Glossary

This chapter defines the terms used in the manual.

85th-percentile speed—the speed at or below which 85 percent of the motorists drive a given road. The speed is indicative of the speed that most motorists consider to be reasonably safe under normal conditions.

AADT—annual average daily traffic. (See *traffic*, *average annual daily*.)

acceleration lane—a paved auxiliary lane, including tapered areas, allowing vehicles to accelerate when entering the through-traffic lane of the roadway.

acceptable gap—the distance to nearest vehicle in oncoming or cross traffic that a driver will accept to initiate a turning or crossing maneuver 50 percent of the time it is presented, typically measured in seconds.

access management—the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway, as well as roadway design applications that affect access, such as median treatments and auxiliary lanes and the appropriate separation of traffic signals.

accessible facilities—facilities where persons with disabilities have the same degree of convenience, connection, and safety afforded to the public in general. It includes, among others, access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, parking, and other components of public rights-of-way.

accommodation (visual)—the ability to change focus from instruments inside the vehicle to objects outside the vehicle.

all-way stop-controlled—an intersection with stop signs at all approaches.

approach—a lane or set of lanes at an intersection that accommodates all left-turn, through, and right-turn movements from a given direction.

auxiliary lane—a lane marked for use, but not assigned for use by through traffic.

base model—a regression model for predicting the expected average crash frequency in each HSM prediction procedure given a set of site characteristics. The base model, like all regression models, predicts the value of a dependent variable as a function of a set of independent variables. The expected average crash frequency is adjusted for changes to set site characteristics with the use of a CMF.

Bayesian statistics—statistical method of analysis which bases statistical inference on a number of philosophical underpinnings that differ in principle from frequentist or classical statistical thought. First, this method incorporates

knowledge from history or other sites. In other words, prior knowledge is formally incorporated to obtain the "best" estimation. Second, the method considers the likelihood of certain types of events as part of the analysis process. Third, it uses Bayes' theorem to translate probabilistic statements into degrees of belief (e.g., the belief that we are more certain about something than others) instead of the classical confidence interval interpretation.

before-after study—the evaluation of implemented safety treatments, accomplished by comparing frequency or severity of crashes before and after implementation. There are several different types of before-after studies. These studies often develop CMFs for a particular treatment or group of treatments. Also known as *BA studies*.

bicycle facility—a road, path, or way specifically designated for bicycle travel, whether exclusively or with other vehicles or pedestrians.

breakaway support—a design feature which allows a device such as a sign, luminaire, or traffic signal support to yield or separate upon impact.

bus lane—a highway or street lane designed for bus use during specific periods.

calibration factor—a factor to adjust crash frequency estimates produced from a safety prediction procedure to approximate local conditions. The factor is computed by comparing existing crash data at the state, regional, or local level to estimates obtained from predictive models.

channelization—the separation of conflicting traffic movements into definite travel paths. Often part of access management strategies.

clear zone—the total roadside border area, starting at the edge of the traveled way, available for use by errant vehicles.

climbing lane—a passing lane added on an upgrade to allow traffic to pass heavy vehicles whose speeds are reduced.

closing speed—movement of objects based on their distance as observed from the driver.

coding—organization of information into larger units such as color and shape (e.g., warning signs are yellow, regulatory signs are white).

collision—see *crash*.

collision diagram—a schematic representation of the crashes that have occurred at a site within a given time period.

comparison group—a group of sites, used in before-and-after studies, which are untreated but are similar in nature to the treated sites. The comparison group is used to control for changes in crash frequency not influenced by the treatment.

comparison ratio—the ratio of expected number of "after" to the expected number of "before" target crashes on the comparison group.

condition diagram—a plan view drawing of relevant site characteristics.

conflict-to-crash ratio—number of conflicts divided by the number of crashes observed during a given period.

conspicuity—relates to the ability of a given object or condition to attract the attention of the road user.

context sensitive design (CSD)—a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility.

continuous variable—a variable that is measured either on the interval or ratio scale. A continuous variable can theoretically take on an infinite number of values within an interval. Examples of continuous variables include measurements in distance, time, and mass. A special case of a continuous variable is a data set consisting of counts (e.g., crashes), which consist of non-negative integer values.

contrast sensitivity—the ability to distinguish between low-contrast features. Ability to detect slight differences in luminance (level of light) between an object and its background (e.g., worn lane lines, concrete curbs).

