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720 DESIGN VEHICLES

720.01 DESIGN VEHICLES

Design vehicles are selected motor vehicles with the dimensions and operating characteristics used to establish highway design controls. For geometric design, each design vehicle has larger physical dimensions and a larger minimum turning radius than almost all vehicles in its class. The principal dimensions of these vehicles are shown in the *TAC Geometric Design Guide for Canadian Roads*.

Good design practice requires that the geometric layout of an intersection and interchange should be checked to ensure that it can accommodate the principal class of vehicle using the road system.

In addition to the current suite of TAC vehicles, the Ministry continues to use a special long-load logging truck (LLT) design vehicle (see Section 720.02) and the WB-15 (BC) design vehicle which has been modified from the Ministry's previous version. The WB-15 (BC) vehicle now represents a tractor with a 48' (14.7 m) semi-trailer.

720.02 DESIGN VEHICLE SELECTION

The trend towards longer and heavier vehicles requires that the WB-20 Design Vehicle shall be used on all Freeways and Expressways and on those Arterials with a predominant mobility requirement as opposed to access.

Certain areas of the province have been identified as requiring intersection and/or interchange designs based on the specific needs of the logging industry to ensure the safety of the driving public. For such areas, the LLT design vehicle may be used for designing appropriate intersections on the logging routes.

The LLT design vehicle represents an envelope created by both the worst load sweep of all vehicles tested (LG3 Tractor Triaxle Trailer) and the worst offtracking of all vehicles tested (LG5 Tractor Tandem Jeep/Pole Trailer). This effectively addresses the path requirements for all currently permitted Long-load Logging Trucks in B.C. Figure 720.A provides the dimensions for the LG3 and LG5 vehicles so that they can be modelled in a vehicle tracking software program.

The WB-15 (BC) design vehicle represents a significant section of the truck fleet; therefore, it should be used for the balance of the road system, unless local fleet characteristics dictate otherwise. Figure 720.B provides the dimensions for the WB-15 (BC).

At a minimum, all turning movements should accommodate emergency vehicles; I-BUS, the TAC Inter-city bus is representative of such vehicles.

720.03 DESIGN VEHICLE TURNING CHARACTERISTICS

Although vehicle tracking software programs can allow for unlimited choices of radii, only a limited number of design radii should be used, to simplify intersection design and checking. The standard radii are indicated in Table 720.A and suggest the typical turning conditions for three speed ranges, i.e.:

1. The vehicle begins to turn from a stationary position and negotiates the turn at speeds up to 15 km/h;
2. The vehicle begins a turn at speeds from 15 km/h to 25 km/h as in a turning manoeuvre right or left from a main highway to a secondary road;
3. The vehicle begins a turn at speeds from 25 km/h to 35 km/h as on a separate turning roadway or ramp.

Table 720.A Turning Radii of Design Vehicles

DESIGN VEHICLE	I-BUS	WB-15 (BC)	WB-20	LLT
SPEED	minimum radius ⁽¹⁾ of outside front wheel			
0-15 km/h	15.2	13.7	14.5	13.6
15-25 km/h	19.8	17.7	17.7	17.7
25-35 km/h	19.8	22.3	22.3	22.3

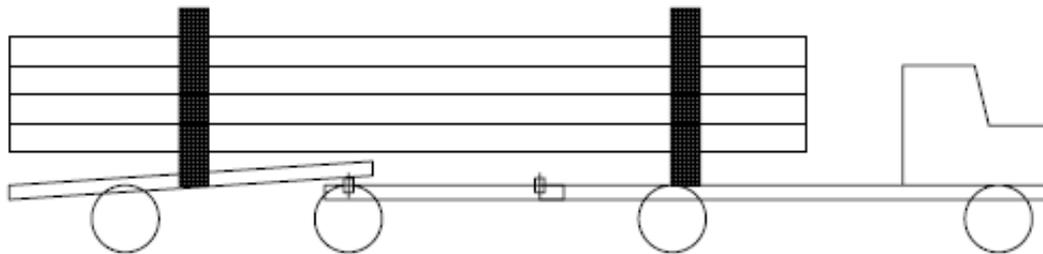
1. Radii taken from 1995 BC MoTH Highway Engineering Design Manual.

Refer to the *TAC Geometric Design Guide* for the characteristics of other design vehicles.

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Figure 720.A LLT Design Vehicle (use LG3 for sweep and LG5 for offtracking)

LG3 - MoT Tri-Axle Trailer Logging Truck



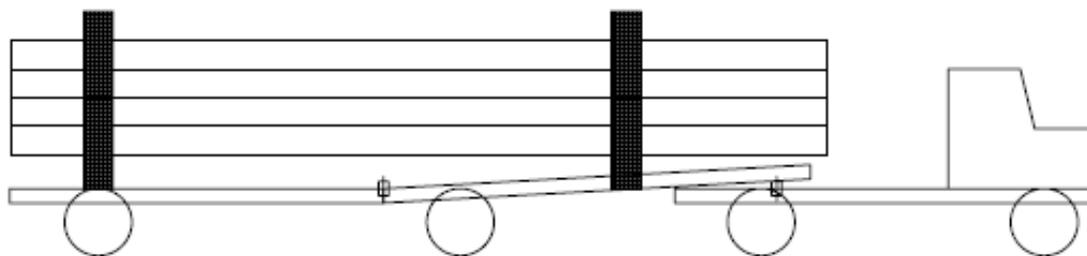
Trailer	Wheelbase	Front Overhang	Rear Overhang	Pin Offset
0	6.80 m	1.10 m	2.76 m	-2.76 m
1 *	3.99 m	0.50 m	0.50 m	0.00 m
2	4.65 m	0.50 m	2.42 m	

Tractor width = 2.60 m
 Trailer width = 2.60 m
 Log width = 2.60 m

Distance Between Log Bunks = 10.35 m
 Log Length FORWARD of Bunk = 2.50 m
 Log Length AFT of Bunk = 3.85 m

* Trailer which telescopes to allow vehicle articulation

LG5 - MoT Tractor Tandem Jeep / Pole Trailer



Trailer	Wheelbase	Front Overhang	Rear Overhang	Pin Offset
0	5.90 m	1.10 m	1.80 m	0.32 m
1	6.59 m	0.70 m	1.60 m	-1.60 m
2 *	5.95 m	0.00 m	1.85 m	

Tractor width = 2.60 m
 Trailer width = 2.60 m
 Log width = 2.60 m

Distance Between Log Bunks = 10.80 m
 Log Length FORWARD of Bunk = 4.20 m
 Log Length AFT of Bunk = 1.80 m

* Trailer which telescopes to allow vehicle articulation

Note: LG3 and LG5 are the designations used within the Ministry's PathTracker software program. The Ministry is no longer providing this software program to non-governmental agencies.