MTO Design Supplement

For
TAC Geometric Design Guide (GDG) for Canadian Roads, June 2017

Appendix A

Glossary

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This glossary is applicable for all chapters of TAC Geometric Design Guide for Canadian Roads – June 2017 and MTO Design Supplement:

TERM	DEFINITION / DESCRIPTION
85th-percentile Speed[b]	The speed at or below which 85 percent of all observed traffic is traveling at a particular point or segment.
Acceleration Lane	An auxiliary lane to enable a vehicle entering a roadway to increase speed to merge with through traffic as applied at channelized intersections, or as speed-change lane at interchanges.
Access Control	See "Controlled Access".
Access Management	The management of the location and basic dimensions of access to property, from a roadway.
Accident	Not used. (See "Collision")
Adverse Crown[a]	A section with the cross-slope removed to a zero slope. This change in cross-slope is accomplished over the tangent runout.
Advisory Speed[b]	The speed displayed on an advisory speed plaque and determined on the basis of an engineering analysis.
Alternating One-way Operation[b]	A construction work zone mitigation strategy used on two-way roadways wherein opposing directions of travel take turns using a single travel lane. Flaggers, with or without pilot vehicles; STOP signs; or signals are normally used to coordinate the two directions of traffic. This strategy compensates for the removal of permanent travel lanes from service and is sometimes referred to as one-lane, two-way operation.
Ancillary Space	The part of the roadway, between the travel lanes and the curb or pavement edge.

Annual Average Daily Traffic[b] (AADT)	The total volume of traffic passing a point or segment of a highway in both directions for 1 year divided by the number of days in the year.
Approach Nose	The end of a median or island that faces approaching traffic.
Approach Taper	The taper required in advance of an intersection to shift the through lanes laterally to the right to provide the width for a left-turn auxiliary lane.
Area of Concern[b]	An area within the roadside environment and within the desirable clear zone that has a higher severity index than a barrier system.
Area of Contents	An object or roadside condition that may warrant safety treatment.
Arterial Road	A road primarily for through traffic.
Assumed Speed[b]	The assumed speed for calculating minimum stopping sight distance is based on the 85th percentile wet weather speeds as derived from a traffic study.
Assured Passing Opportunity[b]	A condition in which a vehicle can safely pass another without restriction either by visibility or opposing traffic.
Auxiliary Lane[a]	A lane in addition to, and placed adjacent to, a through lane intended for a specific maneuver such as turning, merging, diverging, weaving, and for slow vehicles, but not parking.
Average Annual Daily Traffic (AADT)	The total volume of traffic passing a point or segment of a roadway, in both directions for one year, divided by the number of days in the year.
Average Daily Traffic[b] (ADT)	The total volume of traffic during a given time period (in whole days) greater than one day and less than one year divided by the number of days in that time period.
Back Slope[b]	Where the roadway is in cut, the slope between the drainage channel and the natural ground is referred to as a back slope.
Barrier[b]	A device which provides a physical limitation through which a vehicle would not normally pass. It is intended to contain or redirect an errant vehicle of a particular size range, at a given speed and angle of impact.
Barrier System[b]	A system which provides a physical limitation through which an errant vehicle would not normally penetrate or vault over. It is intended to contain or redirect an errant design vehicle of a particular size range, at a given speed and angle of impact.
Barrier Transition	A method by which a change in longitudinal barrier type provides continuous protection to adjacent traffic.
Barrier Warrant	A criterion that identifies a potential need for a traffic barrier.

Bifurcation Point[b]	The point or area at which a roadway divides into two branches or parts.
Bike Lane	A lane intended for the exclusive use of bicycles, within a roadway used by motorized vehicles.
Bike Path	A bicycle facility physically separated from roadways, where motor vehicle traffic, except maintenance vehicles, is excluded.
Bike Route	Any roadway signed specifically to encourage bicycle use.
Bikeway	A roadway, or part of a roadway, intended for the use of bicycles, either exclusively or shared with other vehicular traffic or pedestrians.
Border	The area adjoining the outer edge of the sidewalk.
Boulevard[a]	A reserve which separates the roadway and sidewalk. It provides some protection to the pedestrian and can accommodate street accessories such as traffic signs the fire hydrants. It is a suitable location for underground utilities and may be used for illumination poles. It also provides an area for snow storage.
Brake Reaction Time[b]	The time that elapses from the instant the driver decides to take remedial action, to the instant that remedial action begins (contacts brake pedal).
Braking Distance	The distance travelled from the instant that braking begins to the instant the vehicle comes to a stop.
Break Point	The outer extremity of the shoulder where the side slope begins.
Breakaway	A design feature that allows a device such as a sign, luminaire or traffic signal support to yield or separate upon impact.
Bridge Railing	A longitudinal barrier whose primary function is to prevent an errant vehicle from going over the side of the bridge structure.
Broken Back Curve	An arrangement of curves in which a short tangent separates two curves in the same direction.
Building Line	A line prescribing the nearest limits for the erection of buildings in relation to a roadway.
Bulbing	A widened portion of the median or outer separation, usually at an intersection.
Bullnose[b]	Location where edge of highway and edge of ramp meet each other. Bullnose may include or exclude curb and gutter.

Bus Only lane (BOL), busway, or transit-way[b]	Managed lane dedicated primarily to buses
Channelization	The separation and direction of traffic movements and pedestrians into defined paths at an at-grade intersection through the use of geometric features, pavement markings and traffic control devices.
Choker (Curb Bulb)	A narrowing of a roadway, either at an intersection or mid-block, in order to reduce the width of the roadway surface.
Clear Zone[a]	The unobstructed, traversable area provided beyond the edge of the through travelled way available for use by errant vehicles. -The clear zone includes shoulders, bike lanes, and auxiliary lanes, except those auxiliary lanes that function like through lanes. The clear zone also includes recoverable slopes, and non-recoverable slopes with a clear run-out area. -The selected clear zone width is dependent upon traffic volumes and design speed, and roadside geometry.
Climbing Lane	A lane added on the right side of a roadway on an upgrade intended for use by trucks and other slow vehicles to discourage these vehicle types from using the through lanes.
Collector Lanes[a]	Those lanes of an express/collector system separated from express lanes by an outer separation.
Collector Road	A road on which traffic movement and access have similar importance.
Collision	An event in which travel by a vehicle results in the vehicle being in an inappropriate location, or in an appropriate location at an inappropriate time, culminating in unwanted contact with a fixed object, vehicle, other roadway user or other obstacle.
Collision-Free	Circumstances under which a collision will never occur, i.e. "absolute" safety.
Commercial Motor Vehicle (CMV)[b]	A motor vehicle having a permanently attached truck or delivery body, including fire apparatus, busses, and truck tractors and trailers (combination units) used for hauling purposes on the highways, and requiring a Commercial Vehicle Operating Registration (CVOR).
Construction Work Zone[b]	An area occupied for specific duration days for the purpose of constructing, reconstructing, rehabilitating, or performing preventive maintenance. A construction work zone extends from the first Temporary Traffic Control (TTC) device to the last TTC device.

