Check your coolant level. Make sure you have the cooling system serviced according to the manufacturer's schedule. Like many others, I once thought the service interval for cooling system maintenance was "optimistic." I thought my mechanic was "optimistic" about making money because I would stick to the manufacturer's recommended service plan. Here's the lesson I learned: if you let your cooling system go too long without service, the coolant loses its alkaline nature and becomes more acid. Guess what "more acid" does to your engine parts? My failure to adequately service my cooling system (involving two or three service appointments at about \$50 each over 100,000 miles) led to a more than \$1000 repair bill later. I thought I was saving money, but my water pump, thermostat, radiator and heater core, as well as all the hoses, had to be repaired or replaced. A simple flush and fill every two years would have prevented most of that damage. Your mechanic says, "Pay me now, or pay me more later."

Listen to the sounds your vehicle makes. They will often tell you when things are going wrong. A metallic scuffing sound (and feel) underneath your foot can mean your brake pads are worn and metal parts are scraping on those expensive rotors. Clanking and rattling can mean you have a steering problem. Whirring or shrieking noises under the hood can mean you're about to lose a water pump, a power steering pump, or maybe a belt. Ratcheting noises while turning may mean that your CV struts are about to go. When you hear a noise, get it checked. Waiting to see what happens next can mean lots of extra dollars spent, not only for towing, but quite often, an early repair means LESS needs to BE repaired.

Check the oil, and make sure you keep good quality, fresh oil in the vehicle, at LEAST as often as the manufacturer requires. I don't use the most expensive oil out available, but I use the grade specified by my owner's manual and I make sure it meets the rating required -- SG, SH, whatever the maker says you need. The letter grades are printed on the oil bottle label. You should always use the correct grade or higher (SJ is later than SG, for example).

Pay attention to your car's needs—and it will take you where you want to go on your roadtrip—safely!

Rule 27: Get Rid of Tailgaters

Most driving instructors will tell you not to tailgate other vehicles for several reasons. Following too closely is a factor in about 40% of collisions (in my state of Arizona), and they are not always minor in terms of injuries and fatalities. Following too closely often restricts your vision, making it likely your reaction time will be slower if something happens ahead. What is following too closely? If you are so close that you cannot stop without hitting something,



that's too close! Many states define it just this way. Remember to use the two-second-plus rule to keep a good following distance.

What about when YOU are being tailgated? This is a dangerous situation for you as well. It is important to get the guy behind you "off your back." Here are some things to keep in mind.

First, when someone is tailgating you, add their following distance to yours. Simply put, follow the vehicle ahead of you no closer than 4 seconds ($2+2=4$) so that if you have to react, you've got the extra time and space to slow or stop without the tailgater hitting you. You've got to add his reaction time to yours, because you need the extra space.

Second, the best thing to do is get the tailgater safely around you. Do this by slowing slightly below the normal flow of traffic speed. This allows him more room to pass, and your slower speed makes it easier for him to do so. This is what you WANT. Think about the frame of mind of someone that is tailgating you. If not at first, very soon the tailgater gets impatient, frustrated, and maybe angry. Do you want him behind you, where you have no control over his actions? Tailgaters typically exercise poor judgment and endanger you and others trying to pass when it is not safe. If they still cannot pass after you've slowed a bit, then change lanes or pull off to the side and let them go by. For all of my testosterone-laden brothers out there, just let it go. Your lives are worth more than your egos.

Finally, here's what NOT to do. Don't hit the brakes suddenly, and do not tap your brake lights to warn the other driver to back off. Slamming on the brakes to get rid of a tailgater is against the law almost everywhere, not to mention that some folks get shot for doing it. You'd be irritating a person who is already angry, which is not too smart. Why make the other guy's problem your problem? Tapping your brake lights to get an impatient driver to back off is also not a good tactic. While not illegal (but check -- there may be exceptions), when you tap your brake lights without actually braking, you are crying "wolf." You are training the other driver not to take your brake lights seriously. Let's say you can't get the guy off your tail and he follows you for several blocks. If something requiring immediate response happens and you actually DO hit the brakes, the tailgater's reaction time may be longer because he is thinking you are just "tapping" your brake lights again -- and by tailgating he is already too close for comfort.

Rule 28: Maintain an Even, Measured Pace

One of the most frequent factors behind collisions is the "jackrabbit" driver. He's the guy who's constantly changing speeds, changing lanes, tailgating, and otherwise not fitting into traffic. Other often interrelated causes of traffic collisions are "disparate" vehicle speeds (when one driver is driving much faster than others), impatience, and frequent lane changes.

If you observe traffic way out in front of you, you can visualize what the "flow" of traffic is, as a whole. Visualize traffic as a single, giant organism, like a river. There will be vehicles within the overall picture (or flow) that are traveling faster, and some slower, but you can see what the overall pace of traffic is.



You may be surprised to know that the actual pace of traffic is not that much faster than the speed limit. One of the principles engineers use when setting a speed limit is to consider what speed a normal, reasonable driver actually drives on that particular stretch. Try to match your speed to the overall flow (without exceeding the speed limit by more than a few miles per hour). That said, you must be willing to accept the fact that traveling faster than a posted limit puts you at risk for a citation. But usually, if you are within just a few miles per hour of a speed limit, officers will not bother you, with some obvious exceptions like school zones and construction areas where a posted limit is viewed as an absolute.

Practice my "tortoise" style of driving! Pick your lane, and stay in it. Bopping and weaving from one lane to another, trying to pass every car on the road doesn't gain you much, and *every single lane change you make increases your risk of collision*. As I commute each day, I know which lane is the best for travel under normal circumstances. This may be the lane that I know becomes my exit ramp 5 miles up the road, or it may simply be the lane that flows better most of the time. Often, I choose on the basis of safety. On my motorcycle, for example, I ride in the far right lane (at a slower speed) or in the "car pool lane" for its faster flow, and the "escape" path afforded by the left (or right) shoulder. (In my state, it is legal for motorcycles to use the car pool lanes).

Relax, resist the urge to make frequent lane changes, use [the two-second rule](#), and stay alert to the dangers posed by the jack rabbits around you! If someone needs to merge into the lane, back off a bit and let them in smoothly. In doing this, you are not only maintaining the flow, but you also set an example that others will follow. When you refuse to allow another driver to merge, the person behind you does the same thing. When you act courteously, the driver behind you ALSO will, and that helps keep traffic moving. I've seen repeatedly how discourtesy causes many of the bottlenecks that gridlock traffic every day.

Practice my "tortoise" style of driving, and, nine times out of ten, you will arrive at your destination just as quickly as the "jackrabbit." You will also not be nearly as stressed by the trip, whether it is a commute to work on Monday a.m., or a road trip to Shangri-La! Keep the shiny side up! Next week: Test for hydroplaning.

Rule 29: Check for Hydroplaning!

Hydroplaning is what happens when the tread on your tires cannot channel all the rain-water out from under your tires - or, from under each patch of tire that is supposed to be resting on the road and providing you with traction. When hydroplaning, those tire patches are riding on a layer of water instead of pavement. Many different factors can affect the speed at which a tire will hydroplane, such as water depth, speed, weight of the vehicle, width of the tire, depth of tread, and tread pattern, but *all* tires will hydroplane with the right combination of speed and water depth. Most often, you hydroplane when your fast moving vehicle hits a deep puddle. The steering wheel jerks suddenly and the vehicle veers toward the puddle. It's a good idea to slow down before hitting a puddle. Other times, when rain is pouring down in sheets, there can be enough water on the roadway to cause a vehicle to hydroplane (without apparent puddles).



An attentive driver should recognize the potential for hydroplaning and will have slowed enough to prevent the problem. If not, the first indication will be when the vehicle pulls suddenly in deeper water and begins to slide out of control. Or, you may be approaching a curve and discover that your vehicle doesn't respond to your steering input. On a straight stretch, a slight "wiggle" of the steering wheel can give you immediate information on whether you are hydroplaning or not. I wouldn't try this on a curve, however. Another possibility is to check out your tire tracks in the rear-view mirror (if you can clearly see them). You should be able to see distinct tracks on the wet surface behind you, and even see your tread pattern on the pavement for a few seconds before water covers it again. Remember that *not* hydroplaning means your tread is removing all of the water that gets between your tires and the road surface (channeling it away). If you cannot see your tracks and tread pattern *distinctly* on the road surface behind you, slow down, because you may be waterskiing on four wheels!

If you find yourself hydroplaning, do not touch the brakes. Slow down by smoothly lifting your foot from the accelerator, engage your clutch if you are driving a standard-shift vehicle, and let it coast down to the point where the hydroplaning stops. Some experts advise shifting an automatic transmission into neutral while you slow but I do not recommend this (for the same reason I wouldn't put my transmission in neutral on a downgrade). Remember that smoothness is *very* important -- you don't want to make any sudden moves. You will not be able to steer while the vehicle is hydroplaning.

You can prevent hydroplaning. Keep good tires on your vehicle. Keep your speed down in the rain (slow by at least 1/3) and if you are following another vehicle, try to drive in their tire tracks -- let their tires displace some of the water so yours don't have to work so hard. This will help you "keep the shiny side up!"

Rule 30: Know How To Recover from a Skid

What's the best way not to get into a skid? Avoid it in the first place! One of the best ways to avoid trouble on the road (not just skids) is to drive smoothly. True professionals drive so seamlessly that you do not feel anything when they shift, turn, or brake. Plan ahead, watch carefully, and slow down, especially if you are unfamiliar with the road. Skids almost always happen because the vehicle was running too fast for conditions.

Be careful when conditions might be slippery, as this is when most skids occur. But no matter what the road's surface condition is, skids are caused by driver error. Try to turn too sharply, enter a turn too quickly, or use excessive acceleration or braking, and you'll get the chance to practice skids! Keep your brakes maintained and properly adjusted, because a lateral imbalance in your brakes can cause or aggravate a skid.

There are two common types of skids. "Oversteer" (or fishtailing) occurs when your front wheels are taking a shorter path than desired and the rear-end breaks loose and fishtails. This is the result of power and side forces causing loss of traction on the rear wheels; there is too much power applied for the existing steering input and the resulting side forces cause the rear wheels to break free, often as a result of trying to accelerate out



of a turn. "Understeer" (or plowing) occurs when you have too much steering input for the power you are applying (too sharp an angle between the tires and the direction of motion), and the front wheels skid ahead as a result.

Professional driving instructors advise a new way of teaching skid recovery, instead of the old rule, which was, "Turn into the skid." They say this "new" way is more understandable to non-professionals, but either way, they adamantly say the result is the same. This change was made because many folks didn't clearly understand what "turn into the skid" means.

If you find yourself in an over-steer skid, first thing to do is get off the gas, keep your foot off the brakes, or smoothly release brake pressure if already applied, and if you are driving a standard shift vehicle, disengage the clutch. *Quickly* turn the steering wheel in the direction you want the *front* of the car to go (down the road). Specifically, *this means align your tires with the direction of your intended travel*. As your vehicle turns back in the correct direction, you must then counter steer in time to stop the turning and stay on your desired path. If you do not do this promptly, the vehicle will continue to turn past your intended direction, and you may then skid in that direction. You may have to counter-steer more than once to get things under control.

[Editor's Note: There are two situations where the previous techniques could actually make the skid recovery more difficult. When you are driving either a front-wheel drive vehicle or a rear-wheel drive with the four-wheel drive engaged, a quick reduction on the accelerator can cause a result in a loss of control that mimics what happens when the brake pedal is depressed -- namely, the front wheels are slowed faster than the rear wheels increasing the over-steer skid problem. What is generally recommended is to place the vehicle into neutral (or depress the clutch) to allow the front wheels to coast as the vehicle is turned in the direction described above. My own experience is that control is much easier to reacquire by applying a steady pressure on the gas pedal as one "drives" out of the skid, but this assumes that the driver was traveling an appropriately slow speed to begin with. Our thanks to reader L.N. from York, PA, for reminding us of this issue.]

For an under-steer skid, slightly reduce your steering input *while slowing* (without heavy braking) so you'll regain your directional control as the tires again grip the road surface. In this skid, the critical issue is to reduce speed so that you can regain a grip on the road and complete your turn. Even just a slight decrease in steering input, combined with the reduction in speed, may be enough to stop the skid from progressing.

These techniques are something you need to practice. If there are any high performance driving schools in your area, take advantage of the "safety" course they offer and you'll get the opportunity to practice skid recovery under safe, controlled conditions. You'll have a better idea of what to do, and a better idea of your own capabilities behind the wheel. I guarantee you will be a safer driver.

