Temporary Traffic Control Manual

City of Lethbridge
Infrastructure Services

CITY OF Lethbridge

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1 Introduction

1.1 Purpose

The purpose of this manual is to set out standards, specifications and expectations for Temporary Traffic Control (TTC) plans with the intended outcomes of:

- Safety of employees at a worksite
- Safety of the general public (including motorists, cyclists and pedestrians) within a TTC zone
- Protection of equipment used at a worksite
- Minimization of traffic disruptions around within a worksite

This manual will also define the level of authority and primary responsibilities for all agencies involved.

1.2 Scope

This manual is intended as a practical working reference to be used by private contractors, consultants, utility companies and City of Lethbridge personnel (herein referred to as the Contractor). Uniform standards and procedures are set out in this manual and shall be adhered to when working on or adjacent to roadways under the jurisdiction of the City of Lethbridge (City). The Contractor shall observe and maintain these standards and procedures to ensure:

- Uniform standards for design and quality of TTC devices and TTC plans used within the City-owned road right-of-way (ROW)
- Standardized procedures and placement of TTC devices to minimize confusion for all users
- The promotion of uniform designs and standards throughout Canada

This manual shall be used in conjunction with the latest versions of the *Occupational Health and Safety Act*, the *Traffic Safety Act*, the *Alberta Building Code*, the *Safety Codes Act*, other associated regulations, all applicable bylaws and related contract documents.

In cases where this manual does not provide minimum standards and specifications for a site specific condition this manual is to be used in conjunction with the Transportation Association of Canada's *Manual on Uniform Traffic Control Devices for Canada* (MUTCDC).

1.3 Authority

All work performed within the City-owned ROW shall conform to the policies, standards and procedures set out by the City of Lethbridge (including this Manual) and the *Alberta Occupational Health and Safety Act*.

Infrastructure Services is the final authority on TTC standards and sets the extent of traffic disruptions allowed on all City-owned ROW. As such, Infrastructure Services must be notified and all applicable permits obtained before the commencement of any work on or adjacent to all City-owned ROW.

Contact Information:

City of Lethbridge
Infrastructure Services
304 – Stafford Dr N
Lethbridge, AB T1H 2A6
Phone: 403-320-3076
transportation@lethbridge.ca

	Department	Contact Title	Phone Number
City of Lethbridge	Infrastructure Services	*ROW Coordinator*	403-320-3150
		Traffic & Sign Coordinator	403-315-1508
		Traffic Technologist	403-320-3183
	Waste & Recycling	*Waste & Recycling Coordinator*	403-320-3851
	Lethbridge Transit	*Transit Coordinator*	403-315-1489
	Public Operations	*General Line*	403-320-3850
	Development Services	*General Line*	403-320-3920
	Public Safety Communications Centre (PSCC)	*General Line*	403-329-1225
External	**Organization**	**Contact Title**	**Phone Number**
	Alberta 1 Call	*General Line*	800-242-3447
	Shaw Cable	*General Line*	866-344-7429
	Canada Post	*Local Joint Health & Safety Committee*	403-382-4604 ext. 2004
	Alberta Transportation	*Operations Manager*	403-381-5426
	CP Rail	*General Line*	888-333-6370

2 Requirements

2.1 Worksite Assessment and Checklist

2.1.1 Before the Work

- Have you completed an accredited institution's TTC Training course? Have you supplied a copy of your valid certificate to the City?
- Has the Traffic Technologist, ROW Coordinator or Traffic Engineer approved your planned work and TTC plan?
- Will you need assistance from the Traffic and Sign Coordinator for the implementation of your TTC plan?
- Do you have the necessary permits (e.g. Hoarding Permit, Excavation Permit) in place?
- Have you requested utility locates?
- Has indemnification insurance been provided to and accepted by the City?
- Will there be a potential impact to any of the following services (if yes, be sure to contact the appropriate representative)?
    a. Emergency Services (PSCC)
    b. Lethbridge Transit
    c. City of Lethbridge Waste & Recycling
    d. Canada Post
- Have you given 72 hours advance notice of the work to the affected businesses, utilities and residents (by means of an Infrastructure Services-approved hand delivered letter)?
- Are the proper TTC devices available at the worksite to accommodate traffic?
- Have you ensured access and egress requirements are met for affected properties?

2.1.2 During the Work

- Are pedestrians, cyclists and motorists properly separated and protected from each other and the work zone?
- Is there enough proper equipment available to secure the worksite overnight if necessary? These items may include barricades, reflective signs, markers, flashers, sandbags, and fencing.

- Are there any signs that need to be covered or removed during periods of inactivity (e.g. flag person sign)?
- Are all TTC devices still in their proper places, aligned and standing upright? Do you need to secure the signs?
- Are the signs clean and legible (day and night)?
- Are traffic control persons being used, and are proper procedures being followed? Have the traffic control persons been trained by an accredited institution?
- Does the TTC setup continue to meet the needs of your job? If not, contact the original approver to request a change to the TTC plan immediately.
- Is the work zone being monitored regularly?
- Do you have an approved contingency plan in place to accommodate peak hour traffic if there is the possibility that the work may run into the peak hour?
- Have arrangements been made to bring the ROW back into service?

2.1.3 After the Work

- Have you obtained approval from Infrastructure Services to re-open the roadway?
- Have you cleaned up the worksite and rehabilitated the ROW in a condition equal to or better than it was prior to the start of the work? If not, have arrangements been made to restore or rehabilitate the ROW?
- Have you removed all TTC devices?

2.2 Required Permits & Work Authorization

All work on City-owned ROW requires authorization and permits. For more information, contact Infrastructure Services at 403-320-3076.

2.3 Certification

The person who designs the TTC plan, as well as the field supervisor/foreman implementing the plan, must be accredited by an appropriate agency. The Alberta Construction Safety Association (ACSA) offers each of these courses and is an approved training facility by the City.

Alberta Temporary Traffic Control

This course will assist all parties involved in understanding, designing and implementing TTC plans, practices and procedures for construction worksites in the province of Alberta.

Alberta Temporary Traffic Control – Field Application

This course will assist all parties involved in the implementation of TTC plans. Any individual who will be acting as a traffic control person shall be properly trained in flagging, which is also covered in this course.

For more information, please contact the ACSA at:

Alberta Construction Safety Association
800-661-6090
www.acsa-safety.org

3 Performance Guidelines

3.1 Pedestrian Safety

Although the contents of this manual deal mostly with the motoring public, it must be recognized that providing for the safety of pedestrians is equally important. The following standards shall be maintained to ensure pedestrian safety:

- Pedestrian and vehicular traffic must be physically separated.
- Pedestrian traffic must be physically separated from workers and equipment in the work zone. Accommodations must be made for a safe passage through or around the work zone.

For example, crosswalks and sidewalks may be closed to prevent pedestrian traffic through or around the work zone provided alternate means of detouring pedestrian traffic is available.

In cases where it is not possible to detour pedestrian traffic, pedestrians will have to be protected as they pass through the work zone. This may require the use of barricades to separate the work zone from the pedestrian walkway. It may be necessary to use bridges (complete with handrails) and/or sheltered walkways. In all cases, measures taken to protect the pedestrians must be to the satisfaction of Infrastructure Services.

Specifications used for bridges and sheltered walkways must be reviewed by Infrastructure Services and a building permit from Development Services may be required prior to commencing any work.

If working on or adjacent to a multi-use regional pathway, a pedestrian detour **must** be provided.

3.2 Standards of Performance and Responsibility

With the exception of emergency related work, all work on City-owned ROW shall:

- Be approved by Infrastructure Services under the authority of the Director of Infrastructure Services. The extent of traffic disruption allowed will be determined and a review of the TTC plan for the work proposed will be undertaken.
- Be reported to Infrastructure Services a minimum of **seven days** in advance of the expected start date. This excludes arterial roadways. Notification for arterial roadways is **fourteen days** in advance of the expected start date.
- Require authorization and/or a special permit when working in restricted areas, i.e. rail ROW, river valley.
- Require an Excavation and/or Hoarding Permit from Infrastructure Services before the work begins.
- Require a Building or Demolition Permit from Development Services before building or demolition begins.

In all cases:

- All necessary traffic control devices must be in place before work commences. These devices shall remain in place, be maintained and monitored for the duration of the work while any safety hazard or obstruction to vehicular or pedestrian traffic exists.
- Minimum lane width shall be 3.0 meters per lane. This width shall be adjusted upward under circumstances such as curves, heavy vehicle traffic, truck routes, bus routes or high-speed situations. If this minimum width cannot be met, a lane closure is required.
- Any alterations to the TTC setup require the approval of Infrastructure Services prior to the changes being made.
- Road closures may be preferable rather than using complicated traffic setups or traffic control persons.
- It is the responsibility of the Contractor doing the work to notify affected residents and/or businesses of road closures, parking restrictions and other work that impacts normal traffic flow by means of Infrastructure Services-approved hand delivered letters **72 hours** in advance of non-emergent work. The recommended method to notify the public of parking restrictions is by advanced signage.
- Requests for parking meters to be hooded require **72 hours** advance notice.

- Requests for "No Parking" zones to be established require **seven days** advance notice. The "No Parking" signs shall be placed 12 to 24 hours prior to commencing work. The Contractor is responsible for sign maintenance.
- Lethbridge Transit must be notified of work affecting a bus route or bus stops. For a simple traffic diversion, Lethbridge Transit requires **one full working day** advance notice. For a traffic detour, notify Lethbridge Transit at least **two full working days** in advance. Avoid impacting transit operations whenever possible.
- Waste & Recycling Services shall be notified **one full working day** in advance of laneway or street closures affecting garbage pickup.
- Any work on an arterial roadway must be approved by the Traffic Engineer.
- Peak hour traffic in the City of Lethbridge typically occurs from 7 a.m. to 9 a.m. and from 3 p.m. to 6 p.m. Monday to Friday. During these times, construction work and/or traffic disruption is not permitted on arterial and major collector roads except in cases of emergencies or with prior approval from the Traffic Engineer.
- The Contractor shall ensure that private contractors and other agencies working for them maintain the TTC procedures and standards set out in this manual. Infrastructure Services may inspect any worksite at any time and recommendations made by Infrastructure Services shall be implemented within a reasonable timeframe.
- No permanent traffic sign shall be removed or covered without prior approval from Infrastructure Services.
- Any disruption that may affect signal timing or signal operations shall be coordinated with the Traffic Signals Manager. In the event of an afterhours signal related emergency, contact Public Operations.
- Detouring through school zones and playground zones shall be avoided wherever possible.

3.3 Securing the Worksite

The Contractor is responsible for ensuring a safe work zone that complies with Occupational Health & Safety requirements. Securing the worksite is necessary to protect the public from potential hazardous conditions within the work zone. It is necessary to secure the worksite during any periods of activity as well as inactivity. Some examples of inactivity are shutdowns due to weather conditions, end of shift, weekends, holidays and lunch/coffee breaks. The necessary steps to secure the worksite are outlined below:

3.3.1 During periods of activity

- Ensure that all TTC devices are legible, properly positioned and secured.
- Remove or securely cover any signs that are not required or are conflicting. For example, cover the gazetted speed if the setup requires a speed reduction.

Once secured, drive the through the worksite to ensure that the setup provides the motorists with adequate advance warning and positive guidance through the TTC zone. This should be done during the day, and at night for overnight setups. Adverse conditions may require adjustment of the traffic control devices and any changes made shall be recorded. Ensure that safe pedestrian movement is maintained and pedestrian and vehicle movements are separated and do not conflict.

3.3.2 During periods of inactivity

- Ensure that all TTC devices are legible, properly positioned and secured.
- Chevrons or flashers shall be used to delineate the tapers. Flashers shall be used at night to separate the travel lane(s) and the worksite.
- Remove or cover any TTC signage that is not required.
- Inspect the worksite as required and keep a record of the inspections.

Once secured, drive the worksite to ensure that the setup provides the motorists with adequate advance warning and provides positive guidance through the worksite. This should be done during the day, and at night for overnight setups. Adverse conditions may require adjustment of the traffic control devices and any changes made shall be recorded. Ensure that safe pedestrian movement is maintained and pedestrian and vehicle movements are separated and do not conflict.

3.4 Installation and Maintenance

3.4.1 Installation

All devices shall be placed in a manner so as not to interfere with the existing traffic control devices. It is important to survey the worksite before preparing a TTC plan. This ensures any conflicting signs are covered or removed. For example, if a speed reduction is required, the gazetted signs shall be covered or removed. Work in the proximity of a signalized intersection may require signal timing/phasing adjustments based on the circumstances.

3.4.2 Maintenance

It is important to maintain all TTC devices. Some examples of maintenance include, but are not limited to:

- Cleaning all devices
- Ensuring all devices are located and oriented as per the approved plan
- Ensuring all devices are secured for adverse conditions
- Cleanliness and operation of flashing lights for night use
- Replacing any damaged or missing signs or devices

3.5 Record Keeping

The Contractor is responsible for maintaining a record of the TTC used to document and ensure the appropriate measures are in place at all times, and take the necessary steps to correct any deficiencies. A "Record of Temporary Traffic Control" sample is provided for the purpose of record keeping.

Sample of Record of Temporary Traffic Control

Project:		Date:
Site Address:		Supervisor:
Phone #	Cell #	Fax #
Contractor:		Inspected By:
Completed:		Page of

Date *yyyy/mm/dd*	Time *24hr*	Type of Setup	As per plan?	Type of Deficiency and Location	Photo Taken?	Action Taken
2013/07/22	14:30	Lane Closure	N	Message board not functioning correctly	Y	Reprogrammed the message board
2013/07/31	09:00	Lane Closure	Y	N/A	Y	N/A
2013/08/04	10:15	Lane Closure	N	TTC devices are dirty	Y	Washed all TTC devices

3.6 Duration of Work

Mobile Operation

- Typically performed on the move at low speed and may require periodic stopping for only a few minutes.
- Examples include street sweeping, street plowing, longitudinal pavement marking, watering of trees and hydro-seeding.

Very Short Duration

- Can be completed in 30 minutes or less and may be stationary or mobile with frequent short stops.
- Examples include minor utility and roadwork, crack sealing, bus shelter washing, catch basin cleaning, pothole patching/repair, symbol and transverse road-marking, minor sign maintenance, signal light replacement and emergency response (e.g. spills and vehicular collisions).

Medium Duration

- Stationary and range from more than 30 minutes to 24 hours.
- Examples include maintenance, sidewalk/boulevard repair, tree trimming, utility work, asphalt patching, sanitary main maintenance, and emergency response (e.g. spills and vehicular accidents).

Long Duration

- Stationary and exceed 24 hours.
- Examples include manhole replacement, utility replacement, bridge rehabilitation, roadway upgrading (e.g. interchange construction), large paving operations, emergency water-main repairs, sidewalk/boulevard replacement, and utility repairs & new installations.

