General

The purpose of a Stop sign is to clearly assign right-of-way between vehicles approaching an intersection from different directions. The Stop sign requires drivers to stop their vehicles before entering an intersection and then proceed only when the conditions are safe to do so.

The introduction of a stop control to a non-controlled intersection improves the overall operation of the intersection and the main route. Stop-controlled intersections are believed to be safer than those without any traffic control (i.e., the frequency of certain collision types such as the right angle collisions is usually reduced).

The introduction of a stop control traffic scheme at one of the intersections along a route is not without its disadvantages. Under heavy traffic conditions, the stop condition introduces delays to the minor road traffic and increases the potential for certain collision types (e.g., rear end collisions).

The increase in rear end collisions is particularly evident at intersections located along high speed routes or where a stop condition has been introduced on a previously non-controlled approach (e.g., changed to four-way stop control).

In rural areas, where driving speeds are higher, it is usually desirable to clearly assign right-of-way at an intersection of crossing roadways. Usually, the Stop sign controls traffic movements from a minor roadway onto a major or higher class roadway.

In urban areas, where non-controlled intersections are sometimes present along minor collector roads, a Stop sign is introduced after a traffic assessment has recommended that such stop control is needed.

Provincial Legislation

Alberta Infrastructure and Transportation has jurisdiction over the provincial highways and dictates which intersections should be stop-controlled and when this traffic control scheme may be changed.

Traffic control at intersections located on the provincial highways is enforced through the legislation of the Traffic Safety Act (Alberta Regulation 304/2002 – Use of Highway and Rules of the Road Regulation).

Section 36 of the Regulation 304/2002 includes general regulations for traffic entering the provincial highways.

Based on Section 36 of the Regulation 304/2002:

36 (2) A person driving a vehicle that is about to enter:

a) onto a primary highway or street from a road, service road, alley or driveway, or

b) into an alley or onto a road from a

driveway

shall, unless the intersection of the two roadways is marked with a Yield sign or a Merge sign, bring the vehicle to a stop

c) before entering on the intersecting roadway and at a point no further than 3 metres back from the intersecting roadway, or

d) in the case where there is

(i) a marked crosswalk on the near side of the intersection, immediately before entering on the crosswalk, or

(ii) *a marked stop line on the near side of the intersection, at the stop line.*

Guidelines for installing a Stop sign at intersections with provincial highways are included in the subsequent sections.

For intersections which are already controlled with a Stop sign, the following regulations from Section 37 apply:

37 A person driving a vehicle that is about to enter onto a highway from another highway that is marked by a Stop sign is required to bring the vehicle to a stop:

a) before entering on the intersecting roadway and at a point no further than 3 m back from the intersecting roadway, or

b) in the case where there is

(i) a marked crosswalk on the near side of the intersection, immediately before entering on the crosswalk, or

(ii) a marked stop line on the near side of the intersection, at the stop line.

Section 38 of the Regulation 304/2002 outlines the driver's responsibilities when entering a provincial highway (i.e., a driver has to exercise caution and has to yield the right of way to all vehicles and pedestrians approaching their vehicle along that roadway).

Standard

A standard Stop sign (RA-1) has the shape of an octagon.

RA-1	**600 mm x 600 mm** **900 mm x 900 mm** **1200 mm x 1200 mm** **1500 mm x 1500 mm**	
Colour	Message Background	White Red
Sheeting	ASTM, Type IX	

Guidelines for Use

A Stop sign should be installed in the following situations:

- at a minor provincial highway intersecting a major provincial highway
- at each public roadway intersecting a provincial highway
- at each service road intersecting a provincial highway
- at intersections with a record of collisions or incidents where this record can be improved by introducing a Stop sign
- at an intersection where the safe speed on the approach is less than 15 km/h
- at a major private or public commercial or industrial access to a provincial highway, where traffic volumes entering this access are 50 AADT or more and/or operation of this access presents a safety concern.

A Stop sign is not required at field, farm and other minor private entrances onto a provincial highway.

Stop Sign in a Median Area

A Stop sign may be installed in a median area of an intersection on a divided highway when traffic entering the first set of lanes is controlled by a Stop sign and further enforcement of a stop condition is needed before traffic can enter the second set of lanes.

Usually, the additional Stop sign is justified when the width of a median exceeds 30 metres. The paved median area should have a painted centerline (yellow solid line) to separate the opposing traffic movements.

Stop Sign at a "T" Intersection

A Stop sign should normally be installed on the leg perpendicular or most skewed in relation to the other two legs (leg "A" on Figure 1) unless the distribution of traffic volumes indicates a preference for a different traffic control.