Continuous Right-Turn Auxiliary Lane	A right-turn lane that is continuous for a significant distance serving a number of driveways.
Controlled Access	The condition where the opportunity for access to a roadway is controlled by public authority.
Corner Clearance	The distance between the near curb of a street intersection and the near edge of a driveway throat or public lane.
Crash	Not used. (See "Collision")
Crashworthy[b]	A feature that has been proven acceptable for use under specified conditions either through crash testing or in-service performance.
Crash Cushion[a]	An energy attenuating system which provides a physical limitation through which an errant vehicle would not normally penetrate. It is intended to contain or redirect or stop an errant design vehicle of a particular size range, at a given speed and angle of impact.
Crest Vertical Curve	A vertical curve having a convex shape in profile viewed from above.
Criterion	A value, determined either by mathematical relationships or by experience, that represents the degree of excellence required for a particular application, acknowledged as appropriate for that application where prevailing conditions are normal and typical, recognizing that in atypical circumstances some variation may be appropriate. It may be regarded as a basis for assessing existing designs and formulating opinion on their quality, but is not treated as a rigid value to which there is any obligation for designs to conform.
Cross Fall (Cross Slope)	The average grade between edges of a cross section element.
Crossover[b]	Any portion of a roadway distinctly indicated for pedestrian crossing by signs on the highway and lines or other markings on the surface of the roadway as prescribed by the regulations and the Highway Traffic Act, with associated signs Ra-4, Ra-4t, Ra-5L, Ra-5R, Ra-10, and Ra-11.
Cross Section	The transverse profile of a road.
Cross Street	A street of lower classification that crosses a roadway of higher classification, either at grade or passing over or beneath.
Crosswalk[a]	Any portion of a roadway, at an intersection or elsewhere, distinctly indicated for pedestrian crossing by appropriate pavement markings and/or signs, or by the projections of the lateral lines of the sidewalk on opposite sides of the road.

Crown	The highest break point of the surface of a roadway in cross section.
Cul-De-Sac	A road opens at one end only.
Curb	A structure with a vertical or sloping face along the edge of a lane or shoulder strengthening or protecting the edge or clearly defining the edge.
Curb Drop	The transition length required to decrease the curb height to accommodate a driveway or sidewalk ramp.
Curb and Gutter[b]	Curb and gutter is placed adjacent to an outside lane or shoulder and is intended to control and conduct storm-water and also provides delineation for traffic. In some instances, curb is introduced without a gutter.
Curb Return	The curved section of curb used at intersections or driveways in joining straight sections of curb.
Curve to Spiral (CS)	The point of alignment changes from circular curve to spiral curve, in the direction of stationing.
Curvilinear Alignment	An alignment in which the majority of its length is circular and spiral curve.
Cut[b]	A roadway located below natural ground elevation is said to be in cut.
Cut Side Slope[b]	Where the roadway is in cut, the slope between the road-way and drainage channel is referred to as a cut side slope.
Deceleration Lane[a]	An auxiliary lane to enable a vehicle exiting from a roadway to reduce speed after it has left the through traffic lanes as applied at channelized intersections, or as speed-change lane at interchanges.
Decision Sight Distance	The distance required for a driver to detect an information source or hazard which is difficult to perceive in a roadway environment that might be visually cluttered, recognize the hazard or its potential threat, select appropriate action, and complete the manoeuvre safety and efficiently.
Deflection Angle	The angle between a line and the projection of the preceding line.
Departure Taper	The taper required beyond a flared intersection to laterally shift the through lanes to the left, back to a normal alignment or cross section.
Design Consistency	An indication of the quality of design offered by a roadway.

Design Controls[b]	Factors outside the designer's discretion that may affect the design process and designed solution. Examples include traffic volumes, vehicle size and weight, atmospheric conditions, driver, and other human characteristics.
Design Criteria[b]	Characteristics by which the sufficiency of a design feature may be assessed.
Design Exception	A "Design Exception" is a documented decision to design elements of highway for criteria that do not meet minimum values or ranges established in the highway standards, policies or specifications.
Design Features[b]	Geometric and dimensional characteristics of the roadway and roadside, including horizontal and vertical alignment and cross-sectional elements.
Design Speed[a]	A speed selected for purposes of design and correlation of the geometric features of a road and is a measure of the quality of design offered by the road. It is the highest continuous speed at which individual vehicles can travel with safety on a road when weather conditions are favourable and traffic density is so low that the safe speed is determined by the geometric features of the road.
Design Hour Volume (DHV)	An hourly traffic volume selected for use in geometric design.
Desirable Clear Zone[b]	The recommended width of the clear zone for design purposes, determined as a function of design speed, traffic volume, and foreslope steepness.
Desirable Value[b]	The value at the top of a range of values in a design standard, or the discreet value when a range is not given in a design standard.
Desired Speed	The Operating Speed that drivers will adopt on the less constrained alignment elements of a reasonably uniform section of road (e.g., the longer straights and large radius horizontal curves) when other vehicles or users do not affect their speed choice.
Detour[b]	A construction work zone mitigation strategy wherein traffic in one or both directions is rerouted onto an existing highway to avoid a construction work zone. Detoured vehicles may travel on permanent roads only or on a combination of permanent and temporary roads. This strategy compensates for the removal of permanent travel lanes from service.

Development Roadway	A roadway whose primary purpose is to provide access to undeveloped areas.
Diversion[b]	A construction work zone mitigation strategy wherein traffic in one or both directions on a designated route is carried by a temporary roadway around a work area and reconnected with the permanent infrastructure of the designated route. This strategy compensates for the removal of permanent travel lanes from service.
Double Left-Turn Lanes	A pair of adjacent lanes intended for the exclusive use of vehicles about to turn left. Interchangeable with dual left-turn lane.
Drainage Channel[a]	A drainage channel is placed adjacent to an outside lane or shoulder and is intended to control and conduct storm-water runoff. A shallow drainage channel is sometimes referred to as a swale.
Earth Roadway	A roadway that has a driving surface consisting of subgrade material.
Easement	A right acquired by public authority to use or control property for a designated purpose.
Effective Wheelbase (EWB)	The distance from the centroid of the front axle group to the centroid of the rearmost axle group, which significantly influences the turning envelope. For two-axle vehicles, total and effective wheelbase are the same.
Emergency Turnouts[b]	Segments of wider-than-typical shoulder. May be provided as disabled vehicle refuge at regular intervals or where conditions permit on roadways (perhaps temporary) where it is not practical to provide a continuous full-width shoulder. May also be referred to as intermittent shoulders.
End Treatment	The method by which the end of a barrier facing on-coming traffic is treated to minimize its hazard.
Energy Attenuator	See “Crash Cushion”.
Entrance	The general area where turning roadway traffic enters the main roadway.
Entrance Terminal	The part of an entrance comprised of acceleration lanes or speed change lanes, including the ramp proper up to the ramp controlling curve.
Exit	The general area where turning roadway traffic departs from the main roadway.

