Chapter 4 – Guidelines For Traffic Control Devices

4.1 Signs and Specifications

Below is a listing of common temporary traffic control signs. The sizes identified are recommended under normal conditions. Sign sizes are dictated by roadway classification or by the Transportation Engineering Department. Refer to Manual of Uniform Traffic Control Devices for Canada for sign sizes and signs that are not identified below. Size colour and shape shall be in accordance with the most current version of the Manual of Uniform Traffic Control Devices for Canada (MUTCDC).

All signs, unless otherwise specified, must be retroreflective. Retroreflective sheeting that is classified as Diamond Grade is the minimum intensity for use in temporary traffic control signage. High intensity material (Reflectivity Level 1) is recommended and is County standard.

For other sign sizes and types commonly used in Strathcona County, please refer to the MUTCDC.

Legend

Sign name (MUTCDC)

• Colour information
• Sign description
• Sign size

4.1.1 Regulatory Signs

Regulatory signs are used to identify a traffic regulation that is applicable at a given time or place on a road and to identify the legal requirements. The following codes are used to categorize the various regulatory signs as below:

RA: Right-of-way control signs
RB: Road use control signs
RC: Miscellaneous regulatory signs
Stop Sign (RA-1)
• This sign indicates to drivers that they must come to a complete stop and must not proceed until it is safe to do so.
• Minimum 600 mm x 600 mm.
• White text and border on red background.

Yield Sign (RA-2)
• This sign indicates that drivers must yield the ROW, stop if necessary, and must not proceed until it is safe to do so.
• Triangle with 750 mm sides.
• Red symbol and border on white background.

Maximum Speed Sign (RB-1)
• This sign indicates the maximum legal speed.
• 600 mm x 750 mm.
• Black text and border on white background.

Maximum Speed Ahead Sign (RB-5)
• This sign provides advanced warning of a speed reduction.
• 600 mm x 750 mm
• Black text and border on white background.

Right/Left Turn Prohibited Sign (RB-11R and RB11L)
• This sign indicates that a right or left turn is prohibited.
• 600 mm x 600 mm.
• Black arrow and border, with red circle and bar on white background.

Entry Prohibited Sign (RB-23)
• This sign indicates that access to vehicular traffic is not permitted.
• 600 mm x 600 mm.
• Black border, red symbol on white background.
Two-way Traffic Sign (RB-24)
• This sign indicates that the section of road is a two-way road.
• 600 mm x 750 mm.
• Black symbol and border on white background.

Left (Right) Turn Only Lane Sign (RB-41R and RB-41L)
• Used on approach to an intersection, this sign indicates to drivers that they must only turn from the designated lane at the intersection.
• 600 mm x 600 mm.
• White arrow and border on black background.

Parking Control Sign (RB-51, RB-52, RB-53, RB-60, RB-71)
• This sign indicates that parking is prohibited at all times on all days and on both sides of the sign. Various prohibitions to times, duration and coverage area can be specified.
• 300 mm x 300 mm; 300 mm x 450 mm.
• Black symbol and arrows with red circle and bar, and black border on white background.

Stopping Prohibited Sign (RB-55, RB-57, RB-58, RB-72)
• This sign indicates that stopping is prohibited at all times on all days and on both sides of the sign. Various prohibitions to times, duration and coverage area can be specified.
• 300 mm x 300 mm; 300 mm x 450 mm.
• Black symbol and arrows with red circle and bar, and black border on white background.

4.1.2 Temporary Condition Signs

Temporary Condition signs are used for temporary traffic control and have an orange background with black symbol or text.

Construction Ahead Sign (TC-1)
• This sign indicates advanced warning of a major work zone and are generally used for long-term construction projects.
• 750 mm x 750 mm.
• Black text, symbol and border on an orange background.
Road Work Sign (TC-2)
• This sign indicates that activities such as minor maintenance or utility operations are in progress on or adjacent to the road.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Construction Ends Sign (TC-4)
• This sign indicates the end of the work zone.
• 750 mm x 750 mm.
• Black text and border on an orange background.

Temporary Lane Closed Ahead Sign (TC-5R and TC-5L)
• This sign indicates that a lane is closed ahead.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Lane Closure Arrow Sign (TC-7)
• This sign indicates that traffic must proceed to the left or right of the closed lane.
• 450 mm x 600 mm; 600 mm x 1200 mm.
• Black symbol and border on an orange background.

Detour Ahead Sign (TC-10)
• This sign indicates that traffic will be required to take another road to bypass the temporary road blockage.
• 750 mm x 750 mm.
• Black text, symbol and border on an orange background.

