Approved by Council of Ministers Responsible for Transportation and Highway Safety
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NATIONAL HIGHWAY SYSTEM
Engineering Guidelines and Desired Objectives

Guiding Principles:

- the National Highway System represents critical transportation corridors and linkages in support of Canada's economy and mobility needs
- NHS routes should be designed and maintained to engineering standards appropriate to these roles:
    - *New Construction:* construction of new NHS routes should aspire to achieve common, nationally consistent guidelines and desired objectives
    - *Repair and Rehabilitation*: while aspiring to national consistency, some flexibility and local judgment are necessary components of cost-effective rehabilitation and reconstruction strategies for existing NHS routes

A. Geometric Design

Design or Control Element	Guideline or Desired Objective
Access Control	Complete access control is a desired objective for all freeways, limited access is objective for all other road types
Design Speed[1]	
Two Lane Highways	Mountainous Terrain – min 90 km/hr Rolling and Flat Terrain – min 100 km/hr
Four or More Lane Highways	Mountainous Terrain – min 90 km/hr Rolling Terrain – min 100 km/hr Flat Terrain – min 110 km/hr
Lane Width	Two lane roads – min 3.7 m
Shoulder Width[2]	
Two Lane Highways	Min 3.0 metres of which a minimum of 0.8 m is paved
Four or more lanes	
Right Shoulder	Min 3.0 metres of which a minimum of 0.8 m is paved
Left Shoulder	Min 1.5 metres of which a minimum of 0.8 m is paved
Median Width[2] (Divided Highways)	
Without barrier protection	Min 15 m
With barrier protection	Min 3.7 m
Horizontal Clearance	As specified in the TAC *Geometric Design Guide for Canadian Roads*
Vertical Clearance	Minimum of 5.0 metres including shoulders
Design Loads	Minimum based on national standards for vehicle weights and dimensions, capable of all weather operation with no seasonal load restrictions

[1] The design speed for rehabilitation and/or reconstruction projects on existing roads is at the discretion of the jurisdiction. New construction projects on NHS routes will aspire to achieve the guidelines and desired objectives.

[2] Shoulder and median width for rehabilitation and/or reconstruction projects on existing roads is at the discretion of the jurisdiction, in keeping with design guidelines used by the jurisdiction. However, new construction projects on NHS routes will aspire to achieve the guidelines and desired objectives.

B. Bridges and Overpasses

Design or Control Element	Guideline or Desired Objective
Design - General	As specified in the CAN/CSA *Canadian Highway Bridge Design Code*
Design Loads	Minimum based on national standards for vehicle weights and dimensions
Vertical Clearance	Minimum 5.0 metres, including shoulders
Width	As specified in the TAC *Geometric Design Guide for Canadian Roads*

C. Other Design, Safety and Control Elements

Element	Guideline or Desired Objective
Traffic Control Devices	TAC *Manual of Uniform Traffic Control Devices for Canada*
Signing and Pavement Marking	TAC *Manual of Uniform Traffic Control Devices for Canada*
Right of Way	Clear zone[3] should be maintained and distractions should be minimized.
Roadside Hazard Protection	As per jurisdiction policy
Commercial Signing	Private commercial signing should not be permitted within the right of way.
Illumination	TAC *Guide for the Design of Roadway Lighting*
Overhead Utility Clearance	Minimum 5.5 m, or higher if required by the jurisdiction or by the standards of utility authorities
Facilities and Rest Areas	Public or private rest areas should be available or provided at 1 to 2 hour driving intervals along the system.
Truck Safety Facilities	In mountainous terrain, - brake check facilities should be provided at top of steep grades - chain on/off facilities at top and bottom of steep grades, and - arrester beds provided, as appropriate, on downgrades

[3] *Clear zone* is defined as "the roadside area immediately adjacent to the outer traveled lane, clear of hazards, which may be used safely by errant vehicles" (*Geometric Design Guide for Canadian Roads*, Transportation Association of Canada, 1999)