Appendix A

Definitions

Term	Definition	Relevant Chapter(s)
85th Percentile Speed	The speed at or below which 85-percent of vehicles travel on a given roadway.	2
Abandonment	The relinquishment of the public interest in right-of-way activity thereon with no intention to reclaim or use again for highway purposes.	6
Acceptable	Design criteria which do not meet desirable values, but yet is considered to be reasonable and safe for design purposes.	1
Access	A legal right to enter a highway facility from abutting property or public streets.	6
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.	6
Accessible Route	A continuous, unobstructed path connecting all accessible elements following Americans with Disabilities Act (ADA) guidelines 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.	6
Acquisition or Taking	The process of obtaining land and land interests.	6
Alignment Review	A meeting to determine and address the major project alignment challenges.	1

Alignment and Grade Review (AGR) Report	A report which provides written documentation of the horizontal and vertical alignment determinations made during the preliminary alignment review.	1
Allowable Headwater	The depth or elevation of the impoundment of cross-drainage flow above which damage or some other unfavorable result could occur.	11
Annual Average Daily Traffic (AADT)	The total yearly traffic volume in both directions of travel divided by the number of days in a year.	2
Approach	A road providing access from a public way to a highway, street, road, or to an abutting property.	6
Arterial	A roadway characterized by a capacity to move relatively large volumes of traffic while also serving adjacent properties.	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.	5
Auxiliary Through Lane	A through lane of limited length added upstream and downstream of an intersection.	6
Average Daily Traffic (ADT)	The total traffic volume in both directions of travel during a time period greater than one day but less than one year divided by the number of days in that time period.	2
Average Running Speed	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.	2
Average Travel Speed	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.)	2
Award	The acceptance by MDT of a bid.	12
Axis of Rotation	The line about which the pavement is revolved to superelevate the roadway.	3
Backslope	The side slope created by the connection of the ditch bottom, upward and outward, to the natural ground (often referred to as the cut slope).	5

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" and 12" with a face steeper than 1 horizontal to 3 vertical. This term has been replaced in AASHTO with the term "vertical curb".	5
Barrier Warrant	A criterion that identifies an area of concern which should be shielded by a traffic barrier, if judged to be practical.	9
Begin Curb Return	The point along the top back of curb where the curb return of an intersection meets the highway alignment (typical tangent portion).	6
Bicycle Boxes	Designated spaces at signalized intersections, placed between a set-back stop line and the crosswalk, that allow bicyclists to queue in front of motorized vehicles at traffic signals.	7
Bicycle Lane	A portion of a roadway which has been designated by striping, signing and pavement markings for the exclusive use of bicyclists.	7
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.	7
Borrow	Material that has been dug from one location and will be used at another location.	4
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 approximately 20 feet between undercopings of abutments, between spring lines of arches, or between 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.	5, 11
Bridge Length	The length of a bridge structure is the overall length measured from centerline of bearing to centerline of bearing of the abutments.	5
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.	5

Bridge to Remain in Place	An "existing bridge to remain in place" refers to any bridge work which does not require the total replacement of both the substructure and superstructure.	5
Broken-Back Curves	Two closely spaced horizontal curves with deflections in the same direction and a short intervening tangent.	3
Buffer Area	The area between the roadway and the sidewalk that provides space between motorized vehicle traffic and non-motorized users (pedestrians and bicycles).	5
Buffered Bicycle Lane	An on-street lane that includes an additional striped buffer, typically 2 to 3 feet wide, between the bicycle lane and the motorized vehicle travel lane and/or between the bicycle lane and the motorized vehicle parking lane.	7
Bus	A heavy vehicle involved in the transport of passengers on a for-hire, charter or franchised transit basis.	4
CADD	Computer-aided drafting and design.	12
Capacity	The maximum number of vehicles which reasonably can be expected to traverse a point or uniform roadway section during a given time period under prevailing roadway, traffic, and control conditions.	2
Catch Basin	A structure with an opening for inletting drainage from a gutter or median and discharging the water through a conduit. In common usage it is a grated inlet with or without a sump.	11
Categorical Exclusion	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.	1
Channel	The bed and banks that confine the surface flow of a natural or artificial stream. Braided streams have multiple subordinate channels, which are within the main stream channel.	11
Channelization	The directing of traffic through an intersection by the use of pavement markings (including striping, raised reflectors, etc.), medial separators or raised islands.	6
Circular Curves	Continuous arcs of constant radius which achieve the necessary highway deflection without an entering or exiting transition. Also known as simple curves.	3

