GLOSSARY

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GENERAL

1. Accessible Route. An accessible route is a continuous, unobstructed path connecting all accessible elements and spaces in a building, site or facility. A "site" is defined as a parcel of land bounded by a property line or a designated portion of a public right-of-way. A "facility" is defined as all or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property on a site.

2. Arterial. Functionally classified highway which is characterized by a high degree of continuity and a capacity to quickly move relatively large volumes of traffic but often provide limited access to abutting properties. The arterial system typically provides for high travel speeds and the longest trip movements.

3. Average Running Speed. Running speed is the average speed of a vehicle over a specified section of highway. It is equal to the distance traveled divided by the running time (the time the vehicle is in motion). The average running speed is the distance summation for all vehicles divided by the running time summation for all vehicles.

4. Average Travel Speed. Average travel speed is the distance summation for all vehicles divided by the total time summation for all vehicles, including stopped delays. (Note: Average running speed only includes the time the vehicle is in motion. Therefore, on uninterrupted flow facilities which are not congested, average running speed and average travel speed are equal.)

5. Bicycle Lane. A portion of a roadway which has been designated by striping, signing and pavement markings for the exclusive use of bicyclists.

6. Bicycle Path. A bikeway physically separated from motorized vehicular traffic by an open space or barrier.

7. Bikeway. Any road, path or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or will be shared with other transportation modes.

8. Bridge. A structure, including supports, erected over a depression or obstruction, such as water, a highway, or a railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 ft (6 m) between undercopings of abutments or spring lines or arches or extreme ends of openings for multiple

boxes; may include multiple pipes where the clear distance between openings is less than half of the smaller contiguous opening.

9. Bridge Length. The length of a bridge structure is the overall length measured from centerline of bearing to centerline of bearing of the abutments.

10. Bridge Roadway Width. The clear width of the structure measured at right angles to the center of the roadway between the bottom of curbs or, if curbs are not used, between the inner faces of parapet or railing.

11. Bus. A heavy vehicle involved in the transport of passengers.

12. Collector. Functionally classified highway which is characterized by a roughly even distribution of their access and mobility functions.

13. Controlling Criteria. A list of geometric criteria requiring approval if they are not met or exceeded.

14. Crosswalk. (1) The part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or, in the absence of curbs, from the edges of the traversable roadway. (2) Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrians crossing by lines or other markings on the surface.

15. Department. The Montana Department of Transportation.

16. Design Exception. The process of receiving approval from the FHWA or Preconstruction Engineer for using design elements which do not meet the criteria set forth in the State Geometric Design Standards as control criteria and identified in the MDT Road Design Manual.

17. Design Speed. Speed selected to determine the various geometric design features of the roadway.

18. Divided Highway. A highway with separated roadways for traffic moving in opposite directions.

19. 85^{th} Percentile Speed. The 85th-percentile speed is the speed at or below which 85 percent of the traffic is moving. The most common application of the value is its use as a major factor in determining the speed limit for a highway section.

20. Facility. All or any portion of buildings, structures, site improvements, complexes, equipment, roads, walks, passageways, parking lots, or other real or personal property on a site.

21. Freeway. The highest level of arterial. This facility is characterized by full control of access, high design speeds, and a high level of driver comfort and safety.

22. Frontage Road. A road constructed adjacent and parallel to but separated from the highway for service to abutting property and for control of access.

23. Full Control (Access Controlled). Access is allowed only at specified interchanges or at specified public approaches. It is intended to give high priority to the uninterrupted movement of through traffic. At-grade access is inconsistent with full access control.

24. Grade Separation. A crossing of two highways, or a highway and a railroad, at different levels.

25. Heavy Vehicle. Any vehicle with more than four wheels touching the pavement during normal operation. Heavy vehicles collectively include trucks, recreational vehicles and buses.

26. High Speed. For geometric design purposes, high speed is defined as greater than 45 mph (70 km/h).

27. Highway, Street or Road. A general term denoting a public way for purposes of vehicular travel, including the entire area within the right of way. (*Recommended usage: in urban areas* - highway or street, *in rural areas* - highway or road).

28. Interchange. A system of interconnecting roadways in conjunction with one or more grade separations, providing for the movement of traffic between two or more roadways on different levels.

29. Intersection. The general area where two or more highways join or cross, within which are included the roadway and roadside facilities for traffic movements in that area.

30. Limited Access Control. Access is allowed at specified public roads or at private driveways as specified in legal agreements and/or deeds. The established street system is given first priority in access to the highway. When it is determined that reasonable private access cannot be provided using the public access, direct private access may be allowed at specific points.

31. Local Roads and Streets. All public roads and streets under city or county jurisdiction classified below the collector level.

32. Low Speed. For geometric design purposes, low speed is defined as 45 mph (70 km/h) or less.

33. National Highway System (NHS). A system of highways determined to have the greatest national importance to transportation, commerce and defense in the United States. It consists of the Interstate highway system, other principal arterials, the Strategic Highway Network and Major Strategic Highway Network connectors.

34. National Network (Trucks). A national network of highways that allow the passage of trucks of maximum dimensions and weight.

35. Non-Accessible Route. Any pedestrian facility which contains features that make it impractical to meet all of the criteria for accessible routes.

36. Overpass. A grade separation where the subject highway passes over an intersecting highway or railroad.

37. Pace. The 10 mph (15 km/h) increment of spot speeds that includes the range of speeds in which the highest number of observations is recorded.

38. Posted Speed Limit. The regulatory speed limit on a highway.

39. Ramp. A short roadway connecting two or more legs of an intersection or connecting a frontage road and main lane of a highway.

40. Recreational Vehicle. A heavy vehicle, generally operated by a private motorist, engaged in the transportation of recreational equipment or facilities; examples include campers, boat trailers, motorcycle trailers, etc.

41. Regulated Access. Access is managed through the granting of revocable permits to private parties to construct and maintain an approach. This level is intended to strike a balance between the through mobility on the highway and accessibility to adjacent land use.

42. Roadway. (General) The portion of a highway including shoulders, for vehicular use. A divided highway has two or more roadways. (Construction) The portion of a highway within limits of construction.

43. Running Speed. The moving speed of a vehicle traversing a specified section of highway. It is equal to the distance traveled divided by the running time (the time the vehicle is in motion).

44. Rural Areas. Those places outside the boundaries of urban areas.

45. Shared Roadway. A roadway which is open to both bicycle and motor vehicle travel.

46. Signalized Intersection. An intersection where all legs are controlled by a traffic signal.

47. Site. A parcel of land bounded by a property line or a designated portion of a public right-of-way.

48. State Highway. Any public highway planned, laid out, altered, constructed, reconstructed, improved, repaired, maintained or abandoned by the Montana Department of Transportation.

49. State Maintenance System. Public highways designated by the Transportation Commission that are to be included on the State Maintenance System. This system must include all the highways that the Department maintained on July 1, 1976.

50. Stopped Controlled Intersection. An intersection where one or more legs are controlled by a stop sign.

51. Surface Transportation Program (STP). A program which provides Federal-aid funds for any public road not functionally classified as a minor rural collector or a local road or street. However, in Montana, this program only applies to the State's primary, secondary and urban systems.

52. Truck. A heavy vehicle engaged primarily in the transport of goods and materials, or in the delivery of services other than public transportation. For geometric design and capacity analyses, trucks are defined as vehicles with six or more tires.

53. Underpass. A grade separation where the subject highway passes under an intersecting highway or railroad.

54. Urban Areas. Those places within boundaries set by the responsible State and local officials having a population of 5000 or more.

QUALIFYING WORDS

1. Acceptable. Design criteria that do not meet desirable values, but yet is considered to be reasonable and safe for design purposes.

2. Criteria. A term typically used to apply to design values, usually with no suggestion on the criticality of the design value. Because of its basically neutral implication, this Manual frequently uses “criteria” to refer to the design values presented.

3. Desirable, preferred. An indication that the designer should make every reasonable effort to meet the criteria and that the designer should only use a “lesser” design after due consideration of the “better” design.

4. Guidance. A statement or recommendation, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. In the MUTCD, all Guidance statements are labeled, and the text appears in unbold type. The verb “should” is typically used.