Exit Terminal	The part of an exit comprised of deceleration lanes or speed change lanes, including the ramp proper up to the ramp controlling curve.
Express Lanes[a]	Managed lane that restricts access or a ML that employs electronic tolling in a freeway right-of-way with or without access restrictions. Express lanes can be located within tolled or non-tolled facilities and may be operated as reversible flow or bi-directional facilities to best meet peak demands.
Express-Collector System	A freeway in which the through or express lanes are physically separated from the collector lanes.
Express toll lane (ETL) [b]	ETL is a limited access managed lane employing electronic tolling that charges users' toll, and they do not exempt high occupancy vehicles.
Expressway	A divided arterial road for through traffic with full or partial control of access and with some interchanges.
False Grading	The practice of distorting the profile of a roadway, relative to the top of curb, so as to avoid flat grades in order to effect drainage.
Fill[b]	A roadway located above the natural ground elevation is said to be in fill.
Fill Side Slope[b]	Where the roadway is in fill, the slope between the roadway and the natural ground is referred to as the fill side slope or sometimes the fill slope.
Flare	The variable offset distance of a barrier to place it further from the travelled way.
Flexible Barrier	A form of the longitudinal barrier that is intended to redirect an errant vehicle by rail tension, usually through a system of cables installed in tension.
Four-Lane Divided Highway[b]	A highway consisting of four (4) through lanes total, with two (2) through lanes in each direction which are separated by an unpaved area or physical barrier, including but not limited to a curbed island.
Four-Lane Road[b]	A road that provides two through lanes of traffic in each direction.
Frangible	Readily or easily broken upon impact.
Freeway[a]	A divided highway having at least two lanes in each direction, a continuous dividing median, full control of access and a posted speed of greater than 90 km/h. Access is provided through interchanges, allowing for high-speed merging and diverging.

Freeway[a] (Multi-Lane Freeway)	A multi-lane, divided highway with more than four (4) through lanes total (two (2) through lanes in each direction) with a continuous dividing median. This highway is a fully controlled access road limited to through traffic, with access through interchanges and a posted speed of greater than 90km/h. See also "Staged Freeway"
Friction Factor	The coefficient of friction between tire and roadway, measured either longitudinally or laterally.
Front Overhang (FOH)	The distance from the front bumper of a vehicle to the centroid of its front axle group.
Frontage Roadway	A road contiguous to a through road so designed as to intercept, collect and distribute traffic desiring to cross, enter or leave the through road and to furnish access to property.
Full Road Closure[b]	A construction work zone mitigation strategy wherein traffic operations are removed or suspended in either one or two directions on a segment of roadway or ramp.
Geometric Design	The selection of the visible dimensions of the elements of a road.
Gore Area[a]	Area between edge of highway, edge of ramp and bullnose.
Grade Separation	Vertical separation of two intersecting roadways or a roadway and a railway.
Gradient (Grade)[a]	The rate of rise or fall with respect to the horizontal distance; usually expressed as a percentage.
Gravel Road	A road that has a driving surface consisting of granular material.
Guiderail (Guardrail)	See "Barrier".
Guidelines	Outlines of acceptable practice.
Gutter	A paved shallow waterway provided for carrying surface drainage.
Gutter Line	The bottom of the curb face where it meets the concrete gutter, or the paved surface where a gutter is not employed.
Gutter Lip	The edge of a concrete gutter opposite the curb where it meets the paved roadway.
Hazard	Any obstacle or other feature such as an embankment, or a body of water of depth greater than 1 m which, without protection, is likely to cause significant injury to the occupants of a vehicle encountering it.
Heuristic	An aid to design based on experience - a "rule of thumb".

High-Occupancy-Toll (HOT) Lane, also referred to as Value-Priced lanes [b]	HOV lane that is electronically tolled for single- or lower--occupancy vehicles and free to higher-occupancy vehicles.
High-Occupancy-Vehicle (HOV) Lane[a]	Managed lane restricted primarily to high-occupancy vehicles (no tolling applied).
High-Speed Highway[b]	A road or highway on which traffic operates with an 85th-percentile free-flow speed of 80 km/h or greater.
Highway	Synonymous with roadway but generally limited to higher-speed roadways in rural areas.
Horizontal Alignment[a]	The configuration of a road or as seen in plan, consisting of tangents, lengths of circular curve, and lengths of spiral or transition curves.
Horizontal Curve	A circular curve to plan to provide for change of direction.
Hot Mix Patching[b]	See selective resurfacing.
Independent Alignment	A divided highway in which each roadway is designed independently both in horizontal and vertical alignment, to take advantage of topographical features.
Inside Lane	The left lane in one direction of a roadway with two or more lanes in that direction also referred to as an inner lane.
Interchange	A grade-separated intersection with one or more turning roadways for travel between the through roads.
Intermittent Closure[b]	A construction work zone mitigation strategy wherein all traffic in one or both directions is stopped for a relatively short period to allow for construction operations.
Intersection (At-Grade)	The general area where two or more roads join or cross, within which are included the roadway and roadside facilities for traffic movements.
Intersection Approach	That part of an intersection leg used by traffic approaching the intersection.
Intersection Sight Distance (ISD)	The sight distance to left and right available to a driver intending to execute a maneuver onto a through roadway from an intersecting roadway.
Island	A defined area between traffic lanes for control of vehicle movements or for pedestrian refuge and the location of traffic control devices.

