

**PART A—SIGNS**

**Division 6**

**PEDESTRIAN CROSSING CONTROL**

**A6.1 TO A6.11**



## A6 PEDESTRIAN CROSSING CONTROL

The description of pedestrian crossing control signs and devices and their application is organized as follows:

- Section A6.1 General considerations for pedestrian crossing control
- Section A6.2 Crosswalk lighting
- Section A6.3 Crosswalk pavement markings
- Section A6.4 Pedestrian crosswalks
- Section A6.5 School crosswalks
- Section A6.6 Special crosswalks (pedestrian crossovers, pedestrian corridors)
- Section A6.7 Traffic control signals at pedestrian crossings
- Section A6.8 School and playground areas
- Section A6.9 Other pedestrian signs
- Section A6.10 Accessible pedestrian signals
- Section A6.11 Rectangular rapid flashing beacon crosswalks

### A6.1 GENERAL CONSIDERATIONS FOR PEDESTRIAN CROSSING CONTROL

The challenge of providing safe crossing control and protection for pedestrians may be particularly complex, especially for children and senior citizens. Considerable public pressure may be exerted from various organizations, including parent and community groups, for the installation of signs, signals and pavement markings for these purposes.

The Manual does not attempt to deal with regulations. The signs presented may be adapted to various types of prevailing regulations. Normally, in designing for a given situation, a combination of regulatory signs, warning signs, pavement markings and sometimes traffic control signals will be required.

There are four categories of pedestrian crosswalks. Generally, the category should be selected only after an engineering study has considered all aspects, such as: vehicular traffic volumes and speeds; pedestrian volumes, types and delays; collision experience; visibility conditions; proximity of adjacent traffic control devices; road alignment and geometry; and the availability of an adequate adjacent sidewalk or walkway system.

The pedestrian crosswalk categories are as follows:

- (a) Crosswalks which use ground-mounted signs:
  - (i) Pedestrian Crosswalk (A6.4);
  - (ii) School Crosswalk (A6.5); and
  - (iii) Rectangular Rapid Flashing Beacon Crosswalk (A6.11)
- (b) Special Crosswalk (A6.6);
- (c) Pedestrian Signals (A6.7); and
- (d) Full Traffic Control Signals.

## A6.2 CROSSWALK LIGHTING

Except for Special Crosswalks, no special lighting of the crosswalk area is required.

## A6.3 CROSSWALK PAVEMENT MARKINGS

Pavement markings must not be used alone to indicate a pedestrian crossing. Crosswalk pavement markings must be used in combination with some other traffic control device, such as traffic control signals, pedestrian signals, ground-mounted or overhead signs. Pavement markings must be similar for all categories of crosswalks.

Crosswalk lines must be normal solid white lines (see C1 for pavement marking standards) extending entirely across the pavement. The width of the crosswalk between the crosswalk lines is generally determined by the width of the connecting sidewalk and/or the number of pedestrians crossing. The minimum crosswalk width is 2.5 m. At intersections, it is desirable that the line on the intersection side be placed at least 600 mm from the projected edge of the travelled lanes. The other line on the other side of the crosswalk must be located to provide the necessary width of crosswalk. The stop line, if used, should be 1.0 m from the crosswalk.

If no stop line is provided, it may be desirable, in rural areas and on relatively high-speed urban arterial roads, to increase the width of the crosswalk line to use a wide solid line (200 mm wide) to improve visibility for drivers.

In advance of a Special Crosswalk, a solid directional dividing line and solid lane lines are used. Normal pavement markings are used in advance of all other crosswalks.

## A6.4 PEDESTRIAN CROSSWALKS

Where ground-mounted crosswalk signs are used, they must be supplemented by appropriate crosswalk pavement markings. Signs are not required for crosswalks at signalized intersections or stop signs.

### A6.4.1 Pedestrian Crosswalk Sign (RA-4)

The Pedestrian Crosswalk sign is used to indicate the location of a pedestrian crosswalk. The sign is installed on both sides of the road. On two-way roads, two signs are mounted back-to-back on both sides of the road. The right and left version (RA-4R, RA-4L) of the sign is used as appropriate so that the pedestrian symbol on each sign is walking toward the centre of the road.



RA-4R

600 mm x 750 mm

**A6.4.2 Cross Other Side Sign (RB-73)**

The Cross Other Side sign is used when it is determined that crossing one leg of an intersection should be prohibited for reasons of safety or intersection operation. It is typically installed at the near side of the crossing, facing pedestrians, normally on a signal pole or on a rail barrier blocking the normal access point to the crossing. If mounted on a barrier it may be mounted lower than the recommended height set out by Section A1.7.2(e) of the Manual. If used at the far side of the crossing the size may be increased to improve visibility. The intersection leg where crossing is prohibited shall not have crosswalk lines, but crosswalk lines should be placed at the crossing location where pedestrians are being directed.



**RB-73R**  
600 mm x 450 mm

Where pedestrians are required to cross to the right, the arrow shall point to the right instead (RB-73L)

**A6.4.3 Pedestrian Crosswalk Ahead Sign (WC-2)**

Where there is limited visibility of the crosswalk area, the Pedestrian Crosswalk Ahead sign (WC-2) must be installed 50 m to 150 m in advance of pedestrian crosswalks.

The Pedestrian Crosswalk Ahead sign may be used in advance of a Special Crosswalk.

The pedestrian symbol on the sign must be walking toward the centre of the road. The right version of the sign is installed on the right side of the road. On one-way streets or divided roads, the left version of the sign may also be installed on the left side or in the median, with the pedestrian symbol walking toward the centre of the road.



**WC-2R**  
600 mm x 600 mm

## A6.5 SCHOOL CROSSWALKS

Studies have shown that a significant reduction in collisions involving school children can be achieved when parents and education officials cooperate with police and engineering officials to train children in pedestrian safety and to develop in them a strong sense of personal responsibility.

School crosswalks should be installed only at locations where school or municipal authorities have agreed that a proposed school crosswalk will be supervised by either a police officer, school guard or school child safety patrol during locally-established time periods.

School crosswalk signs must not be installed at intersections where traffic control signals have been installed.

Traffic volumes on rural highways are usually sufficiently low to provide safe crossing gaps at frequent intervals. Moreover, the roads are usually relatively narrow (2 lanes), requiring only a short gap in traffic for safe crossing. Where a crosswalk is designated, it should be installed as in urban areas, except that applicable advance signs, such as the School Crosswalk Ahead sign (WC-16) or the School Area sign (WC-1) must be installed a minimum of 150 m in advance of the crosswalk if the speed limit on the highway is 60 km/h or greater.

Where a School Crosswalk sign is to be installed on a section of rural road and where vehicle speeds are relatively high, it may be necessary to designate a reduced speed limit before the School Crosswalk Ahead sign. This will allow the drivers to reduce vehicle speed sufficiently to provide for proper observance of school warning and crosswalk signs.