When traffic volumes on one of the approaching legs ("B" or "C") of the through roadway constitute less than 20% of the traffic volumes along the approach "A", consideration may be given to installing Stop signs on legs "B" and "C".

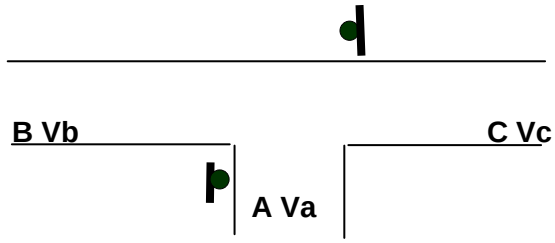


Figure 1 – Non-conventional installation of Stop signs at a "T" intersection.

Conditions Restricting Use of a Stop Sign

A Stop sign should <u>not</u> be used in the following situations:

- on an intersection approach where traffic signals are already controlling traffic operation on this approach
- at unsignalized intersections where a stop condition would interfere with the progression of traffic from adjacent signalized intersections

- as a portable Stop sign, except in emergency or temporary situations, such as at construction sites in conjunction with Traffic Control Persons or at intersections where traffic signals are temporarily not operating.

A Stop sign should never be used as a speed controlling device.

Sizes of a Stop Sign

A standard size of a Stop sign is **600 mm x 600 mm.** This is the minimum sign size permitted on the provincial highways. A 600 mm x 600 mm Stop sign should normally be used to control traffic at intersections with two-lane highways posted at 100 km/h or less.

Oversize Stop signs are allowed under heavy traffic conditions at complex intersections where a larger Stop sign is needed to improve traffic operations and safety.

The following oversize Stop signs are currently in use: **900 mm x 900 mm, 1200 mm x 1200 mm** and **1500 mm x 1500 mm**.

The following guidelines in Table 1 outline operational conditions under which it may be justified to install an oversize Stop sign.

Table 1

Use of Various Stop Sign Sizes on the Provincial Highways

Size of a Stop Sign (mm X mm)	Roadway Class /Warranting Conditions
600 x 600	• Municipal, local roads • Two-lane minor and major highways posted at 100 km/h or less
900 x 900	• Two-lane major highways • Multi-lane highways • Expressways • Used as an oversize sign at major and minor intersections (on all roadway classes), based on the warranting criteria (for oversize Stop sign warrant see the following section).
1200 x 1200	• Used as an oversize sign at major and minor intersections (on all roadway classes), based on the warranting criteria (for oversize Stop sign warrant see the following section). • Installed only as an enhancement when other measures have failed.
1500 x 1500	• Used as an oversize sign at major intersections only (on major highways), based on warranting criteria (see the following section). • Installed only as an enhancement when other measures have failed. A 1500 mm x 1500 mm sign should only be reserved for higher classes, high speed roadways.

A Stop sign **900 mm x 900 mm** may be installed in the following situations:

- at major intersections on two-lane rural highways posted at 100 km/h
- at major intersections on all rural multi-lane undivided and divided highways
- along urban or semi-urban highways where many signs compete for driver attention
- at intersections on two-lane highways posted at 90 km/h or less where the prevailing traffic conditions warrant greater sign visibility or emphasis. These conditions include:
  - locations with a history of three or more collisions or reported incidents (near misses) involving Stop sign violation over a period of five years
  - complex visual environment where many signs compete for the driver's attention (e.g., semi urban or urban intersections).
  - complex intersections with high traffic volumes and complex geometry where a driver must concentrate more on the driving task.

Installation of an oversize **1200 mm x 1200 mm or 1500 mm x 1500 mm** Stop sign may be warranted under the following two conditions:

- an intersection has been identified as a high collision location with three or more collisions involving Stop sign violations over the period of five years
- other corrective measures, such as improving sight lines or installing oversize 900 mm x 900 mm sign, have already been tried and have proven to be ineffective.

Normally, a **1500 mm x 1500 mm** Stop sign should only be reserved for major junctions of the provincial highways with complex geometry, high traffic volumes and high running speeds.

Oversize Stop signs can lose their effectiveness if used indiscriminately.

Stop signs reduced in size may be used on designated off-road bikeways to regulate movements of cyclists. In such situations, the minimum dimensions are 450 mm x 450 mm.

Traffic Control Devices Used in Conjunction with a Stop sign

Roadway geometric and operational conditions may sometimes dictate the need for introducing supplementary traffic control devices to add emphasis to a Stop sign and to provide advance warning prior to a stop condition.

