Temporary Traffic Control Manual

September 2024

REGINA

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I. Definitions

Applicant: Used interchangeably with Contractor.

Closure: Any portion of the public right-of-way unavailable for normal use including bicycle and pedestrian facilities.

Community Safety Zone: A zone designated as a community safety zone in the Regina Traffic Bylaw #9900 and shown in Schedule "S".

Construction: All work zone activities, including but not limited to pre-engineering activities, related to the building, infrastructure repair, or rehabilitation of public highways or utilities, that occur on the right-of-way.

Contractor: Any City department, private contractor, or utility company that is performing work that has any impact to City of Regina's right-of-way.

CSA: In this manual's context, CSA refers to the CSA Group (Canadian Standards Association), the organization responsible for developing national standards relating to personal protective equipment.

Detour: A temporary route that requires a road user to change their route from their preferred path to bypass the work area.

Due diligence: Due diligence is the level of judgment, care, prudence, determination, and activity that a competent individual would reasonably be expected to express under particular circumstances.

Emergency: An emergency is an unforeseen, unplanned combination of circumstances or the resulting situation that calls for immediate action in order to prevent or reduce damage or hazard to road users, workers, or infrastructure. In an emergency, traffic control provisions should be implemented to the greatest extent practicable, including adequate visibility at night, to avoid the creation of additional hazards.

Information signs: A sign that means to notify the road users of a road closure or restriction on a signboard or a variable message board.

Lane: A defined width of the road intended to accommodate a single line of vehicles for either travel or parking.

May: A permissive condition that presents information for consideration.

Median: Means a physical barrier or area that separates lanes of traffic on a roadway.

Mobility Aid: Means a device that is manufactured for operation by a person who requires the device for mobility due to a physical disability and:

(i) Is a wheelchair; or
(ii) Is a motorized device that is used in a normal seated orientation and has:

a. A maximum speed capability of not more than 15 kilometers per hour;
b. A maximum width of not more than 81.2 centimetres; and
c. A maximum mass of not more than 226 kilograms.

Must: A mandatory condition with a legal or regulated obligation to abide by it. Replaceable with “shall”.

Pedestrian: Any person who is on foot or a person in or on a mobility aid. See mobility aid.

Regulation: A prescribed rule, supported by legislation, such as any regulation made under the Highway Traffic Act or Occupational Health and Safety Act or municipal by-law. Regulations provide the legal basis for enforcement.

Regulatory sign: A sign imposing legal obligations and/or restrictions on all traffic.

Right-of-way: Is defined as the:

(i) Width of the road allowance from the property line on one side to the property line on the opposite side of a roadway; or
(ii) Allocation of the right of movement to a road user, with preference over other road users.

Road user: Any entity that uses the public roadways, sidewalks or pathways. This includes licensed vehicles, bicycles, and pedestrians.

Shall: A mandatory condition with a legal or regulated obligation to abide by it. Replaceable with “Must”.

Should: An advisory condition where the statement is advisable or recommended procedure but not mandatory.

Stopping sight distance: The distance required for a driver to see, process, react to stimulus and come to a complete stop.

Traffic control device: Any marker, signs, and signal devices used to inform, guide and control traffic, including pedestrians, drivers, and cyclists.

Traffic control plan: Also referred to as a Traffic Accommodation Plan is a detailed plan for the control of traffic during construction, maintenance, or utility operations on a public highway; taking into account the organized, systematic and safe conduct of a project, including as applicable: detours, staging sequences, work vehicle access to and departure from work sites, temporary barriers, removal of old pavement markings and selection and planned implementation of appropriate typical layouts for traffic control.

Vehicle: Includes a motor vehicle, trailer, traction engine, farm tractor, road-building machine, bicycle, and any vehicle drawn, propelled, or driven by any kind of power, including muscular power, but does not include a motorized snow vehicle or motorcycle sidecar.

Work zone, Worksite or Work area: The section of roadway between the first warning sign and the point beyond the work area where traffic is no longer affected.

II. Introduction

The Temporary Traffic Control Manual (TTCM) provides guidance on the safe and uniform standards and specifications for temporary traffic control, commonly referred to as traffic accommodations, required for any work taking place on City of Regina (City) owned Right-of-Way (ROW). The TTCM identifies minimum safety precautions which must be taken at worksites to protect the workers and any road users. Traffic Bylaw 9900 gives the City of Regina the final authority on the placement of traffic control devices on the public ROW. The TTCM is designed to give guidance on the selection of the appropriate traffic accommodation plan, along with the requirements to follow when setting up, maintaining, and taking down the worksite, in addition to some typical drawings of common work zone set-ups. Traffic accommodation designs are based on predicted traffic patterns and may require modifications if field conditions differ with traffic patterns or driver behavior. Modifications are required to follow the process identified in Section VIII, C.

III. Scope

This TTCM is intended to give guidance for safe and uniform traffic controls for construction occurring on all City ROW. This TTCM is not intended to be comprehensive but to give directions for the common use cases. When using this TTCM it is important to understand that this TTCM provides templates for common work zone set ups and does not provide perfect examples for every single case. Due to the variety in work performed along with the location that the work is occurring there is no one size that fits all template to every situation. Consideration and due diligence must be given to applying the traffic accommodation plans to each specific situation. A safe traffic accommodation plan considers the safety to the road users, to the workers in the construction zone, and to the workers setting up and removing the traffic control devices. This TTCM does not bypass the mandatory traffic accommodation approval process that is outlined in Section V of this document and is just a guide that may be used to apply a specific typical plan to the permit.

IV. Regulations

Traffic control must obey all governing laws, bylaws, and regulations. The City of Regina does not accept liability arising out of any application of the guidelines of this TTCM in any work zone. Supporting legislation and regulations to this TTCM include but are not limited to:

- The Traffic Safety Act
- The Highway Worker and Flag Person Identification Regulations, 2014
- Occupational Health and Safety Regulations, 2020 – Sections 9-21 **Designated signallers** and 9-22 **Risk from vehicular traffic**
- The Regina Traffic Bylaw #9900 – Sections 10 **Speed Limits**, 64 **Temporary Street Closure**, and 65 **Temporary Street Use Permit**
- Transportation Association of Canada's Manual of Uniform Traffic Control Devices Canada (MUTCDC) 6th Edition.

These referenced sections are not inclusive of all sections related to construction zones within the City but are used as guides for reference. All referenced regulations and manuals shall be the latest version as updated or amended. Any conflicting information between the TTCM and any regulation or bylaw will have the provision in the other regulation or bylaw prevail.

V. Preparation work

Anyone performing work on or adjacent to and impeding City ROW must have all the proper approvals and permits including a temporary curb crossing permit where required in place. Unpermitted work is subject to penalties laid out in Regina Traffic Bylaw #9900. The City also has the right to issue stop-work orders for any work conducted on City ROW. The process for obtaining permits is constantly evolving to better satisfy the needs of the vendors and the City so the most up to date information and process can be found on the City of Regina website under the Permits section. With any questions not answered by the City of Regina website reach out to the City at 306-777-7000 or fill out the online service request form on the City of Regina website.

All activities that result in any obstruction on City ROW shall:

- Be approved by the City through the process of a temporary street use permit.
- Have the permit in place before the work starts. Use the timelines provided in the permit section of the City of Regina website to ensure the permit is completed before work is scheduled to begin. No work can begin until there is a signed copy of the permit.
- In the event of emergency related work, contact City of Regina Customer Service Centre at 306-777-7000 or Regina Police Service at 306-777-6500 before the work is started. Notify of the location of any detour or diversion on any arterials, expressways, or freeways. Always use qualified persons or the Regina Police Service to supplement an incomplete set-up under these circumstances.

VI. Undertaking the Work

In all cases:

- All necessary traffic control devices must be in place before work commences. These devices shall be maintained by the applicant or designated representative for the duration of work/temporary traffic control while any obstruction to traffic exists. The approved traffic control plan will be maintained at the worksite.
- A driving lane shall not be reduced to a width of less than 3 meters unless granted permission through the traffic accommodation for extenuating circumstances. This minimum width will be increased under special circumstances such as curves, heavy truck routes, bus routes, and high-speed situations.
- The minimum width a sidewalk can be reduced to is 1.2 meters unless granted permission through the traffic accommodation for extenuating circumstances. This mandatory minimum will be increased as needed at locations with a high chance of pedestrians using mobility aids or as deemed appropriate by the City with high pedestrian traffic areas. The sidewalk shall be free of all horizontal obstructions for 2.1 meters measured vertically from the walking surface. In the case of a temporary sidewalk the width shall match the width of the sidewalk it is replacing. An exception to this will be special permitted temporary pedestrian sheltered walkways.
- The minimum width a bike lane can be reduced to is 1.2 meters per lane unless granted permission through the traffic accommodation for extenuating circumstances. The bike lane shall be free of all horizontal obstructions for 2.5 meters measured vertically from the cycling surface. In a temporary bike lane, the width shall match the width of the permanent facility it is replacing.