### A6.5.1 School Crosswalk Sign (RA-3)

The School Crosswalk sign is used to indicate the location of a school crosswalk.

The sign is installed on both sides of the road. On two-way roads, two signs are mounted back-to-back on both sides of the road. The right and left version (RA-3R, RA-3L) of the sign is used as appropriate so that the pedestrian symbol on each sign is walking toward the centre of the road.



**RA-3R**

600 mm x 750 mm

**A6.5.2 School Crosswalk Ahead Sign (WC-16)**

The School Crosswalk Ahead sign may be used in advance of a school crossing except where the School Area sign (WC-1) is in place.

The right or left version (WC-16R, WC-16L) is used as appropriate so that the pedestrian symbol on each sign is walking toward the centre of the road.



**WC-16R**  
600 mm x 600 mm

**A6.5.3 In-Street School Crosswalk Sign (RA-8)**

The In-Street School Crosswalk sign may be used to increase the conspicuity of a signed or special pedestrian crosswalk located in a school area. The In-Street School Crosswalk sign shall only be used in conjunction with crosswalks with ground-mounted or overhead-mounted signs, or with special crosswalks. The In-Street School Crosswalk sign shall not be used at crosswalk locations that are controlled by a stop sign or a traffic signal. The In-Street School Crosswalk sign may be used in conjunction with a crossing guard.

The sign should only be used at key locations where a need for increased conspicuity has been identified. Key locations may include: high pedestrian volume crosswalks; locations with higher than usual collision frequencies; or locations with sight obstructions. The In-Street School Crosswalk sign is generally used on a part-time basis during school crossing periods and removed when school children are not present.

The In-Street School Crosswalk sign shall be placed on the roadway centreline, or, if available, on a median island. On multi-lane roadways, additional signs shall be placed on the lane lines. The sign shall be double-sided or mounted back-to-back to ensure that it is visible to traffic in both directions. The In-Street School Crosswalk sign shall not be mounted on the left-hand or right-hand side of the roadway.



**RA-8**  
300 mm x 750 mm



**RA-8F**  
300 mm x 750 mm

The top of the In-Street School Crosswalk sign shall be a maximum of 1.2 m above the surface on which the sign is mounted.

Unless the In-Street School Crosswalk sign is placed on a physical island, the sign support shall be designed to bend over and then bounce back to its normal vertical position after an impact with a vehicle.

The border colour of the In-Street School Crosswalk sign shall be fluorescent yellow-green.

#### **A6.6 SPECIAL CROSSWALKS (PEDESTRIAN CROSSOVERS, PEDESTRIAN CORRIDORS)**

A Special Crosswalk is a traffic control system installed to aid pedestrians in crossing the road. Special Crosswalks may have different names across Canada including Pedestrian Crossover (Ontario) or Pedestrian Corridors (Western Provinces). A Special Crosswalk includes the following features:

- (a) extra pavement markings (Section A6.3);
- (b) overhead internally-illuminated signs (RA-5) with pedestrian-activated flashing amber beacons;
- (c) ground-mounted signs (RA-4);
- (d) advance warning signs (WC-2); and
- (e) special lighting of the crosswalk area.

The crosswalk, overhead signs, ground-mounted signs, advance warning signs and pavement markings must be installed in accordance with Figure A6-1.

To improve the visibility of the Special Crosswalk for drivers, a no stopping regulation, in effect at all times, must be implemented for a minimum of 30 m on the near side and 15 m on the far side of the Special Crosswalk.

**A6.6.1 Special Crosswalk Overhead Sign (RA-5)**

The Special Crosswalk Overhead sign (RA-5) indicates the location of a Special Crosswalk. The sign must be installed over the road. The Special Crosswalk installation must include the following features:

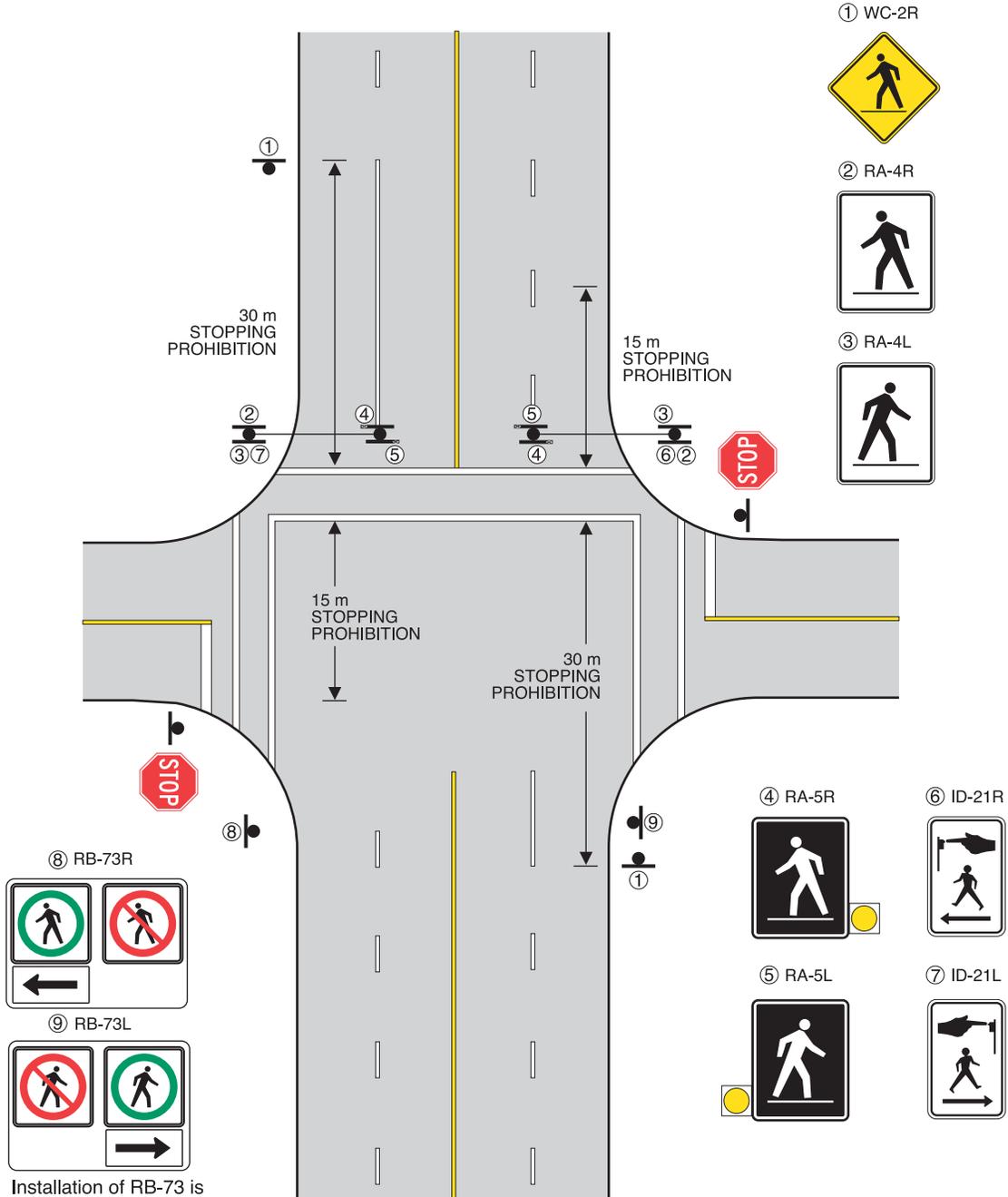
- (a) The right and left version (RA-5R, RA-5L) is used as appropriate so that the pedestrian symbol on each sign is walking toward the centre of the road.
- (b) For each approach, an overhead sign (RA-5) is placed over both sides of the road so that the driver will face two signs.
- (c) The two overhead signs must each be equipped with a pedestrian-activated flashing amber beacon. The beacons are designed to flash alternately (see Table B3-2).
- (d) The overhead signs (RA-5) must be internally-illuminated.
- (e) From each overhead sign, there must be downlighting on the crosswalk area. Each overhead sign must be offset from the crosswalk area, as shown in Figure A6-1, so that the pedestrian is fully illuminated for the approaching driver.