5. Guideline. Indicating a design value which establishes an approximate threshold which should be met if considered practical.

6. Ideal. Indicating a standard of perfection (e.g., traffic capacity under “ideal” conditions).

7. Insignificant, minor. Indicating that the consequences from a given action are relatively small and not an important factor in the decision-making for geometric design.

8. Justified. Indicating that, even though a set of conditions or warrants are met, the recommendation meets sound engineering principles.

9. May, could, can, suggest, consider. A permissive condition. Designers are allowed to apply individual judgment and discretion to the criteria when presented in this context. The decision will be based on a case-by-case assessment.

10. Minimum, maximum, upper, lower (limits). Representative of generally accepted limits within the design community but not necessarily suggesting that these limits are inviolable. However, where the criteria presented in this context will not be met, the designer will in many cases need approval.

11. Option. A statement of practice that is a permissive condition and carries no requirements or recommendation. In the MUTCD, Option may contain allowable

modifications to a Standard or Guidance. Option statements are labeled, and the text appears in unbold type. The verb “may” is typically used.

12. Policy. Indicating MDT practice which the Department generally expects the designer to follow, unless otherwise justified.

13. Possible. Indicating that which can be accomplished. Because of its rather restrictive implication, this word will not be used in this Manual for the application of geometric design criteria.

14. Practical, feasible, cost-effective, reasonable. Advising the designer that the decision to apply the design criteria should be based on a subjective analysis of the anticipated benefits and costs associated with the impacts of the decision. No formal analysis (e.g., cost-effectiveness analysis) is intended, unless otherwise stated.

15. Shall, require, will, must. A mandatory condition. Designers are obligated to adhere to the criteria and applications presented in this context or to perform the evaluation indicated. For the application of geometric design criteria, this Manual limits the use of these words.

16. Should, recommend. An advisory condition. Designers are strongly encouraged to follow the criteria and guidance presented in this context, unless there is reasonable justification not to do so.

17. Significant, major. Indicating that the consequences from a given action are obvious to most observers and, in many cases, can be readily measured.

18. Standard. (Geometrics) Indicating a design value which cannot be violated. This suggestion is generally inconsistent with geometric design criteria. Therefore, “standard” will not be used in this Manual to apply to geometric design criteria. (MUTCD) A statement of required, mandatory or specifically prohibitive practice regarding a traffic control device. In the MUTCD, all Standards are labeled and the text appears in bold type. The verb “shall” is typically used.

19. Support. An informational statement that does not convey any degree of mandate, recommendation, authorization, prohibitation or enforceable condition. In the MUTCD, Support statements are labeled and the text appears in unbold text. The verbs “shall,” “should” and “may” are not used in Support statements.

20. Target. If practical, criteria the designer should be striving to meet. However, not meeting these criteria will typically not require a justification.

21. Warrant. A threshold condition that, if found to be satisfied as part of an engineering study, will result in analysis of other traffic conditions or factors to determine whether a traffic signal or other improvement is justified.

ABBREVIATIONS

1. AASHTO. American Association of State Highway and Transportation Officials.
2. ADA. Americans with Disabilities Act.
3. ANSI. American National Standards Institute.
4. APWA. American Public Works Association.
5. AREA. American Railway Engineering Association.
6. ASCE. American Society of Civil Engineers.
7. ASTM. American Society of Testing and Materials.
8. COE. Corps of Engineers, USDOD.
9. FAA. Federal Aviation Administration.
10. FEMA. Federal Emergency Management Agency.
11. FHWA. Federal Highway Administration, USDOT.
12. HAER. Historic American Engineering Record.
13. HCM. Highway Capacity Manual.
14. HEC. Highway Engineering Circulars and Hydraulic Engineering Center, USDOD, COE, Davis California.
15. ITE. Institute of Transportation Engineers.
16. ISTEA. Intermodal Surface Transportation Efficiency Act of 1991.
17. MDEQ. Montana Department of Environmental Quality.
18. MDFWP. Montana Department of Fish, Wildlife and Parks.
19. MDPHHS. Montana Department of Public Health and Human Services.
20. MDT. Montana Department of Transportation.
21. MEPA. Montana Environmental Policy Act.
22. MUTCD. Manual on Uniform Traffic Control Devices.

23. NCHRP. National Cooperative Highway Research Program.

24. NEPA. National Environmental Policy Act.

25. NHS. National Highway System.

26. NPS. National Park Service.

27. NRHP. National Register of Historic Places.

28. OSHA. Occupational Safety and Health Administration.

29. R/W. Right-of-way.

30. RTF. Reconstruction Trust Fund.

31. SAFETEA-LU. Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users.

32. SHPO. State Historic Preservation Officer.

33. STP. Surface Transportation Program.

34. TEA-21. Transportation Equity Act for the 21st Century.

35. TRB. Transportation Research Board.

36. USDA. United States Department of Agriculture.

37. USDOD. United States Department of Defense.

38. USDOT. United States Department of Transportation.

39. USFS. United States Forest Service, USDA.

40. USPS. United States Postal Service.

PROJECT/PLAN DEVELOPMENT

1. Alignment and Grade Review. A meeting to determine and address the major project alignment concerns.

2. Alignment and Grade Review Report. A report which provides written documentation of the horizontal and vertical alignment determinations made during the preliminary alignment review.

3. Award. The acceptance by the Department of a bid.

4. CADD. Computer-aided drafting and design.

5. Consultant. A firm or person, hired by MDT to conduct special studies, design projects, and/or construction management.

6. Contractor. A company or firm hired by MDT to construct the project in the field according to the plans and specifications.

7. Designer. The person who performs the majority of the project design work and preparation of the specific plan package. Depending upon the project type, the designer may be from the Bridge Bureau, Road Design Section, Traffic Engineering Section or the Consultant.

8. Engineer's Estimate. The Department's cost estimate for construction of a project.

9. Lead Designer. The person who is the team leader responsible for directing or overseeing the work of the design team and is also responsible for a portion of the direct design load.

10. Letting (Bid Opening). The time appointed for the opening of the proposals submitted by bidders.

11. MDT Detailed Drawings. Drawings approved for repetitive use, showing details to be used where appropriate.

12. Notice to Proceed. Written notice given to the contractor to begin the contract work.

13. Plan-in-Hand Review. An in-depth office and on-site review of all project elements to ensure that all details have been satisfactorily incorporated into the construction plans and that the project is ready to advance to construction.

14. Plan-in-Hand Report. A report which provides written documentation of all decisions made during the plan-in-hand office and field review meetings.

15. Plans. The contract drawings which show the location, character and dimensions of the prescribed work, including layouts, profiles, cross sections and other details.

16. Preliminary Field Review. An initial field review meeting held after a project has been nominated to determine the major design features, and to discuss other project-related issues and any potential problems.

17. Preliminary Field Review Report. A report which provides written documentation of all major determinations made during the preliminary field review meeting.

18. Project. An undertaking by the Department for highway construction, including preliminary engineering, acquisition of right-of-way and actual construction, or for highway planning and research, or for any other work or activity to carry out the provisions of the law for the administration of highways.

19. Project Manager. The person who is assigned to oversee the project scoping and to manage project development.

20. Proposal. The written offer of the bidder to perform the work described in the plans and specifications, and to furnish the labor and materials at the prices quoted by the bidder.

21. Public Hearing/Meeting. A meeting conducted by MDT to inform the general public on the Department's proposed plan of action or design proposal.

22. Quantity Summaries. A listing of the project construction quantities which are used by both the Department and the contractor for determining the project construction costs.

23. Scope-of-Work Report. A report that identifies the proposed design elements and major design features of the subject project, provides an overview of the project improvements and lists all approved design exceptions.

24. Special Provisions. Additions and revisions to the Standard and Supplemental Specifications applicable to an individual project.

25. Specifications. The compilation of provisions and requirements for the performance of prescribed work.

26. Standard Specifications. Standard Specifications for Road and Bridge Construction. A book of specifications approved for general application and repetitive use.