- The minimum multi-use pathway shall be 2 meters unless granted permission through the traffic accommodation for extenuating circumstances. This mandatory minimum width will be increased as needed at locations with a high likelihood of pedestrians using mobility aid or heavy pedestrian/cyclist traffic. The multi-use pathway shall be free of all horizontal obstructions for 2.5 meters measured vertically from the pathway surface. In a temporary multi-use pathway, the width shall match the width of the permanent facility it is replacing.
- Sidewalks shall be smooth, free of tripping hazards and provide positive drainage.
- Fully enclosed channelized pedestrian walkways that prevent light from entering shall be sufficiently illuminated.
- Multi-use pathways shall be smooth, free of tripping hazards and provide positive drainage.
- Store vehicles, materials, and equipment outside of the pedestrian route.
- Limit site access across the pedestrian route to controlled points and maintain the pedestrian route surface at the site access driveways to provide a smooth and safe surface for pedestrians.
- When permits are obtained from the City of Regina, the traffic accommodation team will ensure all relevant internal parties in the organization are informed. It is the applicant's responsibility to give notice and communicate to any affected external parties.
- Peak hours in Regina are typically from 07:00 to 09:00 and from 16:00 to 18:00, Monday to Friday. During these times, construction work is not recommended on arterials, expressways, or freeways except in cases of an emergency.
- When traffic lanes within the worksite are required to be open to travel, trenches and small excavation sites may be bridged with steel plates that are designed for this use as per manufacturer specifications or stamped by a professional engineer. This should only be done if backfilling all or part of the trench is not practical.
- On roads with more than one driving lane separated by a median that has sufficient width to place a sign base, all signs shall be doubled by the provision of a second sign on the median or on one-way roads the second sign shall be placed on the left side of the road.
- All applicants and permit holders shall ensure that any subcontractors working for them adhere to City of Regina procedures and standards.
- Occasionally, an emergency vehicle will approach the traffic control zone with lights flashing and possibly a siren active. Worksite employees are responsible to see that traffic is stopped by accepted traffic control methods so the emergency vehicle may drive safely through the traffic control zone.
- All contradictory signage shall be covered up in a way that the cover will not come off due to weather such as wind. These need to be removed after work is complete. Overhead signage shall include one-way signs, do-not-enter signs and prohibited turn signs. Other conflicting overhead signage is not required to be covered unless otherwise specified by the City.
- All access points into the work zone shall be sufficiently barricaded. These need to be removed after the work is complete.
- Upon the completion of the work and the removal of the traffic control devices the infrastructure shall be returned to the condition it was upon the initiation of the work if not better unless there are some legal reasons not to. If this is not possible then a remediation plan needs to be in place to bring the infrastructure up to its former condition later with temporary measures put in place. The work party that completed the work is responsible to maintain and inspect any temporary fixes until the permanent solution can be implemented.

- The following closures require signed detours: closures on a heavy truck route as shown in Traffic Bylaw #9900 Schedule A, closures affecting access to emergency services including hospitals, closures on a collector or arterial when the adjacent roads are not in a grid formation, closures on any expressway or freeway including access ramps.

A. Pedestrian and Cyclist Safety

Traffic control designs and devices shall take pedestrians and cyclists into consideration.

- Pedestrian and vehicular traffic should not be mixed without physical separation.
- Physical separation includes either grade separation, a continuous line of fencing, a continuous line of concrete barriers, or a continuous line of Type 1 barricades with detectable edging along the bottom edge to assist with visually impaired users
- Pedestrian traffic should be physically separated from workers and equipment in the work area. Accommodation must be made for safe passage through or around the work area.
- Pedestrian facilities and crossings may only be closed if there is an alternate crossing or detour available. In cases where it is not possible to detour pedestrian traffic, pedestrians will have to be protected as they pass through the work area. This may require barricades to separate the worksite from the pedestrian walkway. In all cases, measures taken to protect pedestrians must be to the satisfaction of the City.
- A pedestrian detour route must provide a reasonably safe, continuous, accessible, and convenient route with a sooth hard surface and accessible features consistent with the affected facility.
- Temporary pedestrian facilities when implemented shall match the accessible features of the facility it is replacing.
- A bicycle detour route must provide a reasonably safe, continuous, accessible, and convenient route with a smooth hard surface and features consistent with the affected facility.

VII. Securing the worksite

Securing the worksite is necessary to protect all road users from potentially hazardous conditions within the work zone. Any access points into the work zone shall be appropriately barricades to prevent unintended access. It is necessary to secure the worksite during any periods of work or inactivity. Some examples of inactivity are shutdowns due to weather conditions, end of shift, weekends, holidays, and lunch/coffee breaks. It is the contractor's responsibility to ensure that road users are unable to enter the site or to safeguard them from any hazards within the site when they can access it. When barricades or traffic control devices are moved to allow construction vehicles to access the site they must be returned to the approved location as soon as the vehicles has passed. Examples of this would be safe walking paths free of ice and debris to access properties, cover excavations or fencing them, etc.

VIII. Installation and Maintenance

A. Installation

All devices shall be placed so as not to interfere with existing traffic control devices. It is important to survey the site before preparing a temporary traffic control plan. This ensures any conflicting signs are covered. Signs shall be posted on steel or metal support poles. Signs are to be freestanding for winds up to 20 km/h and reinforced with sandbags or other approved method to withstand wind gusts of up to

60km/h. The traffic control devices should be placed in a manner as to not block driving lanes, sidewalks, pathways, and bicycle lanes unless the traffic control devices are placed for the purpose of closing the infrastructure. Signage should be placed with the following considerations in order: placed on a shoulder, placed on a boulevard, placed in a parking lane, placed back of the sidewalk, placed on a sidewalk where it does not reduce the width below 1.2 meters, placed on a sidewalk where it reduces the width below 1.2 meters, and finally in the edge of a driving lane.

When preconstruction communication signage is required, they should be set up and remain in place for 72 hours before work starts. No-parking signage should be installed at least 48 hours prior to the start of construction with a start date and time posted on the sign. Note that metered parking must be set up by the City. No parking signage must be spaced a maximum of 25 meters apart and have a minimum of three signs per block.

B. Maintenance

It is important to maintain all temporary traffic control devices and signs. Some examples of maintenance include, but are not limited to:

- Cleaning all traffic control devices and signs.
- Replacing damaged traffic control devices or illegible signs.
- Ensuring all traffic control devices and signs are located as per plan.
- Ensuring all traffic control devices and signs are secured for adverse conditions including windy conditions.

C. Inspections and Record Keeping

Documented inspections are mandatory to ensure that traffic accommodations are set up as per the approved plan to protect both the workers and any road users. Documented inspections are required to be completed a minimum of twice daily spread out during the duration of active work. Informal inspections for the purpose of zone upkeep shall be performed more frequently during periods of wind greater than 60km/h or for traffic accommodations that have regular unapproved alterations. The contractor is responsible for taking the necessary steps to correct any deficiencies within a reasonable time. The inspection records shall contain the following project information:

- Traffic Accommodation Project Name.
- Traffic Accommodation Plan Number.
- Company Name.
- Company Contact.

The inspection records shall also contain the following inspection information:

- Date of the inspection.
- Time of the inspection.
- Active Phase of the project if applicable.
- Any deficiencies noted (i.e. signs blown over or missing sign, barricade moved, etc.).
- Corrective action to be taken (i.e. signs stood up, missing speed limit sign to be installed, etc.).
- Name of the inspector.
- Inspector’s initials.

- Deficiencies resolved date/time/initial (if not completed during the inspection).

If the traffic accommodation plan needs to be revised, the Contractor is responsible for getting approval from the Traffic Engineering branch prior to changing the traffic accommodation unless there is an immediate risk to public safety. In the event of an immediate risk to public safety the Contractor shall revise the plan and notify the City of Regina Traffic Engineering Branch immediately.

IX. Guidelines for traffic control

A. Fundamentals for application

1. Temporary work zone component areas

A typical temporary traffic control setup contains the entire length of the road from the first advance warning sign to the last traffic control device that returns vehicles to their normal condition. A temporary traffic control setup can be divided in four distinct component areas as shown in figure 2.

- Advance warning area

  This area is used to inform road users of the upcoming work zone and what action to take. The number of traffic control devices in the advance warning area shall account for the required downstream conditions in the work zone such as reduced speed, lane closures, etc. The spacing and number of devices is to allow for sufficient distance for drivers to interpret and react before reaching the work area.

- Transition area

  This area is used to move the road users out of the normal path such as lane closure(s) or shoulder work that may encroach into adjacent travel lane and marks the location where delineation devices are typically introduced. The intended path must be clearly delineated so drivers do not follow the wrong path. It is important to note that vehicle parking, equipment parking, equipment or material storage should not be placed in the transition area.

- Activity area

  This is the area where the work takes place and contains the longitudinal and lateral buffer spaces, workspace and traffic space.

  The longitudinal buffer space provides protection for traffic and workers between the transition area and the workspace. This buffer space provides a recovery area for errant vehicles and should be free from parked vehicles, equipment, or material storage.

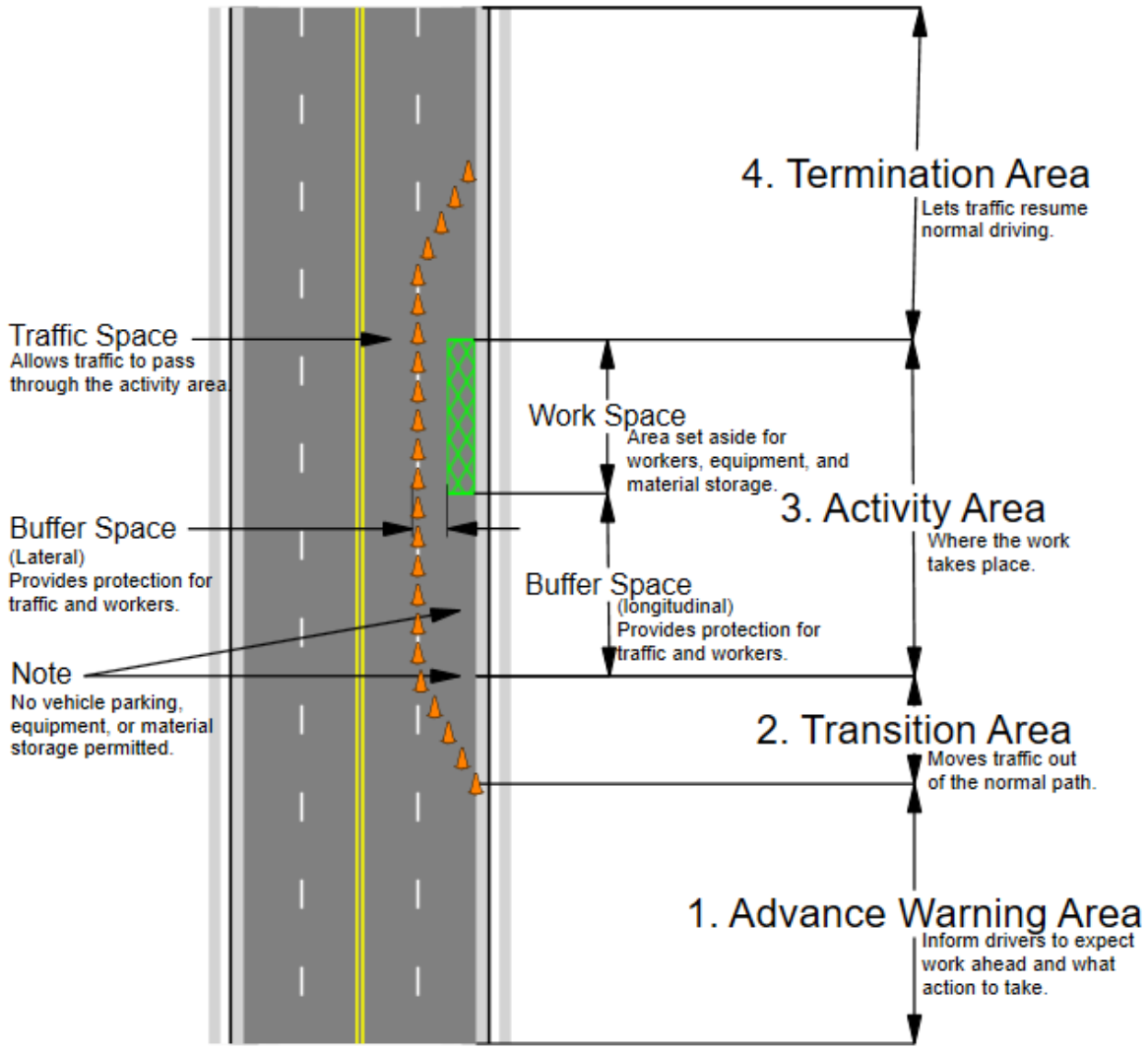
  The lateral buffer space provides separation between the traffic space and the workspace. Engineering judgement should be applied for the lateral buffer space with consideration of speed, traffic volume, lane width, vehicle classification, time of day, and work duration.