Rule 31: Avoid Head-On Collisions

A head-on collision is the worst crash most of us can think of. Thankfully, they are relatively rare. Still, you should be prepared for one. A young mother was on an Arizona highway, with her sister and her child. She had great visibility. In front of her was smooth, dry pavement, wide shoulders and straight road. A snake slithered out. Rather than hit the snake, she went left of center, right into the grill of a semi. All three were killed instantly in a collision that equaled running into a solid wall at over 120 miles per hour. When emergency crews arrived, the truck driver was wandering around, telling anyone who'd listen that he was so close when she swerved, he hadn't had time to turn his wheel and take his rig into the ditch to save them. He couldn't understand why she would hit a truck head on, instead of a snake.



I can tell you why. First, she wasn't [paying attention](#). Second, she reacted without thinking, in a fraction of a second, and she made the WRONG decision. What would you do if you were suddenly faced with a highway head-on? You've got only a few seconds to react, the closing speed is 200 feet per second and maybe more. At this speed you cover each MILE of pavement in 26 seconds. If you think about it ahead of time and often, so it becomes second-nature to you, you may make the right move if you ever face a head-on.

Here's how to avoid head-ons. Anticipate those places and situations where a head-on collision is possible. They can happen on curvy roads, but these typically aren't the full-on, radiator to radiator crashes you normally think of when "head-on" is mentioned. There are head-ons that occur on straight stretches, because someone is asleep or distracted. Pay attention and [look far down the road](#). If you aren't [distracted](#), you're likely to see the vehicle coming long before he's a problem. Watch for erratic behavior. [Use your headlights](#) in daylight -- it makes the other driver THINK about you -- *Why does he have his lights on?* On curvy roads especially, DON'T HUG THE CENTERLINE. Drive on the right side of your lane, and you'll miss the guy that's a little bit wide coming around a blind curve at you.

Despite your best efforts, you could someday face a head-on. First, slow down as quickly as you can without losing control; this will reduce the forces if there is an impact. If the other driver keeps coming in your lane, go off the road to the RIGHT, NOT LEFT. If he recovers at the last second, where do you think he'll go? If you hit him on his side, in the absence of witnesses who can state the truth, it's your fault (if you survive). When going off-road to the right, if you cannot avoid hitting something solid, don't hit it square, but off center, on a side if possible, with a glancing blow. *You are better off having a one-car crash off the right side of the road, than you'd be in a head-on crash at highway speed.* But if you drive right, off the road, you are going to do some damage. For this reason (it's a sure crash), some folks hang on, in the face of an oncoming head-on, until it is too late. Think about it NOW. Slow quickly, drive right, off the road if necessary, live to see tomorrow (and to read my next rule)!

Rule 32: Be a Safe Passer



I was driving from Phoenix to Kingman, one evening, on one of the most dangerous stretches of highway in Arizona. I was passed -- across double yellow lines -- by a delivery truck (similar to a large U-Haul or Ryder rental truck). I was doing the speed limit, or close to it. He passed *in the face of oncoming traffic*, at considerable risk to both of us and to others as well. When we both arrived in Kingman a couple of hours later, *he wasn't more than 1/4 mile ahead*. I'll bet you've seen similar occurrences.

A normal pass at highway speed can easily devour 1,500 feet of asphalt or more. In many places, whether passing is legal or not, there isn't that much visual range, because of rolling terrain or curves. While you are covering that 1,500 feet, you can assume that oncoming vehicles are also closing on you at nearly the same velocity, resulting in a closing speed near 200 feet per second -- about 140 mph. That 1/3 mile of passing distance can be covered by two opposing vehicles in *less than 9 seconds* -- and a normal highway pass takes approximately 15 seconds (time them yourself if you don't believe me!). Think about that!

So what's my point? First, consider whether you really need to pass at all. I think it is often a much wiser thing to do to consider how fast that guy ahead of you is going, and if he's close to your speed already, even if he's traveling a bit slower, then the smart thing to do is *back off*, [maintain a safe following distance](#) (3 or 4 seconds is great) and match his speed. Clearly, that would have been the smartest thing to do for that truck driver on the road to Kingman. We get caught up in the notion that somehow we're not "top dog" if we're not leading the pack, and we're willing to take chances to stay out there. I'll leave it to you whether that truly makes any sense.

If you decide you do need to pass, visually clear the road ahead and behind (others may be passing YOU). Make sure you have enough clear road ahead to pass without interfering with oncoming vehicles. Make sure passing is legal. [Do not tailgate](#) prior to passing -- maintain your following distance so you can see what's ahead. [Don't speed](#) while passing -- if you have to speed to pass someone, then there isn't any need to pass (and it is illegal). Finally, make sure you give the overtaken vehicle enough clearance when returning to your lane -- you should be able to see the front of the vehicle and its tires on the pavement in your mirrors. If you don't, the lane marker "bumps" can dislodge little rocks from your tires and break his windshield. He won't be happy about this.

Finally, remember that not all no-passing zones are always marked with solid yellow stripes or signs -- there are places where you are expected to know that passing is not allowed; some of these are near hill crests, approaching bridges, approaching intersections, etc.

Rule 33: Avoid the Single-Vehicle Collision



When many people think about what the most "dangerous" collision is, they don't always come up with the correct answer on first guess. Many think it is the ["T-Bone"](#) (a 90 degree impact at an intersection), or a head-on. These are serious collisions, and along with [rear-end collisions](#), account for many traffic deaths each year. But time and again, the statistics show that the collision that kills more of us than any other is the single vehicle, off the road collision.

If you think about their causes, then the ways to prevent them become obvious -- they happen when we lose control for one reason or another. The driver might be [distracted](#) for a moment, or fatigued and drift off to sleep. A one-car crash can occur with a loss of traction (and an [uncontrolled skid](#), or even with a [tire failure](#). Driving under the influence contributes to a great number of these crashes each year; in my state, recent numbers show that about 35% of crashes are a result of [impairment](#).

The "classic" one-car crash results when a vehicle does a slow drift to the right, and hits the dirt, or perhaps the rumble strips on the right shoulder of the road. Typically, the driver gets alert at this point, and overreacts, jerking the wheel left to bring the vehicle back onto the road. That "jerk" to the left causes the front left tire to strike the raised edge of the pavement at a fairly sharp angle -- often causing a rollover or a swerve into the oncoming lanes to the left. Why "classic?" Because investigating officers will tell you they see this type of mishap so often, it is now a cliché.

An ounce of prevention... The most important defense you have against death or injury in this type of collision is your [seat belt](#). In a crash, cause of death is often ejection from the vehicle (the single greatest cause of death in motor vehicle collisions). You can die from the simple impact injuries you suffer, or be run over or crushed by your own vehicle as it rolls, or be run over by others (such as emergency vehicles) as they arrive. This is not a rare occurrence.

The preventive cures are simple. Avoid distractions, avoid highway hypnosis (that groggy, hum-drum feeling you get on long, straight, flat roads), be careful about maintaining control and traction, [keep your speed prudent for the conditions](#), and make sure your tires (and other equipment, like your brakes) are in good condition and properly maintained. Make sure you are up to the task of driving -- well-rested, especially after successive days of long-driving-hours. Stay focused on the responsibility of driving, consume NO alcohol before or during driving, and be careful about over-the-counter or even prescription drugs -- they are just as dangerous as alcohol if they impair your driving abilities and just as illegal (read the label, if it says don't drive, then DON'T).

If you find yourself drifting off the right edge of the pavement, release the accelerator and let the vehicle slow as you continue straight ahead along the shoulder, then use the steering wheel to bring the vehicle smoothly back onto the pavement. You can use the brakes while slowing, but be careful not to apply them too heavily, and make sure you are not trying to turn while braking.

Rule 34: Deal with Light Glare



Many of us have seen the old WWII submarine movies (like "Run Silent, Run Deep") where the officers don dark goggles and the sub's interior lights are dimmed to red, in order to protect the night vision of the officers and "lookouts." This was a matter of life and death -- a few seconds on the ocean's surface without sharp eyes could be disastrous if there were enemy aircraft or surface ships around. When you are piloting a vehicle weighing a few thousand pounds down a

highway at 90 or 100 feet per second, having sharp night vision is equally as important for you.

Headlights these days are brighter than ever. Many vehicles are equipped with halogen lights, or even the newer "blue" high intensity discharge lights, and these take an even greater toll on your eyes' ability to recover from nighttime light glare. As we get older, our ability to recover our night-vision after exposure to bright lights is one of the first of our visual functions to diminish (a phenomenon called nyctalopia). I can tell you from my own experience as a professional driver that light glare is one of the most fatiguing things I ever encountered on the highway -- a few hours on a highway at night in heavy traffic would often result in not only fatigue, but headaches as well.

First of all, if you are particularly susceptible to light glare recovery problems (if you are, you probably already know it), make sure you slow down at night as you are particularly vulnerable to [out-driving your headlights](#). If you are faced with a driver whose lights are too bright, it is not a good practice to flash your brights at them -- although that is common practice and most people do it. Think about the results of this action; instead of having one visually handicapped driver, now we have two, and in a potential head-on situation!

It is also illegal to turn your bright lights on in the face of another driver, or approaching closely behind them, even for just a moment, and I have known highway patrolmen who cite drivers who do this to them. In my state of Arizona, the rules are that you must dim your brights within 500 feet of an approaching vehicle, and within 300 feet from behind. Your state has similar provisions.

Deal with light glare by averting your eyes slightly down and to the right. The right-side white stripe outlining the right edge of the usable roadway is called the "fog-line." One of its purposes is to provide drivers with a reference line to keep their vehicle aligned with the roadway in poor visibility situations -- and this is one such situation. Use it to keep your vehicle on the road, but keep aware of the approaching vehicle using your peripheral vision. If that vehicle starts to drift into your lane, you must be able to react quickly (see [Avoid Head-on Collisions](#)).

Rule 35: Never Play Chicken with a Train!

I am amazed at how often cars race trains to a crossing, in order to just barely cross in front of it. This seems to be a right of passage for young drivers in rural areas as they learn to drive. I have even seen this depicted in Hollywood films, as those "wild and crazy teenagers" are out having fun on Friday night. After a train runs over a vehicle at a crossing, folks often wonder why the car cut in front of the train, when the train was obviously so close and moving so fast. Kids aren't the only ones who do it; impatience on the part of hurried drivers results in hundreds of railroad crossing deaths each year.



As a train approaches you, an optical illusion is created that masks the speed of the train -- making it appear to be traveling slower than it really is. The illusion is a result of the train's size and the narrowing aspect of the tracks and train as they recede in the distance. Imagine the horror of a driver and the passengers in a vehicle as they cut in front of a train and suddenly realize they have no time to get out of its way.



According to [Operation Lifesaver](#) (a non-profit railroad safety organization), the forces of a train/car collision are very close to the same thing as a car running over and crushing an aluminum can!

Respect the train for what it is -- an irresistible force and remember that your car is not an immovable object! A train is like an ocean liner -- it may take it more than a mile to stop. Never play chicken with a train by trying to beat it to a grade crossing. Do not drive around lowered gates if the signals indicate a train is coming. Remember to wait after a train passes, until you can clearly see in both directions. Many are killed when they proceed after a train clears a crossing, and a speeding train on a second set of tracks smacks them from the other direction.

If your vehicle gets stuck on the tracks, do not hang around trying to start it, or push it off, if a train is approaching. Get away! If you have to leave your vehicle behind and you know it is going to be hit, remember to run toward the approaching train, not away from it; the debris from a collision will be thrown ahead of the train and it can overtake and kill you.

Operation Lifesaver has a video presentation showing a camera crew riding along with a working train crew. Watching it, I was struck by the incredulity of the train crews as they watched car after car (and trucks as well), dart around the gates and try to make it across even as the train was on top of the crossing. The crews see this as a kind of Russian Roulette, and they weigh the chances of each vehicle as it cuts across the tracks in front of them. They laugh nervously, knowing they have absolutely no chance of stopping even if they tried. In 2002, there were over 3,000 car-train collisions in the United States. Don't become a statistic! Be cautious around railroad tracks, and STOP COLD for trains. [Click here](#) for more information about Operation Lifesaver.

Rule 36: Beware of Stopped or Slow-Moving Vehicles



Be cautious when passing stopped or slow-moving vehicles. They often hide dangers that are not immediately apparent. The first thing to ask yourself is why? Why is the vehicle moving slowly, or why is it stopped? This rule is about patience, courtesy and taking care for others.