Clear Zones	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.	9
Collector	A roadway characterized by a roughly even distribution of its access and mobility functions.	2
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 inertial forces.	6
Compound Curves	These are a series of two or more horizontal curves with deflections in the same direction immediately adjacent to each other.	3
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.	12
Consultant	A firm or person hired by MDT to conduct special studies, design projects, and/or construction management.	1
Contractor	A company or firm hired by MDT to construct the project in the field according to the plans and specifications.	1
Controlling Criteria	A list of geometric criteria requiring approval if they are not met or exceeded.	2
Corner Island	A raised or painted island to channelize right-turn movements.	6
Cover	The extent of soil above the crown of a pipe or culvert (Chapter 11). Aggregate material used as a wearing/friction course with pavement seal application (Chapter 13).	11, 13
Crest Curve	Vertical curve that typically connects ascending grades that form a crest.	4
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, the *RDM* frequently uses "criteria" to refer to the design values presented.	1
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.	4

Critical Parallel Slope	Slopes 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, fill slopes steeper than 3:1 are considered critical.	9
Cross Drainage	The runoff from contributing drainage areas both inside and outside the highway right-of-way and the transmission thereof from the upstream side of the highway facility to the downstream side.	11
Cross Section	A vertical section of the ground and roadway at right angles to the centerline of the roadway, including all elements of a roadway.	3
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.	5
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.	3
Crossing Island	A pedestrian refuge in the median which provides an area in the middle of the road for pedestrians to stop if needed, when crossing the road in two stages (i.e., crossing one direction of vehicular travel at a time).	7
Crosswalk	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. Any portion of a roadway at an intersection or elsewhere distinctly indicated for pedestrians crossing by lines or other markings on the surface.	6
Culvert	A structure which is usually designed hydraulically to take advantage of submergence to increase hydraulic capacity. A structure used to convey surface runoff through embankments. A structure, as distinguished from bridges, which is usually covered with embankment and is composed of structural material around the entire perimeter, although some are supported on spread footings with the streambed serving as the bottom of the culvert.	11
Curb Cut	Any opening in a curb where the full height curb section is terminated.	3
Curb Return	The circular segment of curb at an intersection which connects the tangent/edge of roadway (typically tangents) portions of the intersecting legs.	6
Curve to Spiral (CS)	A common point of the circular curve and the spiral of the far transition.	3

Cuts	Areas of highway cross sections located below natural ground elevation thereby requiring excavation of earthen material.	3
Decision Sight Distance	The distance required for a driver to detect information that is difficult to perceive, to recognize the condition or its potential threat, to select an appropriate speed and path, and to initiate and complete complex maneuvers.	2
Delay	The primary performance measure on interrupted flow facilities, especially at intersections. For intersections, average delay is measured and expressed in seconds per vehicle.	2
Density	The number of passenger car equivalents (PCE) occupying a given length of lane.	2
Department	Montana Department of Transportation.	1
Depressed Median	A median that is lower in elevation than the traveled way and designed to carry a certain portion of the roadway runoff.	5
Design Control	Attributes, values, or qualities that influence discrete geometric element dimensions or considerations.	2
Design Criteria	Dimensions and values that meet design control needs, such as curve radii, cross-sections, and merge lengths.	2
Design Discharge or Flow	The rate of flow for which a facility is designed.	11
Design Exception	The process of receiving approval from FHWA or MDT for using design elements which do not meet the criteria set forth in the *State Geometric Design Standards* as controlling criteria and identified in this *Manual* .	2
Design Flood Frequency	The recurrence interval of a flood event that is expected to be accommodated without exceeding the adopted design constraints. The return interval (recurrence interval or reciprocal of probability) used as a basis for the design discharge.	11
Design Hourly Volume (DHV)	The one-hour vehicular volume in both directions of travel in the design year selected for roadway design. The design hourly volume (DHV) is typically the 30^{th} highest hourly volume during the design year.	2
Design Project Manager	The person who is responsible for the design of a project.	1
Design Speed	Speed selected to establish specific minimum boundaries for the geometric design elements for a particular section of highway.	2