  The traffic space allows traffic to pass through the activity area. The traffic space has minimum width requirements specified in Section VI. Consideration of the emergency services, bus routes, heavy truck routes, lane geometry, off tracking, and shy offset distances should be made in the provision of lane widths.

- Termination area

  This area is used to allow the road users to return to their normal path. The area extends from the work end of the workspace to where traffic returns to its intended path of travel.

Figure 2: Temporary Work Zone Components



2. Traffic Control Taper and Tangent Lengths and Definitions

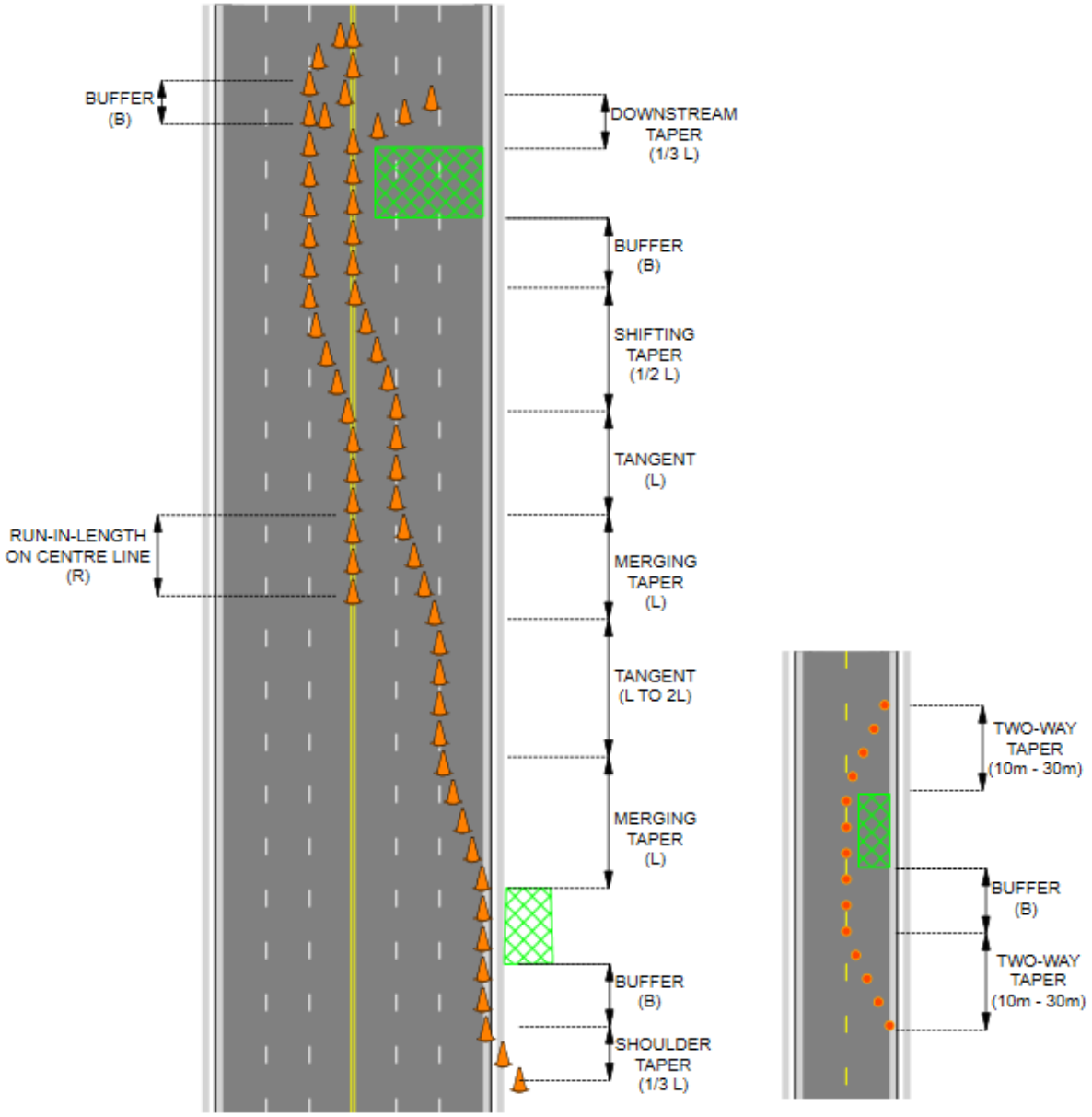
Table #1: Basic temporary traffic control tapers criteria

Tapers	
Description	Length
Merging Taper Where a lane closure taper is utilized to join traffic from a closing travel lane to an adjacent travel lane.	L (min)
Shifting Taper Where a travel lane is shifted laterally by up to one lane width where drivers simply follow a path of travel and are not required to merge or diverge with adjacent travel lanes.	L/2 (min)
Shoulder Taper Where a shoulder is closed to provide a work space on the shoulder for activity or storage. Shoulder tapers may be considered for full time parking lanes; judgement should be exercised for part time parking lanes where a merging taper may be more appropriate.	L/3 (min)
Two-way Taper Where a taper is utilized to close a travel lane for a work area along a two3-way roadway and the remaining portion facilitates alternating traffic in each direction.	10m – 30m
Downstream Taper Where a transition is provided within the termination area from the end of the activity area to where the normal path of travel is provided.	L/3 (min)

Table #2: Basic temporary traffic control tangent criteria

Tangents	
Description	Length
Merge followed by a merge The parallel distance between the end of one merge taper and the start of another merge taper. A minimum length of one merge taper length should be provided although twice the merge length may be considered for high speed or high-volume roadways.	L (min) 2L (desirable)
Merge followed by shifting taper The parallel distance between the end of one merge taper and the start of a shifting taper. A minimum length of one merge taper length should provided to allow the driver to observe and react to traffic control devices between consecutive maneuvers.	L (min)
Buffer Provides a recovery area for an errant vehicle by separating road users and work areas (or other road users where utilized between opposing traffic directions).	B
Run-in-length on centreline Utilized on the centreline as a tangent length before a lane shift or end of a merge.	R

Figure 3: Types of Tapers



3. Traffic Control Devices with Length and Spacing Guidelines

Table #3: Traffic Control Devices – Length and spacing guidelines

V (km/h)	V_R (km/h)	A (m)	L (m)	B (m)	D (m)	R (m)	N	Delineator	Lane Closure
≤50	30	30	30	35	8	40	5	700 mm Cone	Type 2 Heavy Barricade with Chevrons
60	30	50	40	45	12	50	8	1.05 m Delineator Cone	Arrow Board
70	40	75	60	50	15	65			
80	40	100	80	60	15	65			
90	50	100	105	65	18	80			
100	60	125	125	70	18	80			

Where: V = Normal Posted Regulatory Speed Limit
V_R = Maximum permitted reduced speed limit
A = Spacing between signs
L = length of taper
B = length of longitudinal buffer space
D = spacing between delineation devices
R = Run-in-length on centreline
N = Number of delineation devices per taper

The MUTCDC sixth edition has brought some changes to the spacing requirements for temporary traffic control signage. The changes give different spacing requirements based on the purpose of the device in addition to the spacing required for different speeds. Upon completing jurisdictional research for best current practices, the City of Regina differs from the sixth edition in the following requirements.

Sign spacing (A)

To ensure that all zones set up within the urban environment are uniform the sign spacing has been kept from the fifth edition as shown in the table above. The sixth edition brings in different spacing requirements for information signs versus hazard/decision signs. There should always be judgement used in the design of the traffic accommodation plan to appropriately address the hazards of the specific situation. There may be situations where the situation will require alternate and greater sign spacing to provide drivers more distance to conduct maneuvers.

Delineator spacing (D)

To ensure delineator spacing is consistent throughout the urban environment, the City of Regina retains the spacing requirement from the fifth edition MUTCDC. The sixth edition brings in different spacing for the delineators based on if the delineators are used in a taper, are adjacent to a hazard or not adjacent to a hazard. Judgment should always be applied to modify the delineator spacing to enhance clarity for drivers.

Taper Length (L)

Due to distance constraints in the urban environment the taper lengths have been retained from the fifth edition which considers the braking distance of an errant vehicle. The sixth edition MUTCDC has longer taper lengths which is based on the stopping sight distance for roadways. The designer should always use judgment and increase taper lengths where beneficial to the situation.