Stopped vehicles may have people around them who are preoccupied -- perhaps changing a tire, working under the hood, or even working under the vehicle with their legs stuck out into the road. It's not uncommon for someone stranded beside the road to forget where they are and be struck and killed by a passing vehicle when they inadvertently step into the roadway. If you see a vehicle stopped along the roadway, give them extra room. Change lanes if you can. If you cannot, at least move left in the roadway so if someone does get in the way, they will be easier to miss. In the same way, if you come up behind a vehicle stopped in the roadway (instead of beside it), be wary. Instead of automatically going around them, slow down (or stop), and figure out why they're stopped. Maybe an animal or a child is crossing in front of them. This is also a concern at a crosswalk; it is often against the law to pass a car going your way that is stopped at a crosswalk (even if you are in an adjacent lane), because that vehicle may be stopped for a reason that you cannot immediately see! Don't pass until you are SURE it is safe.

Use caution when approaching a slow-moving vehicle. It creates danger when vehicles are moving at different speeds in close proximity to each other. If you are flying up behind another vehicle, the risk of a collision is increased if a conflict develops, plus another driver moving at a very slow speed should cause you to think that something might be wrong, so you could expect other erratic behavior as well. Be prepared to react and slow down until you see that it is safe to go around.

Exercise care if you are coming up behind a line of slower vehicles. It is an error to take an immediate opportunity (if presented) to pass the entire line. Some of those drivers may have been in that line for awhile and they may be getting impatient. They may "bop" out in front of you, so plan for that possibility. Again, slow down. [If you are determined to pass](#), do so safely by passing them one at a time -- and let them know you are coming around by a quick "toot" on your horn or flashing your headlights quickly. It increases your safety if they know your intentions. This same rule applies if the slow vehicles are in a lane beside yours -- you should remain alert to the possibility that any one of them might suddenly change into your lane, and be prepared to avoid a collision if they do.

Rule 37: Practice Animal Avoidance!

As we are now into the autumn migratory season, it's time to talk about wildlife avoidance. Car/animal collisions are a problem across the United States. You might be surprised to learn that over a half million car/animal collisions occur every year! While deer are the most common animal struck, others, such as elk and moose, can pose greater dangers. They are much larger than deer, and on their tall, spindly legs, they are at a perfect height to roll over your hood and cause serious injuries after striking your windshield. Not surprisingly, the severity of injuries is usually higher if you hit an elk than if you hit a deer.



The most important thing is not to hit an animal in the first place. In wildlife country or open range (watch for the warning signs), it's important to slow down at night so you are able to stop or make last second maneuvers within your well-lighted visual range -- over 90% of animal/vehicle collisions occur at night, many near dusk or dawn. Steering is "faster" than braking, but the ability to both steer and brake simultaneously is important. When purchasing a new vehicle, be sure to buy ABS brakes and learn how to use them correctly.



If a moose, elk, or other large animal is standing in the road, don't honk, as he might consider it a rude challenge. Stop for him, and wait patiently while he nonchalantly moves off the road. You've never seen anything quite as nonchalant as a bull elk as he moves slooowly off the road. So be patient. If there is room to go very wide around him, you might try that (slowly), but I wouldn't unless it looked like he was NEVER going to move; I'd wait and let him make the first move. For a doe or a cow, one long blast on the horn may frighten them into moving off the roadway.

Plan ahead -- and wear your seat belts. Use your high-beams whenever you can -- they are more likely to cause a reflection in the animal's eyes that you can see. Know when you are most likely to encounter wildlife -- early morning, dusk, and at the times of year when the animals are moving from summer to winter grazing areas (or back).

If an animal bounds out in front of you, don't swerve immediately, but brake as quickly as possible. This will allow the deer (or whatever it is) to move out of the way. If you swerve, he may run into you as you do it. Also, where there is one animal, there are likely to be more, so be careful about looking around for others. Don't fixate on one and hit another! Finally, if you do hit an animal, don't get close to it or touch it; doing so could result in a sudden move by the animal, and you could be seriously injured .



Wildlife isn't the only four-footed hazard out there! Be wary of areas where livestock may be on the road. In the west, for example, there are many "open range" areas. What's open range? In short, it means no fences, and the cow has the right of way. You may find Elsie on the highway at any time. Some states may have laws that require you to report if you strike livestock on a roadway, so if you do hit one, be sure to call the local law enforcement agency and let them know. Better to be safe than arrested! Same goes for wildlife -- if you hit something large, call it in. Some states have laws that allow the meat to be donated to charity kitchens, orphanages, etc.

Rule 38: Don't Prevent Others from Passing



Defensive driving encompasses many different ideas and practices, one of which is understanding the effects your driving may have on others, and the results this can have on your safety and theirs. In my state of Arizona, there is a law that if another driver approaching from your rear signals by lights or horn their intention to pass you, you must allow them to pass, giving way to the right if necessary to let them around. Many other states have similar laws.

How many times, though, have you had this attitude? "I'm going the speed limit, that guy can just slow down, he doesn't NEED to pass me." I suspect there are few of us that haven't had those feelings at one time or another -- it's just human nature; but it's human nature that we need to overcome, for a couple of reasons.

First, you don't know the reason someone wants to pass you, and while it may be an unusual case, who would want to be in the way of someone who legitimately needs to get somewhere -- like a hospital -- quickly. It doesn't matter that in most such situations, it is better by far to call for emergency help and have the person transported by professionals, in an official emergency vehicle, for many good reasons. In some cases, especially in remote areas, there is no choice but to transport a sick or injured person yourself. On the outside chance this is the case, you should never prevent someone from passing.

Second, each of us, in my opinion, should drive so that the drivers around us stay calm and in control (as much as that is possible), for our OWN safety. You do not want someone behind you that is pressured, frustrated or angry. Preventing another driver from passing you creates unnecessary anger and frustration. In an unsafe attempt to get around you, your obstructive action and their anger can combine to cause serious mishaps, maybe even resulting in injuries or death to you, to them, or to some uninvolved third party. In such a case, you would be partially responsible for the problem, if not legally, certainly morally.

If another driver wants to pass, make every effort to HELP them do it, even pulling off the road if necessary. Doing so takes mere seconds and it is a courteous, safe and intelligent thing to do.

Rule 39: Drive Your Van Safely



Vans are involved in collisions at a higher rate than passenger sedans. You should think about the reasons why, especially if you drive a van infrequently and are less experienced in their characteristics. The most common van mishaps stem from backing unsafely, stopping, and rollovers. Wonder why?

Backing: Statistically, [backing](#) is an unusually risky maneuver in vans. This is because of the visibility limitations (high, or no windows causing large blind spots and the need for backing solely using side mirrors in some cases). Plan ahead so you don't have to back up -- if you don't back, then you cannot have a backing collision! Park so you can pull forward when leaving. If you can't, then do the backing when you arrive. That way, you are backing into a parking space you can plainly see is clear, rather than backing out into traffic later. Beware of blind areas, which are significantly larger than those of a passenger sedan. Use an outside spotter, or stop and get out of the vehicle to check your clearances. You should also do a walk-around inspection before backing -- other vehicles can be hidden by your van's blind spots. Make sure your mirrors are adjusted and clean. Don't back further than necessary and don't back where you cannot see.

Stopping: Don't follow other vehicles too closely when driving vans and other high profile vehicles. Remember the standard [two-second following distance rule](#)? Well, that's a minimum for perfect conditions and normal-sized vehicles. In a van, you should use a greater distance routinely, at least 3 or 4 seconds. Vans are often built on passenger car chasses, and many do not have the heavy-duty brakes and suspensions that a truck should have. This increases the distances needed for stopping and indicates the need for greater following distances. The more weight you have, the longer it takes to stop, same thing for speed. Combine the two and you have a potentially deadly situation, all while you sit in blissful, air-conditioned and distracted comfort! Reduce your following risk -- back off and slow down!

Rollovers: Vans and SUV's are often unstable driving platforms. With higher centers of gravity, the ability to carry more weight, and the added the energy developed by weight and speed, it is EASY to cause a rollover simply by introducing a sudden (even relatively minor) outside force, and especially when a turning movement introduces centrifugal force into the mix. Crosswinds, passing trucks, busses, even dust-devils or whirlwinds, acting on a high profile vehicle like a van, can introduce the sudden triggering force needed to initiate a rollover.

The weight of a fully loaded, full-size van can easily exceed 11,000 lbs. Even at slightly over 50 mph, this equals 3.2 million foot-pounds of force that will be expended in any collision. You need to make sure you, your passengers, and the occupants of the vehicles around you are not the ones that absorb these forces. When driving a van, reduce your risks. Make sure [tires are inflated properly](#) and in good shape. Make no sudden turns. Adjust the driver's seat and [wear seat belts](#), make sure mirrors are adjusted properly. Control your passengers. Do not overload the van; know the limits and don't exceed them. Keep weight loaded low in the vehicle. Use two hands on van steering wheels. [Keep speeds lower](#) and slow down before reaching curves. Check road and weather conditions. Expect wind gusts anywhere, anytime.

Rule 40: Practice Smart Bicycling



Protect your number one asset! I wasn't born rich or good looking -- so my brain is my strong point, although some would argue this. Be that as it may, I'd wear a helmet if I rode a bike. Even minor bumps can cause spills resulting in head impacts and at as little as 4 mph, a head injury can be fatal. One estimate says that as high as 85% of these injuries could be prevented by helmets.

Especially in low-light or at nighttime, a bicyclist is hard to see. I've seen bike riders with no lights, wearing black clothes, riding along in the half-light of dusk, with no clue that they are virtually invisible. Wear bright, reflective clothing or light colors. Use reflective tape; put reflectors and lights on your bike. Battery-powered, pulsating "strobe" lights are especially good for "being seen." Be aware of where and when you are hard to see and *ride to be visible*. Don't ride where you are hidden by other vehicles or obstructions.

Remember the pedestrian you knock off the sidewalk today may be the motorist who sideswipes you tomorrow! Be courteous and respectful. When approaching pedestrians, reduce speed. Give them a polite verbal warning and a wide berth. Be courteous to motorists too. Use hand signals and be careful not to impede traffic. Obey all traffic laws when riding on the roadway. Remember that no matter the cause, if there is a collision, *you lose*.

Pay attention. Be aware of your surroundings and control distractions and impediments. You need all your senses when riding -- don't wear a headset stereo. Same with cell phones; it's *dumb* to ride a bike, watch traffic, and talk on a cell phone all at the same time.

Develop smart "road moves." Be predictable. Ride with the traffic, not against it. One of the top causes of bicyclist injury is riding the wrong way and being hit by a vehicle turning right - the driver doesn't look to the right, he's looking left for the chance to get into traffic. Chances are he *never* looks right until he hears the crash of a bicycle against his right front fender.

"Take the lane" when necessary for safety. Bikes should operate single-file, as close to the right curb as possible. But if the road is too narrow for a car to pass a bike safely within the lane, the bike should "take the lane" in the interest of his own safety (to prevent the motorist from passing unsafely). Do a head check, then move left a quarter or a third of the way into the lane until the road is wide enough to accommodate both the bike and the vehicle safely again. Do the same when there are road hazards. Watch for railroad tracks, debris, uneven road surfaces, loose gravel, and parked cars that are ready to pull out -- or open their doors. Be ready to swing wide when necessary, but make sure you "check six" (look behind you) first.

Finally, make safe left turns. Bikes can join the traffic to make left turns, but while legal, this can be a dangerous thing to do. Instead, why not continue straight across an

intersection in the right lane, stop, get off your bike and use the crosswalk to cross the street, remount, and continue in the desired direction. However you do it, make sure you keep your eyes moving and beware of any impending dangers -- city intersections are dangerous and busy places, especially for a bike rider.

Rule 41: Share the Road With Bicyclists

One of the problems bicyclists face is motorists who think they don't belong on the road. As drivers, we must share roadways safely with all users, and bicyclists have every right to be out there.

Many drivers are not thinking about bicycles and often do not see them. Keep watch for bikes and be wary in places they might be around. Especially around intersections, there's potential for conflict with bikes -- watch out for riders who ignore traffic signals, make turns on the roadway, or change lanes erratically.

Bicyclists get injured or killed riding the wrong way (against the traffic). If you are exiting a drive, a side street, or a parking lot, and plan to make a right turn onto the road, look to the right for bicyclists BEFORE crossing the sidewalk. We often look only to the left, watching for a break in traffic. A rider coming from the right is often not seen; and the resultant collisions cause many injuries and deaths.

Bike lanes are for bikes, so don't drive or park in them. Be especially careful to allow bikes to merge with the flow of traffic as they get close to an intersection. Don't drive on paved shoulders (and don't use them for right turns). Yield the right of way to a bicyclist the same way as you would for any other vehicle, and follow the same rules. Don't crowd them, and don't cut them off. If you are parked along a roadway, be careful not to open your door into the path of a bike -- take a look first and make sure the path is clear.