control group—a set of sites randomly selected to not receive safety improvements.

control task—a major subtask of the driving task model consisting of keeping the vehicle at a desired speed and heading within the lane. Drivers exercise control through the steering wheel, accelerator or brake.

corner clearance—minimum distance required between intersections and driveways along arterials and collector streets.

cost-effectiveness—a type of economic criteria for assessing a potential implementation of a countermeasure or design to reduce crashes. This term is generally expressed in terms of the dollars spent per reduction of crash frequency or crash severity.

cost-effectiveness index—ratio of the present value cost to the total estimated crash reduction.

count data—data that are non-negative integers.

countermeasure—a roadway-based strategy intended to reduce the crash frequency or severity, or both at a site.

countermeasure, proven—countermeasures that are considered proven for given site characteristics because scientifically rigorous evaluations have been conducted to validate the effectiveness of the proposed countermeasure for the given site characteristics.

countermeasure, tried and experimental—countermeasures for which a scientifically rigorous evaluation has not been conducted or because an evaluation has not been performed to assess the effectiveness of such countermeasures.

crash—a set of events not under human control that results in injury or property damage due to the collision of at least one motorized vehicle and may involve collision with another motorized vehicle, a bicyclist, a pedestrian or an object.

crash cushion (impact attenuator)—device that prevents an errant vehicle from impacting fixed objects by gradually decelerating the vehicle to a safe stop or by redirecting the vehicle away from the obstacle in a manner which reduces the likelihood of injury.

crash estimation—any methodology used to forecast or predict the crash frequency of an existing roadway for existing conditions during a past period or future period; an existing roadway for alternative conditions during a past or future period; a new roadway for given conditions for a future period.

crash evaluation—determining the effectiveness of a particular treatment or a treatment program after its implementation. The evaluation is based on comparing results obtained from crash estimation.

crash frequency—number of crashes occurring at a particular site, facility, or network in a one year period and is measure in number of crashes per year.

crash mapping—the visualization of crash locations and trends with computer software such as Geographic Information System (GIS).

crash modification factor (CMF)—an index of how much crash experience is expected to change following a modification in design or traffic control. CMF is the ratio between the number of crashes per unit of time expected after a modification or measure is implemented and the number of crashes per unit of time estimated if the change does not take place.

crash prediction algorithm—procedure used to predict average crash frequency, consisting of three elements. It has two analytical components: baseline models and crash modification factors, as well as a third component: crash histories.

crash rate—the number of crashes per unit of exposure. For an intersection, this is typically the number of crashes divided by the total entering AADT; for road segments, this is typically the number of crashes per million vehicle-miles traveled on the segment.

crash rate method—a method that normalizes the frequency of crashes against exposure (i.e., traffic volume for the study period for intersections, and traffic volume for the study period and segment length for roadway segments). Also known as *accident rate method*.

crash reduction factor (CRF)—the percentage crash reduction that might be expected after implementing a modification in design or traffic control. The CRF is equivalent to (1 – CMF).

crash severity—the level of injury or property damage due to a crash, commonly divided into categories based on the KABCO scale.

critical rate method (CRM)—a method in which the observed crash rate at each site is compared to a calculated critical crash rate that is unique to each site.

cross-sectional studies—studies comparing the crash frequency or severity of one group of entities having some common feature (e.g., stop-controlled intersections) to the crash frequency or severity of a different group of entities not having that feature (e.g., yield-controlled intersections), in order to assess difference in crash experience between the two features (e.g., stop versus yield sign).

cycle—a complete sequence of signal indications (phases).

cycle length—the total time for a traffic signal to complete one cycle.

dark adaptation (visual)—the ability to adjust light sensitivity on entering and exiting lighted or dark areas.

deceleration lane—a paved auxiliary lane, including tapered areas, allowing vehicles leaving the through-traffic lane of the roadway to decelerate.

decision sight distance (DSD)—the distance required for a driver to detect an unexpected or otherwise difficult-to-perceive information source, recognize the object, select an appropriate speed and path, and initiate and complete the maneuver efficiently and without a crash outcome.

delay—the additional travel time experienced by a driver, passenger, or pedestrian in comparison to free flow conditions.

delineation—methods of defining the roadway operating area for drivers.