**RA-5R**  
**600 mm x 750 mm**

The overhead signs must be suspended at a height of not less than 5.1 m or more than 6.0 m from the pavement to the bottom of the sign.

TYPICAL SPECIAL CROSSWALK INSTALLATION



Installation of RB-73 is recommended when crossing a leg of an intersection is prohibited.

FIGURE A6-1

**A6.7 TRAFFIC CONTROL SIGNALS AT PEDESTRIAN CROSSINGS**

Information on Traffic Control Signals at Pedestrian Crossings is covered in Section B5.2. A typical pedestrian signal installation at an intersection is shown in Figure A6-2.

**A6.7.1 Pedestrian Pushbutton Sign (ID-21)**

The Pedestrian Pushbutton sign may be used where there are pedestrian-activated traffic control signals or Special Crosswalks.

The sign must be mounted at each end of the crosswalk, directly above the pushbutton. The pushbutton itself should be installed 1.1 +/- 0.15 m above the ground.

The right and left version (ID-21R and ID-21L) is used as appropriate so that the arrow and pedestrian symbol on each sign point in the direction of the crossing.



**ID-21R**  
130 mm x 200 mm

**A6.7.2 Signalized Intersection Crossing Sign (ID-20)**

The Signalized Intersection Crossing sign may be used where pedestrians and cyclists can only cross the road by pushing a pushbutton to initiate the appropriate signal phase to proceed.

The sign must be mounted at each end of the crosswalk, directly above the pushbutton. The pushbutton itself should be installed 1.1 +/- 0.15 m above the ground.

The right and left version (ID-20R and ID-20L) is used as appropriate so that the arrow, bicycle and pedestrian symbols on each sign point in the direction of the crossing.



**ID-20R**  
130 mm x 200 mm

### A6.7.3 Pedestrian Countdown Signal Information Sign (ID-18)

The Pedestrian Countdown Signal Information sign may be installed adjacent to the pedestrian pushbuttons to inform pedestrians of the usage of Pedestrian Countdown Signals (PCS).

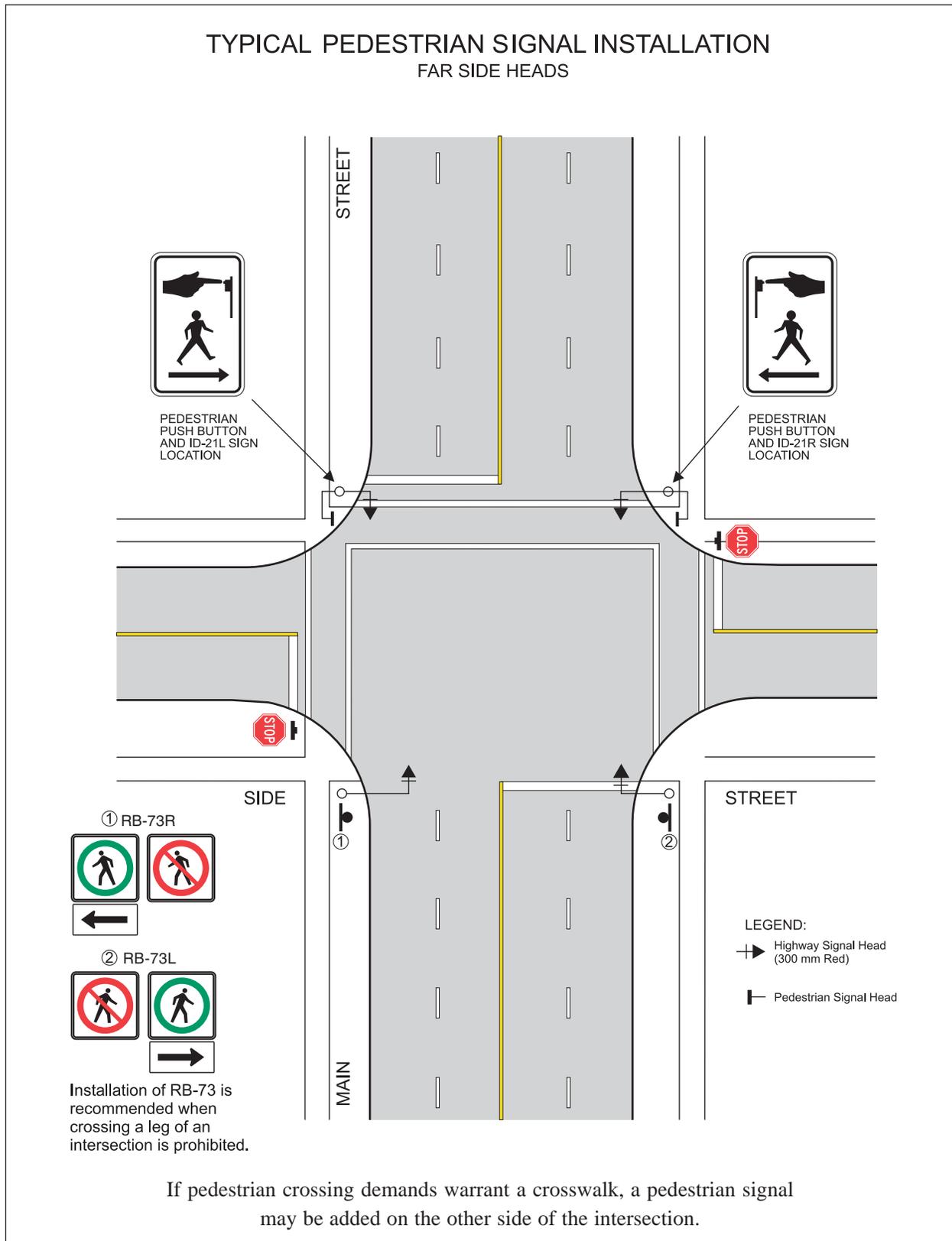
The right or left version (ID-18R and ID-18L) is used as appropriate so that the arrow symbol on each sign point in the direction of the crossing.