3.7 Temporary Traffic Control Zone Components

A typical TTC setup can be divided into four areas:

a) **Advance Warning Area**: informs drivers to expect work ahead

b) **Approach Area**: informs drivers what action to take

c) **Transition Area**: moves traffic out of the normal path

d) **Activity Area:** is where the work takes place

e) **Termination Area:** lets traffic resume normal driving

Basic TTC Tapers and Tangents criteria

Tapers	**Length (L)**
Merging Taper – 2 Lanes to 1 (lane closure)	L (min)
Shifting Taper	L/2 (min)
Shoulder Taper	L/3 (min)
One Lane, Two-Way Traffic Taper	30m (max)
Downstream Taper	30m (min)
Tangents	**Length (L)**
Merge Followed by Merge	2L (desirable), L (min)
Merge Followed by Shift	L/2

Refer to the figures in Chapter 5 for more information and typical layouts.

3.8 Restricted Areas

Heavy Rail ROW – Canadian Pacific Rail (CP Rail)

All work that encroaches on the CP Rail ROW shall be coordinated through the Contractor. For approval and requirements regarding TTC contact CP Rail.

Provincial ROW – Alberta Transportation

All work that encroaches on the Provincial ROW shall be coordinated through the Contractor. For approval and requirements regarding TTC, contact Alberta Transportation.

4 Guidelines for Traffic Control Devices

4.1 Signs and Specifications

Below is a listing of common TTC signs. The sizes identified are recommended under normal conditions. Sign sizes are dictated by roadway classification, speed or by Infrastructure Services. Size color and shape shall be in accordance with the most current version of the MUTCDC.

All signs must meet the minimum retroreflective sheeting requirements set forth in the most current revision of the ASTM D4956 standard specification.

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 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

	**Name**	Stop	**MUTCDC Code**	RA-1
	Size	600mm x 600mm (min)		
	Color	White legend on red background		
	Purpose	Indicates that drivers must come to a complete stop and must not proceed until it is safe to do so.		
	**Name**	Yield	**MUTCDC Code**	RA-2
	Size	750mm sides		
	Color	Red legend on white background		
	Purpose	Indicates that drivers must yield the right of way, stop if necessary and must not proceed until it is safe to do so.		
	**Name**	Maximum Speed	**MUTCDC Code**	RB-1
	Size	600mm x 750mm		
	Color	Black legend on white background		
	Purpose	Indicates the maximum legal speed a vehicle can travel while on the current roadway.		
	**Name**	Maximum Speed Ahead	**MUTCDC Code**	RB-5
	Size	600mm x 750mm		
	Color	Black legend on white background		
	Purpose	Indicates an upcoming change in the maximum legal speed a vehicle can travel while on the current roadway.		
	**Name**	Right (Left) Turn Prohibited	**MUTCDC Code**	RB-11R(L)
	Size	600mm x 600mm		
	Color	Black legend, red restrictive symbol on white background		
	Purpose	Indicates that a right (left) turn is prohibited.		

	**Name**	Entry Prohibited	**MUTCDC Code**	RB-23
	Size	600mm x 600mm		
	Color	Black border, red legend on white background		
	Purpose	Indicates that a vehicle is prohibited to enter the roadway.		
	**Name**	Two-Way Traffic	**MUTCDC Code**	RB-24
	Size	600mm x 750mm		
	Color	Black legend on white background		
	Purpose	Indicates that a roadway operates with two-way traffic.		
	**Name**	Passing Prohibited	**MUTCDC Code**	RB-31
	Size	600mm x 600mm		
	Color	Black legend, red restrictive symbol on white background		
	Purpose	Indicates that a driver shall not overtake another vehicle.		
	**Name**	Right (Left) Turn Only Lane	**MUTCDC Code**	RB-41R(L)
	Size	600mm x 600mm		
	Color	White legend on black background		
	Purpose	Indicates only a right (left) turn from the designated lane.		
	**Name**	Parking Control	**MUTCDC Code**	RB-51
	Size	300mm x 300mm		
	Color	Black legend, red restrictive symbol on white background		
	Purpose	Indicates that parking is prohibited at all times in the direction of the arrow(s).		

4.1.2 Temporary Conditions Signs

Temporary Condition signs are used to raise awareness to and help road users safely navigate a temporary worksite.

	**Name**	Construction Ahead	**MUTCDC Code**	TC-1
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Provides advance warning of a major temporary worksite and temporary traffic control zone ahead.		

	**Name**	Road Work	**MUTCDC Code**	TC-2
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates workers, equipment and/or materials may be exposed to motorists.		
	**Name**	Survey Crew	**MUTCDC Code**	TC-3
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Used when surveying is taking place within the ROW. Must be relocated as necessary.		
	**Name**	Construction Ends	**MUTCDC Code**	TC-4
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates the end of a TTC zone.		
	**Name**	Lane Closed Ahead	**MUTCDC Code**	TC-5
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that a lane is temporarily closed ahead for construction work.		
	**Name**	Lane Closure Taper	**MUTCDC Code**	TC-6
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates the beginning of a temporary lane closure taper. Drivers must merge in the direction of the arrow.		
	**Name**	Lane Closure Arrow	**MUTCDC Code**	TC-7
	Size	600mm x 1200mm		
	Color	Black legend on orange background		
	Purpose	Indicates that a driver must pass to the left (or right) of the temporarily closed lane.		

	**Name**	Detour Ahead	**MUTCDC Code**	TC-10
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that drivers will be temporarily re-routed from the through path of the roadway, around a work zone.		
	**Name**	Detour Direction Marker	**MUTCDC Code**	TC-11
	Size	600mm x 450mm		
	Color	Black legend on orange background		
	Purpose	Indicates the alternate route that drivers are to follow while temporarily detouring around a work zone (either right, left, or straight).		
	**Name**	Road Diversion	**MUTCDC Code**	TC-13
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates a temporary minor deviation from the normal travel path which is 200 metres or less in length.		
	**Name**	Road Realignment	**MUTCDC Code**	TC-15
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates a temporary realignment of the normal travel path.		
	**Name**	Yield To Oncoming Traffic	**MUTCDC Code**	TC-17
	Size	*RA-2:* 750mm x 750mm, *TC-17S:* 3000 x 600mm		
	Color	Red legend on white background		
	Purpose	Indicates which direction has the right of way where only one lane is available for two-way traffic.		
	**Name**	Traffic Control Person Ahead	**MUTCDC Code**	TC-21
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that a traffic control person is temporarily directing traffic ahead.		

	**Name**	Two-Way Traffic Ahead	**MUTCDC Code**	TC-24
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Provides advance warning that the road temporarily operates with two-way traffic ahead.		
	**Name**	Checkerboard	**MUTCDC Code**	TC-30
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates the termination of a road.		
	**Name**	Chevron Alignment	**MUTCDC Code**	TC-31
	Size	450mm x 600mm		
	Color	Black legend on orange background		
	Purpose	Provides additional guidance to drivers where there is a change in the horizontal alignment of the road.		
	**Name**	Road Narrows	**MUTCDC Code**	TC-34
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates a temporary reduction in the width of the road.		
	**Name**	Grooved Pavement	**MUTCDC Code**	TC-47
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates the road surface is temporarily grooved, particularly useful to motorcyclists and cyclists.		
	**Name**	Pavement Drop-Off	**MUTCDC Code**	TC-49
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that either (or both) the adjacent travel lane or shoulder lane are temporarily at a different height than the current travel lane.		

	**Name**	Pavement Ends	**MUTCDC Code**	TC-31
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that the current travel lane surface temporarily changes from pavement to gravel (or dirt) ahead.		
	**Name**	Bump	**MUTCDC Code**	TC-51
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that a temporary bump exists ahead.		
	**Name**	Low Clearance	**MUTCDC Code**	TC-52
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates the maximum vertical clearance ahead.		
	**Name**	Truck Entrance	**MUTCDC Code**	TC-31
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates to drivers that they are approaching a location where trucks are entering, leaving, or crossing the road.		
	**Name**	Speed Fines Double	**MUTCDC Code**	TC-52
	Size	600mm x 600mm		
	Color	Black legend on white background		
	Purpose	Indicates that speed limit violation fines are subject to twice the normal rate when workers are present.		
	**Name**	Speed Fines Double (Begins / Ends)	**MUTCDC Code**	TC-52
	Size	300mm x 600mm		
	Color	White legend on black background		
	Purpose	Indicates the start and end of the speed fines double zone.		

	**Name**	Sidewalk Closed	**MUTCDC Code**	N/A
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that the sidewalk is temporarily closed.		
	**Name**	Crosswalk Closed	**MUTCDC Code**	N/A
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that the crosswalk is temporarily closed.		
	**Name**	Pathway Closed	**MUTCDC Code**	N/A
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that the pathway is temporarily closed.		
	**Name**	Be Prepared To Stop	**AT Code**	WD-111
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates drivers are approaching a zone where they may be temporarily stopped.		
	**Name**	New	**AT Code**	WD-182
	Size	750mm x 750mm		
	Color	Black legend, red circle with white text on yellow background		
	Purpose	Indicates that new intersection geometry or traffic control exist ahead.		
	**Name**	No Centre Line	**AT Code**	WD-187
	Size	750mm x 750mm		
	Color	Black legend on orange background		
	Purpose	Indicates that no centre line road marking exists.		

4.2 Traffic Control Persons

Traffic control persons are required:

- When two-way traffic must be guided through a single travel lane.
- When materials or equipment are being hoisted above a sidewalk.
- When required by Infrastructure Services.

Traffic control persons are responsible for the safety of motorists, pedestrians, their fellow workers and equipment used on the worksite. Traffic control persons shall be certified by an accredited training facility.

A traffic control person is required to use a "Stop/Slow" (TC-65) paddle. At night, a red lantern or flashlight must be used in addition to the paddle.

TC-65
450mm x 450mm
TRAFFIC CONTROL PADDLES

Illumination should be provided for traffic control persons required to be working in areas where normal street lighting is not available during the hours of darkness. Always use a Traffic Control Person Ahead sign (TC-21) and a Be Prepared to Stop sign (WD-111) in advance to alert motorists of a flagging operation.

Where possible, traffic control persons shall co-ordinate direction of traffic flow with existing traffic signals. If coordination cannot be managed, contact the Traffic Signals Manager a minimum of **seven days** prior to the flagging operation to arrange to have the signals changed to an all-red flash mode.

When more than one traffic control person is required at an intersection, traffic shall be moved through the intersection one direction at a time. Use a predetermined clockwise or counter-clockwise rotation to accomplish this.

Certain situations may require assistance from the Lethbridge Regional Police Service (LRPS). Contact Infrastructure Services to discuss the need for police involvement. There will be fees associated to pay for the duty officers. Police involvement is subject to the availability of officers.

4.3 Delineation (Channelization) Devices

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

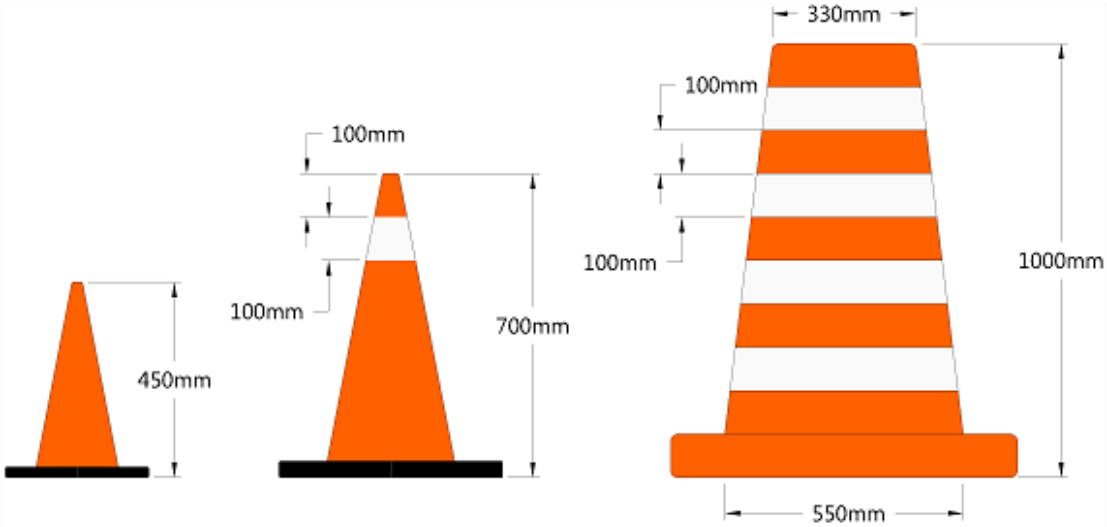
Delineation devices include cones, construction markers, drums, tubular devices and chevron alignment signs. Delineation devices do not include barricades, concrete barriers or signs other than chevron alignment signs.

Traffic cones shall be fluorescent orange and made of rubber or similar flexible material. The minimum height required for cones is as follows:

- 450 mm on roadways with a speed limit of 50 km/h or less
- 700 mm for speeds up to 60 km/h.

Drums shall be used for roadways with a speed of 70 km/h or greater. Tubular markers may be used for tangent sections on roadways (70 km/h or greater) provided recommended spacing is adopted (refer to typical setups for required spacing). Cones with a minimum height of 700mm may be used for tangent sections for short term setups but not for overnight setups on roadways of 70 km/h or more.

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.



TC-61
Traffic Cones

TC-63
Flexible Drum

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 TTC:

- **Type A**: low intensity flashing lights for night time 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 night time work. Night time work can expedite the work, reducing the disruption to traffic. Refer to the City of Lethbridge Noise Bylaw for information on noise level restrictions during night time work.