Design Vehicle	The vehicle used to determine turning radii, off-tracking characteristics, pavement designs, etc., at intersections.	6
Desirable, Preferred	An indication that the design team should make every reasonable effort to meet the criteria and should only use a "lesser" design after due consideration of the "better" design.	1
Directional Design Hourly Volume (DDHV)	The highest of two directional volumes which combine to form the Design Hourly Volume (DHV).	2
Directional Distribution (D)	The distribution by percent of the traffic in each direction of travel during the peak or design hour.	2
Discharge	The rate of the volume of flow of a stream per unit of time, usually expressed in cubic yards per second.	11
Displaced Left-Turn Intersection (DLT)	An intersection that is also known as a continuous flow intersection (CFI) and a crossover displaced left-turn intersection. The displaced left turn (DLT) intersection displaces left-turn movements of an approach to an upstream signaized location, crossing traffic to the other side of the opposing traffic flow.	6
Diverging Diamond Interchange (DDI)	An interchange that is also known as the double crossover diamond and is an alternative to the conventional diamond interchange. The DDI includes directional crossovers on either side of the interchange that eliminates the need for left-turning vehicles to cross the path of approaching through vehicles.	6
Divided Highway	A highway with separated roadways for traffic moving in opposite directions.	2
Divided Roadway	A roadway with a median to separate opposing flows of traffic.	4
Dynamic Deflection	Amount of deformation experienced by a barrier when struck by a vehicle under testing conditions.	9
Edge of Travel Lane	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.	9
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.	9
Embankment	A bank of earth or stone built to prevent flooding or carry a roadway.	9
End Curb Return	The point along the minor roadway top back of curb where the curb return of an intersection meets the highway alignment (typically a tangent section).	6
Engineer's Estimate	MDT's cost estimate for construction of a project.	13

Environmental Assessment (EA)	A study to determine if the environmental impacts of a project are significant, thus requiring the preparation of an Environmental Impact Study (EIS).	1
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.	1
Equivalent Single-Axle Loads (ESALs)	The summation of equivalent 18,000 pound single-axle loads used to convert mixed traffic to design traffic for the design period.	2
Face of Curb	A distance of 6 inches from the back of curb.	5
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.	2
Farm Field Approaches	Revocable access points to the highway from agricultural land.	6
Federal Aid System	The routes within Montana which are eligible for the categorical Federal highway funds.	2
Fill Slopes	Slopes extending outward and downward from the hinge point to intersect the natural ground line.	5
Final Plan Review (FPR) Report	A report which provides written documentation of all decisions made during the Final Plan Review meeting.	
Finding of No Significant Impact (FONSI)	A result of an Environmental Assessment (EA) that shows a project will not cause a significant impact to the environment.	1
Floodplain	The alluvial land bordering a stream, formed by stream processes, that is subject to inundation by floods.	11
Flush Median	A paved median which is level with the surface of the adjacent roadway pavement.	5
Freeboard	The vertical distance between the level of the water surface, usually corresponding to design flow, and a point of interest such as a low chord of a bridge beam or specific location on the roadway grade.	11
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.	2
Frontage Road	A road constructed adjacent and parallel to, but separated from, the highway for service to abutting property and for control of access.	2
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.	2

Gore	The area downstream from the shoulder intersection points of an exit ramp (or upstream from that of an entrance ramp).	10
Gore Nose	The point where the pavement between the shoulders ends and the unpaved area begins as the ramp and mainline diverge from one another is the Gore Nose.	10
Grade Separation	A crossing of two highways, or a highway and a railroad, at different levels. This may also include a crossing of a bicycle/pedestrian facility and a roadway.	6
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 for each 100 feet of horizontal distance. Upgrades in the direction of stationing are identified as plus (+). Downgrades are identified as minus (-).	4
Guideline	Indicating a design value which establishes an approximate threshold which should be met if considered practical.	1
Headwater (H_w)	That depth of water impounded upstream of a culvert due to the influence of the culvert construction, friction and configuration.	11
Heavy Vehicle	Any vehicle with more than four wheels touching the pavement during normal operation. Heavy vehicles collectively include trucks, recreational vehicles and buses.	2, 4
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.	2
High Speed	For geometric design purposes, high speed is defined as greater than 45 mph.	3
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).	2
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 backslope.	5

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 for 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 backslope.	5
Horizontal Alignment	The route of the road defined by a series of horizontal tangents and curves.	3
Hydraulics	The characteristics of fluid mechanics involved with the flow of water in or through drainage facilities.	11
Hydrology	The study of the occurrence, circulation, distribution and properties of the waters of the earth and its atmosphere.	11
Ideal	Indicating a condition that may not exist in reality or be achievable under practical constraints but is regarded as perfect (e.g., traffic capacity under "ideal" conditions).	1
Impact Angle	For a longitudinal barrier, the angle between the face of the barrier and the vehicle's path at impact. For a impact attenuator, it is the angle between the axis of symmetry of the crash cushion and the vehicular path at impact.	9
Impact Attenuator (Crash Cushion)	A traffic barrier used to safely shield fixed objects or other obstacles of limited dimension from approximately head-on impacts by errant vehicles.	9
Improvement (with regard to right-of-way)	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.	1
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.	1
Inslope	The side slope in a cut section created by connecting the subgrade shoulder to the ditch bottom, downward and outward.	5
Intensity	The rate of rainfall upon a watershed, usually expressed in inches per hour.	11
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.	6