**ID-18R**  
225 mm x 375 mm



**ID-18RF**  
225 mm x 375 mm



**FIGURE A6-2**

## A6.8 SCHOOL AND PLAYGROUND AREAS

### A6.8.1 School Area Sign (WC-1)

The School Area sign may be used in advance of a school ground.



**WC-1**  
600 mm x 600 mm

Where a school abuts a road, it is advisable to provide advance warning to the driver approaching an area where children walk along or may cross the road. In these circumstances, the driver is required to exercise caution in proceeding through these areas.

The Ends supplement tab sign should be used with School Area (WC-1) signs to indicate the end of the area or zone. It shall be used on roads where a speed limit reduction is not taking place in the vicinity of a school.



**WC-1S1**  
600 mm x 300 mm



**WC-1S1F**  
600 mm x 300 mm

### A6.8.2 School Area Reduced Speed Zones

Where a school abuts a road, it may be necessary to designate a speed limit, particularly where the school grounds are not fenced. In this case, the Maximum Speed sign (RB-1) should be used. The sign must be mounted with and immediately below the School Area sign (WC-1) so that it may be clearly understood that the maximum speed limit is in effect only for the hours covered by general regulations for speed zones in the vicinity of schools.

**A6.8.3 Playground Area Sign (WC-3)**

The Playground Area sign is used to indicate sections of roads adjoining public playgrounds, where the presence of children on, or near the road, would represent an intermittent hazard to the driver.

In certain areas, particularly where the abutting playground is not fenced, some road authorities designate a speed limit. In such cases, the Maximum Speed sign (RB-1) should be used. It should be mounted with and immediately below the Playground Area sign, so that it may be clearly understood that the speed limit is in effect only for the area and period covered by general regulations for speed zones in the vicinity of playgrounds.

The Ends supplement tab sign should be used with Playground Area (WC-3) signs to indicate the end of the area or zone. It shall be used on roads where a speed limit reduction is not taking place in the vicinity of a playground.



**WC-3**  
**600 mm x 600 mm**



**WC-3S1**  
**600 mm x 300 mm**



**WC-3S1F**  
**600 mm x 300 mm**

## A6.9 OTHER PEDESTRIAN SIGNS

### A6.9.1 Contra-Flow Warning for Pedestrians Sign (WC-18)

The Contra-Flow Warning for Pedestrians sign may be used to indicate the existence of contra-flow traffic to pedestrians approaching a crossing.

The sign may be installed at any pedestrian crossing of a contra-flow lane. It may be used for an introductory period. The appropriate symbol or symbols are used to indicate whether the lane is reserved for buses, taxis, bicycles and/or high occupancy vehicles.

When installed at locations with pedestrian signals, the sign should be installed adjacent to the far side pedestrian signal head. When installed at locations without pedestrian signals, the sign should be placed parallel to the road at the near-side curb adjacent to the contra-flow lane.



WC-18

600 mm x 600 mm



WC-18F

600 mm x 600 mm

### A6.9.2 Second Train Event Warning Sign (WC-27)

The Second Train Event Warning sign with warning tab “ATTENTION 2 TRAINS” is used to warn/alert pedestrians and drivers of the potential presence of a second train at a railway-roadway grade crossing.

When two or more trains are moving across a railway-roadway grade crossing in urban areas (with heavy pedestrian volumes) near a train station, track junction, and/or multiple track alignment (two or more tracks) and where the approach of a second train may immediately follow the departure of the first, then a Second Train Event Warning sign should be used.

The typical installations of the Second Train Event Warning sign are illustrated in Figure A6-3.



