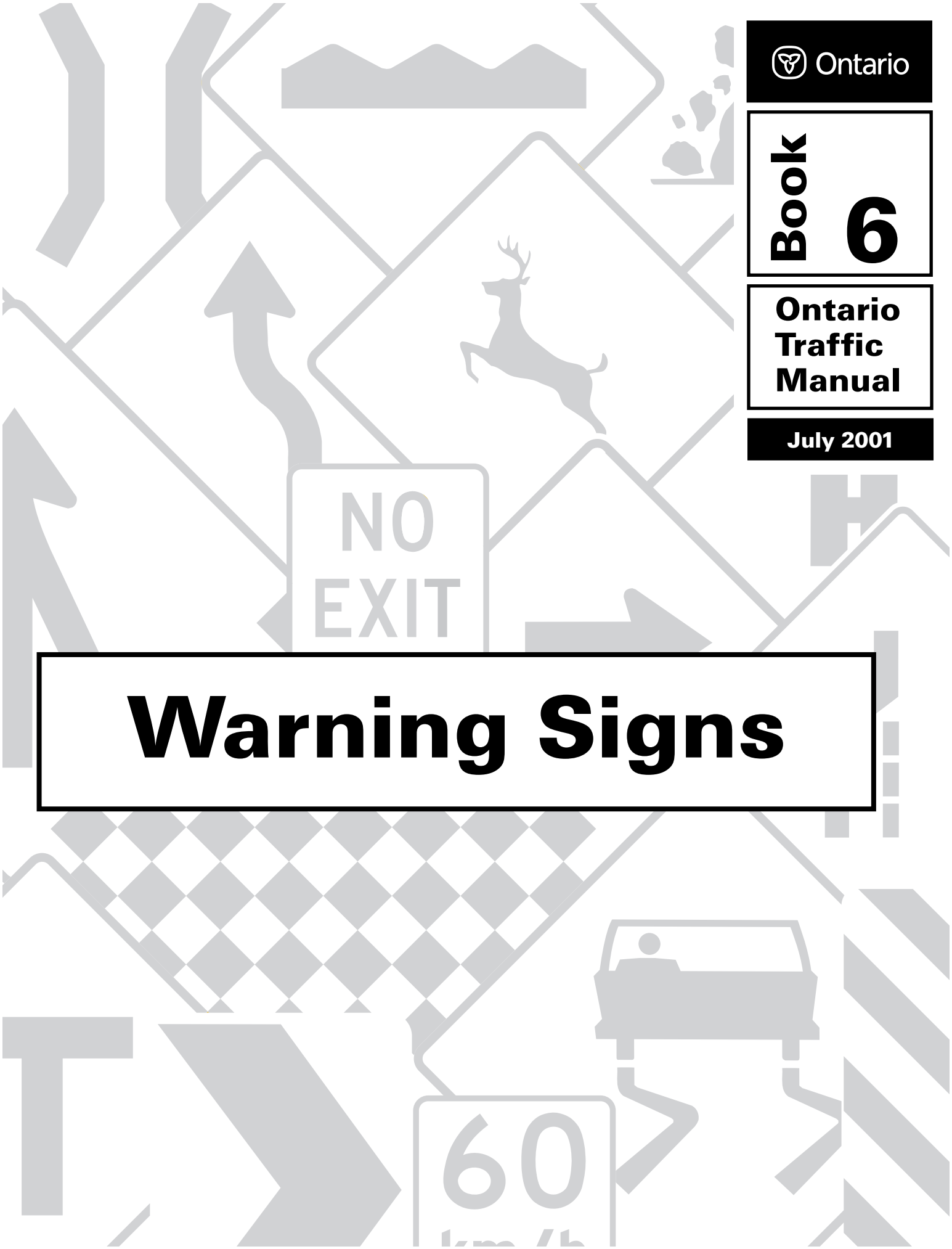

Ontario

Book 6

Ontario Traffic Manual

July 2001

Warning Signs

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ISBN 0-7794-1745-3

Ontario Traffic Manual

Foreword

The purpose of the Ontario Traffic Manual (OTM) is to provide information and guidance for transportation practitioners and to promote uniformity of treatment in the design, application and operation of traffic control devices and systems across Ontario. Further purposes of the OTM are to provide a set of guidelines consistent with the intent of the Highway Traffic Act and to provide a basis for road authorities to generate or update their own guidelines and standards.

The OTM is made up of a number of Books, which are being generated over a period of time, and for which a process of continuous updating is planned. Through the updating process, it is proposed that the OTM will become more comprehensive and representative by including many traffic control devices and applications specific to municipal use. Some of the Books of the OTM are new, while others incorporate updated material from the Ontario Manual of Uniform Traffic Control Devices (MUTCD) and the King's Highway Guide Signing Policy Manual (KHGSPM).

The Ontario Traffic Manual is directed to its primary users, traffic practitioners. The OTM incorporates current best practices in the Province of Ontario. The interpretations, recommendations and guidelines in the Ontario Traffic Manual are intended to provide an understanding of traffic operations and they cover a broad range of traffic situations encountered in practice. They are based on many factors which may determine the specific design and operational effectiveness of traffic control systems. However, no manual can cover all contingencies or all cases encountered in the field. Therefore, field experience and knowledge of application are essential in deciding what to do in the absence of specific direction from the Manual itself and in overriding any recommendations in this Manual.

The traffic practitioner's fundamental responsibility is to exercise engineering judgement and experience on technical matters in the best interests of the public and workers. Guidelines are provided in the OTM to assist in making those judgements, but they should not be used as a substitute for judgement.

Design, application and operational guidelines and procedures should be used with judicious care and proper consideration of the prevailing circumstances. In some designs, applications, or operational features, the traffic practitioner's judgement is to meet or exceed a guideline while in others a guideline might not be met for sound reasons, such as space availability, yet still produce a design or operation which may be judged to be safe. Every effort should be made to stay as close to the guidelines as possible in situations like these, and to document reasons for departures from them.

Custodial Office

Inquiries about amendments, suggestions or comments regarding the Ontario Traffic Manual may be directed to:

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A user response form is provided at the end of Book 1 of this Manual. Inquiries regarding the purchase and distribution of this Manual may be directed to the custodial office.

Book 6 (Warning Signs) was developed with the assistance of a Technical Advisory Committee organized by the Ministry of Transportation.

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NOTE: A Training Package for Book 6 is available separately. For more information, contact:

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1. Introduction

Book 6 (Warning Signs) is one of a series of volumes that makes up the Ontario Traffic Manual (OTM). Book 6 addresses the selection and application of warning signs. It should be read in conjunction with Book 1 (Introduction to the Ontario Traffic Manual) and its appendices, which contain considerable essential information about the fundamental principles and policies behind the design and application of traffic control signs, signals, markings and delineation devices.

Book 6 is not intended to provide sufficient detailed information to allow the design, fabrication and installation of individual signs. For these purposes, reference should be made to Book 1b (Sign Design Principles), Book 2 (Sign Patterns and Fabrication) and Book 3 (Sign Support and Installation).

Other books in the OTM series provide practical guidance on a full range of traffic control devices and their application. A complete listing of the planned and currently available volumes, as well as the tables of contents for all books are found in Book 1, and an illustrated master index, is found in Book 1a (Illustrated Sign and Signal Display Index).

1.1 Application of Warning Signs

Warning signs are intended to provide advance notice to road users about unexpected and potentially dangerous conditions on or near the road. The conditions to which warning signs apply typically require that road users exercise caution, and may require that drivers slow down, in order to travel safely in the presence of a hazard.

In order to retain the public credibility of all traffic control devices, consistency in application is necessary. Insufficient warning signing may leave road users unprepared for encountering hazards, while over-signing or exaggerated signing may result in complacency. It is important, therefore, that warning signs accurately convey the severity of the hazard about which they are warning.

The type of warning signing used and the sign size are impacted by the classification of highway or road to which the signs apply. For determining sign type, road classifications used in the OTM are shown in Figure 1 and defined in Appendix A (Definitions). For determining sign size, the following three speed ranges have been adopted:

(1) Speed limits of 60 km/h or lower;

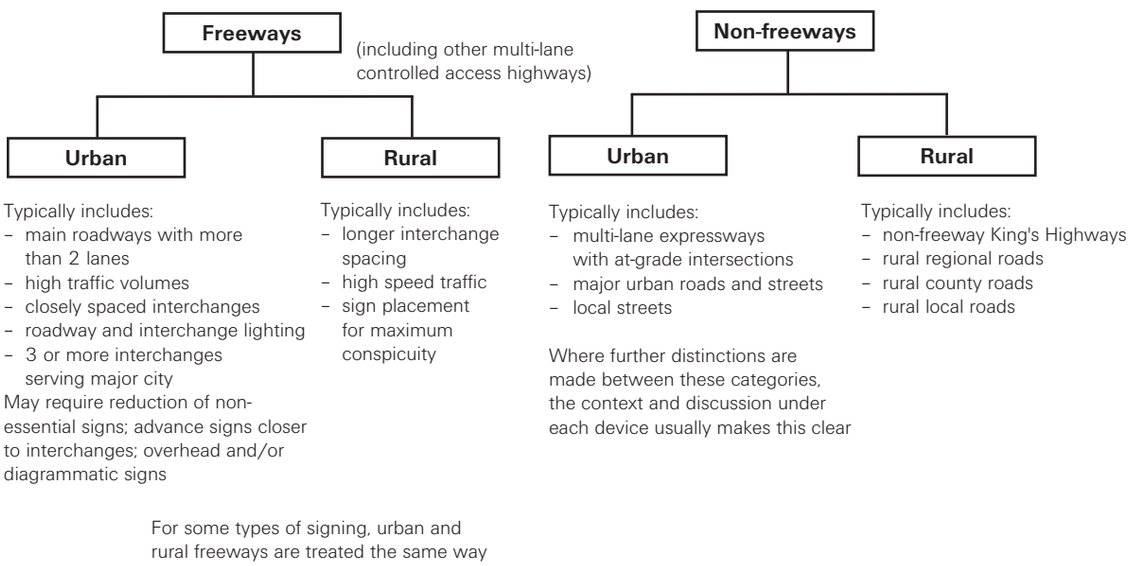
(2) Speed limits of 70 or 80 km/h;

(3) Speed limits of 90 km/h or higher.

Where various sign sizes are shown in the OTM, the base or standard sign size is recommended as the minimum sign size. It is typically the sign size that will apply for the lowest speed range. Where specific sign sizes are recommended for the other speed ranges, they should also be regarded as minimum sizes for those speeds. For some sign designs, only one or two sign sizes are shown. In this case, two or more of the three speed ranges are combined into one.

Where, in the traffic practitioner's judgement, it is felt that the recommended minimum size is too small, and/or greater emphasis is needed, a larger sign size should be used. More information on sign size is provided in Book 1b (Sign Design Principles).

Figure 1 – Road Classification for Sign Types



Additional or alternative methods for improving sign conspicuity or legibility may be considered, such as:

- higher reflectivity;
- flashing amber beacons;
- repeated (double) signing.

As new policies are developed to address the changing traffic environment and to implement signing improvements, Book 6 will be updated to reflect the new policies. The Ontario Traffic Manual Committee is being formed to consider and recommend additions and changes to Book 6 and all other Books of the OTM on a continuing basis.

Where French language or bilingual versions of signs are available, they have not been illustrated in Book 6, but are contained in Book 2 (Sign Patterns and Fabrication).

1.2 Classification of Warning Signs

Warning signs are classified into the following three sub-classes. Each sign has been assigned a unique reference number within that sub-class:

(1) Sub-class Wa, Physical Conditions Warning Signs, described in Sections 2 to 5.

This sub-class contains those signs which indicate physical roadway conditions or changes to which road users need to be alerted, including:

- Roadway alignment changes, such as curves (Section 2);
- Intersections (Section 3);
- Specific roadway features, such as steep hills (Section 4);
- Transitions to, from or along divided roadways (Section 5).

(2) Sub-class Wb, Traffic Regulations Ahead Signs, described in Section 6.

This sub-class contains those signs which indicate downstream conditions of a regulatory nature, including:

- Stop/yield ahead;
- Traffic signals ahead;
- Two-way traffic ahead;
- Keep right ahead.

(3) Sub-class Wc, Pedestrian and Intermittent Hazard Signs, described in Sections 7 and 8.

This sub-class includes those signs which alert road users to conditions that are intermittent and that therefore may be unexpected, including:

- Different kinds of pedestrian activity and hazards affecting pedestrians (Section 7);
- Other intermittent moving and fixed hazards, such as animals crossing, vehicles entering the roadway and water on the road (Section 8).

1.3 Design of Warning Signs

Except for a few signs, such as signs warning of school areas/crossings, CHEVRON ALIGNMENT signs and LANE EXITS signs, warning signs are diamond-shaped (i.e., square-shaped and rotated 45 degrees). Warning signs that are not diamond-shaped are usually rectangular in shape, often with the longer dimension in the vertical direction. A notable anomaly to the warning sign shape convention is the SCHOOL AREA sign, which is uniquely pentagon-shaped in order to stand out, in support of its special function to safeguard school children.

In some cases, a supplementary tab sign is used in combination with the main sign to clarify the warning sign messages. Warning tab signs are rectangular, with the longer dimension in the horizontal direction, or square.

Almost all warning signs contain a black legend on a yellow background. The major exception is the NEW sign, which has a distinctive colour scheme to attract driver attention to a new regulatory right-of-way control device, such as traffic signals, at a location where previously no such device existed. Other exceptions are signs which alert road users to a specific device and which include coloured representations of the device as part of the sign legend, e.g., the YIELD AHEAD sign which depicts a red and white yield symbol.

In several cases, signs with a warning function are used as part of temporary conditions roadwork. In these cases, the warning sign diamond shape is retained, along with the black legend, but the yellow background is replaced by an orange background. Some of the temporary conditions signs have the same legend as warning signs (e.g., LANE ENDS sign) and others have legends that are unique to temporary conditions work (e.g., CONSTRUCTION AHEAD sign). Temporary conditions signs are described in detail in OTM Book 7 (Temporary Conditions).

Legends on some warning signs can be reversed, so that they can apply to situations associated with either left or right directions or sides of the roadway. For example, the SHARP CURVE sign (Wa-2) can depict the road curving to the left or to the right. In these instances, the letter "L" or the letter "R" is appended to the sign number, to signify, respectively, the left or right version of the sign (e.g., Wa-2L or Wa-2R).

The design of warning signs has evolved over a long period of time and has been undertaken with a great deal of care and attention to detail with regard to shape, dimensions, font, letter height and spacing, symbol design and colour. These design parameters have considerable effect on the driver's ability to notice, read, understand and react to the sign while travelling, particularly in a complex driving environment (e.g., where there is an abundance of commercial and/or traffic control devices; where there is a traffic mix with many road user types such as pedestrians, bicyclists, trucks and cars; or where the distances between intersections are short). Signs should therefore be fabricated as described in the detailed patterns contained in Book 2.

Due to the need for uniform application across Ontario, it is not expected that the design of new warning signs will be a common occurrence. If the need for a new sign does emerge, it should be designed in accordance with the specifications set out in Book 1 (Sections 2.5 and 5.12) and Book 1b.

Minimum overall dimensions for each sign are presented in the following sections of this Book. In each case, the smaller dimension is stated first. This convention follows the current practice for specifying sign blanks and other aspects of sign design and fabrication. Where conditions require increased visibility or emphasis (e.g., at high conflict or collision locations), or where the required text or symbols cannot be adequately accommodated, larger signs should be considered. When larger signs are used, all dimensions must be increased proportionately. In some cases, specific sign size recommendations are made in this Book to correspond with particular speed or other road operating characteristics.

For a more rigourous analysis of sign size for a special situation (or where there is uncertainty as to the best sign size), the OTM user may decide to calculate required letter height or symbol size from first principles. Section 7 of Book 1b provides step-by-step instructions on how to perform this type of calculation. For each sign in Book 6, font type, letter height and symbol size for the illustrated sign size are indicated, to enable the user to perform the Book 1b calculations. In determining the size of warning signs, it is important to note that many of the signs require driver manoeuvres, such as slowing down, changing lanes or stopping, which add to the time taken for drivers to respond to the sign, and consequently require larger signs.

For information on factors such as message length, required driver response, or complexity of driving environment that influence sign design and decisions regarding appropriate sign size selection, refer to Book 1b (Sign Design Principles).

1.4 Reflectivity/Luminance

All warning signs are required to be reflectorized or internally illuminated so as to show the same shape, colour and message by night as by day. External sign illumination may be used as a supplement to, but not as a replacement for, reflectorization or internal illumination.

As of January 1, 2002, any in-service examples of warning signs specified in Table 1 must be fabricated using higher grade materials known as high intensity sheeting. When high intensity sheeting is required, a level of Type III or IV must be used, as detailed in the ASTM (American Society for Testing and Materials) Specification D 4956-90 (or its subsequent

revisions). (In Canada, CGSB (Canadian General Standards Board) Specification 62-GP-11 (or its subsequent revisions) also specifies reflective sheeting. However, Book 6 uses the ASTM terminology, where Type I refers to engineering grade sheeting and Type III and Type IV to high intensity sheeting.) The minimum level of sheeting required on various warning sign types is included as part of the data accompanying each sign image. Additional information such as effective dates for new requirements is provided under the "Special Considerations" heading for each sign, if applicable. See Book 1b (Sign Design Principles) for further background on retroreflective sheeting and illumination.

High intensity materials may be used to advantage in other signing applications. Due to the improved nighttime legibility and conspicuity of signs made with high intensity sheeting, the material should be considered to provide emphasis and clarity at complex locations, in the presence of high ambient light levels, in the presence of roadside distractions or wherever a need for increased levels of nighttime conspicuity or legibility can be demonstrated. Examples of complex visual environments include those where there is an abundance of commercial and/or traffic control devices; where there is a traffic mix with many road user types such as pedestrians, bicyclists, trucks and cars; or where the distances between intersections are short. High reflectivity micro-prismatic sheeting is even brighter than high intensity sheeting, and may be used where nighttime emphasis even greater than that provided by high intensity sheeting is appropriate.

Fluorescent sheeting is now available. The presence of fluorescent colouring in the sheeting improves the daytime conspicuity and legibility of signs made with the material, and is also effective under overcast and twilight conditions. Therefore, fluorescent sheeting may be considered for applications where there is a problem with daytime conspicuity, for example at high conflict or high collision locations. At least one

Table 1 – Warning Signs Requiring High Intensity Sheeting

Sign Number	Sign Name	Prescribed Implementation Date
Wa-8	CHECKERBOARD Sign	January 1, 2002
Wa-8L	CHECKERBOARD Sign (One Direction) (Left Version)	
Wa-8R	CHECKERBOARD Sign (One Direction) (Right Version)	
Wa-8LR	CHECKERBOARD Sign (Both Directions)	
Wa-9	CHEVRON ALIGNMENT Sign	
Wa-17	DOUBLE ARROW Sign	
Wa-32	RAMP SPEED KM/H Sign	
Wa-32A	RAMP SPEED Sign	
Wa-32t	KM/H Tab Sign	
Wa-33L	OBJECT MARKER Sign (One Direction) (Left Version)	
Wa-33R	OBJECT MARKER Sign (One Direction) (Right Version)	
Wa-33LR	OBJECT MARKER Sign (Both Directions)	

manufacturer supplies high reflectivity micro-prismatic sheeting which is also fluorescent and has a practicable life cycle. Other manufacturers supply fluorescent sheeting, but without the high reflectivity micro-prismatic characteristics.

1.5 Location

Warning signs must normally be located in accordance with Section 12 (Sign Position) of Book 1b. However, specific or additional requirements for certain warning signs may pre-empt or revise directions or specifications prescribed under the general standards in Book 1b. Such deviations or exceptions from the Book 1b location principles are noted in this Book under the heading "Location Criteria" for the respective signs to which they apply. If for a given sign, exceptions are not noted under this heading, the Book 1b location principles apply.

Warning signs generally refer to downstream conditions, so it is important that the distance between the sign and the actual hazard is sufficient to give drivers the chance to complete any manoeuvres, such as speed reduction or lane changes, prior to encountering the hazard. In addition, consistent placement of signs relative to hazards is an important factor in the safe reaction of drivers unfamiliar with a road.

As a first step in determining the distance between the sign and the hazard, Table 2 allocates warning signs into three groups as follows:

- **Condition A: Driver Judgement Required**
  Driver responses to the Condition A warning signs include complex driving tasks and situations where extra time is needed to make and act on a decision, e.g., approaching a major freeway-to-freeway interchange or negotiating an intersection with an unusual layout.

- **Condition B: Potential or Actual Stop Required**
  Condition C signs cover the full range of speed reductions. Condition B signs are a subset of Condition C signs, in that driver response to a Condition B sign requires, or may require, speed reduction to a full stop, e.g., stopping for traffic signals ahead, for pedestrians at a pedestrian crossover, or at uncontrolled intersections.

- **Condition C: Speed Reduction Required**
  In the case of the Condition C warning signs, driver reaction in the form of a speed reduction is required, e.g., slowing down for curves in road alignment, or negotiating bridges with restricted lateral clearances.

Minimum placement distance of warning signs upstream of hazards is shown for Condition A signs in Table 3, and for Condition B and C signs in Table 4. Table 3 and 4 distances have been calculated using driver manoeuvre times based on human factors research. More information on manoeuvre times is provided in Section 7.3 (Manoeuvre Time) of Book 1b.

Sign placement distances obtained from the tables should be adjusted for field conditions by ensuring that the sign has been placed appropriately with respect to other sign locations, visibility, lighting conditions, angle and other site-specific factors. Where site conditions preclude the placement of a sign at the minimum distance upstream of a hazard, the sign should be placed further upstream, allowing the driver more time to react.

Since all of the minimum placement distances are dependent on posted speed, a change in posted speed may require that some warning signs be relocated. In addition, if any other deciding factor in sign placement is known to have changed, the warning signs impacted should be relocated accordingly.

Table 2 – Allocation of Warning Signs to Location Conditions

Sign No.	Sign Name	Condition A Driver Judgement Required	Condition B Potential/Actual Stop Condition	Condition C Speed Reduction Required
Wa-1	TURN			X
Wa-2	SHARP CURVE			X
Wa-3	CURVE			X
Wa-4	SHARP REVERSE CURVE			X
Wa-5	REVERSE CURVE			X
Wa-6	WINDING ROAD			X
Wa-11	INTERSECTION (Uncontrolled)		X	
Wa-12	INTERSECTION (Uncontrolled)		X	
Wa-13	INTERSECTION (Uncontrolled)		X	
Wa-14	T-INTERSECTION (Uncontrolled)		X	
Wa-15	Y-INTERSECTION (Uncontrolled)		X	
Wa-11A	INTERSECTION (Controlled)		X	
Wa-12A	INTERSECTION (Controlled)		X	
Wa-13A	INTERSECTION (Controlled)		X	
Wa-15A	Y-INTERSECTION (Controlled)		X	
Wa-19	CROSS TRAFFIC DOES NOT STOP		X	
Wa-21	STEEP HILL			X
Wa-22A	BUMP AHEAD			X
Wa-23	LANE ENDS	X		
Wa-24	NARROW STRUCTURE		X	
Wa-24A	ONE LANE ONLY WHEN USED BY TRUCKS		X	
Wa-25	PAVEMENT ENDS			X
Wa-26	LOW CLEARANCE AHEAD		X	
Wa-28	ROADWAY NARROWS			X
Wa-29	SOFT SHOULDERS	X		
Wa-30	OPENING BRIDGE		X	
Wa-30A	TEMPORARY BRIDGE			X
Wa-31	NO EXIT	X		
Wa-32	RAMP SPEED KM/H			X
Wa-32A	RAMP SPEED			X
Wa-34	DIVIDED ROAD BEGINS	X		
Wa-35	DIVIDED ROAD ENDS	X		
Wa-50	LEFT/RIGHT LANE EXITS (Freeway)	X		
Wa-51	LEFT/RIGHT LANE EXITS, NEXT LANE EXIT OR THROUGH (Freeway)	X		
Wa-52	TWO LEFT/RIGHT LANES EXIT (Freeway)	X		
Wa-53	TWO LEFT/RIGHT LANES EXIT, NEXT LANE EXIT OR THROUGH (Freeway)	X		
Wa-54	THREE LEFT/RIGHT LANES EXIT (Freeway)	X		
Wa-56	LEFT/RIGHT LANE EXITS (Non-freeway)	X		

Table 2 – Allocation of Warning Signs to Location Conditions (cont'd)

Sign No.	Sign Name	Condition A Driver Judgement Required	Condition B Potential/Actual Stop Condition	Condition C Speed Reduction Required
Wa-57	TWO LEFT/RIGHT LANES EXIT (Non-freeway)	X		
Wa-58	THREE LEFT/RIGHT LANES EXIT (Non-freeway)	X		
Wa-63	MAXIMUM TONNES ADVISORY (Single Gross Weight)		X	
Wa-63A	MAXIMUM TONNES ADVISORY (Differentiated by Truck Type)		X	
Wa-72	DIVIDED ROAD INTERSECTION AHEAD		X	
Wa-73	DO NOT BLOCK INTERSECTION	X		
Wa-75	TRUCK OVERTURNING	X		
Wa-76	OVERHEIGHT (With Amber Flashers)		X	
Wb-1	STOP AHEAD		X	
Wb-1A	YIELD AHEAD		X	
Wb-2	TRAFFIC SIGNALS AHEAD		X	
Wb-2A	PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD (With Amber Flashers)		X	
Wb-3	NEW		X	
Wb-4	TWO-WAY TRAFFIC AHEAD	X		
Wb-6	KEEP RIGHT	X		
Wb-7	RAMP METERED WHEN FLASHING (With Amber Flashers)		X	
Wc-1	SCHOOL AREA		X	
Wc-2A	SCHOOL CROSSING AHEAD		X	
Wc-3	PLAYGROUND AHEAD		X	
Wc-4	RAILWAY CROSSING AHEAD		X	
Wc-4A	PREPARE TO STOP AT RAILWAY CROSSING AHEAD (With Amber Flashers)		X	
Wc-4B	RAILWAY CROSSING AHEAD (On Crossroad or Sideroad)		X	
Wc-5	SLIPPERY WHEN WET			X
Wc-6	FALLEN ROCK			X
Wc-7	PEDESTRIANS AHEAD		X	
Wc-8	TRUCK ENTRANCE		X	
Wc-9	CATTLE CROSSING		X	
Wc-10	SCHOOL BUS ENTRANCE		X	
Wc-11	DEER CROSSING		X	
Wc-12	MOOSE CROSSING		X	
Wc-13	CEMETERY ENTRANCE		X	
Wc-14	BICYCLE CROSSING AHEAD		X	
Wc-17	CENTRE LINE MARKING ENDS	X		
Wc-18	SNOWMOBILE CROSSING		X	
Wc-21	WATER OVER ROAD			X
Wc-22	HORSE WITH RIDER			X
Wc-23	HORSE-DRAWN VEHICLE			X
Wc-25	FIRE TRUCK ENTRANCE		X	
Wc-26	SCHOOL BUS STOP AHEAD		X	

The distances in Table 3, which refers to sign responses requiring driver judgement, are derived from lane change manoeuvre times for high and low traffic volumes. For lane changes, manoeuvre time is a sum of the time required to search for a gap in traffic and the time to actually perform the lane change. Gap search time increases as traffic volume increases, since it is more difficult to find suitable gaps in traffic. Similarly, other responses requiring driver judgement are more complex and time-consuming in high-volume traffic.

The distances in Table 4, which refers to sign responses requiring speed reduction, are calculated using a deceleration rate of 5.3 km/h per second. If stopping is not required, advisory speed, where available, can be used as the final speed. In the case of a potential or actual requirement to stop, the final speed is set at zero. Initial speed is typically taken to be posted speed. Definitions of advisory speed and posted speed are provided in Appendix A.

In some cases, factors such as roadway configuration (e.g., an unusually short merge taper) may constrain the location of warning signs to a non-standard distance. Also, the presence of an intersection or other feature between the sign and the hazard may result in misinterpretation of a sign (e.g., an intersection between a STOP AHEAD sign and the hazard may result in misinterpretation of the sign. For these situations, the DISTANCE tab sign (Wa-23t), containing text such as "300 m", should be used in combination with the main sign message. A larger sign may also be used for constrained distances between sign and hazard that are on the short side, so that drivers can notice and read the sign from further away.

In addition to helping drivers judge the location where they can expect to encounter a hazard, tab signs can also facilitate the driver task by specifying the approximate length of a hazard that stretches over a distance (e.g., a continuous winding road) as opposed to a hazard confined to a point or a short segment of the road (e.g., a hidden intersection, a single curve). The HAZARD LENGTH tab sign (Wa-6t) should be used to provide information on the length of a significantly extended hazard.

Table 3 – Minimum Advance Placement of Condition A Warning Signs (Requiring Driver Judgement)

Posted Speed (km/h)	Minimum Advance Distance (m)
30	115
40	140
50	195
60	225
70	250
80	280
90	310
100	335

The sign placement guidelines described above indicate minimum advance placement of warning signs. However, in some situations (e.g., complex locations such as where there is an abundance of commercial and/or traffic control devices, where there is a traffic mix with many road user types such as pedestrians, bicyclists, trucks and cars, or where the distances between intersections are short, in locations with many roadside distractions, etc.), additional emphasis may be provided by posting an additional sign on the opposite side of the road from the main sign, or upstream of the main sign.

Where location requirements have changed from the Manual of Uniform Traffic Control Devices (MUTCD) to the OTM, signs installed according to the MUTCD requirements do not need to be relocated specifically

Table 4 – Minimum Advance Placement of Condition B and C Warning Signs (Requiring Stopping or Speed Reduction)*

(km/h)	Final Speed	90	80	70	60	50	40	30	20	10	0
Posted (Initial) Speed	Minimum Advance Distance (m)										
100		250	295	335	370	400	420	440	455	460	465
90			230	270	300	330	355	370	385	395	395
80				205	240	270	290	310	325	330	335
70					185	210	235	255	265	275	275
60						160	185	200	215	225	225
50							95	115	130	135	140
40								80	90	100	100
30									60	70	70

* Based on 2.5 seconds brake reaction time (source: *Ontario Geometric Design Manual*) and 5.3 km/hr/s deceleration time (source: *ITE Transportation and Traffic Engineering Handbook*).

to meet the OTM requirements. However, when signs are replaced or relocated for other reasons, they should be located in accordance with the OTM requirements.

1.6 Supplementary Flashing Beacons

Amber flashing beacons may sometimes be required to draw the driver's attention to the presence of a warning sign, (e.g., TRAFFIC SIGNALS AHEAD sign, OBJECT MARKER sign), particularly when visibility distance is reduced due to severe roadway geometry, or other circumstances are present which suggest that greater emphasis is required. While flashing beacons are powerful for drawing attention to special warning situations (e.g., at locations where the sight distance is poor), the use of flashing beacons should be restricted to critical situations only, in order to ensure that their impact is not lost due to overuse or to ensure that they do not become a distraction to the driver.

In other warning sign applications, amber flashing beacons are not supplementary but necessary to convey the sign message. For example, the PREPARE TO STOP WHEN FLASHING sign warns drivers that they will probably be required to stop at a downstream traffic signal, but only when the amber beacons attached to the sign are flashing.

Further information on the correct use of flashing beacons may be found in OTM Book 12 (Traffic Signals), Section 3.11.

2. Roadway Alignment Signs

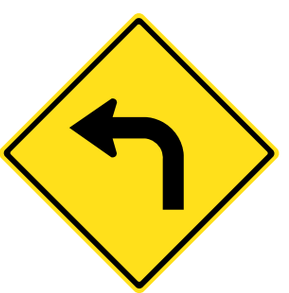
Roadway alignment signs are signs warning of changes in road direction, within the plane of the road surface. Changes in roadway alignment require drivers to steer to the left or right. In Book 6, elevation changes are not considered to be changes in roadway alignment. Warning signs pertaining to changes in road elevation are covered in Section 4 (Specific Roadway Features Signs).

Abrupt turns or curves, or the termination of roadway sections in T-intersections may result in hazardous driving situations unless road users are advised of these conditions in advance. Advance signing for changes in roadway alignment has been shown to reduce accident rates. The driver visual process for negotiating changes in roadway alignment begins two to four seconds upstream of the actual alignment change, therefore it is important to place signs in accordance with the minimum advance placement locations prescribed in Tables 3 and 4.

TURN Sign

Wa-1L	**60 cm x 60 cm**
Wa-101L	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

SHARP CURVE Sign



Wa-2L	**60 cm x 60 cm**
Wa-102L	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

CURVE Sign

Wa-3L Wa-103L	60 cm x 60 cm 75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

SHARP REVERSE CURVE Sign

Wa-4L Wa-104L	60 cm x 60 cm 75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

REVERSE CURVE Sign

Wa-5L Wa-105L	60 cm x 60 cm 75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

ADVISORY SPEED Tab Sign

Wa-7t	45 cm x 45 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The series of curve/turn warning signs is used to indicate road alignment changes not resulting from road termination, that are less extreme than those indicated by the CHECKERBOARD sign (Wa-8).

There are two basic curve configurations represented by the signs in this series: the forward curve and the reverse curve. The forward curve is simply a curve or turn to the right or left, and the reverse curve doubles back, requiring the driver to turn first to the left and then to the right, or vice versa.

Aside from the distinction between forward and reverse curve shapes, the choice of the symbol shape – progressing from curve to sharp curve to turn – depends on a combination of the magnitude of speed reduction from posted speed on the curve approach to advisory speed on the curve itself, together with the absolute advisory speed required to safely negotiate the curve at its greatest degree of curvature.

In situations where a speed reduction is required to negotiate a curve, it is important that the indicated advisory speed be both safe and realistic. An advisory speed that is too high compromises safety by impacting vehicle stability, while one that is too low may also compromise safety by lowering driver compliance. If the general driver perception is that advisory speeds can be exceeded by a significant margin without risk, problems may arise where curves are severe and reduced safety margins apply.

Ball-bank indicator tests are the most common, available and practical way of determining advisory speed. When mounted in a vehicle driving along the curve, the ball-bank indicator (see Figure 2) provides a combined measure of centrifugal force, vehicle roll and superelevation (or the bank angle) of the road. The curve advisory speed depends on the angle of the ball-bank indicator reading and the vehicle travel speed. Usually several readings are taken at different speeds until a satisfactory speed-angle combination is obtained. More information on ball-bank indicator testing is provided in handbooks such as the *Traffic Engineering Handbook*. See Appendix B (References).