27. Supplemental Specifications. Approved conditions and revisions to the Standard Specifications.

PLANNING

1. Annual Average Daily Traffic (AADT). The total yearly volume in both directions of travel divided by the number of days in a year.

2. Average Daily Traffic (ADT). The total traffic volumes in both directions of travel in a time period greater than one day but less than one year divided by the number of days in that time period.

3. Capacity. The maximum number of vehicles which can reasonably be expected to traverse a point or uniform section of a road during a given time period under prevailing roadway, traffic and control conditions. The time period most often used for analysis is 15 minutes.

4. Categorical Exclusion (CE). A classification for projects that will not induce significant environmental impacts or foreseeable alterations in land use, planned growth, development patterns, traffic volumes, travel patterns, or natural or cultural resources.

5. Delay. The primary performance measure on interrupted flow facilities, especially at intersections. For intersections, average delay is measured and expressed in seconds per vehicle.

6. Density. The number of passenger car equivalents (PCE) occupying a given length of lane.

7. Design Hourly Volume (DHV). The one-hour vehicular volume in both directions of travel in the design year selected for determining the highway design.

8. Directional Design Hourly Volume (DDHV). The highest of two directional volumes which combine to form the DHV.

9. Directional Distribution (D). The distribution by percent, of the traffic in each direction of travel during the DHV, ADT and/or AADT.

10. Environmental Assessment (EA). A study to determine if the environmental impacts of a project are significant, thus requiring the preparation of an EIS.

11. Environmental Impact Statement (EIS). A document which is prepared when it has been determined that a project will have a significant impact on the environment.

12. Equivalent Single-Axle Loads (ESAL's). The summation of equivalent 18,000-lb (8165-kg) single-axle loads used to combine mixed traffic to design traffic for the design period.

13. Finding of No Significant Impact (FONSI). A result of an EA that shows a project will not cause a significant impact to the environment.

14. Heavy-Vehicle Adjustment Factor. A factor used in capacity analyses to determine the equivalent flow rate, expressed in terms of passenger cars per hour per lane, of heavy vehicles (i.e., trucks, buses and RVs) in the traffic stream.

15. Level of Service (LOS). A qualitative concept which has been developed to characterize acceptable degrees of congestion as perceived by motorists.

16. New Construction. Horizontal and vertical alignment construction on new location.

17. Overlay and Widening. Work primarily intended to extend the service life of the existing facility by making cost-effective improvements to upgrade the highway. It may include full-depth pavement reconstruction for up to 50% of the project length and may include horizontal and vertical alignment revisions for up to 25% of the project length.

18. Peak-Hour Factor (PHF). A ratio of the volume occurring during the peak hour to the peak rate of flow during a given time period within the peak hour (typically, 15 minutes).

19. Project Scope of Work. The basic intent of the highway project which determines the overall level of highway improvement.

20. Rate of Flow. The equivalent hourly rate at which vehicles pass over a given point or section of a lane or roadway on which the volume is collected over a time interval less than one hour.

21. Reconstruction. Reconstruction of an existing highway mainline will typically include the addition of travel lanes, reconstruction of the existing horizontal and vertical alignment for more than 25% of the project length, and/or full-depth pavement reconstruction for more than 50% of the project length.

22. Service Flow Rate. The maximum hourly vehicular volume that can pass through a highway element at the selected level of service.

23. Truck Factor (T). A factor which reflects the percentage of heavy vehicles (trucks, buses and recreational vehicles) in the traffic stream during the DHV, ADT and/or AADT. For geometric design and capacity analysis, trucks are defined as vehicles with six or more tires.

GEOMETRICS

1. Approach. A road providing access from a public way to a highway, street, road or to an abutting property.

2. Auxiliary Lane. The portion of the roadway adjoining the through traveled way for purposes supplementary to through traffic movement including parking, speed change, turning, storage for turning, weaving or truck climbing.

3. Axis of Rotation. The line about which the pavement is revolved to superelevate the roadway. This line will maintain the normal highway profile throughout the curve.

4. Back Slope. The side slope created by the connection of the ditch bottom, upward and outward, to the natural ground.

5. Begin Curb Return (BCR). The point along the mainline pavement edge where the curb return of an intersection meets the tangent portion.

6. Broken-Back Curves. Two crest or sag vertical curves separated by a short section of tangent (500 ft (150 m) or less).

7. Buffer. The area or strip, also known as a boulevard, between the roadway and a sidewalk.

8. Bus. A heavy vehicle involved in the transport of passengers.

9. Channelization. The directing of traffic through an intersection by the use of pavement markings (including striping, raised reflectors, etc.), medial separators or raised islands.

10. Comfort Criteria. Criteria which is based on the comfort effect of change in vertical direction in a sag vertical curve because of the combined gravitational and centrifugal forces.

11. Compound Curves. A series of two or more horizontal curves with deflections in the same direction and common points of curvature.

12. Corner Island. A raised or painted island used to channel the right-turn movement.

13. Critical Length of Grade. The maximum length of a specific upgrade on which a loaded truck can operate without experiencing a specified reduction in speed.

14. Cross Slope. The slope in the cross section view of the travel lanes, expressed as a percent, based on the change in vertical compared to the change in horizontal.

15. Cross Slope Rollover. The algebraic difference between the slope of the through lane and the slope of the adjacent pavement within the traveled way or gore.

16. Curb Cut. Any opening in a curb where the curb section is terminated.

17. Curve to Spiral (CS). Common point of circular curve and spiral of far transition.

18. Cuts. Sections of highway located below natural ground elevation thereby requiring excavation of earthen material.

19. Depressed Median. A median that is lower in elevation than the traveled way and designed to carry a certain portion of the roadway runoff.

20. Design Vehicle. The vehicle used to determine turning radii, off-tracking characteristics, pavement designs, etc.

21. Edge of Travel Lane (ETL). The line between the portion of the roadway used for the movement of vehicles and the shoulder. The edge of travel lane is the center line, when considering opposing traffic.

22. Edge of Traveled Way (ETW). The line between the portion of the roadway used for the movement of vehicles and the shoulder regardless of the direction of travel.

23. End Curb Return (ECR). The point along the minor roadway pavement edge where the curb return of an intersection meets the tangent portion.

24. Face of Curb. A distance of 6 in (150 mm) from the back of curb.

25. Farm Field Approaches. Revocable entrances to and/or from a field.

26. Fill Slope. A slope extending outward and downward from the hinge point to intersect the natural ground line.

27. Flush Median. A paved median which is level with the surface of the adjacent roadway pavement.

28. Gore Nose. The point where the paved shoulder ends and the sodded area begins as the ramp and mainline diverge from one another.

29. Grade Separation. A crossing of two highways, or a highway and a railroad, at different levels.

30. Grade Slope. The rate of slope between two adjacent VPI's expressed as a percent. The numerical value for percent of grade is the vertical rise or fall in feet (meters) for each 100 ft (100 m) of horizontal distance. Upgrades in the direction of stationing are identified as plus (+). Downgrades are identified as minus (-).

31. Gradient. The rate of slope between two adjacent vertical points of intersection (VPI) expressed as a percent. The numerical value for percent of grade is the vertical rise or fall in feet (meters) for each 100 ft (100 m) of horizontal distance. Upgrades in the direction of stationing are identified as plus (+). Downgrades are identified as minus (-).

32. Heavy Vehicle. Any vehicle with more than four wheels touching the pavement during normal operation. Heavy vehicles collectively include trucks, recreational vehicles and buses.

33. Hinge Point (Freeways). The point from which the fill height and depth of cut are determined. For fills, the point is located at the intersection of the inslope extension and the fill slope. For cuts, the hinge point is located at the toe of the back slope.

34. Hinge Point (Non-Freeways). The point from which the fill height and depth of cut are determined. For fills, the point is located at the intersection of the subgrade cross slope and the fill slope for tangent sections and the low side of superelevated sections. On the high side of superelevated sections, the point is located on the fill slope at a distance from the centerline equal to the distance from the centerline to the hinge point on the tangent section. For cuts, the hinge point is located at the toe of the back slope.

35. Inslope. The side slope in a cut section created by connecting the subgrade shoulder to the ditch bottom, downward and outward.