Detour Direction Markers (TC-11R and TC-11L)
• These signs indicate the alternate route to take as a result of a total road closure.
• 600 mm x 450 mm.
• Black text, symbol and border on an orange background.
Through Traffic Prohibited Sign
- This sign indicates a worksite ahead, but allows for local traffic up to the worksite.
- 750 mm x 750 mm.
- Black text and border on an orange background.

Road Closed Sign
- This sign indicates that access is prohibited to all traffic.
- 450 mm x 900 mm.
- Black text and border on an orange background.

Local Traffic Only Sign
- This sign indicates that local traffic is permitted.
- 450 mm x 900 mm.
- Black text and border on an orange background.

Road Diversion Sign (TC-13R and TC-13L)
- This sign indicates a deviation from the normal road which is 200m in length.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.

Road Realignment Sign (TC-15)
- This sign indicates the road is realigned from normal.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.

Lane Realignment Sign (TC-16)
- This sign indicates the realignment of two or more lanes from normal.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.
Traffic Control Person Ahead Sign (TC-21)
- This sign indicates that traffic is controlled by a traffic control person.
- 600 mm x 600 mm.
- Black symbol and border on an orange background.

Two-way Traffic Ahead Sign (TC-24)
- This sign indicates the approaching section of road is a two-way road.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.

Checkerboard Sign (TC-30; TC-30R; TC-30L; TC-30B)
- This sign indicates the termination of a road.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.

Chevron Alignment Sign (TC-31)
- This sign indicates a change in the horizontal alignment of the road.
- 450 mm x 600 mm.
- Black symbol and border on an orange background.

Road Narrows Sign (TC-34)
- This sign indicates the narrowing of the road.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.

Grooved Pavement Sign (TC-47)
- This sign indicates that the road surface requires attention by motorcycle or bicycle operators.
- 750 mm x 750 mm.
- Black symbol and border on an orange background.
Pavement Drop-off Sign (TC-49)
• This sign indicates that on the approaching section of road, either or both the adjacent lane or shoulder are lower or higher than the driving lane.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Pavement Ends Sign (TC-50)
• This sign indicates that the hard surface road is about to end.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Bump Sign (TC-51)
• This sign warns of approaching bump in the road.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Low Clearance Ahead Sign (TC-52)
• This sign indicates the maximum overhead clearance at bridges and other structures.
• 750 mm x 750 mm.
• Black dimension, arrows and border on an orange background.

Truck Entrance Sign (TC-54R and TC-54L)
• This sign indicates trucks entering the roadway.
• 750 mm x 750 mm.
• Black symbol and border on an orange background.

Construction Marker (TC-62)
• This sign is used to separate the work area from the traffic area.
• 300 mm x 900 mm.
• Orange symbol on a black background.
Double Fine Area Sign (Alberta Infrastructure & Transportation Bulletin #41-2006)
• This sign advises motorists that speed fines double in the work area
• 600 mm x 600 mm.
• Black text and border on a white background.

Start/End of Double Fine Area Signs
• These signs identify where the double fine area starts and ends.
• 300 mm x 600 mm each.
• White text on a black background.
The following drawing shows an example of a typical portable sign stand.

**Typical Portable Sign Stand**
4.2 Speed Fines Double (41/2006)

An amendment to Alberta’s Traffic Safety Act was made to encourage motorists to adhere to the speed limit in active work areas. Active work areas must be kept as short as possible and only extend where actually needed to improve speed limit compliance.

If used, the active work area Speed Fines Double sign and Begins sign must be set up below, or immediately in front of, the Maximum Speed sign. The double fine area will terminate at the Speed Fines Double and Ends signs.

The Speed Fines Double, Begins and Ends signs must be used to mark the extents of active work areas in high speed situations (70 km/h or greater). Active work areas with lower speeds, such as residential areas, may not have these signs. In addition, work areas set up for long duration projects must receive Speed Fines Double, Begins and Ends signs, but areas set up for temporary work may not receive the signs.

Speed Fines Double, Begins and Ends signs must be covered or removed when workers are not present. No double fines will be issued during these times. Motorists can be issued double fines regardless of whether or not Speed Fines Double signs are installed, provided that workers are present or it is anticipated that workers will be present, as it is an active work area.

A construction zone can be composed of more than one active work area. In this situation, more than one double fine area may exist within a given construction zone. In this case, the extent of each double fine area will coincide with Maximum Speed signage used to mark the extent of each active work area.

4.3 Control of Traffic Using a Traffic Control Person

Traffic control persons are required:

1. When two-way traffic has to be guided through a single lane.
2. When materials or equipment are being moved across a traveled lane.
3. To assist motorists through complex traffic control set-ups.
4. When required by Transportation and Agriculture Services.