It is inappropriate to use your horn to tell a bicyclist to get out of the way. Startling bicyclists in this way may cause them to lose control or swerve into traffic. Remember they have the right to use the road, so be careful to pass a bike only when it is safe to do so. You must give the bike plenty of room when passing. You endanger cyclists and risk a citation if you pass them too closely or cut them off when passing. The recommended clearance is five feet between your vehicle and the bike -- more if you drive a very large vehicle. If there's no room to pass safely, then your ONLY option is to follow them at a safe distance until there is.

Allow bicycles room to maneuver around hazards. There's often trash (don't litter!), broken glass, and other debris in the areas where bicycles operate. Even a sewer grate or storm drain can cause problems. Trash collects on the sides and center of a road, thrown and blown by tires and wind, then trapped by walls, fences and curbs. Bicyclists will move into traffic to avoid these dangers, and they have the right to use the ENTIRE lane if needed. Anticipate, slow down, and give them room. Allow them to negotiate railroad tracks -- they may need to move into the road to cross them.



Sharing the road with bicycles is not that difficult, but it requires us to think, use common sense, always be courteous, and drive responsibly so that we don't cause increased danger or harm.

Rule 42: Exercise Prudent Courtesy

Most drivers agree that courtesy is lacking on our roadways -- whether between operators of cars, cars and pedestrians or bicycles, between motorcycles and cars, or trucks and cars. I've often wondered whether the relative anonymity we have when driving leads us to behave in ways we'd never consider if we were meeting another person face to face.



But courtesy is important -- not only in terms of interpersonal conflicts with other drivers and the problems those cause, but also in terms of keeping traffic moving. Here's an example: you're on a freeway, with three lanes of traffic that are narrowing to two lanes just ahead. Do you encounter drivers who stay as close as they can to the rear bumper of the vehicle ahead, so the folks in the right lane cannot merge? Have you done the same thing to others? I know there are times when my little green attitude "devil" takes over. The result is a sure bottleneck and backed-up traffic. Yet if even one driver allows someone to merge in front of them, it often sets the example for others to follow -- and traffic keeps flowing. Is there some big harm in letting someone merge into your lane in front of you? The only real cost is a split second of driving time -- and you lose more than that if traffic chokes to a stop.

It's important to be courteous -- but extending courtesy to others must be done with conscious thought for unintended consequences. Here's a real world example: You are sitting in traffic, waiting for a signal light. You are in the middle of three lanes. A vehicle on your right wants to cut across traffic from a driveway and make a turn into traffic going the opposite direction as you. The driver in the right lane stops and leaves room for them to come across -- and you do the same, waving the person across in front of you. YOUR thought in waving them across your lane is to let them know YOU will allow them to cross in front of you, but in their mind, you are telling them it is safe to cross. They do not see another vehicle coming down the left lane at 45 mph -- and perhaps that driver doesn't see them either -- since they are hidden from view by your vehicle and the other traffic.

In the past fifteen years, I have seen two serious collisions happen EXACTLY this way (and one near miss). In one of them, I was driving the vehicle that was oncoming in the lane and got hit by the crossing traffic (and yes, I should have seen it coming). The other occurred three cars in front of me when others motioned a crossing driver through traffic. The near miss was a high school boy, jaywalking between cars instead of using the crosswalk at the intersection nearby, and a motorist stopped short and waved him across -- where he was almost hit by another vehicle flying down the turn lane approaching the intersection. He was so shaken he collapsed on the sidewalk. Another example is when a driver unnecessarily and abruptly stops for a jaywalker or an animal, and forces someone following behind (who isn't expecting the sudden stop) to take dangerous evasive action.

When being courteous, think about the big picture, and make sure that what you do doesn't contribute to a dangerous situation for the other guy.

Rule 43: Recognize the Futility of Rushing



It's not a good idea to try to make up time on the road when you are late. We once called this behavior "pressure driving." Pressure driving is characterized by speeding, sudden and multiple lane changes, cutting other drivers off, tailgating, or going on private property or off the road to get around obstacles or slower drivers. In short, it's acting in an intimidating manner toward other drivers. It's an example of human beings at their worst (my opinion).

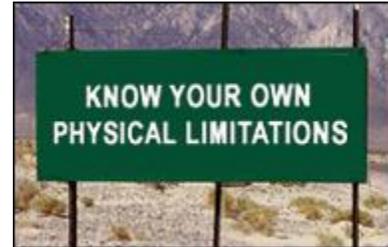
In some places, it can also be a *criminal* act. In my state, most traffic offenses are *civil*, meaning they are handled in court more informally, and you cannot be arrested for them. Criminal acts can result in arrest and detention, and they are handled by attorneys in more formal court proceedings. What driving instructors used to call pressure driving is now called "aggressive driving" under Arizona law, and it is a serious criminal offense.

What's the point, anyway? In most cities, on city streets or boulevards, the traffic lights are "timed." For example, in theory, if a street is timed at 45 mph, and you start from a new green light, accelerate promptly to 45 mph and hold that speed, provided you have no traffic in front of you, you would hit every succeeding light green for as long as the street remains "set" at 45 mph. This also means that if you drive faster than 45 mph, you will encounter almost every red light that is possible on that street! It is therefore almost impossible to make up time on city streets -- you might make it through one light, but after that you're going to hit a lot of red ones. Traffic considerations on city expressways also limit how much time you can make up when you are in a hurry.

It is far better to allow yourself an early start so you can get to your destination without having to rush. When that's not possible, and you are unavoidably late, or traffic is extraordinarily snarled, then relax and recognize that getting impatient and making driving errors that may cause you to have a collision won't really save you any time. If you're going to be late anyway, does your boss really care if it is seven minutes or nine minutes? Late is late, so there's no point in getting more stressed about it.

I don't know about you, but I've done some really stupid things behind the wheel when I've been in a hurry. If I'm ever rude to someone, it's going to be in those circumstances where I'm rushed or impatient and someone does something that causes me to lose a few seconds. Over many years of driving, I have regularly seen that even though someone passed me in a huge hurry, they don't often get anywhere. I'm usually still right with them when they take that off-ramp or make a turn, miles down the road -- or when they reach that next red light. So for me, it makes sense to practice being patient. Since I have to share the road with YOU, I obviously hope you feel the same way.

Rule 44: Make Allowances for Your Physical Limitations



What does the term "impaired driving" mean to you? If you're like many, drinking and driving comes to mind quickest. But impairment is a term that characterizes any similar insufficiency. *Webster's 2nd New Riverside Dictionary, Revised*, defines "impair" as "harm, diminish in strength, value, quality, quantity." So, *anything* that does these things to your driving capabilities "impairs" your ability to drive. At the top of my list are the physical things that prevent you from being at your best while exercising your privilege to drive. There are times when you shouldn't drive. Recognizing WHEN this applies to you is perhaps the toughest part. Our nature is to say, "Sure, I'm OK to drive," but the fact is there are times when we're NOT up to the job -- and shouldn't. Know when to say no.

A few years ago, a local man suffered a broken leg. His leg was placed in a large cast and he probably was told not to drive. But there were places to go, and he figured that with the help of a stick (to operate the accelerator pedal), he could manage. What happened next was predictable - he lost control of his vehicle, it jumped a curb, ran over a nearby phone booth, and killed a man who was in the phone booth, because the driver didn't recognize when he was not capable of operating a vehicle safely.

Even minor illnesses can prevent our ability to think clearly, and affect the motor skills we need to keep control of a vehicle. A severe headache can affect your vision, for example. The temporary loss of the use of a limb should cause us to make sure we leave the driving to someone else - at least one person would be alive today had it not been for someone who wasn't aware it was important to think about that. Pain caused by the flu or other illnesses, even minor ones, can impair our ability to function effectively as drivers.

Some of our physical disabilities are preventable -- poor vision for example. Some of us shouldn't drive without the use of glasses or contacts. In some states this is taken seriously enough that it is a criminal offense to drive without them if your license is noted with a requirement for vision correction. While adequate hearing is not a requirement for a driver license, if you have hearing problems that can be corrected with hearing aids, make sure to wear them. While non-hearing people learn to compensate for their inability to hear and can drive safely, the same may not be true for a person who has not learned to compensate -- and hearing is an important sense for most of us when it comes to driving. Finally, think about those medications you are taking -- some of them will affect your ability to operate motor vehicles. Especially if a medication is new to you, be very careful until you know exactly how it will affect you.

Be skeptical of your own complacency -- if you are thinking "no problem," then give it a second, more critical thought and make sure you know for sure. It's never worth making a mistake when lives are at stake -- whether yours or someone else's.

Rule 45: Start Rested -- Keep Fresh!

As a young guy who absolutely LIVED for vacations, I couldn't wait to get out of town. I worked the evening shift in a factory, and my habit was to pack before work, then leave immediately at shift change - stopping at home only to pick up my bride (lucky girl!). We'd drive all night, all next day and stop, exhausted, in mid-evening. After six or eight hours of rest, I'd be ready to hit the road again (early, of course) and put in another long day. We'd repeatedly drive twelve to fifteen hour days for our two weeks of vacation. For me, the driving itself was the point of the trip, but I always had to rest for days when the trip was done! She divorced me, of course.



Collision statistics show fatigue is a major collision factor. We can even identify areas where fatigue collisions commonly occur -- usually ten to fifteen hours out from major cities along the interstate highways. It's fine to be excited about your road trip, and it's great to plan for an early start, but consider that living to see your next road trip can depend on your staying rested on THIS one. Fatigue limits your coordination and ability to multitask effectively; these are key to your job as a driver, especially at higher speeds.

Smarter Bob now plans a day at home before leaving to prepare (and sometimes two). I get sufficient sleep for at least a couple of days ahead of time. I still drive long days, but the driving is punctuated with stops -- for food, historical markers (ALL of them -- I cannot pass a historical marker), gasoline, sightseeing, etc. When I stop for the day, I stop early enough to relax for awhile, then sleep for eight hours before driving again.

I am prone to drowsiness, especially in the warm morning sun after breakfast. When this happens, I find a shady spot and take a brief nap. Sometimes, even just ten minutes is enough and I am alert again, but more often, it takes twenty to thirty minutes. Don't keep driving if you begin to get drowsy; you may fall asleep without realizing it, and maybe wake up only when your tires drift onto the dirt beside the road. When drivers react suddenly to get back on the road (after falling asleep, for example), they tend to overcorrect and the vehicle is likely to roll over, often ejecting the occupants. This is the one of the most deadly accidents, and the number one type of fatal collision (single vehicle, off the road). [Wear your seat belts!](#)

Since I have learned my own tendencies (morning drowsiness, for example, or eye fatigue in the evenings), I can take steps to counteract them. I may drink coffee in the morning (before I get drowsy), or stop for the day when I feel my eyes start to get lazy. Remember to take "ten out of two" - every two hours, stop for a ten-minute break. Play games to help prevent highway hypnosis. Keeping your mind active is often an effective preventive. Talk to someone, listen to music you don't like, or sing loudly along with songs you DO like. Get fresh air, stop and walk around (or take a short nap), and finally, recognize when it is time to stop! Also, look at the tips on the [RTA Safe Driving Page](#).

Rule 46: Share the Road With Trucks



Drivers must deal safely with all obstacles and situations we encounter. We take responsibility for a safe outcome -- because that's sometimes the only way we can avoid a collision. One special hazard is that posed by heavy trucks. Commercial drivers are proven professionals; they must meet exacting, tough federal standards and maintain excellent driving records to keep their jobs. The differences between trucks and cars require special consideration -- them for us, and us for them.

Give them plenty of room. A truck is like an ocean liner -- developing massive amounts of energy to move down the road. They cannot maneuver "on a dime." A truck driver is trained to leave plenty of space around his vehicle. In our smaller vehicles, we often see this space as a convenient avenue to a lane change. Many a "four-wheeler" has darted in front of a truck and braked to make a right turn -- and found out the hard way how much extra space a truck needs to get stopped. Don't cut a truck off. When you pass them, look to see the entire front of the truck in your mirror before returning to the right lane.

Don't follow closely, either. If you are close behind the trailer, the chances are the driver cannot see you. You also cannot see the road in front of HIM (or her -- there are lots of women drivers these days). Look for his mirrors -- if you can see his FACE in the mirror, he can see you. If you don't have a good following distance and he hits the brakes (more likely if he doesn't know you are there), you run a greater risk of rear-ending him. Leave yourself extra following distance (at least 3 seconds, 4 is better), so you have more time to react and a better view of the road ahead.

Watch for his signals -- a truck makes wide turns. Many collisions occur when a truck swings left to make a wide right turn, and an unaware driver tries to pass on the right as he starts to swing right again.

Be patient. Yesterday, I watched a truck try to back into a loading dock from a busy boulevard. He had difficulty because of a tight, blind angle, and it took longer for him to get out of the way. Cars along the street he was blocking got impatient and began going around -- which made it difficult for him to finish the maneuver, and made it a longer wait for everyone. Have patience - if a truck is in your way, chances are he's aware of it. Give the driver the time and room to get YOUR goods delivered.