Buffer Length (B)

The buffer length in the fifth edition of MUTCDC has been retained as it provides a consistent set up across the urban environment and is required in all set ups. The buffer distance accounts for the brake reaction distance of 2.5 seconds perception/reaction time. The sixth edition has provided the longitudinal buffer length equal to the braking distance of an errant vehicle. The sixth edition also integrates the buffer zone into the taper length for low-speed roads and freeways.

Run-in-length on centreline (R)

The sixth edition of MUTCDC has brought a new requirement for temporary traffic control where a length of delineation devices where a travel lane merges into a travel lane adjacent to the centreline. MUTCDC represents this as a formula of 0.8 multiplied by the posted speed limit. This formula has been computed and rounded into standardized values as shown in the table above.

Number of delineators on taper (N)

To ensure that proper delineation is present in the taper to inform motorists of a merge required a minimum number of devices has been adopted instead of the sixth edition recommended spacing requirements. This creates a uniform and repeatable setup across the urban environment. This value varies across many jurisdictions however, the City of Regina has adopted the value above to maintain consistency in setups.

B. Duration of Work

The length of time that work will affect public ROW is a key consideration in determining the appropriate traffic accommodation. The following definitions for work duration are used throughout the TTCM.

Mobile

Mobile operations are those that are typically performed on the move at low speeds and may periodically stop for only a few minutes.

Examples of mobile operations are: street sweeping, longitudinal pavement marking-paint truck, watering of trees and hydro-seeding.

Very short duration

Very short duration operations are those that can be completed in 30 minutes or less and may be stationary or mobile with frequent short stops.

Examples of very short duration operations are: minor utility and roadwork, bus shelter washing or cleaning, catch basin cleanout, pothole patching/repair, symbol and transverse road markings

maintenance, minor sign maintenance, signal light replacement, streetlight fixture maintenance, survey and emergency response (e.g., spills and vehicular accidents).

Short duration

Short duration operations are stationary and range between 30 minutes and 24 hours.

Examples of short duration operations are: crack sealing, maintenance, sidewalk/boulevard repair, utility work, asphalt patching, emergency watermain repair, and emergency response.

Long duration

Long duration are stationary and take longer than 24 hours.

Examples of long duration operations are: manhole replacement, utility replacement, bridge rehabilitation, roadway upgrading, large paving operations, and sidewalk/boulevard repair.

C. Signs and specifications

The most effective system of regulating, warning, and guiding in work zones is provided through the planned use of traffic control signs and devices that are placed properly and well maintained.

The City of Regina authorizes the use of temporary traffic control signs found in the tables listed below. The size, colour and shape shall be in accordance with the most current version of the MUTCDC. For any signs and sign sizes that are not identified in the tables listed below, refer to the MUTCDC or contact Traffic Engineering.

- For retro-reflectivity, all signs shall be made with prismatic sheeting in accordance with ASTM D4956 compliant with the minimum retroreflectivity levels according to MUTCDC Section A1.6.7 in Table A1-8.

Figure 4: Sign Mounting

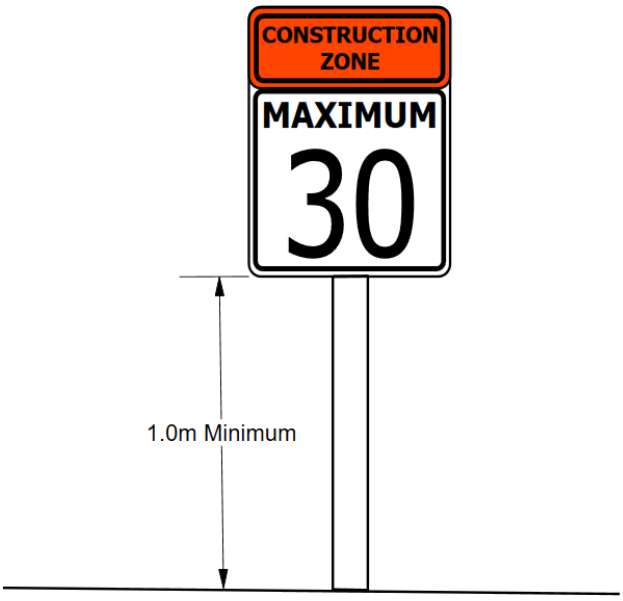
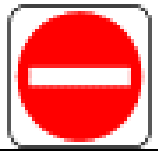


Table 4: Regulatory Sign Descriptions

Code	Sign	Size (mm)	Description
RA-1		750x750	Stop Sign This sign indicates to stop completely and not to proceed until it is safe to do so.
RA-1S4/RA-1S5		400x250	Multi-way Stop Tab This sign indicates that there are two or more approaches controlled by stop signs.
RA-2		600mm height	Yield Sign This sign indicates that drivers must yield the ROW, stop if necessary and must not proceed until it is safe to do so.
RB-1		450x600	Maximum Speed Sign This sign indicates the maximum legal speed.
COR-RB-1CB		600x900	Construction Zone Speed Limit This sign indicates that road users have transitioned into a work zone and have a new maximum legal speed.
COR-RB-1CE		600x900	Construction Zone Ends Speed Limit This sign indicates that road users have exited the construction zone and can resume driving at normal posted speeds.
RB-11R/RB-11L		600x600	Right (Left) Turn Prohibited Sign This sign indicates that a right/left turn is prohibited.
RB-14L/RB-14R		600x600	Turn Right (Left) Sign This sign indicates that all lanes must travel in the direction indicated by the sign.
RB-21		900x300	One-Way Sign This sign indicates to drivers that they are only allowed to travel in the direction of the arrow.
RB-23		600x600	Do Not Enter Sign This sign indicates that road users are not allowed to enter this section of roadway.

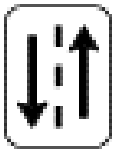
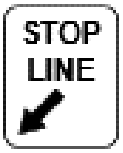
RB-24		600x750	Two-Way Traffic Sign This sign indicates that the section of road has changed from one-way traffic operation to two-way operation.
RB-41R/RB-41L		600x600	Right Turn (Left) Only Lane Sign This sign indicates that the road user must only turn from the designated lane in the direction indicated by the sign.
RB-42L		600x600	Straight Through or Left Turn Only Lane Sign This sign indicates that road users must only proceed straight through or turn left from the designated lane at the intersection.
COR-TC-LD1		600x600	Lane Designation This sign indicates the left turn lane and through lane when approaching a road closure on the other side of the intersection.
COR-TC-RB51		300x300	No Parking This sign indicates that parking is prohibited. The parking sign shows the day of week, date, and time that work is scheduled to start.
RB-66		300x300	No pedestrian Access This sign indicates that pedestrians are prohibited from accessing the section of sidewalk or pathway and must use an alternate route.
RC-4R/RC-4L		600x750	Stop Line Sign This sign indicates the point at which drivers approaching a traffic control device must stop their vehicles.

Table 5: Temporary Condition/Construction Signs

Code	Sign	Size (mm)	Description
TC-2		750x750	Road Work Sign This sign indicates that work zone activities are in progress on or adjacent to the roadway.
TC-3		750x750	Survey Crew Sign This sign indicates that survey work is in progress on or adjacent to the roadway.
TC-4		750x750	Construction Ends Sign This sign indicates the end of the work zone. This sign is used in place of COR-RB-1CE when the construction zone ends within the limits of a playground zone, school zone, or interchange ramp.
TC-5R/TC-5L		750x750	Temporary Lane Closed Ahead Sign This sign indicates that a lane is closed as part of a work zone.
WD-A23R/WD-A23L		750x750	Lane Narrows Sign This sign indicates that a lane's width is reduced but it is still open and traversable as per the minimum widths specified in Section VI.
TC-10		750x750	Detour Ahead Sign This sign indicates that a detour ahead requires road users to alter their route from their normal path of travel.
TC-11R2/TC-11L2		600x450	Detour Direction Markers This sign indicates the detour direction along the detour route.
TC-T-TAB		400x250	Trucks Tab This tab is attached to detour signs for truck specific detours.
TC-13R/TC-13L		750x750	Road Diversion Sign This sign indicates a deviation from the normal road, which is ≤200 meters in length.
TC-15R/TC-15L		750x750	Road Realignment Sign This sign indicates the road is realigned across a median or to return to its normal side of the road.

TC-16R/TC-16L		750x750	Lane Realignment Sign This sign indicates the realignment of two or more lanes from normal. The number of arrows must match the number of lanes on the road.
TC-21		750x750	Traffic Control Person Ahead Sign This sign indicates an area where a traffic control person is directing traffic. Road users shall follow the directions given by the traffic control person.
TC-31		450x600	Temporary Chevron Alignment Sign This sign indicates additional guidance to drivers where there is a temporary change in the horizontal alignment.
TC-32 TC-32R/TC-32L		450x900 300x900	Temporary Object Marker Sign This sign indicates an obstruction and the side of the obstruction that will be passed.
TC-49		750x750	Pavement Drop-off Sign This sign indicates that there is a height different between the shoulder and the lane.
TC-68		450x450	Bicycle Lane Closed Sign This sign indicates that a bicycle lane is temporarily closed.
TC-70/TC-70R2/TC-70L2		450x450	Temporary Bicycle Detour Signage This sign indicates the path of a detour for a bicycle lane.
TC-74/TC-74R2/TC-74L2		450x450	Temporary Pedestrian Detour Signage This sign indicates the path of a pedestrian detour.
TC-76		300x600	Sidewalk Closed Sign This sign indicates that the pedestrian facility is temporarily closed
TC-77		300x600	Sidewalk Closed Use Other Side Sign This sign indicates that the pedestrian facility is temporarily closed and that the other parallel facility is open.

TC-77AR/TC-77AL		450x600	Sidewalk Closed Ahead Cross Here Sign This sign indicates that the sidewalk is closed ahead and indicates the location to cross to the parallel facility.
TC-81		750x750	Temporary Stop/Yield Ahead Sign This sign indicates that there is a temporary stop/yield sign installed ahead. The symbol on the sign shall match the control that is being used.
TC-RC Road Closed		750x750	Road Closed Sign This sign indicates the point where there is a complete closure of a road or direction of travel. Note this sign is not used for half road closures with two-way traffic.
TC-88		750x750	Road Closed Ahead Sign This sign indicates that a complete road closure or closure of a direction of travel is ahead.
TC-NE-TAB		400x250	No Exit Tab This tab is used with the road closed ahead sign to indicate that a full or directional closure occurs before the next intersection and there is no exit after entering that block. Note an alley is not considering in as an exit.