Barricades

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

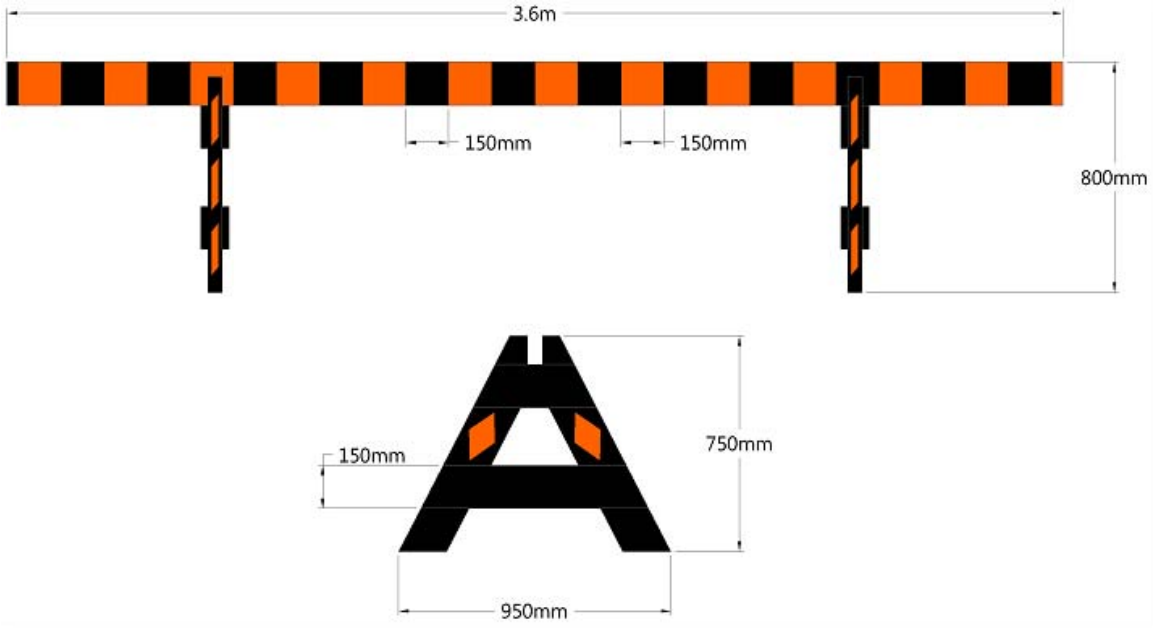
Acceptable use of barricades

- Barricades shall face oncoming vehicular traffic
- Barricades are used to outline and prevent vehicles and pedestrians from entering the work zone
- Barricades are used to warn of and to obstruct entry into an activity area
- Temporary signage may be placed on barricades only if necessary

Non-acceptable use of barricades

- 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 zone or separate adjacent lanes of traffic)
- Barricades shall **not** face oncoming traffic without necessary advance warning devices and signs
- Barricades shall **not** be located within the buffer area

Barricades shall have equally sized alternating black and reflective orange vertical stripes. All stripes should be 150-250mm in width. Barricade design may vary, but should be consistent with City of Lethbridge, Alberta Transportation, or MUTCDC guidelines.



City of Lethbridge Standard Barricade

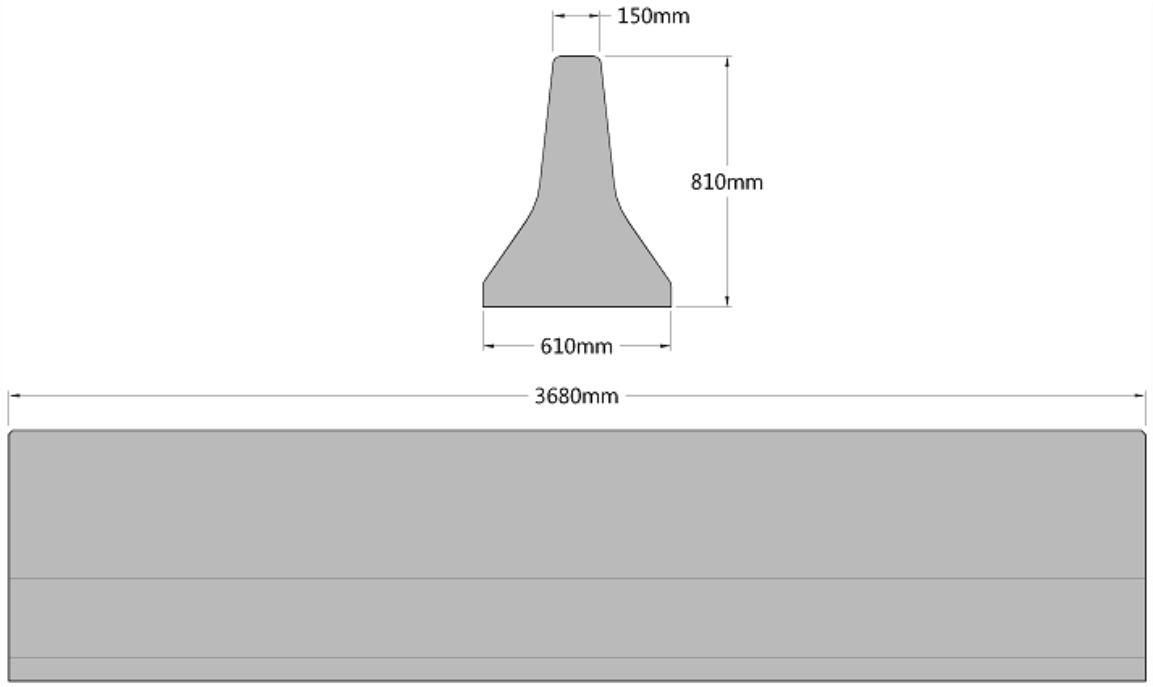
Traffic Barriers

Traffic barriers are used in TTC zones to:

- Limit the possibility of traffic entering the work zone
- Protect the workers
- Separate traffic
- Protect the worksite
- Separate pedestrians from vehicular traffic

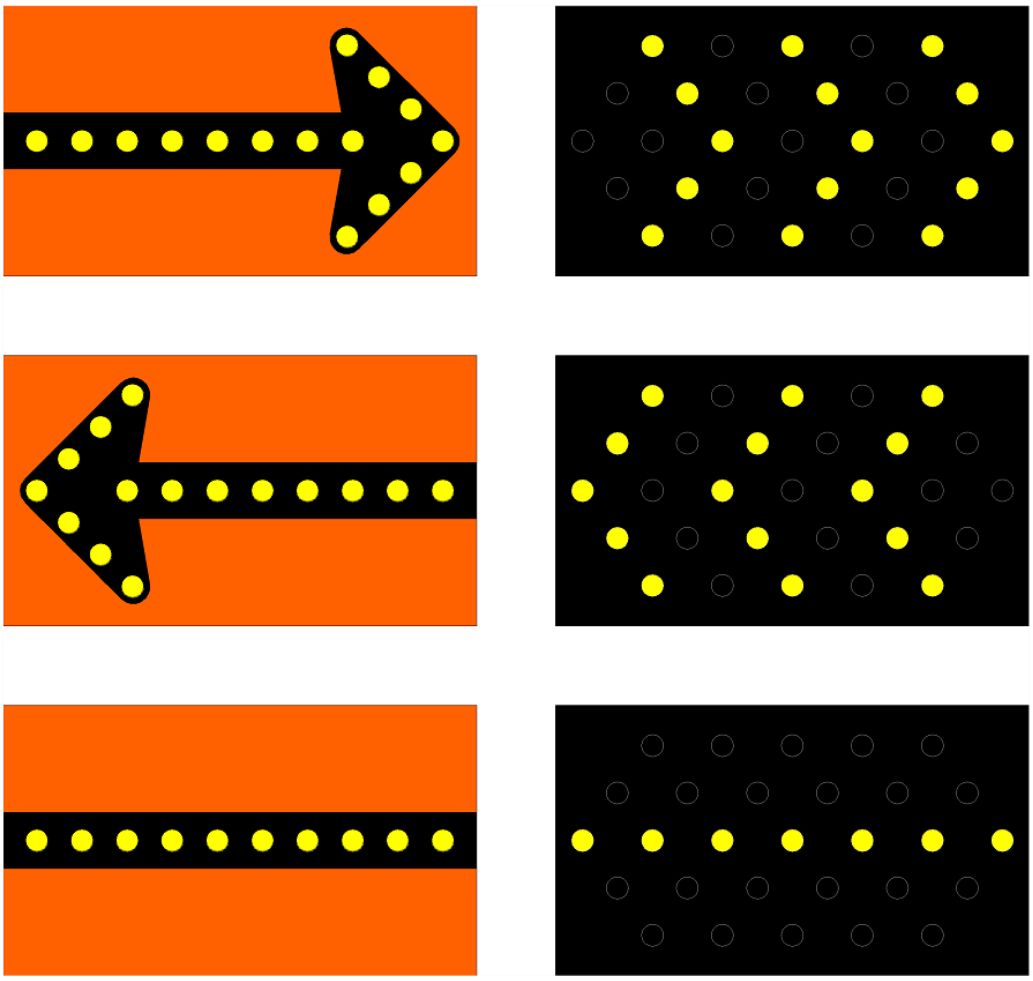
The use, placement and maintenance of traffic barriers should be based on acceptable engineering practices. Traffic barriers should:

- 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 0.6 m from the edge of the driving lane



Arrow Boards

Arrow board are traffic control devices which can provide an illuminated flashing display of a left arrow, a right arrow, or combination of the left-right arrow, sequencing arrow modes, or a bar which inform the driver to either change lanes or proceed with caution. When combined with the use of advance warning signs and delineation devices, arrow boards are very effective, and are especially useful in situations that require higher than normal visibility. Arrow boards shall be used on arterial roadways, and may be used for overnight setups, high speed/high volume roadways (60 km/h and greater) and in poor weather conditions.



Variable Message Boards

Variable message boards are used to relay information to motorists. For example, they are used to advise motorists to expect delays or use alternative routes where possible. Variable message boards should be programmed so motorists are able to read the message twice given the posted speed. These can also be used as arrow boards.

5 Temporary Traffic Control (Typical Applications)

The examples provided here are labeled as typical applications, which provide the user with the minimum requirements for TTC and may require additional signage for specific worksites.

5.1 Drawing Index

6 Glossary

Activity Area

Is the section of roadway where the work activity takes place. It is comprised of the work zone and the traffic space, and may contain one or more buffer spaces.

Advance Warning Area

Is where drivers are informed of what to expect in the downstream work zone.

Advance Warning Signs

Give motorists and pedestrians advance notice of disruptions in normal traffic flow. These signs indicate the nature of traffic disruption, and the required action on the part of motorists and pedestrians.

Contractor

Any City department, private contractor, or public utility agency that has permission and necessary permits to undertake work on, or adjacent to, City-owned road right of way.

Arterial Roadway

A road that is classified as an arterial roadway by the City, primarily for through traffic and designed to move a large volume of traffic.

Buffer Space

Is the area that separates traffic flow from the work activity or a potentially hazardous area and provides recovery space for an errant vehicle. Neither work activity nor storage of equipment, vehicles, or material shall occur in this space. Buffer spaces may be positioned longitudinally and laterally, with respect to the direction of traffic flow.

Collector Road

A road that is classified as a collector roadway by the City.

Detour

Is a temporary route where a driver or pedestrian is required to depart completely from the normal route to bypass the activity area.

Gore Area

An area of pavement delineated by paint lines or delineation devices, between the edge line of the through road and the entry or exit ramp.

Hoarding Permit

A permit issued by the City that is required when a portion of the City-owned ROW (including roadway, laneway, sidewalk or boulevard) needs to be closed or blocked off for the protection of the public and in order for work to take place.

May

Is a permissive condition, and does not indicate a requirement.

Shall

Is a mandatory requirement.

Should

Is an advisory requirement.

Tangent

Is a straight section of roadway. In TTC setups it is the distance between the end of one taper and the beginning of the next.

Taper

Is the gradual narrowing of a lane using channelization devices, intended to safely guide drivers into the adjacent lane.

Merging Taper

A merging taper requires the drivers to merge with an adjacent lane of traffic. The taper should be long enough to enable drivers to adjust their speeds and merge into a single lane before the end of the transition. A merging taper requires a full lane shift.

One-lane, two-way (traffic) taper

Is used where the portion of road is used alternately by traffic in each direction. These are typically used when traffic is controlled by traffic control persons.

Shifting Taper

Is used where a lateral shift (not a full lane merge/diverge) is required and includes a parallel lane shift (lane encroachment) or a shoulder shift taper (shoulder encroachment).

Shoulder taper

Can be used on roadways with improved shoulders that may be mistaken for driving lanes.

Termination (Downstream) Taper

The downstream taper may be useful in termination areas to provide a visual clue to the driver that access is available to the original lane path that was closed.

Temporary Traffic Control (TTC)

Provides for the safe movement of vehicular, bicycle and pedestrian traffic, when the normal function of a roadway is suspended.

Temporary Traffic Control Zone

Is the zone where normal traffic flow is disrupted by guiding traffic around an obstruction.

Termination Area

Is used for traffic to make the transition back to the normal path of the road. It extends downstream from the end of the workspace to the point where normal speed resumes.

Traffic Control Person

Is a trained and certified person responsible for controlling traffic.

Transition Area

Is the section of roadway where road users are redirected from their normal path.

Traffic Control Devices

Devices used to direct vehicle and pedestrian movement through an area in which normal traffic flow has been disrupted. This includes all signs, delineators, barricades and arrow boards.

Upstream

Is the area before the TTC zone in the direction of traffic flow.

Work Zone

Is the area around which traffic is being diverted to enable work to be done. It is usually bound on one or more sides by a traffic control setup. It includes an area for use of equipment, stockpiling materials and the excavation or building site.

Worksite

Is the area within the construction site limits.