Supplementary traffic control devices commonly used in conjunction with a Stop sign include:

- a Stop Ahead sign in advance of a stop condition when sight distance restrictions are present on an approach
- Stop and Stop Ahead pavement markings on an approach prior to a stop condition**.** Guidelines for the application of special pavement markings are included in the *Highway Pavement Marking Guide*.

- transverse rumble strips on an approach prior to a stop condition
- flashing red beacon. Persistent safety problems at some locations may also warrant installation of a supplementary flashing red beacon. The red beacon provides strong reinforcement of a Stop sign and should only be used under special warranting conditions. A flashing beacon should be installed at the top of a Stop sign.

Guidelines For Placement

The following guidelines should be considered when installing a Stop sign:

- A Stop sign should be placed at or as near as possible to the point where a vehicle is to stop, normally on the right side of the roadway and facing the approaching traffic.
- A Stop sign shall not be placed closer than 1.5 metres from the edge of the roadway.
- A Stop sign shall not be placed farther than 15 metres from the near edge of the intersecting road, with its preferred location being not farther than 5 metres from the roadway edge. The desirable location of a Stop sign in various situations is indicated in Figures TCS-A-201 and TCS-A-202.
- Divided highways and one-way roadways with visibility problems may require a supplementary Stop sign installed on the left side of the roadway.
- Legs approaching an intersection at an acute angle should have a Stop sign turned or shielded, so that motorists travelling on the higher priority roadway cannot see it.
- In rural areas, no other traffic signs should be installed together with a Stop sign on a common post.
- In urban areas, a Street Name sign may be placed above a Stop sign.
- At a stop-controlled railway crossing, a Stop sign should be installed immediately below the Railway Crossing sign.
- At an intersection on a divided highway where an additional Stop sign is required in a median area, a Stop sign should be placed at the far edge of the bullet nose.

Stop-controlled intersections with a paved surface should be provided with painted pavement markings indicating a stop condition (i.e., Stop bar). Where pavement markings have been provided, a Stop sign should be placed next to a Stop bar.

The exact location of a Stop bar and Stop sign will depend on the roadway geometric characteristics, location of other traffic control devices, presence of obstructions, etc. Usually, the preliminary layout of the devices (i.e., positions of a Stop bar and Stop sign) will be established during a detailed design stage with consideration of the following factors:

- turning path of the design vehicle (left turn movement from a major highway)
- presence of traffic islands (right turn channelization, median islands, slotted left turn lanes)
- presence of other traffic devices.

All-Way Stop Control

The purpose of introducing All-Way Stop control is to optimize operation of an intersection (i.e., by reducing delays, providing adequate gaps) along all intersecting roadways.

The advantage is not only improved traffic progression but also improved safety at an intersection.

Introducing All-Way stop control often helps to reduce the number and severity of certain types of collisions (e.g., Angle, Entered when Unsafe collisions).

Introducing All-Way control at an intersection is not without its disadvantages. Under the All-Way traffic control scheme, delays are introduced for all drivers and certain types of collisions such as Rear End may increase.

Generally, All-Way stop control should be considered in the following situations:

- as a measure of controlling delays on the approaches (as defined in the Traffic Warrant, below)
- as an interim measure, where traffic control signals are warranted but cannot be implemented immediately
- during a transition period when the traffic control scheme changes (e.g., a transfer of right-of-way from a non-controlled roadway to a stop-controlled roadway).

Where it has been determined that All-Way stop condition is required based on the warranting criteria (see below), the Stop sign should be supplemented with All-Way tabs mounted directly below the Stop sign.

Traffic Warrant

All-Way stop control should only be considered at minor intersections of lower class, lower volume two-lane highways.

Intersections located close to urban centres make better candidates than isolated rural sites. Usually, at such semi-urban intersections drivers may be more aware of the need to reduce their speed. Also, turning maneuvers toward the urbanized centre are more frequent.

All-Way stop control may be introduced at an intersection when the following two conditions are met:

1) Traffic volumes on intersecting roads are approximately equal, and
   (a) the combined pedestrian and vehicular volumes on one of the approaches of the minor road exceed 200 vehicles per hour for each of any eight hours of the day, or
   (b) the average delay to vehicular traffic entering the intersection from the minor road exceeds 30 seconds per vehicle during peak hour.
2) The percentage of vehicles turning from a major highway to a minor highway (right and left turns combined) is between 50 percent and 70 percent of the total volume of traffic (AADT) on the major highway approaches.

Geometry of All-Way Intersection

All-Way stop control should only be considered at intersections where the approaches are directly opposing (i.e., not offset). The approaching roadways should preferably meet at right angles and have an equal number of lanes.