D. Channelization Devices

1. Barricades

Proper placement of barricades is necessary to ensure the safety of any road users. Barricades indicate 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 area 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.
- The following signs may be placed on Type 2 barricades; Road Closed sign, Do Not Enter, or Detour Sign.
- No parking signs may be fixed to Foldable Type Barricades.
- Barricades shall be used to close a road.

Non-acceptable use of barricades:

- Barricades should not be placed parallel to traffic.
- Barricades shall not be placed in oncoming traffic without necessary traffic control devices and signs.
- Barricades should not be used instead of signposts.
- Barricades should not be used for the placement of regulatory signs.
- Barricades should not be located within the buffer area.

Types of Barricades

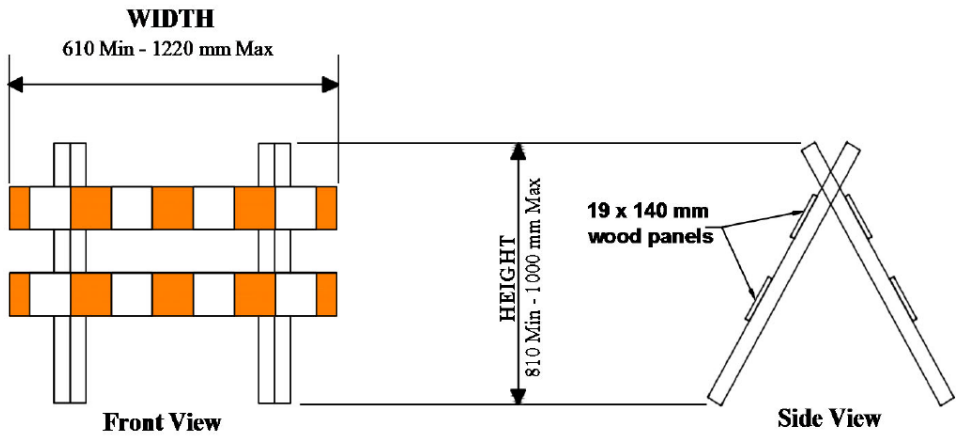
- Foldable Type Barricade

A Foldable Type Barricade is a device with a top hinge and at least one reflective panel per side. This type of barricade is foldable in nature and can be easily stacked and transported from site to site. The following provides some examples of acceptable and non-acceptable use of this type of barricade.

Acceptable use of Foldable Barricade:

- For use on local or collector roads where traffic is maintained through the area.
- For use on local road closures with consideration or request from the City to upgrade to Type 2 Heavy Barricades for longer duration projects.
- For use on arterial and collector road during emergencies where a high degree of mobility is desired as long as other controls and required delineation are provided.

Figure 5: Foldable Type Barricade



- Type 1 Light Barricade

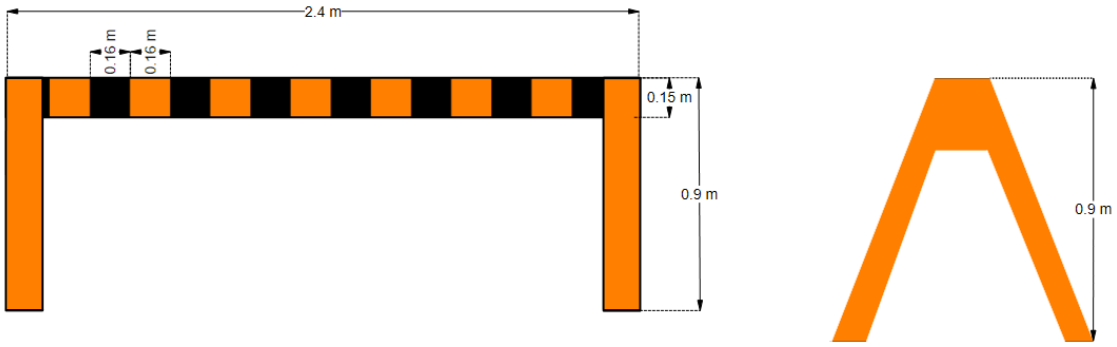
A Type 1 Light Barricade is a light barricade with one reflective panel and shall meet the minimum standards of TC-64A in MUTCDC. The following provides some examples of acceptable and non-acceptable use of this type of barricade.

Acceptable use of Type 1 Light Barricade

- For restrictions on local roads or collector roads where traffic is maintained through the area.

- For use in emergencies as long as other controls and required delineation are provided.
- For use along pedestrian detour routes with continuous detectable edging at ground level in the form of a second rail at ground level.

Figure 6: Type 1 Light Barricade (TC-64A)



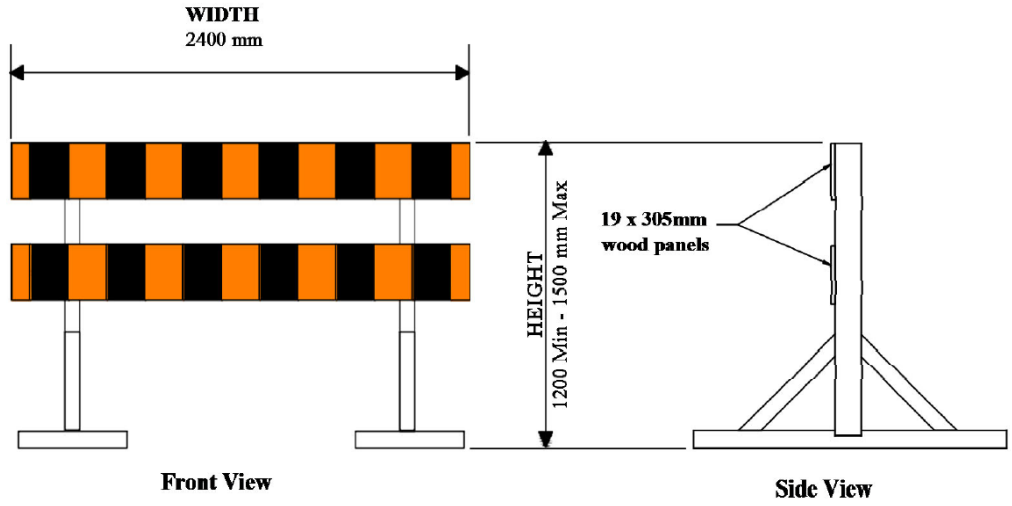
- Type 2 Heavy Barricade

A Type 2 Heavy Barricade is larger with two separate reflective panels on one side. They are constructed of wood and are large in nature to grab the attention of the road users. The minimum acceptable dimensions of a Type 2 Heavy Barricade are shown in figure 7 below but preference will be given to barricades that meet the dimensions of TC-64B from MUTCDC. The following provides some examples of acceptable and non-acceptable use of this type of barricade.

Acceptable use of Type 2 Heavy Barricade

- For use on all road closures and should be considered for long duration local road closures.

Figure 7: Type 2 Heavy Barricade



2. Delineators

Delineation devices are used to form curves, lines or boundaries that guide road users.

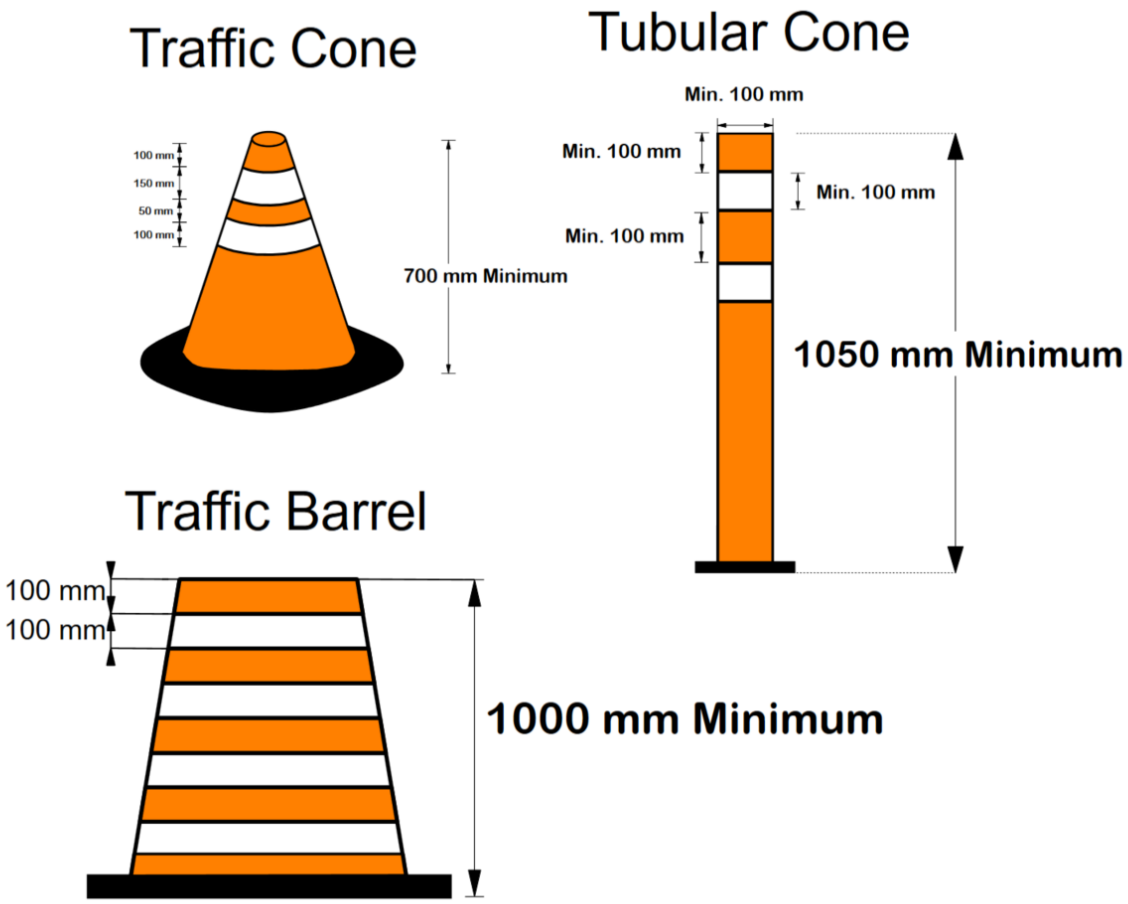
Delineation devices include traffic cones, tubular cones, traffic barrels, and chevron alignment signs. Delineation devices do not include barricades, concrete barriers, or signs other than chevron alignment signs. All delineators must have sufficient ballast to prevent knockdown from wind and normal traffic.