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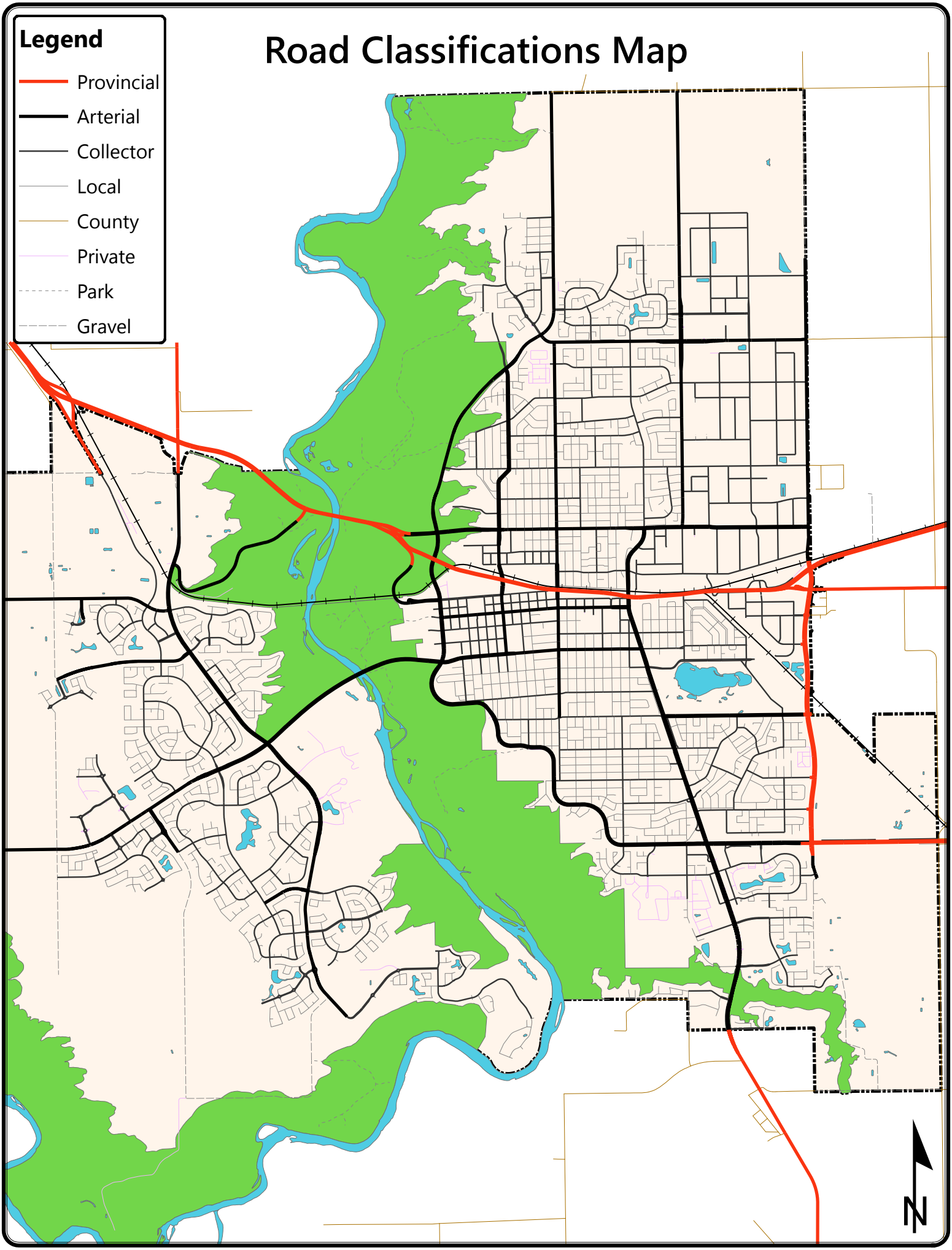
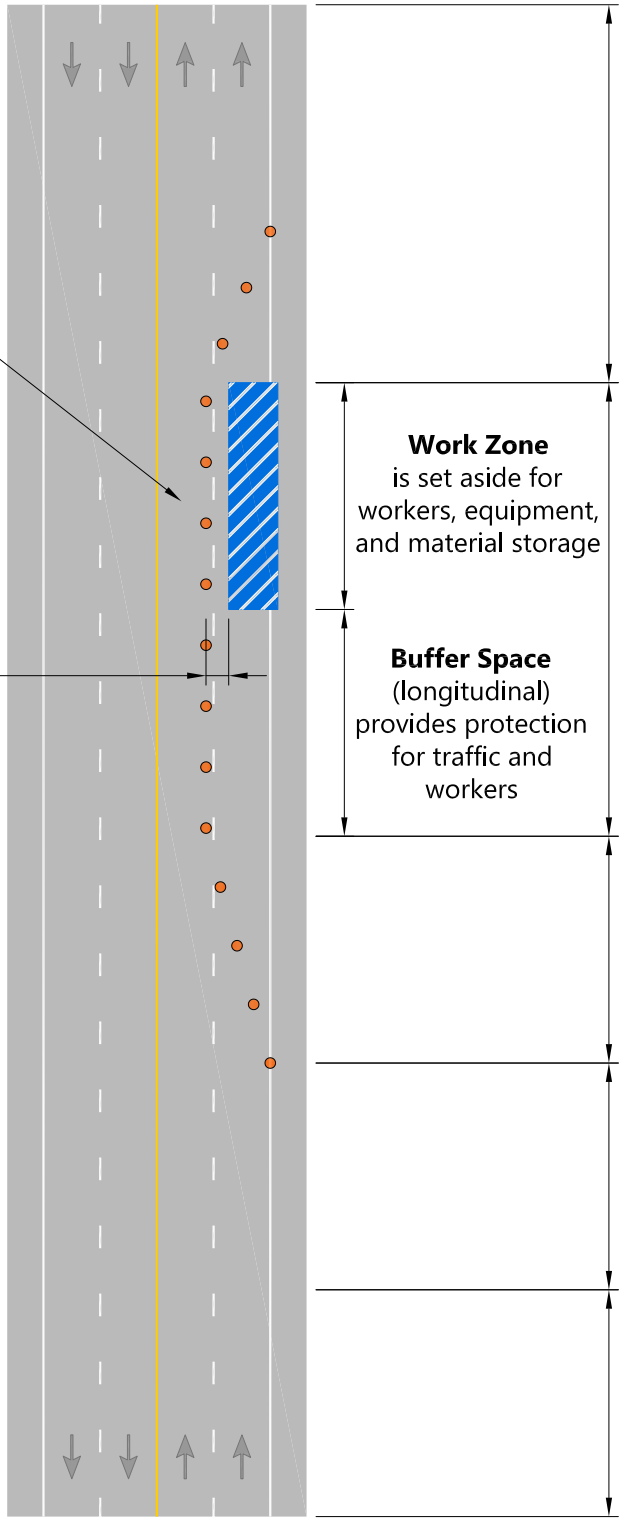
Road Classifications Map





Device Spacing and Type					
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60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
L = Length of Taper
B = Length of Longitudinal Buffer Space
D = Spacing Between Delineation Devices

Note: This drawing is a graphical representation of a typical temporary traffic control setup and is **not drawn to scale**. Site specific traffic control plans should be created and approved by the appropriate person prior to the implementation of the plan.

City of Lethbridge

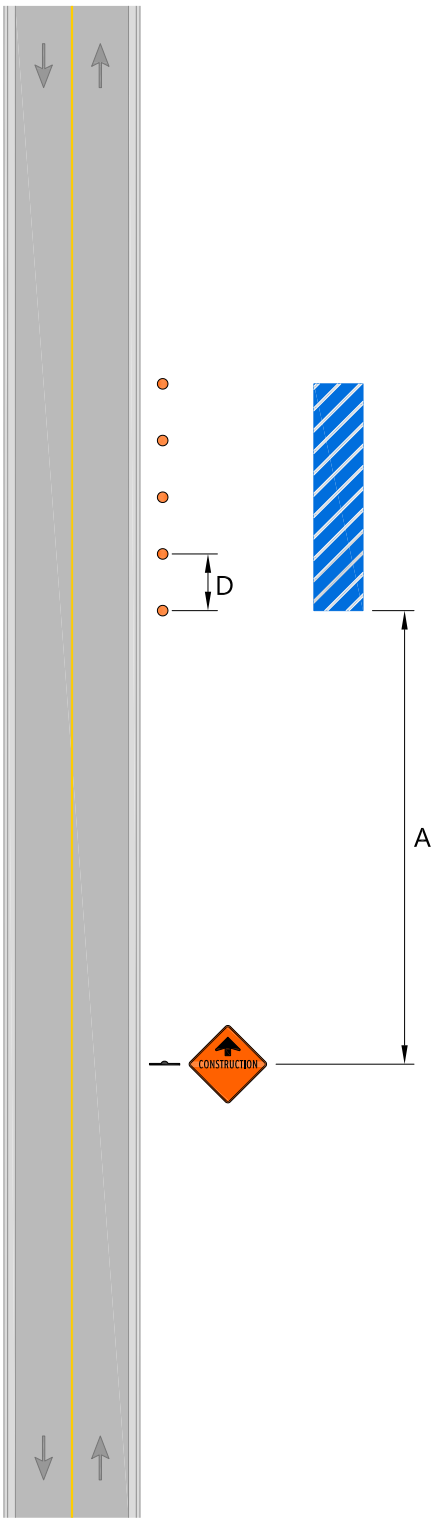
Temporary Traffic Control Manual

Title

Components of a Temporary Traffic Control Zone

Figure No.

5.1.1



Device Spacing and Type					
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City of Lethbridge

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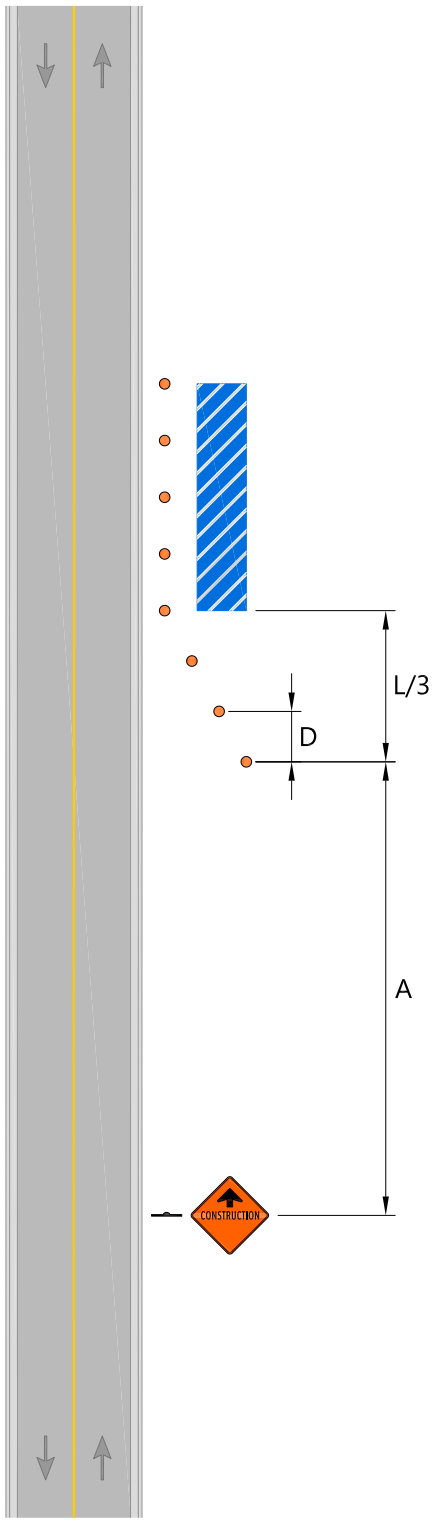
Roadside Work

Figure No.

5.1.2



Device Spacing and Type					
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City of Lethbridge

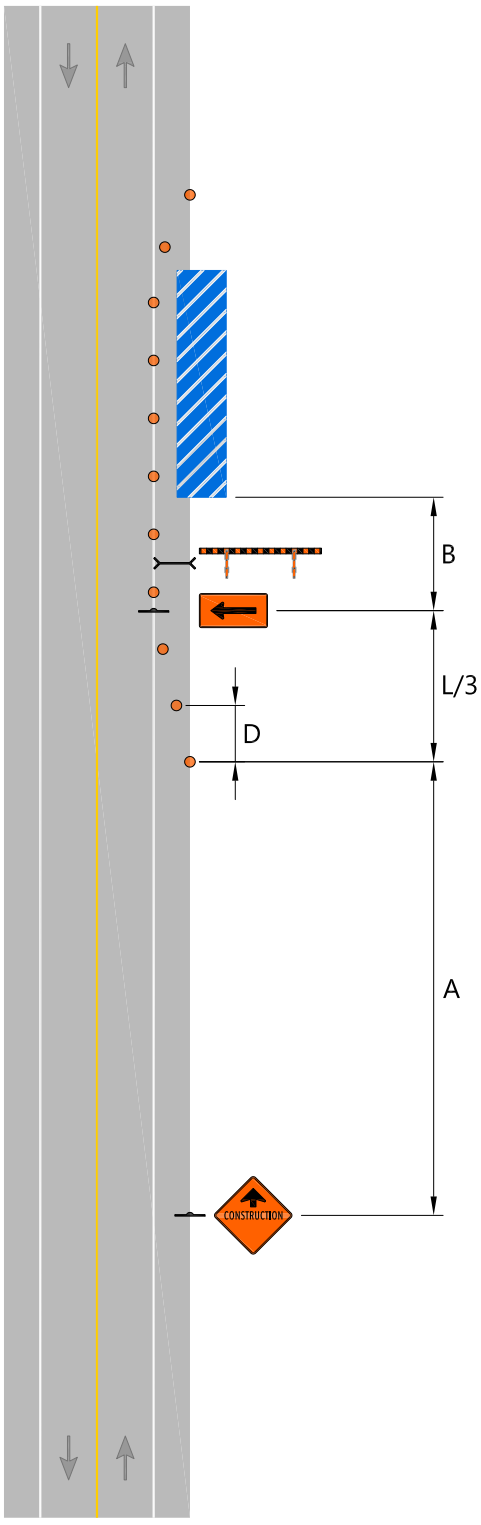
Temporary Traffic Control Manual

Title

Work Adjacent to a Roadway

Figure No.

5.1.3



Device Spacing and Type					
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City of Lethbridge

Temporary Traffic Control Manual

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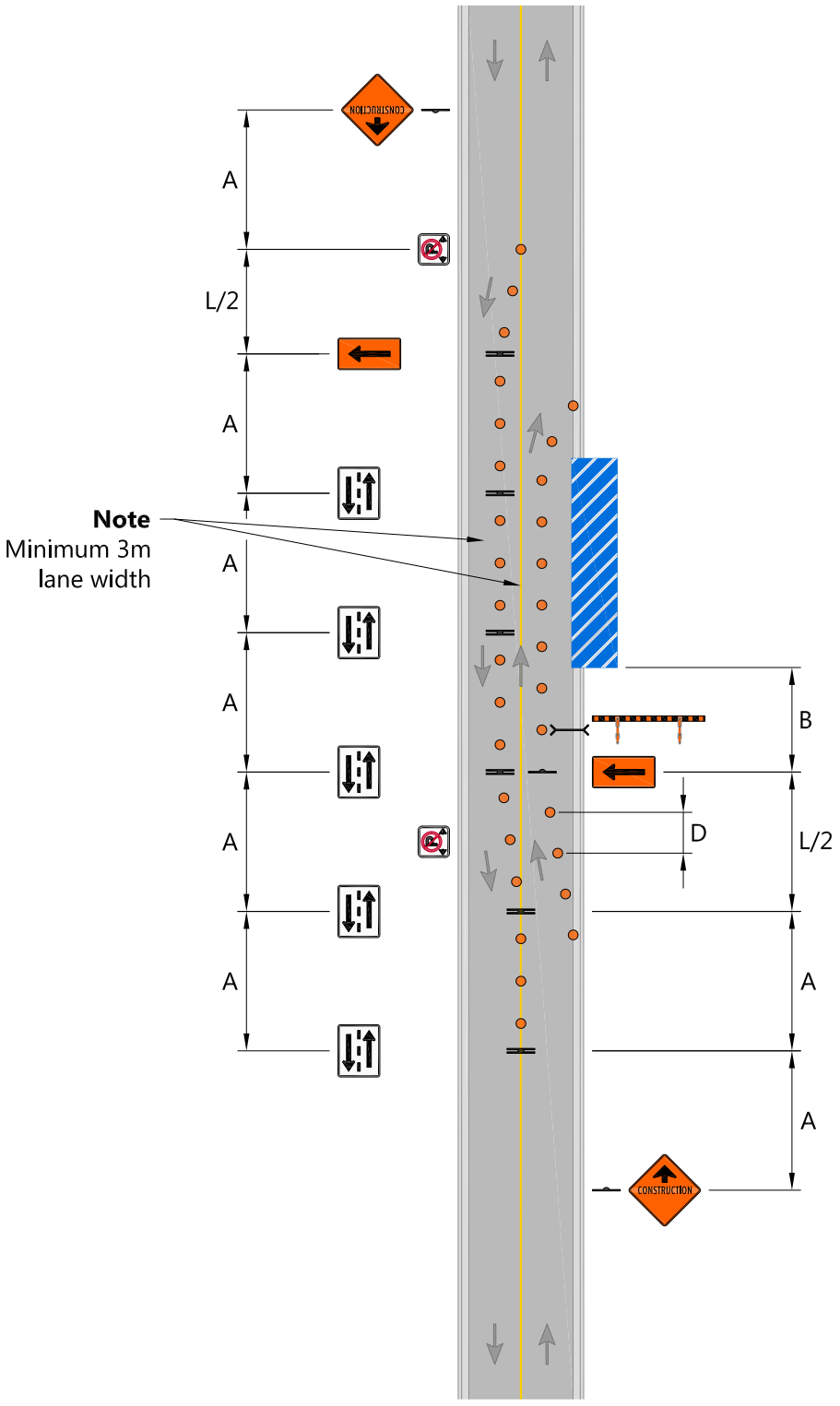
Shoulder Work

Figure No.