King's Highway[b]	An administrative classification referring to all Provincial numbered lower than 500, and including the Queen Elizabeth Way (Q.E.W.). While "Freeways" fall under the administrative classification of a King's Highway, they have their own functional classification that differs from other King's Highways.
Lane (Traffic Lane)	A part of the travelled way intended for the movement of a single line of vehicles.
Lane Closure[b]	A construction work zone mitigation strategy wherein one or more travel lanes and any adjacent shoulders are closed to traffic. As defined here, this term is not limited to closing one lane of a multilane highway. Lane closures are inherent to median crossovers.
Lane Constriction[b]	A construction work zone mitigation strategy wherein the width of one or more travel lanes is reduced. The number of travel lanes may be retained (possibly through median or shoulder use) or reduced.
Left-Turn Lane	A lane added on the approach to an intersection for the exclusive use of left-turning vehicles.
Length of Need	Total length of a longitudinal barrier needed to shield an area of concern.
Local Roadway	A road intended to provide access to development only.
Long Combination Vehicle (LCV)	A combination of a tractor and trailer(s) used for special purposes, with an overall length greater than 25 m. Examples are 'triples' and 'turnpike doubles'.
Longitudinal Barrier[a]	A barrier placed adjacent to a roadway, intended to contain a vehicle leaving the normal travel path, by re-directing it.
Low Volume Roadway[a]	A road with average daily traffic of 200 vehicles per day of less, and whose service functions are oriented toward rural road systems, roads to or within isolated communities, recreation roads and resource development roads.
LRT	Light rail transit.
Mainline	The principal route.

Median[a]	The area that laterally separates traffic lanes carrying traffic in opposite directions. A median is described as flush, raised or depressed, referring to the general elevation of the median in relation to the adjacent edges of traffic lanes. The terms wide and narrow are often used to distinguish different types of median. A wide median generally refers to depressed medians sufficiently wide to drain the base and subbase into a median drainage channel. Flush and raised medians are usually narrow medians.
Median Barrier[a]	A longitudinal barrier placed in the median to prevent a vehicle from crossing the median and encountering oncoming traffic or to protect a vehicle form a fixed object in the median.
Median Crossover[b]	A construction work zone mitigation strategy used on freeways and multilane divided highways to establish two-way traffic. In this strategy: • The number of lanes in both directions is reduced~~;~~ • At both ends, traffic in one direction is routed across the median to the opposite-direction roadway on a temporary roadway constructed for that purpose~~; and~~ • Two-way traffic is maintained on one roadway while the opposite direction roadway is closed~~.~~ This strategy involves the inherent use of median crossovers, and this strategy may be employed in combination with use of shoulder.
Merging-End	The physical end of an entrance terminal between the outer travel lane and the ramp, beyond which traffic merges. Also known as the painted wedge.
Minimum Passing Sight Distance	The least visible distance required by a driver in order to make a passing manoeuvre safely, based on a given set of circumstances.
Minimum Stopping Sight Distance	The least stopping sight distance required by a driver to come to a stop under prevailing vehicle, pavement and climatic conditions.
Minimum Turning Radius (TR)	The radius of the path of the outside of the outer front wheel for the minimum radius turning condition. In former TAC Design Guides, this dimension was used to denote the minimum design turning radius.
Minimum Value[b]	The value at the bottom of a range of values in a design standard.
Multi-Lane Roads[b]	Roads, including freeways, having more than two through lanes of traffic in each direction. In the Traffic and Capacity chapter Multilane refers to four lanes or more.

Multi-Use Path (MUP)	A path with multiple users of different types (e.g., pedestrians, bicycles, and similar user types); a MUP may be shared (all users share the same pathway space, with or without a marked centre line) or may be separated (i.e., the pathway is separated into parallel travelled ways, e.g. one exclusively for pedestrians and one exclusively for bicycles).
Multi-Use Trail (MUT)	See "Multi-Use Path".
Narrow Median[b]	A median without an unpaved area or physical barrier between opposing through lanes.
Noise Berm/Barrier	A physical barrier, consisting of compacted earth in a trapezoidal shape, used as a means of minimizing the transmission of traffic sounds.
Normal Crown	A cross section in which adjacent surfaces slope in opposite directions from the centre line or a lane edge to effect drainage to the sides.
Nominal Safety	Nominal safety is a consideration of whether the highway design elements meet minimum design criteria. For example, if design features such as lane width, shoulder width, lateral clearance, etc. meet the minimum values or ranges, the highway proposed design is considered to have nominal safety.
Obstacle[a]	Any fixed object which is likely to cause significant injury to occupants of a vehicle encountering it. Or Any non-breakaway and non-traversable feature within the roadside environment greater than 100mm in height that can increase the potential for personal injury and vehicle damage when struck by an errant vehicle leaving the roadway.
Offset Mid-Block Crossing	A pedestrian crossing on a divided roadway in which the alignment of the crossing is staggered at the median.
One-lane One-way Road	A road with one lane that carries one-directional traffic.
One-lane Two-way Road	A road that provides sufficient roadway width for the safe passing of opposing vehicles.
Operating Speed	The 85th percentile speed of vehicles at a time when traffic volumes are low and drivers are free to choose the speed at which they travel.
Outer Separation[a]	A reserve on freeways (including shoulders) between lanes carrying traffic in the same direction.

Outside Lane	The right lane in one direction on a roadway with two or more lanes in that direction (also referred to as an outer lane).
Overall Length	The distance between the front bumper of the power vehicle and the rear bumper on the rear unit of a vehicle or trailer combination. It equals the sum of its effective wheelbases, front overhand and rear overhang.
Overpass (vehicle)	A grade separation in which the subject road passes over an intersecting road or railway.
Painted Wedge	See “Merging-End”.
Parameter	A quantity that is a variable in the general case and is constant in the specific case under consideration. (Radius of circular curve is an example, in which radius varies from one curve to another but for one particular circular curve is the same at any point on the curve.).
Parclo	An abbreviation for the PARtial CLOverleaf interchange, a grade separation having loop ramps in fewer than all four quadrants.
Parking Lane	A supplementary lane intended for parking.
Passing Lane	A supplementary lane intended for passing.
Passing Opportunity	The distance ahead required to be visible to a driver to initiate a passing maneuver safely.
Passing Sight Distance	The distance ahead visible to the driver available to complete a passing maneuver.
Perception Time[b]	The time that elapses from the instant that a driver observes an object for which it is necessary to stop, until the instant that he decides to take remedial action.
Platform Intersection	An intersection in which the area common to the two roadways is at the same elevation as the top of curb or sidewalk.
Policy	Principle, course of action, or strategy adopted by government, government agency or technical organization that reflects prevailing community values, intended to provide direction and guidance in the selection of technical and non-technical criteria for general application, and specific dimensions in the planning and design process. Policy necessarily incorporates some element of political or other non-technical community viewpoints.