Traffic cones shall be florescent orange and made of rubber or similar flexible material. The minimum height required for cones is 700mm on roadways with a speed limit of 50km/h or less. On a traffic cone there are also two bands of High Intensity Grade reflective sheeting.

A tubular cone shall have a minimum height of 1050mm and shall be used for roads with a speed limit of greater than 50km/h or as specified by the City and have a minimum of two 100mm bands of High Intensity Grade reflective sheeting.

Traffic barrels have a minimum height of 1000mm with a minimum conical diameter of 330mm at the top. They must be manufactured to include an anti-roll device in case of knockdown. They must have a minimum of four 100mm bands of High Intensity Grade reflective sheeting.

Figure 8: Typical Delineators



Nighttime:

Amber flashers/warning lights should be used to identify obstructions at night where there is no adequate street lighting. 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 for light 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.

3. Barriers

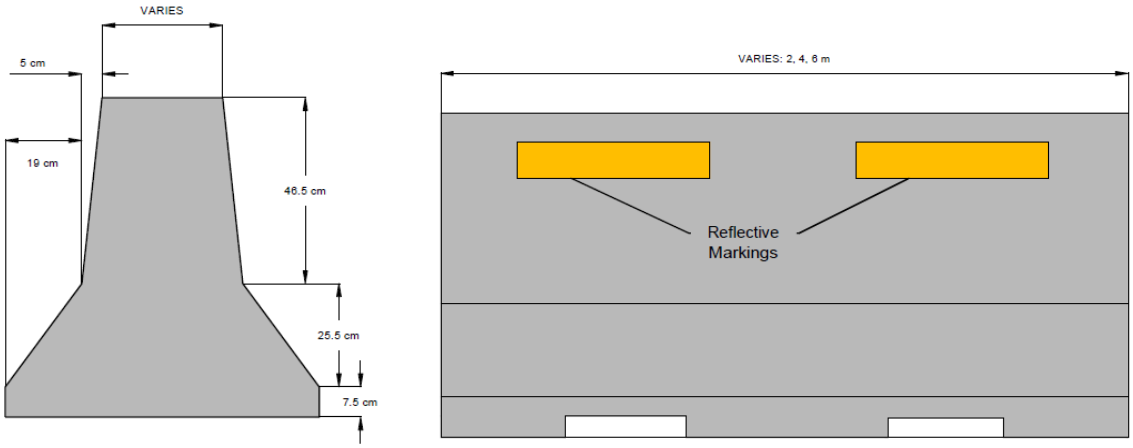
Longitudinal traffic barriers are used in work zones to:

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

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

- Be placed continuously without gaps between sections.
- Have retro-reflective tape or markings with a high reflectivity level attached along the face of the barrier.
- Have acceptable flare rates on the leading edge or have the appropriate end treatments.
- Be equipped with glare screens as necessary.
- Be placed a minimum of 0.6m from the edge of the driving lane.
- Be used during periods of inactivity where excavations compromise safety.

Figure 9: Concrete Barriers



4. Pavement Markings

Under certain situations there may be the requirement to have supplementary pavement markings completed for the project to accommodate long duration complex detours. These pavement markings shall be installed using temporary reflective pavement marking tape in compliance with MUTCDC width requirements. The temporary pavement markings shall be installed at the request and to the design of the City. Before the work zone is opened to the road users all temporary pavement markings shall be removed or eradicated.

5. Pedestrian Accessibility Ramps

Any occurrence of a pedestrian or pathway detour shall be accompanied by a ramp for accessibility. If there is no existing ramp in the sidewalk, or the detour occurs midblock then a supplemental accessibility ramp shall be used to ensure connectivity. These accessible ramps must be installed with the proper delineation to ensure that the detour does not mix vehicular and pedestrian traffic. Temporary accessibility ramps shall have a surface to have enough grip to allow for the safe passage of pedestrians. The maximum permitted slope shall be 8%. The pedestrian accessibility ramps shall be installed to provide sufficient space for a pedestrian using a mobility aid to safely maneuver onto and off the ramps.

E. Devices to Warn, Guide, and Inform

1. Arrow Boards

Arrow Boards shall be utilized on roadways with speed limits greater than 50km/h or where there are limited sightlines to alert drivers of a lane closure and the requirement to merge with the adjacent lane in advance of the work site. Arrow boards should have the capability of following the basic mode selections:

- Flashing Arrow – recommended for full closures with the option of directing traffic in any direction.
- Sequential Flashing Arrow – recommended for full closure where a change of direction is required, and/or a specific direction is desired.

- Sequential Flashing Chevron – Recommended for partial closures or restrictions where traffic is required to change lanes but not direction of travel.
- Alternating Diamonds – recommended for closures of the curb lane where work may intermediately present a hazard to motorists in adjacent driving lanes but a merge or lane change is not required.

Arrow boards shall not be used to replace advanced warning signage or proper delineation. Arrow boards are used to supplement and highlight upcoming maneuvers required by the road users. Arrow boards used during the nighttime shall dim to not impair the vision of approaching motorists.

2. Variable Message Boards

Variable Message Boards are electronic signs displaying work zone information and are used to relay information to motorists for upcoming or existing road construction. Digital variable message boards are to be used on roadways with a posted speed limit of 60km/h or greater. With speed limits of less than or equal to 60km/h where the project is short duration and low impact the sign can be replaced with a static 4-foot by 4-foot or 3-foot by 3-foot informational sign. The sizing on the wording shall follow MUTCDC letter sizing requirements.

The message on the Variable Message Board Shall:

- Be legible for all lanes at a minimum of 200 meters unless geometry prohibits this.
- Be readable twice while traveling at the posted speed limit.
- Not scroll the text horizontally or vertically.
- Not contain both the word left and right in the same message.
- Use standardized abbreviations as identified in Table 6 or in MUTCDC.

The placement of the Variable Message Board Shall:

- Always be placed on the same side of the roadway when two are used and spaced at least 300 meters apart.
- Not interfere with the line of sight, traveling road users, and any other traffic safety issue that may be identified as a hazard.
- Take the reflection of the sun into account.
- Be removed when not in use.
- Not block a driving lane or bicycle lane without the proper delineation and warning.
- Be placed where specified by the City.

Variable Message Boards or informational signs are required to:

- Let the public know of an upcoming closure on a road classified as a collector, arterial, expressway, or freeway indicating the location of the closure along with the start date.
- Let heavy truck traffic know of closures downstream at a point where they can detour along the heavy vehicle and long combination route.
- Let the public know of restrictions downstream on arterials, expressways, or freeways at connecting major roadways that traffic can use to detour if desired.

Table 6: Common Abbreviations

Word	Abbreviation
Alternate	Alt
April	Apr
August	Aug
Avenue	Ave
Boulevard	Blvd
Construction	Const
Crescent	Cres
December	Dec
Drive	Dr
February	Feb
Friday	Fri
Highway	Hwy
January	Jan
July	Jul
June	Jun
March	Mar
Monday	Mon
November	Nov
October	Oct
Parkway	Pkwy
Place	Pl
Restricted	Restr
Road	Rd
Saturday	Sat
September	Sep
Street	St
Sunday	Sun
Thursday	Thurs
Tuesday	Tue
Wednesday	Wed

F. People and Devices to Control Traffic Flow

1. Flagging Operations

Traffic Control Persons commonly referred to as flaggers are typically required:

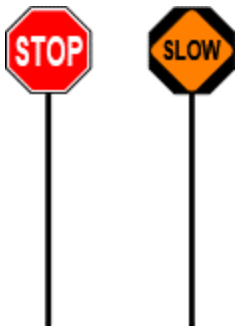
- When two-way traffic must be guided through a single lane.
- When materials or equipment are being moved across a sidewalk, multi-use pathway, or travelled lane.
- To assist pedestrians, cyclists, and motorists through complicated traffic control set-ups.
- When required by the City.

Traffic Control Persons are responsible for the safety of the road users along with all workers in the work site. Therefore, selecting a traffic control person must be based on the individual's experience,

alertness, and decisiveness. Traffic Control Persons shall be certified by an accredited agency and familiar with flagging standards and procedures.

A Traffic Control Persons is required to use a Stop/Slow paddle during the day. The paddle shall meet the minimum requirements of retro-reflectivity as defined in MUTCDC. For nighttime flagging operations a red lantern or flashlight must be used in addition to the paddle. A Traffic Control Person shall wear an approved hard hat, reflective safety vest, and safety shoes as identified in the Saskatchewan Employment Act.

Figure 10: TC-65 Flagger paddle (450mmx450mm)



Illumination shall be provided for Traffic Control Persons required to be working on or adjacent to City ROW during hours of darkness. Always use the appropriate Traffic Control Person Ahead sign (TC-21) and all other required signage/delineation. 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 gear.

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 to relay signals. Where possible Traffic Control Persons shall coordinate direction of traffic flow with existing traffic signals. If coordination is not possible, at the City's discretion the signals may be turned to all-red flash.

When more than one Traffic Control Person is required at an intersection, traffic shall be moved through the intersection one direction at a time. Preferably in counterclockwise rotation.

Flaggers may be replaced by temporary traffic signals in certain circumstances. This is at the discretion of the City.

Certain situations may require the assistance of the Regina Police Service for flagging and directing traffic. Contact Regina Police Service at 306-777-6500. Note that there is a fee for using Regina Police Services.

Flaggers shall have CSA Z96-09, Class 2, Level 2 as a minimum with acceptable colours including white, orange, or fluorescent yellow/green. There may be locations where CSA Z96-09, Class 3, Level 2 is required for higher speed locations.