Conditions Restricting Use of All-Way Stop Condition

All-Way stop control should not be used under the following conditions:

- as a speed control device or as a means of calming traffic through residential areas
- at intersections that are offset, poorly defined or geometrically substandard
- at intersections having less than three or more than four approaching legs
- at intersections that have one or more multi-lane approaches and/or designated turning lanes
- on roads where traffic signals are coordinated and the introduction of a stop condition would interfere with traffic progression
- on arterial roads within urban areas posted at 60 km/h or more.

Stop Sign Installation at a Railway Crossing

In some situations, it may be necessary to introduce a stop condition at an unrestricted railway crossing. Transport Canada has developed guidelines for installing a Stop sign at an unrestricted railway crossing without a grade crossing warning system.

Based on the guidelines, a Stop sign may be installed at an at-grade railway crossing (with no grade crossing warning system) where it is impossible for drivers to see an approaching train within the sightline limits, without first:

- slowing down to a speed of less than 15 km/h, or
- stopping at the railway crossing.

Sightline requirements at a railway crossing are described in the Alberta Infrastructure and Transportation's Highway Geometric Design Guide, Chapter C.9 on "*Railway Crossings"*.

A Stop sign may be used as an interim measure at a railway crossing that is scheduled for grade crossing warning system installation.

When used, the Stop sign should be placed on a common post, immediately below the Railway Crossing sign.

Changes to the Intersection Right-of-Way Status

Transfer of the right-of-way from one roadway to another roadway may require that a stop condition be introduced on a previously uncontrolled roadway. The roadway which was controlled by a Stop sign in the initial traffic control scheme is given the right-of-way.
Such reassignment of the right-of-way is usually accomplished in stages with the All-Way control introduced first and then after an introductory period, Stop signs are eliminated from the previously stop-controlled approaches.

Prior to and during the introductory period, information regarding the change in the right-of-way control should be publicized via local newspapers and radio stations.

Local residents should be advised of the change in traffic control. Advance notification should also be provided to local ambulance services, transit authorities, bus companies, taxi companies and trucking firms known to use the intersection frequently.

The final removal of Stop signs at an intersection should be done during off-peak hours during reduced traffic demand.

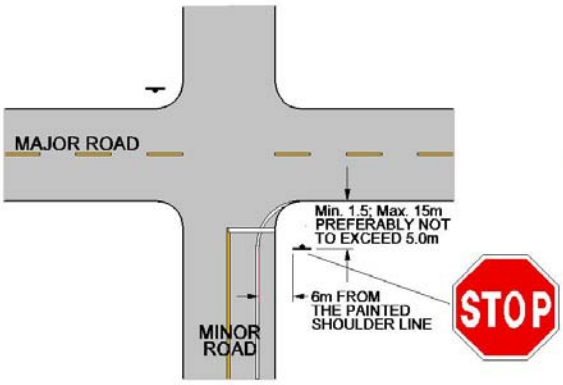
Transfer of the right-of-way from stop-controlled to uncontrolled highway approaches should be completed in the following steps:

- Install new Stop signs on previously uncontrolled approaches (provide oversize Stop signs if warranted). Install stop lines and crosswalk markings, if required.
- Install New Sign (WD-182) signs on the affected approaches.
- Install All-Way tabs on all approaches.
- Install Stop Ahead signs if visibility is a problem.
- After an introductory period (one to two months), remove Stop signs, New Sign signs and pavement markings from the previously stop-controlled approaches.

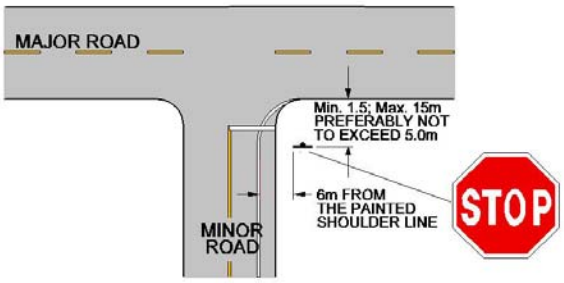
Similarly, an introductory period may be required when a Two-Way control is replaced with an All-Way traffic control or when an All-Way control is replaced with a Two-Way control.