dependent variable—in a function given as $Y = f(X_1, \ldots, X_n)$, it is customary to refer to $X_1, \ldots, X_n$ as independent or explanatory variables, and Y as the dependent or response variable. In each crash frequency prediction procedure, the dependent variable estimated in the base model is the annual crash frequency for a roadway segment or intersection.

descriptive analysis—methods such as frequency, crash rate, and equivalent property damage only (EPDO), which summarize in different forms the history of crash occurrence, type or severity, or both, at a site. These methods do not include any statistical analysis or inference.

design consistency—(1) the degree to which highway systems are designed and constructed to avoid critical driving maneuvers that may increase crash risk; (2) the ability of the highway geometry to conform to driver expectancy; (3) the coordination of successive geometric elements in a manner to produce harmonious driver performance without surprising events.

design speed—a selected speed used to determine the various geometric design features of the roadway. The assumed design speed should be a logical one with respect to the topography, anticipated operating speed, the adjacent land use, and the functional classification of highway. The design speed is not necessarily equal to the posted speed or operational speed of the facility.

diagnosis—the identification of factors that may contribute to a crash.

diamond interchange—an interchange that results in two or more closely spaced surface intersections, so that one connection is made to each freeway entry and exit, with one connection per quadrant.

discount rate—an interest rate that is chosen to reflect the time value of money.

dispersion parameter—see *overdispersion parameter*.

distribution (data analysis and modeling related)—the set of frequencies or probabilities assigned to various outcomes of a particular event or trail. Densities (derived from continuous data) and distributions (derived from discrete data) are often used interchangeably.

driver expectancy—the likelihood that a driver will respond to common situations in predictable ways that the driver has found successful in the past. Expectancy affects how drivers perceive and handle information and affects the speed and nature of their responses.

driver workload—surrogate measure of the number of simultaneous tasks a driver performs while navigating a roadway.

driveway density—the number of driveways per mile on both sides of the roadway combined.

driving task model—the simultaneous and smooth integration of a number of sub-tasks required for a successful driving experience.

dynamic programming—a mathematical technique used to make a sequence of interrelated decisions to produce an optimal condition.

economically valid project—a project in which benefits are greater than the cost.

Empirical Bayes (EB) methodology—method used to combine observed crash frequency data for a given site with predicted crash frequency data from many similar sites to estimate its expected crash frequency.

entrance ramp—a ramp that allows traffic to enter a freeway.

equivalent property damage only (EPDO) method—assigns weighting factors to crashes by severity (fatal, injury, property damage only) to develop a combined frequency and severity score per site. The weighting factors are calculated relative to Property Damage Only (PDO) crash costs. Crash costs include direct costs such as ambulance service, police and fire services, property damage, insurance and other costs directly related to the crashes. Crash costs also include indirect costs, i.e., the value society would place on pain and suffering or loss of life associated with the crash.

exit ramp—a ramp that allows traffic to depart a freeway.

expected average crash frequency—the estimate of long-term expected average crash frequency of a site, facility, or network under a given set of geometric conditions and traffic volumes (AADT) in a given period of years. In the Empiracal Bayes (EB) methodology, this frequency is calculated from observed crash frequency at the site and predicted crash frequency at the site based on crash frequency estimates at other similar sites.

expected average crash frequency, change in—the difference between the expected average crash frequency in the absence of treatment and with the treatment in place.

expected crashes—an estimate of long-range average number of crashes per year for a particular type of roadway or intersection.

expected excess crash method—method in which sites are ranked according to the difference between the adjusted observed crash frequency and the expected crash frequency for the reference population (e.g., two-lane rural segment, multilane undivided roadway, or urban stop-controlled intersection).

experimental studies—studies where sites are randomly assigned to a treatment or control group and the differences in crash experience can then be attributed to a treatment or control group.

explanatory variable (predictor)—a variable which is used to explain (predict) the change in the value of another variable. An explanatory variable is often defined as an independent variable; the variable which it affects is called the dependent variable.

facility—a length of highway that may consist of connected sections, segments, and intersections.

first harmful event—the first injury or damage-producing event that characterizes the crash.

freeway—a multilane, divided highway with a minimum of two lanes for the exclusive use of traffic in each direction and full control of access without traffic interruption.

frequency method—a method that produces a ranking of sites according to total crashes or crashes by type or severity, or both.

frequentist statistics—statistical philosophy that results in hypothesis tests that provide an estimate of the probability of observing the sample data conditional on a true null hypothesis. This philosophy asserts that probabilities are obtained through long-run repeated observations of events.