36. Interchange. A system of ramps in conjunction with one or more grade separations, providing for the movement of traffic between two or more roadways on different levels.

37. Intersection. The general area where two or more highways join or cross at grade.

38. Intersection Sight Distance (ISD). The sight distance required within the corners of intersections to safely allow a variety of vehicular access or crossing maneuvers based on the type of traffic control at the intersection.

39. Island. Channelization (raised or flush) in which traffic passing on both sides is traveling in the same direction.

40. K-Value. The horizontal distance needed to produce a 1% change in gradient.

41. Landing Area. The area approaching an intersection for stopping and storage of vehicles.

42. Length of Circular Curve (L_C). Length of circular curve.

43. Length of Spiral (L_S). Length of spiral.

44. Level Terrain. Level terrain is generally considered to be flat, and has minimal impact on vehicular performance. Highway sight distances are either long or could be made long without major construction expense.

45. Low-Speed Urban Streets. These are all streets within urbanized and small urban areas with a design speed of 45 mph (70 km/h) or less.

46. Maximum Superelevation (e_{max}). The overall superelevation control used on a specific facility. Its selection depends on several factors including overall climatic conditions, terrain conditions, type of facility and type of area (rural or urban).

47. Medial Separator. Channelization which separates opposing traffic flows, alerts the driver to the cross road ahead and regulates traffic through the intersection.

48. Median. The auxiliary portion of a highway separating traffic in opposite directions. The median width includes both inside shoulders.

49. Median Slope. The slope in the cross section view of a depressed median beyond the surfacing inslope, expressed as a ratio of the change in horizontal to the change in vertical.

50. Momentum Grade. A site where an upgrade is preceded by a downgrade, thereby allowing a truck to increase its speed on the upgrade. This increase in speed allows the designer to use a higher speed reduction in the critical length of grade figure.

51. Mountainous Terrain. Longitudinal and transverse changes in elevation are abrupt. Benching and side hill excavation are frequently required to provide the desirable highway alignment. Mountainous terrain aggravates the performance of trucks relative to passenger cars, resulting in some trucks operating at crawl speeds.

52. No Control Intersection. An intersection where none of the legs are controlled by a traffic control device.

53. Normal Crown (NC). The typical cross section on a tangent section referenced to centerline with equal downslope to the edge of pavement.

54. Painted Nose. This is the point (without width) where the pavement striping on the left side of the ramp converges with the stripe on the right side of the mainline traveled way.

55. Passing Sight Distance. For geometric design applications, the distance required for a following vehicle to maneuver around, in the opposing traffic lane, a slower vehicle and to safely return back to the appropriate travel lane.

56. Performance Curves. A set of curves which illustrate the effect grades will have on the design vehicle's acceleration and/or deceleration.

57. Physical Nose. This is the point where the ramp and mainline shoulders converge.

58. Point of Compound Curvature (PCC). Point of compound curvature.

59. Point of Curvature (PC). Point of curvature (beginning of curve).

60. Point of Intersection (PI). Point of intersection of tangents.

61. Point of Reverse Curvature (PRC). Point of reverse curvature.

62. Point of Tangency (PT). Point of tangency (end of curve).

63. Private Approach. An approach which allows access to and/or from a commercial, industrial or residential property.

64. Profile Grade Line. A series of tangent lines connected by vertical curves. It is typically placed along the roadway centerline of undivided facilities and at the edges of the two roadways on the median side on divided facilities.

65. Public Approach. A connection to and/or from a dedicated street, road, alley or other dedicated public roadway to a highway facility.

66. Raised Median. A median which contains a raised portion or island within its limits.

67. Recreational Vehicle. A heavy vehicle, generally operated by a private motorist, engaged in the transportation of recreational equipment or facilities; examples include campers, boat trailers, motorcycle trailers, etc.

68. Relative Longitudinal Slope. The difference between the centerline grade and the grade of the edge of traveled way.

69. Return. The circular segment of curb at an intersection which connects the tangent portions of the intersecting legs.

70. Reverse Crown (RC). A superelevated roadway section which is sloped across the entire traveled way in the same direction and at a rate equal to the cross slope on a tangent section.

71. Reverse Curves. These are two simple curves with deflections in opposite directions which are joined by a common point or a relatively short tangent distance.

72. Roadside. A general term denoting the area adjoining the outer edge of the roadway.

73. Roadway Section. The combination of the traveled way, both shoulders and any auxiliary lanes on the highway mainline.

74. Rolling Terrain. The natural slopes consistently rise above and fall below the roadway grade and, occasionally, steep slopes present some restriction to the desirable highway alignment. In general, rolling terrain generates steeper grades, causing trucks to reduce speeds below those of passenger cars.

75. Shelf. On curbed urban facilities without sidewalks, the relatively flat area (2% slope) located between the back of the curb and the break for the fill slope or back slope.

76. Shoulder. The portion of the roadway contiguous to the traveled way for the accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses. On sections with curb and gutter, the shoulder extends to the face of the curb.

77. Shoulder Slope. The slope in the cross section view of the shoulders, expressed as a percent.

78. Shoulder Width. The width of the shoulder measured from the edge of traveled way to the intersection of the shoulder slope and surfacing inslope planes. On curb and gutter sections, the width of the shoulder is measured from the edge of

the traveled way to the face of curb (a point 0.5 ft (0.15 m) in front of the back of curb).

79. Sidewalk. That portion of the highway section constructed for the use of pedestrians used in combination with curb and gutter.

80. Signalized Intersection. An intersection where all legs are controlled by a traffic signal.

81. Simple Curve. A curve that has a continuous arc of constant radius which achieve the necessary highway deflection without an entering or exiting transition.

82. Slope Offset. On curbed facilities with sidewalks, the area between the back of the sidewalk and the break for the fill slope or back slope.

83. Sloping (Mountable) Curb. A longitudinal element, typically concrete, placed at the roadway edge for delineation, to control drainage, to control access, etc. Mountable curbs have a height of 6 in (150 mm) or less with a face no steeper than 1 horizontal to 3 vertical.

84. Spiral Curve. A curvature arrangement used to transition between a tangent section and a simple curve which is consistent with the transitional characteristics of vehicular turning paths. When moving from the tangent to the simple curve, the sharpness of the spiral curve gradually increases from a radius of infinity to the radius of the simple curve.

85. Spiral to Curve (SC). Common point of spiral and circular curve of near transition.

86. Spiral to Tangent (ST). Common point of spiral and tangent of far transition.

87. Spline Curve. A curve drawn using a flexible template to meet field conditions.

88. Spline Grade. A grade developed using a flexible template to meet field conditions.

89. Stop Controlled Intersection. An intersection where one or more legs are controlled by a stop sign.

90. Stopping Sight Distance (SSD). The sum of the distance traveled during a driver's perception/reaction or brake reaction time and the distance traveled while braking to a stop.

91. Superelevation. The amount of cross slope or “bank” provided on a horizontal curve to help counterbalance the outward pull of a vehicle traversing the curve.

92. Superelevation Rollover. The algebraic difference (A) between the superelevated traveled way slope and shoulder slope on the outside of a horizontal curve.

93. Superelevation Runoff (L). The distance needed to change the cross slope from the end of the tangent runout (adverse crown removed) to a section that is sloped at the design superelevation.

94. Superelevation Transition Length. The distance required to transition the roadway from a normal crown section to full superelevation. Superelevation transition length is the sum of the tangent runout (TR) and superelevation runoff (L) distances.

95. Surfacing Inslope. The slope extending from the edge of shoulder to the subgrade shoulder point, expressed as a ratio of the change in horizontal to the change in vertical.

96. Symmetrical Vertical Curve. A vertical curve where the horizontal distance from the VPC to the VPI equals the horizontal distance from the VPI to the VPT.

97. Tangent Runout (TR). The distance needed to transition the roadway from a normal crown section to a point where the adverse cross slope of the outside lane or lanes is removed (i.e., the outside lane(s) is level).