References to Standards:

Highway Geometric Design Guide Chapter D	At Grade Intersections
Highway Geometric Design Guide Chapter C, Section C.9	Railway Crossings
Canadian Railway-Roadway Grade Crossing Standards, Section 9	Signs and Road Markings



RURAL AREA



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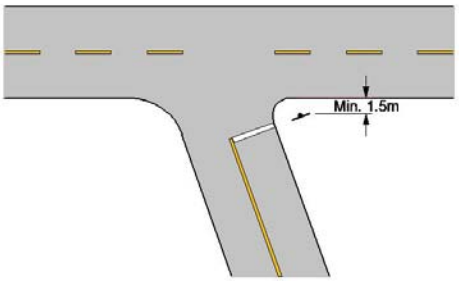
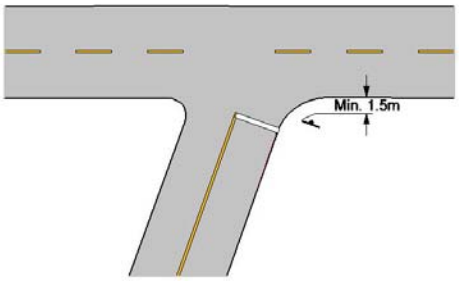


RURAL AERA



RURAL AERA

NO.	DESCRIPTION	BY	DATE

Alberta INFRASTRUCTURE AND TRANSPORTATION

DRAWING
TCS-A-201

Date: DEC 2003

PLACEMENT OF STOP SIGN IN RURAL AREAS

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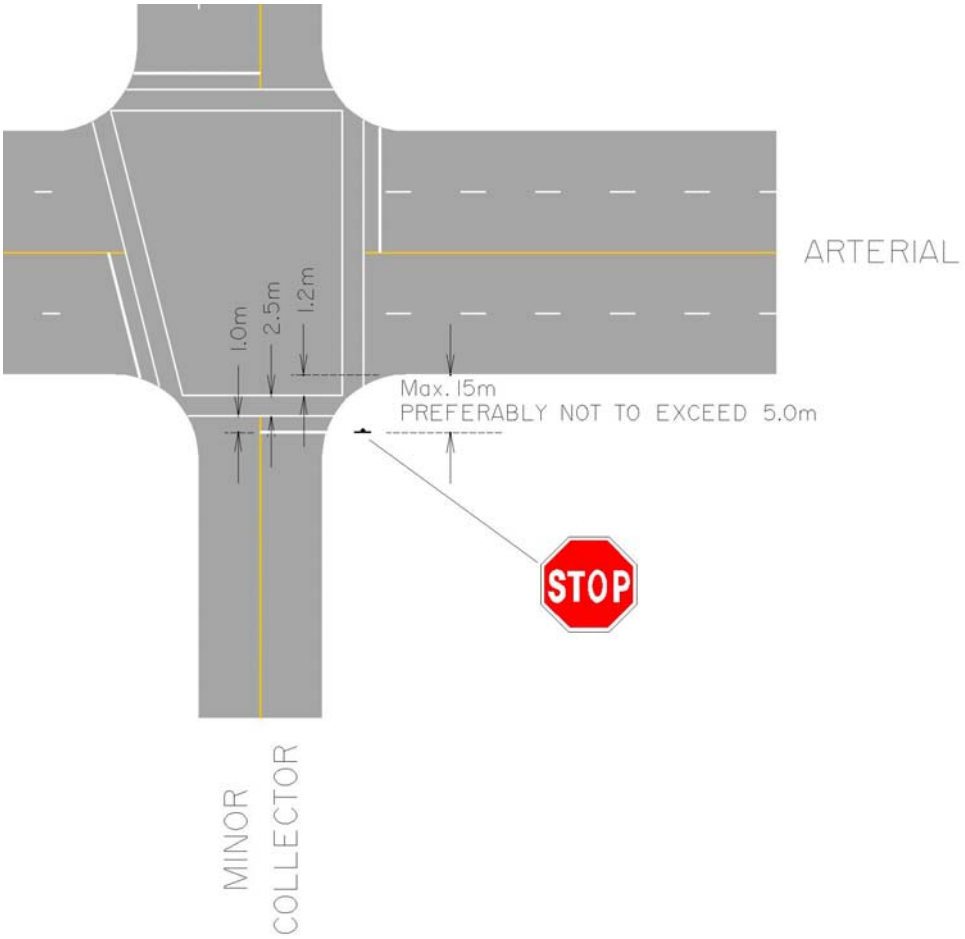

NO.	DESCRIPTION	BY	DATE

Alberta
INFRASTRUCTURE AND TRANSPORTATION

DRAWING
TCS-A-202

Date: DEC 2003

PLACEMENT OF STOP SIGN IN URBAN AREAS

Prepared by:	Checked by:	Scale:	
S.L.	B.B.	N.T.S.	SECTION A2