

**Motorcycle Safety Foundation**  
**RETS LEXICON**

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**Vocabulary, Terms and Phrases for MSF's Rider Education and Training System (RETS)**

**This document provides a list of vocabulary terms and phrases related to two-wheel motorcycling in general. It is intended as a reference for communicating motorcycle-related safety information. A motorcycle owner's manual should be referenced for motorcycle-specific terminology, meaning and use.**

**Anti-lock Brakes; Anti-lock Braking System (ABS)**

Type of braking system that activates when a rider applies too much pressure on the brake controls; ABS automatically releases brake pressure just prior to wheel lockup. The system senses when a wheel first begins to lockup and automatically releases pressure to allow the wheel to begin to roll again. Helps maintain traction and prevent skidding so change of direction is still possible.

**Acceleration Lane**

A portion of an expressway or limited-access highway designed to allow vehicles to gain speed to match the speed of traffic flow in order to blend into a safe gap. It is usually an extension of the entry ramp. There are locations where the entrance ramp and acceleration lane are combined, and this is referred to as a weave lane.

**Accident**

Technically, a pure chance occurrence; an act of God. Typically used to describe a traffic mishap/collision/crash (*crash* is often the preferred term as most crashes can be traced to problems related to human factors). Realistically, such mishaps are almost always the result of a combination of factors and/or negligent acts.

**Angle Park**

Parking a vehicle at an angle to the curb; usually approximately a 30-degree angle to the curb vs. perpendicular parking that is 90 degrees.

**ANSI Z87.1**

American National Standards Institute Standard Z 87.1; impact/shatter-resistant standard used by many government agencies as a standard for eye protection.

**Apex**

The location in a curve where a motorcyclist comes closest to the inside edge of the road (or centerline); usually the slowest point in the curve.

**Attitude**

A predisposition to act or behave a certain way; changes or modifies with knowledge and experience.

**Attitude State**

Refers to the three components of personality (from transactional analysis): Child, Parent and Adult. It can be used in learning activities to address behavior and choices.

**BAC**

An abbreviation for Blood Alcohol Concentration. BAC expresses the percent of alcohol in the body as a percentage of the blood (proportion of alcohol to blood).

**Bike Bonding**

Refers to the connection of the rider and motorcycle. Good bike bonding means riding skills are mostly automated and a rider is "one with the bike." It generally means a rider can comfortably and skillfully handle a personal motorcycle.

**Black Ice**

A layer of clear ice over the pavement that allows the black color of the pavement to show through.

**Blind Spot**

Mostly refers to the area behind or beside a vehicle that cannot be seen with rear view mirrors, or is blocked from view by an object. Large objects and vehicles in the front can also block a view and be considered a blind spot.

**Blip**

A short, quick throttle input between downshifts to bring engine RPMs up to match road speed; enhances smoothness.

**Body Armor**

Padding, hard-shelled material or other impact-absorbing material in motorcyclist apparel to help protect a rider in a crash.

**Brake-Assisted Steering**

Using the brakes in a curve to help adjust turning radius toward the inside of a curve; aims to help riders with their negotiation of a curve to avoid too fast of an entry speed or cornering speed.

**Brake Fade**

Loss of a braking capability; occurs when the brakes heat up and prevent the brake pads from working properly. This is a reason to avoid "riding the brakes." Brake fade is also possible in wet conditions due to wet brake components.

**Braking Distance**

Space traveled between brake application and a completed stop. The distance required to bring a motorcycle to a complete stop once the brakes are applied. This is the 3<sup>rd</sup> part of total stopping distance (added to perception and reaction).

### Breathalyzer

A device used to measure Blood Alcohol Concentration (BAC) by analyzing exhaled breath; most devices used today are called Intoxilyzers.

### Bridge Gratings

The open steel mesh/grating on a bridge that allows water drainage from the bridge roadway surface; may be slippery when wet. Even when surfaces are not wet, the steel gratings provide less traction than asphalt or concrete surfaces. Sudden acceleration, deceleration or steering inputs/leaning may result in a loss of traction.

### Broken White Line

The roadway marking (“dashed line”) between two lanes of traffic traveling in the same direction. A solid white line discourages passing.

### Broken Yellow Line

The roadway marking (“dashed line”) between two lanes of traffic traveling in opposite directions. A solid yellow line prohibits passing.

### Bunching

A condition that occurs when faster-moving vehicles close up behind a slower vehicle; lessens escape areas should an emergency develop because of the reduction in time and space safety margins.

### Bungee Cord

An elastic cord used for securing packages or cargo to a motorcycle. The cord usually has either a fixed or adjustable hook on each end for attachment to the vehicle.

### Camber

Surface angle or slant of a roadway. A flat roadway surface has a zero camber. Off-camber surfaces can make putting a foot down at stops a bit risky if not identified and anticipated.

### CamelBak

Water container worn like a backpack; popular among off-road riders.

### Carbon Monoxide (CO)

A colorless, odorless gas that is produced by fuel combustion. It is extremely toxic and breathing relatively low concentrations may result in death. High concentrations of CO are commonly found in closed areas where engines are running. Initial stages of CO poisoning typically create a feeling of fatigue.

### Cargo Net

Sheathed bungee cord net or webbing with multiple hooks; useful for securing odd-shaped loads to a motorcycle.

### Center Stand

A mechanical device for supporting a motorcycle while at rest. Standard on some motorcycles, this stand lifts the rear wheel off the ground slightly, which can be helpful for maintenance and repair procedures.

### Central Vision

The sharpest part of the visual field; the core vision used to identify what is seen as opposed to peripheral vision that can pick up quick movements in the visual field; surprising to many as the eyes move so quickly and everything looks to be in focus, it consists of only a three-degree cone.

### Chevron Alignment Signs

A sign primarily used in multiples to indicate the sharpness of a curve; used as an early warning sign for riders to slow down.

### Choke

A mechanical device for enriching (more fuel, less air) the fuel/air mixture in a motor vehicle for a “cold” engine start; not needed for fuel-injected engines.