5.1.4



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City of Lethbridge

Temporary Traffic Control Manual

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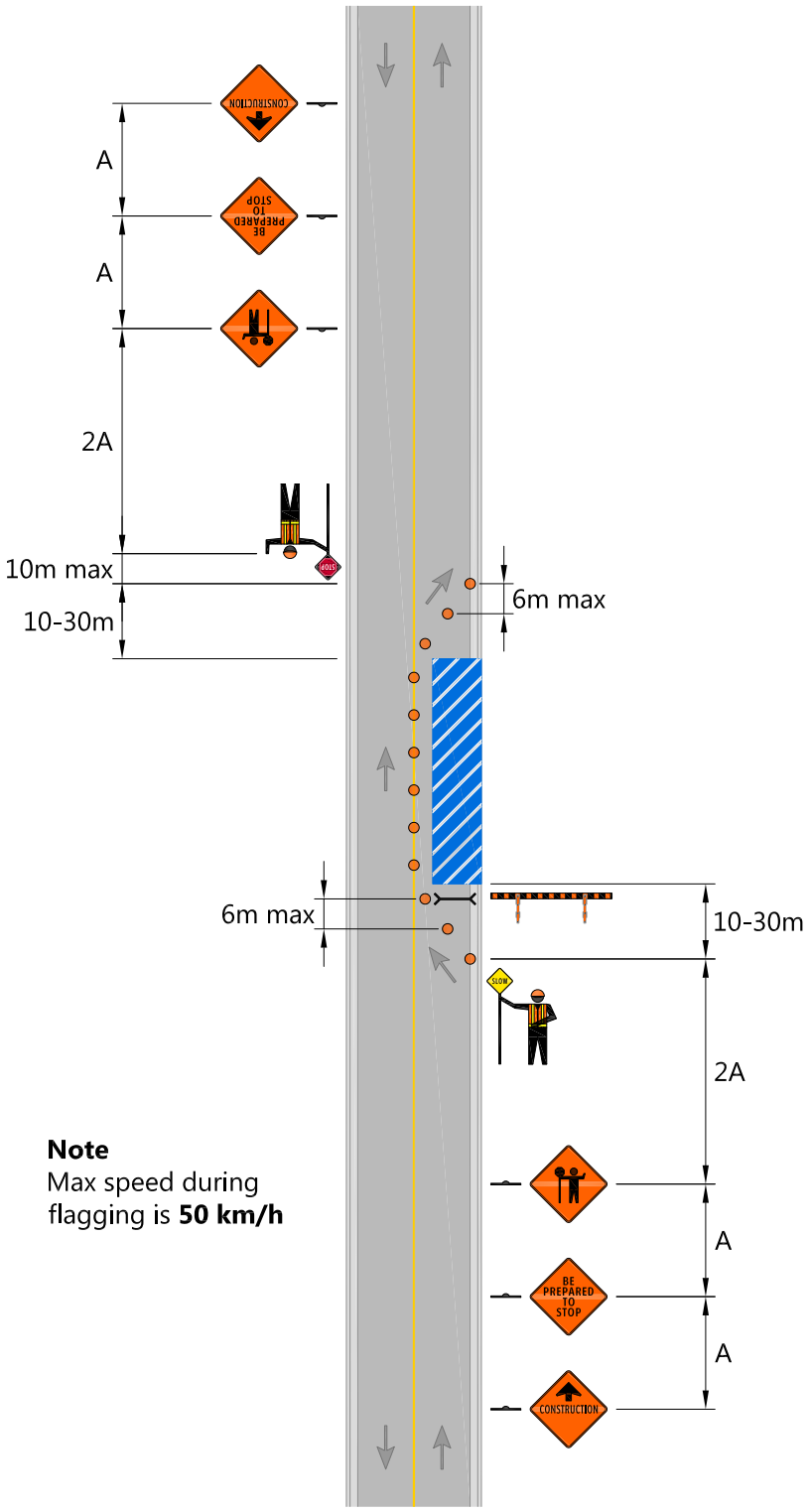
Work on the Edge of a Roadway

Figure No.

5.1.5



Note
Max speed during flagging is **50 km/h**

Device Spacing and Type					
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City of Lethbridge

Temporary Traffic Control Manual

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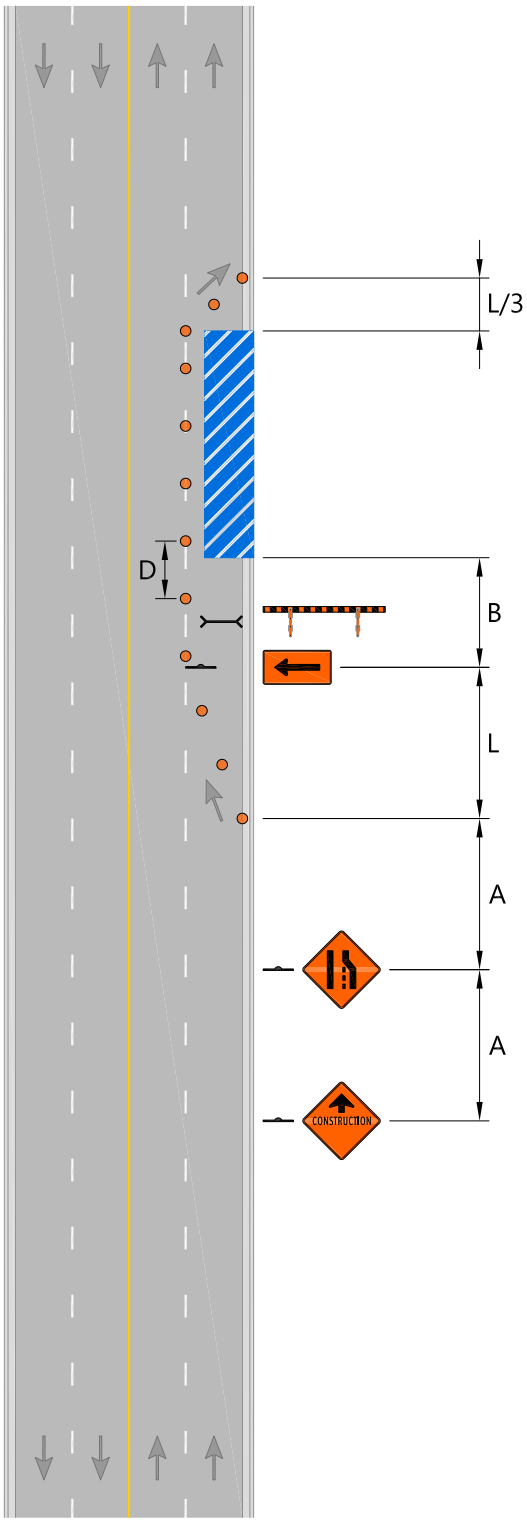
Two-Way Flagging Operation

Figure No.

5.1.6



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City of Lethbridge

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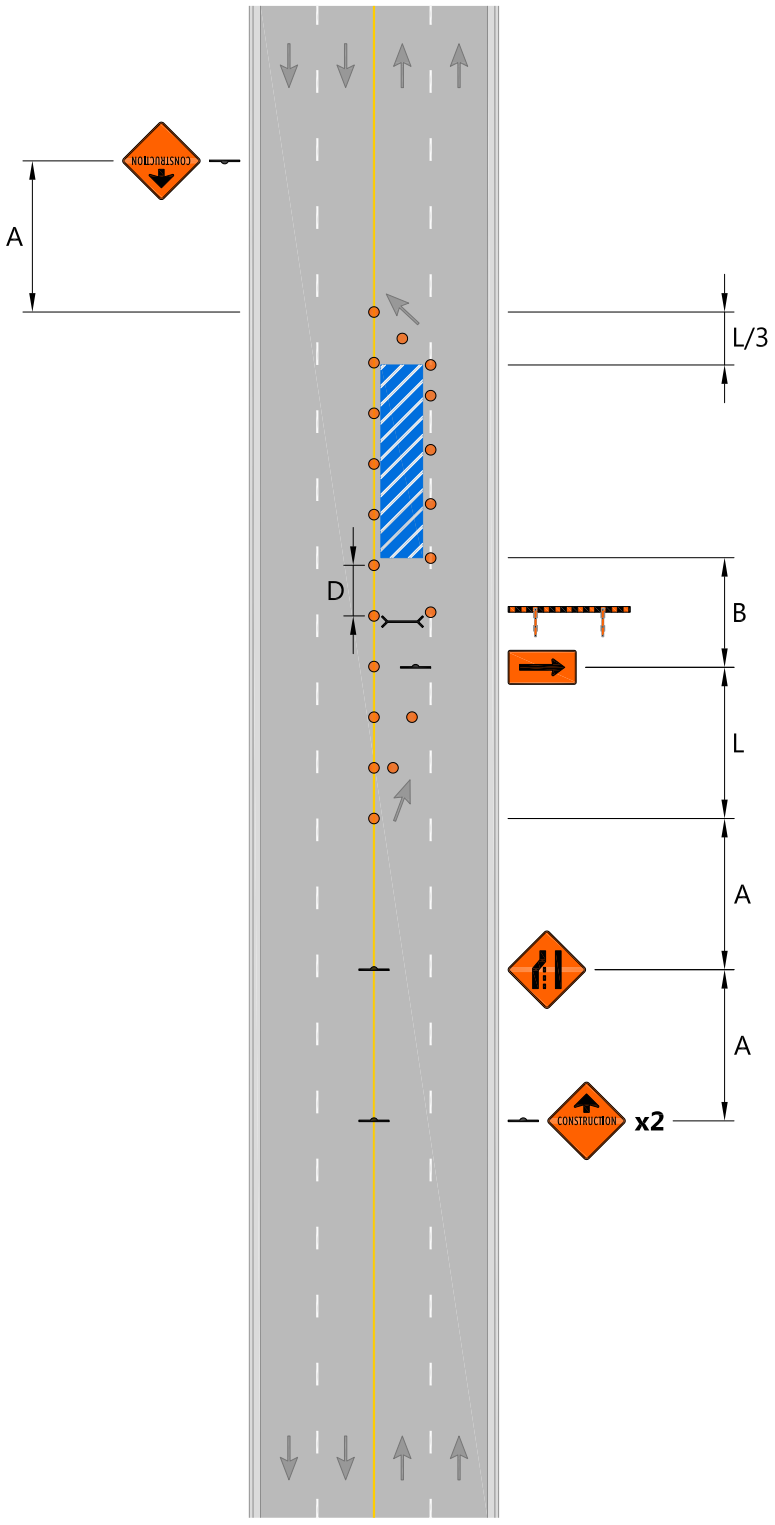
Single Right Lane Closure

Figure No.

5.1.7



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City of Lethbridge

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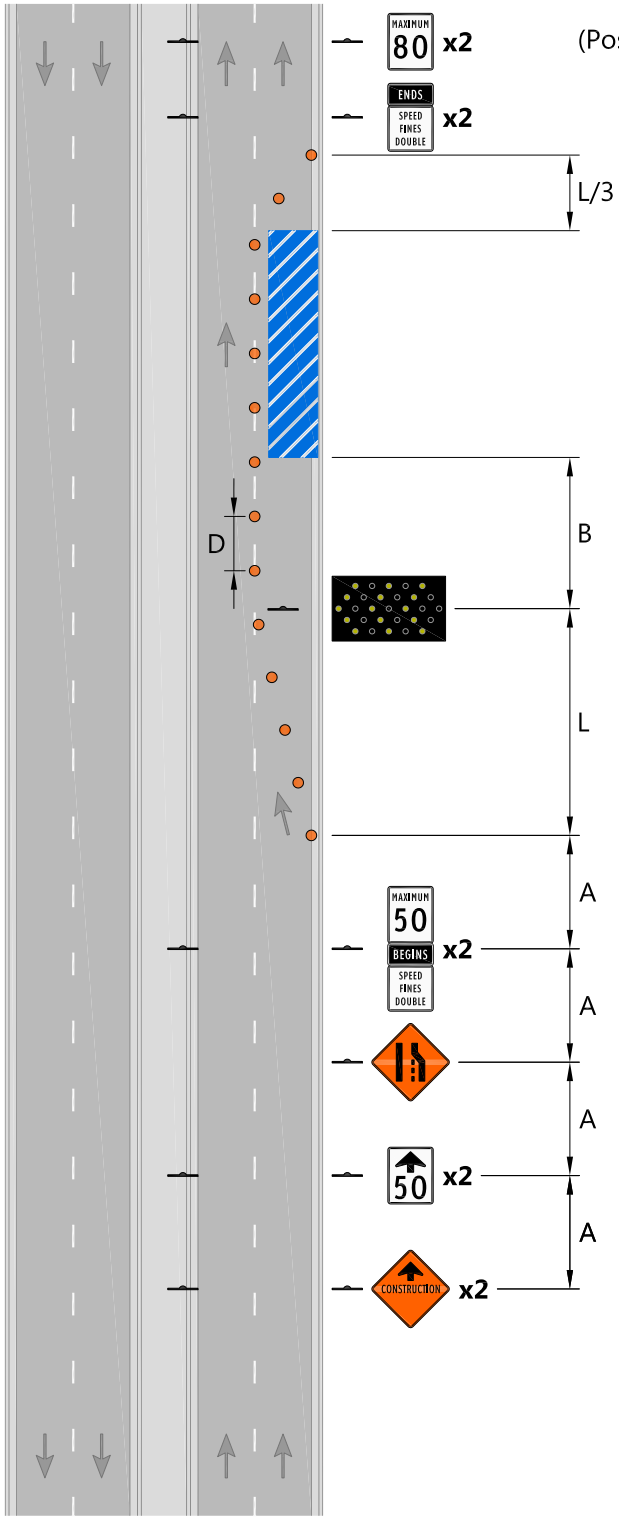
Single Left Lane Closure

Figure No.