Rather than conducting ball-bank indicator tests, some handbooks provide a formula for calculating advisory speed using the same physical principles that apply to ball-bank indicator tests, with the exception of the effect of vehicle roll. The formula determines advisory speed as a function of curve radius, the superelevation rate and the friction factor as follows:

$$V^2 = 11.7R * (e + f)$$

where:

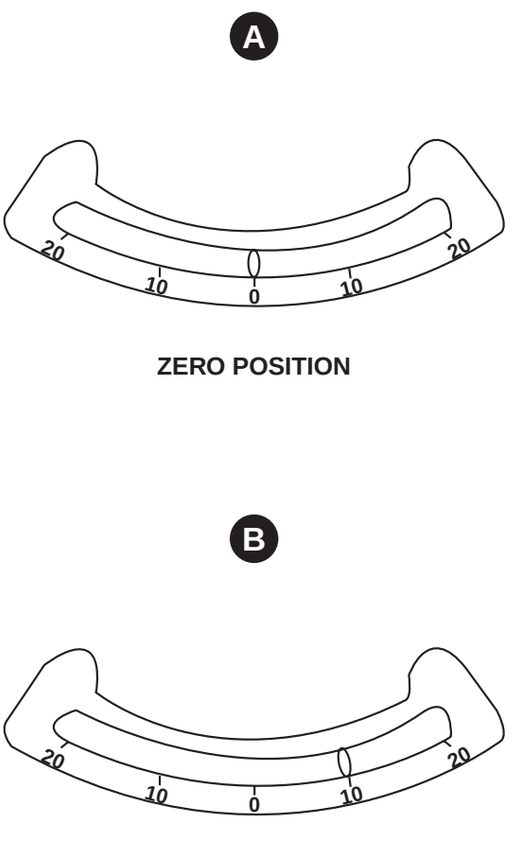
V = advisory speed (km/h)
R = curve radius (m)
e = superelevation rate (m/m)
f = coefficient of side friction (unitless friction factor)

Nomographs based on this formula are sometimes provided in handbooks.

Ball-bank indicators, as well as the formulas and nomographs based on similar friction factors, return conservative results, i.e., advisory speeds that are on the slow side. However, if these results are consistently applied, drivers learn to compensate by adjusting their speed relative to the posted advisory speed. For low advisory speeds, where there is a reduced margin of safety between the ball-bank indicator reading (i.e., the posted advisory speed) and the actual safe speed, curve and advisory speed signing can be emphasized by using larger signs, brighter signs or flashing beacons. These emphasis techniques attract driver attention and encourage further speed reduction.

The assumed driving conditions for which the advisory speed applies also need to be considered. Wet pavement provides less resistance than dry pavement against the centrifugal force encountered on curves. Also, driving the curve in a truck is different than in a car, because of the higher centre of gravity of trucks and greater tendency to roll over. Advisory speeds based on conservative ball-bank indicator readings are sufficiently low to safely accommodate trucks and wet pavement conditions.

Figure 2 – Ball-bank Indicator



Sign Types

The **TURN sign (Wa-1, Wa-101)** indicates the most extreme change in road alignment, of the set of signs indicating forward curve shapes.

The **SHARP CURVE sign (Wa-2, Wa-102)** indicates a less extreme change in road alignment for a forward curve shape than the TURN sign and a more extreme one than the CURVE sign.

The **CURVE sign (Wa-3, Wa-103)** indicates the least extreme change in road alignment, of the set of signs indicating forward curve shapes.

The **SHARP REVERSE CURVE sign (Wa-4, Wa-104)** indicates a more extreme change in road alignment, of the set of signs indicating reverse curve shapes.

The **REVERSE CURVE sign (Wa-5, Wa-105)** indicates a less extreme change in road alignment, of the set of signs indicating reverse curve shapes.

The **standard size** versions of the above signs, including:

- **Standard size TURN sign (Wa-1)**;
- **Standard size SHARP CURVE sign (Wa-2)**;
- **Standard size CURVE sign (Wa-3)**;
- **Standard size SHARP REVERSE CURVE sign (Wa-4)**; and
- **Standard size REVERSE CURVE sign (Wa-5)**;

should be used:

- On roads with one or two lanes per direction;
- Where an ADVISORY SPEED XX KM tab sign is not required (see Table 5); or

- Where the posted speed on the approach to the curve is 60 km/h or less.

The **oversize** version of the above signs, including:

- **Oversize TURN sign (Wa-101)**;
- **Oversize SHARP CURVE sign (Wa-102)**;
- **Oversize CURVE sign (Wa-103)**;
- **Oversize SHARP REVERSE CURVE sign (Wa-104)**; and
- **Oversize REVERSE CURVE sign (Wa-105)**;

must be used:

- On roads with three or more lanes per direction;
- Where an ADVISORY SPEED XX KM tab sign is required (see Table 5); or
- Where prevailing traffic conditions warrant greater visibility or emphasis, e.g., in complex visual environments where many signs and other devices compete for driver attention, or at high traffic volume locations where drivers must concentrate more on the driving task,

and should be used where the posted speed on the approach to the curve is 70 km/h or greater.

The **left** versions of the above signs (e.g., Wa-1L, Wa-101L) must be used where the closest downstream curved portion of the road curves to the left (i.e., a forward curve to the left, or the first curve of a reverse curve curving to the left). The **right** versions of the above signs (e.g., Wa-1R, Wa-101R) must be used where the closest downstream curved portion of the road curves to the right.

The **ADVISORY SPEED tab sign (Wa-7t)** indicates the safe speed for driving along a curve.

Guidelines for Use

Guidelines for selecting which basic types of turn/curve warning sign(s) to use in specific situations are summarized in Table 5. Turn/curve warning signs should be used as specified by the table, in order to consistently address driver expectations which, for this group of signs in particular, directly affect safety (see discussion above under Purpose and Background.)

On the table, posted speed on the curve approach is used to represent the initial speed, and advisory speed on the actual curve where the curvature is greatest is used to represent the final speed. To determine which cell of the table best represents a given field situation, calculated advisory speed (used to select the applicable column in the table) must be rounded **down** to the nearest 10 km/h.

Table 5 was derived based on the general principle that, the greater the difference between the initial curve approach speed and the final speed on the curve, the larger the sign and the more extreme the indication of curvature on the sign symbol (e.g., use of Wa-4 SHARP REVERSE CURVE sign, as opposed to Wa-5 REVERSE CURVE sign). A higher final speed is also related to a sign symbol with a more extreme curvature.

The following specific guidelines are shown in Table 5:

- A turn/curve warning sign must be used where the final speed is less than the initial speed. This condition is represented by all the cells to the right of the centre diagonal in Table 5.
- Even where final speed is equal to the initial speed, a curve warning sign must also be used where:
  - the initial speed is 80 km/h or greater; and

Table 5 – Selection of Turn/Curve Warning Signs

Posted Speed (Initial Speed) (km/h)	Turn/Curve Advisory Speed (Final Speed) (km/h)							
	100	90	80	70	60	50	40	30 or less
100	Wa-103 Wa-105	Wa-103 Wa-105	Wa-103 Wa-105	Wa-103 Wa-105	Wa-102 Wa-104	Wa-102 Wa-104	Wa-101	Wa-101
90		Wa-103 Wa-105	Wa-103 Wa-105	Wa-103 Wa-105	Wa-102 Wa-104	Wa-102 Wa-104	Wa-102 Wa-104	Wa-101
80			Wa-103 Wa-105	Wa-103 Wa-105	Wa-102 Wa-104	Wa-102 Wa-104	Wa-102 Wa-104	Wa-101
70				Wa-103 Wa-105	Wa-102 Wa-104	Wa-102 Wa-104	Wa-102 Wa-104	Wa-101
60					Wa-3 Wa-5	Wa-2 Wa-4	Wa-102 Wa-104	Wa-101
50						Wa-3 Wa-5	Wa-2 Wa-4	Wa-101
40							Wa-3 Wa-5	Wa-1

Wa-7t tab sign is not required.
Curve warning sign is recommended but not required.

Wa-7t tab sign is not required. Curve warning sign is required if curve radius is 1,150 m or less. Otherwise, curve warning sign is recommended but not required.

Wa-7t tab sign is not required.

- the curve radius is 1,150 m or less (degree of curvature of 1 degree 30 minutes or greater).

This application consistently alerts drivers of tighter curves on higher speed roads, which otherwise may not be signed. The condition is represented by the top left cells along the centre diagonal in Table 5 (the green cells).

- To provide supplementary driver guidance, the use of a curve warning sign should be considered in situations other than those described in the preceding point, where the final speed is equal to the initial speed. This condition is represented by the bottom right cells along the centre diagonal in Table 5 (the white cells).

- For initial speeds of 50 km/h or greater, oversize signs and ADVISORY SPEED tab signs must be used where initial speed is greater than final speed by 20 km/h or more (the orange and purple cells).

- Oversize signs should be used for initial speeds of 70 km/h or greater.

- TURN signs (Wa-1, Wa-101) must be used where the final speed is 30 km/h or less (rightmost column).

- The applications for SHARP CURVE signs (Wa-2, Wa-102) and SHARP REVERSE CURVE signs (Wa-4, Wa-104) are similar (orange and yellow cells), as are the applications for CURVE signs (Wa-3, Wa-103) and REVERSE CURVE signs (Wa-5, Wa-105) (purple, blue, green and white cells).

- Reverse curve warning signs must not be used for those combinations of initial speed and final speed which require the use of TURN signs (Wa-1, Wa-101) for forward curves (red cells). Instead, two forward TURN signs (one for each half of the reverse curve) must be used.

The two curves in opposite directions comprising a reverse curve must be separated by a tangent of less than 120 m. If the tangent separating two curves in opposite directions is greater than 120 m, the configuration must be signed as two separate forward curves.

The Wa-7t ADVISORY SPEED tab sign provides motorists with guidance as to the maximum safe speed at which a particular hazard may be negotiated under favourable conditions. The speed shown on the legend must be in multiples of 10 km/h. Advisory speeds equal to or in excess of the posted speed limit must not be shown on ADVISORY SPEED tab signs, regardless of the prevailing operating speed.

The ADVISORY SPEED tab sign must not be posted until a safe advisory speed has been determined (e.g., through ball-bank indicator testing or an alternative method), and its use has been approved by the Road Authority having jurisdiction over the roadway. Since changes in surface characteristics and sight distance may alter the advisory speed, each location should be periodically checked and the ADVISORY SPEED tab sign revised accordingly, if necessary.

Where the ADVISORY SPEED tab sign is used, additional guidance must be provided through the installation of post-mounted delineators or CHEVRON ALIGNMENT signs (Wa-9) along the outside of curves and along curve approaches where:

- The location is rural in nature; or

- The location is urban in nature and is non-illuminated.

Curve delineation devices are not required in urban, illuminated areas, since roadside features such as buildings and streetlights offer drivers ample indication of changes in horizontal road alignment.

Post-mounted delineators are small retroreflective devices installed along the road to guide drivers. They are placed adjacent to the shoulder (in rural areas) or on the edge of the travelled portion of the roadway (in urban areas). Where curve/turn delineation guidance is required, post-mounted delineators should be used in conjunction with curve/turn signs. When used on sections of undivided roadway, bi-directional delineators (delineators visible from both approach directions) or back-to-back unidirectional delineators must be installed on the outside of curves.

Post-mounted delineator spacing should be adjusted on the approaches to and along the outside of horizontal curves, so that five post-mounted delineators are always visible to the right of the sight-line axis created by the directional dividing line on a two-lane roadway, or to the right of the sight-line axis created by the right-hand lane of a multi-lane roadway. This guideline applies to both left curves (where the delineators are placed on the right side of the roadway respective to the direction of travel) and right curves (where the delineators are placed on the left side of the roadway respective to the direction of travel). Table 6 shows the recommended spacing for post-mounted delineators on horizontal curves. See Book 11 (Markings and Delineation) for more information on post-mounted delineators.

CHEVRON ALIGNMENT signs are also mounted along curves and curve approaches, and include an arrow symbol which points in the direction of the road. Where curve/turn delineation guidance is required, CHEVRON ALIGNMENT signs must be used in

Table 6 – Spacing of Highway Delineators on Horizontal Curves

Curve Radius (m)	Degree of Curvature (°)	Spacing on Curve (m)	1st Space Immediately in Advance of Curve (m)	2nd Space in Advance of Curve (m)	3rd Space (Upstream-most) in Advance of Curve (m)
			1st Space Beyond Curve (m)	2nd Space Beyond Curve (m)	3rd Space Beyond Curve (m)
1750	1	27	48	60	60
580	3	15	28	48	60
350	5	12	22	36	60
250	7	10	18	32	60
195	9	9	16	29	56
145	12	7	15	24	48
115	15	7	13	21	44
95	18	6	12	20	39
85	21	6	10	18	36
70	25	6	10	16	35
60	30	5	9	15	30

conjunction with SHARP CURVE, SHARP REVERSE CURVE or TURN signs. CHEVRON ALIGNMENT signs must be placed only on the outside of a curve or sharp turn. CHEVRON ALIGNMENT signs, and details on their spacing, are discussed later in Section 2. Also see Book 11 (Markings and Delineation) for additional information on CHEVRON ALIGNMENT signs.

Curve delineation by post-mounted delineators or CHEVRON ALIGNMENT signs may also be considered for curves/turns with low advisory speed safety margins, which are unsafe unless drivers are travelling very close to the advisory speed. Other means such as brighter sheeting, larger signs, beacons and redundant signs may also be considered for this purpose.

Curve warning signs are not required on local residential streets, including streets within sub-divisions.

Location Criteria

The location criteria for turn/curve signs are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

WINDING ROAD Sign

Wa-6L	**60 cm x 60 cm**
Wa-106L	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

HAZARD LENGTH Tab Sign

Wa-6t	**30 cm x 60 cm**
Font	**Helvetica Bold Condensed**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the WINDING ROAD sign is to indicate a continuous series of curves, that may continue for several kilometres. The sign replaces many individual reverse curve or forward curve warning signs that would otherwise be required.

Sign Types

The **standard size WINDING ROAD sign (Wa-6)** should be used on roads with one or two lanes per direction.

The **oversize WINDING ROAD sign (Wa-106)** must be used:

- On roads with three or more lanes per direction; or
- Where prevailing traffic conditions warrant greater visibility or emphasis, e.g., in complex visual environments where many signs and other devices compete for driver attention, or at high traffic volume locations where drivers must concentrate more on the driving task.

The **left** version of the WINDING ROAD sign (Wa-6L, Wa-106L) must be used where the first curve in the series curves to the left. The **right** version of the WINDING ROAD sign (Wa-6R, Wa-106R) must be used where the first curve in the series curves to the right.

The **HAZARD LENGTH tab sign (Wa-6t)** should be used where the length of the winding road hazard is 1 km or greater.

Guidelines for Use

The WINDING ROAD sign must be used to indicate a series of four or more curves, sharp curves or turns, each separated by tangent distances of less than 120 m.

If, according to Table 5, an advisory speed less than the overall advisory speed for the winding road segment applies to any of its individual forward curves or reverse curves, those curves must be signed separately with the appropriate turn/curve sign and an ADVISORY SPEED tab (Wa-7t). The application of turn/curve warning signs for individual curves within a winding road curve series should be as specified in Table 5, and in accordance with the other information provided in the Guidelines for Use section for turn/curve warning signs.

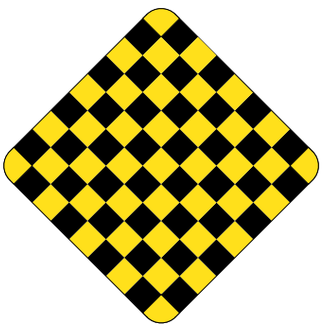
Location Criteria

Spacing of WINDING ROAD signs over extended distances should typically be in the range of 4 km to 8 km. The signs should be posted immediately downstream of major interchanges or intersections and at points along the road which drivers could perceive to be the end of the winding section.

Special Considerations

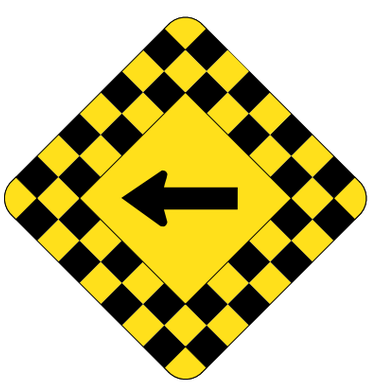
N/A

CHECKERBOARD Sign



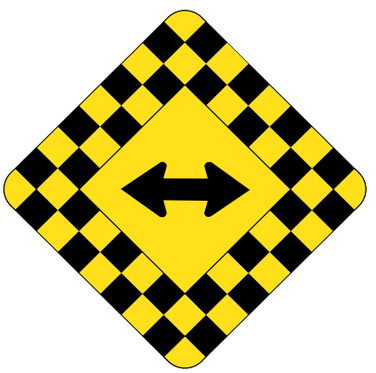
Wa-8	75 cm x 75 cm
Wa-108	90 cm x 90 cm
Font	N/A
Colour	Legend – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

CHECKERBOARD Sign (One Direction)



Wa-8L	90 cm x 90 cm
Wa-108L	120 cm x 120 cm
Font	N/A
Colour	Legend – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

CHECKERBOARD Sign (Both Directions)



Wa-8LR	90 cm x 90 cm
Wa-108LR	120 cm x 120 cm
Font	N/A
Colour	Legend – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

Purpose and Background

The purpose of the CHECKERBOARD sign (Wa-8) is to warn vehicular traffic of the termination, or abrupt change in direction, of a segment of road. There can be an absolute termination (i.e., right turn, left turn and straight ahead paths are all non-existent), or a partial termination or discontinuity (i.e., the road does not continue straight ahead, but the option exists to turn left and/or right). For a partial termination/ discontinuity, the change in road alignment associated with a CHECKERBOARD sign is more extreme than that associated with turn/curve signing.

Because the CHECKERBOARD sign is used to indicate such extreme changes in road alignment, with serious safety implications if the sign is not seen, the sign legend features a unique, eye-catching "checkerboard" pattern. In the case of an absolute road termination, the entire surface of the sign is covered with this striking symbol.

Sign Types

The **CHECKERBOARD sign** must be used where a road terminates, and there is no option to proceed straight ahead, to the left or to the right. The **standard size CHECKERBOARD sign (Wa-8)** should be used where posted speed is 60 km/h or less, and the **oversize CHECKERBOARD sign (Wa-108)** should be used where posted speed is 70 km/h or greater. The oversize sign should also be installed at lower speed locations where prevailing traffic conditions warrant greater visibility or emphasis, e.g., poor sight lines, or there is evidence that motorists are not noticing the sign.

The **CHECKERBOARD sign (one direction) (left version)** must be used where a road terminates, and there is no option to proceed straight ahead or to the right, but there is an option to proceed to the left. The **CHECKERBOARD sign (one direction) (right version)** must be used where a road terminates, and there is no option to proceed straight ahead or to the left, but there is an option to proceed to the right. The **standard size CHECKERBOARD sign (one direction) (Wa-8L or Wa-8R)** should be used where posted speed is 60 km/h or less, and the **oversize CHECKERBOARD sign (one direction) (Wa-108L or Wa-108R)** should be used where posted speed is 70 km/h or greater. The oversize sign should also be installed at lower speed locations where prevailing traffic conditions warrant greater visibility or emphasis, e.g., poor sight lines, or there is evidence that motorists are not noticing the sign.

The **CHECKERBOARD sign (both directions)** must be used where a road terminates, and there is no option to proceed straight ahead, but there are options to proceed to the left or to the right (i.e., a T-intersection). The **standard size CHECKERBOARD sign (both directions) (Wa-8LR)** should be used where posted speed is 60 km/h or less, and the **oversize CHECKERBOARD sign (both directions) (Wa-108LR)** should be used where posted speed is 70 km/h or greater. The oversize sign should also be installed at lower speed locations where prevailing traffic conditions warrant greater visibility or emphasis, e.g., poor sight lines, or there is evidence that motorists are not noticing the sign.

Guidelines for Use

The CHECKERBOARD sign (one direction) and the CHECKERBOARD sign (both directions) should be used only for a sharp change in road alignment.

In low speed urban locations where the roadway forming the stem of a T-intersection is controlled by a STOP sign, the CHECKERBOARD sign (both directions) may be omitted.

CHECKERBOARD signs are not required on residential cul-de-sacs, especially those with turning circles having driveway access, except where end-of-road visibility may be a problem.

Location Criteria

CHECKERBOARD signs must be located so that they are directly in line with the path of approaching vehicles.

The CHECKERBOARD sign (one direction) and the CHECKERBOARD sign (both directions) must be located on the far side of the intersecting crossroad, facing approaching traffic.

Special Considerations

The signs must have Type III or IV high intensity sheeting, as a minimum requirement, as of January 1, 2002. Type I sheeting is the minimum requirement prior to the date indicated.

CHEVRON ALIGNMENT Sign

Wa-9	**45 cm x 60 cm**
Wa-109	**60 cm x 75 cm**
Font	**N/A**
Colour	**Legend – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type III or IV**

Purpose and Background

The purpose of the CHEVRON ALIGNMENT sign is to provide additional guidance to drivers at sharp changes in the horizontal alignment of the roadway. Sharp curves on rural roads or non-illuminated urban roads are often hazardous. CHEVRON ALIGNMENT signs warn drivers of the need to be cautious in the approach to a sharp curve.

Sign Types

The **standard size CHEVRON ALIGNMENT sign (Wa-9)** should be used where the posted speed is 60 km/h or less.

The **oversize CHEVRON ALIGNMENT sign (Wa-109)** should be used where the posted speed is 70 km/h or greater.

Guidelines for Use

Where the ADVISORY SPEED tab sign is used on sharp curves, sharp reverse curves or turns, CHEVRON ALIGNMENT signs must be used along the curves/turns and their approaches if:

- The location is rural in nature; or
- The location is urban in nature and is non-illuminated.

Curve delineation devices are not required in urban, illuminated areas, since roadside features such as buildings and streetlights offer drivers ample indication of changes in horizontal road alignment.

The arrow symbol on the CHEVRON ALIGNMENT sign must point in the direction of the curve.

All signs used at a given location must be the same size.

Where CHEVRON ALIGNMENT signs are used, post-mounted delineators must be omitted. Using both signs and delineators would create visual clutter and promote driver confusion.

More information on the guidelines for use of the CHEVRON ALIGNMENT sign is provided in Book 11 (Markings and Delineation).

Location Criteria

It is important to ensure that CHEVRON ALIGNMENT signs are clearly visible to approaching drivers. Their effectiveness is dependent on their position and number.

CHEVRON ALIGNMENT signs must be placed only on the outside of a sharp curve or turn, and positioned at right angles to oncoming traffic.

The typical placement of CHEVRON ALIGNMENT signs is so that the bottom is 1.5 m above the outside edge of the closest traffic lane. However, when vehicles are approaching on a vertical curve, CHEVRON ALIGNMENT signs may be placed higher or lower, so that they will be illuminated by low-beam headlights.

At least four CHEVRON ALIGNMENT signs must be used at a single location. Spacing of the CHEVRON ALIGNMENT signs is shown in Table 7, and is dependent on radius (or degree of curvature). CHEVRON ALIGNMENT signs should be positioned to be visible for at least five seconds to an approaching driver at night.

More information on location criteria for the CHEVRON ALIGNMENT sign is provided in Book 11 (Markings and Delineation).

Table 7 – Spacing of CHEVRON ALIGNMENT Signs on Horizontal Curves

Curve Radius (m)	Degree of Curvature (°)	Spacing on Curve (m)	1st Space Immediately in Advance of Curve (m)	2nd Space in Advance of Curve (m)
1750	1	80	145	150
580	3	45	85	145
350	5	35	65	110
250	7	30	55	95
195	9	30	50	90
145	12	20	45	70
115	15	20	40	65
95	18	20	35	60
85	21	20	30	55
70	25	20	30	50
60	30	15	30	45

Note: On freeway exit ramps and free flow channelizations, CHEVRON ALIGNMENT signs must not be placed in advance of curves.

Special Considerations

The signs must have Type III or IV high intensity sheeting, as a minimum requirement, as of January 1, 2002. Type I sheeting is the minimum requirement prior to the date indicated.

DOUBLE ARROW Sign

Wa-17	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type III or IV**

Purpose and Background

The purpose of the DOUBLE ARROW sign is to indicate to drivers that they must direct their vehicles to the right or left of obstructions such as:

- Traffic islands with curbs more than 10 cm high;
- Loading islands;
- Refuge islands; and
- Central piers.

Sign Types

There is one type of **DOUBLE ARROW sign: (Wa-17)**.

Guidelines for Use

The DOUBLE ARROW sign is intended for traffic with a common destination. Therefore, the sign must not be used at the approach ends of channelizing islands, such as right turn channelizations or freeway ramp gores. In these situations, the OBJECT MARKER sign is the appropriate sign to use.

The DOUBLE ARROW sign must appear at the approach end (upstream end) of the obstruction, both to indicate that vehicles must navigate around the obstruction and to help define where the upstream end of the obstruction is.

Where traffic must only keep to the right of the island or other obstruction, the KEEP RIGHT sign (Rb-25) must be used. For more information on the KEEP RIGHT sign, see Book 5 (Regulatory Signs).

In order to avoid vehicle conflicts with the obstructions indicated by DOUBLE ARROW signs, drivers must be aware of their presence. Clearly seeing a non-reflectorized obstruction in the middle of the roadway presents a challenge at night. To improve driver awareness of the obstruction during hours of darkness and within complex visual environments, DOUBLE ARROW signs require the use of amber flashing beacons where an island or pier of a structure is located within the paved area of an undivided road, e.g., loading island for street cars.

Low-beam headlights do not provide sufficient light for all drivers to see non-reflectorized obstructions at night in time to stop for speeds above approximately 50 km/h. Therefore it is particularly important that obstructions extending substantially beyond the width of the DOUBLE ARROW sign be reflectorized to indicate their width.

The OBJECT MARKER sign (both directions) (Wa-33LR) must be used beneath the DOUBLE ARROW sign to identify fixed object hazards within 2 m of the roadway edge. The marker must be placed with the stripes sloping at a 45-degree angle down toward the travel lanes of the roadway (down to both the left and the right, when used with the DOUBLE ARROW sign). See Section 4 (Specific Roadway Features Signs) and Book 11 (Markings and Delineation) for more information on the use of the OBJECT MARKER sign.

Beacons must be flashed, day and night, at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal. For more information on the operation of flashing beacons, see Book 12 (Traffic Signals). Further background and details on illumination and retroreflective sheeting can be found in Book 1b (Sign Design Principles).

A composite sign assembly showing the use of the DOUBLE ARROW sign (Wa-17), the HAZARD MARKER sign (Wa-33L) and the flashing amber beacon, together with the appropriate pavement markings is shown in Figure 3. More information on pavement markings and delineation for safety zones, loading islands and other similar applications is found in Book 11 (Markings and Delineation).

Location Criteria

The DOUBLE ARROW sign must be placed facing motorists travelling toward the obstruction.

The DOUBLE ARROW sign should normally be mounted at a height of 2 m above the pavement, directly above the OBJECT MARKER sign.

The mounting location of the sign depends on the type of obstruction, as follows:

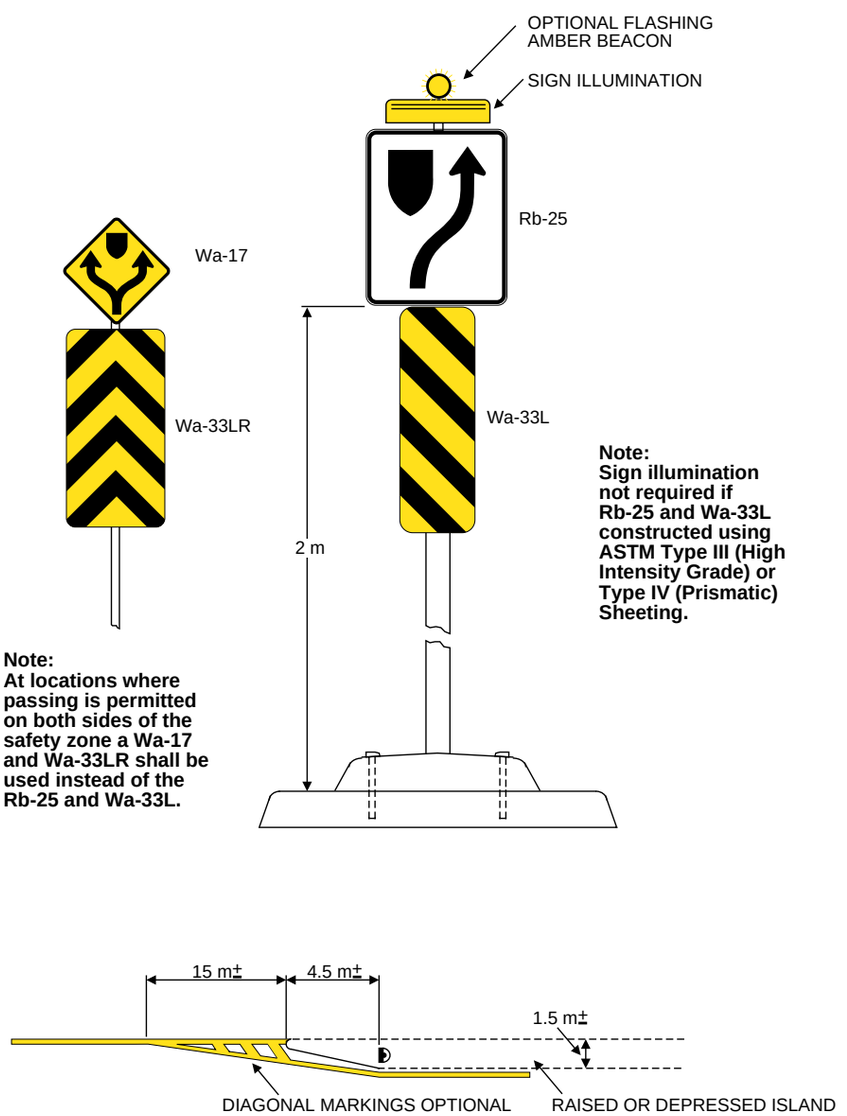
- At channelized traffic islands or on pedestrian islands, the sign must be placed at the upstream end of the island or as close to it as possible.

- At piers or at obstructions in the roadway, the sign should be placed on the face of, or immediately upstream of, such obstructions.

Special Considerations

The signs must have Type III or IV high intensity sheeting, as a minimum requirement, as of January 1, 2002. Type I sheeting is the minimum requirement prior to the date indicated.

Figure 3 – End Protection for Raised or Depressed Safety Zone



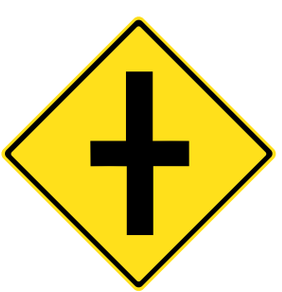
3. Intersection Warning Signs

Intersection warning signs alert motorists to intersections where they may encounter hazards, including the presence of the intersections themselves, merging traffic and changes in right-of-way control.

Unexpected or unseen intersections may present a hazard to through and turning traffic. The hazard is most serious if the intersection has an uncontrolled right-of-way, or is hidden. Even controlled intersections, however, typically require driver caution. In addition, intersection warning signs are used at merge locations and at intersections where right-of-way control is being changed.

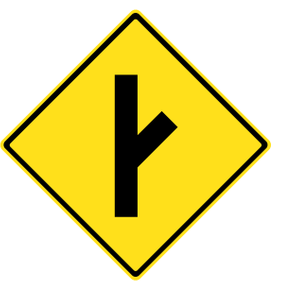
Uncontrolled and controlled intersection signs are most often needed on rural roads. In urban locations, widespread application of right-of-way control devices such as STOP signs and traffic signals, and the typically close spacing between intersections, may make the use of these types of intersection warning signs impractical or redundant.

INTERSECTION Sign (Uncontrolled)



Wa-11	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

INTERSECTION Sign (Uncontrolled)



Wa-12	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

INTERSECTION Sign (Uncontrolled)

Wa-13	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

T-INTERSECTION Sign (Uncontrolled)

Wa-14	60 cm x 60 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Y-INTERSECTION Sign (Uncontrolled)

Wa-15	60 cm x 60 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

Uncontrolled intersection signs are used to warn drivers of an approaching intersection where neither road has a designated right-of-way. Normal right-of-way rules apply, namely, drivers yield to vehicles on their right, except where vehicles are already in the intersection. Caution is required at these intersections, so drivers must be made aware of their presence.

On intersection signs, lines or curves are used to represent the intersection layout and the intersecting angle of the crossing roadway. An arrowhead at the end of a line or curve symbolizes right-of-way. Absence of arrowheads on the uncontrolled intersection signs therefore indicates that neither of the intersecting roadways has the right-of-way.

Sign Types

The **standard size INTERSECTION sign (uncontrolled) (Wa-11)** indicates an uncontrolled intersection where a road crosses the road on which the sign appears.

The **standard size INTERSECTION sign (uncontrolled) (Wa-12)** indicates an uncontrolled intersection where a road approaching from one side at a non-perpendicular angle meets the road on which the sign appears.

The **standard size INTERSECTION sign (uncontrolled) (Wa-13)** indicates an uncontrolled intersection where a perpendicular side road approaching from one side meets the road on which the sign appears.

The **standard size T-INTERSECTION sign (uncontrolled) (Wa-14)** indicates an uncontrolled intersection where a road crosses the termination point of the road on which the sign appears.

The **standard size Y-INTERSECTION sign (uncontrolled) (Wa-15)** indicates a Y-shaped intersection, where traffic approaches from the stem of the "Y" and continues along one branch of the "Y". The side road is represented by the other branch of the "Y".

Guidelines for Use

Uncontrolled intersection signs must not be used:

- On approaches to intersections under stop or yield control. (The STOP AHEAD sign (Wb-1) or YIELD AHEAD sign (Wb-1A) must be used where drivers need to be alerted to the presence of an intersection under stop or yield control.)

- To warn of hidden private driveways or entrances.