gap—the time, in seconds, for the front bumper of the second of two successive vehicles to reach the starting point of the front bumper of the first vehicle. Also referred to as *headway*.

gap acceptance—the process by which a vehicle enters or crosses a vehicular stream by accepting an available gap to maneuver.

geometric condition—the spatial characteristics of a facility, including grade, horizontal curvature, the number and width of lanes, and lane use.

goodness-of-fit (GOF) statistics—the goodness of fit of a statistical model describes how well it fits a set of observations. Measures of goodness of fit typically summarize the discrepancy between observed values and the values expected under the model in question. There are numerous GOF measures, including the coefficient of determination R^2, the F test, and the chi-square test for frequency data, among others. Unlike F-ratio and likelihood-ratio tests, GOF measures are not statistical tests.

gore area—the area located immediately between the edge of the ramp pavement and the edge of the roadway pavement at a merge or diverge area.

guidance task—a major subtask of the driving task model consisting of interacting with other vehicles (following, passing, merging, etc.) through maintaining a safe following distance and through following markings, traffic control signs, and signals.

Haddon Matrix—a framework used for identifying possible contributing factors for crashes in which contributing factors (i.e., driver, vehicle, and roadway/environment) are cross-referenced against possible crash conditions before, during, and after a crash to identify possible reasons for the events.

headway—see *gap*.

Heinrich Triangle—concept founded on the precedence relationship that "no injury crashes" precedes "minor injury crashes." This concept is supported by two basic ideas: (1) events of lesser severity are more numerous than more severe events, and events closer to the base of the triangle precede events nearer the top; and (2) events near the base of the triangle occur more frequently than events near the triangle's top, and their rate of occurrence can be more reliably estimated.

high-occupancy vehicle (HOV)—a vehicle with a defined minimum number of occupants (may consist of vehicles with more than one occupant).

high proportion of crashes method—the screening of sites based on the probability that their long-term expected proportion of crashes is greater than the threshold proportion of crashes.

Highway Safety Improvement Program (HSIP)—SAFETEA-LU re-established the Highway Safety Improvement Program (HSIP) as a core program in conjunction with a Strategic Highway Safety Plan (SHSP). The purpose of the HSIP is to reduce the number of fatal and serious/life-changing crashes through state-level engineering measures.

holistic approach—a multidisciplinary approach to the reduction of crashes and injury severity.

homogeneous roadway segment—a portion of a roadway with similar average daily traffic volumes (veh/day), geometric design, and traffic control features.

human factors—the application of knowledge from human sciences, such as human psychology, physiology, and kinesiology, in the design of systems, tasks, and environments for effective and safe use.

incremental benefit-cost ratio—the incremental benefit-cost ratio is an extension of the benefit-cost ratio method. Projects with a benefit-cost ratio greater than one are arranged in increasing order based on their estimated cost.

independent variables—a variable which is used to explain (predict) the change in the value of another variable.

Indiana Lane Merge System (ILMS)—advanced dynamic traffic control system designed to encourage drivers to switch lanes well in advance of the work zone lane drop and entry taper.

indirect measures of safety—see *surrogate measures*.

influence area (freeway)—an area that incurs operational impacts of merging (diverging) vehicles in Lanes 1 and 2 of the freeway and the acceleration (deceleration) lane for 1,500 ft from the merge (diverge) point downstream.

influence area (intersection)—functional area on each approach to an intersection consisting of three elements: (1) perception-reaction distance, (2) maneuver distance, and (3) queue storage distance.

integer programming—a mathematical optimization technique involving a linear programming approach in which some or all of the decision variables are restricted to integer values.

interchange—intersections that consist of structures that provide for the cross-flow of traffic at different levels without interruption, thus reducing delay, particularly when volumes are high.

interchange ramp terminal—a junction with a surface street to serve vehicles entering or exiting a freeway.

intersection—general area where two or more roadways or highways meet, including the roadway, and roadside facilities for pedestrian and bicycle movements within the area.

intersection functional area—area extending upstream and downstream from the physical intersection area including any auxiliary lanes and their associated channelization.

intersection related crash—a crash that occurs at the intersection itself or a crash that occurs on an intersection approach within 250 ft (as defined in the HSM) of the intersection and is related to the presence of the intersection.

intersection sight distance—the distance needed at an intersection for drivers to perceive the presence of potentially conflicting vehicles in sufficient time to stop or adjust their speed to avoid colliding in the intersection.