98. Tangent to Spiral (TS). Common point of spiral and near transition.

99. Toe of Slope. The intersection of the fill slope or inslope with the natural ground or ditch bottom.

100. Top of (Cut) Slope. The intersection of the back slope with the natural ground.

101. Travel/Traffic Lane. The portion of the traveled way for the movement of a single line of vehicles.

102. Traveled Way. The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

103. Truck. A heavy vehicle engaged primarily in the transport of goods and materials, or in the delivery of services other than public transportation. For geometric design and capacity analyses, trucks are defined as vehicles with six or more tires.

104. Turn Lane. An auxiliary lane adjoining the through traveled way for speed change, storage and turning.

105. Turning Roadway. A channelized roadway (created by an island) connecting two legs of an at-grade intersection. Interchange ramps are not considered turning roadways.

106. Turning Template. A graphic representation of a design vehicle's turning path depicting various angles of turns for use in determining acceptable turning radii designs.

107. Unsymmetrical Vertical Curve. A vertical curve where the horizontal distance from the VPC to the VPI is not equal to the horizontal distance from the VPI to the VPT.

108. Vertical (Barrier) Curb. A longitudinal element, typically concrete, placed at the roadway edge for delineation, to control drainage, to control access, etc. Barrier curbs may range in height between 6 in (150 mm) and 1 ft (300 mm) with a face steeper than 1 horizontal to 3 vertical.

109. Vertical Point of Curvature (VPC). The point at which a tangent grade ends and the vertical curve begins.

110. Vertical Point of Intersection (VPI). The point where the extension of two tangent grades intersect.

111. Vertical Point of Tangency (VPT). The point at which the vertical curve ends and the tangent grade begins.

112. Yield Controlled Intersection. An intersection where one or more legs are controlled by a yield sign.

RIGHT-OF-WAY

1. Abandonment. The relinquishment of the public interest in right-of-way or activity thereon with no intention to reclaim or use again for highway purposes.

2. Access. A legal right to enter the through lanes of a highway facility from abutting property or public streets.

3. Access Control (Control of Access). The condition in which the right of owners or occupants of abutting land or other persons to access, light, air or view in connection with a highway is fully or partially controlled by a public authority.

4. Acquisition or Taking. The process of obtaining land and land interests.

5. Construction Permit. Temporary legal access acquired by the State, outside the permanent right-of-way boundaries, to construct the highway project according to its proper design but on property which is not owned by the State.

6. Farm Field Approaches. An approach to be used only for access to agricultural lands (farm fields) and no other purpose.

7. Full Access Control. Access is allowed only at specified interchanges or at specified public approaches. It is intended to give high priority to the uninterrupted movement of through traffic. At-grade access is inconsistent with full access control.

8. Improvement. Any dwelling, out-building, other structure or fence, or part thereof, but not including public utilities, which lie within an area to be acquired for highway purposes.

9. Limited Access Control. Access is allowed at specified public roads or at private driveways as specified in legal agreements and/or deeds. The established street system is given first priority in access to the highway. When it is determined that reasonable private access cannot be provided using the public access, direct private access may be allowed at specific points.

10. Limited Access Highway (or Facility). A portion of roadway with limited access control imposed by the governing public authority.

11. Permanent Right-of-Way. Highway right-of-way acquired for permanent ownership (fee simple title) by the State for activities which are the responsibility of the State for an indefinite period of time. The State obtains fee title to the property.

12. Permanent Right-of-Way Easements. A right for a specific purpose acquired by the State for the limited usage of property not owned by the State. Types of right-of-way easements may include maintenance easements, utility easements, storm sewer easements and roadway easements.

13. Private Approach. An approach which allows access to and/or from a commercial, industrial or residential property.

14. Public Approach. A connection to and/or from a dedicated street, road, alley or other dedicated public roadway to a highway facility.

15. Regulated Access. Access is managed through the granting of revocable permits to private parties to construct and maintain an approach. This level is intended to strike a balance between the through mobility on the highway and accessibility to adjacent land use.

16. Right of Access. The right of ingress to a highway from abutting land and egress from a highway to abutting land.

17. Right-of-Way. A general term denoting land, property, or interest therein, usually a strip acquired for or devoted to a highway use.

18. Right-of-Way Appraisal. A determination of the market value of property including damages, if any, as of a specified date, resulting from an analysis of facts.

19. Right-of-Way Estimate. An approximation of the market value of property including damages, if any, in advance of an appraisal.

20. Severance Damages. Loss in value of the remainder of a parcel resulting from an acquisition.

21. Temporary Easement. Right-of-way acquired for the legal right of usage by the State to serve a specific purpose for a limited period of time (e.g., maintenance and protection of traffic during construction). Once the activity is completed, the State yields its legal right of usage and returns the land to its original condition as close as practical.

ROADSIDE SAFETY

1. Barrier Guideline. A criterion that identifies an area of concern which should be shielded by a traffic barrier, if judged to be practical.

2. Critical Parallel Slope. A slope which cannot be safely traversed by a run-off-the-road vehicle. Depending on the encroachment conditions, a vehicle on a critical slope may overturn. For most embankment heights, a fill slope steeper than 3:1 is considered critical.

3. Edge of Travel Lane (ETL). The line between the portion of the roadway used for the movement of vehicles and the shoulder. The edge of travel lane is the center line, when considering opposing traffic.

4. Edge of Traveled Way. The line between the portion of the roadway used for the movement of vehicles and the shoulder regardless of the direction of travel.

5. Impact Angle. For a longitudinal barrier, the angle between a tangent to the face of the barrier and a tangent to the vehicle's path at impact. For a crash cushion, it is the angle between the axis of symmetry of the crash cushion and a tangent to the vehicular path at impact.

6. Impact Attenuator (Crash Cushion). A device used to safely shield fixed objects or other obstacles of limited dimension from approximately head-on impacts by errant vehicles.

7. Length of Need. Total length of a longitudinal barrier, measured with respect to the centerline of roadway, needed to shield an area of concern. The length of need is measured to the last point of full-strength rail.

8. Median Barrier. A longitudinal barrier used to prevent an errant vehicle from crossing the median of a divided highway. This prevents collisions between traffic traveling in opposite directions.

9. Non-Recoverable Parallel Slope. A slope which can be safely traversed but upon which an errant motorist is unlikely to recover. The run-off-the-road vehicle will likely continue down the slope and reach its toe. For most embankment heights, if a fill slope is between 3:1 (inclusive) and 4:1 (exclusive), it is considered a non-recoverable parallel slope.

10. Parallel Slopes. Cut and fill slopes for which the toe runs approximately parallel to the flow of traffic.

11. Recoverable Parallel Slope. A slope which can be safely traversed and upon which an errant motorist has a reasonable opportunity to stop and return to the roadway. A fill slope 4:1 and flatter is considered recoverable.

12. Roadside Barrier. A longitudinal barrier used to shield obstacles located within an established clear zone. Roadside barriers include guardrail, half-section concrete median barriers, etc.

13. Roadside Clear Zone. The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicles. This area may consist of a shoulder, a recoverable slope, a non-recoverable slope and/or a recovery area. The desired width is dependent upon traffic volumes, speeds and roadside geometry.

14. Roadside Obstacle. A general term to describe roadside features which cannot be safely impacted by a run-off-the-road vehicle. Roadside obstacles include both fixed objects and non-traversable roadside features (e.g., rivers).

15. Shy Distance. The distance from the edge of the traveled way beyond which a roadside object will not be perceived as an immediate hazard by the typical driver, to the extent that the driver will change vehicular placement or speed.

16. Transverse Slopes. Cut and fill slopes for which the toe runs approximately perpendicular to the flow of traffic. Transverse slopes are typically formed by intersections between the mainline and approach, median crossovers or side roads.

17. Traversable Slope. A slope or cross section in which a vehicle can safely cross. A parallel slope 3:1 or flatter is considered traversable.

18. Utility Occupancy Area. A strip of right-of-way reserved for the placement of utilities.

SIGNING AND PAVEMENT MARKINGS

1. Broken Line. A pavement marking line formed by a series of segments and gaps indicating a permissive condition.

2. Business Sign (Logo Sign). A separately attached sign mounted on a motorist information sign panel to show the brand, symbol, trademark, name or combination of these, for a motorist service available on a crossroad at or near an interchange or intersection.