WC-27

450 mm x 450 mm



WC-27S

450 mm x 200 mm

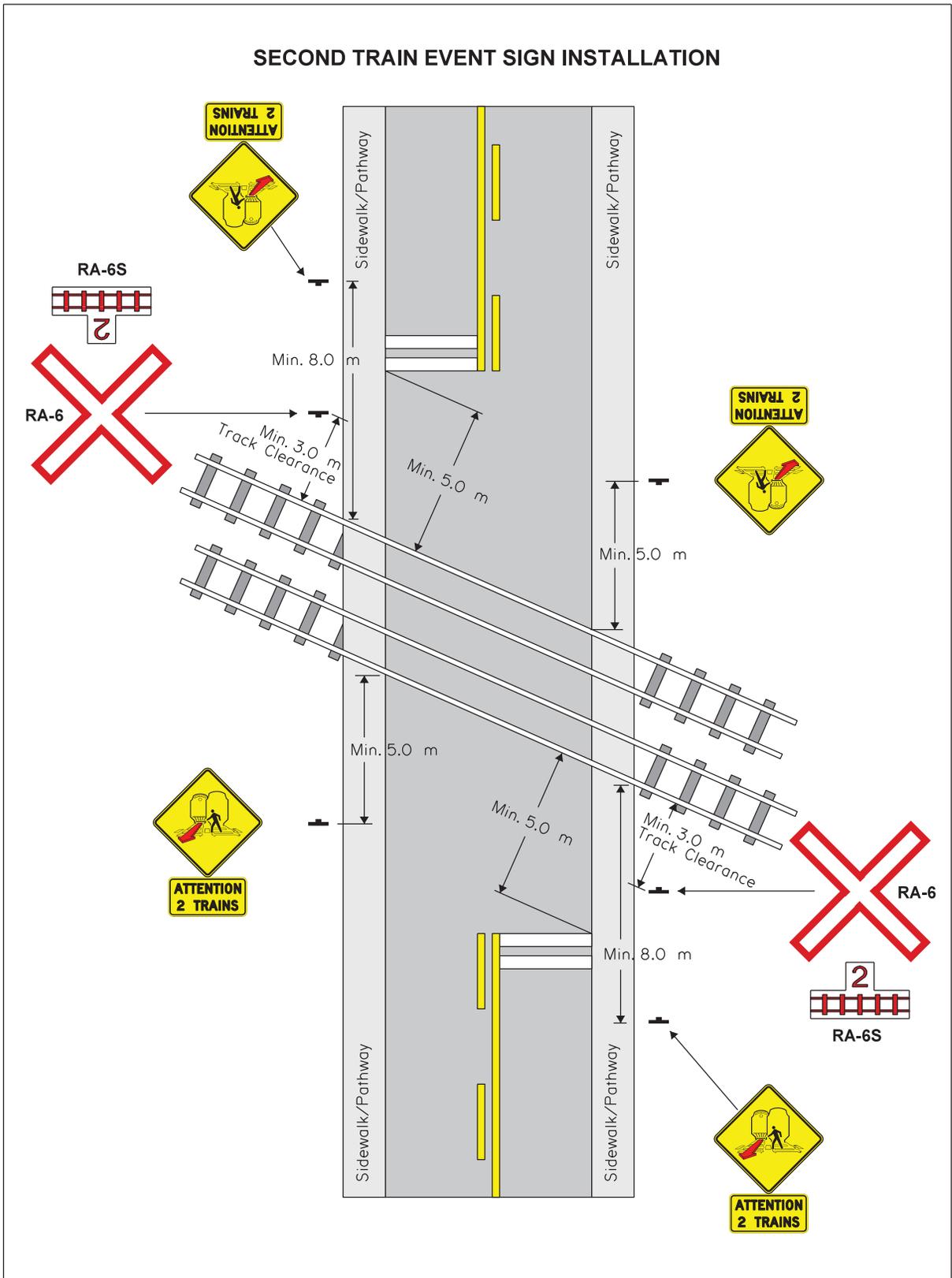


FIGURE A6-3

## **A6.10 ACCESSIBLE PEDESTRIAN SIGNALS**

The purpose of Accessible Pedestrian Signals (APS) is to assist pedestrians with vision loss in road crossings at locations which are controlled by traffic signals. APS provide audible and vibrotactile indications that act as the “walk” signal for this community and any other users who may benefit from additional sensory prompts (e.g., senior citizens and children). APS may be used at locations with pre-timed, vehicle-actuated or pedestrian-activated control provided that appropriate pedestrian timing intervals (walk and pedestrian clearance) are used.

Local organizations providing support services to the visually-impaired may act as advisors to the road authority. Mobility instructors or similar staff may be able to provide a wide range of advice. Information may range from accessing the needs of a single individual to commenting on the operation of a completed APS.

Further information on APS is available in the *TAC Guidelines for Understanding, Use and Implementation of Accessible Pedestrian Signals*.

### **A6.10.1 Location Conditions**

#### **A6.10.1.1 Candidates for APS**

When considering whether an APS is required at an existing or proposed traffic signal, the road authority should first determine if the location has complex phasing or conditions such that pedestrians with vision loss may have difficulty crossing, or if there is a high demand for crossing by pedestrians with vision loss. Secondly, it must be feasible to equip the intersection or crosswalk(s) with APS which will provide clear information to pedestrians with vision loss about the crosswalk(s) to which the APS apply. Thirdly, the road authority should consult with an official local organization representing pedestrians with vision loss, if available, regarding the need for an APS at a particular location.

#### **A6.10.1.2 Establishing Installation Priorities**

Several geometric, traffic and control conditions must be considered when determining priorities for APS installations. These include the following:

- (a) Pedestrian crossing volumes - the number of pedestrians with vision loss, and the number of deaf-blind persons, who will use the crossing facility;
- (b) Surrounding environment - the physical conditions of the site may create challenges for pedestrians with vision loss;

- (c) Proximity to alternative crossings - an APS is most needed where there are no appropriate crossings nearby;
- (d) Traffic conditions - vehicle volumes, operating speeds, directional distribution, vehicle types, traffic congestion, and flow characteristics may assist or hinder a visually/hearing impaired pedestrian in crossing the intersection; and
- (e) Crosswalk distance - wider streets are more difficult for visually impaired pedestrians to cross, as there is a higher probability of the pedestrian veering outside the crosswalk.

These factors can be used to establish a ranking of candidate sites to be fitted with APS. They do not, however, constitute an installation warrant for APS.

### A6.10.2 Operational Details

A typical APS operation will exhibit the following features:

- (a) Pedestrian wayfinding through pushbutton locating tones;
- (b) Pedestrian orientation guidance through signs and other tactile and audible (i.e., recorded voice) assistance;
- (c) Limitations on the practical sound range of the APS units to mitigate the sound impacts on the surrounding neighbourhood;
- (d) Fixed or actuated APS operation; and
- (e) Audible and vibrotactile indications of start of “walk”, and not generally as a guide across the intersection. Under normal conditions, two sounds are used. The sounds are:
  - (i) Bird call “cuckoo” for the north-south direction. This sound consists of alternating higher and lower tones, with each tone sounding for approximately 70 ms. The time between the first and second tones in the sequence should be approximately 0.3 seconds. The full sequence should repeat approximately every 1.5 seconds; and
  - (ii) “Canadian Melody” sound for the east-west direction <http://tac-atc.ca/sites/tac-atc.ca/files/site/doc/resources/cdn-aps-melody.wav>. The “Canadian Melody” sound incorporates multiple (i.e., mixed or changing) frequencies, ranging from 500 Hz to 1000 Hz, with higher harmonics. These are ideal for localization of sounds, mitigating lateral deviation, and for pedestrians with age-related hearing loss. The ‘A-Weighted’ sound pressure levels should conform to ISO 1996-1:1982 and ISO 1996-2:1987.

If additional audible indications are required to address unusual intersection configuration or phasing, the sounds should alternate on and off with approximately the same repetition rate and tone-to-silence ratio as the “cuckoo” sound; and incorporate multiple frequencies as described for the standard “cuckoo” and melody tones above. These alternate audible indications are to be considered under special circumstances only. Alternate solutions employing the standard audible indications should be attempted first.

Beaconing (i.e., louder sounds to be heard throughout the crosswalk) may be used to address specific operational circumstances, such as unusual geometry, an exceedingly long crossing distance, or a pedestrian phasing that limits the ability to use parallel traffic noise as a guide (e.g., exclusive pedestrian phase, or pedestrian scramble phase).

### **A6.10.3 Design Standards**

The APS design standards are provided to identify:

- (a) Desirable design criteria to be used when installing new traffic control signals; and
- (b) Target design guidelines to work towards upon retrofit of equipment and reconstruction of traffic control infrastructure.

The key design standards that must be considered are:

- (a) Layout;
- (b) Pushbutton location;
- (c) Pushbutton mounting height ( $1.1\text{m} \pm 0.15\text{m}$ ) and alignment;
- (d) Pedestrian walking path;
- (e) Beacon mounting height (between 3m and 4m above the ground), and alignment; and
- (f) Pedestrian information signing.

Figures A6-3 through A6-7 illustrate the preferred location for the placement of APS pushbutton

APS installations should be designed to consider both the needs of the requesting party, and the needs of other pedestrians who may benefit from the installation. The decision regarding whether to incorporate all legs of an intersection should be made on a case-by-case basis, and should be based principally on local user needs. Local stakeholders should be consulted (as appropriate for the circumstances) to determine the local needs.