The Y-INTERSECTION sign must not be used at intersections channelized by traffic islands, or where junction signs or turn markers are present. In these situations, the context and signing are sufficient to alert motorists to the presence of an intersection. Also, at channelized intersections, traffic does not enter, but can only exit, the main road via the right branch of the "Y".

A left and/or inverted version of the Wa-12 or Wa-13 should be used where appropriate to represent the actual intersection layout.

Where an intersection occurs along a forward or reverse curve, an adapted intersection sign must be used. The adapted sign design is based on the applicable turn/curve warning sign (Wa-1 to Wa-5), without the arrowhead on the turn/curve symbol, and with one or more side strokes added to indicate a side road entering.

Where one or more of the curves included under a WINDING ROAD sign (Wa-6) contains an uncontrolled intersection, an individual turn/curve warning sign, adapted to be an uncontrolled intersection sign, must be posted. The WINDING ROAD sign indicates a symbolic configuration only, and is not precise enough to represent to drivers the actual location of the uncontrolled intersection.

In situations where the intersection configuration varies significantly from what is symbolized on the sign options discussed above, signs should be created with new symbols to represent actual intersection layouts. In such cases, roads must be represented as lines **without** arrowheads, to indicate uncontrolled right-of-way on both intersecting roads.

Uncontrolled intersection warning signs are not required on local residential streets, including streets within sub-divisions.

For more information on turn/curve warning signs, see Section 2 (Roadway Alignment Signs). For more information about STOP AHEAD and YIELD AHEAD signs, see Section 6 (Traffic Regulations Ahead Signs). Information on right-of-way control and STOP and YIELD signs can be found in Book 5 (Regulatory Signs).

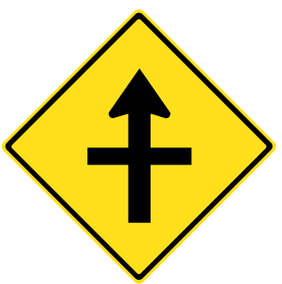
Location Criteria

The location criteria for uncontrolled intersection signs are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

For further details on right-of-way rules at an intersection not controlled by a STOP or YIELD sign or traffic signal, refer to the Highway Traffic Act, Section 135 (R.S.O. 1990).

INTERSECTION Sign (Controlled)



Wa-11A	60 cm x 60 cm
Wa-111A	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

INTERSECTION Sign (Controlled)

Wa-12A	60 cm x 60 cm
Wa-112A	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

INTERSECTION Sign (Controlled)

Wa-13A	60 cm x 60 cm
Wa-113A	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Y-INTERSECTION Sign (Controlled)

Wa-15A	60 cm x 60 cm
Wa-115A	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

HIDDEN INTERSECTION Tab Sign

Wa-18t	**30 cm x 60 cm**
Wa-118t	**45 cm x 90 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

DISTANCE Tab Sign

Wa-23t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

Purpose and Background

Controlled intersection signs are used to warn drivers on a through road of an approaching intersection at which the intersecting side road is under stop or yield control.

On intersection signs, lines or curves are used to represent the intersection layout and the intersecting angle of the crossing roadway. An arrowhead at the end of a line or curve symbolizes right-of-way. On all controlled intersection signs, a line/curve symbol with an arrowhead represents the through road, signifying that this road has right-of-way.

Sign Types

The **INTERSECTION sign (controlled) (Wa-11A, Wa-111A)** indicates an intersection where a road under stop or yield control crosses the through road on which the sign appears.

The **INTERSECTION sign (controlled) (Wa-12A, Wa-112A)** indicates an intersection where a road under stop or yield control, approaching from one side at a non-perpendicular angle, meets the through road on which the sign appears.

The **INTERSECTION sign (controlled) (Wa-13A, Wa-113A)** indicates an intersection where a road under stop or yield control, approaching from one side at a perpendicular angle, meets the through road on which the sign appears.

The **Y-INTERSECTION sign (controlled) (Wa-15A, Wa-115A)** indicates a Y-shaped intersection, where through traffic approaches from the stem of the "Y" and continues along the branch of the "Y" with the arrowhead. The road representing the other branch of the "Y" is under stop or yield control at the point of intersection with the through road.

The **standard size** versions of the above signs, including:

- **Standard size INTERSECTION sign (controlled) (Wa-11A)**;
- **Standard size INTERSECTION sign (controlled) (Wa-12A)**;
- **Standard size INTERSECTION sign (controlled) (Wa-13A)**; and
- **Standard size Y-INTERSECTION sign (controlled) (Wa-15A)**;

should be used:

- On roads with one or two lanes per direction; or
- Where posted speed limit is 60 km/h or less.

The **oversize** versions of the above signs, including:

- **Oversize INTERSECTION sign (controlled) (Wa-111A)**;
- **Oversize INTERSECTION sign (controlled) (Wa-112A)**;
- **Oversize INTERSECTION sign (controlled) (Wa-113A)**; and
- **Oversize Y-INTERSECTION sign (controlled) (Wa-115A)**;

must be used:

- On roads with three or more lanes per direction; or
- Where prevailing traffic conditions warrant greater visibility or emphasis, e.g., in complex visual environments where many signs and other devices compete for driver attention, where sight lines are obscured by vegetation or hills, or at high traffic volume locations where drivers must concentrate more on the driving task;

and should be used where posted speed limit is 70 km/h or greater.

The **HIDDEN INTERSECTION tab sign** is used in combination with other controlled intersection signs, to warn drivers on the through road that side road traffic under stop or yield control does not have an adequate view of traffic approaching on the through road. Where the HIDDEN INTERSECTION tab sign is required, the **standard size HIDDEN INTERSECTION tab sign (Wa-18t)** must be used together with standard size controlled intersection signs, and the **oversize HIDDEN INTERSECTION tab sign (Wa-118t)** must be used together with oversize controlled intersection signs.

The **standard size DISTANCE tab sign (Wa-23t)** indicates the distance from the sign to the hidden intersection.

Guidelines for Use

Controlled intersection signs must not be used:

- Where there is no designated right-of-way for either of the intersecting roads. (Uncontrolled intersection signs are intended for these applications.);
- On approaches to intersections under stop or yield control (the STOP AHEAD sign (Wb-1) or YIELD AHEAD sign (Wb-1A) must be used where drivers need to be alerted to the presence of an intersection under stop or yield control); or
- To warn of hidden private driveways or entrances.

The Y-INTERSECTION sign must not be used at intersections channelized by traffic islands, or where junction signs or turn markers are present. In these situations, the context and signing are sufficient to alert motorists to the presence of an intersection. Also, at channelized intersections, traffic does not enter, but can only exit, the main road via the right branch of the "Y".

A left version of the Wa-12A, Wa-13A or Wa-15A sign should be used where appropriate to represent the actual intersection layout.

Where an intersection occurs along a forward or reverse curve, an adapted intersection sign must be used. The adapted sign design is based on the applicable turn/curve warning sign (Wa-1 to Wa-5), with one or more side strokes added to indicate a side road entering.

Where one or more of the curves included under a WINDING ROAD sign (Wa-6) contains a controlled intersection, an individual turn/curve warning sign, adapted to be a controlled intersection sign, must be posted. The WINDING ROAD sign indicates a symbolic configuration only, and is not precise enough to represent to drivers the actual location of the controlled intersection.

In situations where the intersection configuration varies significantly from what is symbolized on the sign options discussed above, signs should be created with new symbols to represent actual intersection layouts. In such cases, the through road must be represented as a line **with** an arrowhead, to indicate that it has right-of-way, and that the intersecting road does not.

Hidden intersection signing consists of a controlled intersection sign combined with the HIDDEN INTERSECTION tab sign (Wa-18t). The word "hidden" refers to traffic on the road with the designated right-of-way, which is hidden from traffic on the side road. Hidden intersection signing must not be installed at uncontrolled intersections, since the combination of no designated right-of-way and poor visibility of traffic can be extremely hazardous. Where the drivers on a side road of an uncontrolled intersection do not have an adequate view of traffic on the main road, right-of-way control in the form of STOP of YIELD signs must be provided on the side road prior to installing hidden intersection signing.

To determine if a HIDDEN INTERSECTION tab sign is required, the sight distance of the driver stopped on the side road at the STOP or YIELD sign must be measured:

- From an assumed eye height of 1.05 m above the surface, 5 m from the edge of pavement or travelled portion of the roadway, at the vehicle stop location;
- To an assumed vehicle height of 1.05 m above the surface on the centreline of the through road, at the upstream-most location that a vehicle is visible to the driver on the side road.

A HIDDEN INTERSECTION tab sign must be installed when the sight distance measured using the above procedure is less than the minimum sight distance specified in Table 8.

Table 8 – Minimum Sight Distance for HIDDEN INTERSECTION Tab Sign

	Normal Regulatory Posted Speed on Major Highway (km/h)					
Type of Roadway	**50**	**60**	**70**	**80**	**90**	**100**
Two-lane Roadway	95	115	135	150	170	—
Four-lane Divided Roadway (Median width more than 5.5 m)	95	115	135	150	170	190
Other Four-lane Roadway	115	135	160	180	205	225

A standard size DISTANCE tab sign (Wa-23t), indicating the distance from the sign to the intersection, may supplement HIDDEN INTERSECTION tab signs. The DISTANCE tab signs are especially relevant if the signs need to be placed at locations different from those specified in Tables 3 and 4, due to obstructions or the presence of other nearby intersections that could be confused with the hidden intersection.

Controlled intersection warning signs are not required on local residential streets, including streets within sub-divisions.

For more information on turn/curve warning signs, see Section 2 (Roadway Alignment Signs). For more information about STOP AHEAD and YIELD AHEAD signs, see Section 6 (Traffic Regulations Ahead Signs). Information about right-of-way control and STOP and YIELD signs can be found in Book 5 (Regulatory Signs).

Location Criteria

The location criteria for controlled intersection signs are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

MERGE Sign

Wa-16	**75 cm x 75 cm**
Wa-116	**90 cm x 90 cm**
Wa-1116	**120 cm x 120 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The MERGE sign may be placed upstream of a point where two roadways converge, and where traffic on these roadways is moving in the same direction of travel and must merge into one lane. The MERGE sign alerts drivers that vehicles from the other roadway may soon be entering the lane in which they are travelling, and that they must exert caution and adjust their positioning to accommodate the ingress of vehicles. MERGE signs are also used to provide warning to traffic entering the roadway that they do not have the right of way and must prepare to merge with the through traffic.

Acceleration lanes from ramps entering freeways, or channelized turn lanes are common examples of merge conditions.

Sign Types

The **standard size MERGE sign (Wa-16)** should be used:

- On roads with one or two lanes per direction; or
- Where the posted speed is 60 km/h or less.

The **oversize MERGE sign (Wa-116)** should be used:

- On roads with three or more lanes per direction;
- At locations where there is evidence that motorists are not noticing the sign; or
- Where the posted speed is 70 km/h or 80 km/h.

The **special oversize MERGE sign (Wa-1116)** should be used on freeways and where the posted speed is 90 km/h or greater.

Guidelines for Use

A MERGE sign should be used:

- Where the merging traffic conditions are unexpected, out of the road user's view, or otherwise not obvious to the road user; and
- Where the length of an acceleration lane and/or taper is within the range of values specified in Table 9.

Where its use would help to solve operational or collision problems related to traffic entering the roadway and failing to merge safely, a supplementary MERGE sign addressing the entering traffic should also be used.

A MERGE sign must not be used:

- Where the length of acceleration lane and/or taper is less than the minimum length specified in Table 9. If this is the case, a YIELD sign (Ra-2) must be installed on the minor roadway to heighten the awareness and improve the safety of drivers entering the major roadway;
- Where the length of acceleration lane and/or taper is greater than the maximum length specified in Table 9. If this is the case, a LANE ENDS sign (Wa-23) must be installed to indicate to drivers that they have a dedicated lane available to them which, however, is about to terminate;
- In place of a PAVEMENT NARROWS sign (Wa-28), where lanes of traffic moving in the same direction along the same roadway must merge due to reduction in the actual or usable pavement width;
- At urban intersections with far-side lane drops.

Table 9 – Range of Acceleration Lane/Taper Lengths for MERGE Sign

Normal Regulatory Posted Speed on Through Highway (km/h)	Length of Acceleration Lane and/or Taper (m)	
	Minimum	Maximum
50	50	115
60	60	135
70	65	155
80	70	180
90	80	200
100	85	225

For more information about the LANE ENDS sign and the PAVEMENT NARROWS sign, see Section 4 (Specific Roadway Features Signs). YIELD signs are described in Book 5 (Regulatory Signs).

Location Criteria

The primary MERGE sign must be installed on the side on the roadway where merging traffic will be encountered. The sign must be placed in a position where it will not obstruct a driver's view of vehicles about to merge.

Where there is a requirement to warn traffic entering the roadway of the merge condition, a secondary MERGE sign may be placed in advance of the primary MERGE sign, on the ramp or channelization, so that it is clearly visible by traffic entering the roadway.

Special Considerations

N/A

DIVIDED ROAD INTERSECTION AHEAD Sign

Wa-72	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The DIVIDED ROAD INTERSECTION AHEAD sign indicates to drivers that they are approaching an intersection with a divided road. The warning prepares drivers for a dual roadway configuration, and helps orient their turning movements.

Sign Types

There is one type of **DIVIDED ROAD INTERSECTION AHEAD Sign: (Wa-72)**.

Guidelines for Use

The DIVIDED ROAD INTERSECTION AHEAD sign indicates to drivers that they are approaching an intersection with a divided road.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

CROSS TRAFFIC DOES NOT STOP Sign

12.5

Wa-19	**90 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

AFTER (MONTH AND DAY) Tab Sign

12.5

Wa-19t	**45 cm x 75 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the CROSS TRAFFIC DOES NOT STOP sign is to inform the drivers that a previously controlled crossroad approach to an intersection has been changed to an uncontrolled approach. The AFTER (month and day) tab sign indicates when the change will take place.

The most common changes in intersection right-of-way control for which these signs are used are:

- Where right-of-way is being reassigned from one roadway to another crossing roadway, through the elimination of an existing STOP sign control and the installation of STOP sign control on the previously uncontrolled roadway; and

- Where an existing all-way stop control is to be removed and a through roadway created.

The CROSS TRAFFIC DOES NOT STOP sign and the AFTER (month and day) tab sign are temporary signs that educate drivers about the change in intersection right-of-way. The signs are critical for changing the

expectations and ingrained habits of drivers who travel a route regularly. The CROSS TRAFFIC DOES NOT STOP sign is only removed when its continued presence is not required.

Sign Types

The **CROSS TRAFFIC DOES NOT STOP sign (Wa-19)** is the standard text sign.

The **AFTER (month and day) tab sign (Wa-19t)** should be used with the CROSS TRAFFIC DOES NOT STOP sign to specify when the sign message takes effect.

Guidelines for Use

The CROSS TRAFFIC DOES NOT STOP sign and the AFTER (month and day) tab sign are used for the following changes in intersection right-of-way control:

- Where right-of-way is being reassigned from one roadway to another crossing roadway, through the elimination of an existing STOP sign control and the installation of STOP sign control on the previously uncontrolled roadway; or
- Where an existing all-way stop control is to be removed and a through roadway created.

Detailed recommended procedures have been developed for implementing these changes in right-of-way control (see Special Considerations).

The NEW sign is described in Section 6 (Traffic Regulations Ahead Signs). For more information on right-of-way control, STOP signs and ALL-WAY tab signs, see Book 5 (Regulatory Signs).

Location Criteria

The location criteria for these signs are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

Procedures for Amending Intersection Right-of-way Control

Where right-of-way is being reassigned from one roadway to another crossing roadway, through the elimination of an existing STOP sign control and the installation of STOP sign control on the previously uncontrolled roadway, an introductory period is required to safely carry out the transition.

The recommended procedure for completing such a reversal is described below.

(1) Install new STOP signs on the previously uncontrolled approaches along with stop lines and crosswalk markings, if required. Oversize STOP signs and/or additional left side installations may be provided where conditions warrant. Install ALL-WAY tabs on all approaches. A painted STOP legend on the roadway, in advance of the stop line, may be added for additional emphasis.

Install a CROSS TRAFFIC DOES NOT STOP sign (Wa-19), on the newly controlled roadway, in advance of the STOP sign. This is the standard size of sign. A larger size may be used where prevailing traffic conditions warrant greater visibility or emphasis, e.g., in complex visual environments where many signs and other devices compete for driver attention.

Install a NEW sign (Wb-3) above, and an AFTER (month and day) tab (Wa-19t) below, stating the date that the old control will be removed. The warning sign's position should be such that it does not block the approaching motorist's view of the STOP sign but commands attention and may be read as the driver approaches the stop line. A location approximately 30 m in advance of the stop line is recommended, in low speed applications.

Install a STOP AHEAD (Wb-1) sign, with NEW sign (Wb-3) above, at the proper location in advance of the intersection on the newly controlled approaches. An oversize STOP AHEAD sign, and a STOP AHEAD roadway marking legend may be provided for additional warning where conditions warrant.

(2) After 30 days, remove the STOP AHEAD signs, if any, the STOP signs, stop lines and any crosswalk lines from the previously controlled roadway. Remove the ALL-WAY tabs from all approaches. Remove the NEW signs on the Wa-19 signs and the STOP AHEAD signs. Remove the Wa-19t tabs. Any roadway marking legends, if provided, should be allowed to fade and not be replenished unless local conditions warrant the continued provision of this additional warning.

(3) After an additional period of at least 30 days, the Wa-19 signs should be removed. Any oversize STOP signs may now be replaced with standard size signs unless the continued additional emphasis is warranted. STOP AHEAD signs should be reduced from oversize to standard size or removed if their continued presence is unwarranted.

Where an existing all-way stop control is to be removed and a through roadway created, the following procedure is recommended:

(1) Install CROSS TRAFFIC DOES NOT STOP signs (Wa-19) on the approaches where the STOP control is to remain, at least 30 days before the removal of control.

Install a NEW sign (Wb-3) over the sign and an AFTER (month and day) tab sign (Wa-19t), stating the date when the control on the crossing roadway will be removed.

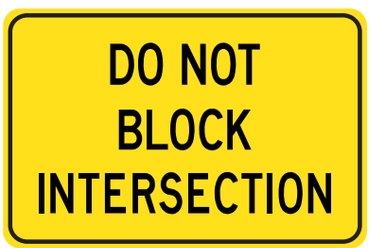
(2) On the appointed date, remove the STOP AHEAD signs, if any, on the crossing roadway. Remove the STOP signs, stop lines and any crosswalk lines on these approaches. Remove all of the ALL-WAY tabs at the intersection. Remove the Wa-19t tabs from the warning signs.

(3) After an additional period of at least 30 days, the NEW signs and Wa-19 signs should be removed.

Any actual removal or revision of the control at an intersection should occur prior to the start of the morning peak on the specified date, both to preserve the integrity of the Wa-19t tab message and to permit the revision to take place during a period of reduced demand.

DO NOT BLOCK INTERSECTION Sign

10



Wa-73	**60 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the DO NOT BLOCK INTERSECTION sign is to warn queuing drivers to leave a gap in the queue at an intersection, so vehicles can enter and leave the cross street. The sign is typically used in urban settings, for example, where an unsignalized intersection immediately upstream of a signalized intersection tends to be blocked by traffic queuing for a red signal.

The DO NOT BLOCK INTERSECTION sign is a rectangular sign, rather than a diamond-shaped one, to better accommodate the text message.

Sign Types

There is one type of **DO NOT BLOCK INTERSECTION Sign: (Wa-73)**.

Guidelines for Use

The DO NOT BLOCK INTERSECTION sign should be used only where a recurring problem has been identified that queuing drivers are cutting off access to and egress from cross streets at unsignalized intersections.

The DO NOT BLOCK INTERSECTION sign should not be used to refer to driveways and unsignalized commercial entrances.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

4. Specific Roadway Features Signs

Specific roadway features signs warn road users of physical features other than turns and curves. These physical features include hills, narrow structures, pavement transitions, roadway surface changes, obstructions beside, around, above or on the road, and similar conditions which may constitute unexpected hazards. Appropriate warning signs are therefore placed in advance of such conditions to alert the motorist and to enable the motorist to cope successfully with the hazard. Signs warning of changes in horizontal alignment (e.g., curve/turn warning signs) are discussed separately in Section 2 (Roadway Alignment Signs).

STEEP HILL Sign

Wa-21	75 cm x 75 cm
Wa-121	90 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

USE LOWER GEAR Tab Sign

Wa-21t	45 cm x 75 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

HAZARD LENGTH Tab Sign

Wa-6t	30 cm x 60 cm
Font	Helvetica Bold Condensed
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of the STEEP HILL sign and its associated tab signs is to notify motorists of steep downgrades that may require a change in driving behaviour. Not being aware of steep hills in time could result in drivers, particularly truck drivers, beginning the descent too fast and losing control over their vehicles.

Sign Types

The **standard size STEEP HILL sign (Wa-21)** should be used where the posted speed is 60 km/h or less.

The **oversize STEEP HILL sign (Wa-121)** should be used where the posted speed is 70 km/h or greater.

The **USE LOWER GEAR tab sign (Wa-21t)** informs drivers that a lower gear is required to safely negotiate the steep hill.

The **HAZARD LENGTH tab sign (Wa-6t)** informs drivers of the length of the steep hill hazard.

Guidelines for Use

The STEEP HILL sign must only be used in advance of downgrades of 6% or more:

- Where the length of the grade is greater than indicated in Table 10; or
- Where any part of the grade is affected by adverse geometrics which complicate the driving task, (e.g., sharp curves or intersections).

The steepest grade of the descent must be indicated at the bottom of the sign, as part of the sign legend.

Where a safe descent of the grade requires driving in intermediate or low gear, the oversize STEEP HILL sign (Wa-121) must be used, together with the USE LOWER GEAR tab sign.

For grades 6% or steeper, having a length of more than 1,000 m, the supplementary HAZARD LENGTH tab sign (Wa-6t), may also be used, to prepare drivers for the significant length of the hill.

Table 10 – Minimum Grades for Steep Hill Signing

Percent Grade	Minimum Length of Grade to Require Steep Hill Signing (m)
6	600
7	300
8	250
9	150
11	120
13	100
15	50
16 or greater	Any length

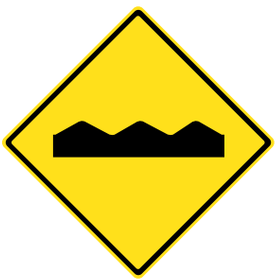
Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

BUMP Sign



Wa-22	60 cm x 60 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

BUMP AHEAD Sign

Wa-22A	60 cm x 60 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

HAZARD LENGTH Tab Sign

Wa-6t	30 cm x 60 cm
Font	Helvetica Bold Condensed
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

BUMP Tab Sign

Wa-22t	22.5 cm x 45 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of the BUMP AHEAD and BUMP signs is to give warning of a sharp change in the profile of the roadway that is sufficiently abrupt:

- to create a hazardous discomfort to passengers;
- to cause a shifting of cargo; or
- to deflect a vehicle from its intended course when the bump is crossed at the posted speed limit.

Drivers typically need to slow down to negotiate the bump in a safe and comfortable manner.

Sign Types

The **BUMP sign (Wa-22)** is used to indicate that a bump is located adjacent to the sign.

The **BUMP AHEAD sign (Wa-22A)** is an advance warning sign used to indicate that a bump is located downstream of the sign.

The **HAZARD LENGTH tab sign (Wa-6t)** informs drivers of the length of the bump hazard.

The **BUMP tab sign (Wa-22t)** may be attached to the BUMP sign (Wa-22) to convey in words the meaning of the bump symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The BUMP sign (Wa-22) must be used whenever there is a sharp change in profile that cannot be driven safely or comfortably at the posted speed. This sign is not an advance sign, as are most warning signs. Instead, it is installed directly adjacent to the bump, since it is difficult for drivers to identify from a distance the exact bump location.

The BUMP AHEAD sign (Wa-22A) must be used in advance of the BUMP sign.

Where a series of bumps occur over a significant length of roadway, a supplementary HAZARD LENGTH tab sign (Wa-6t) may be added to the BUMP AHEAD sign to indicate the distance in kilometres over which bumps may be experienced.

Location Criteria

The BUMP AHEAD sign (Wa-22A) must be located in advance of the bump or series of bumps. The BUMP sign (Wa-22) must be placed directly adjacent to the bump.

If a Wa-6t supplementary tab is used, the message should be repeated at intervals of 5 km, and downstream of major intersections.

Special Considerations

N/A

SPEED HUMP Sign

Wa-74	**45 cm x 45 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

SPEED HUMP Tab Sign

Wa-74t	**22.5 cm x 45 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the SPEED HUMP sign is to warn road users travelling in a slow speed environment (e.g., traffic-calmed neighbourhood) of the locations of speed humps, so that they can safely brake and manoeuvre their vehicles comfortably over the speed hump.

It is assumed that drivers are aware from other signing and contextual information when they are in traffic-calmed neighbourhoods or other slow speed zones, and that they are already travelling at an appropriate speed. Therefore, advance warning of speed humps is not normally required.

Sign Types

The **SPEED HUMP sign (Wa-74)** is used to indicate that a speed hump is located adjacent to the sign.

The **SPEED HUMP tab sign (Wa-74t)** may be attached to the SPEED HUMP sign (Wa-74) to convey in words the meaning of the speed hump symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The SPEED HUMP sign (Wa-74) should be used whenever there is a speed hump within the context of a traffic-calmed neighbourhood or other slow speed zone. This sign is not an advance sign, as are most warning signs. Instead, it is installed directly adjacent to the speed hump, since it is difficult for drivers to identify from a distance the exact speed hump location.

Pavement markings are used to distinguish speed humps. For more details, see Book 11 (Markings and Delineation).

For more information on the use of SPEED HUMP signs in the context of traffic-calmed neighbourhoods, see Book 20 (Traffic Calming).

Location Criteria

The SPEED HUMP sign (Wa-74) must be placed directly adjacent to the speed hump.

Special Considerations

N/A

NARROW STRUCTURE Sign

Wa-24 **Wa-124**	**75 cm x 75 cm** **90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

ONE LANE ONLY WHEN USED BY TRUCKS Sign

Wa-24A	**90 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

ONE LANE Tab Sign

Wa-24t	**45 cm x 60 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

NARROW BRIDGE Tab Sign

Wa-70t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the NARROW STRUCTURE sign is to indicate:

- A decrease in the width of the roadway, resulting from a structure that is narrower than the approach roadway width; or
- A structure having a clear roadway width of less than 6 m.

Narrow structures include bridge culverts, tunnels or subways, underpasses, overpasses or similar structures.

For tunnels or subways with arched openings, the decreased roadway width may result in commercial vehicles having to use the centre of the roadway to maintain truck height clearance. In this event, the tunnel is effectively restricted to one lane whenever a commercial vehicle is present. If the overall roadway width at a structure is sufficiently narrow, all vehicles may have to drive in the centre of the road. That section of the roadway then becomes a one-lane roadway.

Drivers need to be warned of narrow structures, since they may need to adjust the positions of their vehicles laterally to clear the sides of the structure, exert additional caution or reduce speed. If commercial vehicles are required to drive in the centre of the roadway, they must be alerted to do so. Furthermore, it is critical that other vehicles are made aware of this condition in order to avoid collisions, including head-on collisions. Similarly, if a one-lane roadway is created because of a very narrow structure, it is critical that all vehicles be alerted to use added caution, so that head-on collisions do not occur.

Sign Types

The **standard size NARROW STRUCTURE sign (Wa-24)** should be used where the posted speed is 60 km/h or less.

The **oversize NARROW STRUCTURE sign (Wa-124)** should be used where the posted speed is 70 km/h or greater.

The **ONE LANE ONLY WHEN USED BY TRUCKS sign (Wa-24A)** is used in conjunction with the oversize NARROW STRUCTURE sign (Wa-124), where commercial vehicles must drive in the centre of a road in order for the top of the vehicle to clear the opening of a structure such as a subway or tunnel.

The **ONE LANE tab sign (Wa-24t)** should be used to indicate that the lateral clear width of the structure may not accommodate two vehicles traversing the structure simultaneously.

The **NARROW BRIDGE tab sign (Wa-70t)** may be attached to the NARROW STRUCTURE sign at a bridge or overpass application, to convey in words the meaning of the narrow structure symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The NARROW STRUCTURE sign must be used to indicate a bridge culvert, tunnel or subway, underpass, overpass or similar structure:

- Having a clear roadway width of less than 6 m; or
- With a roadway clearance less than the width of the approach pavement.

In all cases where the NARROW STRUCTURE sign is required, additional emphasis must be provided by the use of OBJECT MARKER signs (Wa-33) to warn drivers of the physical limits of the structure. More information on the OBJECT MARKER sign is provided later in Section 4 and in Book 11 (Markings and Delineation).

Where a tunnel or subway with an arched opening results in a truck having to use the centre of the roadway in order to clear the top of the structure opening, an oversize Wa-124 sign must be used and augmented by the downstream placement of the ONE LANE ONLY WHEN USED BY TRUCKS sign (Wa-24A).

The ONE LANE tab sign (Wa-24t) must be used where the structure has a clear roadway width of less than 5 m, thereby permitting only a single lane of traffic. The sign may also be used:

- Where the roadway width of the structure is less than 5.5 m; or
- Where the road alignment of the approach to the structure is poor.

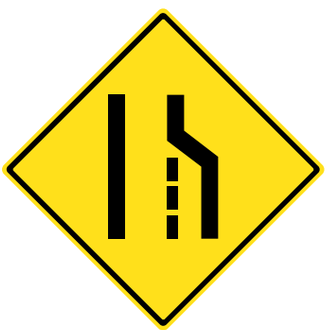
Location Criteria

The ONE LANE ONLY WHEN USED BY TRUCKS sign (Wa-24A) must be installed approximately 50 m downstream of the NARROW STRUCTURE sign.

Special Considerations

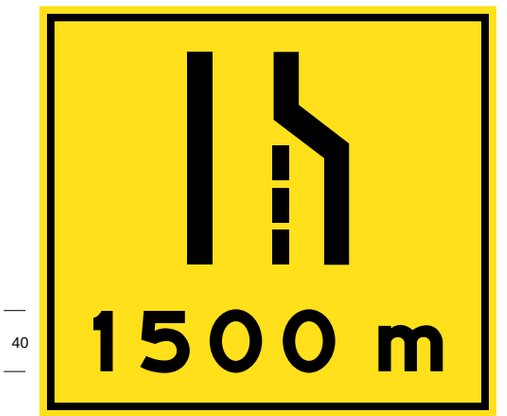
N/A

LANE ENDS Sign



Wa-23R	75 cm x 75 cm
Wa-123R	90 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

LANE ENDS Sign (Overhead)



Wa-1123R	270 cm x 300 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

DISTANCE Tab Sign

Wa-23t	30 cm x 60 cm
Wa-123t	45 cm x 90 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

RIGHT LANE ENDS Tab Sign

Wa-23Rt	**60 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

LEFT LANE ENDS Tab Sign

Wa-23Lt	**60 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the LANE ENDS sign is to give drivers advance notice of a reduction in the number of lanes, such as from three lanes to two lanes, or from four lanes to three lanes. Typical applications of the sign include:

- Acceleration lanes with tapers at freeway on ramps;
- Right turn channelized lanes; and
- Three-lane sections of highway, where the middle lane is a passing lane (e.g., truck climbing lane) allocated to one direction of traffic.

Drivers need to be warned of lane reductions so that drivers in the lane being discontinued can safely perform the lane change manoeuvre to merge into the through lane. Also, drivers in the through lane(s) need to be aware of, and to accommodate, vehicles from the discontinued lane merging into their own lane(s).

Sign Types

The **standard size LANE ENDS sign (Wa-23)** should be used where the posted speed is 60 km/h or less.

The **oversize LANE ENDS sign (Wa-123)** should be used where the posted speed is 70 km/h or greater.

The **special oversize LANE ENDS sign (overhead) (Wa-1123)** should be used on divided highways where the posted speed is 90 km/h or greater, and where a lane is discontinued where it would not normally be expected, e.g., beyond an exit ramp.

The **left** version of the LANE ENDS sign (Wa-23L, Wa-123L) indicates that the left lane is being discontinued. The **right** version of the LANE ENDS sign (Wa-23R, Wa-123R) indicates that the right lane is being discontinued.

The **DISTANCE tab sign** indicates the distance to the lane end hazard. If a DISTANCE tab sign is used, the **standard size DISTANCE tab sign (Wa-23t)** must be used with the standard size LANE ENDS sign

(Wa-23) and the **oversize DISTANCE tab sign (Wa-123t)** must be used with the oversize LANE ENDS sign (Wa-123) or the special oversize LANE ENDS sign (overhead) (Wa-1123).

The **LEFT LANE ENDS tab sign (Wa-23Lt)** may be attached to the LEFT LANE ENDS sign, and the **RIGHT LANE ENDS tab sign (Wa-23Rt)** may be attached to the RIGHT LANE ENDS sign, to convey in words the meaning of the sign symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

On freeways and on rural non-freeways, the LANE ENDS sign must be used where the right lane or the left lane is discontinued, and the termination is unexpected or out of the driver's view. On urban non-freeways, the sign should be used on roads where a lane becomes unavailable to through traffic at any time, and the termination is unexpected or out of the driver's view. It must not be used where the number of lanes in the cross-section is reduced because a dedicated turning lane disappears downstream of an intersection, where a lane is truncated at the far side of an intersection (e.g., by a bus bay), or where a lane physically continues but is occupied by parked vehicles.

The LANE ENDS sign should be used where the length of an acceleration lane and/or taper is greater than the values specified in Table 11.

A LANE ENDS sign must not be used where the length of acceleration lane and/or taper is less than specified in Table 11. If this is the case, either a MERGE sign (Wa-16) or a YIELD sign (Ra-2) applies on the minor roadway. The length of the acceleration lane/ taper determines whether the LANE ENDS sign, MERGE sign or YIELD sign is the correct sign to be used (see Table 9).

The supplementary DISTANCE tab sign (Wa-23t) should be used:

- At locations where, due to horizontal or vertical curvature, the start of the lane reduction is not visible sufficiently in advance to safely perform the required lane change manoeuvre; or
- Where considered desirable for an education period.

The oversize supplementary DISTANCE tab sign (Wa-123t) must be used with the oversize LANE ENDS sign (Wa-123) at truck climbing lane and other passing lane locations. For this application, the "300 m" text on the tab sign should be consistently used so that driver expectations can be developed based on a standard distance between the sign and lane termination.