### Clutch

A mechanical system that allows a rider to temporarily disengage the engine from the drive train. The clutch system consists of a clutch lever and a set of clutch and pressure plates between the engine and the transmission.

### Collision Trap

An area ahead that contains several factors that could combine to produce a mishap, collision, crash or accident. It implies a potential need for braking and/or swerving maneuver.

### Color Blindness

The inability of a person to distinguish between colors. This trait may be evidenced by the inability to distinguish between any color (all colors appear to be shades of black and white), or between two specific colors (e.g., red and green).

### Combination Braking

The act of simultaneously applying both front and rear brakes. This type of braking will typically result in the best braking performance.

### Complex Reaction Time

Time interval between when a rider perceives a new situation and chooses an action to take (such as applying the brakes); normally around 0.75 seconds. (See Simple Reaction Time.)

### Conflict

Refers to a chain-of-events where a rider fails to minimize risk and a “close call” or critical incident (conflict) occurs and an evasive maneuver is needed. The chain of events is typically produced by a combination of factors.

### Conspicuity

Refers to how potentially visible a rider is to others; enhanced by bright upper torso clothing, a white helmet, and daytime high-beam headlight use. Can be improved at night with reflective clothing and materials.

### Constant Radius Turn

A turn with the same radius throughout the turn; in neither increases or decreases in radius.

### Contact Patch

Portion of a tire that touches the road surface.

### Controlled Access Roadway

A roadway that offers limited access to leave or enter the traffic flow. Generally found on multi-lane highways or interstate highways, where access to/from the highway is only allowed at major cross streets or other controlled access roadways.

### Controlled Braking

The condition of applying the brakes in a controlled manner so brake pressure can be modulated as needed.

### Convex Mirror

A mirror with an outward-curved surface. This type of mirror shows more area than a flat mirror, but objects appear farther away than they actually are.

### Counter-steering

A momentary steering deflection away from the intended direction of travel caused by pressing on the handgrip in the direction of the turn (or pulling on the opposite grip); used to initiate and adjust lean.

### Counterweight

Adjusting upper (and/or lower) body position to balance a motorcycle at very low speeds; requires weight shift that is counter, or opposite, to the lean of the motorcycle. It can help with low-speed maneuvers.

### Cover the Brake

Refers to positioning the hand and/or foot over the brake controls; may reduce the reaction time in applying the brakes.

### Crossbuck

The X-shaped railroad sign used to designate where the track is located. Oftentimes it will have the words "Look, Listen, Live" on it. Usually preceding this sign is a round railroad warning sign positioned several seconds from the track.

### Crosswalk

The painted or unpainted lines that show the path for pedestrians to cross a roadway. Pedestrians have the right-of-way if in the crosswalk.

### Crowned Road

Roadway surface that is higher in the middle to cause water runoff on both sides.

### Deceleration Lane

The portion of an expressway that allows riders to decrease speed before exiting (reaching the exit ramp). Its purpose to provide a slow-down area so riders won't have to adjust speed in the driving lane portions of the expressway.

### Decreasing Radius Turn

A turn that becomes progressively tighter (increasingly smaller radius).

### Delineator

A marker in or on the roadway surface to assist identifying driving lanes; may be white or yellow in color depending on the roadway's direction of travel.

### Depth Perception

The ability to determine the distance of an object.

### Disc Brakes

A braking system consisting of a thin disc rotor fixed to the rotating wheel and a set of one or more fixed brake pads, which rub against the disc when the brake lever or pedal is applied.

### DOT

Department of Transportation. Federal agency whose mission includes ensuring a viable transportation system that meets national interests and enhances the quality of life.

### Downshifting

Placing the transmission in a lower gear to match engine speed to road speed. Also refers to a brain-based phenomenon in which the brain loses some of its analysis capability due to stress or overloading causing instinctual, and sometimes inappropriate, responses.

### D-ring

A metal ring in the shape of the capital letter "D" commonly used to fasten the chinstrap on a helmet. The retention system may have a single D-ring with a sliding friction bar to hold the chinstrap from moving, or double D-rings where the chinstrap is threaded between the two rings to prevent loosening.

### DUI

Driving Under the Influence. This normally describes drug misuse while operating a vehicle.

### Dumping the Clutch

Abrupt release of the clutch lever that causes the bike to lurch; usually stalls the engine unless throttle is applied.