KABCO—an injury scale developed by the National Safety Council to measure the observed injury severity for any person involved as determined by law enforcement at the scene of the crash. The acronym is derived from (Fatal injury (K), Incapacitating Injury (A), Non-Incapacitating Injury (B), Possible Injury (C), and No Injury (O).) The scale can also be applied to crashes: for example, a K crash would be a crash in which the most severe injury was a fatality, and so forth.

lateral clearance—lateral distance from edge of traveled way to a roadside object or feature.

level of service of safety (LOSS) method—the ranking of sites according to their observed and expected crash frequency for the entire population, where the degree of deviation is then labeled into four classes of level of service.

median—the portion of a divided highway separating the traveled ways from traffic in opposite directions.

median refuge island—an island in the center of a road that physically separates the directional flow of traffic and that provides pedestrians with a place of refuge and reduces the crossing distance of a crosswalk.

meta analysis—a statistical technique that combines the independent estimates of crash reduction effectiveness from separate studies into one estimate by weighing each individual estimate according to its variance.

method of moments—method in which a site's observed crash frequency is adjusted based on the variance in the crash data and average crash counts for the site's reference population.

minor street—the lower volume street controlled by stop signs at a two-way or four-way stop-controlled intersection; also referred to as a *side street*. The lower volume street at a signalized intersection.

Model Minimum Inventory of Roadway Elements (MMIRE)—set of guidelines outlining the roadway information that should be included in a roadway database to be used for safety analysis.

Model Minimum Uniform Crash Criteria (MMUCC)—set of guidelines outlining the minimum elements in crash, roadway, vehicle, and person data that should ideally be in an integrated crash database.

most harmful event—event that results in the most severe injury or greatest property damage for a crash event.

motor vehicle crash—any incident in which bodily injury or damage to property is sustained as a result of the movement of a motor vehicle, or of its load while the motor vehicle is in motion.

multilane highway—a highway with at least two lanes for the exclusive use of traffic in each direction, with no control, partial control, or full control of access, but that may have periodic interruptions to flow at signalized intersections.

multivariate statistical modeling—statistical procedure used for cross-sectional analysis which attempts to account for variables that affect crash frequency or severity, based on the premise that differences in the characteristics of features result in different crash outcomes.

navigation task—activities involved in planning and executing a trip from origin to destination.

net benefit—a type of economic criteria for assessing the benefits of a project. For a project in a safety program, it is assessed by determining the difference between the potential crash frequency or severity reductions (benefits) from the costs to develop and construct the project. Maintenance and operations costs may also be associated with a net benefit calculation.

net present value (NPV) or net present worth (NPW)—this method is used to express the difference between discounted costs and discounted benefits of an individual improvement project in a single amount. The term "discounted" indicates that the monetary costs and benefits are converted to a present-value using a discount rate.

network screening—network screening is a process for reviewing a transportation network to identify and rank sites from most likely to least likely to benefit from a safety improvement.

non-monetary factors—items that do not have an equivalent monetary value or that would be particularly difficult to quantify (i.e., public demand, livability impacts, redevelopment potential, etc.).

observational studies—often used to evaluate safety performance. There are two forms of observational studies: before-after studies and cross-sectional studies.

offset—lateral distance from edge of traveled way to a roadside object or feature. Also known as *lateral clearance*.

operating speed—the 85th percentile of the distribution of observed speeds operating during free-flow conditions.

overdispersion parameter—an estimated parameter from a statistical model that when the results of modeling are used to estimate crash frequencies, indicates how widely the crash counts are distributed around the estimated mean. This term is used interchangeably with dispersion parameter.

p-value—the level of significance used to reject or accept the null hypothesis (whether or not a result is statistically valid).

passing lane—a lane added to improve passing opportunities in one or both directions of travel on a two-lane highway.

peak searching algorithm—a method to identify the segments that are most likely to benefit from a safety improvement within a homogeneous section.

pedestrian—a person traveling on foot or in a wheelchair.

pedestrian crosswalk—pedestrian roadway crossing facility that represents a legal crosswalk at a particular location.

pedestrian refuge—an at-grade opening within a median island that allows pedestrians to wait for an acceptable gap in traffic.

pedestrian traffic control—traffic control devices installed particularly for pedestrian movement control at intersections; it may include illuminated push buttons, pedestrian detectors, countdown signals, signage, pedestrian channelization devices, and pedestrian signal intervals.