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.	6
Intersection Angle	The angle between two intersecting roadways.	6
Intersection Sight Distance	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.	6
Intersection Traffic Control	The type of control (stop sign, signal, yield) provided at an intersection to allow multiple directions of traffic to take turns passing through the intersection.	6
Islands	Areas between traffic lanes used for controlling traffic movements.	6
Jacking and Boring	A type of horizontal auger earth boring. A type of culvert installation where an auger and hydraulic press is used to install the culvert without excavating.	11, 13
K-Values	The horizontal distance needed to produce a 1% change in vertical profile gradient.	4
Landing Area	The approach of a roadway leading into an intersection that stores stopped vehicles. A landing area may also apply to ramp design for pedestrian facilities.	6
L_c	Length of circular curve when spirals are used.	3
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.	9
Letting (Bid Opening)	The time appointed for the opening of the proposals submitted by bidders.	12
Level of Service (LOS)	A qualitative concept which has been developed to characterize a traveler's perception of quality of service. In the *Highway Capacity Manual (HCM)* , the qualitative grades for each level of service (A through F) have been assigned to quantitative measures for each highway element.	2
Level Terrain	Relatively flat ground surface where the available stopping sight distances are generally long or can be made to be so without construction difficulty or major expense.	2

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.	2
Limited Access Highway (or Facility)	A portion of roadway with limited access control imposed by the governing public authority.	2
Local Road	All public roads and streets not classified as freeways, arterials, or collectors are classified as local roads and streets. Local roads and streets are characterized by their many points of direct access to adjacent properties and their relatively minor value in accommodating mobility.	2
Low Speed	For geometric design purposes, low speed is defined as 45 mph or less.	3
Low Speed Urban Streets	All streets within urbanized and small urban areas with a design speed of 45 mph or less.	3
L_s	Length of spiral.	3
Major Collector	A roadway that serves traffic generators that are not served by the higher arterial system. This could include schools, freight distribution areas, parks or other agricultural areas. Major collectors link these types of areas to routes of higher classification, such as arterials.	2
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).	3
May, Could, Can, Suggest, Consider	A permissive condition. The design team is 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.	1
MDT Detailed Drawings	Drawings approved for repetitive use, showing details to be used where appropriate.	12
Median	The portion of a divided highway separating the two traveled ways for traffic in opposite directions. The median width includes both inside shoulders.	5
Median Barrier	A longitudinal barrier used to prevent an errant vehicle from crossing the median of a divided highway. This prevents crashes between traffic traveling in opposite directions.	9

Median Crossover	Temporary segments of roadway that transfer one or more lanes of traffic across a median away from an adjacent construction zone segment.	10
Median Opening	Openings in the median (raised or depressed) on divided facilities which allow vehicles to cross the facility or to make a U-turn.	6
Median Separator	Channelization which separates opposing traffic flows, alerts the driver to the cross road ahead and regulates traffic through the intersection.	5
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.	5
Median U-Turn (MUT) Intersection	An intersection that is also known as the Median U-Turn Crossover, and sometimes referred to as a boulevard turnaround, a Michigan loon, or a ThrU-Turn Intersection. The MUT intersection replaces direct left-turns at an intersection with indirect left-turns using a U-turn movement in a wide median.	6
Minimum, Maximum, Lower, Upper (Limits)	Representative of generally accepted limits within the design community but not necessarily suggesting that these limits are inflexible.	1
Minor Arterial	In rural areas, minor arterials will provide a mix of interstate and interregional travel service. In urban areas, minor arterials may carry local bus routes and provide intra-community connections. When compared to the principal arterial system, the minor arterials accommodate shorter trip lengths and lower traffic volumes, while providing more access to property.	2
Minor Collector	A roadway that provides links to local traffic generators within rural and urban areas. These types of routes may be spaced consistently to accumulate traffic from local roads and bring developed areas to other collector roadways.	2
Mountable Curb	A longitudinal element, typically concrete, placed at the roadway edge for delineation, to control drainage, to control access, etc. Mountable curbs typically have a height of 6” or less with a face no steeper than 1 horizontal to 3 vertical. This term has been replaced in AASHTO with the term “sloped curb”.	5
Mountainous Terrain	Steep ground surface where longitudinal and transverse changes in elevation are abrupt and extensive grading is frequently needed to obtain acceptable alignments.	2