Posted Speed	A speed limitation introduced for reason of safety, economy, traffic control and government regulatory policy aimed at encouraging drivers to travel at an appropriate speed for surrounding conditions.
Public Lane (Alley)	A narrow minor street, usually without sidewalks, located at the rear of lots for vehicle access to garages or other parking spaces and which also serves as a utility right of way.
Raised Crosswalk	A crosswalk on a curbed street whose elevation is the same as the top of curb or sidewalk.
Ramp	A turning roadway to permit the movement of traffic from one highway to another.
Reaction Time	The time that elapses from the instant a visual stimulus is perceived by a driver to the instant the driver takes remedial action.
Rear Overhang (ROH)	The distance from the rear bumper of a vehicle to the centroid of its rearmost axle group.
Recovery Area	Generally synonymous with clear zone.
Retrofit	The reconstruction of an existing roadway with geometric improvements.
Reverse Crown	A typical surface cross section in which adjacent surfaces slope in the same direction at the normal crown.
Reverse Curve	Two curves, curving in opposite directions from a common point.
Right-Of-Way (ROW)	The area of land acquired for or devoted to the provision of a road.
Right-Turn Lane	A lane added on the approach to an intersection for the exclusive use of right-turning vehicles.
Right-Turn Taper	The taper from the edge of the through lane to the beginning of a right-turning roadway at an intersection, where an auxiliary lane is not used.
Rigid Barrier	A form of longitudinal barrier that is intended to redirect an errant vehicle with minimum deflection in the barrier system and usually consist of a continuous concrete mass.
Road	The entire right-of-way comprising a common or public thoroughfare, including a highway, street, bridge and any other structure incidental thereto.
Roadside	The area adjoining the outer edge of the roadway.
Roadside Barrier	A longitudinal barrier used to shield roadside obstacles or non-traversable terrain features. It may occasionally be used to protect pedestrians from vehicle traffic.

Roadside Environment[b]	The portion of the ROW beyond the roadway, including medians, not designed for vehicular use. ~~-~~The roadside environment may include a variety of surfaces and slopes, fixed Obstacles (such as signs, poles, bridges piers, abutments, culverts, ditches, sideslopes, backslopes, barrier systems, crash cushions, etc.) and natural features (such as water bodies, trees and other vegetation, boulders and rock outcrops, etc.).
Roadway	That part of the road that is improved, designed or ordinarily used for the passage of vehicular traffic, inclusive of the shoulder.
Roadway Hump	A speed control device in which the roadway surface is raised over a length of about 3.5 to 4.0 m to a maximum height of 80 mm.
Roundabout	A channelized intersection in which traffic moves counterclockwise around a centre island of sufficient size to induce weaving movements in place of direct crossings. It is sometimes referred to as a rotary or traffic circle.
Rounding[a]	Width between edge of shoulder and cut or fill slope.
Rumble Strips	Indentations in the surface of a paved shoulder that provide an audible or tactile warning to a driver that the vehicle has left the travelled lane.
Runout Length[b]	The distance parallel to the roadway, measured from the object to the point of vehicle encroachment. This distance varies with design speed and traffic volume.
Rural Area	An area characterized by low density development on large parcels.
Safety Zone[a]	An area officially established within a roadway for the exclusive use of pedestrians, protected or so indicated as to be plainly visible.
Sag Vertical Curve	A vertical curve having a concave shape in profile viewed from above.
Secondary Highway[b]	An administrative classification referring to all 500 and ~~,~~ 600~~, and 700~~-Series Provincial Highways.
Selective Resurfacing[b]	Selective resurfacing and hot mix patching are interchangeable terms. It is an intermittent or non-continuous maintenance operation carried out as a holding strategy.
Semi-rigid Barrier[a]	A form of longitudinal barrier that is intended to direct an errant vehicle by a system of steel beam action to adjacent posts.
Service Road	Same as frontage road but not necessarily contiguous with the through road.

Severity Index[b]	A number from zero to ten used to categorize the potential severity of an encroachment or impact by an errant vehicle for a range of design speeds over a variety of surfaces and slopes, fixed objects and natural features within the roadside environment. The number is used for evaluating alternative safety treatments.
Shared Street	A street designed to be shared by pedestrians, cyclists, and slow-moving motorists, with no physical separation of modes and typically an emphasis on use as a livable public space.
Shielding	The introduction of a barrier or crash cushion between a vehicle and an obstacle or area of concern to reduce the severity of impacts of errant vehicles.
Shoulder[a]	Areas of pavement, gravel or hard surface placed adjacent to through or auxiliary lanes. They are intended for emergency stopping and travel by emergency vehicles only. They also provide structural support for the pavement.
Shoulder Closure[b]	A construction work zone mitigation strategy wherein a shoulder is closed to traffic.
Shy-Line Offset	A distance beyond which a roadside object will not be perceived by a driver to be a threat, to the extent of changing lane position or speed.
Sidewalk	A travelled way intended for pedestrian use, following an alignment generally parallel to that of the adjacent roadway.
Sight Distance	From any given point, the unobstructed distance a driver can see, usually along the roadway ahead.
Sight Distance at Intersection[b]	See “Intersection Sight Distance”.
Sight Triangle	The triangle formed by the line of sight and the two sight distances of drivers, cyclists or pedestrians approaching an intersection on two intersecting streets.
Simple Open Throat Intersection[a]	A simple or un-channelized intersection where additional area of pavement may be provided for turning of large vehicles.
Slot Left-Turn Lane	On a divided roadway, a left-turn lane which is angled and situated entirely within a wide median to accommodate a divisional island between the left- turn lane and the adjacent through lane.
Speed Hump	See “Roadway Hump”.
Speed Change Lane	A deceleration or acceleration lane.

Spiral Parameter (A)[a]	"A" designates the sharpness of the spiral. It is a measure of the flatness of the spiral, the larger the parameter, the flatter the spiral.
Spiral to Curve (SC)	The point of change form spiral curve to circular curve, in the direction of stationing.
Spiral to Tangent (ST)	The point of change from spiral curve to tangent, in the direction of stationing.
Spline	A flexible drafting tool used to draw curved lines of varying radii.
Staged Freeway[b]	A freeway (typically rural) that is planned to be a multi-lane divided freeway that is built using staged construction. In the plans for each stage of development, provisions should be made to adapt each stage to the next or the ultimate stage (completion). The transition should be made with minimum waste of the exiting plant and minimum interference to traffic. Typically, this might include treatments such as interim at-grade intersections in lieu of interchanges.
Standard	A value for a specific design feature, which practice or theory has shown to be appropriate for a specific set of circumstances, where no unusual constraints influence the design.
Steering Angle	The angle between the longitudinal axis of the vehicle and the direction of the steering wheels, limited by the dimensions of parts of the steering mechanism.
Stop Block[b]	Pavement marking to indicate where vehicles are required to stop for a traffic control device.
Stopping Distance	The distance travelled by a vehicle from the instant the driver decides to stop, to coming to a stop.
Stopping Sight Distance	The required distance between a vehicle and an object, for which the driver decides to stop, ~~to~~ at the instant the ~~vehicle~~ object begins to come into view.
Street	Synonymous with road, but generally limited to lower speed roads in urban areas.
Street Furniture	Practical and decorative features introduced into the streetscaping, intended to enhance the comfort, convenience and aesthetic quality of the roadway environment.
Streetscaping	The practice of applying aesthetic treatments to the street and its facilities, intended to enhance the quality of the roadway environment.