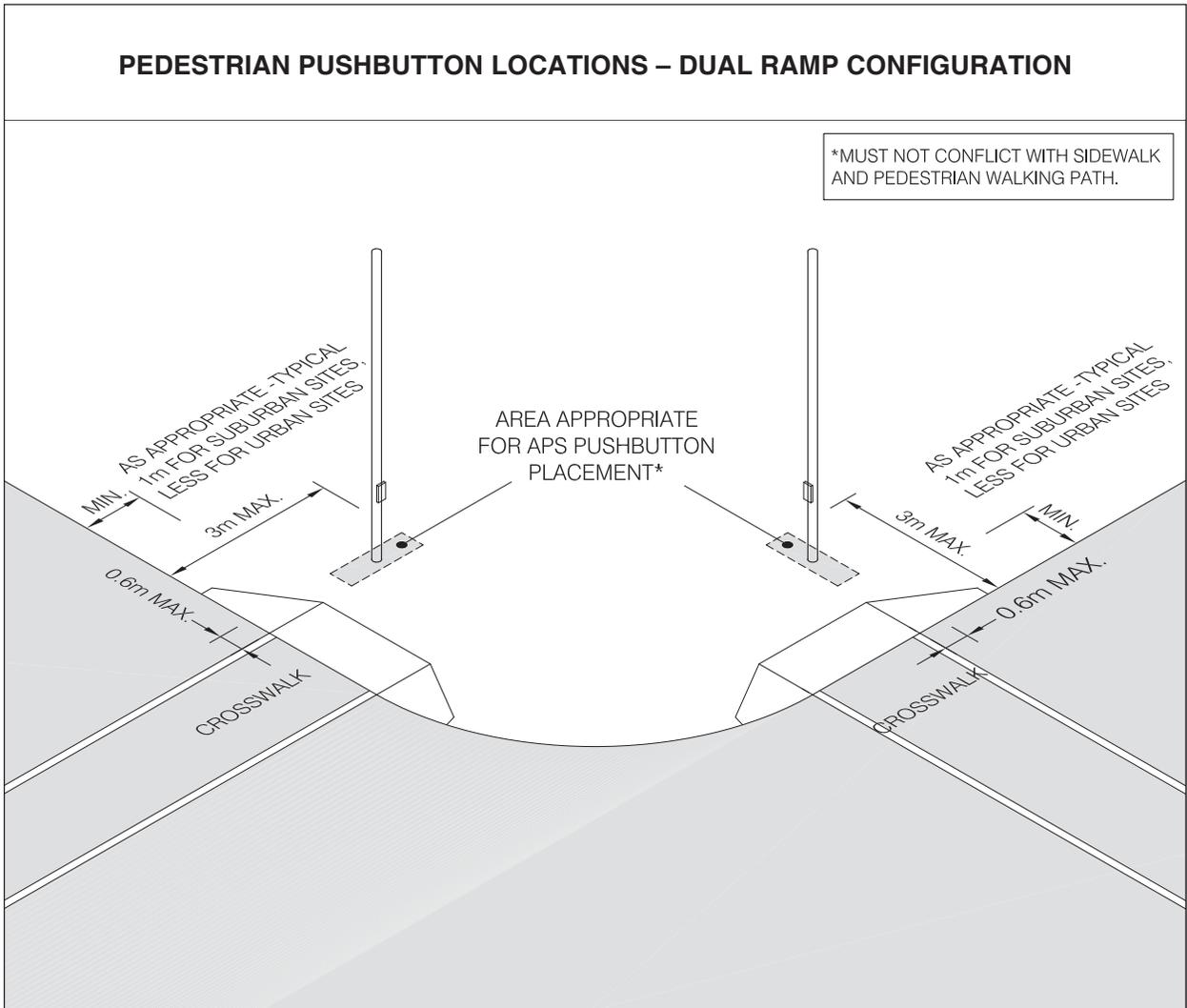
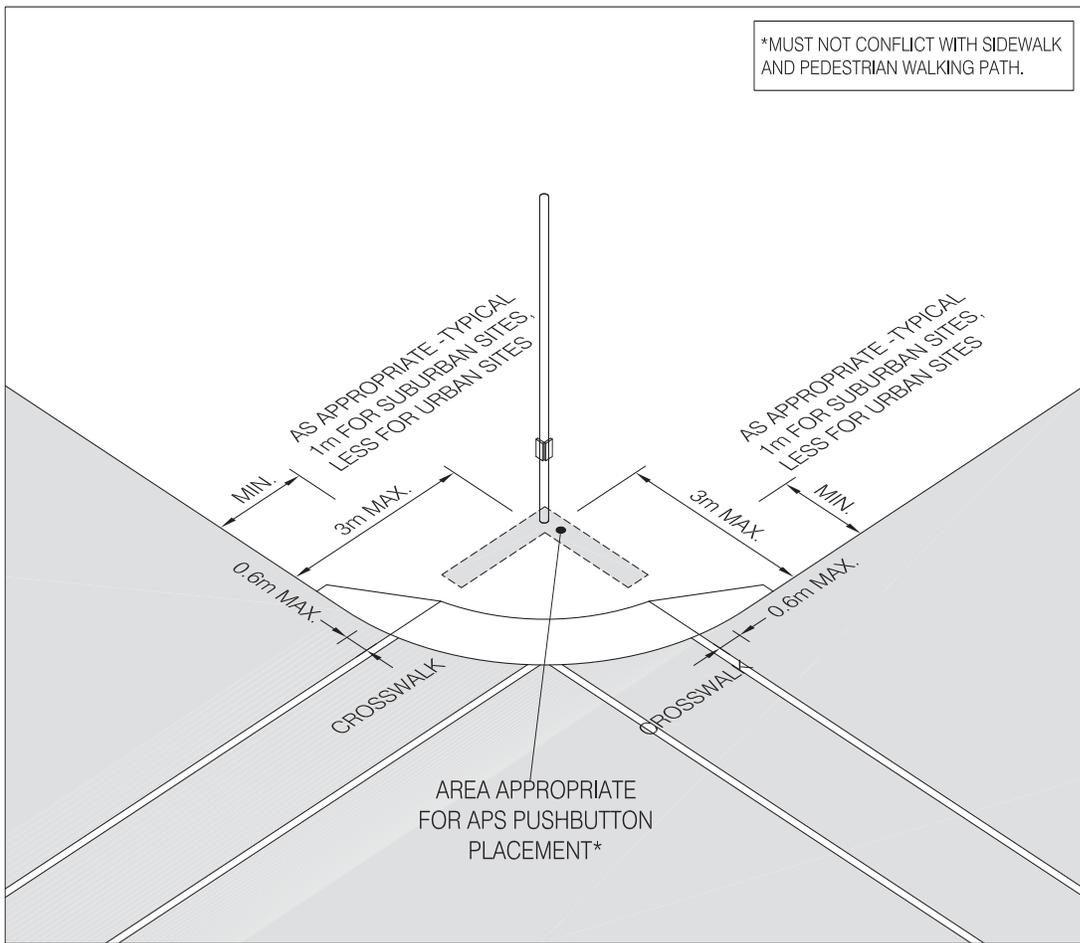
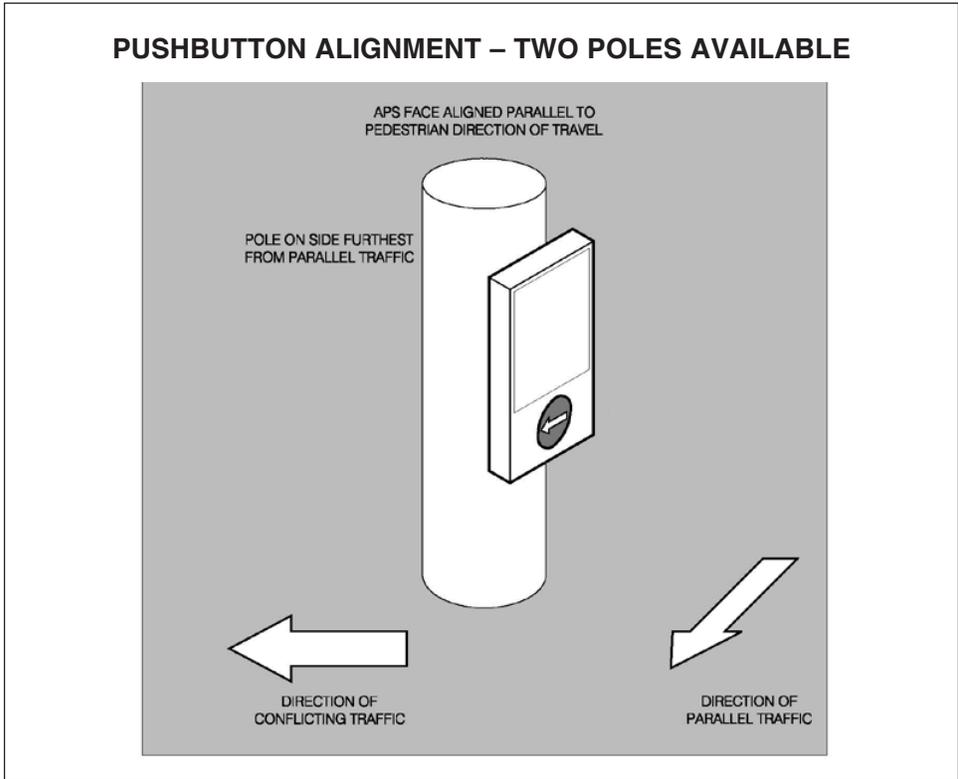