perception-reaction time (PRT)—time required to detect a target, process the information, decide on a response, and initiate a response (it does not include the actual response element to the information). Also known as *perception-response time*.

perception-response time—see *perception-reaction time*.

performance threshold—a numerical value that is used to establish a threshold of expected number of crashes (i.e., safety performance) for sites under consideration.

peripheral vision—the ability of people to see objects beyond the cone of clearest vision.

permitted plus protected phase—compound left-turn protection that displays the permitted phase before the protected phase.

perspective, engineering—the engineering perspective considers crash data, site characteristics, and field conditions in the context of identifying potential engineering solutions that would address the potential safety concern. It may include consideration of human factors.

perspective, human factors—the human factors perspective considers the contributions of the human to the contributing factors of the crash in order to propose solutions that might break the chain of events leading to the crash.

phase—the part of the signal cycle allocated to any combination of traffic movements receiving the right-of-way simultaneously during one or more intervals.

positive guidance—when information is provided to the driver in a clear manner and with sufficient conspicuity to allow the driver to detect an object in a roadway environment that may be visually cluttered, recognize the object and its potential impacts to the driver and vehicle, select an appropriate speed and path, and initiate and complete the required maneuver successfully.

potential for safety improvement (PSI)—estimates how much the long-term crash frequency could be reduced at a particular site.

predicted average crash frequency—the estimate of long-term average crash frequency which is forecast to occur at a site using a predictive model found in Part C of the HSM. The predictive models in the HSM involve the use of regression models, known as Safety Performance Functions, in combination with Crash Modification Factors and calibration factors to adjust the model to site-specific and local conditions.

predictive method—the methodology in Part C of the manual used to estimate the 'expected average crash frequency' of a site, facility, or roadway under given geometric conditions, traffic volumes, and period of time.

primacy—placement of information on signs according to its importance to the driver. In situations where information competes for drivers' attention, unneeded and low-priority information is removed. Errors can occur when drivers shred important information because of high workload (process less important information and miss more important information).

programming, dynamic—a mathematical technique used to make a sequence of interrelated decisions to produce an optimal condition. Dynamic programming problems have a defined beginning and end. While there are multiple paths and options between the beginning and end, only one optimal set of decisions will move the problem from the beginning to the desired end.

programming, integer—an instance of linear programming when at least one decision variable is restricted to an integer value.

programming, linear—a method used to allocate limited resources (funds) to competing activities (safety improvement projects) in an optimal manner.

project development process—typical stages of a project from planning to post-construction operations and maintenance activities.

project planning—part of the project development process in which project alternatives are developed and analyzed to enhance a specific performance measure or a set of performance measures, such as, capacity, multimodal amenities, transit service, and safety.

quantitative predictive analysis—methodology used to calculate an expected number of crashes based on the geometric and operational characteristics at the site for one or more of the following: existing conditions, future conditions, or roadway design alternatives.

queue—a line of vehicles, bicycles, or persons waiting to be served by the system in which the flow rate from the front of the queue determines the average speed within the queue.

randomized controlled trial—experiment deliberately designed to answer a research question. Roadways or facilities are randomly assigned to a treatment or control group.

ranking methods, individual—the evaluation of individual sites to determine the most cost-effective countermeasure or combination of countermeasures for the site.

ranking methods, systematic—the evaluation of multiple safety improvement projects to determine the combination of projects that will provide the greatest crash frequency or severity reduction benefit across a highway network given budget constraints.

rate—see *crash rate*.

rate, critical—compares the observed crash rate at each site with a calculated critical crash rate unique to each site.

reaction time (RT)—the time from the onset of a stimulus to the beginning of a driver's (or pedestrian's) response to the stimulus by a simple movement of a limb or other body part.

redundancy—providing information in more than one way, such as indicating a no passing zone with signs and pavement markings.

regression analysis—a collective name for statistical methods used to determine the interdependence of variables for the purpose of predicting expected average outcomes. These methods consist of values of a dependent variable and one or more independent variables (explanatory variables).

regression-to-the-mean (RTM)—the tendency for the occurrence of crashes at a particular site to fluctuate up or down, over the long term, and to converge to a long-term average. This tendency introduces regression-to-the-mean bias into crash estimation and analysis, making treatments at sites with extremely high crash frequency appear to be more effective than they truly are.