3. Center Line. A pavement marking line used to separate vehicles traveling in opposite directions.

4. Channelizing Line. A pavement marking line used to separate traffic movement into definite paths to facilitate a safe and orderly movement.

5. Crossroad. A marked route or other public road intersecting a main highway for which access is provided at an interchange or intersection.

6. Delineators. Light retroreflective devices mounted along side the roadway to guide motorists.

7. Dotted Line. A pavement marking line formed by a series of segments and gaps indicating a guidance condition.

8. Double Line. Two parallel solid pavement marking lines indicating maximum or special restrictions.

9. Edge Line. A pavement marking line used to delineate the edge of the traveled way.

10. General Service Sign. A sign used to inform motorists of the availability of general and specific services.

11. Guide Sign. A sign used to aid motorists with simple and specific information in reaching their designation.

12. Lane Line. A pavement marking line used to separate lanes of traffic traveling in the same direction.

13. Motorist Information Sign. A rectangular sign panel located in the same manner as other official traffic signs, readable from the main traveled way and is a specific information sign or tourist-oriented directional sign.

14. Motorist Service. Service required by motorists which include gas, food, lodging, camping, recreation and tourist service.

15. Object Markers. Panels used to mark obstructions that are within or adjacent to the roadway.

16. Recessed Pavement Markers. Reflective devices placed in a precut groove used to supplement other markings or position guidance devices.

17. Reflectorization. Material placed on a sign or in pavement markings to improve their night visibility.

18. Regulatory Sign. A sign used to inform motorists of traffic laws and regulations which apply at definite locations and at specific times.

19. Solid Line. A continuous, solid pavement marking line that discourages or prohibits crossing depending on the specific applications.

20. Specific Information Sign. A motorist information sign located on the Interstate highway system that contains the words GAS, FOOD, LODGING or CAMPING; directional information; and one or more individual business signs.

21. Tourist-Oriented Directional Sign. A motorist information sign located on the non-Interstate Highway System to provide business identification and directional information for businesses, services and activities of interest to tourists.

22. Trailblazer Sign. A small sign with the type of service, name of business, direction and distance to a qualified business.

23. Variable Message Sign. A sign where the message displayed varies.

24. Warning Sign. A sign used to warn motorists of unusual or potentially hazardous condition(s) on or adjacent to a street or highway.

TRAFFIC SIGNALS

1. Accessible Pedestrian Signal. A device that communicates information about pedestrian timing in non-visual format (e.g., audible tones, verbal messages, vibrating surfaces).

2. Active Railroad Grade Crossing Warning System. The flashing signals, with or without warning gates, together with the necessary control equipment used to inform road users of the approach or presence of trains at railroad-highway grade crossings.

3. Actuated (Operation). Operation of a controller in which some or all signal phases are operated on the basis of detection.

4. Actuation. Initiation of a possible change in traffic signal phase through detection.

5. Approach. All lanes of traffic moving toward an intersection or a mid-block location from one direction, including any adjacent parking lane(s).

6. Average Day. A day representing traffic volumes normally and repeatedly found at a location, typically a weekday when volumes are influenced by employment or a weekend day when volumes are influenced by entertainment or recreation.

7. Background Cycle. The period of time provided to serve all the assigned intervals to their maximum allotted time within the coordination plan. In coordinated systems, the background cycle is common to all intersections in the system.

8. Backplate. A thin strip of material that extends outward from and parallel to a signal face on all sides of a signal housing to provide a background for improved visibility of the signal indication.

9. Cabinet. A weatherproof enclosure for housing the controller and associated equipment.

10. Call. The input into a controller as a result of the actuation of a vehicle or pedestrian detector.

11. Conflict Monitor (Malfunction Management Unit). A device used to detect and respond to improper or conflicting signal indications and improper operating voltages in a controller.

12. Controller. A complete electrical device responsible for controlling the operation of a traffic signal.

13. Coordination. The establishment of timed relationships between the interval sequences of adjacent signal installations.

14. Crosswalk. (1) The part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the centerline. (2) Any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by lines on the surface, which may be supplemented by a contrasting pavement texture, style or color.

15. Cycle. The period of time used to display a complete sequence of signal indications.

16. Delay. (1) A measure of the time that has elapsed between the stimulus and the response; (2) Traffic Delay. The time lost by vehicle(s) due to traffic friction or control devices (e.g., lane changes, parking maneuvers, driveways).

17. Demand. The need for service; for example, the number of vehicles desiring to use a given segment of roadway during a specified unit of time.

18. Detection. The process used to identify the presence or passage of a vehicle at a specific point or to identify the presence of one or more vehicles in a specific area. Detection also refers to the process used to identify the presence of pedestrians.

19. Detector. A device used for indicating the presence or passage of vehicles or pedestrians (e.g., inductive loop, microloop detector, pedestrian push button).

20. Dilemma Zone. A range of distances from the intersection where drivers may react unpredictably to a yellow change interval (i.e., deciding to stop or to continue through the intersection).

21. Dual-Arrow Signal Section. A type of signal section designed to include both a yellow arrow and a green arrow.

22. Extension Time. The amount of time the green interval is displayed once vehicular demand has left the inductive loop.

23. Flasher. A device used to turn signal indications on and off repetitively.

24. Flashing (Flashing Mode). A mode of operation in which a traffic signal indication is turned on and off repetitively.

25. Flashing Beacon. A single signal indication that operates in a flashing mode.

26. Full-Actuated Operation. The operation of a traffic signal in which all signal phases function on the basis of detection.

27. Interconnected. Traffic signals, signs and/or computers that are connected through common communication.

28. Interval. A discrete part of a signal cycle during which signal indications do not change.

29. Interval Sequence. The order of appearance of signal indications during successive intervals of a signal cycle.

30. Interval Timing. The passage of time that occurs during an interval.

31. Lag. An additional interval or phase that must follow the previous phase.

32. Lane-Use Control Signal. An overhead signal displaying indications to permit or prohibit the use of specific lanes of a roadway or to indicate the impending prohibition of such use.

33. Lead. An additional interval or phase that must precede the next phase.

34. Loop Detector. A device capable of sensing a change in the inductance caused by the passage or presence of a vehicle over an inductive loop embedded in the roadway.

35. Louver. A device that can be placed inside a signal visor to restrict visibility of a signal indication from the side or to limit the visibility of the signal indication to a certain lane or number of lanes.

36. Major Roadway. The roadway normally carrying the higher volume of vehicular traffic.

37. Minor Roadway. The roadway normally carrying the lower volume of vehicular traffic.

38. Offset. The time difference, in seconds, between the start of the green interval at one intersection as related to the start of the green interval at another intersection. May also be expressed in percent of cycle length.

39. Overlap. An assigned traffic movement that runs during one or more traffic phases.

40. Network. A geographical arrangement of intersecting roadways.

41. Passage Time. The amount of time the green interval is displayed once vehicular demand has left the inductive loop.

42. Pedestrian Change Interval. An interval during which the flashing UPRAISED HAND (symbolizing DON'T WALK) symbol indication is displayed. When a verbal message is provided at an accessible pedestrian signal, the verbal message is "wait."

43. Pedestrian Signal Indication. A signal head that is installed to direct pedestrian traffic at a signal installation.

44. Pedestrian Clearance Time. The time provided for a pedestrian crossing in a crosswalk, after leaving the curb or shoulder, to travel to the far side of the traveled way or to a median.

45. Permitted Mode. A mode of traffic signal control in which left or right turns may be made when a circular green indication is displayed after yielding to oncoming traffic and/or pedestrians.

46. Platoon. A group of vehicles or pedestrians traveling together as a group either voluntarily or involuntarily because of traffic signals, geometrics or other factors.

47. Point Detection. The detection of a vehicle as it passes a point along a roadway.

48. Preemption Control. The transfer of normal operation of traffic signals to a special control mode. Normal signal operation is interrupted and/or altered in deference to a special situation (e.g., the passage of a train, bridge opening, the granting of right-of-way to an emergency vehicle).

49. Presence Detection. The ability of a detector to sense that a vehicle, whether moving or stopped, has appeared in its detection area.