2. Spotting

Spotters or traffic observers are used in certain situations where a flagger is not required but worker safety may be compromised by not being able to observe oncoming traffic. Traffic Spotters are not

flaggers; their sole responsibility is the safety of the other workers at the job site. However, they must be certified to the standards of a flagger.

Spotters must be in a position that has a clear view of oncoming traffic and their sole responsibility is to watch the traffic and warn the workers if oncoming traffic appears to be a threat. No work can be conducted on site until the spotter gives the “All Clear”.

X. Typical Plans

This chapter contains examples of how signs and traffic control devices are used for temporary applications. Since all site-specific conditions cannot be captured these are considered typical applications and are to guide designs. These drawings offer requirements for temporary traffic control. The signs and devices must be placed outside of the pedestrian and bicycle routes, such as sidewalks and multi-use pathways. The spacing requirements for the traffic control devices shall follow Table #2 or as attached to each typical application.

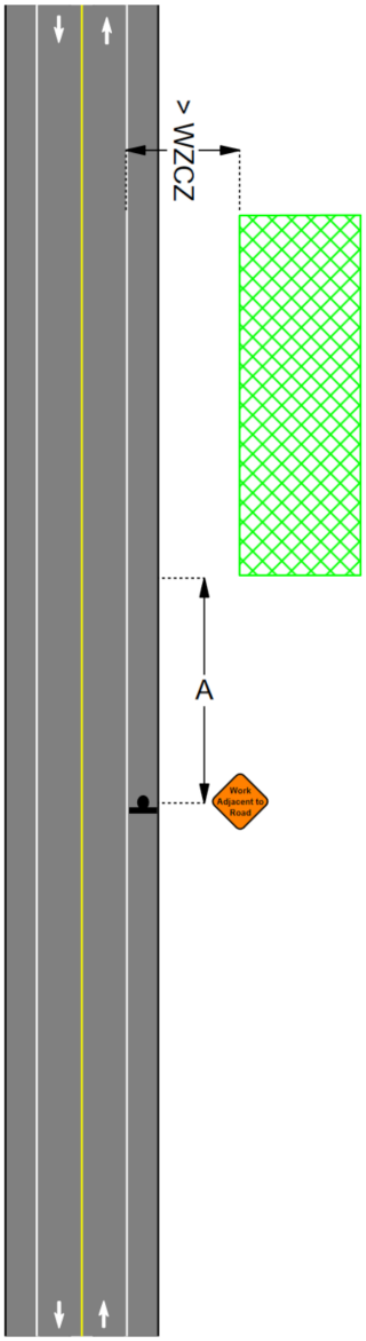
The maximum speed reduction by a single sign is 30km/h. In situations where the speed must be reduced beyond 30km/h from the normal posted limit it must be completed in multiple stages with separate speed limit signs posted at the appropriate spacing.

When a construction zone terminates in a school or playground zone then the Construction Ends Speed Limit sign shall be replaced with the Construction Ends sign without the posted speed.

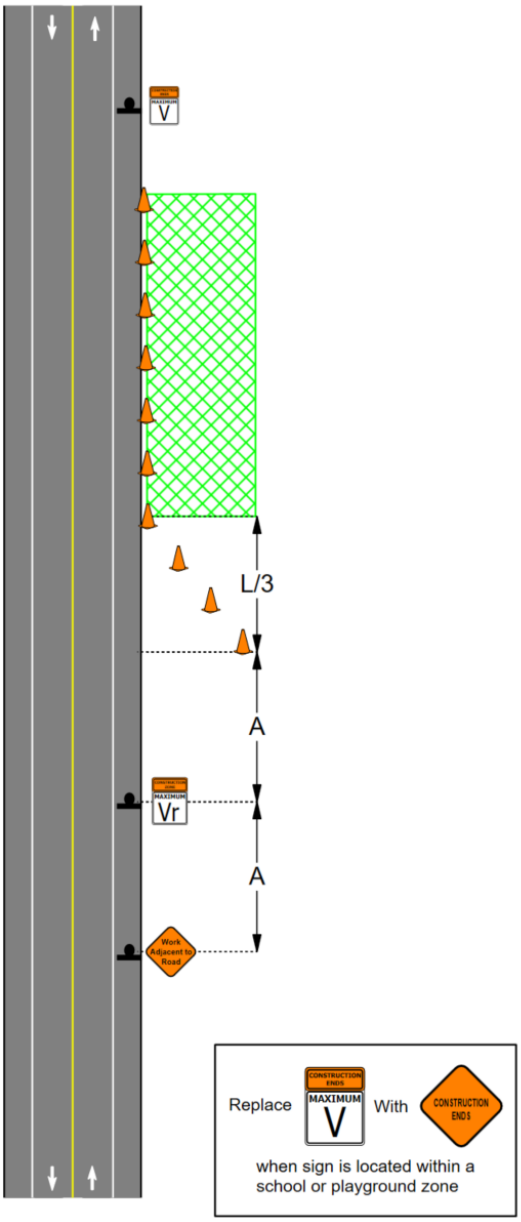
Drawing Index

Drawing 1: Work Adjacent to Roadway Outside of Clear Zone

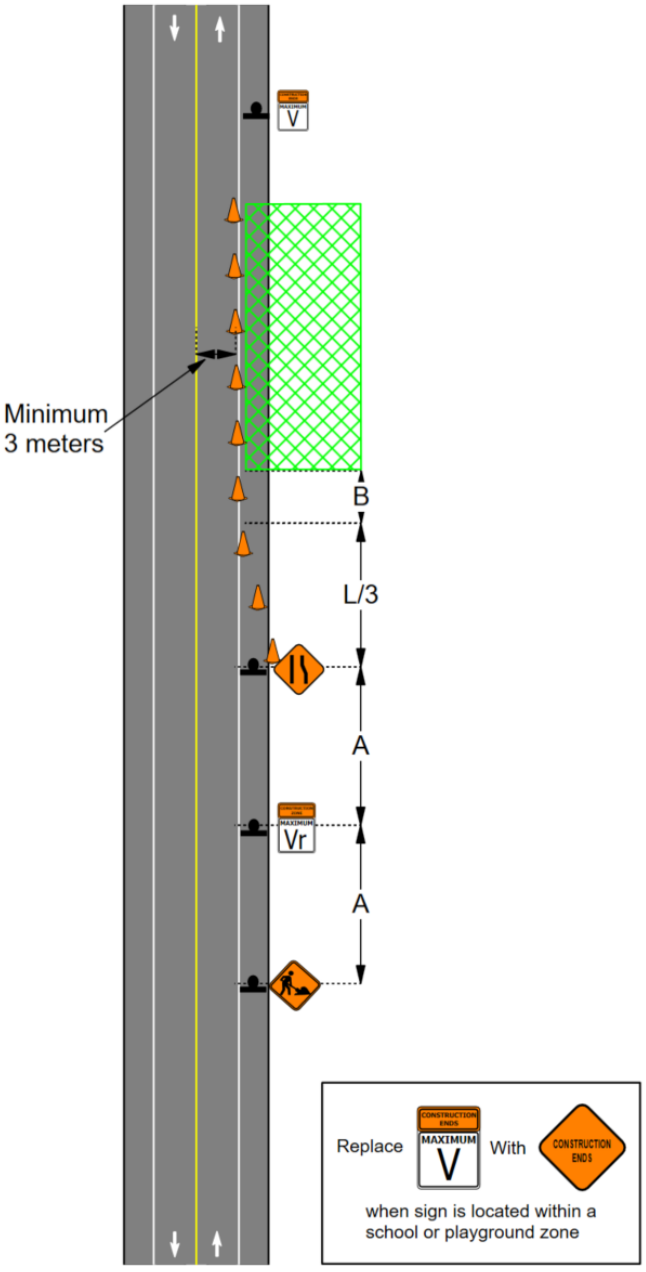
Speed (km/h)	Work Zone Clear Zone Length (WZCZ)
≤50	3 meters
60	4 meters
70	5 meters
80	6 meters
90	7 meters
100	9 meters



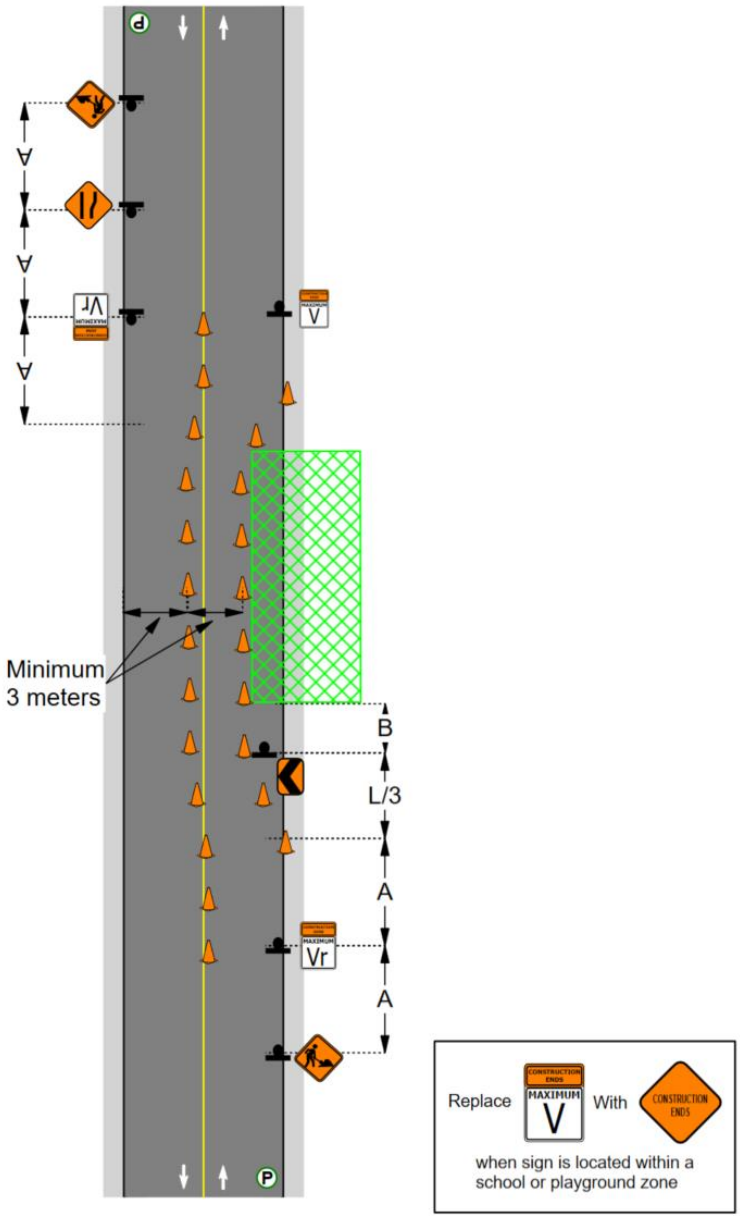
Drawing 2: Work Adjacent to Roadway Inside Clear Zone