National Highway System	A system of highways determined to have the greatest national importance to transportation, commerce and defense in the United States.	2
National Network for Trucks	In Montana, the Interstate highway system and all primary routes that existed prior to the Intermodal Surface Transportation Efficiency Act (ISTEA).	2
New Construction	Horizontal and vertical alignment on a new location.	2
No Control Intersection	An intersection where none of the legs are controlled by a traffic control device.	6
Non-Accessible Route	Any pedestrian facility which contains features that make it impractical to meet all of the criteria for accessible routes, following Americans with Disabilities Act (ADA) guidelines.	6
Non-Recoverable Parallel Slope	Slopes 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.	9
Normal Crown	The typical cross section on a tangent section referenced to centerline with downslope to the edge of pavement.	3
Notice to Proceed	Written notice given to the contractor to begin the contract work.	12
One-Way Separated Bicycle Lane	A facility that is also known as a cycle track or protected bicycle lane, is a bicycle facility within the street right-of-way separated from motorized vehicle traffic by a buffer and/or a physical barrier.	7
Operating Speed	The speed at which drivers are observed operating their vehicles during free-flow conditions.	2
Overpass	A grade separation where the subject highway passes over an intersecting highway or railroad.	6
Pace	The 10 miles per hour (mph) range of speeds in which the highest number of speed observations are recorded.	2
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.	6
Parallel Slopes	Cut and fill slopes for which the toe runs approximately parallel to the flow of traffic.	9
Parking Lane	An additional lane for the parking of vehicles.	6
Passing Lane	An auxiliary lane added to two-lane facilities to allow vehicles to pass. For multilane facilities, the inside lane is sometimes referred to as a passing lane.	5

Passing Sight Distance	Passing sight distance considerations are limited to two-lane, two-way highways. On these facilities, vehicles may overtake slower moving vehicles, and the passing maneuver must be accomplished on a lane used by opposing traffic.	2
Pavement Preservation	A type of preventative maintenance that includes such treatments as crack seal, seal and cover, milling less than or equal to 0.2 feet, and overlays less than or equal to 0.2 feet (the overlay thickness can be increased to a total of 0.22 feet, if an isolation lift is needed to address heavy crack sealing of the existing surfacing).	2
PC	Point of curvature (beginning of curve).	3
PCC	Point of compound curvature.	3
Peak Discharge	The highest value of discharge attained by a flood. The maximum discharge rate on a runoff hydrograph for a given flood event.	11
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).	2
Pedestrian Hybrid Beacon	A pedestrian/bicyclist activated signal that rests in dark when not in use. It begins with a yellow light flashing that turns solid to alert drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians and bicyclists receive a walk indication. The beacon then changes to alternating flashing red lights while pedestrians and bicyclists receive a flashing don't walk indication to signal that motorists may proceed after pedestrians and bicyclists are no longer in conflict.	7
Pedestrian Path	A hard-surface path adjacent to the roadway in lieu of a sidewalk in areas where other bicycle facilities exist or where bicyclists typically share the road on a low-volume facility.	7
Performance Curves	A set of curves which illustrate the effect grades will have on the design vehicle's acceleration and/or deceleration.	4
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
Physical Nose	The point where the ramp and mainline shoulders converge.	6
PI	Point of intersection of tangents.	3

Plan-in-Hand (PIH) Report	A report which provides written documentation of all decisions made during the Plan-In-Hand office and field review meetings.	1
Plan-in-Hand (PIH) Review	An in-depth office and on-site review of all project elements to ensure that major details have been satisfactorily incorporated into the construction plans, and to define the limits of construction for use in permitting, Right-of-Way acquisition, and utility relocation.	1
Plans	The contract drawings which show the location, character and dimensions of the prescribed work, including layouts, profiles, cross sections and other details.	1
Policy	A MDT practice which MDT generally expects the design team to follow, unless otherwise justified.	1
Positive Protection	Devices that contain and/or direct vehicles and prevent intrusion into the work area.	10
Possible	Indicating that which can be accomplished. Because of its rather restrictive implication, this word will not be used in the *RDM* for the application of geometric design criteria.	1
Posted Speed Limit	The regulatory speed limit on a highway.	2
Practical, Feasible, Reasonable	Advising the design team 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.	1
PRC	Point of reverse curvature.	3
Preliminary Field Review (PFR)	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.	1
Preliminary Field Review (PFR) Report	A report which provides written documentation of all major determinations made during the Preliminary Field Review meeting.	1
Primary System	A system of routes that includes Non-National Highway System (NHS) rural minor arterials.	2
Principal Arterial	In both rural and urban areas, the principal arterials serve the highest traffic volumes and the greatest trip lengths. These facilities may be two or more lanes in each direction, with or without a median. In some cases, the level of geometric design is equivalent to that of freeways.	2
Private Access Control	The condition where the public authority fully or partially controls the right of abutting owners to have access to and from the public roadway.	2