Pavement markings and delineators must also be used to mark lane end transitions. In terms of pavement markings, lane end transitions are typically indicated with dashed continuity lines that are wider and more densely spaced than dashed lane lines, and by widening the road edge line adjacent to the lane

Table 11 – Minimum Acceleration Lane/Taper Lengths for LANE ENDS Sign

Normal Regulatory Posted Speed on Through Highway (km/h)	Minimum Length of Acceleration Lane and/or Taper (m)
50	115
60	135
70	165
80	180
90	200
100	225

being terminated. More information on lane end pavement markings and delineators is provided in Book 11 (Markings and Delineation).

Location Criteria

On divided highways where the width of the median island can accommodate a sign, two LANE ENDS signs must be installed, one on the median and one on the shoulder. In this type of situation, the sign on the median must be placed 300 m upstream of the sign on the shoulder.

At truck climbing lane and other passing lane locations, the LANE ENDS sign must be placed 300 m upstream of the lane termination.

Special Considerations

N/A

ROADWAY NARROWS Sign

Wa-28	**75 cm x 75 cm**
Wa-128	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

ROAD NARROWS Tab Sign

8

Wa-28t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the ROADWAY NARROWS sign is to warn traffic of a reduction in roadway width, preventing two vehicles from passing or meeting safely without reducing speed. Drivers need to be warned of narrowing roads, to have time to reduce speed and make driver judgements necessary to avoid head-on collisions or driving off the side of the road.

Sign Types

The **standard size ROADWAY NARROWS sign (Wa-28)** should be used where the posted speed is 60 km/h or less.

The **oversize ROADWAY NARROWS sign (Wa-128)** should be used where the posted speed is 70 km/h or greater.

The educational **ROAD NARROWS tab sign (Wa-28t)** may be attached to the ROADWAY NARROWS sign, to convey in words the meaning of the sign symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The ROADWAY NARROWS sign must be used to indicate a reduction in roadway width, where the number of lanes is not reduced. The sign must be used:

- On all high-volume roads;
- On low-volume roads where the pavement is reduced to a width of less than 5 m.

The symbol on the sign indicates only that part of the road configuration where the width reduction occurs. However, the sign also applies at locations not covered by the NARROW STRUCTURE sign, where the road narrows for a distance, then broadens back to its previous width. The NARROW STRUCTURE sign is described earlier in Section 4.

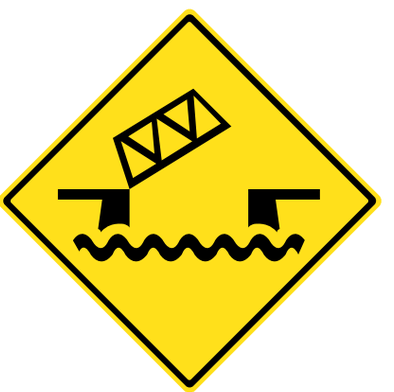
Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

OPENING BRIDGE Sign



Wa-30	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

OPENING BRIDGE Tab Sign

Wa-30t	**45 cm x 75 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the OPENING BRIDGE sign is to alert motorists of bridges that, when in operation, can be lifted or swung to permit the passage of watercraft.

Sign Types

The **OPENING BRIDGE sign (Wa-30)** is the standard symbol sign.

The **OPENING BRIDGE tab sign (Wa-30t)** may be attached to the OPENING BRIDGE sign to convey in words the meaning of the opening bridge symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The OPENING BRIDGE sign (Wa-30) must be installed upstream of all locations where a bridge, when in operation, can be lifted or swung to permit the passage of watercraft.

At locations where the speed and volume of traffic on the approaches to the bridge are high, traffic signals may be necessary to control traffic at the bridge. If this is the case, a TRAFFIC SIGNALS AHEAD sign must also be used. See Section 6 (Traffic Regulations Ahead Signs) for a description of the TRAFFIC SIGNALS AHEAD sign, and Book 12 (Traffic Signals) for more information on traffic signals.

Location Criteria

For locations where traffic signals are warranted, the TRAFFIC SIGNALS AHEAD sign (Wb-2) must be placed upstream of the bridge and the OPENING BRIDGE sign must be placed upstream of the Wb-2 sign.

Special Considerations

N/A

TEMPORARY BRIDGE Sign

Wa-30A	**90 cm x 90 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

ADVISORY SPEED Tab Sign

Wa-7t	**45 cm x 45 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the TEMPORARY BRIDGE sign is to alert motorists that they are approaching a temporary bridge structure, such as a Bailey bridge, on which speed of operation is severely reduced. A Bailey

bridge is a modular steel truss bridge often used on construction sites, due to its ease and speed of installation and removal. Drivers need to reduce speed and exercise caution when driving on a Bailey bridge or other type of temporary bridge, because of the typically narrow lanes, and because slipping off the driving surface and coming into contact with the transverse deck members may result in loss of vehicle control.

Sign Types

The **TEMPORARY BRIDGE sign (Wa-30A)** is the standard text sign.

The **ADVISORY SPEED tab sign (Wa-7t)** indicates to drivers the safe speed for travelling across the temporary bridge.

Guidelines for Use

The TEMPORARY BRIDGE sign (Wa-30A) must be installed upstream of all temporary bridge locations.

Where the posted speed on the approach to the temporary bridge is greater than 50 km/h, the ADVISORY SPEED tab sign (Wa-7t) must be used in conjunction with this sign. The advisory speed to be posted must be determined by the local Road Authority.

Location Criteria

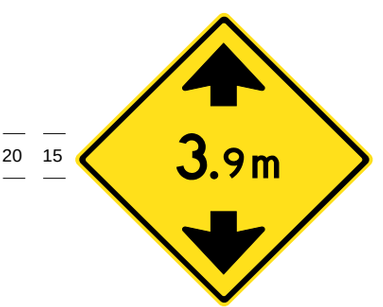
The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

The TEMPORARY BRIDGE sign replaces the BAILEY BRIDGE sign, since many drivers do not know what is meant by a Bailey bridge, and can better perceive the hazards associated with a structure referred to as a temporary bridge.

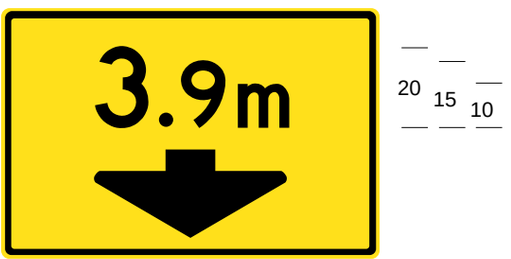
The new sign design must be implemented on all installations by January 1, 2007.

LOW CLEARANCE AHEAD XX M Sign



Wa-26	**60 cm x 60 cm**
Wa-126	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

LOW CLEARANCE XX M Sign

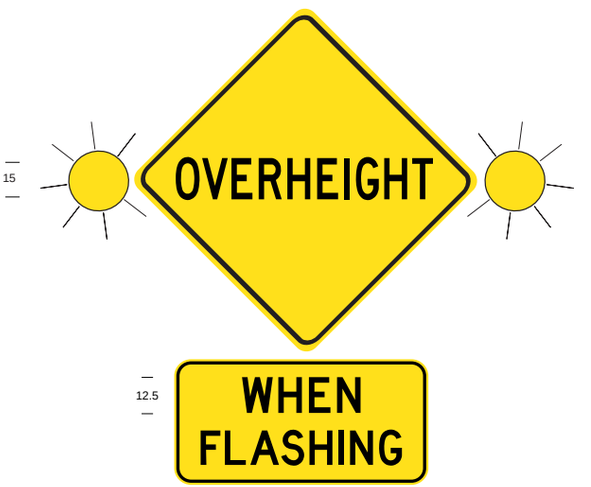


Wa-27	60 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

DISTANCE Tab Sign

Wa-23t	30 cm x 60 cm
Wa-123t	45 cm x 90 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

OVERHEIGHT Sign (With Amber Flashers)



Wa-76	90 cm x 90 cm
Wa-176	120 cm x 120 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

WHEN FLASHING Tab Sign

Wa-76t	45 cm x 90 cm
Wa-176t	60 cm x 120 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of the LOW CLEARANCE signs is to warn of low overhead clearance at low bridges, underpasses and other structures, by showing the calculated amount of vertical clearance. The advance sign provides information to motorists so that they can change their route if required, prior to arriving at the hazard.

The OVERHEIGHT sign (with amber flashers) and the WHEN FLASHING tab sign, in conjunction with an electronic overheight vehicle detection system, may be used to warn specific drivers that their vehicles are too high to clear a low height structure.

Sign Types

The **standard size LOW CLEARANCE AHEAD XX M sign (Wa-26)** is an advance warning sign, and should be used where the posted speed is 60 km/h or less.

The **oversize LOW CLEARANCE AHEAD XX M sign (Wa-126)** is an advance warning sign, and should be used where the posted speed is 70 km/h or greater.

The **LOW CLEARANCE XX M sign (Wa-27)** is used at the upstream end of the actual low clearance location.

The **standard size DISTANCE tab sign (Wa-23t)** indicates distance to the hazard and may be used in conjunction with the standard size LOW CLEARANCE AHEAD XX M sign.

The **oversize DISTANCE tab sign (Wa-123t)** indicates distance to the hazard and may be used in conjunction with the standard size LOW CLEARANCE AHEAD XX M sign.

The **standard size OVERHEIGHT sign (with amber flashers) (Wa-76)** is used in conjunction with an electronic overheight vehicle detection system, and should be used where the posted speed is 60 km/h or less.

The **oversize OVERHEIGHT sign (with amber flashers) (Wa-176)** is used in conjunction with an electronic overheight vehicle detection system, and should be used where the posted speed is 70 km/h or greater.

The **standard size WHEN FLASHING tab sign (Wa-76t)** must be used in conjunction with the standard size OVERHEIGHT sign (with amber flashers) (Wa-76) to indicate the intent of the amber flashing beacons.

The **oversize WHEN FLASHING tab sign (Wa-176t)** must be used in conjunction with the oversize OVERHEIGHT sign (with amber flashers) (Wa-176) to indicate the intent of the amber flashing beacons.

Guidelines for Use

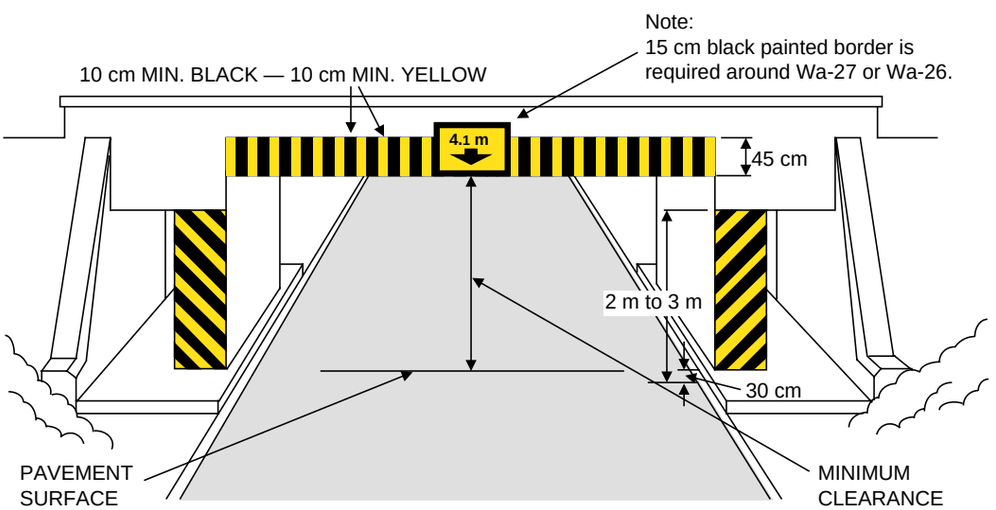
The LOW CLEARANCE XX M sign (Wa-27) must be used at all locations where clearance from the roadway to the low point of a low bridge, tunnel, underpass or other overhead structure is less than 4.5 m. The clearance to be posted must be calculated by:

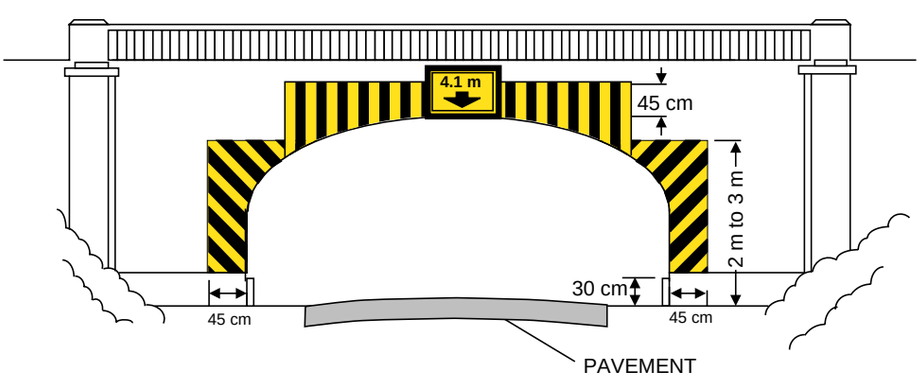
- Taking the measured clearance (to the nearest 0.01 m);
- Rounding down to the nearest 0.1 m; and
- Subtracting an additional 0.1 m to allow for a safety margin.

For example, if the measured clearance is 4.08 m, then the value would be rounded down to 4 m and then, with an additional 0.1 m, subtracted the posted clearance would be 3.9 m.

The LOW CLEARANCE AHEAD XX M sign (Wa-26) must be installed upstream of the low clearance. Wherever possible, advance warning of the low clearance condition must be provided at the last opportunity upstream of the structure where overheight vehicles can select an alternate route without turning back. If this location is significantly

Figure 4 – Clearance Markings – Low Clearance Structures





ARCH TYPE UNDERPASS

greater than the minimum advance warning sign placement distance specified in Table 4, two LOW CLEARANCE AHEAD XX M signs must be installed as follows:

- One at the minimum advance warning sign placement distance, or near this point and upstream of it; and

- One at the alternate route decision point, together with a DISTANCE tab sign to indicate the atypical advance sign placement distance.

Black and yellow striped markings must be painted on overhead structures where the clearance between the road surface and the structure is less than 4.15 m. In this situation, a 15 cm solid black border must be placed around the perimeter of the LOW CLEARANCE XX M sign, to more clearly distinguish the sign from the painted background. The placement of the LOW CLEARANCE XX M sign on a marked overhead structure is illustrated in Figure 4. More information on low structure markings is provided in Book 11 (Markings and Delineation).

Where overheight vehicles frequently travel along a route having a low clearance structure, an electronic overheight vehicle detection system may be installed in conjunction with dynamic message signing or the OVERHEIGHT sign (with amber flashers) (Wa-76) together with the WHEN FLASHING tab sign (Wa-76t). For more information on electronic overheight vehicle detection systems and dynamic message signing for this application, see Book 10 (Changeable Message Signs) and Book 19 (Advanced Traffic Management Systems).

Two flashing amber beacons interconnected with the signal controller must be part of the OVERHEIGHT sign (with amber flashers). The double amber beacons must flash in an alternating side-to-side pattern. The beacons must be flashed at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal. For more information on the operation of the flashing beacons, see Book 12 (Traffic Signals).

The OVERHEIGHT sign (with amber flashers) must be illuminated from above at night to prevent message washout from the flashing beacons.

The OVERHEIGHT sign (with amber flashers) (Wa-76) must be installed upstream of the low clearance and downstream of the overheight sensors and the LOW CLEARANCE XX M AHEAD sign. Wherever possible, the OVERHEIGHT sign (with amber flashers) must be placed upstream of the structure where overheight vehicles can select an alternate route without turning back. If this location is significantly greater than the minimum advance warning sign placement distance specified in Table 4, a second sign should be installed downstream of the alternate route access point and downstream of the second LOW CLEARANCE AHEAD XX M sign.

Location Criteria

The advance LOW CLEARANCE AHEAD XX M sign (Wa-26) and, if required in conjunction with an overheight vehicle detection system, the OVERHEIGHT sign (with amber flashers) (Wa-76) must be located upstream of the structure with the low clearance. Additional guidelines for placement of these signs are included under Guidelines for Use.

The LOW CLEARANCE XX M sign (Wa-27) must be located at the upstream end of the structure, at the point where the low clearance is first encountered. The sign at the hazard location is required to clearly identify to drivers the structure referred to by the advance sign, and to indicate the exact places having low clearance.

The following location criteria govern the mounting locations of the LOW CLEARANCE XX M sign (Wa-27) on the actual structure:

- The LOW CLEARANCE XX M sign (Wa-27) must be mounted on the structure, if possible, just above the opening and over the centre of the roadway.
- If the clearance between the roadway and the structure is less at the curb or edge of pavement than at the centre line, an additional LOW CLEARANCE XX M sign must be installed on the structure, just above the opening and over the curb or edge of pavement.
- Where there is a difference in clearance across the structure, and the roadway is considered as one lane when used by trucks, there must be three LOW CLEARANCE XX M signs located at the centre line and each edge of pavement.

Special Considerations

N/A

PAVEMENT ENDS Sign

Wa-25	**75 cm x 75 cm**
Wa-125	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

PAVEMENT ENDS Tab Sign

Wa-25t	**30 cm x 60 cm**
Wa-125t	**45 cm x 90 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

Purpose and Background

The PAVEMENT ENDS sign is used to warn motorists that an asphalt or concrete roadway is about to end and that its continuation has a gravel surface. It is critical that drivers notice the PAVEMENT ENDS sign and understand its meaning, since the change in road

surface is not obvious from the driving context, especially at night. If the transition is from a smooth to a very rough surface, unprepared drivers may lose control of their vehicles.

Sign Types

The **standard size PAVEMENT ENDS sign (Wa-25)** should be used where the posted speed is 60 km/h or less.

The **oversize PAVEMENT ENDS sign (Wa-125)** should be used where the posted speed is 70 km/h or greater.

The **standard size PAVEMENT ENDS tab sign (Wa-25t)** may be used in conjunction with the standard size PAVEMENT ENDS sign (Wa-25), and the **oversize PAVEMENT ENDS tab sign (Wa-25t)** may be used in conjunction with the oversize PAVEMENT ENDS sign (Wa-125), to convey in words the meaning of the pavement ends symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The PAVEMENT ENDS sign (Wa-25) must be used where an asphalt or concrete roadway is about to end and the roadway continuation has a gravel surface.

The PAVEMENT ENDS sign must also be used on road sections where the pavement has been torn up, for a temporary duration or permanently, for distances greater than 150 m.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

SOFT SHOULDERS Sign

10

Wa-29	**60 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the SOFT SHOULDERS sign is to warn drivers of a potential hazard that they would encounter if their vehicles were to leave the roadway. Causes of soft shoulders include erosion and recent grading. Soft shoulders are a temporary hazard that exists until the condition causing it can be corrected.

Sign Types

There is one type of **SOFT SHOULDERS sign: (Wa-29)**.

Guidelines for Use

The SOFT SHOULDERS sign must be used where soft shoulders present a hazard to vehicles that may leave the pavement.

The sign is intended for temporary application only, and must only be in place as long as the soft shoulder condition exists. It should be removed after the shoulders have become thoroughly compacted.

Location Criteria

This sign should be placed at regular intervals, at spacings of about 300 m to 600 m, and downstream of major intersections.

Special Considerations

N/A

NO EXIT Sign

Wa-31	**45 cm x 45 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the NO EXIT sign is to warn motorists at an entrance to a side road that the side road has no outlet. The sign is intended to divert through traffic, and to prevent unnecessary and potentially hazardous back-tracking manoeuvres.

Sign Types

There is one type of **NO EXIT sign: Wa-31**.

Guidelines for Use

The NO EXIT sign must be used at the entry point to a roadway that has no outlet.

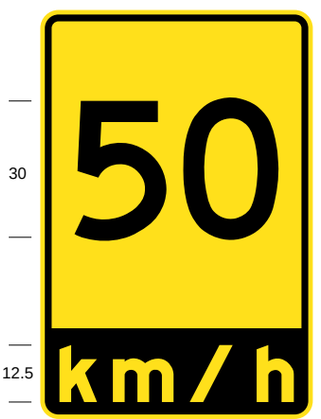
Location Criteria

The sign must be conspicuously posted on both sides of the entrance, at an angle of 45 degrees to the centreline of the no exit road, so as to be easily seen by traffic approaching from the left, right or head-on.

Special Considerations

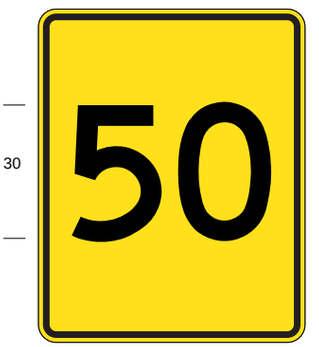
N/A

RAMP SPEED KM/H Sign



Wa-32	60 cm x 90 cm
Wa-132	90 cm x 120 cm
Wa-1132	150 cm x 210 cm
Font	Highway Gothic D & E (Standard) Highway Gothic C (Oversize)
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

RAMP SPEED Sign



Wa-32A	60 cm x 75 cm
Wa-132A	90 cm x 120 cm
Font	Highway Gothic D & E (Standard) Highway Gothic C (Oversize)
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

KM/H Tab Sign

Wa-32t	20 cm x 60 cm
Wa-132t	30 cm x 90 cm
Font	Highway Gothic E
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

TRUCK OVERTURNING Sign

Wa-75	**75 cm x 75 cm**
Wa-175	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the RAMP SPEED sign is to indicate the safe speed of travel on the ramp of an interchange or channelization leg. Ramp configurations involve changes in horizontal roadway alignment, and therefore, vehicles must often reduce speed to safely negotiate ramp curves.

As is the case for turn/curve warnings, finding a realistic advisory ramp speed is critical to driver compliance and safety (see Section 2 (Roadway Alignment Signs)). The issues are even more complex, however, for ramps, which typically have tighter radii and higher superelevation. Vehicle friction must balance the considerable centrifugal force, so wet and icy roads can significantly affect the advisory speed. The combination of small radius and large superelevation also has a large impact on truck roll stability because of the higher centre of gravity of trucks.

Because of the sensitivity of safe ramp speeds to surface moisture and higher centre of gravity, the basis for setting advisory speed needs careful consideration. Setting the advisory speed on the basis of cars travelling on dry pavement would result in realistic speeds for this set of conditions, but the advisory speed would not be safe for wet or icy pavement. At this advisory speed, trucks may also be operating within a small margin of their critical roll-over speed, depending on the type of truck, type of load and load configuration. Advisory speeds based on ball-bank indicator readings do provide a small margin of safety for trucks on wet pavements. The safe and recommended solution would be to set advisory speeds, based on ball-bank indicator readings, and to warn trucks separately of overturning hazards that may exist.

The above approach results in advisory speeds which car drivers generally consider to be too low, and to which they make adjustments based on previous experience. This reinforces the need for consistency in signing advisory ramp speeds. For low advisory speeds, where there is a reduced margin of safety between the ball-bank indicator reading (i.e., the posted advisory speed) and the actual safe speed, ramp speed signing can be emphasized by using larger signs, brighter signs or flashing beacons. These emphasis techniques attract driver attention and encourage further speed reduction.

Sign Types

The **standard size RAMP SPEED KM/H sign (Wa-32)**, which includes the "km/h" text in its legend, should be used where the posted speed on the ramp approach is 60 km/h or less.

The **oversize RAMP SPEED KM/H sign (Wa-132)**, which includes the "km/h" text in its legend, should be used where the posted speed on the ramp approach is 70 km/h or greater.

The **special oversize RAMP SPEED KM/H sign (Wa-1132)**, which includes the "km/h" text in its legend, should be used on divided highways where the posted speed on the ramp approach is 90 km/h or greater, and where problems with driver compliance have been observed.

The **standard size KM/H tab sign (Wa-32t)** may be used in conjunction with the standard size RAMP SPEED sign (Wa-32A).

The **standard size RAMP SPEED sign (Wa-32A)**, which does not include the "km/h" text in its legend, should be used where the posted speed on the ramp approach is 60 km/h or less. This sign combined with the standard size KM/H tab sign (Wa-32t) may be used as an alternate to the standard size RAMP SPEED KM/H sign (Wa-32).

The **oversize RAMP SPEED sign (Wa-132A)**, which does not include the "km/h" text in its legend, should be used where the posted speed on the ramp approach is 70 km/h or greater. This sign combined with the oversize KM/H tab sign (Wa-132t) may be used as an alternate to the oversize RAMP SPEED KM/H sign (Wa-132).

The **KM/H tab sign** indicates the metric units for the ramp advisory speed limit. If it is used, the **standard size KM/H tab sign** must be used in conjunction with the standard size RAMP SPEED sign (Wa-32A), the **oversize KM/H tab sign** must be used in conjunction with the oversize RAMP SPEED sign (Wa-132A).

The **standard size TRUCK OVERTURNING sign (Wa-75)** should be used where a truck overturning hazard exists, and the posted speed on the ramp approach is 60 km/h or less.

The **oversize TRUCK OVERTURNING sign (Wa-175)** should be used where a truck overturning hazard exists, and the posted speed on the ramp approach is 70 km/h or greater.

Guidelines for Use

In some cases, a supplementary "km/h" legend text has been mandated by the Road Authority. In other cases, Road Authorities may opt to use the legend text for some or all applications.

The safe speed may be determined on the site by use of a ball-bank indicator. See the discussion on ball-bank indicator testing and other methods for determining advisory speed under the turn/curve warning sign description in Section 2 (Roadway Alignment Signs).

RAMP SPEED signs (with or without the KM/H tab sign) or RAMP SPEED KM/H signs must be used at all exit ramps from a freeway, where the safe speed is less than the speed limit on the freeway.

At entrance ramps to freeways, RAMP SPEED signs (with or without the KM/H tab sign) or RAMP SPEED KM/H signs must be used only when the speed limit on the road linking with the freeway is 60 km/h or over, and the safe speed on the ramp is less than the posted speed of the road linking with the freeway.

The TRUCK OVERTURNING sign should be used where there is an overturning hazard for trucks, as determined by factors such as tight radius, spiral curve geometrics, large superelevation, large difference between posted ramp approach speed and ramp advisory speed, operating experience, etc.

Location Criteria

Where used at ramps exiting to the right, the RAMP SPEED or RAMP SPEED KM/H sign must be located on the left hand side of the exit ramp close to the bullnose, and in line with traffic approaching the turn-off in the deceleration lane(s) or taper. At ramps exiting to the left, the signs are placed on the right hand side of the ramp.

Where used at freeway-to-freeway interchange ramps, RAMP SPEED or RAMP SPEED KM/H signs should be installed on both the left and right sides of the roadway.

Special Considerations

The above signs, excluding the TRUCK OVERTURNING sign (Wa-75, Wa-175), must have Type III or IV high intensity sheeting, as a minimum requirement, as of January 1, 2002. Type I sheeting is the minimum requirement prior to the date indicated.

OBJECT MARKER Sign (One Direction) (Left Version)

Wa-33L	30 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

OBJECT MARKER Sign (One Direction) (Right Version)

Wa-33R	30 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type III or IV

OBJECT MARKER Sign (Both Directions)

Wa-33LR	**45 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type III or IV**

Purpose and Background

Objects within and immediately adjacent to the pavement constitute a hazard to passing traffic. Bridge piers and abutments, narrow structures, raised median islands, guide rail approach ends, trees, rocks, and poles are all objects which can encroach on the roadway. OBJECT MARKER signs warn road users that they are approaching these types of objects, so that they can adjust their path and reduce speed, if necessary, to avoid contact with them.

Sign Types

The **OBJECT MARKER sign (one direction) (left version) (Wa-33L)** is placed to the left of approaching traffic, and has stripes which slope at a 45-degree angle down to the right, toward the travel lanes of the roadway.

The **OBJECT MARKER sign (one direction) (right version) (Wa-33R)** is placed to the right of approaching traffic, and has stripes which slope at a 45-degree angle down to the left, toward the travel lanes of the roadway.

The **OBJECT MARKER sign (both directions) (Wa-33LR)** is placed so that approaching traffic can travel either to the left or right of the sign, and has stripes with slope at a 45-degree angle down to both the left and the right, toward the travel lanes of the roadway.

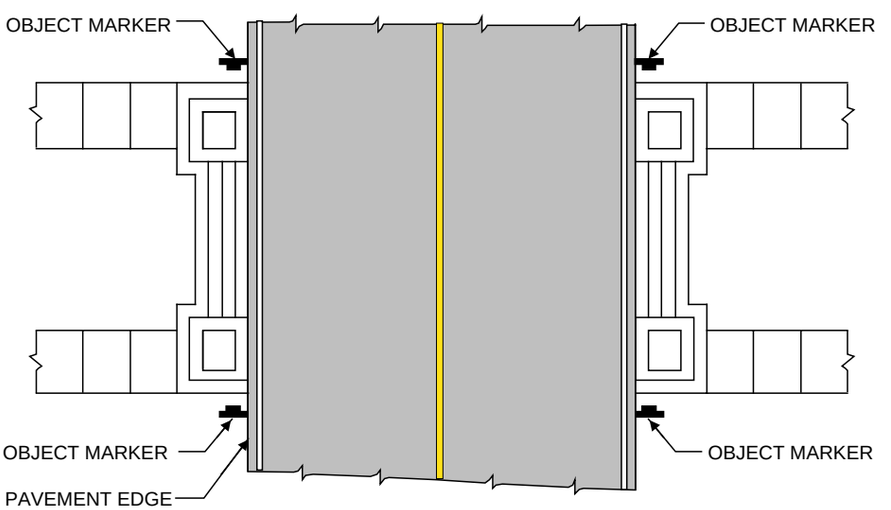
Guidelines for Use

The OBJECT MARKER sign must be used to mark all edges of a structure, such as a bridge pier or abutment, on the roadway shoulder or within 2 m or the roadway edge, if the edge of that structure is not protected by an approved safety appurtenance or guide rail system. Yellow and black markings must be painted directly onto the structures. See also Book 11 (Markings and Delineation).

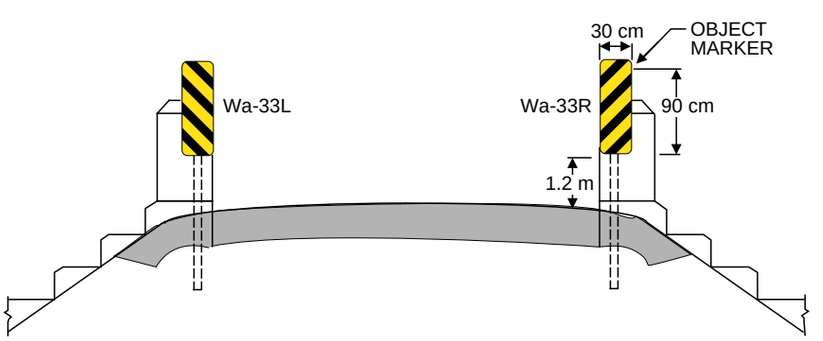
The OBJECT MARKER sign must be used on a structure wherever a NARROW STRUCTURE sign (Wa-24) is used in advance of the structure. If the structure extends above the top of the marker, markings must be painted onto the actual structure. More information on the NARROW STRUCTURE sign is provided earlier in Section 4, and more information on structure markings is provided in Book 11 (Markings and Delineation).

OBJECT MARKER signs must be used to mark all other hazards (such as trees, rocks, poles, curbs or guide rail approach ends) on the shoulder or within 2 m of the edge of the roadway in rural and urban areas.

Figure 5 – Typical Marker Location at Bridge Ends



PLAN



CROSS SECTION

All raised or depressed islands and median dividers within the flow of traffic must be marked by OBJECT MARKER signs (see Figure 3). Object markers may be installed alone or in combination with signs such as the KEEP RIGHT sign (Rb-25), DOUBLE ARROW sign (Wa-17) or guide signs. More information on the DOUBLE ARROW sign is provided in Section 2 (Roadway Alignment Signs), more information on the KEEP RIGHT sign is provided in Book 5 (Regulatory Signs), and more information on markings used with OBJECT MARKER signs is provided in Book 11 (Markings and Delineation).

OBJECT MARKER signs must be used on the approach ends of channelizing islands or dividers where traffic streams diverge and do not rejoin (such as right-turn channelization or freeway ramp gores). If inadequately indicated, this type of configuration may be unexpected by drivers, causing confusion and possibly erratic manoeuvres or other errors. For additional visibility, pavement and structure markings may be used. See Book 11 (Markings and Delineation) for more information.

Location Criteria

The OBJECT MARKER sign should normally be installed so that the bottom of the sign is 1.2 m above the surface of the nearest traffic lane.

When the OBJECT MARKER sign applies to a hazardous object which by its nature requires a lower or higher mounting, the vertical mounting height may vary according to the need. The vertical mounting height may also be varied to accommodate the height at which the headlights of an approaching vehicle on an uphill or downhill gradient will strike the marker.

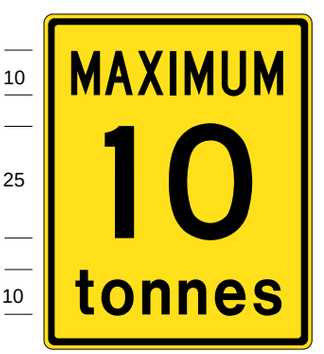
For OBJECT MARKER signs mounted on structures or objects, the inside edge of the sign (edge closest to the roadway) must be in line with the inside edge of the structure or object it marks.

Figure 5 shows the typical placement of OBJECT MARKER signs at bridge ends.

Special Considerations

The signs must have Type III or IV high intensity sheeting, as a minimum requirement, as of January 1, 2002. Type I sheeting is the minimum requirement prior to the date indicated.

MAXIMUM TONNES ADVISORY Sign (Single Gross Weight)



Wa-63	**60 cm x 75 cm**
Font	**Highway Gothic C** **Helvetica Medium**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Under some circumstances, it is necessary to limit the gross weight of vehicles on bridges on a temporary, seasonal or more permanent basis. In some cases, the configuration of the heavy vehicle (that is, its division into tractor and trailer units) is not critical to the safety of the bridge. Rather it is the

overall vehicle weight that impacts the bridge structure, and the same maximum weight restriction applies to both single and combination vehicles. If so, the MAXIMUM TONNES ADVISORY sign (single gross weight) (Wa-63) is used to limit loads on constrained bridges.