Traffic control persons are responsible for the safety of motorists, pedestrians, their fellow workers and equipment used on the worksite. Therefore, selecting a traffic control person must be based on the individual's experience, alertness and decisiveness. Traffic control persons shall be familiar with flagging standards and procedures as set out by the Alberta Construction Safety Association (ACSA). For more information on courses offered on flagging operations, please contact the ACSA at (1-800-661-2272) or visit http://www.acsa-safety.org.
A traffic control person is required to use a “Stop/Slow” paddle during the day. The paddle shall be reflectorized for night use. At night, a red lantern or flashlight must be used in addition to the paddle. A traffic control person must wear an approved hard hat, reflective safety vest and safety shoes as identified by the *Occupational Health and Safety Act* and the MUTCDC – C3.6.6 Personal Protective Equipment.

Illumination should be provided for traffic control persons required to be working in areas where normal street lighting is not available during hours of darkness. Always use a Traffic Control Person Ahead sign (TC-21) and a Maximum Speed Ahead sign (WB-9) in advance to alert motorists of a flagging operation. Traffic control persons shall stop traffic from the side of the traffic lane and shall never turn their back to traffic. Traffic control persons shall never leave their post until relieved by another traffic control person in full safety apparel.

Each traffic control person shall keep in visual contact with any other traffic control persons on the job. If visual contact cannot be maintained, there must be radio contact or a third traffic control person to relay signals. For example, a third traffic control person can relay signals from a position on the middle of a curve, or atop a hill (where visibility is obstructed by horizontal or vertical curves).
Where possible, traffic control persons shall co-ordinate direction of traffic flow with existing traffic signals. If coordination cannot be managed, contact Transportation and Agriculture Services, a minimum of two working days prior to the flagging operation, to arrange Transportation Engineering Branch in the Engineering and Environmental Planning Department to have the signals changed to accommodate the anticipated traffic flows.

When more than one traffic control person is required at an intersection, traffic shall be moved through the intersection one direction at a time using a predetermined rotation (clockwise).

Certain situations may require the use of the RCMP/Enforcement Services. Contact Transportation and Agriculture Services to discuss the need for RCMP involvement.

4.4 **Delineation (Channelization) Devices**

Delineation devices are used to form curves, lines, or boundaries that guide road users to the intended path. The appropriate advanced warning signs shall be used with all delineation devices.

Delineation devices include cones, construction markers, drums, tubular devices and chevron alignment signs. Delineation devices do not include barricades, concrete barriers or signs, other than chevron alignment signs.

Traffic cones shall be fluorescent orange and made of rubber or similar flexible material. The minimum height required for cones is 450 mm on roadways with a speed limit of 60 km/h or less, and 700 mm for speeds up to 70 km/h. For use on roadways where the speed is 70 km/h or greater, drums shall be used. Tubular markers may be used for tangent sections on roadways (70 km/h or greater) provided recommended spacing is adopted (refer to typical set-ups for required spacing).

Construction markers may be used for delineation devices, however, they are not recommended. Drums for high volume/high speed roadways, or cones for lower speed roadways are the preferred methods as indicated above. Drums shall be constructed of a material that does not create a hazard to vehicles on impact and should be manufactured so as not to roll.
Delineation Devices

TC-61

TC-63

TC-51

700mm

450mm

330mm

1000mm

550mm
Chevron alignment signs may be used to provide additional guidance on the outside of curves or sharp turns.

Amber flashers/warning lights shall be used to identify obstructions at night. There are three main types of lights for the purpose of temporary traffic control:

- Type A: low intensity flashing lights for nighttime use.
- Type B: high intensity flashers are effective day and night.
- Type C: steady burn, low-wattage lights are used at night for delineation.

Additional consideration should be given for nighttime work. Nighttime work can expedite the work, reducing the disruption of traffic. If floodlights are used for nighttime work, care should be taken so as not to impair the vision of approaching motorists.

**4.5 Barricades**

Proper placement of barricades is necessary to ensure public safety, as barricades may be a potential hazard. The following provides some examples of acceptable and non-acceptable use of barricades:

**Acceptable use of Barricades:**
- Barricades shall face oncoming vehicular traffic.
- Barricades are used to outline hazardous work areas and to prevent vehicles and pedestrians from entering the work area.
- Barricades are used to warn of an activity area and to obstruct entry into an activity area.
- Temporary signage may be placed on barricades only if necessary to accommodate a modified ‘lane closure arrow’, ‘road closed’ and ‘no through traffic’ signs.
- Barricades shall be used to close a road.