5.1.8



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City of Lethbridge

Temporary Traffic Control Manual

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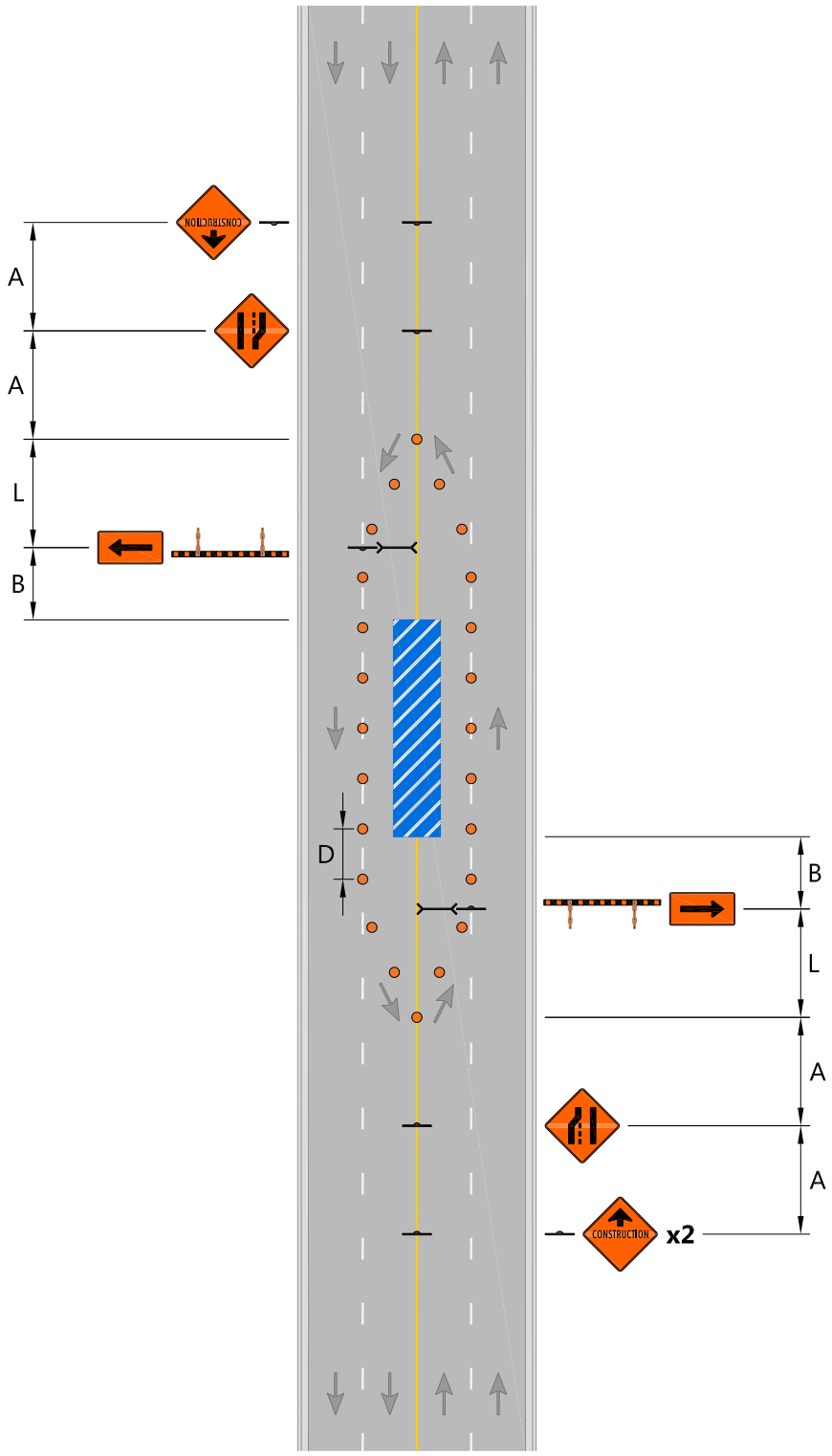
Speed Fines Double (Right Lane Closure)

Figure No.

5.1.9



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City of Lethbridge

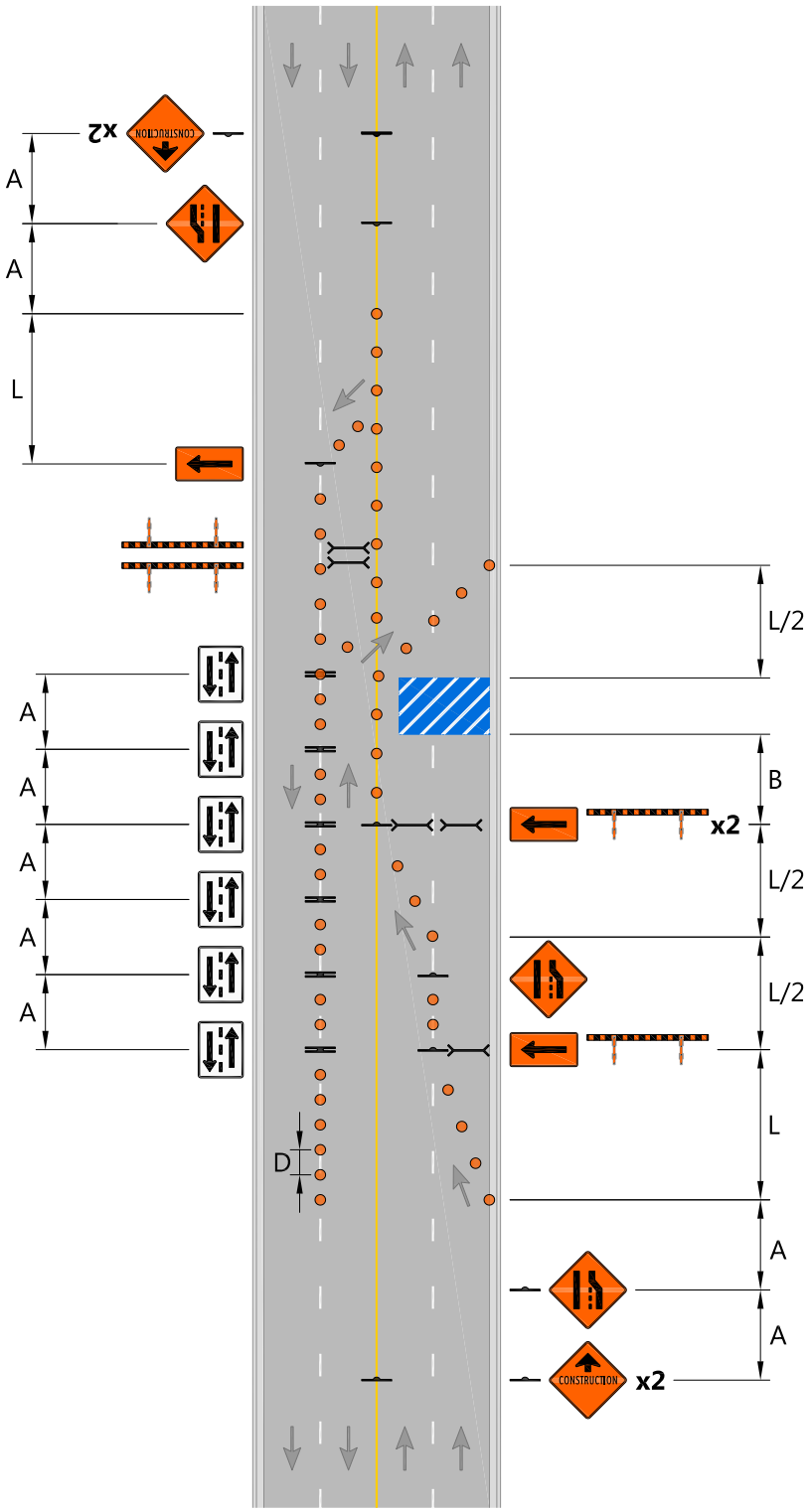
Temporary Traffic Control Manual

Title

Multi-Lane Closure - Left Lane Closed in Each Direction

Figure No.

5.1.10



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City of Lethbridge

Temporary Traffic Control Manual

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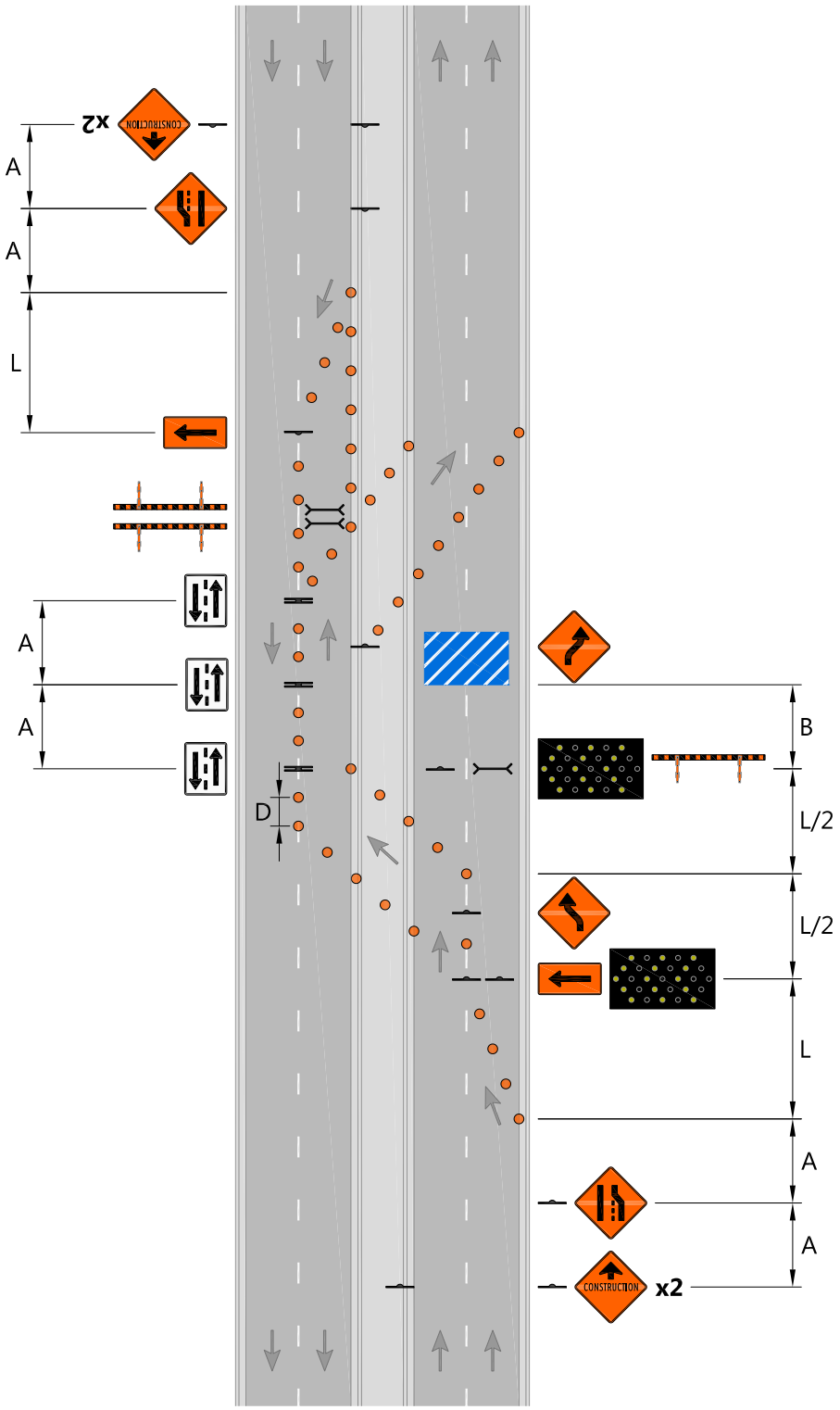
Center Line Cross-Over (Two-Way Traffic)

Figure No.

5.1.11



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City of Lethbridge

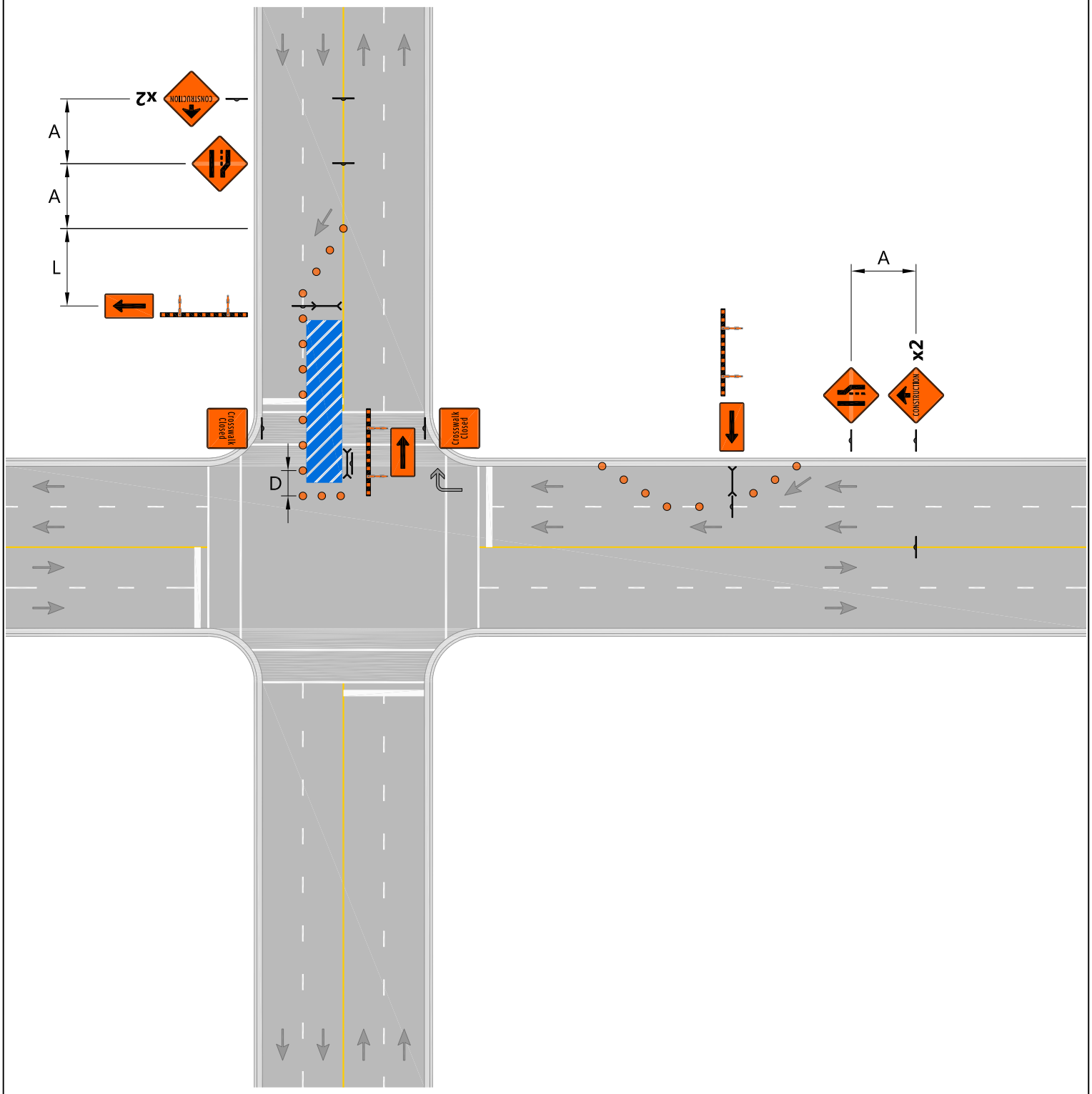
Temporary Traffic Control Manual

Title

Median Cross-Over (Two-Way Traffic)

Figure No.