Private Approach	An approach which allows access to and/or from private property (e.g., commercial, industrial and residential).	2
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.	4
Project	An undertaking by MDT 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.	1
Project Scope of Work	The basic intent of the highway project which determines the overall level of highway improvement.	1
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.	1
PT	Point of tangency (end of curve).	3
Public Approach	A connection to and/or from a street, road, alley or other public roadway to a highway facility.	2
Public Hearing/Meeting	A meeting conducted by MDT to inform the general public on MDT's proposed plan of action or design proposal.	2
Public Information	The communication strategies that seek to inform affected roadway users, the general public, area residences and businesses, as well as appropriate public entities about the project, the expected construction zone impacts, and the changing conditions of the project.	10
Quantity Summaries	A listing of the project construction quantities which are used by both MDT and the contractor for determining the project construction costs.	13
Raised Median	A median which contains a raised portion or island within its limits.	5
Ramp	A short roadway connecting two or more legs of an interchange or connecting a frontage road and main lane of a highway.	6
Ramp Terminal Intersections	An intersection between a cross road and the on- or off-ramp from a freeway.	6
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.	2

Reconstruction	Work which includes one or more of the following: a) Full-depth pavement reconstruction for more than 50-percent of the project length; b) Intermittent reconstruction of the existing horizontal and vertical alignment for more than 25-percent of the project length; and/or c) Addition or removal of through travel lanes.	2
Recoverable Parallel Slope	Slopes which can be safely traversed and upon which an errant motorist has a reasonable opportunity to stop and return to the roadway. Fill slopes 4:1 and flatter are considered recoverable.	9
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.	4
Rectangular Rapid-Flashing Beacon	A pedestrian-actuated set of amber light-emitting diodes (LEDs) that rapidly flash when actuated.	7
Regulated Access	Means of limiting access to/from private property and the highway right-of-way by the use of revocable approach permits.	2
Rehabilitation	Work primarily intended to extend the service life of the existing roadway by making cost-effective improvements to upgrade the roadway. It may include full-depth pavement reconstruction for up to 50-percent of the project length and may include horizontal and vertical alignment revisions for up to 25-percent of the project length.	2
Relative Longitudinal Slope	The difference between the centerline grade and the grade of the edge of traveled way.	3
Restricted Crossing U-Turn (RCUT) Intersection	An intersection that is also known as a superstreet intersection, a J-turn intersection, or a synchronized street intersection. The RCUT intersection replaces direct left-turns and through movements from cross street approaches at an intersection with indirect left-turns using a U-turn movement in a wide median.	6
Reverse Crown	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.	3
Reverse Curves	Two simple curves with deflections in opposite directions which are joined by a common point or a relatively short tangent distance.	3
Right-of-Way	A general term denoting land, property or interest therein, usually a strip acquired for or devoted to a highway use.	1

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.	1
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.	12
Right-of-Way Estimate	An approximation of the market value of property including damages, if any, in advance of an appraisal.	1
Roadside	A general term denoting the area adjoining the outer edge of the roadway.	1
Roadside Barrier	A longitudinal barrier used to shield obstacles located within an established clear zone. Roadside barriers include guardrail, concrete barrier rails, etc.	9
Roadside Obstacles	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).	9
Roadway	The portion of a highway including shoulders, for vehicular use. A divided highway has two or more roadways. During construction, the roadway is the portion of a highway within the limits of construction.	1
Roadway Section	The combination of the traveled way, both shoulders and any auxiliary lanes on the highway mainline.	5
Rock Cut	A roadway cut excavated through rock.	13
Roller Coaster	A type of profile that may be an outcome of fitting an alignment across varying topography; however the design team should avoid excessive ups and downs, which may be unpleasant aesthetically and difficult for drivers to navigate.	4
Rolling Terrain	Ground surface where the natural slopes consistently fall below and rise above the roadway and occasional steep slopes offer some restriction to horizontal and vertical alignment.	2
Roundabout	A form of yield-controlled intersection with a generally circular shape, characterized by yield on entry and circulation around a central island.	6
Rumble Strips	A series of grooves cut into the pavement or a series of raised strips along the centerline or shoulder or the roadway which change the noise a vehicle's tires make on the surface and create vibrations that warn drivers of speed restrictions or the edge of the lane.	5