Sign Types

There is one type of **MAXIMUM TONNES ADVISORY sign (single gross weight): Wa-63**.

Guidelines for Use

Where no legal authority has been established, but an advisory load limit notice is desired, the Wa-63 MAXIMUM TONNES ADVISORY sign must be used. Once a legal authority to mandate the restriction has been obtained, the Rb-63 MAXIMUM TONNES sign (single gross weight) must be used. The Rb-63 MAXIMUM TONNES sign (single gross weight) is identical to the Wa-63 sign, except that the regulatory sign background is white instead of yellow. For more details on the Rb-63 sign, see Book 5 (Regulatory Signs).

The MAXIMUM TONNES ADVISORY sign (single gross weight) must be used on bridges where the same maximum gross weight applies to single and combination vehicles.

The MAXIMUM TONNES ADVISORY sign (single gross weight) must be used for emergency situations until a detailed analysis can be made of the bridge.

Location Criteria

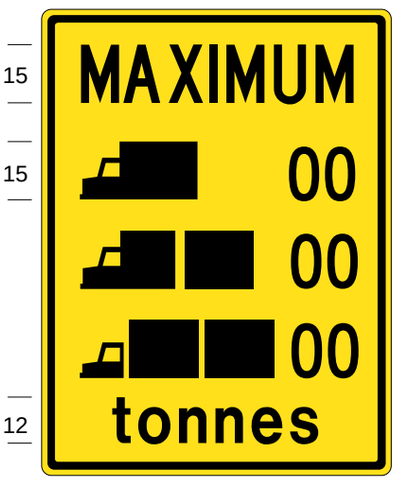
The sign must be located immediately upstream of the bridge or structure to which it applies, or mounted on the bridge structure itself. A supplementary sign may be placed on the left side of the roadway approaching the bridge or structure.

If the weight restriction applies at an intermediate point along a road where there is no alternative route, truck route signing should be provided to divert heavy vehicles to the nearest intersection where a suitable alternative route is available.

Special Considerations

N/A

MAXIMUM TONNES ADVISORY Sign (Differentiated by Truck Type)



Wa-63A	**90 cm x 120 cm**
Font	**Highway Gothic C** **Helvetica Medium**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Like the Wa-63 MAXIMUM TONNES ADVISORY sign (single gross weight), the Wa-63A MAXIMUM TONNES ADVISORY sign (differentiated by truck type) is used to limit weights of heavy vehicles on weak structures such as bridges. In some situations, vehicle configuration and the weight distribution of the different vehicle components across the bridge structure is critical to the safety of the bridge. The Wa-63A sign must be used where structural engineers have set individual load restrictions prescribing the maximum permitted gross vehicle weights for a single vehicle unit (e.g., a cube truck), a combination of two vehicle units (e.g., a tractor and trailer), and a combination of three vehicle units (e.g., a tractor and two trailers). The Wa-63A sign indicates the maximum weight for each vehicle combination.

Sign Types

There is one type of **MAXIMUM TONNES ADVISORY sign (differentiated by truck type): Wa-63A**.

Guidelines for Use

Where no legal authority has been established, but an advisory load limit notice is desired, the Wa-63A MAXIMUM TONNES ADVISORY sign (differentiated by truck type) must be used. Once a legal authority to mandate the restriction has been obtained, the Rb-63A MAXIMUM TONNES sign (differentiated by truck type) must be used. The Rb-63A MAXIMUM TONNES sign (differentiated by truck type) is identical to the Wa-63A sign, except that the regulatory sign background is white instead of yellow. For more details on the Rb-63A sign, see Book 5 (Regulatory Signs).

The MAXIMUM TONNES ADVISORY sign (differentiated by truck type) must be used on bridges where different maximum gross weights apply to single and combination vehicles.

Location Criteria

The sign must be located immediately upstream of the bridge or structure to which it applies, or mounted on the bridge structure itself. A supplementary sign may be placed on the left side of the roadway approaching the bridge or structure.

If the weight restriction applies at an intermediate point along a road where there is no alternative route, truck route signing should be provided to divert heavy vehicles to the nearest intersection where a suitable alternative route is available.

Special Considerations

N/A

5. Divided Road Transition Signs

Divided road transition signs are used to provide advance warning to drivers of a major change in road cross-section configuration, where a road splits into two roadways, or two roadways join together to form one. Examples of these transitions are:

- Transition from an undivided road with one roadway, to a divided road with two roadways (one in each direction), physically separated by an unpaved area, a raised island, or another type of physical barrier;
- Transition from a divided road to an undivided road;
- Separation of one or more entire lanes from the left or right side of the road, leading to a destination independent from that of the remaining lanes comprising the through roadway.

It is critical that drivers are informed of roadway transitions. If undetected, a transition from a divided to an undivided road could result in dangerous passing manoeuvres, if the driver does not expect oncoming traffic. Drivers who fail to notice roadway splits may inadvertently drive onto a roadway where they did not wish to be, and from which egress is difficult and possibly dangerous (for example, driving on the left side of a divided highway and confronting opposing traffic head on). Unintentionally remaining in a lane that exits is more inconvenient than dangerous, unless the driver attempts dangerous manoeuvres to return to the through lanes when it is too late to do so. It is the function of divided road transition signs to give drivers advance notice of these important transitions, so they can prepare for them and respond accordingly.

DIVIDED ROAD BEGINS Sign

Wa-34	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

DIVIDED ROAD ENDS Sign

Wa-35	75 cm x 75 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

DIVIDED ROAD BEGINS Tab Sign

10

Wa-34t	60 cm x 60 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

DIVIDED ROAD ENDS Tab Sign

10

Wa-35t	60 cm x 60 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of the DIVIDED ROAD BEGINS sign and the DIVIDED ROAD ENDS sign is to warn drivers upstream of the transition to and from a divided road. The DIVIDED ROAD BEGINS sign warns drivers that they are approaching a division of the road into two roadways, each carrying traffic in one direction only, separated by a median. The median consists of a physical barrier, such as an unpaved area with or without guard rail or a raised island with a curb. In advance of the downstream end of the divided road, the DIVIDED ROAD ENDS sign warns drivers that they are approaching a single two-direction roadway where ability to pass is restricted.

Sign Types

The **DIVIDED ROAD BEGINS sign (Wa-34)** provides advance warning of the division of a single two-direction roadway into two one-direction roadways separated by a median.

The **DIVIDED ROAD ENDS sign (Wa-35)** provides advance warning of the joining of two one-direction roadways separated by a median into a single two-direction roadway.

The **DIVIDED ROAD BEGINS tab sign (Wa-34t)** may be attached to the DIVIDED ROAD BEGINS sign (Wa-34) to convey in words the meaning of the divided road begins symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

The **DIVIDED ROAD ENDS tab sign (Wa-35t)** may be attached to the DIVIDED ROAD ENDS sign (Wa-35) to convey in words the meaning of the divided road ends symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The DIVIDED ROAD BEGINS sign and DIVIDED ROAD ENDS sign must be used for divided roads where the continuous median separating the opposing flows of traffic has a minimum length of 500 m. Divided road warning signs should not be used at urban signalized intersections where short discontinuous medians are provided primarily to organize intersection traffic movements.

The DIVIDED ROAD BEGINS sign is used together with the following warning and regulatory signs:

- KEEP RIGHT sign (Rb-25), which indicates that drivers must keep their vehicles to the right of median obstructions;

- OBJECT MARKER sign (Wa-33L), which identifies the median as a fixed object hazard within 2 m of the roadway edge. Depending on the circumstances (e.g., proximity to a signalized intersection), a flashing beacon may also be required on the OBJECT MARKER sign.

The DIVIDED ROAD ENDS sign is used together with the following warning and regulatory signs:

- TWO-WAY TRAFFIC AHEAD sign (Wb-4), which warns drivers travelling on a one-way roadway on a divided road that they are approaching a roadway section where two-way traffic is in operation, and that their ability to pass freely will be restricted by opposing traffic;

- TWO-WAY TRAFFIC sign (Rb-24), which indicates the actual transition from one-way to two-way operation for which the TWO-WAY TRAFFIC AHEAD sign provides advance warning.

Details on the OBJECT MARKER sign are provided in Section 4 (Specific Roadway Features Signs), and details on the TWO-WAY TRAFFIC AHEAD sign (Wb-4) are provided in Section 6 (Traffic Regulations

Ahead Signs). More information on the KEEP RIGHT sign (Rb-25) and the TWO-WAY TRAFFIC sign (Rb-24) is available in Book 5 (Regulatory Signs).

Location Criteria

The DIVIDED ROAD ENDS sign must be installed upstream of the median termination on both sides of the roadway, i.e., on the shoulder and on the median.

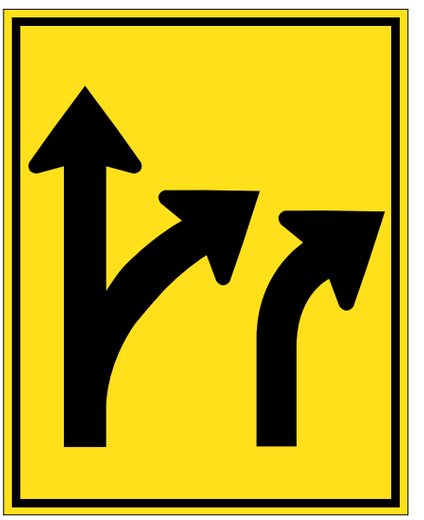
Special Considerations

N/A

RIGHT LANE EXITS Sign (Freeway)

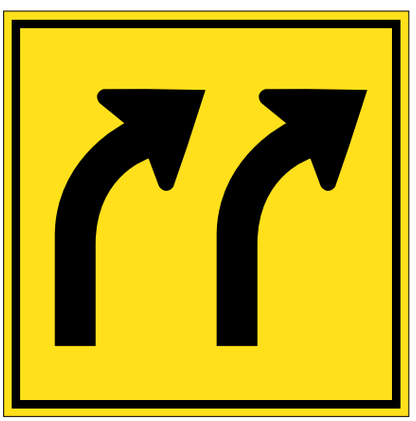
Wa-50R	**90 cm x 120 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

RIGHT LANE EXITS, NEXT LANE EXIT OR THROUGH Sign (Freeway)



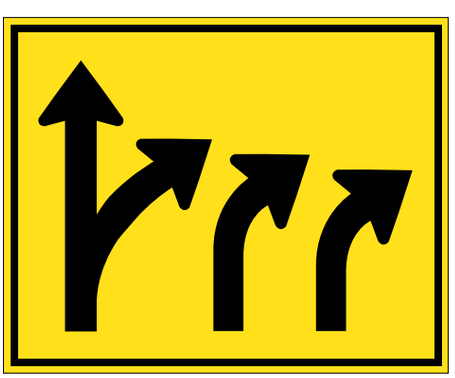
Wa-51R	**120 cm x 150 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

TWO RIGHT LANES EXIT Sign (Freeway)



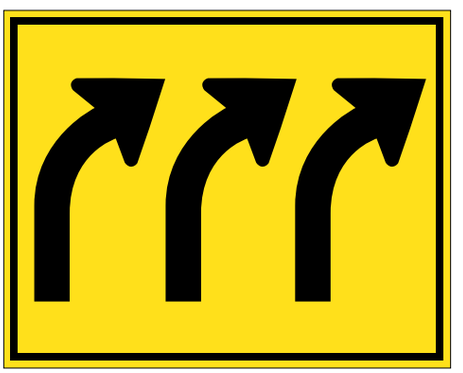
Wa-52R	120 cm x 120 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

TWO RIGHT LANES EXIT, NEXT LANE EXIT OR THROUGH Sign (Freeway)



Wa-53R	120 cm x 150 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

THREE RIGHT LANES EXIT Sign (Freeway)



Wa-54R	120 cm x 150 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of lane exits signing for freeway applications is to provide advance warning that one or more entire lanes exit from the left or right side of the road, and lead to a different destination from that of the remaining lanes comprising the through roadway. Drivers who remain in one of the dedicated exit lanes will become channelled into the exiting traffic flow and cannot continue along the freeway mainline. An "either-or" lane which divides into two lanes – one which exits and another which continues in the through directions – is not considered to be a dedicated exit lane.

Because of the high speeds and high traffic volumes typical of freeway traffic operations, it is critical to safety that drivers are aware of dedicated exit lanes, and have a clear idea of the lane configuration at the exit locations. Driving manoeuvres to attempt to undo wrong lane choices can be dangerous at exit locations, where traffic patterns are already less stable

than along the freeway mainline. Symbol signs are therefore used on freeways to more clearly convey lane configurations and available path choices. (At non-freeway locations, these decisions are not as critical, and text signing is considered to be sufficient.)

The symbolic freeway lane exits signing does not conform to the shape convention for warning signs. Rectangular sign blanks are used instead of diamond-shaped ones. If diamond-shaped signs were used, the LEFT LANE EXITS and RIGHT LANE EXITS signs would be very similar to CURVE signs, and would likely confuse drivers. The rectangular signs, together with their location in the context of freeway exit guide signing, alleviates this confusion. The rectangular shape also facilitates the use of wider sign blanks to represent more exiting lanes, without increasing sign height, enabling the arrow symbols on all signs to be approximately the same size. (For example, the RIGHT LANE EXITS sign legend contains one arrow, and the sign is 90 cm wide. The THREE RIGHT LANES EXITS sign, which has a legend with three arrows, is 150 cm wide. Both signs are 120 cm high.)

Several years ago, the Manual of Uniform Traffic Control Devices (MUTCD) contained a series of text signs with legends such as "right lane must exit". The message implied that they were regulatory signs. These signs have been discontinued because they have a warning function rather than a regulatory one. The symbolic lane exits signs described below replace the discontinued text signs, and at the same time alleviate the need for additional bilingual signing.

Sign Types

The **LEFT LANE EXITS sign (freeway) (Wa-50L)** warns drivers in advance that the entire left-most lane is designated to exit the freeway.

The **RIGHT LANE EXITS sign (freeway) (Wa-50R)** warns drivers in advance that the entire right-most lane is designated to exit the freeway.

The **LEFT LANE EXITS, NEXT LANE EXIT or THROUGH sign (freeway) (Wa-51L)** warns drivers in advance that the entire left-most lane is designated to exit the freeway, and that the next adjacent lane divides into two lanes: one which exits the freeway and one which continues along the freeway mainline.

The **RIGHT LANE EXITS, NEXT LANE EXIT OR THROUGH sign (freeway) (Wa-51R)** warns drivers in advance that the entire right-most lane is designated to exit the freeway, and that the next adjacent lane divides into two lanes: one which exits the freeway and one which continues along the freeway mainline.

The **TWO LEFT LANES EXIT sign (freeway) (Wa-52L)** warns drivers in advance that the two entire left-most lanes are designated to exit the freeway.

The **TWO RIGHT LANES EXIT sign (freeway) (Wa-52R)** warns drivers in advance that the two entire right-most lanes are designated to exit the freeway.

The **TWO LEFT LANES EXIT, NEXT LANE EXIT OR THROUGH sign (freeway) (Wa-53L)** warns drivers in advance that the two entire left-most lanes are designated to exit the freeway, and that the next adjacent lane divides into two lanes: one which exits the freeway and one which continues along the freeway mainline.

The **TWO RIGHT LANES EXIT, NEXT LANE EXIT OR THROUGH sign (freeway) (Wa-53R)** warns drivers in advance that the two entire right-most lanes are designated to exit the freeway, and that the next adjacent lane divides into two lanes: one which exits the freeway and one which continues along the freeway mainline.

The **THREE LEFT LANES EXIT sign (freeway) (Wa-54L)** warns drivers in advance that the three entire left-most lanes are designated to exit the freeway.

The **THREE RIGHT LANES EXIT sign (freeway) (Wa-54R)** warns drivers in advance that the three entire left-most lanes are designated to exit the freeway.

Guidelines for Use

Freeway lane exits warning signs must be used where one or more entire lanes are designated to exit a freeway mainline.

Freeway lane exits warning signs with directional arrows must only be used in conjunction with overhead guide signing as part of an integrated freeway guide signing system. Lane exits signs are linked to lane-specific EXIT tab signs indicating the path to destinations shown on the overhead guide signs. See Book 8 (Directional Guide Signs) for more information on guide signing for freeways.

Location Criteria

Two signs should be used at each lane exit location. One sign should be located 100 m to 150 m in advance of the turn-off sign. In the case of a through lane exiting the freeway, the second (upstream) sign should be located 100 m to 150 m in advance of the other sign. In the case of a newly created lane exiting the freeway, the second (upstream) sign should be located where the new lane fully develops, just downstream of the taper.

Signs referring to left lanes exiting must be placed on the left side of the road. Supplementary signs may also be placed on the right side of the road.

Special Considerations

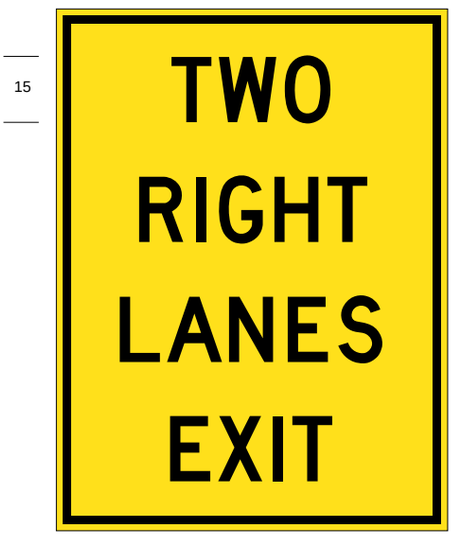
N/A

RIGHT LANE EXITS Sign (Non-freeway)

15

Wa-56R	**90 cm x 90 cm**
Wa-156R	**120 cm x 120 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

TWO RIGHT LANES EXIT Sign (Non-freeway)



Wa-57R	90 cm x 120 cm
Wa-157R	120 cm x 150 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

THREE RIGHT LANES EXIT Sign (Non-freeway)

Wa-58R	90 cm x 120 cm
Wa-158R	120 cm x 150 cm
Font	Highway Gothic D
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of non-freeway lane exits signs is to provide advance warning that one or more entire lanes separates from the through road and lead to an independent destination. In urban applications, the lanes that separate are typically dedicated to left or right turns at intersections. In such situations, the non-freeway lane exits signs can be used in conjunction with regulatory turn lane designation signs, which indicate turning movements permitted from specific lanes.

Lane Exits signing with text may be used alone, or in advance of lane designation signing (Rb-41 through Rb-44), to provide advance warning to motorists that certain lane(s) have designated turning manoeuvres that will force motorists to change lanes.

Sign Types

The **LEFT LANE EXITS sign (non-freeway) (Wa-56L, Wa-156L)** provides advance warning to drivers on non-freeway roads that the entire left-most lane is a designated exit lane and that through movements are not available from this lane.

The **RIGHT LANE EXITS sign (non-freeway) (Wa-56R, Wa-156R)** provides advance warning to drivers on non-freeway roads that the entire right-most lane is a designated exit lane and that through movements are not available from this lane.

The **TWO LEFT LANES EXIT sign (non-freeway) (Wa-57L, Wa-157L)** provides advance warning to drivers on non-freeway roads that the two entire left-most lanes are designated exit lanes and that through movements are not available from these lanes.

The **TWO RIGHT LANES EXIT sign (non-freeway) (Wa-57R, Wa-157R)** provides advance warning to drivers on non-freeway roads that the two entire right-most lanes are designated exit lanes and that through movements are not available from these lanes.

The **THREE LEFT LANES EXIT sign (non-freeway) (Wa-58L, Wa-158L)** provides advance warning to drivers on non-freeway roads that the three entire left-most lanes are designated exit lanes and that through movements are not available from these lanes.

The **THREE RIGHT LANES EXIT sign (non-freeway) (Wa-58R, Wa-158R)** provides advance warning to drivers on non-freeway roads that the three entire right-most lanes are designated exit lanes and that through movements are not available from these lanes.

The **standard size** versions of the above signs, including:

- **Standard size LEFT LANE EXITS sign (non-freeway) (Wa-56L)**;
- **Standard size RIGHT LANE EXITS sign (non-freeway) (Wa-56R)**;
- **Standard size TWO LEFT LANES EXIT sign (non-freeway) (Wa-57L)**;
- **Standard size TWO RIGHT LANES EXIT sign (non-freeway) (Wa-57R)**;
- **Standard size THREE LEFT LANES EXIT sign (non-freeway) (Wa-58L)**; and
- **Standard size THREE RIGHT LANES EXIT sign (non-freeway) (Wa-58R)**;

should be used where posted speed is 80 km/h or less.

The **oversize** versions of the above signs, including:

- **Oversize LEFT LANE EXITS sign (non-freeway) (Wa-156L)**;
- **Oversize RIGHT LANE EXITS sign (non-freeway) (Wa-156R)**;
- **Oversize TWO LEFT LANES EXIT sign (non-freeway) (Wa-157L)**;
- **Oversize TWO RIGHT LANES EXIT sign (non-freeway) (Wa-157R)**;

- **Oversize THREE LEFT LANES EXIT sign (non-freeway) (Wa-158L)**; and

- **Oversize THREE RIGHT LANES EXIT sign (non-freeway) (Wa-158R)**;

should be used where posted speed is 90 km/h or greater.

Guidelines for Use

Non-freeway lane exits signs may be used on non-freeway roads where there is evidence that drivers are not aware that dedicated lanes are separating from the through roadway.

The LEFT LANE EXITS sign may be used in advance of the regulatory LEFT TURN ONLY sign (Rb-41) which designates a lane for left-turn movements only at an intersection. The RIGHT LANE EXITS sign may be used in advance of the regulatory RIGHT TURN ONLY sign (Rb-42) which designates a lane for right-turn movements only at an intersection.

Non-freeway lane exits signs must not be used on freeways.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

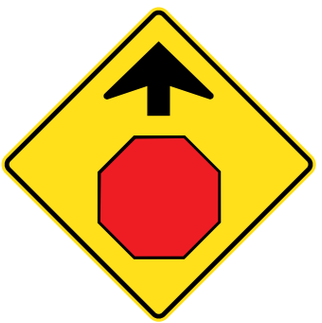
Oversize versions of non-freeway lane exits signs have been added to accommodate higher speed traffic on non-freeway roads.

6. Traffic Regulations Ahead Signs

The function of regulatory signs and devices is to indicate or reinforce traffic laws and regulations. However, in some circumstances, drivers may not notice the regulatory signs themselves, and may fail to respond, or to respond in time, to the regulations indicated by the regulatory signs. For example, poor sight lines, changing roadway alignment, elevation changes, complex visual environments, high approach speeds or other factors may result in drivers missing key regulatory signs. Also, a change in the regulations that apply at a specific location, and therefore the regulatory signs/devices associated with the regulations, may not be detected by drivers who regularly drive the route and are in the habit of following the previous regulations.

The consequences of failure to notice regulatory signs (e.g., STOP signs, TWO-WAY TRAFFIC signs) or regulatory devices (e.g., traffic signals) can be serious. Traffic regulations ahead warning signs (e.g., STOP AHEAD sign, TWO-WAY TRAFFIC AHEAD sign, TRAFFIC SIGNALS AHEAD sign) are used to draw driver attention to the presence of a downstream traffic regulation. The traffic regulations ahead warning sign is located in advance of the regulatory sign/device itself, at a sufficient distance to enable drivers to react and respond to the regulatory sign/device. For more information on driver reaction and response times, see Book 1b (Sign Design Principles).

STOP AHEAD Sign



Wb-1	75 cm x 75 cm
Wb-101	90 cm x 90 cm
Wb-1101	120 cm x 120 cm
Font	N/A
Colour	Stop Symbol – Red Reflective Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

YIELD AHEAD Sign

Wb-1A	75 cm x 75 cm
Wb-101A	90 cm x 90 cm
Font	N/A
Colour	Yield Symbol – Red & White Reflective Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

The purpose of the STOP AHEAD sign is to warn drivers of a downstream regulatory STOP sign, and the purpose of the YIELD AHEAD sign is to warn drivers of a downstream regulatory YIELD sign. A STOP AHEAD or YIELD AHEAD sign is required if there is evidence that drivers are failing to notice the respective regulatory sign in time to safely respond to it, i.e., having sufficient time and distance to bring their vehicles to a smooth and complete stop at the location of the STOP or YIELD sign. Reasons for not noticing the regulatory signs could include poor sign visibility or a new or modified sign installation.

Sign Types

The **standard size STOP AHEAD sign (Wb-1)** should be used to warn of a standard size STOP sign (Ra-1), where the posted speed is 60 km/h or less.

The **oversize STOP AHEAD sign (Wb-101)** should be used to warn of an oversize STOP sign (Ra-101), where the posted speed is 70 km/h or greater. This sign may also be installed at lower speed locations where high conflict experience, high collision experience or other evidence of poor STOP sign observance, indicates a need for greater impact of the STOP AHEAD sign.

The **special oversize STOP AHEAD sign (Wb-1101)** should be used to warn of a special oversize STOP sign. This sign may also be installed at other locations where high conflict experience, high collision experience or other evidence of poor STOP sign observance, indicates a need for greater impact of the STOP AHEAD sign.

The **standard size YIELD AHEAD sign (Wb-1A)** should be used to warn of a standard size YIELD sign (Ra-2), where the posted speed is 60 km/h or less.

The **oversize YIELD AHEAD sign (Wb-101)** should be used to warn of an oversize YIELD sign (Ra-101), where the posted speed is 70 km/h or greater. This sign may also be installed at lower speed locations where high conflict experience, high collision experience or other evidence of poor YIELD sign observance, indicates a need for greater impact of the YIELD AHEAD sign.

Guidelines for Use

The STOP AHEAD sign must be used upstream of a STOP sign that is not visible from the location where drivers must first see it, in order to bring their vehicles safely to a smooth and complete stop at the location where they are required to stop. The YIELD AHEAD sign must be used under the same conditions, but as applied to the YIELD sign and the action of yielding. Obstruction of view, due to horizontal or vertical curves, parked vehicles, tall buildings, foliage, etc., should be considered in determining the need for installing STOP AHEAD or YIELD AHEAD signs.

STOP AHEAD or YIELD AHEAD signs should also be used if there is evidence that drivers are not noticing or heeding the STOP or YIELD signs, e.g., collision or conflict experience directly attributed to lack of observance of the stop/yield regulation. For example, unfamiliar drivers who are distracted by looking for or reading guide signs may notice a STOP or YIELD sign too late. Similarly, drivers may be distracted in complex visual environments where many other signs and devices compete for driver attention. In high traffic volume locations, drivers may miss signs because of the need to concentrate on their interactions with other traffic.

STOP AHEAD or YIELD AHEAD signs should also be used to warn drivers of new STOP or YIELD sign installations. Where one of these signs is installed for this reason, the NEW warning sign (Wb-3) must be mounted 2.5 cm above the STOP AHEAD or YIELD AHEAD sign on the same sign support. The combination of the NEW sign and the STOP AHEAD or YIELD AHEAD sign should remain in place for a period of at least 30 days, and until motorists become familiar with the new installation. (The maximum installation period should generally not exceed 60 days.)

The STOP AHEAD sign is used where right-of-way is being reassigned from one roadway to another crossing roadway, through the elimination of an existing STOP sign control and the installation of STOP sign control on the previously uncontrolled roadway. Detailed recommended procedures have been developed for implementing this type of change in right-of-way control. The procedures are described in Section 3 (Intersection Warning Signs), under the description of the CROSS TRAFFIC DOES NOT STOP sign and the AFTER (month and day) tab sign. These procedures also involve the use of other warning signs, such as the NEW sign (Wb-3), the CROSS TRAFFIC DOES NOT STOP sign (Wa-19) and the AFTER (month and day) tab sign (Wa-19t), as well as the regulatory STOP sign (Ra-1) and ALL-WAY tab sign (Ra-1t).

The NEW sign is described in Section 6 (Traffic Regulations Ahead Signs). For more information on right-of-way control, STOP signs and ALL-WAY tab signs, see Book 5 (Regulatory Signs). Details on pavement markings required for amending intersection right-of-way control are found in Book 11 (Markings and Delineation).

Location Criteria

The location criteria for these signs are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

TRAFFIC SIGNALS AHEAD Sign

Wb-2	**60 cm x 60 cm**
Wb-102	**75 cm x 75 cm**
Font	**N/A**
Colour	**Signal Head – Red, Amber & Green Reflective** **Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the TRAFFIC SIGNALS AHEAD sign is similar to that of the STOP AHEAD and YIELD AHEAD signs. The TRAFFIC SIGNALS AHEAD sign warns drivers of a downstream set of traffic control signals which drivers are failing to notice in time to safely respond. Safe response requires having sufficient time and distance to bring vehicles to a smooth and complete stop as regulated by the signals. Reasons for not noticing the traffic signals could include poor visibility conditions or a new traffic signal installation. Also, drivers may not expect a traffic signal when it is the first signal entering an urban area, or when it is the first signal encountered after many kilometres of driving in a rural area.

Sign Types

The **standard size TRAFFIC SIGNALS AHEAD sign (Wb-2)** should be used where the posted speed is 60 km/h or less.

The **oversize TRAFFIC SIGNALS AHEAD sign (Wb-102)** should be used where the posted speed is 70 km/h or greater. This sign may also be installed at lower speed locations where high conflict or collision experience resulting from poor observance of the traffic signals, indicates a need for greater impact of the TRAFFIC SIGNALS AHEAD sign.

Guidelines for Use

The TRAFFIC SIGNALS AHEAD sign must be used upstream of traffic signals that are not visible from the location where drivers must first see them, in order to bring their vehicles safely to a smooth and complete stop at the location where they are required to stop. Obstruction of view, due to horizontal or vertical curves, parked vehicles, tall buildings, foliage, etc., should be considered in determining the need for installing STOP AHEAD or YIELD AHEAD signs.

The TRAFFIC SIGNALS AHEAD sign should also be used if there is reason to believe that drivers have difficulty noticing the traffic signals, e.g., conflict or collision experience directly attributed to lack of compliance with traffic signal regulations. For example, drivers may not notice traffic signals in complex visual environments where many signs and other devices compete for driver attention, or at high traffic volume locations where drivers must concentrate more on the driving task. At the other extreme, drivers may not expect, and therefore may not be prepared to respond to, isolated signal installations in high speed rural areas.

Poor visibility or conspicuity of traffic signals can result in drivers misjudging driving speed and deceleration timing, due to lack of contextual clues on whether they will actually have to stop at the signals. If this is the case, the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) (Wb-102A) should be used instead of the TRAFFIC SIGNALS AHEAD sign.

The TRAFFIC SIGNALS AHEAD sign must be used to warn drivers of a new traffic signal installation. In this situation, the NEW warning sign (Wb-3) must be mounted 2.5 cm above the TRAFFIC SIGNALS AHEAD sign on the same sign support. The combination of the NEW sign and the TRAFFIC SIGNALS AHEAD sign should remain in place for a period of at least 30 days, and until motorists become familiar with the new installation. (The maximum installation period should generally not exceed 60 days.)

The NEW sign is described in Section 6 (Traffic Regulations Ahead Signs). For more information on traffic signals, see Book 12 (Traffic Signals).

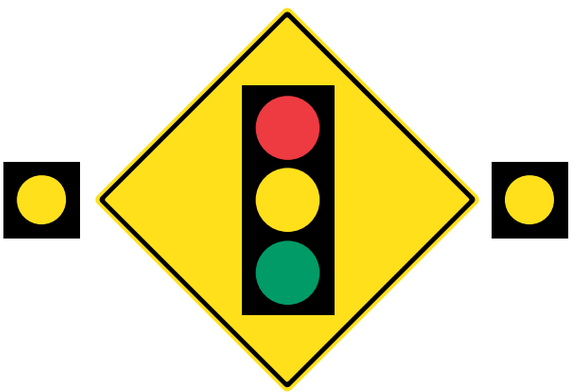
Location Criteria

In urban areas with closely placed traffic signals, it may be necessary to place TRAFFIC SIGNALS AHEAD signs at distances less than the minimum advance placement distances specified in Table 3, in order to clarify that the sign refers to the next downstream traffic signal. In these situations, a DISTANCE tab sign (Wa-23t) should be used to indicate an atypical advance distance.

Special Considerations

N/A

PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD Sign (With Amber Flashers)



Wb-102A	**120 cm x 120 cm**
Font	**N/A**
Colour	**Signal Head – Red, Amber and Green Reflective** **Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

PREPARE TO STOP WHEN FLASHING Tab Sign

Wb-102At	**75 cm x 120 cm**
Font	**Helvetica Bold Condensed**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

If drivers are not sure of whether they will have to stop for a traffic signal, their driving behaviour just upstream of the intersection may be erratic. For example, some drivers may see an amber signal and, deciding that there is insufficient time to clear the signal, stop in anticipation of the red phase. Other drivers may decide at the same point that they cannot stop safely, and they maintain their speed, or even accelerate, to clear the signal. Different driver responses occurring simultaneously along the segment of road upstream of a traffic signal, known as the dilemma zone, create chaos and can result in collisions. The purpose of the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) is to reduce dilemma zone incidents by using dynamic flashing beacons, interconnected with the traffic signal controller, to inform drivers whether they will have to stop at the signal.

The main reason for having to inform drivers exactly when they need to stop for a red signal phase is because the signal is poorly visible or inconspicuous. In this situation, drivers do not receive the contextual clues to guide speed and deceleration rate, that they would otherwise obtain by observing phase-to-phase transitions over a distance. The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign, then, is related to the TRAFFIC SIGNALS AHEAD sign, but provides additional information to drivers if they require it due to dilemma zone problems.

It is not recommended to use the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign because drivers are travelling too fast to react in time to an amber signal. There is evidence that use of the sign at these locations actually extends the dilemma zone and results in increased speeds and increased rear-end collisions. If the concern is high speeds, then long distance detection (placement of a detector at the upstream end of the dilemma zone) and double long distance detection (placement of a second speed detector in advance of the long distance detector) are much more effective dilemma zone solutions, and are therefore recommended in these situations.

Sign Types

The **oversize PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) (Wb-102A)** is the symbol sign and amber beacon assembly.

The **oversize PREPARE TO STOP WHEN FLASHING tab sign (Wb-102At)** must be used in conjunction with the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) (Wb-102A) to indicate the intent of the amber flashing beacons.

Guidelines for Use

The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) warns drivers upstream of a traffic control signal that there is a high probability that they will have to stop for a red traffic signal indication ahead.