- DWI**  
Driving While Intoxicated; operating a motor vehicle with a Blood Alcohol Concentration (BAC) above a jurisdictional legal limit. Some states have upper BAC limits as well as other criteria for defining DWI (e.g., slurred speech, failing a field sobriety test, inability to control the motor vehicle, etc.). For the majority of drinkers, impairment occurs before the legal limit is reached.
- Emergency Flashers**  
A motor vehicle device that flashes all front and rear turn signal lights to indicate an emergency condition exists (e.g., mechanical malfunction, flat tire, out of fuel, etc.). Flashers may also be used in hazardous riding conditions such as poor visibility due to weather for added conspicuity. Not all motorcycles have emergency flashers.
- Endo**  
An endo occurs when hard braking causes the motorcycle's and rider's weight to shift far enough forward to cause the motorcycle to stand up on the front tire with the rear tire completely off the ground. Correction, if completed soon enough, is to release brake pressure to cause the rear of the motorcycle to return to the ground. Not making a correction could result in a crash. (An endo can also be caused by hitting a solid object.)
- Endorsement**  
Designation as to what types of vehicles a licensee may operate.
- Engine Braking**  
Braking force created by the engine in a moving motorcycle when the throttle is rolled off. Internal engine friction and combustion chamber pressure will cause the engine and motorcycle to slow down.
- Engine Stop Switch**  
A switch on the handlebars that cuts electrical power to the engine's ignition system. Sometimes referred to as the Engine Cutoff Switch or Emergency Stop Switch.
- Entrance Ramp**  
A lane that allows access to an expressway. It is typically a curved path that leads to an acceleration lane where speed can be increased to match the flow of traffic. Ramp speed should be kept low.
- Entry Speed**  
Related to turning and cornering, it is the motorcycle's speed at the point of initial steering input. The maximum desired entry speed is one that allows for some roll-on of the throttle to maintain speed and stability while cornering, one that assures no deceleration in a turn will be required, and one that provides time and space to "straighten and brake" if necessary.
- Escape Path**  
A potential path that could be used to avoid a hazard or possible mishap/crash. The competent motorcycle rider is constantly looking for escape routes that may consist of the shoulder of the road, a median or other area where no obstructions exist.
- Executive Function**  
Refers to the personal task of setting priorities and connecting thinking to action. If a rider makes safety a conscious, top-of-mind priority, there is a better chance to maintain good risk offset.
- Exit Ramp**  
Referring to a limited-access roadway, a lane configured after a deceleration lane that leads to a new roadway. These often are decreasing radius curves and caution should be used. A sign is usually posted to provide a suggested exit ramp speed.
- Eye Lead Times**  
Refers to the three portions of RiderRadar<sup>SM</sup>: 2-second following distance, 4-second urgent path, and 12-second anticipated path.
- Fading Turn**  
A turn in which the rider swings wide, opposite the direction of the turn, to set up for the turn. It is not a recommended practice.
- Fairing**  
A structure on the front of a motorcycle that protects the rider from wind and debris. It typically includes a windshield and side areas that, to some extent, protect the operator's hands, body and head; it may provide for storage of small items.
- False Neutral**  
An incomplete shift between gears where neither gear is engaged, similar to the Neutral between 1<sup>st</sup> and 2<sup>nd</sup> gears. A proper response is to shift up as opposed to down (to prevent skidding or over-revving).
- Field of Vision**  
The width or angle a person can see to the sides while focusing straight ahead. This is normally around 180 degrees.
- Fixate**  
To focus one's eyes or attention on too long (see Target Fixation).
- FMVSS 218**  
Federal Motor Vehicle Safety Standard 218; the guidelines for a DOT-compliant helmet.
- Fog Lights**  
Lights designed to provide a measure of visibility during foggy conditions.
- Fog Line**  
The white line painted on the outside edge of the pavement, usually 2" in from the pavement/shoulder edge.

#### Following Distance

Distance between moving vehicles in the same lane; measured in terms of the time it takes a following vehicle to pass a point in the road that a vehicle in front has already passed. A minimum distance in clear, dry conditions is two seconds.

#### Footrests

The physical portion of a motorcycle where the operator/passenger rests the feet.

#### Force of Impact

A measure of the capacity to cause physical change when two objects collide. The impact force increases as the square of speed; i.e., doubling speed quadruples the force of impact.

#### Friction Zone

Area of clutch lever movement that begins where the clutch mechanism starts to transmit power to the rear wheel and ends just prior to full clutch engagement.

#### Fuel Injection

A method or system where fuel in an engine is reduced to a fine spray and injected directly into the combustion chamber(s). This system has largely replaced carburetor/intake manifold systems on many motorcycles.

#### Fuel Supply Valve

A valve usually located on the left side of the engine that controls the flow of gasoline from the gas tank to the engine. Typical positions are ON, OFF, RESERVE, and PRIME. This valve is not found on fuel injected engines.

#### Full Lock Steering

The point at which the handlebars cannot be turned further.

#### Gap

Refers to the time and space in traffic that a rider needs to enter or blend with traffic flow. It applies to turning at intersections, lane changes and expressway merging.

#### Glare

An intense, blinding light that may be the result of sunlight or artificial light shining directly into a rider's eyes or reflecting from the roadway or some other object/surface. A common phenomenon at night when oncoming vehicles are using high beams; riders should avoid looking directly at oncoming lights.

#### Glare Recovery

Refers to the time required for a rider to recover from the effects of glare; a rider's ability to distinguish objects is greatly diminished during this time.

#### GPS

Global Positioning System; uses satellites in a geostationary orbit to triangulate a location.

#### Green Arrow

A traffic light indicator that allows/prompts travel in the direction of the arrow (e.g., left or right turn); usually means a protected left turn in which oncoming traffic yields the right-of-way.

#### Grooved Pavement

Pavement with channels cut into it to aid in draining rainwater or in preparation for resurfacing; typically not dangerous but can make motorcycle steering feel loose.

#### Guide Signs

Green traffic signs used to help highway users.

#### Head Check

Refers to a rider's head turn to either the left or right to check the blind spot (i.e., the area behind that cannot be seen in the rear view mirror). Also can refer to checking for gaps in traffic while waiting to cross an intersection or enter a roadway.

#### Headlight Modulator

Electronic device that causes a headlight to pulse and make the motorcycle more visible during the day (see Modulating Headlight); a rider should check their state laws for its appropriate use.

#### Helmet

A protective device for motorcycle riders that protects the head from injury. A motorcycle helmet typically consists of four major components: a hard outer shell (to protect from injuries caused by impact or penetrating objects); an energy absorbing inner liner (typically a dense Styrofoam material); a soft, padded, comfort liner, and a retention system (typically a nylon chin strap with one of various connecting devices). Configurations may be half, three-quarter or full-face.

#### Helmet Use Law

Refers to a state or local traffic ordinance that specifies the required use of a motorcycle helmet. Helmet Use Laws may require the use of helmets by all motorcycle riders or only riders below a certain age (partial helmet law).

#### High Occupancy Vehicle (HOV) Lanes

Traffic lanes designated for use only by vehicles with two or more occupants; also known as carpool lanes; a motorcycle with a solo rider is usually not prohibited from using an HOV lane.

#### High-Side Crash

A crash in which a rider is thrown over the motorcycle; typically caused during a rear wheel skid when the rear brake pedal is released while the rear wheel is out of alignment with the front wheel, causing a very quick straightening of the motorcycle

which ejects the rider over the high side of the motorcycle. (When a motorcycle is leaning, the side closest to the road surface is called the “low side”; the other side is the “high side.”)