Suburban Area	An area characterized by larger scale developments.~~-~~ Building coverage and development density can vary, but typically are less than in Urban Areas.
Substantive Safety	Substantive Safety is the expected or estimated long-term average, safety performance of a roadway. The concept of substantive encompasses methods for estimating the following expected quantitative measures: • Collision Frequency • Collision types • Collision severity
Summer Average Daily Traffic (SADT)[b]	The average 24-hour, two-way traffic for the period July 1st to August 31st including weekends.
Superelevation	The gradient measured at right angles to the centre line across the roadway on a curve, from the inside to the outside edge.
Superelevation Runoff	The transition between a typical section of normal crown and a fully superelevated section. (See also Tangent Runout.)
Surfaced Roadway	A roadway in which the travelled lanes have been hard surfaced, usually by some form of bituminous or concrete surface.
Swale	A shallow drainage channel.
Tangent Runout	The length of road needed to accomplish the change in cross slope from a normal cross-section to a section with the adverse crown removed.
Tangent to spiral (TS)	The point of alignment change from tangent to spiral curve, in the direction of stationing.
Taper	Where an auxiliary lane is being developed or terminated, the straight-line transition from the edge of the through lane to the beginning of the full width auxiliary left- or right-turn lane.
Target Speed	The speed at which the designer intends for traffic to operate.
Temporary Construction Barrier[b]	A temporary construction traffic barrier is a portable construction safety shape barrier.
Temporary Roadway[b]	A roadway constructed to carry highway traffic exclusively during construction. Temporary roadways are used in conjunction with diversion and median crossover work zone strategies and may be used with a detour work zone mitigation strategy.

Temporary Traffic Control[b]	A construction work zone mitigation strategy wherein devices and measures are used to facilitate road users through work zones.
Terminal[b]	A crashworthy end treatment or crashworthy anchor used at the end of a barrier system.
Tertiary Highway[b]	An administrative classification referring to all 800-Series Provincial Highways.
Throat Length	The provision of sufficient unobstructed on-site driveway length to prevent stopped vehicles from blocking the path of entering vehicles or vehicles travelling along the circulation roadways on site.
Through Lane	A lane intended for through traffic movement.
Toll Lane (Toll Road) [a]	A road open to traffic only upon payment of a direct toll or fee; sometimes called tollway, throughway, turnpike or auto-route~~.~~ (may not be a managed lane if travel benefits are not assured).
Total Wheelbase (TWB)	The centre-to centre distance from the front axle to the rearmost axle of a tractor-trailer combination. (The nomenclature used for design vehicles is based on total wheelbase, for example "WB-19" refers to a tractor-semitrailer having a total wheelbase of approximately 19 m.)
Traffic Barrier/Barrier[b]	Traffic barriers are placed adjacent to a roadway to protect traffic from hazardous objects either fixed or moving (other traffic). Barriers placed in a median are referred to as median barriers and may be placed in flush. Raised or depressed medians.
Traffic Management Plan[b] (TMP)	A strategy to manage the work zone impacts of a project. Each TMP will include a Traffic Staging Plan.
Traffic Staging Plan[b] (TSP)	Drawings showing the plan, profile, cross section, signage and pavement markings of a specific stage of the work zone.
Trail	A beaten or maintained path or track often for a specified type of traffic (e.g. ski trail).
Transit Lane	A lane intended primarily for public transit vehicles.
Transition	A method by which a change in longitudinal barrier type provides continuous protection to errant vehicles.
Transition (spiral) curve	A curve whose radius continuously changes.

Travelled Way[a]	That part of a roadway intended for vehicular travel. This includes through lanes, turn lanes, and other auxiliary lanes. This does not include shoulders or ancillary space. It may have a variety of surfaces but is most commonly hard surfaced with asphalt or concrete or gravel surfaced.
Truck Escape Ramp (TER)	A ramp provided on the right side of a long downhill section of roadway to allow vehicles (usually trucks) to escape in the event of brake failure.
Turning Roadway	A separate roadway or ramp to accommodate turning traffic at the intersection or interchange of two roads.
Turnout	A widened section of roadway provided for passing of vehicles travelling in opposite directions on a one-lane roadway, or in the same direction on a two-lane roadway.
Two-Lane Road	A road that provides for one lane of through traffic in each direction.
Two-Way Left-Turn Lane (TWLTL)	The middle lane on a two-way undivided street intended for the exclusive use of vehicles about to turn left from either direction into property accesses.
Underpass	A grade separation in which the subject roadway passes under a roadway or railway.
Use of Shoulder[b]	A construction work zone mitigation strategy involving the use of a right-side or median shoulder as all or part of a temporary traffic lane. This strategy compensates for the removal of permanent travel lanes from service. Employing this strategy may require constructing or upgrading shoulder pavement structures to adequately support traffic loads.
Urban Area	An area characterized by extensive development and building coverage.
Vertical Alignment[a]	The configuration of a road or roadway as seen in longitudinal section, consisting of tangents and parabolic curves.
Vertical Curvature (K)	The horizontal distance along a parabolic curve required to effect a one percent change in gradient.
Vertical Curve[a]	A parabolic curve on the longitudinal profile or in a vertical plane of a road to provide for change of gradient.
Warrant[a]	A criterion that identifies a potential need or the justification for an addition to the highway such as traffic signals, traffic barrier, truck climbing lanes, passing lanes, left turn lanes etc.
Waterbody[b]	Any natural or constructed body of water.

Watercourse[b]	Any stream, river, or channel in which flow of water occurs either continuously or intermittently.
Weaving	The condition in which vehicles move obliquely from one lane to another, and cross the paths of other vehicles moving in the same direction.
Weaving Lane	A lane added to provide additional capacity and operational improvement in sections of roadway experiencing weaving.
Weaving Section	A section of roadway between an entrance and an exit, such that the frequency of lane changing exceeds that for open highway condition.
Wide Median[b]	A median on a divided roadway and/or freeway consisting of an unpaved area or physical barrier between opposing through lanes.
Work Zone[b]	An area, usually made up of six component areas, where traffic control devices have been set up to provide positive guidance to highway users through a temporary situation and include the entire section from the first advance warning sign through to the last traffic control device, where traffic returns to its normal path and conditions. A work zone can be in the travelled portion of the road or on the boulevard or shoulders and may be stationary or mobile. See OTM Book 7 for various duration of work.
Work Zone Design Speed[b]	A selected speed used to determine specific work zone geometric design features.