FIGURE A6-4

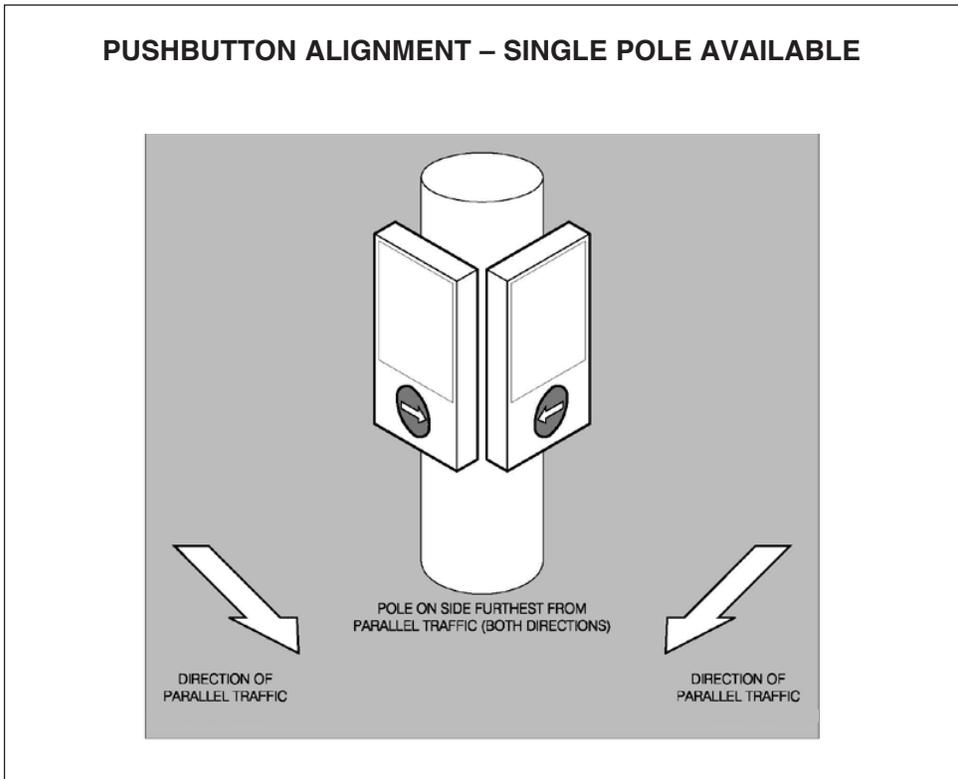
**PEDESTRIAN PUSHBUTTON LOCATIONS – SINGLE RAMP CONFIGURATION**



**FIGURE A6-5**



**FIGURE A6-6**



**FIGURE A6-7**

### ALIGNMENT OF BEACONED APS

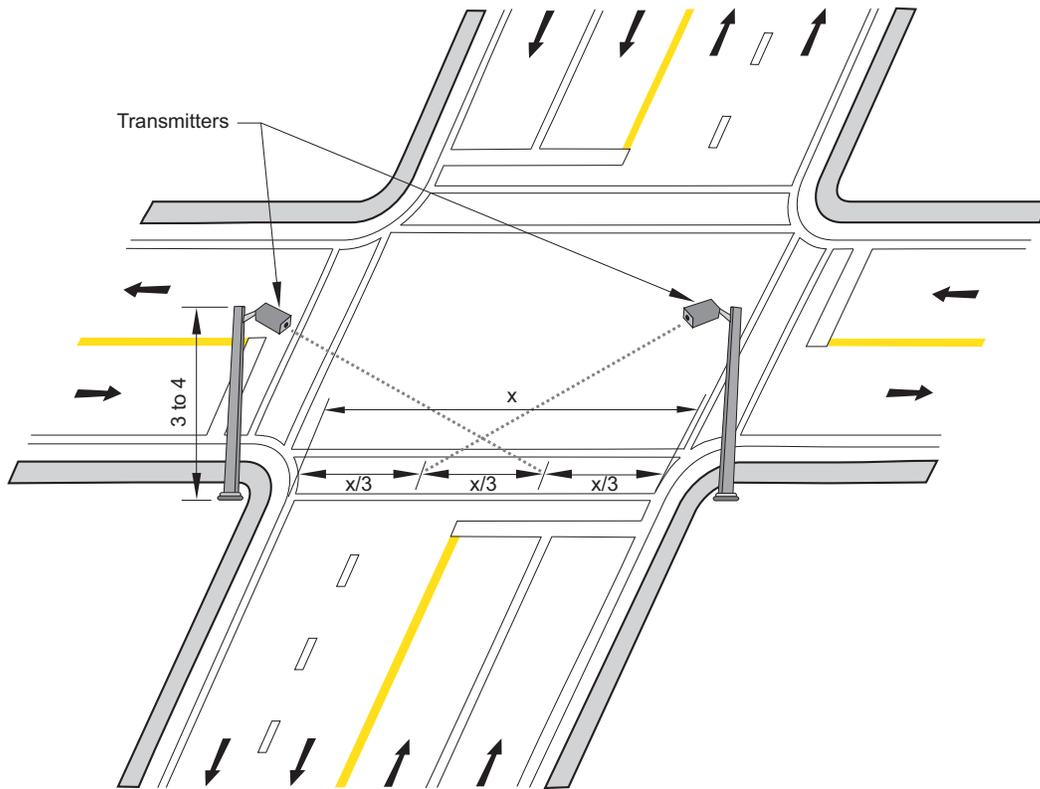


FIGURE A6-8

### A6.11 Rectangular Rapid Flashing Beacon (RRFB) Crosswalks

A Rectangular Rapid Flashing Beacon Crosswalk is a pedestrian or school crosswalk installed with the following additional features:

- (a) Rectangular Rapid Flashing Beacon on both sides of the road
- (b) Pedestrian Pushbutton Sign (ID-21) on both sides of the road
- (c) RRFB Crosswalk Actuation Indicator on both sides of the road

Typical installation of the crosswalk markings, side mounted signs, advance warning signs where visibility is limited, pedestrian push button with signs and Rectangular Rapid Flashing Beacons are shown in Figure A6-9. An RRFB shall not be used for crosswalks across approaches controlled by YIELD signs, STOP signs, or traffic control signals. This prohibition is not applicable to a crosswalk across the approach to and/or egress from a roundabout.