Finally, use your lights to communicate. It's not possible for the driver of a long rig to see exactly where the rear of the truck is. Let him know he's safely past by switching your headlights on/off. In daylight, watch his mirror and when you see him look at you, turn your lights on for a few seconds. At night, turn your lights off for a second or two. Please do NOT flash your brights (this blinds him just like it would YOU). He will know you're telling him he's clear, and usually, you'll get a blinking clearance light "thank-you" as he moves back into your lane.

Rule 47: Make Space for Parked Vehicles on a Roadway



Imagine yourself happily motoring down an Interstate highway when you have a sudden blow-out or other emergency situation. You roll (or coast) to the side, but you have limited ability to get too far off the roadway (because of obstacles or a curb), and you have to stop fairly close to the main-traveled portion of the roadway -- too close for comfort. Imagine yourself outside, trying to change that flat tire, next to the traffic lanes, people flying past you, less than 18 inches away and at break-neck speeds. Pretty scary, eh? I've seen cases where people who were trying to work beside the road underneath their vehicles lost their legs (or their lives) because they mistakenly swung them out too far toward the traffic lane. I have heard of highway patrolmen killed while making traffic stops, or while standing behind or beside their vehicles to investigate traffic collisions.

It used to be common to see virtually all approaching drivers give way to the left and give a stopped vehicle a wide berth. That person on the side of the road is in grave danger, but these days you rarely see other vehicles give them the safety cushion of an empty lane between them and the traffic. Sometimes, we don't see them soon enough to be able to switch lanes, or we find that another vehicle is already in the left lane, either passing us, or hanging right there with us and refusing to back off so we could merge in front of them (whether deliberately or not). One way we can prevent this kind of a bottleneck is to make certain to [keep our vision up and down the road at least 15 seconds ahead or farther](#).

Sometimes we are just oblivious. I believe some drivers are simply unaware of the danger they are creating for the other guy. The second you see a vehicle on the side up ahead, whether it is a stranded motorist, a highway patrolman making a stop, or even a trucker doing a brake check in advance of a downgrade, PLEASE move left and give them "a brake." Do this whether you are on a controlled access highway or on a city street. Do it even if you can't change lanes completely -- just move left as far as you can. Your courtesy could save a life.

Rule 48: Give Way on Mountain Roads



Most of us know the rules about driving to the right on multilane highways under normal conditions, and moving left only to pass. This isn't just courtesy, or standard operating procedure, but it's often a legal requirement as well. But what about roads where there is only a single lane in each direction?

If you've driven much, especially during the seasons where lots of vacationers are on the roads, you've encountered slower vehicles, sightseers, or often large vehicles (RVs or trucks) or those pulling trailers of some sort, slowing up traffic on curvy, steep mountain roads. If you've

ever had to follow such a vehicle very far without being able to pass, you know it can be very frustrating.

If you are the driver of a vehicle that's held up by a slower vehicle, think about staying calm and patient, and don't take chances. As drivers, we have the responsibility to deal safely and positively with all situations we encounter on the road -- and slow vehicles are just one of the possibilities. We stay in control and drive safely despite the crazy folks around us! Pros don't let things get to them, and neither should the rest of us. It's easier said than done, but your safety is worth more than a moment's anger.

If you are the driver of a slower vehicle, frequently give way to following traffic that wants to pass. In my state of Arizona, if you are holding up five or more vehicles that appear to want to pass, you **MUST** yield the roadway to them at the first safe opportunity. You do not have to pull off on a dangerous shoulder, but at the first improved, safe place, you must yield, stopping if necessary, and allow the following vehicles to pass. Many states have similar laws. Keep in mind this law isn't at all affected by how underpowered or overloaded your vehicle may be -- it is not a defense to say that if you had pulled off, you'd not have been able to get rolling again. If that's the case, then you are not driving a vehicle that's safe under the conditions existing -- conditions that you've created by the choices you made.

As a defensive driver, I think about the state of mind of the other drivers around me, since their unsafe actions may also endanger me. With that in mind, I will often pull off and allow even just one or two following vehicles to pass me. It is not worth it to me to have an impatient and possibly angry driver on my tail. Does it cost me time? Yes, it does! But it's *only a few seconds*, and one of my goals in life is to relax and enjoy the ride a little more, so this fits in with my overall "plan." To sum up, drive to the right if you're not passing on multilane roads, and yield to faster vehicles even on narrow mountain roads.

Rule 49: Make Safe and Sane Left Turns



Left turns at controlled intersections are one of the most dangerous driving maneuvers. They don't have to be -- the dangers can be controlled. The most important thing is to be knowledgeable -- and then MINDFUL -- of what they are.

When you enter an intersection, the immediate danger is the traffic coming from your LEFT on the cross-street. Look left first, to make sure all traffic is stopping before you enter the intersection. Look left first, then right, then left **AGAIN** before you roll into the intersection. A red light runner is going to arrive, on average, within four seconds of the light change. You don't want to be there if he does.

Pull into the intersection (unless the law in your state dictates otherwise), but leave room for left turners coming the opposite direction to do the same. Modernized intersections have off-set opposing left turn lanes, so that both directions have a good view of the oncoming traffic. Some driving instructors will tell you **NOT** to enter the intersection until it

is clear to turn. I disagree. The greatest danger in entering the intersection is the red light runner -- and after the first four seconds that danger largely evaporates. Sitting behind the crosswalk prevents others from making their left turns on that light cycle. This is unnecessary and holds up traffic flow.

Once you're out there, yield to all oncoming traffic. In my state, the left-turner must yield to ALL oncoming traffic, even if they run the red light. This is because the left-turner is almost always the last person with the opportunity to avoid collision -- since he is typically sitting still, waiting for the traffic to clear. If you do not have a clear view of the oncoming traffic, in all the lanes, then don't begin your turn. When you see that all traffic has stopped, then you can go. I am amazed at the number of drivers who gamble everything they have by making BLIND left turns. I've watched some of them die. If you think about how most people view yellow signal lights ("time to hit the gas"), you understand the dangers!

Don't turn your wheels in the direction you are turning until it is clear to go. If you are rear-ended while you are waiting, your already-turned wheels will guide your vehicle into the oncoming traffic -- so keep them straight until the way is clear to complete your turn. Then, complete the turn into the correct lane.

One last hint -- if the traffic is heavy, the left-turn lane is crowded, and it looks like it will take more than one light cycle to be able to make a left turn, consider continuing through the intersection and make three right turns instead. If you do this on side streets (not private property) it's legal and often quicker (when traffic is congested).

Rule 50: Connect Your Mind To Your Eyes!



What color is a "yield" sign? Think about that for a few moments and we'll come back to it.

Human beings are prone to [operating on "autopilot."](#)

Especially on familiar roads, our minds wander away from our immediate task to other things. It is virtually impossible to keep this from occurring, but it is important to recognize it and bring our attention back to what we're doing as often as possible -- especially if what we happen to be doing is piloting a 3,000 lb piece of machinery down the road at a brisk pace.

A few years ago, network television produced a "national driving test," sponsored by the Valvoline Corporation. One of the questions in the program involved a trip down a city boulevard -- with the viewer "riding along" as a passenger. At a specific point, the camera froze and the viewer was asked to identify the last traffic sign the camera vehicle passed. This program has been used in thousands of traffic school classes in my state over the past 15 years, and you may have guessed by now that most participants are not able to identify what that last sign was. We LOOK, but we don't SEE.

One of the most important aspects of defensive driving is recognizing impending hazards BEFORE they become a problem for you. Early recognition allows the time you need to avoid trouble. It is vitally important that you recognize and become IMMEDIATELY aware of what you see while driving. This is what I mean by "connecting your mind to your eyes." It is thinking about the possibility the ball rolling across the road may be chased by a child, that a vehicle approaching on an adjacent roadway may not stop at a cross street, and not being so deeply lost in thought that you fail to see a "no turn" sign, or a partially hidden railroad crossing up ahead. Use your EYES to see, and your MIND to analyze what you see for potential dangers.

What was the first thing that came to your mind when I asked you what color "yield" signs are? Yellow? You are not alone, if that's the case. Do you know that yield signs have not been yellow since the early 1970s? Yet, because we often don't really see them, our minds still think of them that way (yellow). Back about 1974, the United States adopted the international standards for road signs and since that time, ALL yield signs have been red and white. I guarantee you have not SEEN a yellow yield sign on a public roadway for over 20 years. Don't believe me? Check it out next time you drive. Really LOOK at one!

Rule 51: Make Defensive Stops!

You can minimize the danger of collision at intersections by learning to stop defensively.

First, make sure your deceleration to the stop doesn't surprise the guy behind you. You already know how to identify a "stale" green light -- by watching the pedestrian signal. Typically, when there are only a few seconds left, the red "Don't Walk" signal light will flash to let the pedestrians know to get out of the street. Plan ahead by starting to slow down then -- this keeps you from making sudden stops and gives the guy behind you ample warning that you are stopping (so he doesn't hit you).



Next, pay attention to WHERE you stop. Leave space in front of your vehicle. When driving a normal passenger sedan (not a van), stop so that when you look out over your hood, you see either the painted stop line on the pavement in front of you, or if you are behind another vehicle, you can see its rear tires touching the pavement. This gives you about a car-length of space between you and that vehicle or the stop line. If you drive a van, try to stop about the same distance back -- about one car length.

Stopping with space in front of you gives you room to pull forward if another vehicle comes up behind and is about to rear-end you (you're still checking those mirrors every five to eight seconds, right?). Sometimes, all you need is three or four feet to give that rear-end guy enough space to miss you. Second, if the vehicle stopped in front of you stalls or breaks

down, this leaves you room to pull around, and you won't get stuck there at the light. Third, it helps you reacquire your [two-second space cushion](#) when it's time to go. And, it helps keep you out of that intersection for a moment when the light turns green, and helps you miss the red-light runner. [Don't enter intersections for the first four seconds after a light change.](#)

When the light does change, make sure you clear the cross street (look left, right, and left AGAIN) before you enter the intersection. It is not legal to enter on the green light until the intersection is clear of traffic and pedestrians (and you do want to avoid those pesky red-light runners).

Finally, do you know WHERE you have to stop? You can stop sooner if you choose, but remember this: a signal or stop sign tells you that you HAVE to stop, the pavement markings tell you WHERE. If there is a painted stop line, stop prior to crossing it. If there is only a painted crosswalk, stop prior to crossing that. If there are NO painted markings, then your stop position is at the closest place to the intersection that you have a clear view of approaching traffic -- without entering the [intersection](#).

Rule 52: Slow Down When Approaching Intersections!

Did you know that the AVERAGE speed of a vehicle passing through a controlled intersection is about 52 mph? How many times have you approached and entered an intersection without having any idea if someone is about to run the red light?



Statistically, one of the collisions that is most likely to be fatal or cause serious injury is the one that happens when two vehicles collide at 90 degree angles. We call it a "T-bone." These are the collisions that happen in the situation described above. Imagine another vehicle hitting you at 52 mph -- right into your driver's side door. It's easy to see how people get hurt or killed in these collisions. In many cases, your air bags won't protect you in a T-bone. Even your seat belt may be of limited value, if you are hit directly from the side. From a 90-degree side angle, you are in a most vulnerable position.

The cure is a good amount of healthy skepticism around intersections and some specific defensive driving practices. [Don't trust anyone!](#) [People run red lights](#) all the time, so remember that a red light isn't what stops a car; only the driver's foot on the brake pedal can do that. How many people do you see that VISIBLY [aren't paying attention to their driving](#)? Some others are off in a world of their own, thinking about everything except what they are doing with their vehicle and oblivious to everything that's going on around them.

To the extent that you can, take responsibility for creating your own safety. After all, you cannot control what the "other guy" does. But keep in mind that IF you are [paying attention](#), almost EVERY collision can be prevented, even the ones where that other guy makes some boneheaded mistake. Unpreventable collisions are rare exceptions.

Slow down approaching intersections! Some driving instructors advise that you take your foot physically off the accelerator and hold it suspended over the brake. This eliminates some of the reaction time required if you should have to stop suddenly or slow to avoid a vehicle or pedestrian. Personally, I don't usually "cover the brake" unless I see something that I think might pose a conflict, but it is not a bad idea. Then, look "left-right-left" before you enter the intersection to make sure it is safe to cross.

Finally, if you are coming to an intersection where the approaches of the side streets are hidden from view, slow down even more and exercise caution. It is foolhardy to drive into the path of something you can't see, so don't commit yourself until you CAN see and you know it is safe.

Rule 53: Beware of Traffic Holes!