50. Pretimed Operation. A type of controller operation during which the length of various intervals remains constant.

51. Priority Control. A means by which the assignment of right-of-way is obtained or modified.

52. Protected Mode. A mode of traffic signal control in which there are no vehicular or pedestrian conflict movements.

53. Ramp Control Signal (Ramp Meter). A traffic signal installed to control the flow of traffic onto freeways at entrance ramps and freeway-to-freeway connections.

54. Recall. A mode of operation where a call is registered in the controller independent of demand.

55. Red Clearance Interval. An optional interval during which all directions are shown a red signal indication that follows a yellow change interval and precedes the next conflicting green interval.

56. Resistance Gate (Barrier Gate). A type of traffic gate designed to provide a physical barrier to vehicular and/or pedestrian traffic when placed in the appropriate position.

57. Right-of-Way (Assignment). Permitting vehicles and/or pedestrians to proceed in a lawful manner in preference to other vehicles or pedestrians by the display of signal indications.

58. Semi-Actuated Operation. A type of controller operation in which at least one, but not all, signal phases function on the basis of actuation.

59. Separate Left-Turn Signal Face. A signal face for controlling a left-turn movement that sometimes displays a different color of circular signal indication than the adjacent through signal faces display.

60. Shared Left-Turn Signal Face. A signal face, for controlling both a left-turn movement and the adjacent through movement, that always displays the same color of circular signal indication that the adjacent through signal face or faces display.

61. Signal Face. The front of a signal head.

62. Signal Head. An assembly of one or more signal faces together with the associated signal housings.

63. Signal Indication. The illumination of a signal lens or equivalent device or a combination of several lenses or equivalent devices at the same time.

64. Signal Installation. The traffic signal equipment, signal heads and their supports, and associated electrical circuitry at a particular location.

65. Signal Lens. That part of the signal section that projects the light coming directly from the light source and its reflector, if any.

66. Signal Phase. The part of the cycle length allotted to any vehicular or pedestrian movement.

67. Signal Section. The assembly of a signal housing, lens, and light source with necessary components and supporting hardware to be used for providing one signal indication.

68. Signal System. Two or more traffic signal installations operating in coordination.

69. Signal Visor. That part of a signal section that directs the signal indication specifically to approaching traffic and reduces the effect of direct external light entering the lens.

70. Steady (Steady Mode). The continuous illumination of a signal indication for the duration of an interval, phase or consecutive phases. The steady mode is used when a signalized location is operated in a stop-and-go manner.

71. Traffic Signal. A power-operated traffic control device by which traffic is alternately assigned the right-of-way to the various movements at an intersection or other roadway location.

72. Visibility-Limited Signal Indication. A type of signal face, signal section or signal indication designed to restrict the visibility of a signal indication from the side, or to limit the visibility of a signal indication to a certain lane or number of lanes or to a certain distance from the stop line.

73. Warning Gate. A type of traffic gate designed to warn, but not primarily to block, vehicular and/or pedestrian traffic when placed in the appropriate position.

74. Warrant. A threshold condition that, if found to be satisfied as part of an engineering study, will result in analysis of other traffic conditions or factors to determine whether a traffic signal or other improvement is justified.

75. Yellow Change Interval. The first interval following the green right-of-way interval in which the signal indication for that interval is yellow.

76. Yield Point. The point at which the controller permits a signal phase to be terminated to service a conflicting signal phase.

HIGHWAY LIGHTING

1. Average Initial Illuminance. The average level of horizontal illuminance on the pavement area of a traveled way at the time the lighting system is installed when lamps are new and luminaires are clean; expressed in average footcandles (fc) (lux) for the pavement area. See definition of illuminance, footcandle and lux.

2. Average Maintained Illuminance (E_h). The average level of horizontal illuminance on the roadway pavement when the output of the lamp and luminaire is diminished by the maintenance factors (LLD and LDD); expressed in average footcandles (fc) (lux) for the pavement area.

3. Ballast. A device used with an electric-discharge lamp to obtain the necessary circuit conditions (voltage, current and wave form) for starting and operating. It limits the current through the lamp and may also transform voltage.

4. Blinding Glare. Glare so intense that for an appreciable length of time no object can be seen.

5. Candela (cd). A measure of the luminous intensity of a light source as seen by the eye. For example, because the eye is less sensitive to blue light than to green light, a blue light source must radiate more power in watts (W) than must a green light source if the two are to have the same luminous intensity. Most light sources have different luminous intensities when viewed from different directions and so the luminous intensity for a light source may vary with the angle at which it is viewed.

6. Candela per Square Meter (cd/m^2). The International System (SI) unit of luminance (photometric brightness) equal to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square meter (lm/m^2) or the average luminance of any surface emitting or reflecting light at that rate. One candela per square meter equals 0.2919 footlambert.

7. Candle (cd). The unit of luminous intensity. See Candela.

8. Candlepower (cp). The luminous intensity in a specific direction; expressed in candelas (cd). It is not an indication of the total light output.

9. Coefficient of Utilization (CU). The ratio of the luminous flux (lm) from a luminaire received on the surface of the roadway to the lumens emitted by the luminaire's lamps alone.

10. Direct Glare. Glare resulting from high luminances or insufficiently shielded light sources in the field of view or from reflecting areas of high luminance. It is

usually associated with bright areas (e.g., luminaires), that are outside the visual task or region being viewed.

11. Disability Glare. Glare resulting in reduced visual performance and visibility. It often is accompanied by discomfort. See Veiling Luminance.

12. Discomfort Glare. Glare producing discomfort. It does not necessarily interfere with visual performance or visibility. See Glare.

13. Equipment Factor. A factor used in illuminance or luminance calculations to compensate for light losses due to normal production tolerances of commercially available luminaires when compared with laboratory photometric test models.

14. Footcandle (fc). The unit of illumination when the foot is taken as the unit of length. It is the illumination on a surface one square foot in area on which there is a uniformly distributed flux of one lumen, or the illumination produced on a surface, all points of which are at a distance of one foot from a directionally uniform point source of one candela.

15. Footlambert (fL). A unit of luminance (photometric brightness) equal to $1/\pi$ candela per square foot, or to the uniform luminance of a perfectly diffusing surface emitting or reflecting light at the rate of one lumen per square foot, or to the average luminance of any surface emitting or reflecting light at that rate.

16. Glare. The sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort or loss in visual performance and visibility. See Blinding Glare, Direct Glare, Disability Glare and Discomfort Glare.

17. House Side. The horizontal direction which is away from the roadway or behind the nadir of the luminaire. See Street Side.

18. Isofootcandle (Isolux) Diagram. A diagram plotted on any appropriate set of coordinates to show all points on a surface for which the illuminance is the same, as represented by a series of isofootcandle (isolux) line curves.

19. Illuminance. The density of the luminous flux incident on a surface. It is the quotient of the luminous flux (lumen) by the area of the surface (ft^2 (m^2)), when the latter is uniformly illuminated. See definition of Footcandle and Lux.

20. Lamp. A generic term for a man-made source of light produced either by incandescence or luminescence.

21. Lamp Lumen Depreciation Factor (LLD). A depreciation factor that indicates the decrease in a lamp's initial lumen output over time. For design calculations, the initial lamp lumen value is reduced by LLD to compensate for the anticipated lumen reduction. This multiplier is to be used in illumination calculations to relate the initial rated output of light sources to the anticipated minimum rated output based on the relamping program to be used.

22. Light Loss Factor. A depreciation factor applied to the calculated initial average luminance or illuminance.

23. Light Standard (Pole). A pole provided with the necessary internal attachments for wiring and the external attachments for the bracket and luminaire.

24. Longitudinal Roadway Line (LRL). Any line along the roadway parallel to the curb or shoulder line.

25. Lumen (lm). The unit of luminous flux. It is equal to the flux through a unit solid angle (steradian), from a uniform point source of one candela (cd), or to the flux on a unit surface all points of which are at unit distance from a uniform point source of one candela.

26. Luminaire. A complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.

27. Luminaire Dirt Depreciation Factor (LDD). A depreciation factor that indicates the expected reduction of a lamp's initial lumen output due to the accumulation of dirt on or within the luminaire over time.