NOTES:

a These definitions are modified from the Glossary of TAC Geometric Design Guide for Canadian Roads - June 2017.

b These definitions are in addition to the Glossary of TAC Geometric Design Guide for Canadian Roads - June 2017.

MTO Design Supplement

For
TAC Geometric Design Guide (GDG) for Canadian Roads

Appendix B

Geometric Design Standards Summary Tables

~~October 2023~~July 2026

Overview

The summary tables presented in this document are to act as a tool utilized during the creation of Design Criteria(s) (DC). The information presented in these tables are extracted from the *Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads,* the *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads* and the *Roadside Design Manual.*

The values presented in the summary tables are the standard minimum values of attributes, for a 6% superelevation. It is MTO common practice to use a maximum superelevation of 6%, however, if a differing superelevation is to be used, the standard values presented in these tables will be incorrect, and the designer must refer to the source documents (the *Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads,* the *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads* and the *Roadside Design Manual*) to determine the proper values.

Notes and terminology included in this document have been taken directly from the above-mentioned source documents where possible, which may result in minor terminology discrepancies. However, in a few cases minor modifications have been made for clarity purposes.

The use of these tables does not remove the obligation from designers to base their designs on the source documents. This document should be considered more of a tool for checking design parameters obtained. In the event of a discrepancy between this document and the source documents, the source documents shall take precedence.

GEOMETRIC DESIGN STANDARDS FOR RURAL KING'S HIGHWAYS (6% SUPERELEVATION)

Design Speed	Design Year Traffic Volume		Max Grade	Width (m)			Minimum Curves			Min. Stopping Sight Distance
							Horiz.	Vertical		
km/h	AADT	DHV	%	Lane	Shoulder	Rounding	Radius (m)	K-Crest	K-Sag	m
130	>4000	>600	3	3.75	3.00	1.00	950	130	80	285
120	>4000	>600	6 - 7	3.75	3.00	1.00 (I)	750	100	70	250
	3000-4000	450-600	-	-	-					
	2000-3000	300-450	-	-	-					
	1000-2000	150-300	-	-	-					
	400-1000	60-150	-	-	-					
	<400	<60	-	-	-					
110	>4000	>600	6 - 7	3.75	2.50 (E)	1.00 (I)	600	80	60	220
	3000-4000	450-600	6 - 7	3.75	2.50 (E)					
	2000-3000	300-450	6 - 7	3.75	2.50					
	1000-2000	150-300	6 - 7	3.50 (C)	2.50					
	400-1000	60-150	-	-	-					
	<400	<60	-	-	-					
100	>4000	>600	6 - 8	3.75	2.50 (E)	1.00 (I)	440	60	45	185
	3000-4000	450-600	6 - 8	3.50 (A)	2.50					
	2000-3000	300-450	6 - 8	3.50 (B)	2.50					
	1000-2000	150-300	6 - 8	3.50	2.00 (G)					
	400-1000	60-150	6 - 8	3.50	1.00					
	<400	<60	-	-	-					
90	>4000	>600	6 - 8	3.50 (A)	2.50	0.50 (I)	340	40	40	160
	3000-4000	450-600	6 - 8	3.50 (A)	2.50					
	2000-3000	300-450	6 - 8	3.50	2.00 (F)					
	1000-2000	150-300	6 - 8	3.25	2.00					
	400-1000	60-150	6 - 8	3.25	1.00					
	<400	<60	-	-	-					
80	>4000	>600	6 - 8	3.50	2.50	0.50 (I)	250	30	30	130
	3000-4000	450-600	6 - 8	3.50	2.50					
	2000-3000	300-450	6 - 8	3.25	2.00					
	1000-2000	150-300	6 - 8	3.25	2.00					
	400-1000	60-150	6 - 8	3.25	1.00					
	<400	<60	8	3.25 (D)	1.00 (H)					
70	>4000	>600	-	-	-	0.50 (I)	190	18	25	105
	3000-4000	450-600	6 - 12	3.25	2.00					
	2000-3000	300-450	6 - 12	3.25	2.00					
	1000-2000	150-300	6 - 12	3.00	1.00					

Design Speed	Design Year Traffic Volume		Max Grade	Width (m)			Minimum Curves			Min. Stopping Sight Distance
							Horiz.	Vertical		
km/h	AADT	DHV	%	Lane	Shoulder	Rounding	Radius (m)	K-Crest	K-Sag	m
	400-1000	60-150	6 - 12	3.00	1.00					
	<400	<60	12	3.00	1.00 (H)					
60	>4000	>600	-	-	-	0.50 (I)	130	12	18	85
	3000-4000	450-600	-	-	-					
	2000-3000	300-450	-	-	-					
	1000-2000	150-300	6 - 12	3.00	1.00					
	400-1000	60-150	6 - 12	3.00	1.00					
	<400	<60	12	3.00	1.00 (H)					
50	>4000	>600	-	-	-	0.50 (I)	90	8	15	65
	3000-4000	450-600	-	-	-					
	2000-3000	300-450	-	-	-					
	1000-2000	150-300	-	-	-					
	400-1000	60-150	-	-	-					
	<400	<60	12	2.75	1.00 (H)					

NOTES:

A. If commercial motor vehicle percentage exceeds 10% of AADT, increase lane width by 0.25 m.
B. If commercial motor vehicle percentage exceeds 15% of AADT, increase lane width by 0.25 m.
C. If commercial motor vehicle percentage exceeds 25% of AADT, increase lane width by 0.25 m.
D. 3.00m lane width may be acceptable where the type, size, and volume of commercial vehicles are not significant.
E. If commercial motor vehicle percentage exceeds 10% of AADT, increase shoulder width by 0.50 m.
F. If commercial motor vehicle percentage exceeds 15% of AADT, increase shoulder width by 0.50 m.
G. If commercial motor vehicle percentage exceeds 25% of AADT, increase shoulder width by 0.50 m.
H. Shoulder width of 0.50 m is acceptable on King's Highways where there is no foreseeable possibility of the road being paved within a 20-year period. Where guide rail is installed, shoulder width must be 1.00 m.
I. On Major Capital Expansion Projects, desirable rounding width should be as detailed in Table 2-8 of the Roadside Design Manual.

- Minimum lane width for all paved 2-lane King's Highways is 3.50 m.
- For design use DHV if available.
- Minimum usable shoulder width for disabled vehicle: 2.00 m.
- Highway 11:3.50 m minimum lane width, 2.00 m minimum shoulder width.
- Highway 17: 3.75 m minimum lane width, 2.50 m minimum shoulder width.
- Standard lane width increments of 0.25 m.
- Standard shoulder width increments of 0.50 m.
- Lane widths of 3.33 m or 3.66 m may be encountered on existing highways do to previously used imperial measurements. These lane widths can be maintained if no operational and/or safety concerns are present.
- Minimum shoulder width for pavement support: 0.50 m paved, 1.00 m granular surfaced.