#### Highway Hypnosis

Refers to the condition where a motor vehicle operator has become mesmerized or bored by driving and is no longer fully aware of what is happening; sort of a blank stare. Sometimes referred to as “being on autopilot,” a motorist will likely be very slow to react to changing conditions and may take actions that are unsafe to other roadway users.

#### Hydroplaning

Water buildup under the tires resulting in loss of traction; the condition where tires are actually riding on a thin layer of water and not in direct contact with the roadway surface.

#### Hyperthermia

Above normal body temperature.

#### Hypothermia

Below normal body temperature due to the cooling effects of cold and wind. Hypothermia can cause loss of concentration, slowed reactions, and loss of smooth, precise muscle control/movement.

#### Idiot Lights

Refers to the warning lights on a motor vehicle (e.g., oil pressure, side stand, Neutral, etc.). This common phrase comes from the assumption once the light comes on, it’s too late to prevent or fix a problem.

#### Impending Skid

Used to describe a tire’s traction limit just prior to loss of traction; usually used when discussing maximum braking procedures.

#### Implied Consent

Refers to a state law that means if persons are stopped for a possible DUI/DWI, they have implied that they have given their consent to take a test for BAC determination (a test of blood, breath or urine); refusal may lead to automatic loss of license.

#### Inattentive Blindness

A failure to see an object when looking at it because mental attention (the brain) is thinking about something else.

#### Increasing Radius Turn

A curve in the roadway where the radius of the turn increases (i.e., opens up) as a rider progresses through the curve.

#### Inhibition

The conscious or unconscious restraint of a behavioral process, desire, or impulse. For instance, the use of beverage alcohol tends to lower a person’s inhibitions, causing them to do things rational thought would normally keep them from doing, such as taking unreasonable risks while riding.

#### Input Overload

Typically refers to the condition where a rider is receiving too many visual or mental clues to process. Commonly results in important information being overlooked or acted upon incorrectly and may be a factor in inattentive blindness.

#### Integrated Braking System

System that applies partial front brake pressure when the rear brake lever is applied.

#### Intoxilyzer

A device used that analyzes a breath sample to determine BAC.

#### Lane Position

Refers to the motorcycle position within a lane. A motorcyclist has more than one option. For a straight road, the roadway is generally divided into left, center and right, with the left position being a good default position as it allows for good visibility ahead. For a curve, a recommended lane position is middle-middle-middle for approach, apex and exit. A performance approach to a negotiating a curve is to use an outside-inside-outside path of travel to minimize lean angle so as to maintain a higher speed.

#### Laying the Bike Down

An improper crash avoidance action that produces a crash. A persistent myth: intentionally falling to the ground will minimize a rider’s injury if a crash is imminent. Actually, a motorcycle with brakes applied will slow more effectively than a motorcycle sliding on pavement, and a motorcycle that is still upright has more of a chance of swerving out of harm’s way.

#### Lean Angle

Refers to the degree a motorcycle leans from its perpendicular position, usually when turning, cornering or swerving.

#### Lean In

The process of the motorcyclist (or passenger) leaning farther to the inside of the curve than the motorcycle is leaning. A practice on the racetrack where speeds are higher and the amount of ground clearance for the motorcycle is limited. (see Lean Out, Lean With)

#### Lean Out

The process of the motorcyclist (or passenger) leaning less than the motorcycle, or in the opposite direction of the motorcycle. Typically used at extremely low speeds such as in parking lots, this technique allows the motorcyclist to actually balance the motorcycle during a tight, low-speed turn. This technique is also referred to as counterweighting or counterbalancing (see Lean In, Lean With).

#### Lean With

The process of the motorcyclist (or passenger) leaning in the same direction and at the same angle as the motorcycle. This is a proper and effective technique for normal cornering (see Lean In, Lean Out).

#### Legal Limit

A blood alcohol content (BAC) limit that a state sets as the level of presumed intoxication. In 2005, the legal limit for adults in all 50 states was 0.08%.

#### Linked Brakes

A motorcycle braking system that applies brake pressure to both brakes when either brake control is applied.

#### Load Triangle

The imaginary triangle formed by the lines from the rider's head to the front and rear axles, and the line between the two axles. When loading a motorcycle, heavier items should be placed within or as close to this triangle as possible.

#### Lock-up

A condition in which the wheel(s) stop turning, causing a skid; results from too much brake pressure (see Locked Wheel).

#### Locked Wheel

Braking to a point where the tire is no longer rotating and is skidding.

#### Look, Listen, Live

A slogan that refers to safety procedures for approaching and crossing railroad tracks.

#### Low-Side Crash

Crash in which the rider falls to the motorcycle's low side (to the side it was leaned). (See High-Side Crash.)

#### Lugging

Rough or jerking operation due to selecting a gear that is too high for road speed. The condition where a motor vehicle's engine speed needs to be increased.

#### Maximum Braking

Application of both brakes simultaneously to the point just short of skidding (see Controlled Braking and Threshold Braking).

#### Median

The dividing area, either paved or landscaped, between opposing lanes of traffic on some roadways.

#### Mental Set

Refers to visual perception and knowing where to look and what to look for.

#### Merging Traffic

The process where two or more lanes of traffic, traveling in the same direction, gradually merge together into one lane.

#### Mesh Clothing

Highly perforated riding gear designed to maximize the air's cooling effects in hot weather.

#### Modular Helmet

Full-coverage helmet with a chin bar that can be swung up to ease taking the helmet on/off, taking glasses on/off, and ease the ability to talk/eat/drink with the helmet still on; most are designed to have the chin bar down and locked when riding.

#### Modulating Headlight

A headlight that cycles from high intensity to low intensity. It is used to improve conspicuity to the front of a motorcycle (see Headlight Modulator). A rider should check state laws for its legal use.

#### MOM

Motorcycle Owner's Manual. Normally provided by the motorcycle manufacturer, this manual contains useful information regarding operation and general maintenance.