relative severity index (RSI)—a measure of jurisdiction-specific societal crash costs.

relative severity index (RSI) method—an average crash cost calculated based on the crash types at each site and then compared to an average crash cost for sites with similar characteristics to identify those sites that have a higher than average crash cost. The crash costs can include direct crash costs accounting for economic costs of the crashes only; or account for both direct and indirect costs.

roadside—the area between the outside shoulder edge and the right-of-way limits. The area between roadways of a divided highway may also be considered roadside.

roadside barrier—a longitudinal device used to shield drivers from natural or man-made objects located along either side of a traveled way. It may also be used to protect bystanders, pedestrians, and cyclists from vehicular traffic under special conditions.

roadside hazard rating—considers the clear zone in conjunction with the roadside slope, roadside surface roughness, recoverability of the roadside, and other elements beyond the clear zone such as barriers or trees. As the RHR increases from 1 to 7, the crash risk for frequency and/or severity increases.

road-use culture—each individual road user's choices and the attitudes of society as a whole towards transportation safety.

roadway—the portion of a highway, including shoulders, for vehicular use.

roadway cross-section elements—roadway travel lanes, medians, shoulders, and sideslopes.

roadway environment—a system in which the driver, the vehicle, and the roadway interact with each other.

roadway, intermediate or high-speed—facility with traffic speeds or posted speed limits greater than 45 mph.

roadway, low-speed—facility with traffic speeds or posted speed limits of 30 mph or less.

roadway safety management process—a quantitative, systematic process for studying roadway crashes and characteristics of the roadway system and those who use the system, which includes identifying potential improvements, implementation, and the evaluation of the improvements.

roadway segment—a portion of a road that has a consistent roadway cross-section and is defined by two endpoints.

roundabout—an unsignalized intersection with a circulatory roadway around a central island with all entering vehicles yielding to the circulating traffic.

rumble strips—devices designed to give strong auditory and tactile feedback to errant vehicles leaving the travel way.

running speed—the distance a vehicle travels divided by running time, in miles per hour.

rural areas—places outside the boundaries of urban growth boundary where the population is less than 5,000 inhabitants.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—a federal legislature enacted in 2005. This legislature elevated the Highway Safety Improvement Program (HSIP) to a core FHWA program and created requirement for each state to develop a State Highway Safety Plan (SHSP).

safety—the number of crashes, by severity, expected to occur on the entity per unit of time. An entity may be a signalized intersection, a road segment, a driver, a fleet of trucks, etc.

safety management process—process for monitoring, improving, and maintaining safety on existing roadway networks.

safety performance function (SPF)—an equation used to estimate or predict the expected average crash frequency per year at a location as a function of traffic volume and in some cases roadway or intersection characteristics (e.g., number of lanes, traffic control, or type of median).

segment—a portion of a facility on which a crash analysis is performed. A segment is defined by two endpoints.

selective attention—the ability, on an ongoing moment-to-moment basis while driving, to identify and allocate attention to the most relevant information, especially within a visually complex scene and in the presence of a number of distracters.

service life—number of years in which the countermeasure is expected to have a noticeable and quantifiable effect on the crash occurrence at the site.

severity index—a severity index (SI) is a number from zero to ten used to categorize crashes by the probability of their resulting in property damage, personal injury, or a fatality, or any combination of these possible outcomes. The resultant number can then be translated into a crash cost and the relative effectiveness of alternate treatments can be estimated.

shoulder—a portion of the roadway contiguous with the traveled way for accommodation of pedestrians, bicycles, stopped vehicles, emergency use, as well as lateral support of the subbase, base, and surface courses.

sight distance—the length of roadway ahead that is visible to the driver.

sight triangle—in plan view, the area defined by the point of intersection of two roadways, and by the driver's line of sight from the point of approach along one leg of the intersection to the farthest unobstructed location on another leg of the intersection.

site—project location consisting of, but not limited to, intersections, ramps, interchanges, at-grade rail crossings, roadway segments, etc.

sites with potential for improvement—intersections and corridors with potential for safety improvements and identified as having possibility of responding to crash countermeasure installation.

skew angle, intersection—the deviation from an intersection angle of 90 degrees. Carries a positive or negative sign that indicates whether the minor road intersects the major road at an acute or obtuse angle, respectively.

slalom effect—dynamic illusion of direction and shape used to influence traffic behavior.