Some of my defensive driving rules focus on preventing trouble in specific danger spots. Especially when they're in tight, congested areas where it is difficult to maneuver, drivers sometimes get impatient. In situations like trying to get into traffic from a parking lot or making a left turn across heavy traffic, drivers often take advantage of any opening to "get moving." We think, with certain justification, that if we don't seize "opportunities" to "fill a hole" or take advantage of a gap in traffic, we will languish away into old age, still waiting beside the street! Especially in congested areas, we

tend to think that it doesn't pay to be too timid. This leads to traffic conflicts and increased potential for collisions.

You've learned by experience to watch for gaps in traffic -- because you KNOW that someone is very likely to barge through them and suddenly materialize in front of your vehicle. I was driving my MG-B down a busy boulevard in Phoenix years ago, approaching an intersection where I needed to make a right turn. I was decelerating in the right lane. Both lanes to the left of me were backed up with stopped vehicles all the way to the intersection (perhaps 1 or 2 city blocks). I was [carrying on a conversation](#) with my daughter, who was in the passenger seat beside me.

A vehicle coming from the opposite direction stopped in the center left turn lane, and the traffic in the two lanes immediately to my left created room for him to [make the left turn](#) in front of them, and therefore also in front of me. But [I was talking](#) to my daughter, instead of [seeing](#) the impending danger! When the left-turning vehicle "suddenly" appeared in front of me, there was no room to stop and no place to go. I was as much a surprise to

him as he was to me. The resulting collision wiped out my MG right back to the windshield. The person making the left turn was cited (and properly so) for failing to yield while making a blind left turn.

The judge dismissed that citation, stating that "sometimes these things are simply accidents." Nothing could have been further from the truth. It wasn't an "accident;" it was entirely predictable. The driver making the left turn erred in making a left turn without being able to see ALL oncoming lanes and a height-challenged sports car that was approaching in the lane he couldn't see. And the driver of that MG-B also could have prevented the crash -- by paying attention and recognizing the extremely likely chance that someone would USE a gap in congested traffic to make a left turn. This was a situation where my daughter and I could easily have been seriously injured, but we were lucky that day -- and we were wearing seat belts. The lesson I learned was to be wary of gaps in the traffic -- "traffic holes" -- and approach them with caution. Since that day, I have witnessed at least two additional collisions that occurred in precisely the same way, one of them involving a pedestrian. So watch out for "traffic holes!"

Rule 54: Turn Right, LOOK Right!



In the United States, a driver's natural tendency when making a right turn is to look left, since left is the direction the traffic is coming from (we hope). For this reason, right-turning motorists are one of the biggest dangers to bicyclists!

Many bicyclists ride on the wrong side of the street -- if you are riding a bike, you are supposed to ride WITH the flow of traffic. But for convenience or whatever other reason, you ride down the street on the wrong side (on the sidewalk) -- facing the opposing traffic.

So...Joe Driver is leaving his neighborhood supermarket, and he stops short of the sidewalk for a split second, looks to his left to make sure he's not about to be hit, then begins to pull out to make a right turn onto the street. Maybe he's in a bit of a hurry because other traffic is quickly approaching. As he crosses onto the sidewalk, Joe Bicyclist runs smack into the side of his vehicle, from his right, and the forces of impact (quite possibly) toss him out into the street where another oncoming car runs over him. He's D.O.A. This is one of the leading causes of death for bicyclists.

While a bicyclist is quicker, and he's not supposed to be riding the wrong way, you can have the same unfortunate encounter with a law-abiding pedestrian. If you are a bicyclist, or a pedestrian, your life may very well depend on following the "rules," and never assuming that a motorist will see or yield to you. You need to be aware of danger areas. Don't run down sidewalks, or across streets - walk, but don't lollygag, and keep an eye on everything around you. (If you are running, you tend to get "tunnel vision.")

Most of us know we're supposed to stop before crossing a sidewalk, when exiting a private drive, parking lot, or side street. But many of us do not think about the dangers

posed by not looking BOTH directions, to make sure that sidewalk is clear. You can probably think of other situations where you might not think about looking both ways -- but should. One way streets, for example -- might a motorist be coming down that street the WRONG way? Or, there can be places where your vision is hampered by obstacles, and dangers can pop out without warning. Be wary -- and continually work on your [situational awareness](#), whether you're a driver, a biker, or a pedestrian. [Don't take anything for granted](#). Always make it a habit to look BOTH ways, whether something should be coming from that direction or not!

Rule 55: Avoid Changing Lanes in Intersections



One of the misconceptions that people have about traffic law is that it is illegal to change lanes in an intersection. Quite often, it isn't. (Check what the law actually says in your state). One of the laws here in Arizona requires that a driver not pass another vehicle (left of the center line) either within 100 feet of an intersection, or while passing through one. Over the years, people started remembering this as a prohibition on changing lanes, rather than crossing the center line. These are two separate things.

At 3:00 a.m. on a deserted city boulevard, it may not be unsafe to change lanes in an intersection. But one of the elements of safe driving, and driving in compliance with law, is that we make a habit of doing the "right" thing. Here's an example. In my state, you must signal a turn at least 100 feet in advance. But there is an exception; if no one else is nearby that would be affected by the movement, you need not signal. If you think about this, however, it is better to always signal the turn, making it a habit rather than trying to decide in each instance whether anyone will be affected by the turn. If you practice the latter approach, eventually you will make a mistake; you won't see someone coming and NOT signal a turn you should have. You may cause a collision, or get a citation for failing to signal. So, we say ALWAYS signal, and it will be more likely you WILL signal when it is necessary for safety and legally required.

For the same reasons in reverse, you should make a habit of NOT changing lanes in intersections. Think about all the potential conflicts and the possible high speeds of traffic approaching and transiting intersections (remember the average speed of traffic through a controlled intersection is about 52 miles per hour). Think about everything that is going on out there -- turns, red light runners, people heading toward you that may be distracted by internal or external factors, pedestrians. Why add another complicating factor to that mix? It may not be illegal to change lanes in intersections, but perhaps it should be. Practice holding your position relative to other traffic and staying in the same lane until you are safely through. Make it a HABIT. Also remember to slow down before entering the intersection to give yourself extra space and time.

Rule 56: Don't Abuse the Two-Way Left Turn Lane

Some folks call the center two-way turn lane the "suicide" lane! That's a little extreme -- traffic engineers will tell you these lanes are actually pretty safe. But every day, you see people using them in ways that were never intended, and some of these actions are NOT safe. The lane I'm referring to is the one in the center of many streets and highways that both directions of traffic can use to make left turns.

I would bet that the laws governing the use of these two-way left turn lanes are hotly argued in many states; before you take ANY of the advice I offer in this article, it is essential you find out how the rules for use of this lane are written in your state, what is allowed and what isn't. Also keep in mind that no matter how the laws are written, there can be differences in enforcement practices and interpretation, which will complicate things when you are trying to stay out of trouble. What one jurisdiction allows without a raised eyebrow, another might find totally inappropriate and issue a citation.

In my state of Arizona, the two-way left turn lane must be used for all turns made from the roadway. It is also legal to use it to stage a left turn into a roadway, from a parking lot or side street, for example. You may make a left turn into the center lane, then make a right LANE CHANGE into the flow of traffic to complete the movement. It is NOT legal to use the lane for a ROLLING merge into that same traffic -- our law states that you cannot drive in the lane unless you are MAKING a left turn -- since the left turn is already completed at this point, it is illegal in my opinion to accelerate while trying to merge***. This is the most controversial aspect to the use of these lanes, and you may find that different law enforcement agencies or judges in your area have opposing views on the correct use of these lanes.



You should not use this lane to pass through any intersections (remember that "intersection" can also be a side street with a major street), and you should never use the lane to PASS other traffic. These are the most common errors, along with the natural tendency of drivers to make those rolling merges after making a left turn into a roadway. To make a left turn into the roadway correctly, you must STOP once you've made the turn into the center two-way left turn lane. Then, visually clear the traffic over your shoulder and merge right into the left traffic lane when it is safe to do so.

So why do we call them "suicide" lanes? Having traffic moving in opposite directions using these lanes at the same time can be a stress-inducer. Normally, the low speeds involved keep conflicts at a minimum. Remember that even if the other guy was in the lane first, both directions of traffic still have the right to use it, and I have never seen or heard of any specific right-of-way rules for their use. The only sane way to deal with multiple vehicles using the lane at the same time is to be unfailingly courteous and try to fit into the lane in a way that is a win/win for all participants. It's no place for road-hoggery!

***Editor's note (6/4/06) As Robert Schaller so accurately notes, the interpretation of laws and regulations by the various governmental agencies is sometimes conflicting. Reader Mike Kelly, an Arizona resident, found a different opinion in the Arizona Drivers License Manual

issued by Arizona Department of Motor Vehicles. The following language is copied directly from the [Arizona Driver License Manual](#):

"This lane is only for use of vehicles turning left in either direction. This lane provides a safe area to slow before a left turn off of the street, *or to speed up after a left turn onto a street.* Drivers should follow these rules:

- Signal before entering the lane
- Move completely into the lane
- Be alert for others using the lane
- Do not use the lane for passing or for through traffic"

With this in mind, we recommend that you contact your own state authority to determine what the allowable use of this lane is in your local city or other jurisdiction.

Rule 57: Avoid "Reverse Traffic" Lanes

Some cities designate the center lane of some major streets as "Reverse Traffic Lanes." These are used during rush hours to help move traffic that is predominantly headed in one direction. Here's an example: in Phoenix, Arizona, 7th Avenue has a normal center two-way left-turn lane between Northern Avenue and McDowell Road (a total of 6 miles). But during the morning rush hour (6:00 a.m. to 9:00 a.m.), that center lane is designated only for southbound travel as commuters head into the downtown area to begin their workday. Later, from 3:00 p.m. to 7:00 p.m., this lane is used only by northbound traffic as these same people head back north toward their homes. These lanes help keep traffic moving when the normal number of lanes would not be enough, and traffic would choke. So, you'd think they'd be a good thing. But I advise people NOT to use them, or if they do use them, to be aware of the increased dangers.



First of all, driving in a reverse traffic lane puts you in extremely close proximity to oncoming traffic -- with no buffer between you and it. These lanes are often narrower than what you normally find, and driving in them can cost you a side view mirror -- or worse.

Second, these lanes are designated for use only during specific times. Let's say, for example, that use of a particular reverse traffic lane begins at 7:00 a.m. (hours of use are usually designated by overhead signage). When was the last time you synchronized your watch with all the other expert drivers on the street? Uh-huh, I didn't think so! Left turns are usually prohibited at intersections or altogether when these lanes are in use. So, it is 7:01 a.m. on YOUR Swiss chronograph, but on the other guy's "flea market special" it is 6:59 a.m. Might you two have a misunderstanding about him making a left-turn from the lane?

You might be blithely tooling down the lane when some other soul -- someone suffering from terminal tunnel vision and oblivious to the signage AND the time -- suddenly remembers he wants to make a left turn and whips into what he thinks is a center left-turn lane. He does this at the same time YOU are thinking it is the reverse traffic high speed

lane. You (and your Hummer) try to become a hood ornament on his Cutlass Supreme. You fail, and unfortunately end up somewhere in the vicinity of his trunk.

Reverse traffic lanes were a good try at an efficient method of moving traffic without having to widen some streets and maybe condemning some private property in the process. Maybe they've saved cities some funds they really needed to use for other projects. But there are too many confused souls behind the wheels of automobiles, and the ambiguities associated with these lanes make them a poor bet for a defensive driver. The city of Tucson used to have a few of reverse-traffic lanes, but they recently eliminated their last one. Phoenix is still clinging to the idea, but I have hopes they will eventually put a stop to their use and convert the two streets back to standard two-way left-turn lanes. Meanwhile, I'll stay in one of the other lanes and that much further out of harm's way.

Rule 58: Move Right When Approaching Intersections

This rule is about visibility in heavier traffic situations, and collision prevention. You cannot [assume](#) the other guy is [paying attention](#) -- sometimes he's not -- and you cannot assume you will be readily visible. Many factors can prevent the other driver from having a clear view and keep him from [recognizing your presence](#). Take responsibility to make sure he sees you.



As you approach an intersection where there is congestion, it is often difficult for oncoming traffic (especially left-turners) to see you. Especially in darkness, many drivers have problems with depth perception and this makes it difficult to distinguish individual vehicles from the background of lights, shadows and colors. Also, backed up traffic in a left turn lane may prevent oncoming traffic from having a clear view of your approach. Finally, if it is near twilight, or if the sun is behind you, the poor light may contribute to a dangerous situation for you.