#### Moped

A lightweight motorized bicycle (pedalcycle) that may or may not have pedals; powered by a small engine.

#### More Speed = More Brakes

Refers to the need to have highly skilled braking actions when traveling at higher speeds. Research shows riders are more comfortable with accelerating "harder" than braking "harder," and this could lead to higher risk-taking in situations requiring hard braking.

#### Motor-Driven Cycle

Classification in some states between motorized bicycle and motorcycle.

#### Motor Scooter

A two-wheeled vehicle with small wheels and a low-powered gasoline engine geared to the rear wheel.

#### Motor Skill Principles

Motor skills refer to the ability to use the muscles in a precise, controlled manner to effect coordinated and desired actions. Principles of development include: gross-to-fine skills (that use major muscles first and then move to finer skills that use smaller muscles; accuracy before speed-of-movement (developing precise action patterns before fine-tuning techniques). For example, squeezing and releasing the clutch lever is a gross skill, while using the friction zone to rock back and forth or smoothly start out is a finer skill, and the speed-of-movement improves as the skill because "overlearned" or automated.

#### MSF

Motorcycle Safety Foundation. Since 1973, the Motorcycle Safety Foundation® (MSF) has set internationally recognized standards that promote the safety of motorcyclists with rider education courses, operator licensing tests, and public

information programs. MSF works with the federal government, state agencies, the military, and others to offer training for all skill levels so riders can enjoy a lifetime of responsible motorcycling. MSF is a not-for-profit organization sponsored by leading motorcycle manufacturers and distributors. The MSF website is [www.msf-usa.org](http://www.msf-usa.org). Its mission is to make motorcycling safer, and more enjoyable, by ensuring access to quality education and training for current and prospective riders, and by advocating a safe riding environment.

#### MSF 100 Motorcyclists Naturalistic Study

The first broad-scale study using instrumented motorcycles with multiple cameras to identify rider behaviors. Completed in conjunction with the Virginia Technical Transportation Institute (VTTI).

#### Muscle Memory

Refers to motor skill development in which repeated practice leads to the mind/muscles being able to carry out specific required actions without intense thought on the procedures, e.g., learning the proper amount of pressure when using the controls.

#### NHTSA

National Highway Traffic Safety Administration, part of the [U.S. Department of Transportation](http://www.transportation.gov); established by the Highway Safety Act of 1970 as the successor to the National Highway Safety Bureau to carry out safety programs under the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966. NHTSA is responsible for reducing deaths, injuries and economic losses resulting from motor vehicle crashes. This is accomplished by setting and enforcing safety performance standards for motor vehicles and motor vehicle equipment, and through grants to state and local governments to conduct effective local highway safety programs. The NHTSA slogan is “People Saving People.” NHTSA investigates safety defects in motor vehicles, sets and enforces fuel economy standards, helps states and local communities reduce the threat of drunk drivers, promotes the use of safety belts, child safety seats and air bags, investigates odometer fraud, establishes and enforces vehicle anti-theft regulations and provides consumer information on motor vehicle safety topics. NHTSA also conducts research on driver behavior and traffic safety, to develop the most efficient and effective means of bringing about safety improvements.

#### Night Blindness

A condition of the eyes in which vision is normal in daylight but is abnormally weak or completely lost at night or in dim light.

#### Novelty Helmets

Helmets that are sold for appearance or fun only; not designed to be compliant with Department of Transportation standards.

#### No-Zone

The area around a truck or other large vehicle that creates a blind spot for its driver (see Blind Spot).

#### Odometer

The mechanical or electronic device on the instrument panel that shows total miles driven on the vehicle.

#### OEM

Original Equipment Manufacturer; typically applied to parts and accessories for motor vehicles manufactured and distributed by the original supplier of those parts and accessories.

#### Off-Camber Turn

Corner in which the roadway surface slopes, usually downward toward the outside of the turn.

#### Overriding the Headlight(s)

Riding at a speed in which total stopping distance exceeds the sight distance available from headlight illumination at night.

#### Over-inflation

Typically refers to the condition in which a motor vehicle’s tires are inflated to a pressure higher than recommended by the tire for vehicle manufacturer. This may result in excessive tire wear and/or handling difficulties.

#### Over-revving

The condition where engine speed is excessively high for its road speed. The engine is being over-revved when the engine speed (revolutions per minute or RPM) is at or over the “red line” on the tachometer.

#### Overtake

When a person passes a slower moving vehicle that is going the same direction on a multi-lane road (as opposed to passing, which indicates going around a vehicle in the same lane).

#### Owner’s Manual

A publication, usually distributed by the manufacturer, that contains useful information about the operation and general maintenance of the specific vehicle to which it applies.

#### Per Se

Of, in, or by itself or oneself; intrinsically. The term relates to the use of beverage alcohol in which a certain BAC level is in and of itself a violation, no matter the resulting behavioral effect.

#### Perception

Accurate recognition and interpretation of sensory stimuli; e.g., the point where a rider accurately sees an object or condition.

#### Perception Distance

Space traveled between when factors are developing until there is a recognized problem that requires a response or reaction.

#### Perception Time

The time it takes for a rider to recognize that a hazard or problem has developed.



### Peripheral Vision

The area to the sides that can be seen while looking straight ahead. Perceived or perceiving near the outer edges of the retina; i.e., how far to the side a person can see objects without turning his/her head. It is typically around 180-190 degrees; less than 140 degrees is considered tunnel vision.

### Perpendicular Parking

The act of parking a motor vehicle at a right angle (i.e., perpendicular) to a curb or pavement marking. A line of vehicles perpendicularly parked are thus side by side, instead of in line (as in parallel parking).

### Pillion (pillion pad)

Synonym for passenger. A small seat mounted on the rear fender for a passenger.

### Powered Two-Wheeler (PTW)

Refers to vehicles such as mopeds, scooters and motorcycles.

### Presumption Level

A level of intoxication (BAC) that authorities use as a threshold in determining if a rider is in violation of the law.