- Minimum stopping sight distance is for level terrain only.

GEOMETRIC DESIGN STANDARDS FOR SECONDARY HIGHWAYS (6% SUPERELEVATION)

Design Speed	Design Year Traffic Volume		Max Grade	Width (metres)			Minimum Curves			Minimum Stopping Sight Distance
							Horiz.	Vertical		
km/h	AADT	DHV	%	Lane	Shoulder	Rounding	Radius (m)	K-Crest	K-Sag	m
100	>1000	>150	6 - 8	3.50	2.00 (B)	0.50	450	60	45	185
	400-1000	60-150	6 - 8	3.50	1.00					
	<400	<60	-	-	-					
90	>1000	>150	6 - 8	3.25	2.00	0.50	340	40	40	160
	400-1000	60-150	6 - 8	3.25	1.00					
	<400	<60	-	-	-					
80	>1000	>150	6 - 8	3.25	2.00	0.50	250	30	30	130
	400-1000	60-150	6 - 8	3.25 (A)	1.00					
	<400	<60	8	3.25 (A)	1.00 (C)					
70	>1000	>150	6 - 12	3.00	1.00	0.50	190	18	25	105
	400-1000	60-150	6 - 12	3.00	1.00					
	<400	<60	12	3.00	1.00 (C)					
60	>1000	>150	6 - 12	3.00	1.00	0.50	130	12	18	85
	400-1000	60-150	6 - 12	3.00	1.00					
	<400	<60	12	3.00	1.00 (C)					
50	>1000	>150	-	-	-	0.50	90	8	15	65
	400-1000	60-150	-	-	-					
	<400	<60	12	2.75	1.00 (C)					

NOTES:

A. 3.00 m lane width may be acceptable where the type, size, and volume of trucks are not significant.
B. If commercial motor vehicle percentage exceeds 25% of AADT (or AADT > 2000) shoulder width to increase by 0.50 m.
C. Shoulder width of 0.50 m is acceptable on where there is no foreseeable possibility of the road being paved within a 20-year period. Where guide rail is installed, shoulder width must be 1.00 m.

- Major secondary highways shall have a minimum lane width of 3.50 m.
- For design use DHV if available.
- Lane width may be increased by 0.25 m to a maximum of 3.50 m if warranted by type, size and volume of commercial motor vehicles.
- Minimum shoulder width for pavement support: 0.50 m paved, 1.00 m granular surfaced.
- Minimum usable shoulder width for disabled vehicle: 2.00 m.
- Minimum stopping sight distance is for level terrain only.

GEOMETRIC DESIGN STANDARDS FOR UNDIVIDED URBAN ROADS (6% SUPERELEVATION)

Design Speed	Design Year Traffic Volume		Max Grade	No. of Lanes	Width (meters)	
km/h	AADT	DHV	%		Lane	Parking Lane
80	>6000	>600	6 - 8	4	3.50 - 3.75 (B)	3.00
	3000-6000	300-600	6 - 8	2 - 4 (A)	3.50 - 3.75 (B)	3.00
	2000-3000	200-300	6 - 8	2	3.50	3.00
	1000-2000	100-200	-	-	-	-
	<1000	<100	-	-	-	-
60 - 70	>6000	>600	6 - 12	4	3.50	2.50
	3000-6000	300-600	6 - 12	2 - 4 (A)	3.50	2.50
	2000-3000	200-300	6 - 12	2	3.25	2.50
	1000-2000	100-200	6 - 12	2	3.25	2.50
	<1000	<100	-	-	-	-
50	>6000	>600	-	-	-	-
	3000-6000	300-600	-	-	-	-
	2000-3000	200-300	8 - 12	2	3.00	2.50
	1000-2000	100-200	8 - 12	2	3.00	2.50
	<1000	<100	8 - 12	2	3.00	2.50
40 - 50	>6000	>600	-	-	-	-
	3000-6000	300-600	-	-	-	-
	2000-3000	200-300	-	-	-	-
	1000-2000	100-200	-	-	-	-
	<1000	<100	8 - 12	2	2.75 - 3.00 (B)	2.50

NOTES:

A. Four lanes are appropriate in the upper part of this traffic volume range where there is a measurable capacity deficiency with only two lanes.

B. Upper value is desirable, lower value is acceptable.

- Minimum lane width for all paved 2-lane King's Highways is 3.50 m.
- For design use DHV if available.

GEOMETRIC DESIGN STANDARDS FOR FREEWAYS & DIVIDED HIGHWAYS (6% SUPERELEVATION)

Design Speed	Max Grade	Width (m)								Minimum Curves			Minimum Stopping Sight Distance ~~(E)~~
					Shoulder					Horiz.	Vertical		
		Lane			4-Lane Divided		Multi-Lane Freeway						
km/h	%	4-Lane Divided		Multi-Lane Freeway	Left Side	Right Side	Left Side	Right Side	Round	Radius (m)	K-Crest	K-Sag	m
		Urban	Rural										
130	3	3.75	3.75	3.75 (A)	1.00	3.00	2.50 (C)	3.00	1.00	950	150	80	~~305~~ 285
120	3	3.75	3.75	3.75 (A)		3.00			1.00	750	100	70	~~265~~ 250
110	3 - 4	3.75	3.75	3.75 (A)		(B)			1.00	600	80	60	~~235~~ 220
100	3 - 4	3.75	3.75	3.75 (A)					0.5	450	60	45	~~200~~ 185
90	4 - 5	3.75	3.50	3.75 (A)					0.5	340	40	40	~~170~~ 160

NOTE:

A. For multi-lane freeways, the width of the median lane is 3.50 m, and all other lanes are to be 3.75 m to minimize overall pavement width. The pavement may be striped to equal lane width.

B. Right side shoulder width for 4-lane divided highways is to be same as for undivided King's Highways. Please refer to ***GEOMETRIC DESIGN STANDARDS FOR RURAL KING'S HIGHWAYS (6% SUPERELEVATION)*** or ***Exhibit 4-J*** in ***MTO Design Supplement for the TAC Geometric Design Guide for Canadian Roads.***

C. Left or median shoulder is 2.50 m. Where a median barrier system is placed, the left median shoulder width varies according to the type of barrier used.

D. Multi-Lane Freeway is defined as any divided highway with more than four (4) through lanes total (two (2) through lanes in each direction) with a continuous dividing median. This highway is a fully controlled access road limited to through traffic, with access through interchanges and a posted speed of greater than 90km/h.

~~E. The minimum stopping sight distance is similar to Exhibit 2-E for avoidance maneuver 'A' and based on 3.0 sec perception reaction time.~~