5.1.12



Device Spacing and Type					
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City of Lethbridge

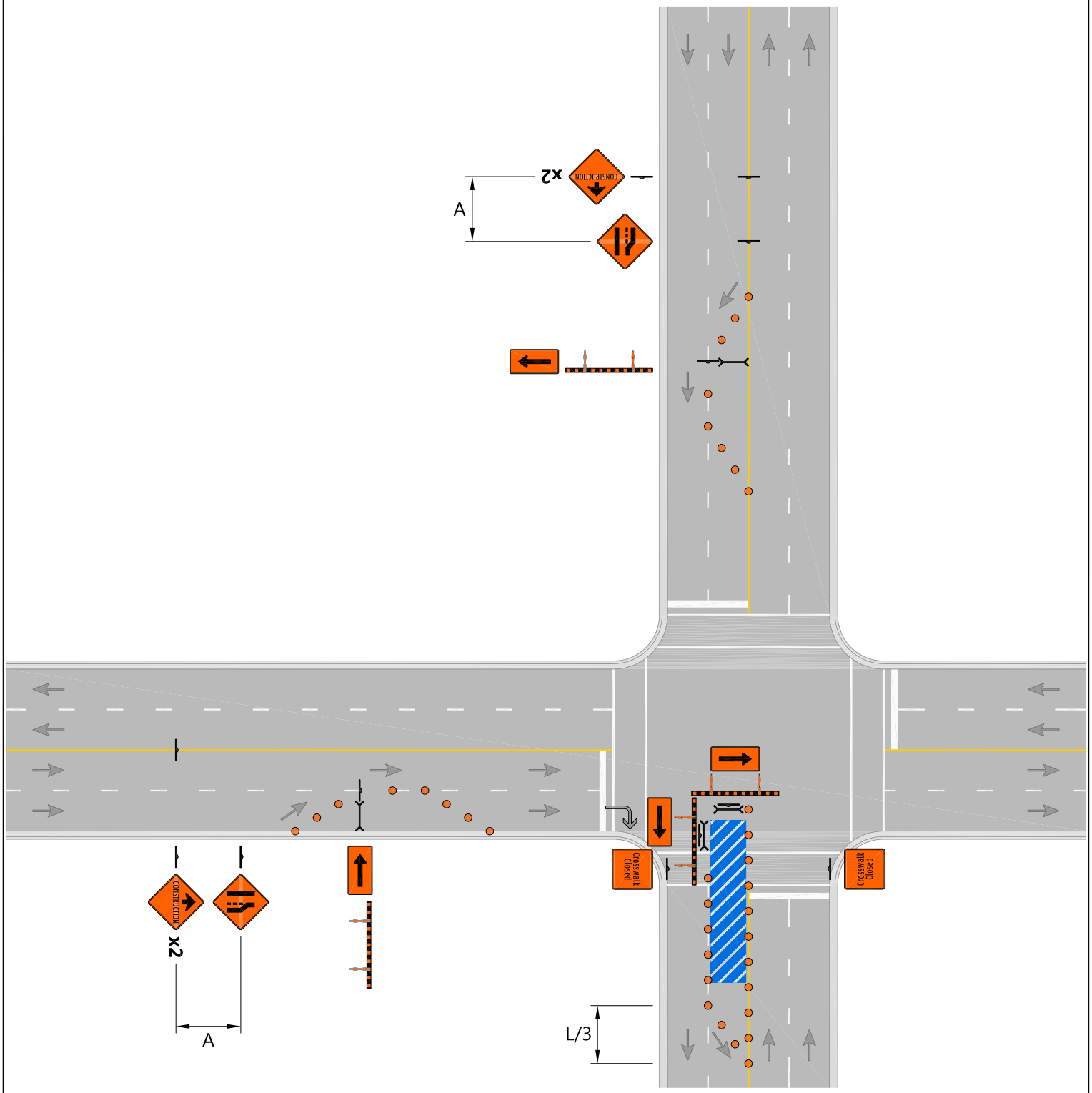
Temporary Traffic Control Manual

Title

Intersection Work Example 1

Figure No.

5.1.13



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City of Lethbridge

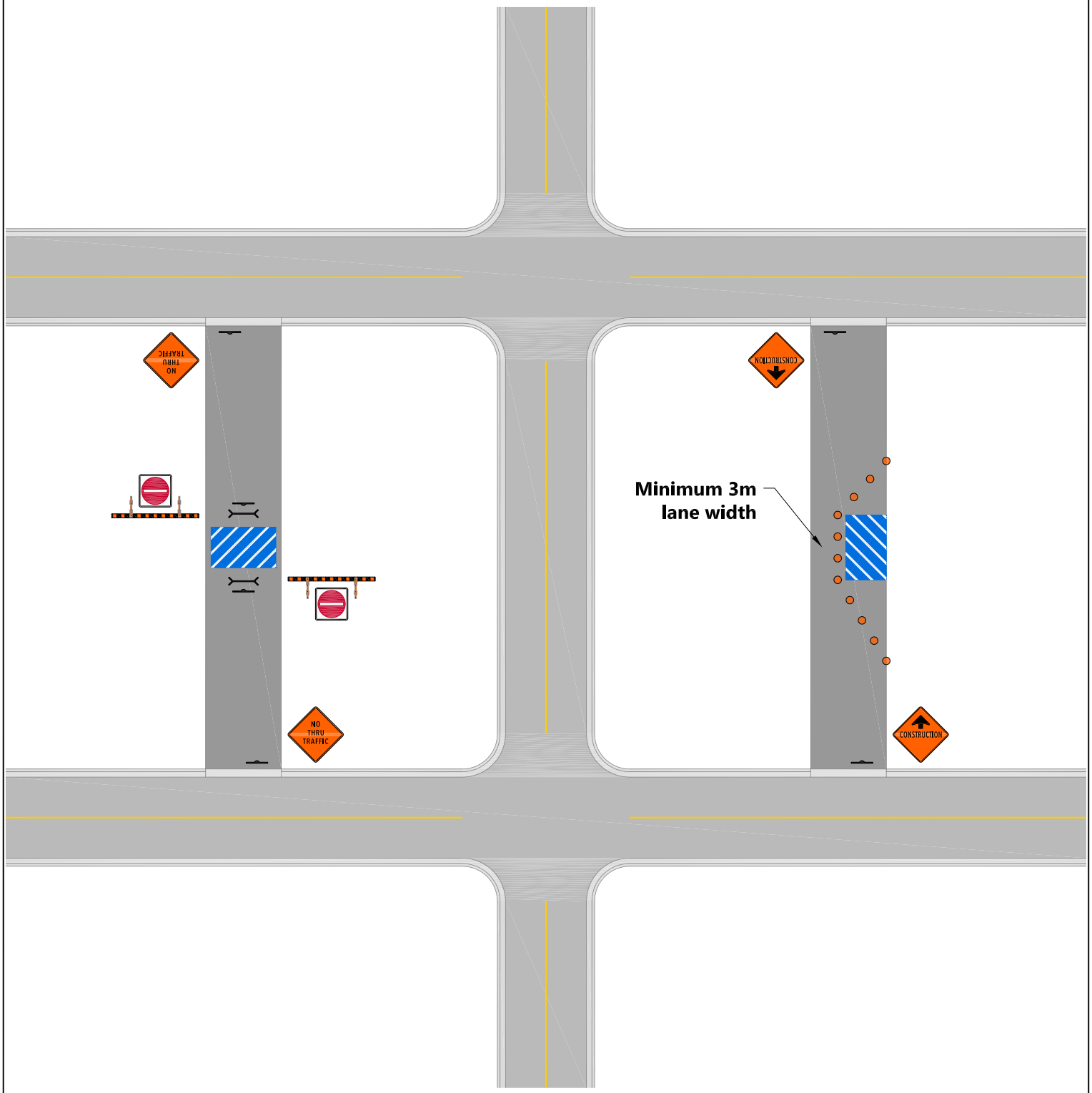
Temporary Traffic Control Manual

Title

Intersection Work Example 2

Figure No.

5.1.14



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
L = Length of Taper
B = Length of Longitudinal Buffer Space
D = Spacing Between Delineation Devices

Note: This drawing is a graphical representation of a typical temporary traffic control setup and is **not drawn to scale**. Site specific traffic control plans should be created and approved by the appropriate person prior to the implementation of the plan.

City of Lethbridge

Temporary Traffic Control Manual

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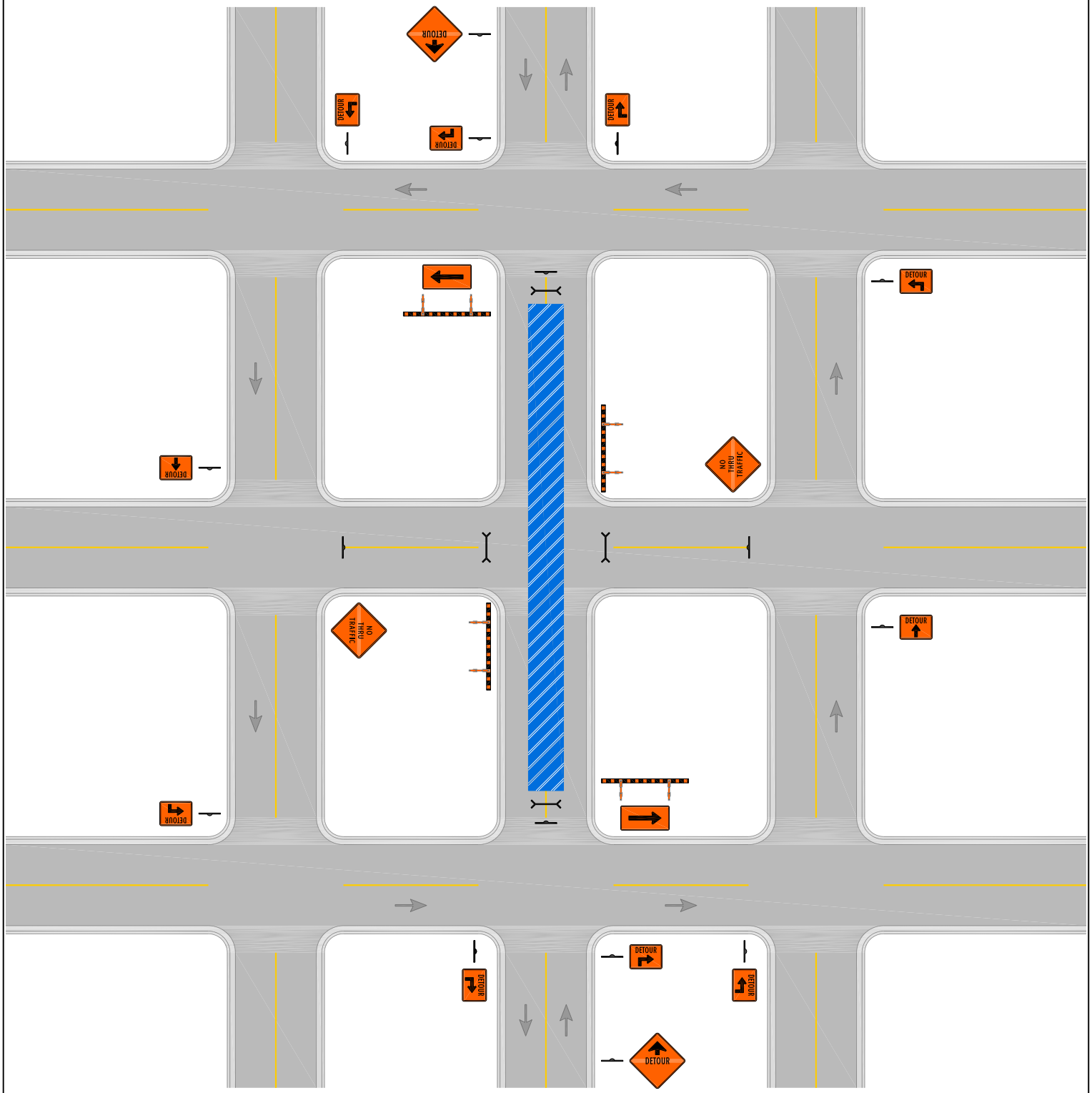
Alley Closure

Figure No.