Where there is a limited visibility of the crosswalk area, the Pedestrian Crosswalk Ahead Sign (WC-2) should be installed in advance of the pedestrian crosswalk. The School Crosswalk Ahead Sign (WC-16) should be used in the school area with limited visibility. A no stopping regulation, in effect all times, must be implemented for a minimum of 15m on each approach to the crossing, and 10m following the crossing. In addition, a passing restriction on single lane approaches as well as lane change prohibition on multiple lane approaches using solid white line should be implemented. The recommended length of solid line is dependent on approach speed.

The RRFB Crosswalk should be supplemented with the following signs where applicable:

- (a) Pedestrian Crosswalk Sign (RA-4)
- (b) Pedestrian Crosswalk Ahead Sign (WC-2)
- (c) School Crosswalk Sign (RA-3)
- (d) School Crosswalk Ahead Sign (WC-16)
- (e) Pedestrian Pushbutton Sign (ID-21)

### TYPICAL RECTANGULAR RAPID FLASHING BEACON INSTALLATION

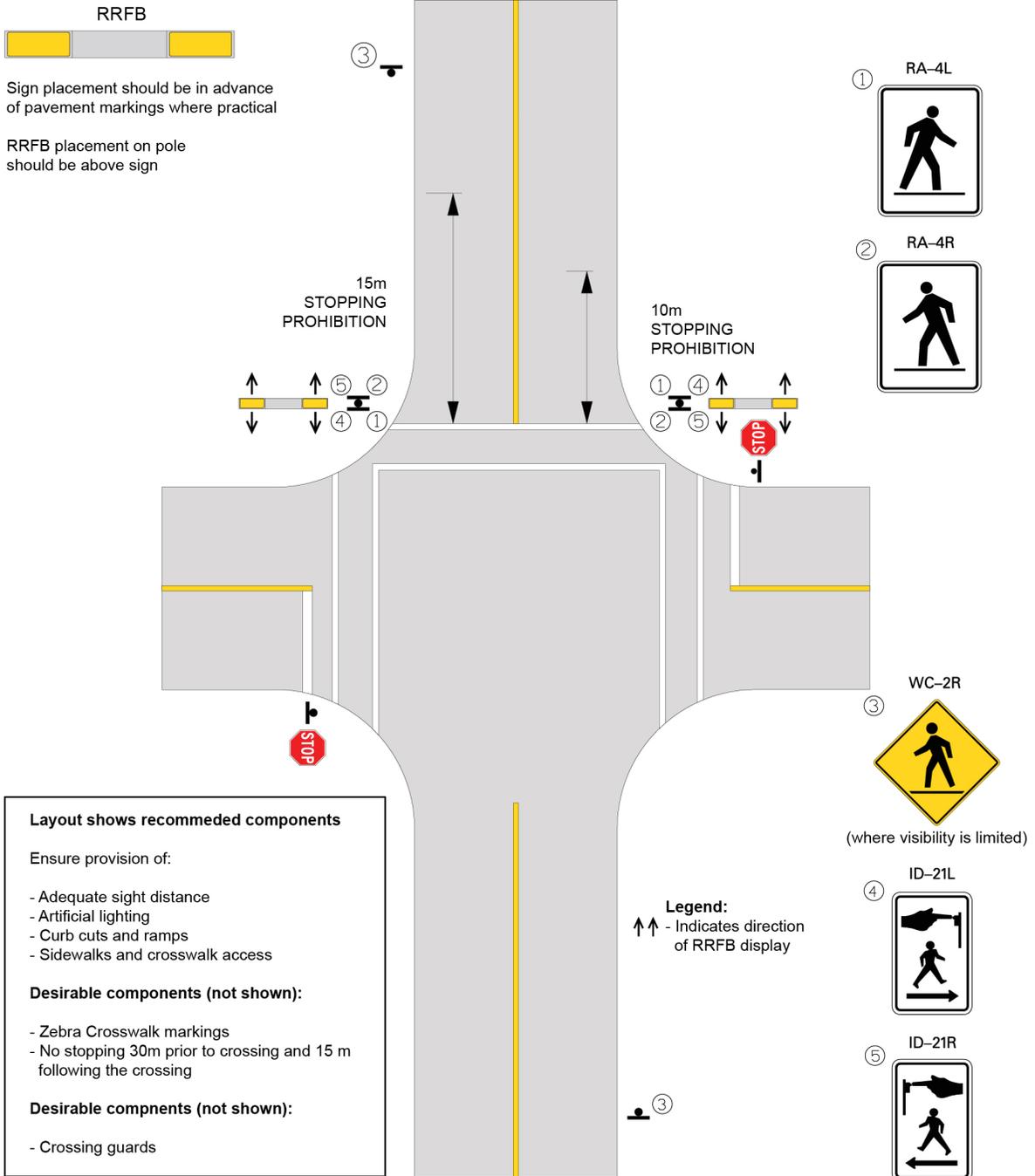


FIGURE A6-9