**Non-acceptable use of Barricades:**
- Barricades shall not be used as a delineation device.
- Barricades shall not be placed parallel to the flow of traffic. (For example, they are not to be used to mark the boundary between a travel lane and the work area or separate adjacent lanes of traffic.)
- Barricades shall not be placed in oncoming traffic without necessary advanced warning devices and signs.
- Barricades shall not be used instead of signposts.
- Barricades shall not be used for the placement of regulatory signs.
- Barricades shall not be located within the buffer space.
Light Barricades (as shown)

- A Light Barricade is a portable device that typically has one rail.
- Light Barricades may be used for road, street, lane, or shoulder closures of short duration.
- Light Barricades should be stabilized using sandbags placed on the lower section of the frame. Under no circumstances shall they be placed over the rail of the barricade.

Heavy Barricades (as shown)

- A Heavy Barricade typically has three rails and is more permanent in nature as compared to a Light Barricade.
- Heavy Barricades shall be used for road, street, lane or shoulder closures of long duration.
- Heavy Barricades may be used for road closures of short duration.

Typical Light Barricade (Temporary)
TC-64A
Typical Heavy Barricade (permanent)
TC-64C (Directional and Non-directional)
4.6 Traffic Barriers

Longitudinal traffic barriers are used in work zones to:

- Limit the possibility of traffic entering the work area.
- Protect the workers.
- Separate traffic.
- Protect the construction site,
- Separate pedestrians from vehicular traffic.

The use, placement and maintenance of longitudinal barriers should be based on acceptable engineering practices. Traffic barriers should:

- Be placed continuously without gaps between sections.
- Have acceptable flare rates on the leading edge, or have appropriate end treatments (e.g., Impact attenuators).
- Be equipped with glare screens where necessary.
- Be placed 1.0m from the edge of the driving lane.
- Be used during periods of inactivity where excavations compromise safety.

For information on temporary concrete barriers and acceptable barriers, refer to the following website:


For acceptable applications and installation requirements, please refer to the roadside safety section of the Transportation Association of Canada - Geometric Design Guide for Canadian Roads.
Standard Concrete Barrier
4.7 Arrow Boards

Arrow boards are a safe and effective method of traffic control, when used as intended. They are not to take the place of advance warning signs or delineation devices. When combined with the use of advanced warning signs and delineation devices, arrow boards are very effective. They are especially useful in situations that require higher than normal visibility. Examples where arrow boards should be used are on overnight set-ups, high-speed, high volume roadways (speeds 70 km/h and greater) and in poor weather conditions. It is important to note that arrow boards used for nighttime applications should be less bright than during daytime operations so as not to impair the vision of the approaching motorists.

4.8 Variable Message Boards

Variable Message Boards are used to relay information to motorists for upcoming or existing road construction. Typically, these are used on high volume roadways where road construction is expected to cause delays. For example, they are used to advise motorists to expect delays or use alternative routes where possible. Variable Message Boards are more effective at capturing the attention of the road users than static signs. Variable Message Boards should be programmed so motorists are able to read the message twice given the posted speed.
4.9 Impact Attenuators

Impact Attenuators (also known as crash cushions) are used to prevent an errant vehicle from impacting a fixed object by controlled deceleration. Impact Attenuators in temporary traffic control zones protect the motorists from the exposed ends of barriers, fixed objects and other hazards. There are two types of attenuators commonly used for temporary traffic control: (1) stationary, and (2) truck mounted/mobile. Truck Mounted Attenuators (TMAs) are mounted on the rear of a crash truck and deforms on impact in a controlled manner.

Stationary attenuators are recommended for long term situations, while TMAs are preferable for short term or mobile operations. For more information on the use and types of these devices, refer to the Transportation Association of Canada - Geometric Design Guide for Canadian Roads.

4.10 Intelligent Transportation Systems (ITS) Applications

Intelligent Transportation Systems can improve the safety of the workers and the motorists, and reduce driver frustration through work zones. There are many products available to assist in achieving these goals. Below are some examples of ITS and some typical applications:

- Over Height Vehicle Detection Systems can be used in situations where bridge maintenance requires false work, thereby reducing the normal clearance of a bridge. These systems typically use sensors to identify approaching over height vehicles and alert the drivers of the restricted clearance.

- Work Zone Intrusion Sensors/Alarms Systems are used to prevent crashes and injuries in work zones by alerting both the workers and the errant vehicle drivers of an intrusion into the work zone.

- Advanced Travelers Information System (ATIS) can be used to inform drivers of expected delays, caution drivers to reduce speed, advise motorists of closures, and provide information on alternate routes.

- Dynamic Work Zone Systems can promote smooth traffic flow leading into a work zone by creating a dynamic no passing zone upstream of the work zone. ITS monitoring systems detect speed and volume to adapt the length of the zone to changing traffic conditions. The dynamic system deters vehicles from attempting to get ahead in the line by changing lanes at the last possible opportunity.

The above systems are just a few examples of Intelligent Information Systems that are available for use for temporary traffic control.