### Progressive Signal System

A traffic design in which the traffic lights change so traffic, if flowing near the speed limit, will not have to stop. It only applies to one-way streets.

### Protected Left Turn

A roadway traffic signal condition where left turning vehicles have the right of way (normally indicated by a green left turn arrow) and all other traffic is required to stop.

### PSI

Pounds per square inch; a measure of tire pressure.

### Psychophysical Characteristics

Most commonly refers to rider abilities related to visual acuity, night vision, glare vision reaction time, depth perception, color vision, and reaction time.

### Pumping the Brakes

The act of applying a motor vehicle's brakes firmly and then releasing them with a steady rhythm; yields a longer braking distance than threshold braking. Useful technique for stopping or slowing a vehicle under low traction conditions (ice, rain, mud, etc.) to help prevent skidding. Should not be used on vehicles with ABS.

### Push Start

The process of starting a motorcycle engine by pushing the motorcycle or rolling it downhill (beginning with the engine pre-start routine completed and the transmission in 1<sup>st</sup> or 2<sup>nd</sup> gear with the clutch lever squeezed in). Once sufficient momentum is attained, the rider releases the clutch lever. This causes sufficient engine rotation to create combustion in the cylinders. This technique is commonly used when the battery is too weak to start the engine. Push starting does not work if an engine is fuel-injected.

### Rain Grooves

The thin grooves, approximately one quarter inch deep by one quarter inch wide, that are cut into the pavement to promote water runoff between tires and the pavement. Designed to minimize hydroplaning.

### Rake

The angle of the steering head from vertical. Sport bikes usually have a steep rake (small angle) making them quick to steer as compared to cruisers.

### Random Contextual Interference Effect

A motor skill development principle that produces improved transference of learning by using random and varied skill exercises; the opposite method would be to use single-skill exercises, which may show better short-term skill gains but will not transfer as well to other contexts.

### Reaction Distance

The space traveled between perceiving a situation and taking action; the time between when an object/hazard is seen until a rider begins to brake or otherwise react to the object/hazard.

### Reaction Time

The elapsed time from when an object/hazard is seen until the rider begins to brake or otherwise react to the object/hazard.

### Red Arrow

A traffic light that has a directional signal for a turning lane that prohibits a turn.

### Red Line

The line or area on a tachometer that indicates maximum engine speed or maximum revolutions per minute (RPMs).

### Reflective

A surface that reflects light. (see Retro-reflective)

### Regulatory Signs

Roadway signs that provide information regarding traffic rules for a specific roadway (speed limits, allowed paths of travel, weight restrictions, etc.). They use a black-and-white color and rectangular shape.

## Relay Signaling

To signal to someone behind that someone ahead is turning; although sometimes used as a form of communication, it is not recommended as it actually fails to communicate accurately with other highway users.

## Respond vs. React

Refers to a rider's thought process in preventing a potential collision trap from becoming a crash. It's better to respond to factors well ahead of time (adjusting speed and/or direction) than react quickly to an emergency (hard braking or swerving).

## Retro-reflective

A specific type of reflective material where the surface is designed to reflect a major portion of received light back to the light source, rather than in all directions equally (see Reflective).

## Rev

Refers to increasing engine speed by opening the throttle (i.e., more revolutions per minute).

## Reverse Traffic Flow

A highway design that allows traffic to flow in one direction during one part of the day and the other direction during another part of the day; used to ease traffic congestion during peak morning and evening hours.

## RiderRadar<sup>SM</sup>

A concept that refers to searching the roadway to evaluate factors; relates to the eye lead times (or visual lead times) of 2, 4 and 12 seconds (following, urgent, anticipated).

## Riding Subtasks

Refers to motorcycle riding being a mental, physical, social and emotional task; mental in that it requires processing information and making decisions; physical in that it requires vision and motor skill processes; social in that it requires interacting effectively with other people in traffic and following the rules of the road and traffic regulations; emotional in that it requires normal emotional states to effectively use a strategy to minimizing risk and maintain good risk offset.

## Risk

The possibility (chance) of suffering harm or loss; danger. A responsible rider will have a strategy to minimize overall risk as well as moment-to-moment risks.

## Risk Awareness

A concept that means a person knows the risks associated with motorcycling.

## Risk Offset

A concept to address keeping skills "ahead of" risks. The idea is to have more skill than the overall or moment-to-moment risks a rider may take.

## Risk Management

The process a person uses to minimize or reduce danger or potential danger.

## Road Rage

A situation when a roadway user becomes aggressive and acts in dangerously inappropriate ways.

## Roadway Furniture

Used by the Federal Highway Administration (FHWA) to refer to solid or nearly solid objects along the sides of the road, such as sign posts, guardrails, etc.

## Roll-off

Refers to the process of decelerating by rolling the right handgrip forward (see Roll-on).

## Roll-on

Refers to the process of accelerating by rolling the right handgrip toward the body (see Roll-off).

## RPMs

Revolutions per minute; refers to the engine speed or how fast it [the crankshaft] rotates.

## Rubber Band Effect (also referred to as a yoyo effect)

Related to group riding, when a lead rider maintains a steady speed and the riders behind lag behind and need to speed up significantly to keep up; this is especially true for riders near the back of the group.

## Rumble Strips

The intentionally constructed rough edge of a roadway designed to generate noise and a rough ride when traveled over so as to alert the user reestablish a proper position on the roadway.

## Safety Margins

It has three separate meanings, each of which has factors that can lead to a crash: (1) Rider-Motorcycle, how a rider fits and the ability to reach and manipulate the controls accurately; (2) Tires-Pavement, the degree of friction or grip; and (3) Time-and-Space, having sufficient space to brake and/or steer to avoid a crash. Exceeding the limit of any one could produce a mishap.

## Scanning

A method of looking in multiple directions to visually identify potential hazards; far-and-near and side-to-side.

## SEE

Mental process used to make judgments and take action in traffic. Stands for Search, Evaluate, Execute.