5.1.15



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
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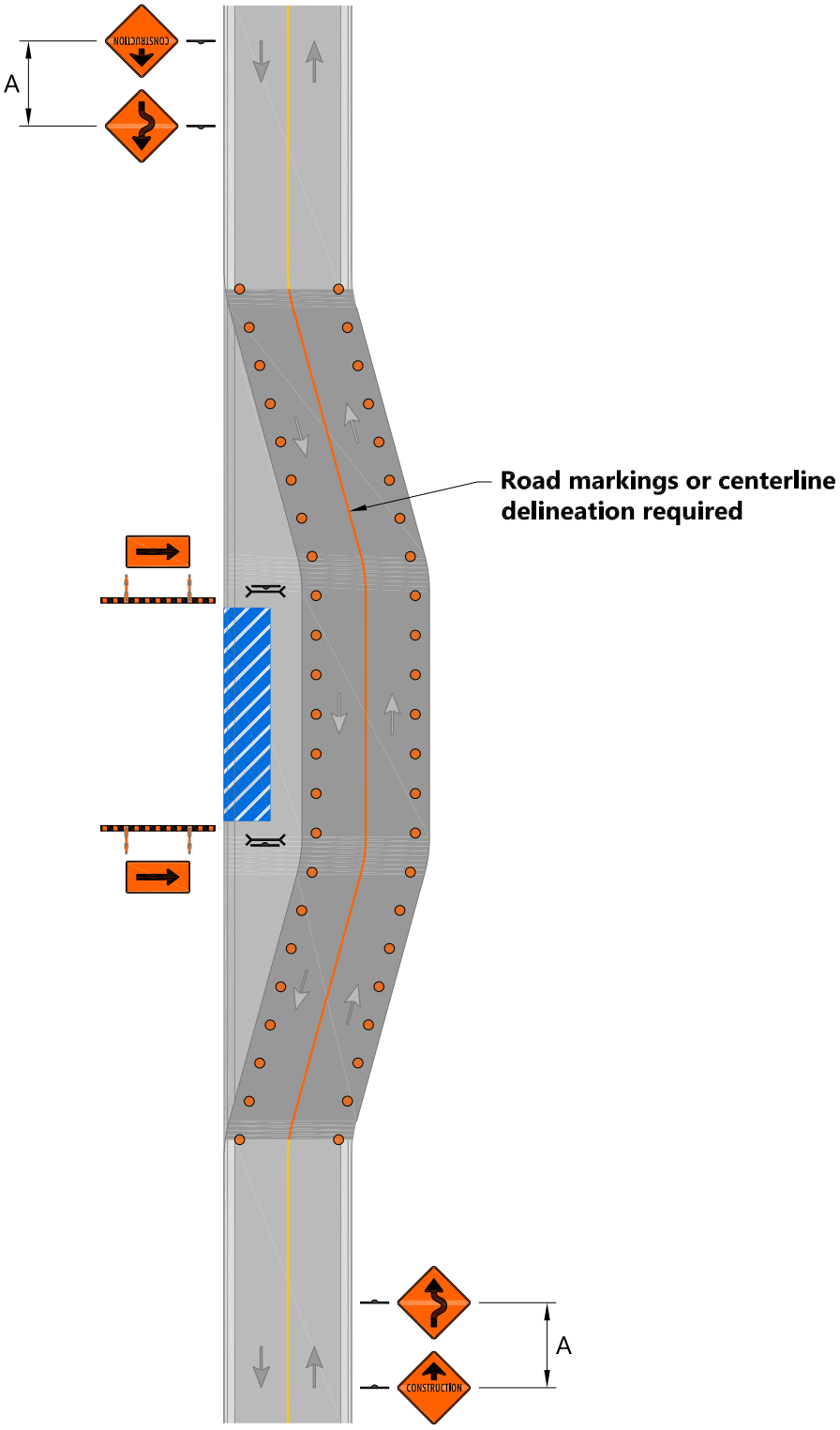
Road Closure

Figure No.

5.1.16



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
L = Length of Taper
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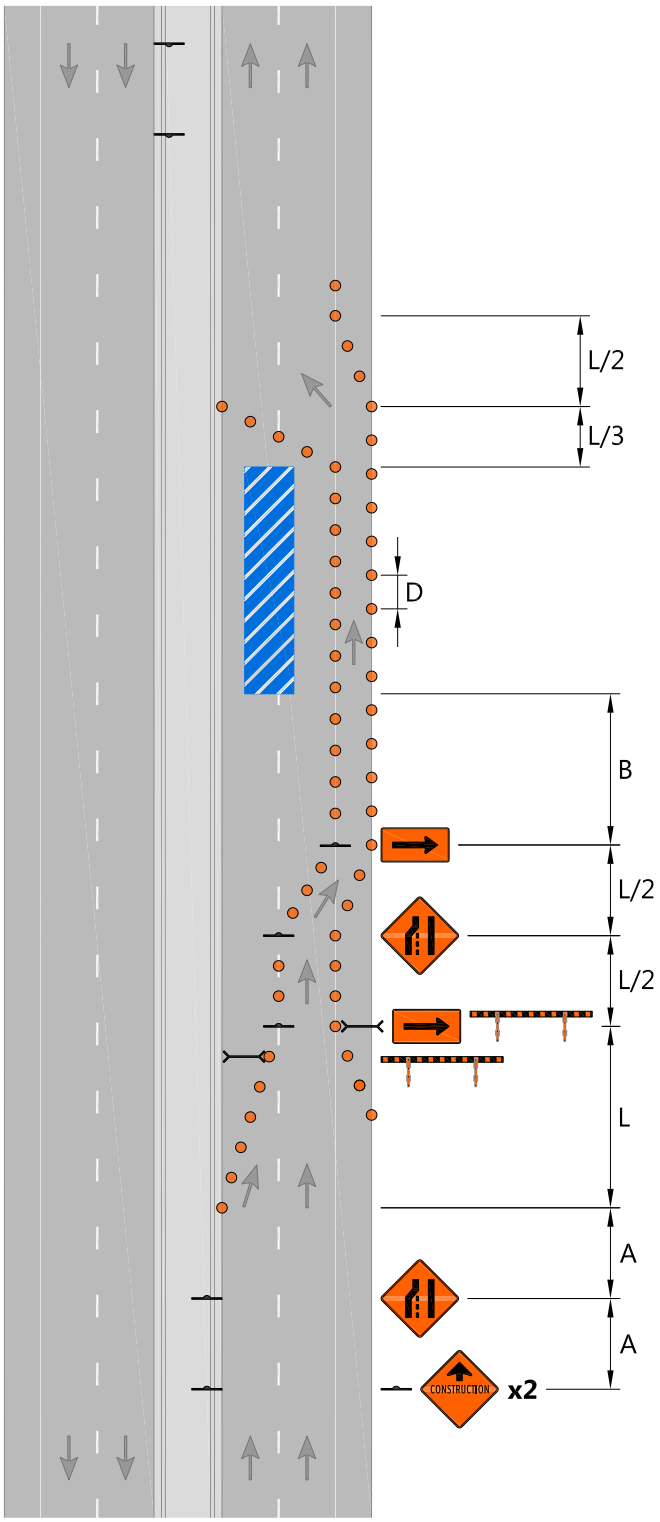
Road Diversion (Two Direction)

Figure No.

5.1.17



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
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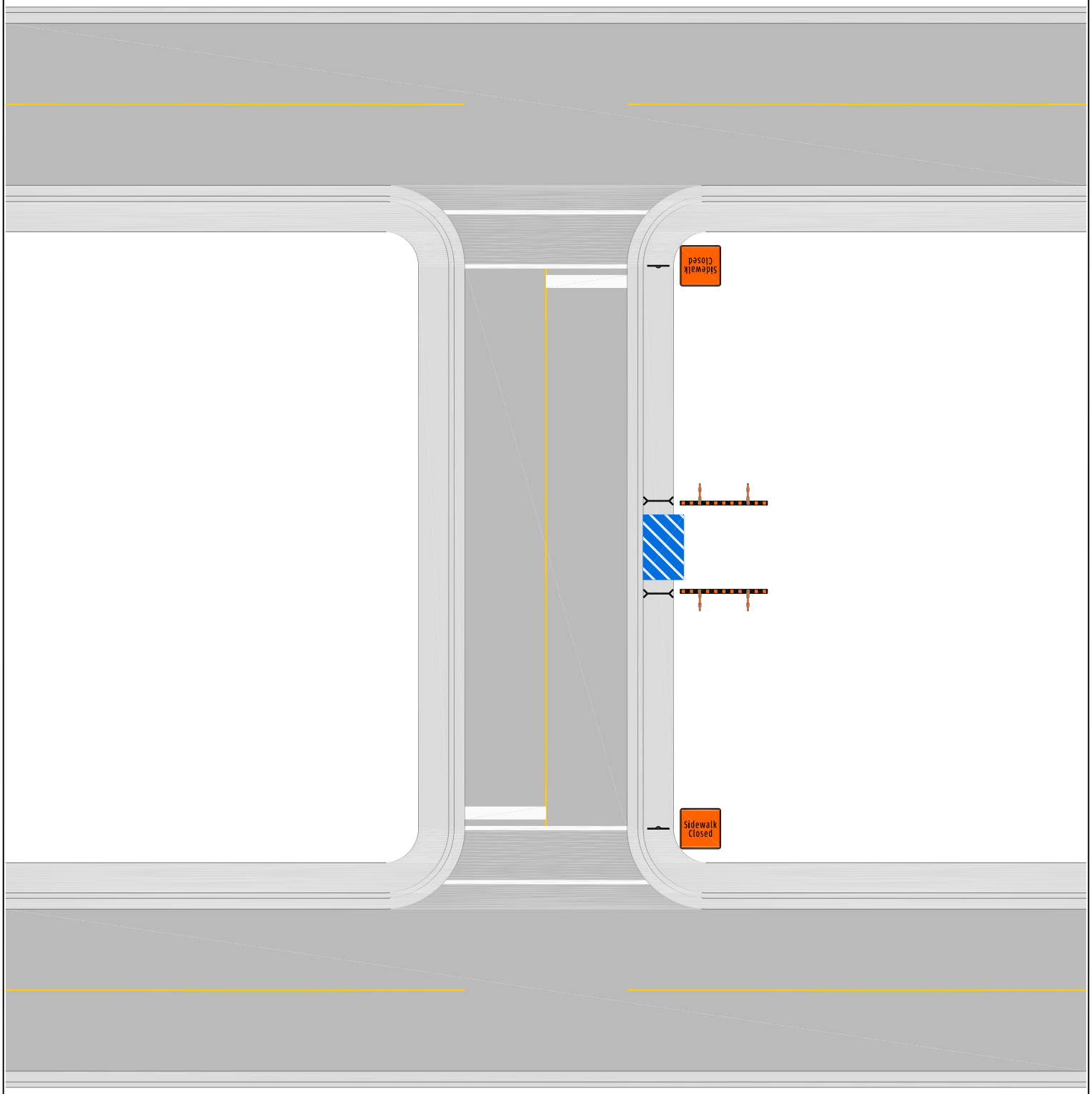
Shoulder Detour

Figure No.

5.1.18



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
L = Length of Taper
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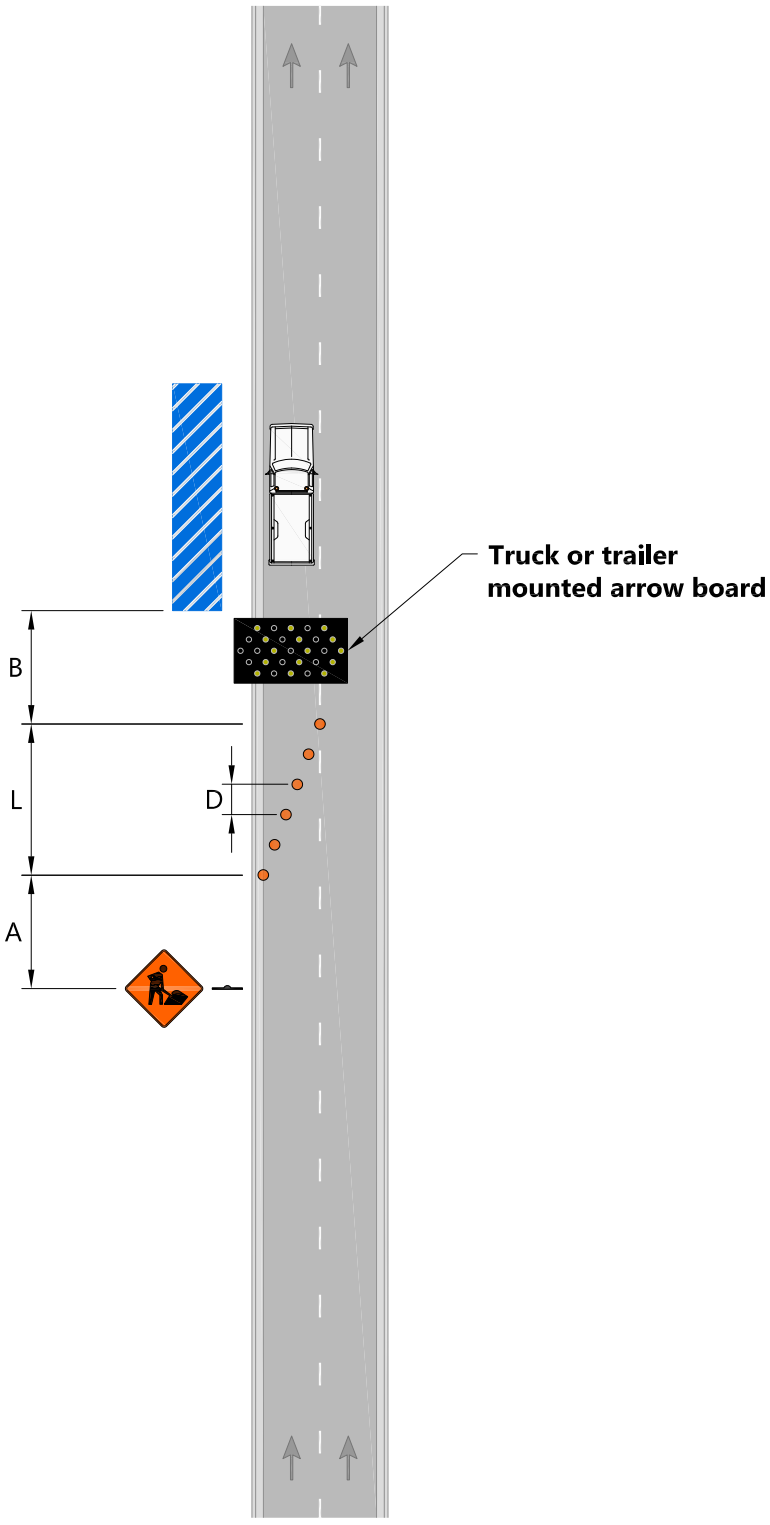
Sidewalk Closure

Figure No.

5.1.19



Device Spacing and Type					
V (km/h)	A (m)	L (m)	B (m)	D (m)	Device Types
50	50	30	35	8	Cone
60	50	40	45	12	
70	75	60	50	15	Drum
80	100	80	60	15	
90	100	105	65	18	

V = Posted Speed Limit
A = Spacing Between Signs
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City of Lethbridge

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Very Short Duration Operation

Figure No.

5.1.20