The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) should be used in advance of signalized intersections only where there are actual or potential dilemma zone problems Relevant factors for dilemma zone problems include:

- Poor visibility (e.g., due to horizontal or vertical curves, parked vehicles, tall buildings, foliage, etc.) such that a safe stopping sight distance is not available;

- Where drivers are exposed to many kilometres of roadway with posted speeds of 60 km/h or greater and then encounter a traffic control signal;

- Where freeway conditions come to an end at a signalized intersection;

- Where there is a grade approaching an intersection sufficient to require more than normal braking effort (i.e., 3% or greater);

- Collision or conflict experience related to the amber signal phase.

The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) should not be used to address dilemma zone problems resulting from high speeds (e.g., where the posted speed is 60 km/h or greater and the operating speed exceeds posted speed by 20 km/h or more). Long distance detection or double long distance detection should instead be used in these situations.

Two flashing amber beacons interconnected with the signal controller must be part of the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign. The double amber beacons must flash in an alternating side-to-side pattern. The beacons must be flashed at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal.

The amber beacons must begin to flash either:

- As the signal changes from green to amber (active advance operation); or

- A set time in advance of the signal changing from green to amber, to provide additional warning (true active advance operation).

Vehicles passing the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign when the beacons are not flashing must have sufficient green time to safely clear the intersection.

For both active advance signs and true active advance signs, the amber beacons must stop flashing at the beginning of the next green signal indication. The amber beacons must flash continuously if the signal goes into flashing operation.

Active advance signs may be used as a supplement to double long distance detection on downhill grade approaches.

True active advance signs must only be implemented where the intersection operates in fixed time or is semi-actuated (no advance detection on the approach where the sign is being considered). True active advance signs should not be used in combination with long distance detection and must not be used in combination with double long distance detection. True active advance warning signs are not used on provincial highways.

Where the PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) is used, the static TRAFFIC SIGNALS AHEAD sign (Wb-2) should be omitted.

The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) must be illuminated from above at night to prevent message washout from the flashing beacons. Book 12 (Traffic Signals) provides further details on long distance detection and double long distance detection, the operation of flashing beacons, active advance and true active advance operation, and traffic signal timing and actuation.

Location Criteria

The signs must be mounted:

- Overhead above the lanes of travel; or

- In a conspicuous position adjacent to the road.

The beacons and sign should be accurately located so that vehicles passing flashing beacons have sufficient time and distance to stop safely before the intersection. This calculation should take into account typical queue lengths expected at that intersection, especially if the queues have restricted visibility.

Special Considerations

N/A

NEW Sign (For Stop, Yield and Signal Control)

Wb-3	**90 cm x 90 cm**
Font	**Highway Gothic D Compressed**
Colour	**Inside Circle** **Legend & Border – White** **Background – Red Reflective** **Outside Circle** **Legend & Border – Black Lines** **Background – Strong Yellow-green Reflective**
Minimum Sheeting	**Type I, except high-reflectivity, micro-prismatic fluorescent (e.g., diamond grade) for outside circle background**

Purpose and Background

The purpose of the NEW sign is to alert drivers of a new STOP sign, YIELD sign or traffic control signal installation, at a location where previously no such sign/device existed. The NEW sign also warns drivers about changes in signal timing phases (e.g., deletion of an advance green phase).

Drivers who regularly travel along a given route can become complacent about traffic control signs and devices they routinely encounter, and their response to them can become automatic. Special measures need to be taken to change ingrained driving patterns when new right-of-way control signs/devices are installed or existing devices are significantly modified, since the failure to notice and heed such signs/devices can have dangerous consequences. The distinctive shape and colour scheme of the NEW sign, together with its eye-catching "sunburst" pattern, is designed to fulfill this important function.

Sign Types

There is one type of **NEW sign (for stop, yield and signal control): (Wb-3)**.

Guidelines for Use

The NEW sign must be used in conjunction with:

- The STOP AHEAD sign (Wb-1, Wb-101, Wb-1101);
- The YIELD AHEAD sign (Wb-1A, Wb-101A);
- The TRAFFIC SIGNALS AHEAD sign (Wb-2, Wb-102); and
- The PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) (Wb-102A);

to warn motorists of new installations of STOP signs, YIELD signs and traffic signals, respectively.

For this application, the NEW warning sign (Wb-3) must be mounted above the STOP AHEAD sign, YIELD AHEAD sign, TRAFFIC SIGNALS AHEAD sign or PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers) on the same sign support. The combination of the NEW sign and the primary traffic regulations ahead sign should remain in place for a period of at least 30 days until motorists become familiar with the new installation. (The maximum installation period should generally not exceed 60 days.)

The NEW sign must be used for the following changes in intersection right-of-way control:

- Where right-of-way is being reassigned from one roadway to another crossing roadway, through the elimination of an existing STOP sign control and the installation of STOP sign control on the previously uncontrolled roadway; and

- Where an existing all-way stop control is to be removed and a through roadway created.

Detailed recommended procedures have been developed for implementing these types of changes in right-of-way control. These procedures also involve the use of other warning signs, such as the STOP AHEAD sign (Wb-1), the CROSS TRAFFIC DOES NOT STOP sign (Wa-19) and the AFTER (month and day) tab sign (Wa-19t), as well as the regulatory STOP sign (Ra-1) and ALL-WAY tab sign (Ra-1t).

For the right-of-way control amendments, the following sign assemblies incorporating the NEW sign are required:

- A CROSS TRAFFIC DOES NOT STOP sign, with a NEW sign installed above it and an AFTER (month and day) tab sign installed below it, to warn drivers when stop control on the crossing roadway will be removed. (This sign assembly is required for both types of right-of-way control amendments);

- A STOP AHEAD sign with a NEW sign installed above it, to warn drivers approaching a new stop control installation. (This sign assembly is required where right-of-way is being reassigned from one roadway to another crossing roadway).

When used for right-of-way control amendment applications, the NEW sign should remain in place for a period of at least 30 days until motorists become familiar with the new right-of-way control. (The maximum installation period should generally not exceed 60 days.)

Where right-of-way is being reassigned from one roadway to another crossing roadway, the sign(s) remaining on the sign assembly after removal of the NEW sign should remain in place for an additional period of at least 30 days until motorists become familiar with the new right-of-way control.

The NEW sign may also be considered for use at signalized locations where signal timing phases are being significantly changed, e.g., the deletion or addition of an advance green phase, the deletion or addition of a protected turn phase, etc.

The procedures for amendment of intersection right-of-way control are detailed in Section 3 (Intersection Warning Signs), under the description of the CROSS TRAFFIC DOES NOT STOP sign and the AFTER (month and day) tab sign. The STOP AHEAD sign is described in Section 6 (Traffic Regulations Ahead Signs). For more information on right-of-way control, STOP signs and ALL-WAY tab signs, see Book 5 (Regulatory Signs). Details on pavement markings

required for amending intersection right-of-way control are found in Book 11 (Markings and Delineation). More information on traffic signal phasing is provided in Book 12 (Traffic Signals).

The NEW sign (for stop, yield and signal control) should be used only in conjunction with the STOP AHEAD sign, YIELD AHEAD sign, TRAFFIC SIGNALS AHEAD sign, PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers), or major changes in traffic signal phasing, and should not be used in conjunction with the implementation of other changes in traffic control. In order to preserve the effectiveness of this sign when used in conjunction with critical changes to the right-of-way control, the frequency and duration of its use should be strictly limited.

Location Criteria

Where used with the STOP AHEAD sign, YIELD AHEAD sign, TRAFFIC SIGNALS AHEAD sign or PREPARE TO STOP AT TRAFFIC SIGNALS AHEAD sign (with amber flashers), the NEW sign must be mounted 2.5 cm above the primary traffic regulations ahead sign.

Where used with a CROSS TRAFFIC DOES NOT STOP sign, the NEW sign must be installed 2.5 cm above the primary sign, and an AFTER (month and day) tab sign must be installed below the primary sign.

Special Considerations

N/A

TWO-WAY TRAFFIC AHEAD Sign

Wb-4	**75 cm x 75 cm**
Wb-104	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

DISTANCE Tab Sign

Wa-23t	**30 cm x 60 cm**
Wa-123t	**45 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the TWO-WAY TRAFFIC AHEAD sign is to warn drivers travelling on a one-way street or highway that they are approaching a roadway section where two-way traffic is in operation, and that their ability to pass freely will be restricted by opposing traffic. The warning sign is used together with the

regulatory TWO-WAY TRAFFIC sign, which indicates the actual transition from one-way to two-way operation. The advance warning sign is required to convey the message in time to drivers, and is particularly important in high speed situations where drivers need a significant amount of time and distance to notice and read the sign, and then manoeuvre their vehicles into the correct travel lane.

Sign Types

The **standard size TWO-WAY TRAFFIC AHEAD sign (Wb-4)** must be used where the posted speed is 60 km/h or less.

The **oversize TWO-WAY TRAFFIC AHEAD sign (Wb-104)** must be used where the posted speed is 70 km/h or greater. This sign may also be installed at lower speed locations where prevailing traffic conditions warrant greater visibility or emphasis, e.g., in complex visual environments where many signs and other devices compete for driver attention, or at high traffic volume locations where drivers must concentrate more on the driving task

The **standard size DISTANCE tab sign (Wa-23t)** must be used in conjunction with the standard size TWO-WAY TRAFFIC AHEAD sign (Wb-4) to indicate the downstream distance where two-way traffic operation begins.

The **oversize DISTANCE tab sign (Wa-123t)** must be used in conjunction with the oversize TWO-WAY TRAFFIC AHEAD sign (Wb-104) to indicate the downstream distance where two-way traffic operation begins.

Guidelines for Use

The TWO-WAY TRAFFIC AHEAD sign must be used in conjunction with regulatory TWO-WAY TRAFFIC signs (Rb-24). The regulatory sign symbol and the warning sign symbol are the same, but the regulatory sign is rectangular (longer dimension vertical) and has a white background. See Book 5 (Regulatory Signs) for more details on the Rb-24 sign.

Where speeds are 70 km/h or greater, oversize versions of both the regulatory and warning signs must be used. In this case, two-way arrow pavement marking symbols may be required. Book 5 (Regulatory Signs) provides more details on the oversize application of TWO-WAY TRAFFIC signs, and Book 11 (Markings and Delineation) provides information on the required pavement markings.

The DISTANCE tab sign (Wa-23t, Wa-123t) must be attached to TWO-WAY TRAFFIC AHEAD signs. For this application, the “300 m” text on the tab sign should be consistently used so that driver expectations can be developed based on a standard distance between the sign and the commencement of two-way traffic operation.

Location Criteria

The TWO-WAY TRAFFIC AHEAD sign must be placed 300 m upstream of the location where two-way traffic operation begins.

Special Considerations

N/A

KEEP RIGHT Sign

Wb-6	**60 cm x 60 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the KEEP RIGHT warning sign (Wb-6) is to warn motorists to keep to their own half of the roadway, on segments of two-lane road having the combined hazards of narrow pavement width and restricted sight distance.

Sign Types

There is one type of **KEEP RIGHT sign: (Wb-6)**.

Guidelines for Use

The KEEP RIGHT warning sign must only be used on two-lane roads where the pavement width is narrow and the sight distance is restricted (e.g., due to horizontal or vertical curves, vegetation, etc.).

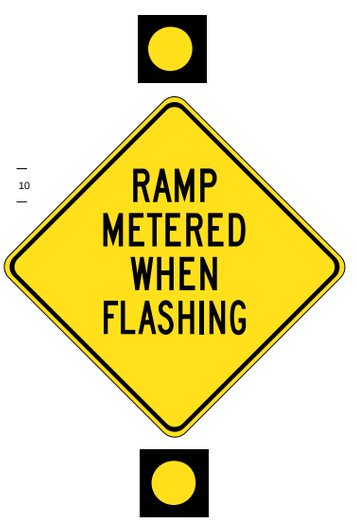
Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

There is also a KEEP RIGHT regulatory sign (Rb-25), which is unrelated in application to the KEEP RIGHT warning sign. Information on the Rb-25 sign can be found in Book 5 (Regulatory Signs).

RAMP METERED WHEN FLASHING Sign (With Amber Flashers)



Wb-7	**75 cm x 75 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the RAMP METERED WHEN FLASHING sign (with amber flashers) may be used at freeway ramp metering installations, to warn drivers when ramp metering is in effect. Drivers unfamiliar with ramp metering operations, or drivers not expecting ramp metering at a given ramp, may not be prepared to stop, and hence a warning is appropriate.

Sign Types

There is one type of **RAMP METERED WHEN FLASHING sign (with amber flashers): (Wb-7)**.

Guidelines for Use

The RAMP METERED WHEN FLASHING sign (with amber flashers) may be used in the context of freeway ramp metering installations, to warn drivers that ramps are metered when the beacons are flashing. The flashers must be turned off during those periods that ramp metering is not in operation, and that a continuous green signal is displayed. More information on ramp metering is privided in Book 19 (Advanced Traffic Management Systems) and Book 12 (Traffic Signals).

Two flashing amber beacons interconnected with the signal controller must be part of the RAMP METERED WHEN FLASHING sign. The double amber beacons must flash in an alternating up-and-down (bouncing ball) pattern. The beacons must be flashed at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal. For more information on the operation of the flashing beacons, see Book 12 (Traffic Signals).

Where used at night, the RAMP METERED WHEN FLASHING sign (with amber flashers) should be illuminated from above to prevent message washout from flashing beacons.

Location Criteria

The beacons and sign should be accurately located so that vehicles passing flashing beacons have sufficient time and distance to stop before the ramp metering signal. This calculation should take into account typical queue lengths expected at that intersection, expecially if the queues have restricted visibility.

Special Considerations

N/A

7. Pedestrian Warning Signs

Some pedestrian warning signs are used to warn drivers about situations involving the presence and activity of pedestrians, which may pose a safety hazard both to the pedestrians and to the vehicular traffic. School crossing signs are a subset of the group of pedestrian warning signs.

Pedestrian warning signs addressing drivers should be kept to a minimum and should be used primarily where traffic operations, sight restrictions, complex driving environment, lack of visual contextual clues associated with pedestrian activities, and other general conditions limit the driver's awareness of pedestrian activities, thus reducing the driver's ability to respond in time to the unexpected presence of pedestrians on or near a roadway. Where pedestrian warning signs are associated with a specific pedestrian generator (e.g., school, playground, seniors' facility), they must be removed if the pedestrian generator is relocated and the pedestrian hazard no longer exists.

Other pedestrian warning signs are intended to address pedestrians directly. These signs warn pedestrians about special conditions at crossings (e.g., two-stage crossings), so that they can safely complete their crossings.

For more information on the application of pedestrian warning signs in the general context of pedestrian control and protection, see Book 15 (Pedestrian Control and Protection).

SCHOOL AREA Sign

Wc-1	**60 cm x 60 cm**
Wc-101	**80 cm x 80 cm**
Font	**N/A**
Colour	**Legend & Border – White Reflective** **Background – Blue Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Where children from a school adjacent to a road walk along or cross that road, road users need advance warning of this situation so that they are prepared to exercise caution and foresight in proceeding through these areas. The purpose of the SCHOOL AREA sign is to provide advance warning of this nature, by informing motorists that they are approaching a school area.

The distinctively different pentagon shape of the SCHOOL AREA warning sign is intended to distinguish it from other pedestrian signing and to attract driver attention to potentially increased hazards or dangers related to the unpredictable behaviour of school children near traffic.

Sign Types

The **standard size SCHOOL AREA sign (Wc-1)** should be used where posted speed upstream of the school speed zone is 60 km/h or less.

The **oversize SCHOOL AREA sign (Wc-101)** should be used where posted speed upstream of the school speed zone is 70 km/h or greater.

Guidelines for Use

SCHOOL AREA signs should be used where the school is adjacent to a major highway or arterial road that school children walk along and cross. SCHOOL AREA signs may be advisable where the school is adjacent to a residential street with relatively high traffic volumes.

An advance warning sign for a school area is not necessary, since the SCHOOL AREA sign is itself an advance sign, warning motorists that they are approaching a school area, where children may be walking along or crossing the road.

The request for the SCHOOL AREA sign is made to the local Road Authority, typically by the school board or the transportation company under contract to the board. SCHOOL AREA signs must be reviewed on an annual basis due to the changing nature of school locations and pedestrian school access routes. Signing that is no longer applicable must be removed.

High intensity sheeting may be considered for the SCHOOL AREA sign when it is probable that school children are in the vicinity during hours of darkness.

The pentagon school area symbol is also a part of the SCHOOL ZONE MAXIMUM SPEED sign (Rb-6) and the SCHOOL ZONE MAXIMUM SPEED WHEN FLASHING sign (Rb-6A). These regulatory signs apply to specifically defined school speed zones. See Book 5 (Regulatory Signs) for more information on speed control in school zones.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

SCHOOL CROSSING Sign

Wc-2	**60 cm x 90 cm**
Wc-102	**90 cm x 120 cm**
Font	**N/A**
Colour	**Legend & Border – White Reflective** **Background – Blue Reflective**
Minimum Sheeting	**Type I**

SCHOOL CROSSING Tab Sign

Wc-2t	45 cm x 60 cm
Wc-102t	45 cm x 90 cm
Font	Highway Gothic C
Colour	Legend & Border – White Reflective Background – Blue Reflective
Minimum Sheeting	Type I

CROSSING AHEAD Tab Sign

Wc-2At	45 cm x 60 cm
Wc-102At	45 cm x 90 cm
Font	Highway Gothic C
Colour	Legend & Border – White Reflective Background – Blue Reflective
Minimum Sheeting	Type I

SCHOOL CROSSING AHEAD Sign

Wc-2A	60 cm x 90 cm
Wc-102A	90 cm x 120 cm
Font	N/A
Colour	Legend & Border – White Reflective Background – Blue Reflective
Minimum Sheeting	Type I

Purpose and Background

Supervised school crossings are implemented at specific locations close to a school where significant volumes of school children cross the road on their way to or from school. Local Road Authorities are responsible for defining the minimum volumes of crossing school children required for implementing a supervised school crossing. Consistency in the location and operation of supervised school crossings is important to satisfy the safety of children who use the crossings and the expectancies of drivers who regularly drive past the crossings. Therefore the location of supervised school crossings requires approval by the local Road Authority and the operation of supervised school crossings is regulated.

There are two main types of school crossing warning signs:

- Those that provide advance warning of the crossing;
- Those that provide warning at the actual crossing location.

Warning signs, rather than regulatory signs, are used at the actual location, since the school crossing signs and markings are not covered under the Highway Traffic Act. The definition and responsibilities of a school crossing guard, and the hand-held school crossing stop sign displayed by the crossing guard, however, are included in the Highway Traffic Act (Section 176 (R.S.O. 1990).

Sign Types

The **standard size SCHOOL CROSSING sign (Wc-2)** must be used at the supervised school crossing location, and should be used where the posted speed upstream of the school speed zone is 60 km/h or less.

The **oversize SCHOOL CROSSING sign (Wc-102)** must be used at the supervised school crossing location, and should be used in rural areas or where the posted speed upstream of the school speed zone is 70 km/h or greater. This sign may also be used at lower speed locations on roads wider than 7.5 m, having traffic volumes high enough that gaps in traffic are generally insufficient to enable children to cross.

The **standard size SCHOOL CROSSING tab sign (Wc-2t)** may be attached to the standard size SCHOOL CROSSING sign (Wc-2), and the **oversize SCHOOL CROSSING tab sign (Wc-102t)** may be attached to the oversize SCHOOL CROSSING sign (Wc-102) to convey in words the meaning of the school crossing symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

The **standard SCHOOL CROSSING AHEAD sign (Wc-2A)** must be used upstream of the supervised school crossing location, and should be used where the posted speed upstream of the school speed zone is 60 km/h or less.

The **oversize SCHOOL CROSSING AHEAD sign (Wc-102A)** must be used upstream of the supervised school crossing location, and should be used in rural areas or where the posted speed upstream of the school speed zone is 70 km/h or greater. This sign may also be used at lower speed locations on roads wider than 7.5 m, having traffic volumes high enough that gaps in traffic are generally insufficient to enable children to cross.

The **standard size CROSSING AHEAD tab sign (Wc-2At)** may be attached to the standard size SCHOOL CROSSING AHEAD sign (Wc-2A), and the **oversize CROSSING AHEAD tab sign (Wc-102At)** may be attached to the oversize SCHOOL CROSSING AHEAD tab sign (Wc-102A) to convey in words the meaning of the school crossing ahead symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

Signed school crossings must only be implemented at locations where school or municipal authorities have provided written assurance to the local Road Authority that the school crossing will be supervised by a police officer, a school guard or a School Child Safety Patrol person during locally established time periods. See Highway Traffic Act, Subsection 176.(1) (R.S.O. 1990) for the definition of a school crossing guard.

School crossing signs must be reviewed on an annual basis due to the changing nature of school locations and pedestrian school access routes. Signing that is no longer applicable must be removed.

In addition to the school crossing signs, pavement markings in the form of a painted crosswalk are required to designate supervised school crossings. More information on pavement markings at school crossings is provided in Book 11 (Markings and Delineation).

Signed school crossings must not be located at pedestrian crossovers, at intersections with traffic signals, or at intersections with pedestrian signals.

High intensity sheeting may be considered for school crossing signs when it is probable that school children are in the vicinity during hours of darkness.

Location Criteria

SCHOOL CROSSING signs (Wc-2, Wc-102) must be used directly at the painted crosswalk, one on each side of the roadway, for both directions of travel.

Special Considerations

For further details and instructions on the implementation and operation of a school crossing, refer to the Highway Traffic Act, Section 176 (R.S.O. 1990).

PLAYGROUND AHEAD Sign

Wc-3	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the PLAYGROUND AHEAD sign is to provide advance warning of a locally designated playground that is located adjacent to a downstream section of road. The presence of children on or near the road travelling to or from the playground may present an unexpected hazard to motorists unless they are warned in advance by the PLAYGROUND AHEAD sign.

Sign Types

There is one type of **PLAYGROUND AHEAD sign: (Wc-3)**.

Guidelines for Use

The PLAYGROUND AHEAD sign may be installed in advance of playgrounds adjacent to the road where, in the opinion of the Road Authority, safety considerations for drivers and pedestrians alike require the placement of a warning sign.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

The size of the PLAYGROUND AHEAD sign has increased from 60 cm x 60 cm to be consistent with the size of the PEDESTRIANS AHEAD sign (75 cm x 75 cm).

The new sign size must be implemented on all installations by January 1, 2007.

PEDESTRIANS AHEAD Sign

Wc-7	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

SENIORS Tab Sign

Wc-7t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the PEDESTRIANS AHEAD sign is to provide advance warning to motorists that pedestrians may be in the area. The PEDESTRIANS AHEAD sign would normally be used in rural areas where, from visual observation, the presence of pedestrians in rather uninhabited areas would come as a surprise to the motorist.

Sign Types

The **PEDESTRIANS AHEAD sign (Wc-7)** is the standard symbol sign.

The **SENIORS tab sign (Wc-7t)** is used to indicate that a significant portion of the pedestrians are senior citizens.

Guidelines for Use

The PEDESTRIANS AHEAD sign should be installed where field observations have indicated that a significant number of pedestrians frequently cross the road or walk adjacent to it, provided that pedestrian volumes are not high enough to justify the installation of a pedestrian crossover. For further information on pedestrian crossovers, see Book 15 (Pedestrian Control and Protection).

Typical uses of the PEDESTRIANS AHEAD sign are as follows:

- Park areas;
- First Nations communities, where specifically requested by the Band Council;
- Near hospitals;
- Near senior citizens' centres, retirement homes, adult lifestyle communities, and other locations where there are large volumes of senior citizen pedestrian traffic.

The SENIORS tab sign should be used in conjunction with the PEDESTRIANS AHEAD sign where it is installed to warn of senior citizen pedestrian traffic. The tab sign provides drivers with additional detail on the type of pedestrian traffic to expect and accommodate.

The PEDESTRIANS AHEAD sign must not be used:

- Within a school area (the SCHOOL AREA sign (Wc-1) is used for this application);
- At or upstream of a supervised school crossing (the SCHOOL CROSSING sign (Wc-2) and the SCHOOL CROSSING AHEAD sign (Wc-2A) are used for this application); or
- Upstream of a playground that is adjacent to or very near to the road (the PLAYGROUND AHEAD sign (Wc-3) is used for this application).

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

OVERHEAD X Sign (Also known as PEDESTRIAN CROSSOVER Sign)

Wc-20 **Wc-120**	**40 cm x 90 cm** **60 cm x 180 cm**
Font	**N/A**
Colour	**Legend – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Ground-mounted and overhead pedestrian crossover signs are used to indicate the presence of a pedestrian crossover, which is a protected pedestrian crossing at an unsignalized location. The OVERHEAD X sign, certain ground-mounted regulatory signs (see Book 5 (Regulatory Signs)), pedestrian-oriented information signs, (see Book 8 (Information Signs)), flashing amber beacons (see Book 12 (Traffic Signals)) and pavement markings (see Book 11 (Markings and Delineation)), are all components of pedestrian crossovers.

The purpose of the OVERHEAD X sign, is to alert drivers to the presence of a pedestrian crossover, and to indicate to them the exact crossover location. Pedestrian-actuated flashing amber beacons provide an active dynamic warning, letting drivers know that pedestrians are about to cross or actually crossing.

For further details on pedestrian crossover installation criteria and how the various components comprising a pedestrian crossover are combined, see Book 15 (Pedestrian Control and Protection). Until Book 15 is available, refer to Section A-6 (Pedestrian Crossovers) of the Ontario Manual of Uniform Traffic Control Devices (MUTCD).

Sign Types

The **standard size OVERHEAD X sign (Wc-20)** must be used at all pedestrian crossover locations where the presence of aerial wires (e.g., streetcar or trolley bus lines) requires the signing to be segmented.

The **oversize OVERHEAD X sign (Wc-120)** must be used at all pedestrian crossovers where the use of the standard size OVERHEAD X sign does not apply.

Guidelines for Use

OVERHEAD X signs must be installed at all pedestrian crossover locations.

OVERHEAD X signs must be double-sided, internally illuminated and provide continuous downward illumination over the entire pedestrian crossover, from curb to curb. Downward illumination must be no less than 45 lux (4 foot candles), measured at the roadway under the mid-point of the sign. The sign message must be continuously illuminated, both day and night, displaying the yellow background colour specified in the ASTM specification D 4056-90.

Four pedestrian-actuated flashing amber beacons (two per direction) must be installed in conjunction with the OVERHEAD X signs. The double amber beacons must flash in an alternating side-to-side pattern. The beacons must be flashed at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal. For more information on the operation of the flashing beacons, see Book 12 (Traffic Signals).

Pedestrian actuation of the flashing amber beacons must be by pushbutton. The actuation must not be delayed. Visual and/or audible indications that overhead flashers are in operation may be provided to pedestrians.

Pedestrian-actuated beacons must flash for a minimum period of time, calculated as follows:

minimum flashing time =
(crossing distance / walking rate) + 5 seconds

The walking rate should be in the range of 1 m/s to 1.25 m/s, but a lower rate may be used where local conditions or pedestrian characteristics demand.

The pedestrian standing area near the pushbutton must be illuminated at night so that drivers can clearly see pedestrians wishing to cross at the crossover.

Location Criteria

The OVERHEAD X sign must be installed at a minimum height of 4.5 m, measured from the crown of the roadway to the bottom of the sign.

On two-lane roadways where the Wc-120 OVERHEAD X sign must be used, one sign must be centred over the roadway. On roadways having more than two lanes, where the Wc-120 OVERHEAD X sign must be used, two signs must be each centred over one half of the roadway. On roadways where the Wc-20 OVERHEAD X sign must be used, three signs should be spaced around the aerial wires. Typical positioning of OVERHEAD X signs is shown in Figure 6.

Flashing amber beacons must be offset by at least 0.3 m from the end of the OVERHEAD X sign, for conspicuity reasons. Typical positioning of beacons on OVERHEAD X sign installations is shown in Figure 6.

Special Considerations

N/A

WAIT FOR GAP Sign

10

Wc-28	**45 cm x 60 cm**
Font	**Clearview**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

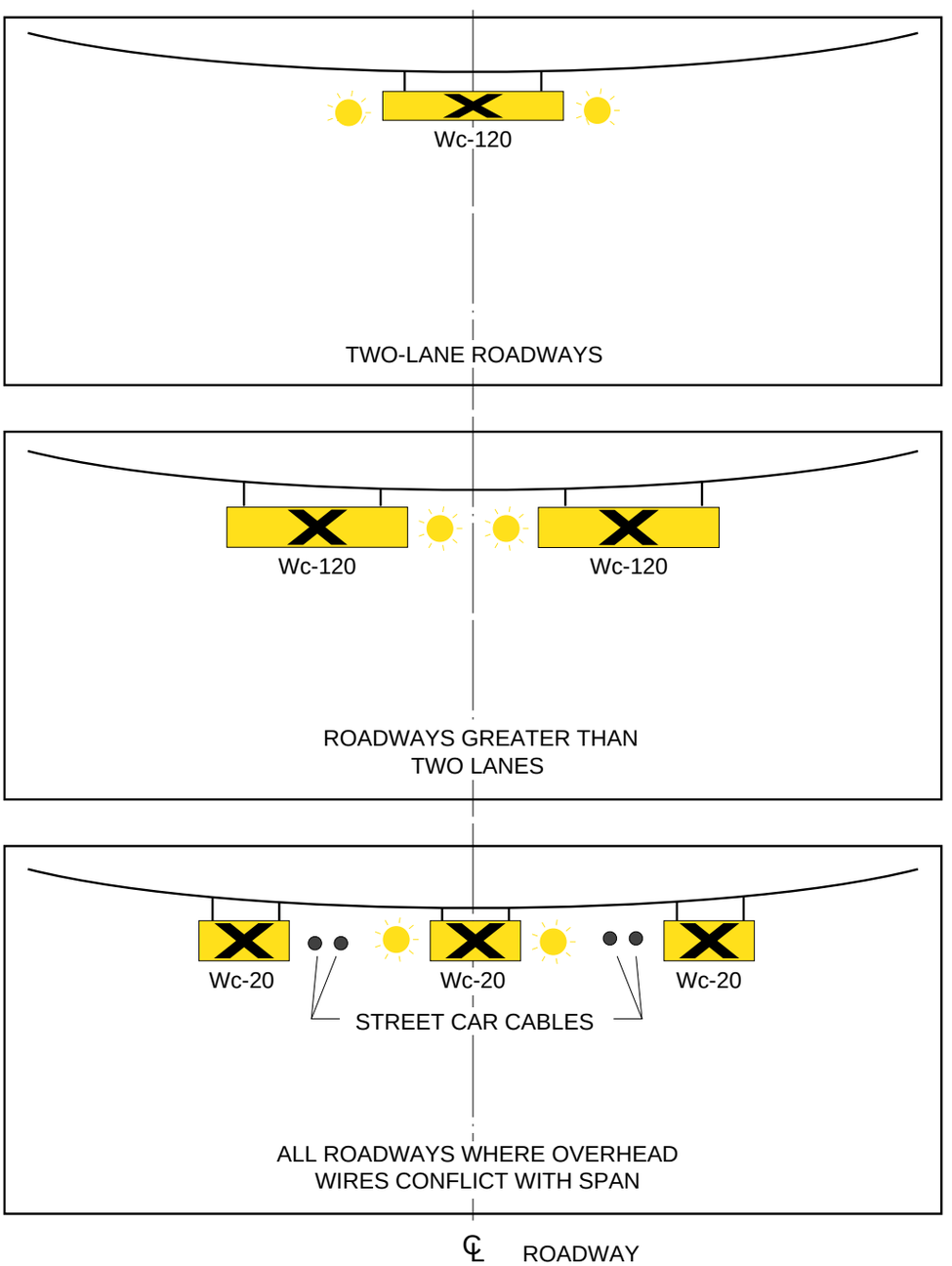
The purpose of the WAIT FOR GAP sign is to warn pedestrians wishing to cross at a channelized intersection, a pedestrian refuge island not located at a pedestrian crossover, or at a similar location that they do not have the right-of-way, and that they must wait for a gap in traffic sufficiently large to enable them to cross safely.

The WAIT FOR GAP sign is a rectangular sign, rather than a diamond-shaped one, to better accommodate the text message.

Sign Types

There is one type of **WAIT FOR GAP sign: (Wc-28)**.

Figure 6 – Positioning of Overhead Signs and Flashers at Pedestrian Crossovers



Guidelines for Use

The WAIT FOR GAP sign should be installed where field observations have indicated that pedestrians frequently cross at a channelized intersection, at a pedestrian refuge island that is not at a pedestrian crossover, or at a similar location, and that there is evidence that pedestrians are failing to cross in a safe manner.

WAIT FOR GAP signs should be used in conjunction with the PEDESTRIANS AHEAD sign (Wc-7), which warns drivers to expect pedestrian traffic. The PEDESTRIANS AHEAD sign is described earlier in Section 7 (Pedestrian Warning Signs).

If the pedestrian volume is significant, and/or the conflict or collision experience is high, consideration should be given to rerouting pedestrian traffic to another crossing location, installing pedestrian signals or implementing a pedestrian crossover. For further information on pedestrian signals, see Book 12 (Traffic Signals), and for further information on pedestrian crossovers and pedestrian refuge islands, see Book 15 (Pedestrian Control and Protection).

The crossing locations may be indicated by pavement markings shown where the pedestrian crossing demand occurs. See Book 11 (Markings and Delineation) for more details. At locations with low pedestrian volumes and high vehicular speeds, installing the pavement marking crosswalk lines may be potentially misleading, and the risk of installing crosswalk lines in these cases would be greater than not installing crosswalk lines.

Location Criteria

The WAIT FOR GAP sign should be placed on the far side of the crossing or on pedestrian refuge islands, where pedestrians would normally look to find pedestrian signal heads. The sign must face pedestrians about to cross the road. Signs should be provided for both directions of crossing pedestrians.

The WAIT FOR GAP sign should be oriented so that motorists do not see the sign and potentially misunderstand it.

Special Considerations

N/A

TWO STAGE PEDESTRIAN CROSSING Sign

10

Wc-29	**60 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the TWO STAGE PEDESTRIAN CROSSING sign is to warn pedestrians wishing to cross at a two-stage crossing location (e.g., at a divided roadway or wide road separated by a median island or pedestrian refuge) that the pedestrian signals are timed for a two-stage crossing. The intended safe crossing strategy is for pedestrians to cross the first stage of the crossing, wait on the divider or median island, and cross the second stage of the crossing on the next signal cycle.