## Search-Setup-Smooth

An approach for negotiating curves.

Search: look far-and-near and side-to-side well before curve entry and while in the curve.

Setup: have an appropriate entry speed and lane position.

Smooth: use non-jerky control inputs.

#### Self-Assessment

Refers to checking oneself as to how one thinks, feels and behaves. Can lead to improved decision-making and enhanced by reflecting on experiences with a critical mindset.

#### Shoulder

The edge or border running on either side of a roadway. This border is normally paved on highways and expressways, and may or may not be paved on other roadways. The shoulder can be a good escape path should a conflict materialize.

#### Side Stand

Sometimes referred to as a kickstand, this device is normally found on the left side of a motorcycle and is used to support the vehicle when parked. The sidestand is usually spring-loaded and will snap back to the upright position when moved partially toward that position.

#### Simple Reaction Time

Time interval between when a rider decides what to do and actually begins doing it (such as applying the brakes); normally around .44 seconds when a specific situation is anticipated. (See Complex Reaction Time.)

#### Single-track vehicle

A term used to describe motorcycles, bicycles, and other two-wheelers with one wheel in front of the other. Single-track vehicles must be counter-steered and leaned to turn except at very low speeds.

#### SIPDE

Search, Identify, Predict, Decide, Execute.

#### Slipping the Clutch

Refers controlling the motorcycle at low speeds by very slight clutch lever movement in the friction zone.

#### Slow, Look, Press, Roll

The four basic steps for learning to negotiate a curve:

**Slow:** roll off the throttle and/or apply both brakes, as needed.

**Look:** look up and through the curve.

**Press:** to initiate motorcycle lean, press forward on the handgrip in the direction of the turn; (e.g., press left, lean left, go left).

**Roll:** roll on the throttle gently, as needed, through the curve.

A three-word, more generalized process for negotiating a curve is Search-Setup-Smooth.

#### Smith System<sup>©</sup>

A copyrighted traffic strategy taught in some training programs; stresses proper use of the eyes to maintain a space cushion. It has five keys: 1) aim high in steering, 2) keep the eyes moving, 3) get the big picture, 4) leave yourself an out, and 5) make sure they see you.

#### Snell

Refers to the Snell Memorial Foundation, an organization that has established standards and procedures for testing motorcycle safety helmets (and other types of helmets); named after a race car driver.

#### Social Drinker

A person who normally only drinks beverage alcohol in a social setting. Studies show an average drinker will consume no more than two drinks a day; also, frequently drinking alone is a sign of a drinking problem.

#### Space Cushion

Area you create and maintain between yourself and other vehicles; provides an escape path.

#### Spark Plug

The component in an internal combustion engine that causes fuel combustion. When the spark plug receives the proper voltage through the ignition system, a spark ignites the fuel/air mixture in the engine combustion chamber and thus provides power by pushing the piston down.

#### Speed Bump

An intentionally constructed bump (hump) on the roadway surface that is designed to slow the speed of traffic.

#### Square the Bars (Handlebars)

Refers to centering the steering by putting the handlebars in a straight-ahead position just before making a stop; helps to keep the motorcycle upright and balanced; helps prevent feeling the weight of the motorcycle leaned with the handlebars turned.

#### Staggered Formation

Group riding formation where riders use alternating portions (left/right) in a lane. In a staggered formation, the leader rides in the left third of the lane, while the next rider stays at least one second behind in the right third of the lane, with the rest of the group following in the same pattern behind. If the formation is correct, the third rider is two seconds behind the leader, but only one second behind the second rider.

#### Stale Green Light

A traffic light that has been green for a time period and is likely to change at any moment. For an intersection with traffic-actuated traffic signals, the light is about to change because intersecting traffic is no longer present.

### Standing on the Pegs

Refers to the technique of a motorcycle rider shifting his/her body weight from the seat to the footrests by standing up slightly before riding over an obstacle.

### Stop Line

The wide painted line on the pavement at an intersection, beyond which no part of a vehicle should protrude when coming to a stop. It typically precedes a marked crosswalk.

### Stoppie

An extreme braking maneuver that causes the motorcycle to rotate around its front axle, lifting the rear wheel off the ground, and the motorcycle is temporarily balanced over the front tire. If done on purpose it is considered a stunt.

### Swing Arm

The portion of a motorcycle's chassis/suspension system that links the rear wheel and attached components (e.g., final drive, rear shock absorbers, etc.) to the front frame/chassis members through a horizontal pivot point.

### Synergistic Effect

The interaction of two or more agents that produces a combined effect greater than the sum of their individual effects. For example, combining beverage alcohol with medications or other drugs may have a depressing effect on the human body that is magnified greatly over the individual effects of each substance.

### Tachometer

An instrument used to measure the rotations or revolutions per minute (rpm) of a rotating shaft (e.g., the crankshaft of a motorcycle engine). *Tach's* usually have a red zone (red line) graphically displayed.

### Tail Trunk

The rear luggage component on some motorcycles. The owner's manual has specific information if it is a standard feature. There is usually a storage weight limit; overloading can affect steering.

### Tailgate

Following at a distance of less than 2 seconds.

### Tangent Point

Refers to negotiating curves; it's the inside point or area in a curve; the point at which a rider's gaze intersects the visible bend in the curve. Studies show drivers devote about 80 percent of the visual gaze in this area so they can determine the curvature of the roadway.

### Tar Strips

Road surface cracks that have been filled or repaired with tar. The surface may be more slippery than regular pavement.

### Target Fixation

Staring at an area or object too long. To stare at an object that you are trying to avoid; the condition where a rider is visually and mentally focused on one object to the exclusion of everything else (see Fixate).

### TCLOCS

Term used to remember motorcycle components that should be examined during a pre-ride inspection. The components are: Tires and wheels; Controls, such as levers, cables, and throttle; Lights and electrics; Oils and other fluids; Chassis and chain; and Stands (side and/or center).