One solution to this is to move right so that you become more distinctly visible to the oncoming vehicles; this is particularly important for a motorcyclist, but I do it just the same way in my pick-up. Just the movement to the right can be enough for that oncoming driver to recognize your presence -- the relative movement involved helps his eyes to pick you out. I also move to the right side of my lane so the on-comers' view of my vehicle is not blocked by those vehicles lined up to my left to make left turns.

Rule 59: Beware of Stopped Vehicles at Crosswalks

This is a simple rule, but it is one that many drivers don't think about. When you are driving down a city street, and you see a pedestrian crossing the roadway ahead of you, you know you must yield to them; but what about the pedestrians that you cannot see?

If you are approaching a crosswalk and there is a vehicle traveling in the same direction as you that has already stopped at the



crosswalk, then you should also stop and make sure the roadway in front of that vehicle is clear before you proceed. In many places, this isn't just defensive driving, but it is also a legal requirement.

While you might see SOME pedestrians as they cross in front of that stopped car, there are others that you wouldn't see -- children are the most obvious example, or maybe a person in a wheel chair. Another person might stop to pick something up off the pavement, and then bounce back up and into your path after they do.

It is for the same reason that we do not permit passing in a school crossing area. If you pass a slow (or stopped) vehicle in a school zone, you may endanger kids that are crossing the street and hidden from your view by that vehicle. So, when driving in a school zone, we require that you maintain your relative position to other traffic that's passing through it at the same time.

Pay attention to crosswalks as you approach them, and if anyone else has stopped, slow down and stop until you figure out WHY they stopped. Then, if it is clear to go, proceed. Your caution may save someone's life.

Rule 60: Use the Center Lane for Safety

If you have a choice whether to use a controlled access roadway (or freeway, expressway, etc), or a city boulevard, you should choose the controlled access road, because your potential for a collision is less. A freeway has no intersections, and, with few exceptions, traffic is typically moving at similar speeds. This contributes to safer travel.



But what's the best lane to use on the freeway? I suggest that in most cases, the center lane is your safest bet. While you read my advice on this topic, put your thinking cap on. This particular rule is an exercise in logic and experience, and there aren't many statistics that bear on the topic. You may have a different point of view, but I want you to think about it -- just as you should every aspect of the driving task.

Some driving instructors advise drivers to always use the right lane. I don't usually agree, but I see their point. (And when I'm on my motorcycle, I often use this advice, because of other overriding concerns.) It's based on the idea that speeds are slower in the right lane. Therefore if there is a collision, the results will be less serious and result in fewer injuries. However, near on/off ramps, the right lane is used for preparing to enter and exit - it is the closest equivalent to an intersection on the freeway. With vehicles constantly transitioning on and off, there is an increased potential for collisions -- even if usually they are minor ones. My goal is to avoid ALL collisions.

Other instructors suggest the left lane is safest, because there are fewer vehicles over there. But we call that lane the "high speed lane" or the "passing lane," right? If you have a collision there, it can have serious results because of the higher speeds. Second, in many states, it is not legal to drive in the left lane unless you are passing someone -- vehicles that are not passing are required to drive to the right. Is there any such thing as a "high

speed lane?" Is the speed limit any different in the left lane? The answer to both questions is, "No." Is it legal to speed in order to pass someone? It is not, contrary to popular belief.

I believe the center lane or lanes are the safest. One of your goals should be to avoid getting "boxed in." Constantly adjust your speed as necessary to maintain a safety cushion all around your vehicle. Don't let others drive in your blind spots, and don't drive in theirs. In the center lanes, you will find it is easier to ensure you have a "way out" when you need it -- because you'll have two ways to go. If you work to maintain your space, then the only vehicles to worry about are the ones you are passing, or who are passing you. With a lane on each side, you have increased odds of a clear path if you suddenly need one.

In the center lanes, you avoid the vehicle conflicts that occur in the right lane, and you are out of the way of the speeders and tailgaters common to the left lane. Anyone coming up behind can get around, left or right, if they want. All things considered, the center lane is where I want to be.

Rule 61: Never Stop on a Freeway!



This one seems like such a no-brainer, but you see vehicles stopped on controlled access highways all the time. You may have no other choice if you have an emergency, but otherwise, take an off-ramp and find a parking lot to get out of traffic and off the road for a minute or two, to read your map or change CDs, etc.

You would think other drivers would see a vehicle stopped along a freeway shoulder and be able to keep from hitting it, but the collision statistic books are filled each year with this kind of mishap. I think a large part of the reason is that many drivers do not [keep their eyes up](#) and looking down the road -- instead, they're looking somewhere directly over their hood ornament. They don't see hazards waiting beside the road ahead. Other times, [distracted drivers](#) may be looking somewhere else within the vehicle, which makes it an even greater possibility their vehicle will drift from the roadway. Still another potential danger is the driver who is impaired and whose eyes fixate on a stopped vehicle, causing him to run straight into it. Don't discount the numbers of impaired drivers; at peak times, as many as 5 out of 10 drivers can be impaired, so these folks can be a significant source of danger to you.

All of these reasons make the side of a freeway a very dangerous place to be.

Stopping on a freeway is SO dangerous that highway patrolmen are taught never to stand between two vehicles -- to prevent being crushed if and when their patrol vehicle gets rear-ended. If my vehicle breaks down on a freeway, and I roll to a stop with a flat tire, for example, the last thing I would do is repair it there. Generally, I would suggest that you stay in the vehicle and call for a tow. Fix the flat tire somewhere off the freeway right-of-way, where other vehicles aren't blazing past at 75 miles per hour. Maybe you haven't noticed, but most drivers do not slow down for stopped vehicles -- nor will they [change lanes](#) to provide a little extra room. How many times have you seen a distracted motorist

working on a flat tire with his or her back to traffic that's mere inches away? Even worse is seeing them underneath the vehicle with their legs sticking out toward the traffic lanes.

If you decide you have to walk away from your vehicle, some highway safety experts say that it is safer to walk in the direction you were headed while driving, rather than to the rear. The logic is that other drivers are more likely to see you after they've seen your vehicle stopped, rather than the other way around. I don't know of any hard numbers that corroborate this, but it is worth thinking about. Either way, you may be safer staying IN your vehicle until help arrives, unless you can quickly walk to a SAFE spot away from your vehicle and away from the roadway (for instance up the shoulder or partly up an adjoining hillside). Such a location can be a safer place to wait for assistance, but be careful about walking along the shoulder next to the traffic to get to it -- that's where the danger is. If you have to walk along the shoulder, get as far off the roadway as you possibly can. Then, you can return to your vehicle when the service truck arrives to assist you.

Rule 62: Don't Cross a Freeway Median!



The "technical" term for an Interstate, a freeway, or an expressway is "controlled-access highway." The elements behind the safety and speed of travel on these highways are common direction, common speed, and no intersections to choke traffic or create conflicts. Simply stated, everyone should be headed in the same direction at close to the same speeds.

This uniformity and the lack of intersections has created and enhanced both safety and efficient movement. You might already know that our interstate system was first proposed and implemented by President Eisenhower. He had seen firsthand the benefits of these modern highways when he led our troops into Germany in 1944 and 1945 and saw the German Autobahn system. He saw how these high-tech roads facilitated the movement of troops and supplies. When he proposed the American Interstate System, it was the military benefits that first came to his mind. The Interstate System is also known as the National Defense Highway System.

We accelerate on the on-ramp, we decelerate on the off-ramp, but at the points we enter or exit, we should be traveling at almost the speed of traffic, if not exactly. But what happens if I need to turn around? Crossing a median requires deceleration on the left side of the roadway where the faster traffic is. The only other choice is slowing on the right shoulder, then making a kamikaze-change-of-direction across the traffic lanes into the median in the face of 70 mph traffic. Once in the median, we must find a break in the left-lane traffic. Depending on how congested the roadway is at the time, we have to either merge and accelerate back to highway speed in the left traffic lane -- where traffic is running at 70+ mph -- or once again shoot across all the lanes to the right side before merging back into traffic in the reverse direction. Does any of this sound safe to you? Yet drivers take the chance and do it every day.

The only legal and SAFE way to "turn around" on the freeway is to continue on to the next exit, crossover at the interchange, and reenter the freeway via the onramp in the desired direction. But why, then, do many freeways have crossovers? They are only for the use of highway maintenance workers and law enforcement. It is illegal for anyone else to use them, and it's extremely unsafe, so don't do it!

Rule 63: Seat Belts and Air Bags Go Together!



The term auto manufacturers use for air bags is "Supplemental Restraint Systems" -- or "SRS." Seat belts and air bags are designed to work together to prevent serious injuries.

In any crash, there are three collisions to worry about. The first collision is when your vehicle hits something - another vehicle, a tree, an embankment, etc. The second collision is when an occupant's body is thrown against the vehicle structure. The third collision is when a person's internal organs are slammed against each other or against the skeletal parts of the body. Horrifying, isn't it? But fortunately you have some "friends" in such a situation.

The vehicle is designed to collapse around you, and in so doing, it dissipates some of its stored energy. I've heard people say that cars aren't made like they used to be. Thank heavens they aren't. Since your vehicle IS made to crumple and absorb crash forces, it is more expensive to repair after the crash; but that high repair bill is a direct result of the significant crumple protection it affords you. In those old tank-like cars, the rigid impact-resistant structure transmitted ALL of the crash forces directly to the passengers -- guaranteeing that injuries would be the result of almost any crash.

Second, the modern vehicle's interior appointments are designed to cause less injury to you in the "second collision." Softer plastics, vinyls, & paddings are all meant to prevent injuries if you should be thrown into them. This is where the air bag comes into play. Manufacturers are making them "smarter" now -- they can sense the severity of a crash and match that against the physical characteristics of the person in order to better calculate the opening forces and the timing required to best protect the occupant. Manufacturers continue to add side and curtain air bags to the available systems, further defining the "safe" space for you and your passengers.

Finally, what about that "third" collision? Have you heard the term "impact ride-down." This is similar to the function of a parachute. If you jump out of an airplane, it isn't the fall that kills you. What kills is the sudden stop at the end! A parachutist avoids that sudden stop with his or her parachute. When a parachute opens, it does not slow the parachutist's fall instantly, but it creates drag and slows the user's descent gradually, over a few seconds, finally resulting in a survivable rate of descent (and impact). Your seat belt works the same way. In a crash, it stretches and tightens as you are thrown forward, resulting in a relatively gradual deceleration of your body and preventing some (if not all) of the injuries caused by

the second and third collision impacts -- this is "impact ride-down." Hopefully, an SRS system is also present to further protect you from those second and third collision forces.

This brings me to this week's rule: an air bag is a "supplemental" restraint because it does not work by itself. It works IN CONJUNCTION with your seat belts. It cannot help you if you've been thrown out of position. Correctly used, the seat belts keep you restrained in the exact place where the air bag can protect you. So make sure you use the two systems together, as their designers intended.

Rule 64: Avoid Head Injuries



What's the one part of the human body that doesn't heal quickly (or at all) if injured? Forty to fifty percent of brain injuries occur in vehicular mishaps and even in cases of minor injuries, the long term effects can be permanent and life-altering. For kids, 20% of head injuries result from cycling accidents. Legs, arms, ribs, and many other "parts" can heal, but quite often, brains don't, at least not in the way we want them to.

If a head injury is classified as "minor," most victims fully recover in 3 to 4 months (still, some don't). For moderate head injuries, recovery more likely takes 6 to 9 months. If the injury is severe, recovery for "most" victims is much less likely at all. According to Headway, an association for brain injuries in the United Kingdom, long term -- and even permanent -- effects for any level of brain injury can include:

- loss of sensations
- reduced perception, recognition and judgment
- loss of initiative
- slowed responses
- inappropriate behavior
- inability to concentrate
- personality changes
- physical disabilities and loss of basic motor skills
- poor memory
- poor cognitive and communication skills

Without even considering the physical pain and headaches involved, does this sound like the kind of life you want to live?

Once the brain is injured, complications (and further damage) can result from lack of oxygen through blood loss or blockages, and/or from rising pressure and swelling in the cranial cavity within the skull. According to Headway, "the only cure is prevention."

It is not necessary to bang your head against something in order to sustain a brain injury - the whipping movement possible in a collision (whiplash, for example) can cause injury by twisting or stretching the thousands of nerve fibers and soft tissues in the brain,

and also result in ruptures of the veins and arteries within it. Make certain your head restraints are adjusted properly, and wear your seat belts. The head restraint should be raised up where it is behind your HEAD, not your neck. In a lower position, it will actually make your injuries worse, as it acts as a pivot around which your head can rotate.

Another source of head injuries is being ejected from your vehicle. In any wrecking yard, you'll find vehicles where people were thrown into the windshield, leaving a circular shatter-pattern in front of their position. Head injuries also occur when vehicle occupants are thrown headfirst into solid objects outside -- such as a telephone pole. Wear seat belts and shoulder harnesses to keep you inside the vehicle where you are afforded some protection.