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).	2
Rural Area	Those places outside the boundaries of urban areas.	2
Sag Curve	Vertical curve that typically connects descending grades forming a sag.	4
Scope of Work (SOW) 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.	1
Secondary System	A system of routes that includes Non-National Highway System (NHS) rural major collectors.	2
Service Flow Rate	The maximum hourly vehicular volume which can pass through a highway element at the selected level of service.	2
Shall, Require, Will, Must	A mandatory condition. The design team is 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, the *RDM* limits the use of these words.	1
Shared Facility	A facility along a roadway that can serve both pedestrians and bicyclists.	7
Shared Roadway	A roadway which is open to both bicycle and motor vehicle travel.	7
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 backslope.	5
Should, Recommend	An advisory condition. The design team is strongly encouraged to follow the criteria and guidance presented in this context, unless there is reasonable justification not to do so.	1
Shoulder	The portion of the roadway contiguous to the traveled way for lateral support of base and surface courses, improved roadway operation, increased clear recovery area, space for emergency stops, and for other purposes. On sections with curb and gutter, the shoulder extends to the face of the curb.	5
Shoulder Slope	The slope in the cross section view of the shoulders, expressed as a percent.	5
Shoulder Width	The width of the shoulder measured from the edge of the 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 a point 0.5 feet in front of the back of curb.	5

Shy Distance	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 it will change vehicular placement or speed.	9
Side Friction Factor (*f*)	A numerical factor which represents the vehicle's need for side friction between the vehicle's tires and the pavement surface. It also represents the lateral acceleration that acts on a vehicle.	3
Side Slope	Both fill slopes and cut slopes used to conform to existing conditions along the roadside.	5
Sidewalk	A dedicated pedestrian facility adjacent to the roadway and separated from vehicular traffic by a curb (e.g., curb-tight sidewalk) or buffer area (detached sidewalk).	5, 7
Signalized Intersection	An intersection which is controlled by a traffic signal. The operations of a signalized intersection are impacted by the signal phasing and timing of the intersection.	6
Significant, Major	Indicating that the consequences from a given action are obvious to most observers and, in many cases, can be readily measured.	1
Site	A parcel of land bounded by a property line or a designated portion of a public right-of-way.	1
Slope Offset	On curbed facilities with sidewalks, the area between the back of the sidewalk and the break for the fill slope or backslope.	5
Small Urban Area	Those areas with a population greater than 5,000 and not within any Urbanized Areas.	2
Special Provisions	Additions and revisions to the Standard and Supplemental Specifications applicable to an individual project.	14
Specifications	The compilation of provisions and requirements for the performance of prescribed work.	14
Speed Reduction Treatment	A roadway treatment designed to reduce vehicle speeds.	6
Spiral Curves	Curvature arrangements used to transition between a tangent section and a circular curve, which are consistent with the transitional characteristics of vehicular turning paths. When moving from the tangent to the circular curve, the sharpness of the spiral curve gradually increases from a radius of infinity to the radius of the circular curve.	3
Spiral to Curve (SC)	A common point of the spiral and the circular curve of the near transition.	3
Spiral to Tangent (ST)	A common point of the spiral and the tangent of the far transition.	3

Spline Curve	A curve drawn using a flexible template to meet field conditions.	4
Spline Grade	A grade developed using a flexible template to meet field conditions.	4
Standard	A design value which cannot be changed without formal documentation, such as a design exception.	2
Standard Bicycle Lane	An on-street facility that provides space designated for bicyclists, separated from vehicles by pavement markings.	7
Standard Specifications	*Standard Specifications for Road and Bridge Construction.* A book of specifications approved for general application and repetitive use.	14
State Highway	Any public highway planned, laid out, altered, constructed, reconstructed, improved, repaired, maintained or abandoned by the Montana Department of Transportation.	2
State Maintenance System	Public highways designated by the Transportation Commission that are to be maintained by the State. This system must include all the highways that the Department maintained on July 1, 1976.	2
Stationing	A system of measurement used for road layout and construction.	3
Stop Controlled Intersection	An intersection where one or more legs are controlled by a stop sign.	6
Stopping Sight Distance	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.	2
Storm Drain Inlet	A structure for capturing concentrated surface flow. May be located along the roadway, in a gutter, in the highway median, in a roadside ditch or in a field.	11
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.	3
Superelevation Rollover	The algebraic difference (A) between the superelevated traveled way cross slope and shoulder slope on the outside of a horizontal curve.	3
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.	3
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.	3
Supplemental Specifications	Approved conditions and revisions to the Standard Specifications.	14