28. Luminance (Photometric Brightness). The luminous intensity (candela) of any surface in a given direction per unit of projected area (ft^2 (m^2)) of the surface as viewed from that direction.

29. Luminous Efficacy (lm/W). The quotient of the luminous flux (lumen) emitted by the total lamp power input (watt). It is expressed in lumens per watt (lm/W).

30. Luminous Efficiency (%). The ratio of the total luminous flux emitted by a luminaire to that emitted by the bare lamp.

31. Luminous Intensity. See definition of candela.

32. Lux (lx). The International System (SI) unit of illumination. It is the illuminance on a surface one square meter in area on which there is a uniformly distributed flux of one lumen, or the illumination produced at a surface all points of which are

at a distance of one meter from a uniform point source of one candela. (1 lx = 1 lm/m^2).

33. Maintenance Factor (MF). A combination of light loss factors used to denote the reduction of the illumination for a given area after a period of time compared to the initial illumination on the same area (MF = LLD • LDD).

34. Mounting Height (MH). The vertical distance between the roadway surface and the center of the light source in the luminaire.

35. Nadir. The vertical axis which passes through the center of the luminaire light source.

36. Offset. The horizontal distance between the face of a light standard and the edge of traveled way.

37. Overhang. The horizontal distance between a vertical line through the nadir of a luminaire and the edge of traveled way or edge of the area to be illuminated.

38. Spacing. For roadway lighting the distance between successive lighting units, measured along the centerline of the street.

39. Street Side. The horizontal direction that is toward the roadway from the nadir of the luminaire. See house side.

40. Transverse Roadway Line (TRL). Any line across the roadway that is perpendicular to the curb or shoulder line.

41. Uniformity Ratio (E_h/E_{min}). The ratio of average maintained horizontal illuminance (E_h) to the maintained horizontal illuminance (E_{min}) at the point of minimum illumination on the pavement. A uniformity ratio of 3:1 means that the average footcandle (lux) value (E_h) is three times the footcandle (lux) value (E_{min}) at the point of least illuminance on the pavement.

42. Utilization Efficiency. A plot of the quantity of light falling on the horizontal plane both in front (street side) of and behind (house side) the luminaire. It shows only the percent of bare lamp lumens that fall on the horizontal surface and is plotted as a ratio of width of area to mounting height of the luminaire.

43. Veiling Luminance. A luminance superimposed on the retinal image that reduces its contrast. It is this veiling effect produced by bright sources or areas in the visual field that results in decreased visual reflected glare.

TRAFFIC ENGINEERING STUDIES

1. Arithmetic Mean. The most common measure of central tendency. It is determined by summing all the data points and dividing it by the sample size.

2. Average Travel Speed. The distance summation for all runs of a floating car divided by the total time summation. (Note: Average running speed only includes the time the vehicle is in motion. Therefore, on uninterrupted flow facilities which are not congested, average running speed and average travel speed are equal.)

3. Design Speed. The speed selected to determine the various geometric design features of the roadway.

4. 85th-Percentile Speed. The speed at or below which 85% of the traffic is moving. The most common application of the value is its use as a major factor in determining the speed limit for a highway section.

5. Frequency Distribution. Frequency distribution demonstrates at what speeds the majority of the drivers are traveling for a given location.

6. Median Speed. The speed represented by the middle value when all data speed points are arranged in ascending order. For spot speed studies, it represents the 50th-percentile driver.

7. Modal Spot Speed. The speed value that occurs most frequently in a sample of speed measurements.

8. Normal Distribution. The normal distribution can be constructed from statistical formulas but, essentially, it is a distribution that falls under a bell curve. A bell curve is defined as a curve in which its highest point is at the median speed.

9. Pace. The 10 mph (15 km/h) increment of spot speeds that includes the range of speeds in which the highest number of observations is recorded.

10. Running Speed. The moving speed of a vehicle traversing a specified section of highway. It is equal to the distance traveled divided by the running time (the time the vehicle is in motion).

11. Sample Size. The minimum number of readings required to obtain a desired level of confidence.

12. Speed Delay Study. A study to measure the delay lost by a vehicle due to causes beyond the control of the driver.

13. Spot Speed Study. A study to measure speeds at specific locations under the traffic and environmental conditions prevailing at the time of the study.

14. Travel Time Study. A study to measure the time taken by a vehicle to traverse a given segment of a street or highway.

TRAFFIC IMPACT STUDIES

1. Approach. That section of highway right-of-way between the outside edge of shoulder and the right-of-way line that is designed as a roadway for the movement of vehicles between the highway and abutting property. The width of the approach, excluding flares or radii, is measured at right angles to the approach centerline at the right-of-way limit.

2. Capacity. The maximum hourly rate at which vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic and control conditions.

3. Developer. The land owner or otherwise bona-fide applicant of an approach permit or development proposal.

4. Distance Between Approaches. The distance measured along the curb line or outside edge of shoulder between the extensions of the near edges of adjacent approaches, excluding flares or radii.

5. Frontage. The distance a property is contiguous to the highway right-of-way.

6. Frontage Boundary Line. A line perpendicular to the highway centerline that passes through the point of intersection of the property line and the highway right-of-way line.

7. Horizon Year. The target year or years of analysis.

8. Influence Area. The geographic area surrounding the site from which the development is likely to draw a high percentage of the total site traffic.

9. Level of Service (LOS). A set of criteria that describes the degree to which an intersection, roadway, weaving section or ramp can effectively serve peak-hour and/or daily traffic.

10. On-Site Circulation. Vehicular network that primarily accommodates site-generated traffic within the site boundary and includes roadways, parking lots, loading docks, parking garages and parking deck travelways.

11. Pass-By Trip. A trip that is diverted from traffic already on the roadway system.

12. Planned Development. A new land-use project for which site plans are being or have been developed, but no firm date has been established for construction. Completion, however, is expected within the study horizon.

13. Planned Transportation System Improvement. A new roadway or traffic operation improvement for which plans are being or have been developed but no firm date has been set for construction. Completion, however, is expected within the study horizon.

14. Plot Plan. A plan to show the proposed location of the approach. It should show the distance from the nearest reference or station marker. In urban areas, ties should be made to street centerlines. The sketch should show the highway right-of-way, property lines, approach location, other approaches in the vicinity of the development and other pertinent information.

15. Private Approach. An approach that allows access to and/or from a commercial, industrial, residential or otherwise private property.

16. Programmed Development. A new land-use project for which site location, type and density is firmly established for construction.

17. Programmed Transportation System Improvement. A new roadway or traffic operational improvement for which planning is established and funding is identified.

18. Public Approach. An entrance to and/or from a highway, street, road or alley that is on dedicated public right-of-way.

19. Site Access Plan. A scaled drawing that explicitly illustrates the location, configuration and geometrics of all site approaches in relation to the local highway system and other approaches. The site access plan should also illustrate the supporting internal circulation, parking and loading facilities of the development, the footprints of key building structures and any out-parcel locations, and the type and location of any required off-site improvements.

20. Study Area. The road network and land-use area that encompasses the principal intersections, road links, etc., and the land-use developments of primary concern in the traffic impact study.

21. System Impact Action Process. An internal MDT process for the review and assessment of development projects that significantly and permanently impact the State transportation system.

22. Traffic Generation. The estimated number of origins from and destinations to a site resulting from the land-use activity on that site.

23. Traffic Generator. A designated land use (e.g., residential, commercial, office, industrial) that generates vehicular and/or pedestrian traffic to and from the site.

24. Traffic Impact. The effect of site traffic on highway operations and safety.

25. Traffic Impact Analysis. An engineering and traffic study that determines the potential traffic impacts of a proposed traffic generator. A complete analysis includes an estimation of future traffic with and without the proposed generator, analyses of the traffic impacts and recommended roadway improvements that are necessary to accommodate the additional site traffic.

26. Traffic Impact Mitigation. The reduction of traffic impacts on roadways and/or intersections to an acceptable level of service.

27. Vehicular Trip. A single or one-way vehicular trip with its origin (i.e., outbound), destination (i.e., inbound) or both trip ends made inside the study area.