It doesn't take much force to cause serious brain injuries -- impacts as low as 4 mph can cause fatalities. I knew someone who died in a very low speed impact, and my friend's death has made this a matter of personal importance to me.

Rule 65: Don't Ride in Pick-Up Truck Beds!



The bed of a pick-up truck is for CARGO, not people. If you care about your passengers (or your pets), do not allow them to ride in the back of your truck. You may be the best driver in the world -- but you are not always totally [alert](#) while you are driving. You never know when some other driver may cut you off or cause a collision some other way. Don't put people or animals at risk by allowing them to ride in unprotected places.

In a collision, the sudden deceleration or other crash forces will launch the person out of the bed. Most of the time, no amount of "holding on" can prevent this (even at slower speeds). In some collisions I have attended, pick-up bed passengers thrown out this way have been subsequently run over by the vehicle -- or other vehicles.

Rule 66: Secure Loose Objects!



Many injuries are caused by loose objects that "fly" in a collision. When your vehicle suffers a sudden deceleration (as in a collision), the only things that stop with it, at least immediately, are the ones that are secured somehow. When the vehicle decelerates, a loose object temporarily keeps traveling at the speed the vehicle was originally going, until it hits something else in the slowing vehicle -- like you, maybe.

Even fairly light-weight objects can cause serious injuries. A tissue box weighing half a pound, at 60 mph, would feel roughly like about 30

pounds hitting you in the back of the head! I think that would hurt a little bit. Think about the damage heavier objects could do. Do you ever carry a bowling ball in your vehicle? What about canned goods in a grocery sack or two? The forces involved in more serious collisions can send these things flying like cannon shot -- and send you to the hospital.

Finally, inanimate objects are not the only loose objects that can hurt (or even kill) you. If I should fail in my responsibilities as a driver and hit something, or get hit by someone else, any passenger in my vehicle that is not belted becomes a loose object also. Drivers, safely belted into their seats, have been killed by un-belted back seat passengers who are launched forward in a crash. Babies, if not safely strapped into child-restraint seats, can be launched out windshields. Some parents think they can hold on to a baby in a crash. Because of the forces involved, that is often not the case; children can be involuntarily ejected from their parents' arms, despite their best efforts to "hang on." In my vehicle, everyone is asked to buckle up -- no belt, no ride.

Rule 67: Keep Your Child Safe in the Center



This may come as a surprise if you're not a parent, but kids aren't born with perfectly formed and completed bodies! Their skeletal structure, for one thing, isn't fully grown and "put together" at birth. Their bones aren't as supportive and rigid as yours -- and crash forces and impacts can hurt them in different ways than they hurt us. It is therefore important kids get a little more help from their parents or caregivers in terms of how and where they sit in the vehicle.

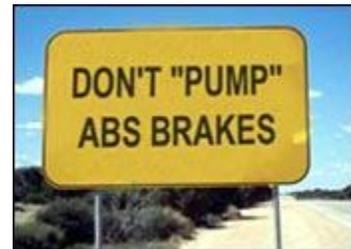
The safest place for a child is in the center of the rear seat, in a protective seat (for as long as you can keep them in it). The front-right seat in a left-hand drive vehicle is not a safe place for a smaller child (or maybe not even for you). The front-right seat in an American vehicle has sometimes been referred to as the "suicide" chair, although the driver's side is probably even a bit more dangerous, from a hazards point of view (given that the most common fatal collision in city driving is a left turn collision). But given a choice of evasive actions, a driver will instinctually turn away from a collision -- leaving it more likely the damage will be to the right front side. Couple that with the reality that a child doesn't "fit" the passive safety equipment at that location and you increase the likelihood of injury. Both seat belts and air bags can injure the occupant if they do not fit correctly. The safer choice is to put all children in the back seat. Let me state this more clearly -- children should NEVER be seated behind an armed air bag in the front-right seat. If the air bag fires, the child can be injured or even killed, the seat belt system may not secure the child well enough, and the chances of impact on that side and area are increased. If you've been reading my rules, you know I rarely ever say never.

Most vehicles have center seat belts. Placing the child and/or the safety restraint seat in the center isolates the child from the potential of rear-door side-impact injuries. Make sure you belt the seat in properly and that it fits the seat at that location. Once a child is about five years old, many state laws allow them to be seat belted rather than in a child restraint seat. Again, keep the kid in the restraint seat as long as they'll let you. As long as the seat fits them correctly, they are safer there.

Some states may still have a law that the child restraint seat is to be used until a specific age or weight. If you have a child that is heavier than other children of the same age, you might think that child can be taken out of the child seat. For example, in Arizona, the law used to be that a child had to be in the seat until they were older than 4 years of age, or more than 40 pounds. Remember what I said about kids' bone structure not being fully developed? That doesn't happen until they are between 4 and 5 years old. If a child is 2 ½ , but weighs more than 40 pounds, he needs to be in a restraint seat even more because of the extra stress and strain on his undeveloped bones. Many states are therefore changing these laws to simply state an age limit, rather than age or weight.

Rule 68: Don't "Pump" ABS Brakes!

ABS brakes have been around awhile, but there are still drivers who have not learned what they are and how they work. I was lucky enough a few years ago to get a "guest" slot in a "tactical driving course." The course teaches officers how to maneuver, control, brake, corner, back up, etc., without losing control. Having taken the course, I think it teaches very well what cars can and cannot do. I learned that high performance driving takes PRACTICE, and lots of it. Most of us don't get the chance to practice the skills required to drive at the maximum capabilities of our machines. This is why ABS brakes are so important.



Emergency braking with non-ABS brakes requires a sensitive touch on the brake pedal, using a technique called "threshold braking." Threshold braking is what most of us would call "pumping the brakes." But that's not really what it is. Awkwardly pumping the brakes with no "feel" for what the wheels and brakes are doing is counterproductive in a situation where maximum braking effort is needed. Threshold braking means applying brake pressure right up to the point of a skid, backing off just enough to prevent the skid, then constantly adjusting throughout the stop to keep the braking effort right at that point. This is not easy. You have to acquire a "feel" for it, literally. What works one millisecond won't work the next, and you have to be quick enough on the pedal to stay on the edge of a skid, without actually locking your wheels. Once mastered, the technique will stop you faster than any other way. But it takes practice to master -- I slid through the cones about ten times before I could do it. I am Bob, Killer of Cones!

Threshold braking is what ABS brake systems do FOR you. Computer-controlled sensors at each wheel "feel" when that tire is about to slip, and lessen the brake pressure at that wheel to keep the skid from occurring -- hundreds of times a second. You don't skid, and therefore you don't lose your ability to steer. This is the important part. In a panic stop with ABS brakes, you can steer around whatever it is you are trying to miss -- whether it's traffic cones or something else, like a car -- or a kid. Having tried and practiced threshold braking, and then doing the same exercise in a vehicle with ABS, I can tell you that I will never buy another vehicle without ABS brakes.

Remember this: if you try to pump ABS brakes, they will not work. Pumping ABS brakes defeats the computer's efforts to sense a wheel skid. If your vehicle has ABS brakes, when you need to stop in a hurry press the brake hard and hold your foot on the pedal no matter what it feels or sounds like. ABS brakes pulsate, they rattle, and they make noise.

Do not release the pedal until you no longer need to brake. I suggest you go to an empty parking lot somewhere, and stop hard enough to activate your ABS system. You'll then know what it feels like before you really have to use it. Doing so might save your life -- no exaggeration -- or some one else's.

Rule 69: Choose Your Route for Safety!



Life is fragile, and although we humans are tough creatures, it doesn't take much for us to exceed the limits of what our bodies can take. How do we mitigate the dangers of an active life? For me, the answer is to consider the risks and eliminate or manage them. That's why I practice defensive driving. It's learning where the dangers are and planning ahead to avoid them.

I ride my motorcycle to work on the congested and busy freeways of Phoenix, Arizona. I don't have to tell you this is a dangerous ride. A motorcyclist in the city at rush hour is mixing it up with people who are angry, harried, pressured and distracted. If I don't keep track of all of them, and ahead of myself, eventually I will end up a hood ornament on somebody's Trans Am.

I face different dangers, depending on the route I take. Riding on city streets or boulevards, I'm subject to an intersection collision (the most common fatal collision in an urban area). On the freeway, I risk being run over if I have to brake suddenly (so I carry as much following distance as I can, and I actively work to keep people from tailgating me). Another big danger is the driver making a sudden lane change without looking. My preventive measure is to keep away from clusters of traffic congestion, to keep an open lane beside me (even if it is a shoulder), and keeping an eye on everyone -- even two lanes over. I figure the risks are more manageable on the freeways, so I prefer them to riding on boulevards.

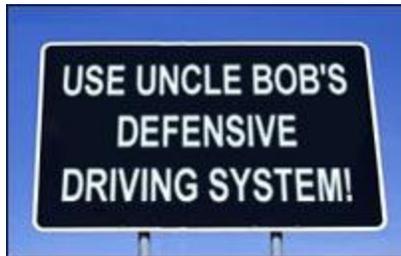
On my way home each day, I take Interstate 10 to SR51, and transition over a freeway "stack" interchange from one to the other. Once I get onto the northbound lanes of SR51, the safest place for me is in the car pool lane. To get there, I have to cross three lanes of heavy traffic. Vehicles of all kinds are changing lanes to the left while others are changing lanes to the right to exit at the next off-ramp. A motorcyclist, at that place and time, is like a crippled duck on a pond on opening day of hunting season.

I found another way. My new route goes around downtown Phoenix on a street that has little traffic, and I get onto SR51 about two miles south of that congested stack interchange. The traffic is lighter, and the lanes increase one at a time over the two miles. I can move left in a leisurely manner, and be in the car pool lane before I get to the dangerous stretch. I managed the risk by choosing a safer route.

As you plan your trips, especially over routes you use repeatedly, think about where the dangers are. Can you take a different route to avoid a particularly dangerous intersection? Can you use a route that has fewer left turns? Is there a freeway route where

the traffic is lighter, that avoids a route with thirty intersections between you and your destination? Thinking ahead and minimizing risk by making better choices is part of driving defensively.

Rule 70: Use Uncle Bob's Defensive Driving System



With this article, I've written 70 rules of defensive driving. I'm certain we could come up with a few more if we thought about it, but we've covered all the main concepts and more, from general to specific. In Rule 5, I said that if ALL drivers would do just four things, no one would ever die in a traffic crash. Please read on, and see if you don't agree (but I'm going to add a fifth...)

- 1. Pay attention.** The number one over-arching cause of traffic collisions is inattention and distraction. Almost every collision involves one or both of these two related errors. When I'm behind the wheel, driving is my number one task. It is my responsibility to keep my ton of metal, rubber and glass pointed safely down the road without hitting you or your property. I am not honoring that responsibility when I'm daydreaming, eating a burger, or chatting away on my cell phone. I don't have the right to endanger you. Paying attention is the first and most important way I can shoulder that critical responsibility.
- 2. Don't speed.** Speeders like to say that speeding doesn't "cause" collisions. That's rubbish. Speeding (driving at a speed higher than is safe for conditions) leaves you with less reaction time and distance than you may need to avoid a crash. An honest, intelligent person has to come to the conclusion that the cause of such a crash is the excessive speed. Speed also increases the risk of serious injury in a crash. "Speed not reasonable and prudent" is the most common measurable element in traffic collisions.
- 3. Use the Two-Second Rule.** About 40% of all collisions are rear-end collisions. Avoid them by maintaining your following distance. This rule is so basic, and yet it is one of the most ignored. Also keep in mind that two seconds is the minimum -- three or four is better. Stretch it out when you can, because sometimes two seconds isn't enough. Don't believe for a second you can't use this technique in heavy traffic; you can, and that's when it is most important.
- 4. Don't drive impaired.** Wait at least two hours *for each drink* before you drive. Staying on top of the driving task means being 100% there to do the job. You need all your skills and faculties for driving. Even small amounts of alcohol impair the most important skills you need to drive safely. Studies have proven that impairment starts with alcohol concentrations as low as .03% or .04% -- about half of the "legal limit" in most states, and the first thing affected is your judgment. Not surprisingly, studies have linked impaired driving to increased incidences of reckless driving. Typically, about 30% to 50% of all collisions have driver impairment as a factor, and fatality is more likely in alcohol-related crashes.
- 5. Buy and use safety equipment.** Automotive safety engineering has come a long way. Today's automobile is the safest vehicle ever produced for ground transportation. Take

advantage of its safety features! Buy ABS brakes, traction-control systems, & air bags. Wear your safety belts. The use of safety belts alone typically cuts the rate of injury and death in traffic collisions by about 50%.

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