CHAPTER 3 – SUMMARY OF REVISIONS

Section 3.5.2: CROSS-SLOPES AND TRAFFIC OPERATIONS: APPLICATION HEURISTICS

Former guidance (June 2017):

3. On high speed, hard surfaced roadways, cross-slopes higher than 2% with a central crown are not desirable. This is because in a passing maneuver, drivers must cross and re-cross the crown line and negotiate a total rollover or crossover slope change more than 4%. The reverse path of travel causes a reversal in the direction of centrifugal force, which is further exaggerated by the effect of reversing cross-slope. Trucks with high body loads crossing the crown line may be caused to sway, at which time control may be difficult.

5. Although with high quality surfaces the cross-slopes would normally be limited to 1.5 to 2%, steeper slopes are required for various reasons such as; lower quality surfaces, constrained urban areas, ramps, and areas with drainage concerns.

Revised guidance (July 2025):

3. On high speed, hard surfaced roadways, historically cross-slopes higher than 0.020 m/m with a central crown are not desirable for the lane on either side of the crown. This is because in a passing maneuver, drivers must cross and re-cross the crown line and negotiate a total rollover or crossover slope change more than 0.040%. The reverse path of travel causes a reversal in the direction of centrifugal force, which is further exaggerated by the effect of reversing cross-slope. Trucks with high body loads crossing the crown line may be caused to sway, at which time control may be difficult. However, highway jurisdictions with cross-slopes of 0.030 m/m, worldwide and in some provinces in Canada, have not found this to be the case.

5. Although with high quality surfaces the cross-slopes would normally be limited to 0.015 to 0.030 m/m, steeper slopes are required for various reasons such as; lower quality surfaces, roadways susceptible to rutting, constrained urban areas, ramps, and areas with drainage concerns.

10. On multi-lane facilities, in tangent sections consideration should be given to increasing the cross slope on lanes further from the crown to account for the increased drainage path, particularly in areas with shallow vertical profile (<0.010 m/m). A similar consideration should be made for other wide surfaces considering climate change and the potential for increased rainfall in the study area.

Section 3.5.3.1 – Design Domain: Quantitative Aid

Former guidance (June 2017):

Roadway surface cross-slopes should be adequate to provide proper drainage. Generally, the lower the quality of roadway surface, the steeper is the rate of cross-slope required in order to ensure drainage. Normally cross-slopes range from 0.015 to 0.020 m/m for higher quality surfaces, from 0.020 to 0.030 m/m for intermediate quality surfaces, and 0.030 to 0.040 m/m for lower quality roadway surfaces.

The minimum cross-slopes for the most common surface types are:

- Portland cement concrete 1.5%
- Asphalt pavement 2.0%
- Asphalt surface treatment 2.0% - 4.0%
- Gravel or crushed stone 3.0% - 4.0%
- Earth 4.0%

Revised guidance (July 2025):

Roadway surface cross-slopes should be adequate to provide proper drainage. Generally, the lower the quality of roadway surface, the steeper is the rate of cross-slope required in order to ensure drainage. Normally, the rougher the roadway surface (i.e. gravel versus pavement) the steeper the road cross slope rate that should be considered.

The desirable minimum cross-slopes for most common surface types are provided in Table 3.5.1. The consideration of climate change and increased rainfall has increased some of these ranges.

Table 3.5.1 – Desirable Minimum Cross-Slopes

Cross-Slope m/m		
Surface Limit	**Lower Limit**	**Upper Limit**
Portland Cement Concrete	0.015	0.020
Asphalt Pavement	0.020	0.030
Asphalt Surface Treatment	0.020	0.040
Gravel or Crushed Stone	0.030	0.040
Earth	0.030	0.040

CHAPTER 5 – SUMMARY OF REVISIONS

Section 5.7.6: Bikeway Facilities at Bridges or Tunnels

New paragraph to the end of the existing Section 5.7.6 (July 2025).

When bikeway and pedestrian facilities are incorporated into bridges, consideration should be given to the style and size of expansion joint required to accommodate the bridge's thermal movements. The running surface of the joint may entrap bicycles or wheelchairs causing users to pitch over handlebars or to be ejected from their chairs, resulting in serious if not catastrophic injuries.[55] Roadway or pathway signage may also be considered to alert users to the hazard, but signage alone should not be considered mitigation.

[55] Broker, J. and Hottman, M.M., 2016. *Bicycle Accidents, Crashes, and Collisions: Biomechanical, Engineering, and Legal Aspects, Second Edition*. Lawyers & Judges Publishing Company, Inc., Tucson, Arizona.

CHAPTER 9 – SUMMARY OF REVISIONS

Section 9.9.2.1: Approach Sight Triangles

Changes made to last paragraph in section.

Former guidance (June 2017):

Although desirable at higher volume intersections, approach sight triangles like those shown in Figure 9.9.1 may not be needed for intersection approaches controlled by stop signs or traffic signals. In that case, the need for approaching vehicles to stop at the intersection is determined by the traffic control devices and not by the presence or absence of vehicles on the intersecting approaches.

Revised guidance (July 2025):

Intersection approach sight triangles like those shown in Figure 9.9.1 may be constrained at some intersection approaches controlled by stop signs or traffic signals. In that case, the need for approaching vehicles to stop at the intersection is determined by the traffic control devices and not by the presence or absence of vehicles on the intersecting approaches. In circumstances where approach sight distance cannot be accommodated due to existing conditions or site- specific property, environmental, or other insurmountable constraints, additional safety and operations remedial actions should be evaluated.