sliding-window approach—analysis method that can be applied when screening roadway segments. It consists of conceptually sliding a window of a specified length (e.g., 0.3 mile) along the road segment in increments of a specified size (e.g., 0.1 mile). The method chosen to screen the segment is applied to each position of the window, and the results of the analysis are recorded for each window. The window that shows the most potential for safety improvement is used to represent the total performance of the segment.

slope—the relative steepness of the terrain expressed as a ratio or percentage. Slopes may be categorized as positive (backslopes) or negative (foreslopes) and as parallel or cross slopes in relation to the direction of traffic.

speed adaptation—phenomenon experienced by drivers leaving a freeway after a long period of driving, and having difficulty conforming to the speed limit on a different road or highway.

speed choice—speed chosen by a driver that is perceived to limit the risk and outcome of a crash.

spreading—where all the information required by the driver cannot be placed on one sign or on a number of signs at one location, spread the signage out along the road so that information is given in small amounts to reduce the information load on the driver.

stopping sight distance (SSD)—the sight distance required to permit drivers to see a stationary object soon enough to stop for it under a defined set of worst-case conditions, without the performance of any avoidance maneuver or change in travel path; the calculation of SSD depends upon speed, gradient, road surface and tire conditions, and assumptions about the perception-reaction time of the driver.

Strategic Highway Safety Plan (SHSP)—a comprehensive plan to substantially reduce vehicle-related fatalities and injuries on the nation's highways. All departments of transportation are required by law to develop, implement, and evaluate a Strategic Highway Safety Plan for their state, in coordination with partner groups as stipulated in federal regulations.

suburban environment—an area with a mixture of densities for housing and employment, where high-density non-residential development is intended to serve the local community.

superelevation—the banking of a roadway in a curve to counteract lateral acceleration.

surrogate measure—an indirect safety measurement that provides the opportunity to assess safety performance when crash frequencies are not available because the roadway or facility is not yet in service or has only been in service for a short time, or when crash frequencies are low or have not been collected, or when a roadway or facility has significant unique features

system planning—the first stage of the project development process, in which network priorities are identified and assessed.

systematic prioritization—the process used to produce an optimal project mix that will maximize crash frequency and severity reduction benefits while minimizing costs, or fitting a mixed budget or set of policies.

systematic reviews—process of assimilating knowledge from documented information.

taper area—an area characterized by a reduction or increase in pavement width, typically located between mainline and ramp or areas with lane reductions.

total entering volume—sum of total major and minor street volumes approaching an intersection.

total million entering vehicles (TMEV)—measurement for total intersection traffic volume calculated from total entering vehicles (TEV) for each intersection approach.

traffic, annual average daily—the counted (or estimated) total traffic volume in one year divided by 365 days/year.

traffic barrier—a device used to prevent a vehicle from striking a more severe obstacle or feature located on the roadside or in the median or to prevent crossover median crashes. As defined herein, there are four classes of traffic barriers, namely, roadside barriers, median barriers, bridge railings, and crash cushions.

traffic calming—measures that are intended to prevent or restrict traffic movements, reduce speeds, or attract drivers' attention, typically used on lower speed roadways.

traffic conflict—an event involving two or more road users, in which the action of one user causes the other user to make an evasive maneuver to avoid a collision.

Transportation Safety Planning (TSP)—the comprehensive, systemwide, multimodal, proactive process that better integrates safety into surface transportation decision making.

traveled way—lanes, excluding the shoulders.

urban environment—an area typified by high densities of development or concentrations of population, drawing people from several areas within a region.

useful field of view (UFOV)—a subset of the total field of view where stimuli can not only be detected, but can be recognized and understood sufficiently to permit a timely driver response. As such, this term represents an aspect of visual information processing rather than a measure of visual sensitivity.

visual acuity—the ability to see details at a distance.

visual demand—aggregate input from traffic, the road, and other sources the driver must process to operate a motor vehicle. While drivers can compensate for increased visual demand to some degree, human factors experts generally agree that increasing visual demand towards overload will increase crash risk.

volume—the number of persons or vehicles passing a point on a lane, roadway, or other traffic-way during some time interval, often one hour, expressed in vehicles, bicycles, or persons per hour.

volume, annual average daily traffic—the average number of vehicles passing a point on a roadway in a day from both directions, for all days of the year, during a specified calendar year, expressed in vehicles per day.