The TWO STAGE PEDESTRIAN CROSSING sign is a rectangular sign, rather than a diamond-shaped one, to better accommodate the text message.

Sign Types

There is one type of **TWO STAGE PEDESTRIAN CROSSING sign: (Wc-29)**.

Guidelines for Use

The TWO STAGE PEDESTRIAN CROSSING sign should be installed at two-stage crossing locations where the pedestrian phase of traffic signal is too short to enable most pedestrians to safely cross both stages of the crossing. Two-stage crossings are typically located at crossings of divided roadways, or wide roads separated by a median island or pedestrian refuge.

For further information on pedestrian signals, see Book 12 (Traffic Signals), and for further information on pedestrian crossings, see Book 15 (Pedestrian Control and Protection).

Location Criteria

The TWO STAGE PEDESTRIAN CROSSING sign should be placed on the median island or divider, on the traffic signal pole where pedestrians would normally look to find pedestrian signal heads. The sign must face pedestrians about to cross the road. Signs should be provided for both directions of crossing pedestrians.

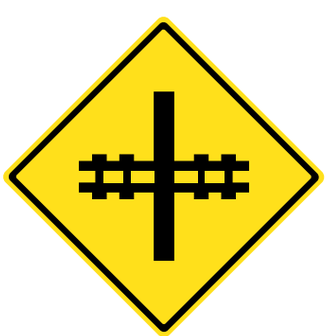
Special Considerations

N/A

8. Intermittent Hazards Signs

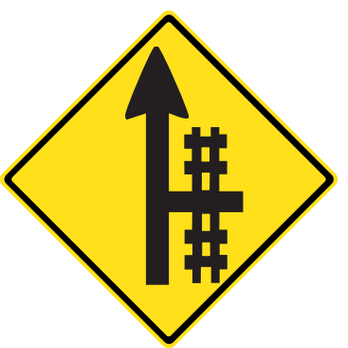
Intermittent hazards are classified as potential hazards that a driver may encounter along a specific stretch of road. Intermittent hazards include weather-related conditions (e.g., road slippery when wet), natural phenomena (e.g., deer or moose crossing the road) and special road users (e.g., fire trucks, school buses, snowmobiles, bicycles), which may interfere with traffic flow or result in traffic conflicts. Because these hazards are not continuously present, and because many of them are mobile, drivers may not expect them, and require advance warning to be informed of their presence and to respond if necessary.

RAILWAY CROSSING AHEAD Sign



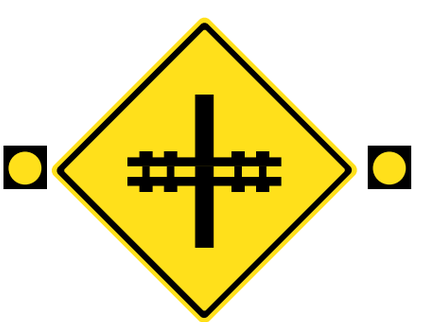
Wc-4	75 cm x 75 cm
Wc-104	120 cm x 120 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

RAILWAY CROSSING AHEAD Sign (On Crossroad or Sideroad)



Wc-4B	75 cm x 75 cm
Wc-104B	120 cm x 120 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

PREPARE TO STOP AT RAILWAY CROSSING AHEAD Sign (With Amber Flashers)



Wc-104A	120 cm x 120 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

PREPARE TO STOP WHEN FLASHING Tab Sign

15

Wb-102At	**75 cm x 120 cm**
Font	**Helvetica Bold Condensed**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The RAILWAY CROSSING AHEAD sign provides advance notice of an at-grade railway crossing and alerts drivers to the fact that they may be required to stop to allow a train to pass. The sign symbol indicates whether the railway crossing is on the same road as the sign, or on a crossroad (i.e., road crossing the through road) or sideroad (i.e., road forming a T-intersection with the through road).

The primary function of the dynamic PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (with amber flashers) is to reduce dilemma zone incidents, where some drivers feel that they cannot safely clear the railway crossing when a railway crossing signal is activated, and others feel that they cannot safely stop. The dynamic flashing beacons on the sign are interconnected to the rail crossing signal. They indicate to drivers that there is a good probability that the railway crossing signals ahead will be in operation and that stopping will be required.

Sign Types

The **standard size RAILWAY CROSSING AHEAD sign (Wc-4)** (version with symbol representing the actual road and track configuration) must be used where the crossing is on the same road as the sign, and should be used where posted speed is 60 km/h or less.

The **oversize RAILWAY CROSSING AHEAD sign (Wc-104)** (version with symbol representing the actual road and track configuration) must be used where the crossing is on the same road as the sign, and should be used where posted speed is 70 km/h or greater.

The **standard size RAILWAY CROSSING AHEAD sign (on crossroad or sideroad) (Wc-4B)** (version with symbol representing the actual road and track configuration) must be used where the crossing is on a minor crossroad or sideroad, and should be used where posted speed is 60 km/h or less.

The **oversize RAILWAY CROSSING AHEAD sign (on crossroad or sideroad) (Wc-104B)** (version with symbol representing the actual road and track configuration) must be used where the crossing is on a minor crossroad or sideroad, and should be used where posted speed is 70 km/h or greater.

The **oversize PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (with amber flashers) (Wc-104A)** (version with symbol representing the actual road and track configuration) should be used where posted speed is 90 km/h or greater. This sign may also be installed at lower speed locations with visibility restrictions, or where downgrades result in vehicle acceleration.

The **oversize PREPARE TO STOP WHEN FLASHING tab sign (Wb-102At)** must be used in conjunction with the PREPARE TO STOP AT RAILWAY

CROSSING AHEAD sign (with amber flashers) (Wc-104A) to indicate the intent of the amber flashing beacons.

Guidelines for Use

Either the RAILWAY CROSSING AHEAD sign (Wc-4) or the PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (Wc-104A) must be located in advance of every railway crossing, even if the railway crossing is protected by:

- Signals;
- Gates; or
- Railway personnel;

except at a minor siding or spur which is infrequently used and which is guarded when in use by a member of the train's crew.

The RAILWAY CROSSING AHEAD sign (on crossroad or sideroad) (Wc-4B) should be used where:

- A major road and a parallel rail line are located in close proximity;
- The parallel road and rail line are intersected by a crossroad or sideroad; and
- The distance on the crossroad or sideroad between the railway crossing and the intersection with the major road is less than the minimum advance placement distance for a RAILWAY CROSSING AHEAD sign (Wc-4). See Section 1.5 (Location).

The sign version with a symbol that graphically depicts the actual configuration and angle intersecting track(s) and road(s) must be used. On the Wc-4B sign, an arrowhead at the end of a line or curve symbolizes right-of-way on the through road represented by that line or curve.

The PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (with amber flashers) should only be used where there are actual or potential dilemma zone problems at railway crossings. Relevant factors for dilemma zone problems include:

- High train and vehicle speeds;
- High train volumes;
- High traffic volumes, including heavy trucks;
- Poor visibility (e.g., due to horizontal or vertical curves, parked vehicles, tall buildings, foliage, etc.);
- Presence of environmental conditions which frequently restrict visibility (e.g., fog, factory smog, etc.);
- Collision or conflict experience related to the railway crossing signal.

Conditions on each approach to the railway crossing should be considered separately, as the PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign may not be necessary on both approaches.

Two flashing amber beacons interconnected with the signal controller must be part of the PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign. The double amber beacons must flash in an alternating side-to-side pattern. The beacons must be flashed at a rate of 50 to 60 on and off flashes per minute, with the duration of the on and off flashes being approximately equal. For more information on the operation of the flashing beacons on the Wc-104A sign, see Book 12 (Traffic Signals).

The duration and start/stop timing of the flash operations should be designed taking into consideration the geometry of the road, speed and local driver behaviour. The flashing of the beacons must commence prior to the start of the red flashing indication at the railway crossing signals, and must

be displayed for the duration of the red flashing indication. Early or late beacon activities will negate the basic warning function of the sign. Vehicles passing the signs when the beacons are not flashing must have sufficient clearance time to clear the railway crossing.

The PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (with amber flashers) must be illuminated from above at night to prevent message washout from flashing beacons.

Location Criteria

The beacons and signs should be accurately located such that vehicles passing the signs and beacons when they are flashing have sufficient time and distance to stop before the railway crossing.

On a divided highway or one-way street, supplementary signs may be placed on the left side of the roadway or within the median divider.

If there is one or more street intersection between the RAILWAY CROSSING AHEAD sign and the railway crossing, additional sign(s) should be placed downstream of the intersections to warn traffic approaching the crossing from each intersection.

The RAILWAY CROSSING AHEAD (on crossroad or sideroad) sign (Wc-4B) must be installed to address both directions of traffic along the road on which it is posted.

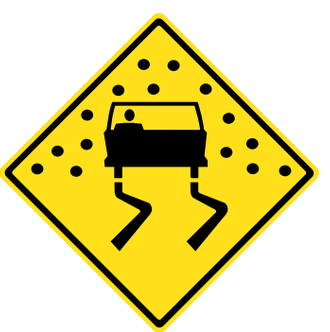
The PREPARE TO STOP AT RAILWAY CROSSING AHEAD sign (with amber flashers) and PREPARE TO STOP WHEN FLASHING tab sign must be mounted:

- Overhead above the lanes of travel; or
- In a conspicuous position adjacent to the road.

Special Considerations

Providing and maintaining the cross-buck signing, the signals and the gates at railway crossings is the responsibility of the railways (under Federal authority).

SLIPPERY WHEN WET Sign



Wc-5	**75 cm x 75 cm**
Wc-105	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

SLIPPERY WHEN WET Tab Sign

8

Wc-5t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

ADVISORY SPEED Tab Sign

Wa-7t	**45 cm x 45 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the SLIPPERY WHEN WET sign is to advise drivers that the surface of the roadway has a significantly reduced wet weather skid resistance. This condition typically results from precipitation, although roadway cleaning operations can also result in a wet surface.

Competent drivers are aware that the friction of the road surface decreases when wet, and that speed reduction is prudent for wet driving conditions. Therefore, the SLIPPERY WHEN WET sign is reserved only for those road surfaces where skid resistance is reduced to an unexpectedly low level, thereby constituting a hazard.

A reduction in skid resistance of an asphalt surface usually results from extensive wear, poor quality aggregates, excessive asphalt cement or a poor mix design. Concrete surfaces will often become smooth over time as a result of use. The SLIPPERY WHEN WET sign must not be considered as a permanent solution to the problem and roadway surface improvement should be undertaken as soon as possible.

Sign Types

The **standard size SLIPPERY WHEN WET sign (Wc-5)** should be used where posted speed is 60 km/h or less.

The **oversize SLIPPERY WHEN WET sign (Wc-105)** should be used where posted speed is 70 km/h or greater.

The educational **SLIPPERY WHEN WET tab sign (Wc-5t)** may be attached to the SLIPPERY WHEN WET sign (Wc-5) to convey in words the meaning of the slippery when wet symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

The **ADVISORY SPEED tab sign (Wa-7t)** indicates the safe speed for driving along a section of road to which the SLIPPERY WHEN WET sign (Wc-5) applies.

Guidelines for Use

The SLIPPERY WHEN WET sign should be used:

- At locations where field investigations determine that a pavement has a significantly reduced wet weather skid resistance;
- Where for no other identifiable reason more than one third of all collisions on a given section of highway are occurring on wet pavement;
- At locations which consistently have an abnormally high number of wet weather conflicts or collisions; or
- For other reasons related to wet pavement hazards, under approval from the local Road Authority.

Application of the SLIPPERY WHEN WET sign must be kept to an absolute minimum, with its use restricted to extraordinary situations only. The sign must be removed immediately upon correction of the skid resistance problem (e.g., through resurfacing). These guidelines preclude using the sign for normal wet surface conditions, so that driver expectations and responses to the signed hazards remain consistent.

The ADVISORY SPEED tab sign (Wa-7t) may be used together with the Wc-5 sign to indicate the safe speed for travelling on wet pavement, if the safe speed is different from the posted speed.

Location Criteria

Signs must be located at intervals of 3 km or less on long sections of slippery pavement. In urban areas sign spacing should be at intervals of 1 km or less.

Special Considerations

The symbol on the SLIPPERY WHEN WET sign has been modified by showing dots representing rain or snow on the upper half of the sign. U.S. studies have indicated that sign comprehension improved significantly with the addition of the dots.

The new sign design must be implemented on all installations by January 1, 2007.

FALLEN ROCK Sign

Wc-6L	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

WATCH FOR FALLEN ROCK Tab Sign

8

Wc-6t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The FALLEN ROCK sign is used at rock cuts or other vertical or near vertical faces where there is a threat of rock or earth falling to the roadway. This threat is often more serious during the spring because the freeze/thaw effect of the water in the crevices has loosened the rocky material. Field investigations and maintenance patrols are good methods for determining if there is a hazard.

Sign Types

The **FALLEN ROCK sign (Wc-6)** is the standard symbol sign.

The **left** version of the FALLEN ROCK sign (Wc-6L) indicates a fallen rock hazard on the left side of the road. The **right** version of the FALLEN ROCK sign (Wc-6R) indicates a fallen rock hazard on the right side of the road.

The educational **WATCH FOR FALLEN ROCK tab sign (Wc-6t)** may be attached to the FALLEN ROCK sign (Wc-6) to convey in words the meaning of the fallen rock symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The FALLEN ROCK sign must be used to warn drivers of the possible hazard of fallen rock or the accumulation of earth on the pavement at locations where there is a high probability of rock or earth falling to the roadway.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

TRUCK ENTRANCE Sign

Wc-8R	**75 cm x 75 cm**
Wc-108R	**90 cm x 90 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

TRUCK ENTRANCE Tab Sign

Wc-8t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Truck entrances can be hazardous to drivers, particularly when drivers are required to exercise caution and slow down to accommodate fully loaded trucks requiring more acceleration time. Truck entrances for temporary sites, such as construction or quarry sites, pose an additional hazard, because drivers may not be anticipating large, slow-moving

vehicles merging with the traffic at these locations. TRUCK ENTRANCE signs are therefore required to provide advance warning of truck entrances to drivers, so that they are prepared to react to the associated hazards.

Sign Types

The **standard size TRUCK ENTRANCE sign (Wc-8)** should be used where posted speed is 60 km/h or less.

The **oversize TRUCK ENTRANCE sign (Wc-108)** should be used where posted speed is 70 km/h or greater.

The **left** version of the TRUCK ENTRANCE sign (Wc-8L, Wc-108L) indicates a truck entrance from the left side of the roadway. The **right** version of the TRUCK ENTRANCE sign (Wc-8R, Wc-108R) indicates a truck entrance from the right side of the roadway.

The educational **TRUCK ENTRANCE tab sign (Wc-8t)** may be attached to the TRUCK ENTRANCE sign (Wc-8) to convey in words the meaning of the truck entrance symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The TRUCK ENTRANCE sign must be used in advance of a heavily used truck entrance where:

- There is inadequate sight distance (i.e., the truck entrance is concealed to the extent that a driver on the main roadway would not have sufficient time to reduce speed to accommodate a slow-moving truck); or
- Trucks are using a temporarily entrance where they would not normally be expected (e.g., a lane into a quarry or borrow pit).

A heavily used entrance can be defined as an entrance where there are 5 vehicles/hour or more that use the entrance for ingress or egress during any hour of any day.

To determine if a TRUCK ENTRANCE sign is required on the basis of inadequate sight distance, the sight distance must be measured from the perspective of the truck driver stopped on at the downstream end of the truck entrance, approaching the main roadway. The measurement must be made:

- From an assumed eye height of 1.05 m above the surface, 5 m from the edge of pavement or travelled portion of the truck entrance roadway, at the vehicle stop location;

Table 12 – Minimum Sight Distance for TRUCK ENTRANCE Tab Sign

	Normal Regulatory Posted Speed on Major Highway (km/h)					
Type of Roadway	**50**	**60**	**70**	**80**	**90**	**100**
Two-lane Roadway	95	115	135	150	170	—
Four-lane Divided Roadway (Median width more than 5.5 m)	95	115	135	150	170	190
Other Four-lane Roadway	115	135	160	180	205	225

- To an assumed vehicle height of 1.05 m above the surface on the centreline of the through road, at the upstream-most location that a vehicle is visible to the driver on the side road.

A TRUCK ENTRANCE sign must be installed when the sight distance measured using the above procedure is less than the minimum sight distance specified in Table 12.

If truck entrances are located on both sides of the roadway, either the left or right version of the sign may be used. The version of the sign used should reflect the most critical situation, as determined by factors such as:

- Volume of trucks entering;
- Visibility of the truck entrance; and
- Frequency of entries to the main road that require left-turn movements.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

A new truck entrance symbol has been incorporated into the sign design, to better convey the concept of an entrance to the main road. The new symbol was adopted on the basis of positive results from random comprehension tests, conducted as described in Book 1b, Section 14.1 (Comprehension Testing).

The new sign design must be implemented on all installations by January 1, 2007.

CATTLE CROSSING Sign

Wc-9	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

In a lot of rural areas, farmers must move livestock from one field to another. This often involves crossing a road at a location that may not be easily visible to approaching vehicles. Collision with a vehicle can be fatal to both the driver and the livestock. The CATTLE CROSSING sign is used to provide advance warning to drivers that they may be required to stop in order to allow the livestock to pass.

Sign Types

There is one type of **CATTLE CROSSING sign: (Wc-9)**.

Guidelines for Use

The CATTLE CROSSING sign (Wc-9) must only be used:

- Where livestock cross the road periodically;
- Where the driver's sight distance to the cattle crossing location is 250 m or less; and
- Where the farmer has agreed to hang the Wc-9 signs in advance of the crossing location before the cattle cross, and to remove them after the cattle have crossed.

If the cattle crossing location can be viewed from a distance greater than 250 m, it is assumed that the driver has sufficient time to see the hazard and stop.

The guidelines for using the CATTLE CROSSING sign apply to approaches in both directions.

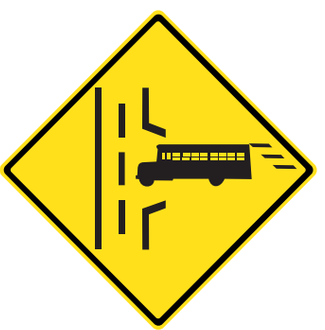
Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

SCHOOL BUS ENTRANCE Sign



Wc-10R	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The SCHOOL BUS ENTRANCE sign indicates to drivers that they are approaching a location at which school buses are entering, leaving, or crossing the road and where the requirement for an unusual manoeuvre by the school bus, or a physical condition (e.g., inadequate sight distance, steep grade) presents an uncommon degree of hazard. Drivers may be required to exercise additional caution and slow down to accommodate the school bus.

The symbolic SCHOOL BUS ENTRANCE sign replaces the text-only SCHOOL BUS TURNING sign. The symbol reduces reading time, and is consistent with other entrance signs in this section (e.g., TRUCK ENTRANCE, FIRE TRUCK ENTRANCE, etc.).

Sign Types

The **SCHOOL BUS ENTRANCE sign (Wc-10)** is the standard symbol sign.

The **left** version of the SCHOOL BUS ENTRANCE sign (Wc-10L) indicates a school bus entrance from the left side of the roadway. The **right** version of the SCHOOL BUS ENTRANCE sign (Wc-10R) indicates a school bus entrance from the right side of the roadway.

Guidelines for Use

The SCHOOL BUS ENTRANCE sign (Wc-10) must be used only where the driver's sight distance to the location where buses enter or leave the main road is 250 m or less. If the school bus entrance location can be viewed from a distance greater than 250 m, it is assumed that the driver has sufficient time to see the hazard and stop.

The SCHOOL BUS ENTRANCE sign should be used where an unusual turning manoeuvre is required for the school bus to enter the through roadway.

If school bus entrances are located on both sides of the roadway, either the left or right version of the sign may be used. The version of the sign used should reflect the most critical situation, as determined by factors such as:

- Volume of school buses entering;
- Visibility of the school bus entrance; and
- Frequency of entries to the main road that require left-turn movements.

At intersections where a HIDDEN INTERSECTION tab sign (Wa-18t) is required as an attachment to an INTERSECTION sign (controlled) (Wa-11A, Wa-12A, Wa-13A or Wa-15A), a SCHOOL BUS ENTRANCE sign must not be used. For more details on the HIDDEN INTERSECTION tab sign and INTERSECTION signs (controlled), see Section 3 (Intersection Warning Signs).

The SCHOOL BUS ENTRANCE sign should only be used if relocation of the bus entrance to a location with adequate visibility or geometric conditions is not practicable or feasible.

The request for a SCHOOL BUS ENTRANCE sign is made to the local Road Authority, typically by the school board or the transportation company under contract to the board. SCHOOL BUS ENTRANCE signs must be reviewed and applied for on an annual basis due to the changing nature of School Bus Routes. Signing for any school bus entrance no longer in use must be removed.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

The SCHOOL BUS ENTRANCE sign (Wc-10) must replace all installations of the SCHOOL BUS TURNING sign by January 1, 2007.

DEER CROSSING Sign

Wc-11	60 cm x 60 cm
Wc-111	90 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

MOOSE CROSSING Sign

Wc-12	60 cm x 60 cm
Wc-112	90 cm x 90 cm
Font	N/A
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

NIGHT DANGER Tab Sign

Wc-12t	30 cm x 60 cm
Font	Highway Gothic C
Colour	Legend & Border – Black Background – Yellow Reflective
Minimum Sheeting	Type I

HAZARD LENGTH Tab Sign

Wa-6t	30 cm x 60 cm
Font	Helvetica Bold Condensed
Colour	Legend & Border – Black ackground – Yellow Reflective
Minimum Sheeting	Type I

Purpose and Background

On highways which pass through the natural habitat of deer or moose, the risk of collisions or conflicts with these animals can be fairly high, and the consequences of collisions can be serious to both the motorists and wildlife involved. DEER CROSSING and MOOSE CROSSING signs alert drivers to locations where deer or moose crossings are particularly frequent, so that drivers can be proactive in watching for and dealing with these hazards.

Sign Types

The **standard size DEER CROSSING sign (Wc-11)** is used to indicate a deer crossing, and should be used where posted speed is 60 km/h or less.

The **oversize DEER CROSSING sign (Wc-111)** is used to indicate a deer crossing, and should be used where posted speed is 70 km/h or greater.

The **standard size MOOSE CROSSING sign (Wc-12)** is used to indicate a moose crossing, and should be used where posted speed is 60 km/h or less.

The **oversize MOOSE CROSSING sign (Wc-112)** is used to indicate a moose crossing, and should be used where posted speed is 70 km/h or greater.

The **NIGHT DANGER tab sign (Wc-12t)** is used in conjunction with the DEER CROSSING sign (Wc-11, Wc-111) or the MOOSE CROSSING sign (Wc-12, Wc-112) to indicate that the deer or moose crossing hazard is particularly severe at night.

The **HAZARD LENGTH tab sign (Wa-6t)** may be used in conjunction with the DEER CROSSING sign (Wc-11, Wc-111) or the MOOSE CROSSING sign (Wc-12, Wc-112) to indicate the length of the deer or moose crossing hazard.

Guidelines for Use

The DEER CROSSING sign and MOOSE CROSSING signs must be used only:

- Where it is known that deer or moose are accustomed to crossing the road (established through field observations), and thereby present a hazard to drivers;
- At sections of road 8 km or less in length, that have at least one deer or moose collision annually, for a minimum of five years; or
- At sections of road less than 1.5 km in length, that have at least four deer or moose accidents over a one-year period.

The tab sign Wc-12t may be used where, based on field observations, the potential hazard is more severe at night.

The tab sign Wa-6t may be used to indicate the length of the crossing hazard.

Location Criteria

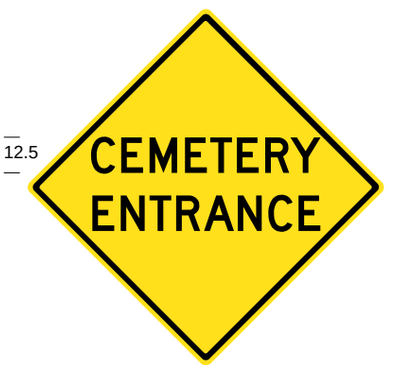
The DEER CROSSING sign or the MOOSE CROSSING sign should be installed:

- At intervals of 8 km; and
- Immediately downstream of major intersections.

Special Considerations

Information on locations where deer and moose congregate and travel can be obtained from the local District Office of the Ministry of Natural Resources.

CEMETERY ENTRANCE Sign



Wc-13	**90 cm x 90 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow**
Minimum Sheeting	**Non-reflective**

Purpose and Background

In many municipalities, the interruption of funeral processions is prohibited by municipal by-law. Therefore, there is a potential hazard to drivers at the entrance to cemeteries where funeral processions may be turning. The CEMETERY ENTRANCE sign warns drivers of this potential hazard.

Sign Types

There is one type of **CEMETERY ENTRANCE sign: (Wc-13)**.

Guidelines for Use

The CEMETERY ENTRANCE sign must be used to warn motorists of the presence of a cemetery, where the cemetery entrance is not readily apparent from a distance of 150 m.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

BICYCLE CROSSING AHEAD Sign

Wc-14	**60 cm x 60 cm**
Font	**Highway Gothic D**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

Conflict situations may arise at locations where bicycle routes and roads intersect. The BICYCLE CROSSING AHEAD sign is used to warn drivers of the potential hazard so that they are prepared to exercise caution and slow down should they encounter a crossing bicycle.

Sign Types

There is one type of **BICYCLE CROSSING AHEAD sign: (Wc-14)**.

Guidelines for Use

The BICYCLE CROSSING AHEAD sign (Wc-14) should be used in advance of a location where a bicycle route crosses a road.

See Book 18 (Bicycle Facilities) for further information on signing for bicycle routes and crossings.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

CENTRE LINE MARKING ENDS Sign

Wc-17	**90 cm x 90 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The CENTRE LINE MARKING ENDS sign is used to alert drivers to the downstream termination of the permanent marking along the centreline of the road, designating lanes for opposing traffic. This condition typically occurs at locations where the pavement ends and painted markings are not possible. Drivers need to be informed that the centre line marking is ending in order to adjust their orientation within the road limits, to be aware that two-way traffic operation is continuing, and to compensate for a different road surface material.

Sign Types

There is one type of **CENTRE LINE MARKING ENDS sign: (Wc-17)**.

Guidelines for Use

This sign must be used in advance of where the centre line pavement marking ends.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

SNOWMOBILE CROSSING Sign

Wc-18	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

SNOWMOBILE CROSSING Tab Sign

8

Wc-18t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black**
	Background – Yellow Reflective
Minimum Sheeting	**Type I**

Purpose and Background

Conflict situations arise at locations where snowmobile trails and roads intersect. The SNOWMOBILE CROSSING sign is used to warn drivers of the potential hazard so that they are prepared to exercise caution and slow down should they encounter a snowmobile crossing the roadway.

Sign Types

The **SNOWMOBILE CROSSING sign (Wc-18)** is the standard symbol sign.

The educational **SNOWMOBILE CROSSING tab sign (Wc-18t)** may be attached to the SNOWMOBILE CROSSING sign (Wc-18) to convey in words the meaning of the snowmobile crossing symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The SNOWMOBILE CROSSING sign must be used in advance of a location where a snowmobile route crosses a road, and the crossing is used by a

significant volume of snowmobiles. Visibility at the snowmobile crossing must meet the minimum sight distance requirements as described for the TRUCK ENTRANCE sign (Wc-8), and specified in Table 12 (Section 8). Otherwise, snowmobile crossings should be discouraged and the trail relocated.

Where the SNOWMOBILE CROSSING sign is used, warning must be provided for both directions of travel.

The SNOWMOBILE CROSSING sign must be posted prior to the commencement of snowmobile season and must be removed at the end of the season.

Where the snowmobile crossing is located at an intersection, intersection warning signs must be used in place of SNOWMOBILE CROSSING signs. See Section 3 (Intersection Warning Signs) for more information on intersection warning signs.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

A new snowmobile crossing symbol, showing a horizontal line to indicate a crossing, has been incorporated into the SNOWMOBILE CROSSING sign design. A similar convention is used for other signs referring to crossings.

The new sign design must be implemented on all installations by January 1, 2007.

WATER OVER ROAD Sign

Wc-21	**75 cm x 75 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

WATER OVER ROAD Tab Sign

Wc-21t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the WATER OVER ROAD sign is to warn road users of the possible hazard of water over the roadway, where seasonal changes or heavy precipitation results in pooled or running water over the roadway, and the depth of the water is sufficient to impact driver control over their vehicles. Field investigations and local knowledge are useful in identifying these locations.

Ditch realignment and clearing operations should be undertaken wherever possible to alleviate this situation.

Sign Types

The **WATER OVER ROAD sign (Wc-21)** is the standard symbol sign.

The educational **WATER OVER ROAD tab sign (Wc-21t)** may be attached to the WATER OVER ROAD sign (Wc-21) to convey in words the meaning of the water over road symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The WATER OVER ROAD sign (Wc-21) may be installed on a temporary or seasonal basis where inadequate drainage results in the accumulation of water deep enough that those driving through it may lose control of their vehicles.

The WATER OVER ROAD sign must be removed once the inadequate drainage condition abates or is corrected.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

HORSE WITH RIDER Sign

Wc-22	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

HORSE-DRAWN VEHICLE Sign

Wc-23	**60 cm x 60 cm**
Font	**N/A**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The purpose of the HORSE WITH RIDER sign is to indicate to drivers that they are approaching an area where it is known that horses with riders may be expected to travel on or cross the road. The purpose of the HORSE-DRAWN VEHICLE sign is similar, but pertains to the presence of horse-drawn vehicles.

Because of their slow travel speed relative to cars and trucks, their vulnerability and the potential risk of unpredictable animal behaviour, horses present a hazard to the drivers of motorized vehicles. Signs are therefore required to provide advance warning of horses and horse-drawn conveyances to drivers, so that drivers are prepared to exercise caution and slow down to accommodate them.

Sign Types

The **HORSE WITH RIDER sign (Wc-22)** indicates the presence of horses with horse-riders.

The **HORSE-DRAWN VEHICLE sign (Wc-23)** indicates the presence of horse-drawn vehicles.

Guidelines for Use

The signs should be installed in areas where horses with riders or horse-drawn vehicles may travel on or cross the road and present a hazard.

Location Criteria

The HORSE WITH RIDER sign or the HORSE-DRAWN VEHICLE sign should be installed:

- At intervals of 8 km or less; and
- Immediately downstream of major intersections, or upstream of major access points for horses with riders or horse-drawn vehicles.

Special Considerations

N/A

FIRE TRUCK ENTRANCE Sign

Wc-25	**75 cm x 75 cm**
Font	**N/A**
Colour	**Fire Truck Flasher Symbol – Red** **Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

FIRE TRUCK ENTRANCE Tab Sign

Wc-25t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The FIRE TRUCK ENTRANCE sign indicates to drivers that they are approaching a location where fire trucks may unexpectedly enter, leave or cross the road, causing an unusual degree of hazard.

Sign Types

The **FIRE TRUCK ENTRANCE sign (Wc-25)** is the standard symbol sign.

The **left** version of the FIRE TRUCK ENTRANCE sign (Wc-25L) indicates a fire truck entrance from the left side of the roadway. The **right** version of the FIRE TRUCK ENTRANCE sign (Wc-25R) indicates a fire truck entrance from the right side of the roadway.

The educational **FIRE TRUCK ENTRANCE tab sign (Wc-25t)** may be attached to the FIRE TRUCK ENTRANCE sign (Wc-25) to convey in words the meaning of the fire truck entrance symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

Guidelines for Use

The FIRE TRUCK ENTRANCE sign should be considered where high traffic volumes, lack of visibility, conflict or collision experience, high vehicle speeds, delay of fire truck entry or frequent fire truck entry are a factor.

The sign must not be used where traffic control signals are installed at a fire truck entrance.

If fire truck entrances are located on both sides of the roadway, either the left or right version of the sign may be used. The version of the sign used should reflect the most critical situation, as determined by factors such as:

- Volume of fire trucks entering;
- Visibility of the fire truck entrance; and
- Frequency of entries to the main road that require left-turn movements.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

SCHOOL BUS STOP AHEAD Sign

Wc-26	**75 cm x 75 cm**
Font	**N/A**
Colour	**School Bus Flasher Symbol – Red** **Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

SCHOOL BUS STOP AHEAD Tab Sign

Wc-26t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

DISTANCE Tab Sign

Wa-23t	**30 cm x 60 cm**
Font	**Highway Gothic C**
Colour	**Legend & Border – Black** **Background – Yellow Reflective**
Minimum Sheeting	**Type I**

Purpose and Background

The School Bus Stop Ahead sign indicates to drivers that they are approaching a school bus stop with limited sight distance. Drivers need to exercise caution at these hidden locations, to protect school children crossing the road on their way to or from the school bus, and to be prepared for frequent school bus stops.

School bus stops are located on designated School Bus Routes. A School Bus Route is the sequence of roads travelled by a school bus for the purpose of picking up and dropping off school children at their schools and residences.

Sign Types

The **SCHOOL BUS STOP AHEAD sign (Wc-26)** is the standard symbol sign.

The educational **SCHOOL BUS STOP AHEAD tab sign (Wc-26t)** may be attached to the SCHOOL BUS STOP AHEAD sign (Wc-26) to convey in words the meaning of the school bus stop symbol. An educational tab sign is normally used when a new sign is first introduced in an area until motorist familiarity with the symbol is established.

The **DISTANCE tab sign (Wa-23t)** indicates the distance to the lane end hazard.

Guidelines for Use

The sign should be installed where horizontal curves, vertical curves or foliage limit sight distance to less than the minimum stopping sight distance, as specified in Tables 13 and 14 below. The minimum

Table 13 – Minimum Stopping Sight Distance for SCHOOL BUS STOP AHEAD Sign

Posted Speed (km/h)	Minimum Stopping Sight Distance (m)
40	65
50	110
60	135
70	160
80	185
90	215
100	245

Source: *Geometric Design Standards for Ontario*, Table C2-1.

stopping sight distance is the minimum distance between a vehicle and an object that allows a driver to perceive, react and brake in time to avoid a collision on wet pavement.