### Threshold Braking

Brake pressure that is at a point just short of wheel lock-up; the act of fully applying the brakes as much as possible without causing a wheel to stop rotating and skid. Sometimes referred to as braking to the "point of impending skid" (see Controlled Braking; Maximum Braking).

### Tie-Down

A strap with a locking device designed to secure a motorcycle on a trailer or other platform.

### Tire Loading

Refers to weight shift forward during initial braking (front tire pushes down on the pavement; helps provide traction (frictional grip) between the tire and surface).

### Tire Pressure

A measure of the amount of air in a tire, normally expressed in pounds per square inch (PSI).

### Tire Valve

Sometimes referred to as a Schrader valve, this device has a spring loaded component in the valve core that allows compressed air to enter the tire when the center of the valve is depressed, and closes when the air source is removed.

### Toll Plaza

The collection of buildings and booths where a highway user is required to pay a fee before proceeding onto or off of the road. A common hazard for a motorcyclist is a slick surface where oil drippings from other vehicles accumulate.

### Total Stopping Distance

The total distance required to stop; the sum of perception distance, reaction distance, and braking distance.

### Total Stopping Time

The total time required to stop a motor vehicle; the sum of perception time, reaction time, and braking time.

### To It Not Through It

Refers to using the clutch friction zone when starting from a stopped position. Helps a new rider pause before releasing the clutch lever too much or too quickly when getting underway.

#### Touring

Refers to long distance travel, usually over several hundred miles; differentiated from short “run-an-errand” or commuting.

#### Track Day

Non-race day where a motorcycle race circuit is open to non-professional motorcyclists.

#### Tracking

Refers to placing the tires exactly in the path of travel desired. Good tracking requires good perceptual and physical skill.

#### Traction

Adhesive friction or the grip between the tire and the roadway surface.

#### Traffic-Actuated Signal

A traffic light that senses a vehicle’s presence; activated by the vehicle’s weight or magnetic properties.

#### Traffic Control Devices

Refers to signs, signals and pavement markings designed to control traffic and make highway user actions predictable.

#### Trail Braking

A technique where the brakes are used beyond the entrance to a curve or turn and are gradually released up to the apex.

#### Tread

The grooved face of a tire that makes contact with the road; helps channel water and keep a tire from overheating.

#### Trip Odometer

The re-settable trip meter that shows miles traveled for any specific trip or ride. It can be used as a fuel gauge.

#### Tunnel Vision

Vision in which the visual field is severely constricted (either physically or mentally), as if within a tunnel looking out. It is defined specifically as having 140 degrees or less of peripheral vision.

#### Under-inflation

The condition where a motorcycle tire has too low a pressure for the load it is carrying.

#### Uneven Lanes

A built-up lane adjacent to a graded one resulting in an abrupt difference or step in road height when changing lanes. This is a hazardous condition and care must be used when changing lanes.

#### Upshifting

Placing the transmission in a higher gear to match engine speed to road speed.

#### Useful Field of View (UFOV)

Refers to the part of peripheral vision in which a person can distinguish objects or patterns. Normal peripheral vision is generally around 180 degrees, but the farther an object is in the periphery, the more difficult it is to identify.

#### Velocitized

The condition where a rider has been operating a motorcycle at a high speed for an extended period of time and can no longer accurately estimate actual speed; the rider estimates a much lower speed than what is actual.

#### VESC-8

Vehicle Equipment Safety Commission Standard 8; impact/shatter-resistant standard used by many government agencies for eye protection.

#### VIN

Vehicle Identification Number; 17 digits.

#### Visibility

The state of being visible to others (conspicuity); also, having a clear, unobstructed view (e.g., a clean windshield providing good visibility).

#### Visual Acuity

Sharpness or clearness of vision as tested with a Snellen eye chart that uses small letters. Normal visual acuity is expressed as 20/20, meaning a person sees at 20 feet what a person with average visual acuity sees at 20 feet. Most states have a minimum requirement for visual acuity in order to be licensed. This measurement is usually 20/40 and means the person sees at 20 feet what a person with 20/20 vision would see at 40 feet.

#### Visual Leads

Refers to a time reference to look ahead. Safety experts recommend a 12-second anticipated path, a 4-second urgent path, and a 2-second minimum following distance.

#### Visual Perception

The act or faculty of apprehending (perceiving) accurately by the sense of sight.

#### Warning Signs

A type of road sign that is diamond in shape, with a yellow background color and black letters; used to provide advanced notice of an impending situation that should be approached with caution.

#### Wear Bar

A motor vehicle tire wear indicator; a raised portion of rubber extending across the width of the tire tread and below the surface of the unworn tread blocks. The wear bar is exposed when the tire tread is worn down to an unsafe level.

#### Weave

A relatively slow oscillation of the rear of the motorcycle; this condition may be caused by a flat rear tire, suspension problem or other mechanical malfunction.

Weave Lane

On an expressway, refers to an area shared by both acceleration and deceleration lanes.

Weight Transfer

Refers to the shift of weight forward under braking and rearward under acceleration.

Wheel lock-up

Condition in which the brakes cause a wheel to stop turning, even though the motorcycle is still moving. It occurs when the braking force is greater than the available friction between tire and road surface. (Also known as a “skid”.)

Wheelie

Making the motorcycle’s front end come up off the ground using quick acceleration; this is not a street riding technique and is dangerous.

Wind Blast

Refers to the sudden change in wind direction or magnitude produced by passing another motor vehicle (in either direction but usually more abrupt changes occur when passing a vehicle traveling in the opposite direction) or when the roadway conditions change (e.g., between hills, over bridges/overpasses, through mountain passes into open plains, etc.).

Wind Buffeting

Refers to the effect caused by air turbulence when alongside or passing a vehicle, usually a large one.

Wind Chill Factor

The temperature of air on exposed human skin given the combination of wind speed and air temperature; the lower the air temperature and/or the higher the wind speed, the lower the wind chill factor.

Wobble

A rapid oscillation of the front wheel and steering components due to a mechanical problem or chassis instability.