Surface Transportation Program	Refers to all Non-NHS routes and is a block-grant program which provides Federal-aid funds for any public road not functionally classified as a minor rural collector, or a local road or street.	2
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.	5
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.	4
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).	3
Tangent to Spiral (TS)	A common point of the spiral and the tangent of the near transition.	3
Target	Selected criteria that the design team is striving to achieve. However, not meeting these criteria will typically not require a justification.	1
Temporary Easement	Property acquired for the legal right of usage by MDT 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, MDT yields its legal right of usage and returns the land to its original condition as close as practical.	12
Temporary Roadway	A road that is designed and built along a temporary alignment solely for use during construction.	10
Time of Concentration (T_c)	The time it takes water from the most distant point (hydraulically) to reach a watershed outlet. T_c varies, but it is often used as a constant.	11
Toe of Slope	The intersection of the fill slope with the natural ground or the inslope with the ditch bottom.	5
Top of (Cut) Slope	The intersection of the backslope with the natural ground.	5
Traffic Calming Measures	Physical designs or other measures put in place on roadways for the intention of slowing down or reducing motor-vehicle traffic as well as improving safety for pedestrians and bicycles.	8
Traffic Control Plan	Describes measures within the contract to facilitate roadway users through a construction zone, work zone, or an incident area, and addresses traffic safety and control through the construction and work zone.	10
Transition Length	The distance required to transition the roadway from a normal crown (NC) section to a full superelevation. Superelevation transition length is the sum of the tangent runout (TR) and superelevation runoff (L) distances.	3

Transitional Area	Those areas providing connections between urban and rural areas.	2
Transportation Management Plan	A plan established to clearly direct and control traffic disruptions that call for coordinated actions from several services responsible for road management on a given roadway network.	10
Transportation Operations	Operations used to mitigate impacts of the construction zone on the operation and management of the transportation system within the construction zone impact area.	10
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.	9
Travel/Traffic Lane	The portion of the traveled way for the movement of a single line of vehicles.	5
Traveled Way	The portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.	5
Traversable Slopes	A slope or cross section in which a vehicle can safely cross. Parallel slopes 3:1 or flatter are considered traversable.	9
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. Data on trucks are compiled and reported by the Transportation Planning Division.	4
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.	2
Turn Lane	An auxiliary lane adjoining the through traveled way for speed change, storage and turning.	6
Turning Roadway	A channelized roadway (generally separated by a raised island or depressed gor area) connecting two legs of an intersection.	6
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.	6
Two-Stage Left-Turn Box	A designated area of an intersection that allows bicyclists to safely and comfortably make left-turns at multilane intersections from a right-side bicycle lane or cycle track.	7

Two-Way Left-Turn Lane (TWLTL)	A lane configuration that provides a center lane exclusively for left-turning vehicles from either direction.	5
Two-Way Separated Bicycle Lane	A facility, also known as a two-way cycle track or two-way protected bicycle lane, within the street right-of-way separated from motorized vehicle traffic by a buffer and a physical barrier.	7
Typical	Indicating a design practice that is most often used in application. However, this practice does not necessarily represent the "best" treatment at a given site.	1
Underpass	A grade separation where the subject highway passes under an intersecting highway or railroad.	6
Undivided Roadway	A roadway with one or multiple lanes in each direction arranged within a single roadway with no median to separate opposing flows of traffic.	4
Unsymmetrical Vertical Curve	A vertical curve where the horizontal distance from the Vertical Point of Curvature (VPC) to the Vertical Point of Intersection (VPI) is not equal to the horizontal distance from the VPI to the Vertical Point of Tangency (VPT).	4
Urban Area	Those places within boundaries set by the responsible State and local officials or a place that has urbanized characteristics.	2
Urban System	A system that includes both minor arterials and major collectors within urban boundaries.	2
Urbanized Area	Those areas with a population greater than 50,000, as designated by the Bureau of the Census.	2
Utility Occupancy Area	A strip of right-of-way reserved for the placement of utilities.	9
Vertical Clearance	A vertical dimension which must be clear of obstructions to allow vehicles to pass.	4
Vertical Alignment	The vertical aspect of the road, including crest and sag curves and the straight grade lines connecting them.	3
Vertical Point of Curvature (VPC)	The point at which a tangent grade ends and the vertical curve begins.	4
Vertical Point of Intersection (VPI)	The point where the extension of two tangent grades intersect.	4
Vertical Point of Tangency (VPT)	The point at which the vertical curve ends and the tangent grade begins.	4
Yield Control Intersection	An intersection where one or more legs are controlled by a yield sign and are permitted to enter the intersection without stopping if there are no potentially conflicting vehicles on the major roadway.	6