The sight distance should be measured from the eye of the driver to the two overhead flashing red lights on the school bus. Driver eye height is assumed to be 1.05 m. On a large school bus, the flashers are at a height of approximately 2.74 m. Other school vehicles can include vans (flasher height 2.0 m) and station wagons (flasher height 1.3 m).

The minimum stopping sight distances shown in Table 13 apply to level terrain or downgrades, and those shown in Table 14 apply to crest curves. In Table 14, a K factor is used. The K factor is a measure of the flatness of a vertical curve, and is equal to the length of curve (measured horizontally in a straight line) divided by the change in gradient. If, for a given horizontal length of curve, there is only a small change in gradient (as would be the case for a flatter curve), the K factor is large. Therefore, a large K factor indicates a flatter crest, and a small K factor indicates a steeper crest.

Table 14 – Minimum Stopping Sight Distance on Crest Curves for SCHOOL BUS STOP AHEAD Sign

Object Height (m)	0.38		1.30		2.00		2.70	
K Factor	Posted Speed (km/h)	Distance (m)	Posted Speed (km/h)	Distance (m)	Posted Speed (km/h)	Distance (m)	Posted Speed (km/h)	Distance (m)
8	40	65	50	115	50	95	50	105
15	50	110	60	150	60	130	60	145
25	60	135	70	180	70	170	70	185
35	70	160	90	215	80	200	90	220
50	80	185	100	255	100	240	100	265
70	90	215						
90	100	245						

Notes: Eye height = 1.05 m
Crest curve longer than safe stopping sight distance.
Object heights: 0.38 m = taillight
1.30 m = top of station wagon
2.00 m = van type school bus
2.70 m = regular school bus
Crest curve shorter than safe sight stopping distance requires individual analysis.

Source: *Geometric Design Standards for Ontario,* Table C4-6.

Relocation of the bus stop to a location with adequate visibility of the stopped bus should first be assessed prior to considering sign installation.

The request for the SCHOOL BUS STOP AHEAD sign is made to the local Road Authority, typically by the school board or the transportation company under contract to the board.

SCHOOL BUS STOP AHEAD signs must be reviewed and applied for on an annual basis due to the changing nature of school bus stops and School Bus Routes. Signing for any stop no longer in use must be removed.

The supplementary DISTANCE tab sign may be used to indicate the distance to the school bus stop.

Location Criteria

The location criteria for this sign are as described for warning signs in Section 1.5 (Location), and as described as described for signs in general, in Book 1b, Section 12 (Sign Position). No exceptional location criteria are noted.

Special Considerations

N/A

9. Renumbered Signs, Added Signs, New Sign Designs and Tab Signs

In general, sign numbers used in Book 6 are consistent with those in the Ontario Manual of Uniform Traffic Control Devices (MUTCD). In a few instances, however, it was necessary to renumber signs or add new sign numbers. Signs were renumbered or added for the following reasons:

- To simplify numbering conventions, for example, setting up corresponding numbers for signs and their associated tab signs;
- To maintain consistency with other sign numbers;
- To accommodate signs from other sources, such as the Canadian Manual of Uniform Traffic Control Devices and the City of Toronto.

Table 15 lists signs that have been renumbered from the Ontario Manual of Uniform Traffic Control Devices, and Table 16 lists new signs added from sources other than the Ontario Manual of Uniform Traffic Control Devices.

Table 15 – Renumbered Signs

New Number	Previous Number	Sign Name
Wa-7t	Wa-7	ADVISORY SPEED Tab Sign
Wa-8LR	Wa-8 (L&R)	CHECKERBOARD Sign (Both Directions)
Wa-15A	Wa-15	Y-INTERSECTION Sign (Controlled)
Wa-18t	Wa-18	HIDDEN INTERSECTION Tab Sign
Wa-33LR	Wa-133	OBJECT MARKER Sign (Both Directions)

Table 16 – Added Signs

Sign Number	Sign Name	Source
Wa-15	Y-INTERSECTION Sign (Uncontrolled)	—
Wa-22t	BUMP Tab Sign	MUTCDC
Wa-1123L	LANE ENDS Sign (Overhead)	MUTCDC
Wa-23Lt	LEFT LANE ENDS Tab Sign	MUTCDC
Wa-23Rt	RIGHT LANE ENDS Tab Sign	MUTCDC
Wa-28t	ROAD NARROWS Tab Sign	MUTCDC
Wa-32A	RAMP SPEED Sign	MUTCDC
Wa-32t	KM/H Tab Sign	—
Wa-34t	DIVIDED ROAD BEGINS Tab Sign	MUTCDC
Wa-35t	DIVIDED ROAD ENDS Tab Sign	MUTCDC
Wa-70t	NARROW BRIDGE Tab Sign	MUTCDC
Wa-72	DIVIDED ROAD INTERSECTION AHEAD Sign	MUTCDC
Wa-73	DO NOT BLOCK INTERSECTION Sign	City of Toronto
Wa-74	SPEED HUMP Sign	Canadian Guide to Neighbourhood Traffic Calming
Wa-74t	SPEED HUMP Tab Sign	Canadian Guide to Neighbourhood Traffic Calming
Wa-75	TRUCK OVERTURNING Sign	MTO
Wa-76	OVERHEIGHT Sign (With Amber Flashers)	MTO, City of Toronto
Wa-76t	WHEN FLASHING Tab Sign	MTO, City of Toronto
Wb-7	RAMP METERED WHEN FLASHING Sign (With Amber Flashers)	MTO
Wc-18t	SNOWMOBILE CROSSING Tab Sign	MUTCDC
Wc-21t	WATER OVER ROAD Tab Sign	MUTCDC
Wc-22	HORSE WITH RIDER Sign	MUTCDC
Wc-23	HORSE-DRAWN VEHICLE Sign	MUTCDC
Wc-25L	FIRE TRUCK ENTRANCE Sign	MUTCDC
Wc-25t	FIRE TRUCK ENTRANCE Tab Sign	MUTCDC
Wc-26	SCHOOL BUS STOP AHEAD Sign	MUTCDC
Wc-26t	SCHOOL BUS STOP AHEAD Tab Sign	MUTCDC
Wc-28	WAIT FOR GAP Sign	City of Toronto
Wc-29	TWO STAGE PEDESTRIAN CROSSING Sign	City of Toronto
Wc-4B	RAILWAY CROSSING AHEAD Sign (On Crossroad or Sideroad)	MUTCD
Wc-5t	SLIPPERY WHEN WET Tab Sign	MUTCDC
Wc-6t	WATCH FOR FALLEN ROCK Tab Sign	MUTCDC
Wc-7t	SENIORS Tab Sign	—
Wc-8t	TRUCK ENTRANCE Tab Sign	MUTCDC

Some sign designs were also modified to improve comprehension and/or maintain consistency with other similar signs. Signs with modified designs are shown in Table 17.

Table 18 provides a list of all Warning signs that are tab signs.

Table 17 – New Sign Designs

Sign Number	Sign Name	Comment
Wa-30A	TEMPORARY BRIDGE Sign	Previous text (BAILEY BRIDGE) revised for improved comprehension
Wb-3	NEW Sign (For Stop, Yield and Signal Control)	Colour now includes strong yellow-green
Wc-5	SLIPPERY WHEN WET Sign	Rain droplets in symbol improve comprehension
Wc-8	TRUCK ENTRANCE Sign	New perspective improves comprehension
Wc-10	SCHOOL BUS ENTRANCE Sign	Symbolic entrance sign replaces text-only SCHOOL BUS TURNING sign
Wc-18	SNOWMOBILE CROSSING Sign	Revised from entrance to crossing. Line included to symbolize crossing

Table 18 – Tab Signs

Sign Number	Tab Sign Name
Wa-6t	HAZARD LENGTH
Wa-7t	ADVISORY SPEED
Wa-18t	HIDDEN INTERSECTION
Wa-19t	AFTER (Month and Day)
Wa-21t	USE LOWER GEAR
Wa-22t	BUMP
Wa-23t	DISTANCE
Wa-23Lt	LEFT LANE ENDS
Wa-23Rt	RIGHT LANE ENDS
Wa-24t	ONE LANE
Wa-25t	PAVEMENT ENDS
Wa-28t	ROAD NARROWS
Wa-30t	OPENING BRIDGE
Wa-32t	KM/H
Wa-34t	DIVIDED ROAD BEGINS
Wa-35t	DIVIDED ROAD ENDS
Wa-70t	NARROW BRIDGE
Wa-74t	SPEED HUMP
Wa-76t	WHEN FLASHING
Wb-102At	PREPARE TO STOP WHEN FLASHING
Wc-2t	SCHOOL CROSSING
Wc-2At	CROSSING AHEAD
Wc-5t	SLIPPERY WHEN WET
Wc-6t	WATCH FOR FALLEN ROCK
Wc-7t	SENIORS
Wc-8t	TRUCK ENTRANCE
Wc-12t	NIGHT DANGER
Wc-18t	SNOWMOBILE CROSSING
Wc-21t	WATER OVER ROAD
Wc-25t	FIRE TRUCK ENTRANCE
Wc-26t	SCHOOL BUS STOP AHEAD

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Appendix A • Definitions

A

Acceleration
A rate of change of speed (km/h/sec or m/sec^2) resulting in an increase in travel speed.

Acceleration Lane
A speed change lane for the purpose of:

(1) enabling a vehicle entering a roadway to increase its speed to a rate at which it can more safely merge with through traffic;

(2) providing the necessary merging distance; and

(3) giving the main road traffic the necessary time to make appropriate adjustments.

Access
A way of entering or travelling towards a location. It is used when describing which vehicle movements may be permitted at an intersection (such as with an access-only barrier). It is also used when describing the location of driveways and walkways which provide an entrance to a property. See Egress and Ingress.

Accident
See Collision.

Actuation
The operation of a detector in registering the presence or passage of a vehicle or pedestrian.

Advisory Maximum Speed
An advisory speed posted when the roadway geometrics result in a maximum safe speed which is 20 km/h or more below the operating speed, and is 10 km/h or more below the regulatory speed limit.

Advisory Speed
The speed, determined to the nearest 5 km/h, at which traffic may safely negotiate a potential hazard under favourable driving conditions.

All-red Interval (Traffic Signal)
The time in seconds of a red indication for all intersection traffic. It is used following an Amber Clearance Interval to permit vehicles or pedestrians to clear the intersection before conflicting traffic receives a green indication. In Temporary Conditions (Book 7), the All-red Interval is used to clear a one-lane section through a work site before opposing traffic receives a green indication.

Amber Clearance Interval (Traffic Signal)
The clearance interval in which the signal indication for that Phase is amber. A clearance interval to warn approaching traffic to clear the intersection before conflicting traffic receives a green indication.

Approach Speed
The maximum safe speed that can be maintained over a short section of highway immediately in advance of a potentially hazardous location, taking into account pavement and shoulder width, horizontal and vertical alignment, sight distance, and other controlling factors. The approach speed does not necessarily coincide with the Design Speed.

Arterial Road
A Major Road, used primarily for through traffic rather than for access to adjacent land, that is characterized by high vehicular capacity and continuity of movement. Intersections are spaced relatively far apart and are frequently signalized. See also Collector Road and Local Road.

ASTM
American Society for Testing and Materials.

At-grade Intersection
An intersection of two roadways where there is no vertical separation between the two roadways at their point of intersection.

B

Bailey Bridge
A modular steel truss bridge often used on construction sites due to its ease and speed of installation and removal, often having a single, narrow lane. Now called Temporary Bridge for signing purposes

Ball Bank Indicator
A mechanical or electronic device that can be mounted inside a four-wheel vehicle. Readings of the ball bank indicator show the combined effects of the body rolling angle, centrifugal force and superelevation angle to estimate the safe operating speed around a curve.

Bicycle
A vehicle having only two tandem wheels, propelled solely by human power, upon which typically one or two persons may travel. The HTA definition of bicycle includes tricycles and uni-cycles and excludes motor-assisted bicycles.

Bicycle Route
A segment of a system of bikeways designated by the jurisdiction having authority, with appropriate directional and information markers, with or without a specific bicycle route number.

Brightness
A term that refers to human perception of Luminance. Whereas luminance is a photometrically measured quantity, brightness describes how intense a light source or lighted surface appears to the human eye.

Built-up Area
The territory contiguous to a highway not within a city, town, village or police village where:

(1) not less than 50% of the frontage upon one side of the highway for a distance of not less than 200 m is occupied by dwellings, buildings used for business purposes, schools or churches;

(2) not less than 50% of the frontage upon both sides of the highway for a distance of not less than 100 m is occupied by dwellings, buildings used for business purposes, schools or churches;

(3) not more than 200 m of the highway separates any territory described in clause (1) or (2) from any other territory described in clause (1) or (2); and signs are displayed as required.

Business District
The territory contiguous to and including a highway when within 180 m along such highway there are buildings in use for business or industrial purposes, including but not limited to, hotels, banks or office buildings which occupy at least 90 m of frontage on one side or 90 m collectively on both sides of the highway.

C

CBD
Central Business District.

Central Business District (CBD)
The downtown retail trade and commercial area of a city or an area of very high land valuation, traffic flow, and concentration of retail busines offices, theatres, hotels and services.

Centreline
See Directional Dividing Line.

CGSB
Canadian General Standards Board.

Channelization
The separation or regulation of traffic movements into definite paths of travel by use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movement of traffic, both vehicular and pedestrian.

Chevron Alignment Sign
A delineation sign used to delineate sharp roadway alignment changes. See Book 11.

Collector Road
A road for which vehicle movement and access are of equal importance. Direct access to adjacent properties may be permitted in some cases, typically in lower-density residential areas. Intersections are spaced at varying intervals and are typically only signalized where the collector road intersects an arterial road or in some cases another collector road. See Arterial Road and Local Road.

Collision
An incident resulting in property damage, personal injury or death and involving the loss of control and/or the striking of one or more vehicles with another vehicle, a person, an animal or an inanimate object.

Commercial Motor Vehicle
A motor vehicle having a permanently attached truck or delivery body, including fire apparatus, buses, and truck tractors and trailers (combination units) used for hauling purposes on the highways, and requiring a Commercial Vehicle Operating Registration (CVOR).

Community
A group of individuals with a common interest. A community is often defined by neighbourhood boundaries, but may also include individuals who live outside the neighbourhood, but who work or operate businesses in the neighbourhood, or whose children attend school in the neighbourhood.

Continuous Wide Median
On a divided highway, a median that has a continuous width of 10 m or more. See also Divided Highway.

Controlled Intersection
An intersection where traffic approaching from any or all directions is regulated by some form of traffic control device.

Crossover
See Pedestrian Crossover.

Crosswalk
See Pedestrian Crosswalk.

Cul-de-sac
The round or circular section of the end of a dead-end street.

Curb
A vertical or sloping construction element along the edge of a pavement or shoulder forming part of a gutter, strengthening or protecting the edge, and clearly defining the edge to vehicle operators. The surface of the curb facing the general direction of the pavement is called the “face”.

Curve
A horizontal or vertical deviation in the roadway. A horizontal curve appears as a bend in the roadway, requiring drivers to turn the steering wheel. A vertical curve appears either as a “crest” or a “sag” to provide for a change in gradient on the profile of the roadway.

Curve Sign
A Warning Sign used to inform drivers of an upcoming change in roadway alignment. In some cases, a reduction in speed is recommended.

CVOR
Commercial Vehicle Operating Registration.

Cycle
(1) When referring to a traffic signal, cycle describes one complete sequence of signal indications.

(2) See Bicycle.

D

Deceleration Lane
A speed change lane for the purpose of enabling a vehicle that is to make an exit from a roadway to slow to the safe speed on the exit after it has left the main stream of traffic.

Deflection
A vertical and/or horizontal change in the course or path of a vehicle as the result of a physical feature of a roadway. For example, a Speed Hump deflects the wheels, suspension and chassis of a vehicle in a vertical direction. A traffic circle requires that the vehicle be steered from its straight path to manoeuvre past the feature.

Delineation
One, or a combination of several types of devices (excluding Guide Signs) that regulate, warn, or provide tracking information and guidance to drivers.

Delineators
Small, Retroreflective devices erected in a series adjacent to the edge of a travelled portion of the roadway for the purpose of providing positive driver guidance.

Design Speed
A speed selected for purposes of design and correlation of those features of a highway, such as curvature, superelevation, and sight distance, upon which the safe operation of vehicles is dependent.

Detector (Traffic Signal)
A device for indicating the presence or passage of vehicles including sensor device, lead-in cable and detector sensor (amplifier) unit.

Device (Traffic Calming)
A physical feature of the roadway, constructed for the purpose of affecting the movement of motor vehicles, bicycles and/or pedestrians.

Device (Traffic Control)
See Traffic Control Device.

Diamond Grade Material
A non-metalized, micro-prismatic sign sheeting material with very high reflectivity (Type VII).

Directional Dividing Line
A yellow Pavement Marking indicating the division of the roadway between traffic travelling in opposite directions.

Divided Highway
A multi-lane highway consisting of roadways for opposing traffic which are separated by an unpaved area or other physical barrier, including a curbed island. See also Continuous Wide Median.

Driver
A person who operates a vehicle on a highway.

E

Egress
A way of exiting or travelling away from a location. Is used when describing which vehicle movements may be permitted at an intersection (such as with an egress-only barrier). Is used when describing the location of driveways and walkways which provide an exit from a property.

Eighty-fifth (85th) Percentile Speed
The speed at, or below which, 85% of motorists are travelling.

Engineering Grade Material
A retroreflective sign sheeting material meeting ASTM Specification for Type I material or CGSB Specification 62-GP-11M for Reflectivity Level II material.

Expressway
A divided arterial highway for through traffic with full or partial control of access and generally with grade separations at major intersections.

F

Freeway
An Expressway with full control of access and interchanges in place of At-grade Intersections. This term includes Toll Highways built to a freeway configuration.

G

Geometry
When referring to roadway design, geometry refers to the physical characteristics and dimensions of parts of the roadway.

Gross Axle Weight
That part of the gross vehicle weight in kilograms transmitted to the highway by an axle unit.

Gross Vehicle Weight
The total weight in kilograms transmitted to the highway by a vehicle or combination of vehicle and load.

Guide Sign
A Traffic Sign used to direct traffic along a route towards a destination.

Guideline
A recommended (but usually not required) practice, method or value for a specific design feature or operating practice.

H

Hazard Marker
See Object Marker.

High Intensity Material
A retroreflective sign sheeting material meeting ASTM Specification for Type III or higher or CGSB Specification 62-GP-11M for Reflectivity Level I material.

Highway
A general term denoting a public way for purposes of vehicular and pedestrian travel, including the entire area within the Right-of-way. This includes King's Highways, regional and county roads, rural roads, municipal roads and streets.

Human Factors
The consideration of human physical, perceptual and mental limitations in engineering design, so as to optimize the relationship between people and things. The objective is to reduce error and increase user comfort.

I

Ingress
A way of entering or travelling into a location. Is used when describing which vehicle movements may be permitted at an intersection (such as ingress-only barriers). Is also used when describing the location of driveways and walkways which provide access into a property.

Interchange
A system of interconnecting roadways in conjunction with one or more grade separations, providing for the interchange of traffic between two or more roadways on different levels.

Intersection
The area embraced by the prolongation of lateral curb lines or, if none, of the rights-of-way of two or more highways that join one another at an angle, whether or not one highway crosses the other.

Intersection Approach
That part of an intersection leg used by traffic approaching the intersection.

Intersection Channelization
Raised or painted islands at an intersection that prevent specific movement(s) from being made or provide better definition of large uncontrolled areas of pavement.

Intersection Leg
That part of any one of the roadways radiating from the intersection which is close to the intersection but outside the area of the intersection proper.

Intersection Sight Distance
The distance at which a driver on the roadway approaching an intersection can see vehicles on the other intersection legs to the left and right of the path of travel. May also be referred to as vision triangle.

K

Kilometre
A measure of distance equal to 1000 m (.622 miles).

King's Highway
A highway, including secondary and tertiary roads designated under the Public Transportation and Highway Improvement Act.

km
Abbreviation for kilometre.

L

Lane
A defined width of road intended to accommodate a single line of moving vehicles.

Left-turn Lane
A lane reserved for left-turning vehicles and so designated by Pavement Markings and/or lane-use signs.

Legal Authority
The authority provided, by legislation and regulation, to a jurisdiction or enforcement body for the actions it takes.

Light Rail (LRT)
An electric railway with a "light volume" traffic capacity compared to "heavy rail". Light rail may use shared or exclusive right-of-way, high or low platform loading, and multi-car trains or single cars. Also known as Streetcar, Trolleycar and Tramway.

Local Road
A street or road used primarily for access to residence, business or other abutting property.

Low Volume/High Volume Roadway
The volume of a roadway is normally expressed as a daily volume and includes the combined traffic in both directions. Low volume roadways are typically defined as having volumes less than 3,000 vehicles per day. The appropriate value can be obtained from the local road authority.

Luminance
The luminous flux in a light ray, emanating from a surface or falling on a surface, in a given direction, per unit of projected area of the surface as viewed from that direction, per unit of solid angle (reflective light).

M

m
Abbreviation for metre.

Major Road
The principal route of two roads at an intersection. Also called Main Road.

Marker
See Object Marker and Route Marker.

Marking (Pavement)
See Pavement Marking.

Maximum Speed
The maximum speed drivers are permitted to travel. The maximum speed is imposed by the Highway Traffic Act, or municipal by-laws.

Median
That portion of a Divided Highway separating the travelled ways for traffic in opposite directions.

Median Barrier
A raised island, wall or structure located on the Centreline of a roadway through an intersection or along a road that prevents left turns or straight through movements from being made to and from a side street or private/commercial driveway.

MUTCD
The Manual of Uniform Traffic Control Devices for Ontario, 1995.

MUTCDC
The Manual of Uniform Traffic Control Devices for Canada.

MUTCD-US
The U.S. Manual of Uniform Traffic Control Devices, 1988.

O

Object Marker
A traffic sign mounted temporarily or permanently on an obstruction, within or adjacent to the roadway, to make the obstruction as highly visible as possible.

Operating Speed
The speed at which the majority of vehicles are travelling, typically the 85th Percentile, regardless of the speed limit.

Overhead Sign
A Traffic Sign mounted above the Roadway, usually with 4.5 m to 5.3 m of vertical clearance and preferably located over the lane or lanes to which the sign applies.

Oversize Sign
A Traffic Sign with greater proportional dimensions than the minimum dimensions specified in this Manual. Such signs are generally required on higher speed highways, or on other highways in special cases.

P

Pavement
That part of the Roadway having a constructed hard surface for the facilitation of vehicular movement.

Pavement Marking
A coloured marking applied to the pavement to provide drivers with roadway alignment information.

Pedestrian
Any person who is not in or upon a vehicle, motorized or otherwise propelled.

Pedestrian Crossover
Any portion of a Roadway, designated by by-law of a municipality, at an intersection or elsewhere, 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 regulation and the HTA, with associated signs Ra-4, Ra-4t, Ra-10 and Ra-11.

Pedestrian Crosswalk
Any portion of the 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.

Perception-reaction Time
The time required to make a decision, after reading or encountering a traffic control device, and initiate a manoeuvre if required.

Phase (Traffic Signal)
A part of a cycle where one or more traffic movements receive a green indication at the same time. Phase time is the time required from the start to the finish of the phase including Amber and All-red Interval times.

Post-mounted Delineator
A delineation device that consists of Retroreflective Material mounted on a 1.2 m post to provide long-range information on roadway alignment.

Posted Advisory Speed
The maximum advisory speed as indicated by appropriate Warning Signs.

Posted Speed Zone
A section of highway upon which the maximum speed is indicated by appropriate Regulatory Signs.

Provincial Highway
Any public highway under the jurisdiction of the Ministry of Transportation of Ontario (MTO). See King's Highway.

R

Railroad
All forms of non-highway ground transportation that run on rails or electro-magnetic guideways, including:

(1) Commuter or short haul rail passenger service in a metropolitan or suburban area; and

(2) high speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads.

Railroad Crossing
A location where one or more railroad tracks cross a public highway, road, street, or a private roadway, and includes sidewalks and pathways at or associated with the crossing.

Ramp
An interconnecting roadway of a traffic interchange, or any connection between highways at different levels or between parallel highways, on which the vehicles may enter or leave a designated roadway.

Ramp Metering
Used on a freeway or expressway entrance ramp to control the rate of vehicle entrance to the highway. The operation of the metering signals is normally carried out only during rush hours and in a preferred direction (normally toward the Central Business District (CBD) in the morning and outbound from it in the evening).

Reflectance
See Reflectivity.

Reflectivity
A measure of the degree to which a surface reflects incident light. A related term, reflectance, is the amount of light reflected back from a sign, relative to the amount of light shining on the sign. See Retroreflectivity, Coefficient of (R).

Reflectorization
A method of incorporating light-reflective material on the approach face of a Traffic Sign so that the face will reflect light during the hours of darkness while retaining the same colours as by day.

Regulation
A prescribed rule, supported by legislation, such as any regulation made under the HTA or municipal by-law. Regulations provide the legal basis for enforcement.

Regulatory Sign
A Traffic Sign advising drivers of action they should or must do (or not do), under a given set of circumstances. Disregard of a regulatory sign would usually constitute an offence.

Residential District
That portion of a municipality, or an area within the influence of a municipality, in which the dominant land use is residential development, but where small business areas may be included.

Retroreflective Material
A type of material applied in either strips or sheets which reflects illumination back to its source.

Retroreflectivity, Coefficient of (R)
R indicates the proportion of light reflected back to the driver from a retroreflective sign surface, in candelas per lux per square metre. See Book 1b (Sign Design Principles), Section 9.1.

Right-of-way
(1) Allocation of right of movement to a road user, in preference over other road users;
(2) The width of the road allowance from the property line on one side to the property line on the opposite side of the roadway.

Road
See Highway.

Road Authority
The body (Municipal, Provincial or private) that has legal jurisdiction over a Roadway.

Roadway
The part of the Highway that is improved, designed or ordinarily used for vehicular traffic, but does not include the Shoulder, and, where a highway includes two or more separate roadways, the term "roadway" refers to any one roadway separately and not to all of the roadways collectively.

Route Marker
A Guide Sign bearing a route number which is erected along numbered highways.

Rural Area
An area outside of the limits of any incorporated or unincorporated city, town, village, or any other designated residential or commercial area.

S

Safe Speed
See Advisory Speed.

Safe Stopping Distance
The distance required to bring a vehicle completely and safely to rest with normal braking and road conditions.

School Bus
Any bus which is used for the express purpose of transporting students to and from school. Ontario registered vehicles must be chrome yellow in colour.

School and Pedestrian Signs
A group of signs, both Regulatory and Warning, used to control vehicles and protect pedestrians wherever students and pedestrians are likely to be present and conflict with vehicles may occur.

School Zone
A roadway section with a mandatory 40 km/h maximum speed zone in effect every school day at designated times, in the vicinity of a school. The HTA also makes provision for 60 km/h speed zones on King's Highways.

Shoulder
The portion of a Highway between the outer edge of the roadway and the Curb, or point of intersection of the slope lines at the outer edge of the roadway and the fill, ditch, or median slope, for the accommodation of stopped vehicles, for emergency use, and for lateral support.

Sight Distance
The distance visible to the driver of a passenger vehicle, measured along the normal travel path of a roadway, to the roadway surface or to a specified height above the roadway, when the view is unobstructed by traffic.

Sign
A Traffic Control Device mounted on a fixed or portable support which conveys a specific message by means of symbols or words, and is officially erected for the purpose of regulating, warning, or guiding traffic.

Sign Assembly
Any Traffic Sign mounted and erected alone or in conjunction with any combination of associated Tab Signs.

Single Axle Weight
The total weight transmitted to the roadway by all wheels whose centres may be included between two parallel transverse vertical planes 1 m apart, extending across the full width of the vehicle.

Snowmobile
A motorized vehicle solely designed to operate on snow or ice.

Speed Bump
A raised pavement area that extends transversely across the travel way. Speed bumps generally have a height of 0.075 m to 0.10 m and a length of 0.3 m to 0.9 m.

Speed Change Lane
A tapered auxiliary traffic lane used by traffic entering or leaving a freeway or expressway for the purpose of acceleration or deceleration respectively.

Speed Hump
A raised pavement area that extends transversely across the travel way. Speed humps generally have a height of 0.08 m and a length of 4 m to 7 m.

Speed Limit
The maximum vehicular speed allowed within any given posted or unposted Speed Zone.

Speed Zone
A specific section of roadway upon which a maximum speed limit has been imposed. Such zones may be posted or unposted.

Standard
A rule, principle, pattern or measure, which practice or theory has shown to be appropriate for a given set of conditions, and applicable, as the case may be, to planning, design, traffic control devices, operations or maintenance.

Steep Hill
A downgrade of 6% or more.

Stopping Sight Distance
The distance required by a driver of a vehicle, travelling at a given speed, to bring the vehicle to a stop after an object on the roadway becomes visible. It includes the distance travelled during the Perception-reaction Time and the vehicle braking distance.

Street
An Urban Highway.

Streetcar/Tram
An electrically powered rail car that is operated singly or in short trains in mixed traffic on track in city streets. See also Light Rail (LRT).

Suburban Area
An area, primarily residential, generally located between an urban centre of a community and the surrounding rural area.

T

Tab Sign
A sign smaller than the primary sign with which it is associated, and mounted below it. There are two types of tab signs:

(1) Supplementary tab sign – contains additional, related information;

(2) Educational tab sign – conveys the meaning of symbols during their introductory period.

Taper
The gradual narrowing of a lane which is intended to safely guide drivers into the adjacent lane. The taper length is the length of the section of roadway required to achieve full lane closure (e.g., construction zone) or full lane transition.

Temporary Bridge
A modular steel truss bridge often used on construction sites due to its ease and speed of installation and removal, often having a single, narrow lane.

Through Roadway
(1) The portion of the roadway used by through traffic as opposed to the parts used by traffic which is stopping or turning; or

(2) A road at which vehicular traffic from intersecting roads is required to stop before crossing or entering.

Through Traffic
(1) Traffic using a through roadway; or

(2) Traffic proceeding through an area and not having an origin and destination therein.

Timing
When referring to traffic signals, timing describes the amount of time allotted to each Phase within each signal cycle.

Toll Highway
A Highway, often built to Freeway configuration, where a fee (toll) is charged for use of the highway.

Traffic Calming
The combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users.

Traffic Calming Measure
A physical device, regulation or other action which affects the movement of motor vehicles, bicycles, and/or pedestrians.

Traffic Control Device
Any sign, signal, marking, or device placed upon, over or adjacent to a roadway by a public authority or official having jurisdiction, for the purpose of regulating, warning, guiding or informing road users.

Traffic Control Signal (Traffic Signal)
Any power-operated Traffic Control Device, whether manually, electrically or mechanically operated, by which traffic is alternately directed to stop and permitted to proceed. Traffic Signal:

(1) When used in general discussion, a traffic signal is a complete installation including signal heads, wiring, controller, poles and other appurtenances.

(2) When used specifically, the term refers to the signal head which conveys a message to the observer.

(3) That part of a traffic control signal system that consists of one set of no less than three coloured lenses, red, amber and green, mounted on a frame and commonly referred to as a signal head.

Traffic Island
A raised or painted island designed to separate streams of vehicular traffic.

Traffic Sign
A device (other than Delineators and Traffic Control Signals) which may be erected beside or above a Roadway for the purpose of regulating, warning or guiding traffic.

Trolleycar
See Light Rail (LRT).

Turn Sign
A Warning Sign used to inform drivers of an upcoming change in roadway alignment. See also Curve Sign.

Turn Signal
A lamp on a motor vehicle used to indicate to other motorists a change in direction or change of lane by emitting a flashing light on the side of the vehicle towards which a turn will be made.

Two-lane Highway
An undivided two-way facility having one lane for traffic moving in each direction.

Two-way Left-turn Lane
The centre lane on some three, five or seven lane sections of undivided highway which is designed to facilitate left turns from each direction.

U

Uncontrolled Intersection
An intersection which does not have right-of-way control devices on any of the approaches.

Urban Area
An indefinite area of land used primarily for residential, commercial, and/or industrial purposes, usually associated with a given area size, population, and density.

Urban Highway
Any Highway, road, or street within the boundaries of an Urban Area.

V

Vehicle
Includes a motor vehicle, trailer, traction engine, farm tractor, road-building machine, bicycle, and any vehicle drawn, propelled or driven by any kind of power, including muscular power, but does not include a motorized snow vehicle or motorcycle sidecar.

Vision Triangle
See Intersection Sight Distance.

Volume
The number of vehicles or pedestrians that pass over a given section of a lane or a roadway or make a particular movement during a specific time period (such as one hour or 24 hours).

W

Warning Sign
A sign which indicates conditions on or adjacent to a highway or street that are actually or potentially hazardous to traffic operations.

Appendix B • References

Referenced Documents

Geometric Design Standards for Ontario Highways; Ministry of Transportation Ontario, 1985

Highway Traffic Act (HTA); Office Consolidation, Revised Statues of Ontario, 1990, Chapter H.8 and the Regulations thereunder (as amended), 1996

King's Highway Guide Signing Policy Manual; Ministry of Transportation Ontario, 1990

Manual of Uniform Traffic Control Devices; Ministry of Transportation Ontario, 1985

Manual of Uniform Traffic Control Devices; Transportation Association of Canada, 1997

Ontario Traffic Manual; Books 1, 2, 3, 5, 7, 8, 11, 12, 15, 18 and 20, 2000

Specification 62-GP-11M; Canadian General Standards Board, 1978 (Amendment No. 1, 1987)

Specification D 4956-95; American Society for Testing and Materials, 1995

Traffic Engineering Handbook; Institute of Transportation Engineers, 1992

Additional References

Canadian Guide to Neighbourhood Traffic Calming; Transportation Association of Canada and Institute of Transportation Engineers, 1999

Highway Capacity Manual; Transportation Research Board, 1994

Manual of Uniform Traffic Control Devices; U.S. Department of Transportation, 1997

Municipal Act; Revised Statues of Ontario, 1990

Ontario Traffic Manual; Books 22 and 23, 2000

School Bus Stop Ahead Sign; Traffic Program Management Operational Policy, Ministry of Transportation of Ontario, 1997

Transportation Planning Handbook; Institute of Transportation Engineers, 1992

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