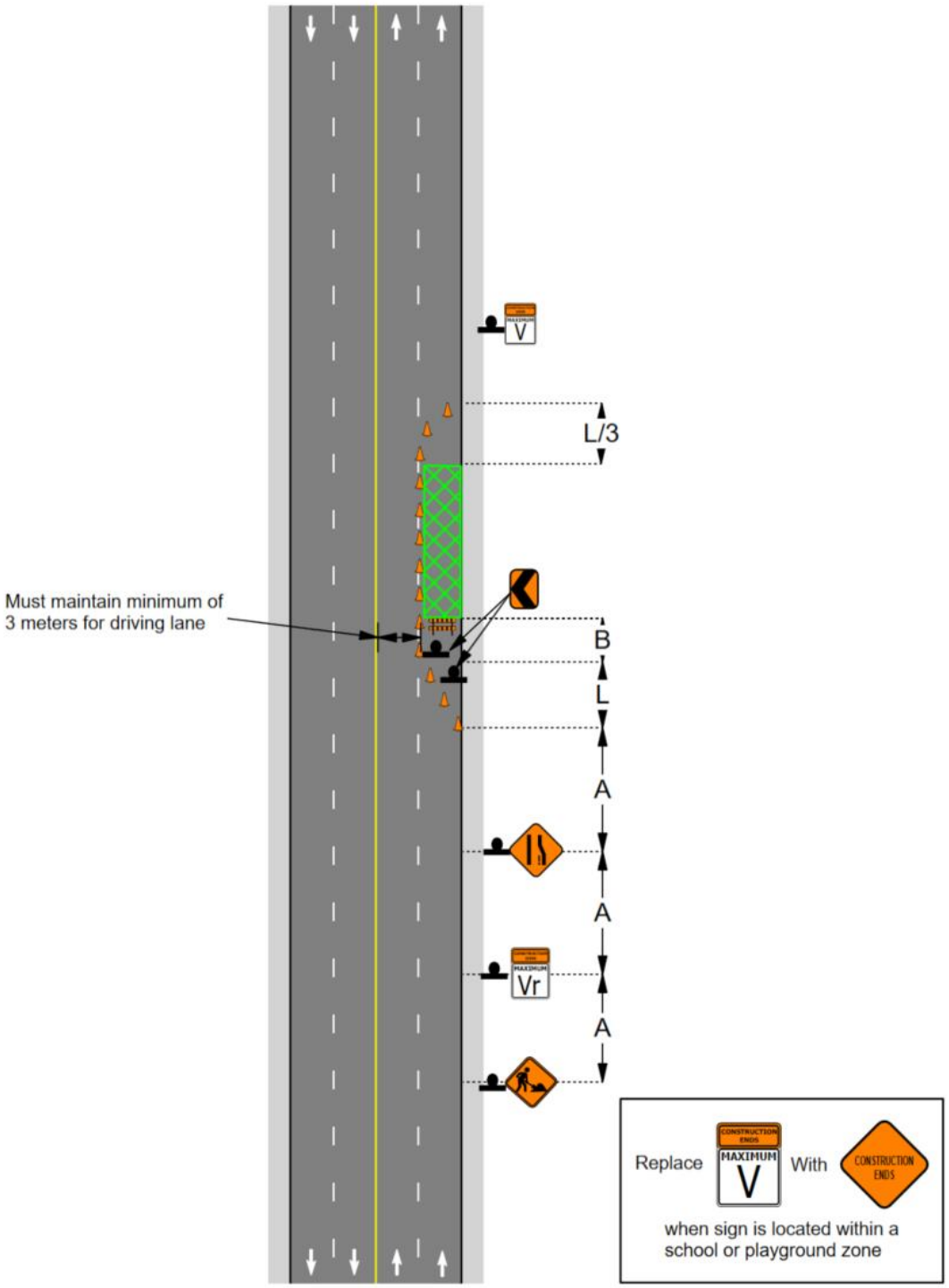
Drawing 3: Work on Shoulder



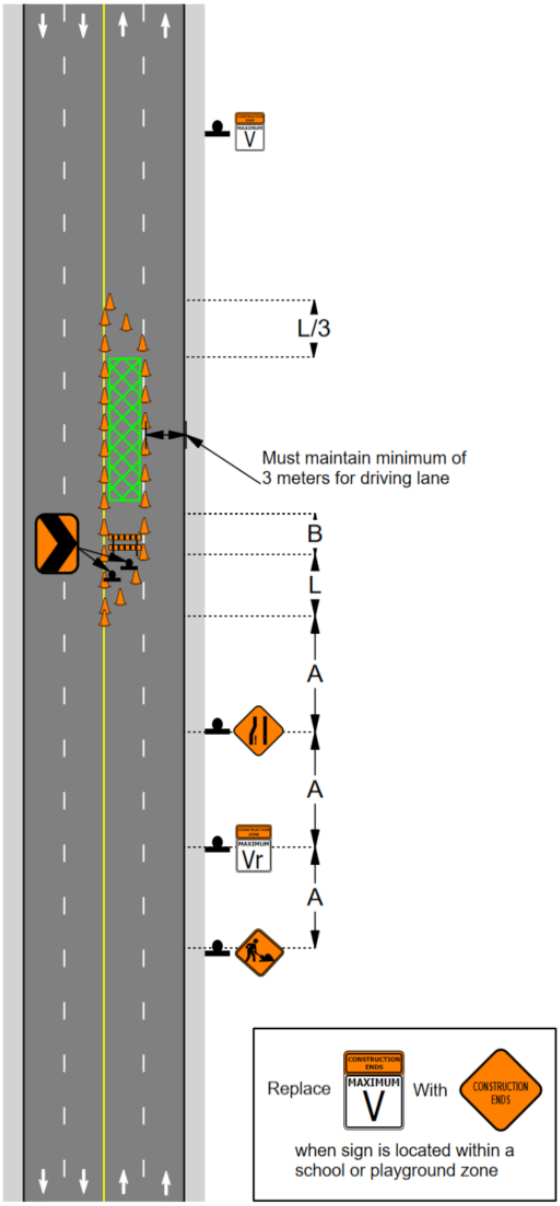
Drawing 4: Work on Edge of Roadway



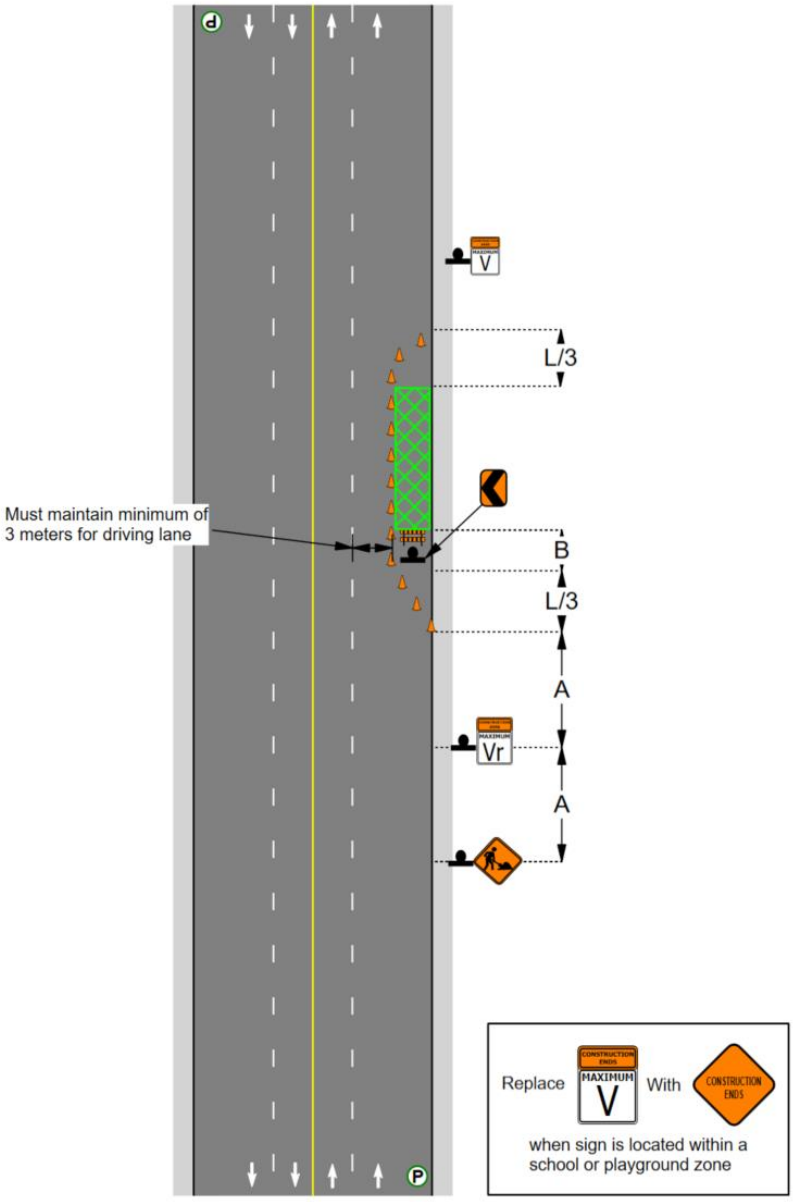
Drawing 5: Right Lane Closure



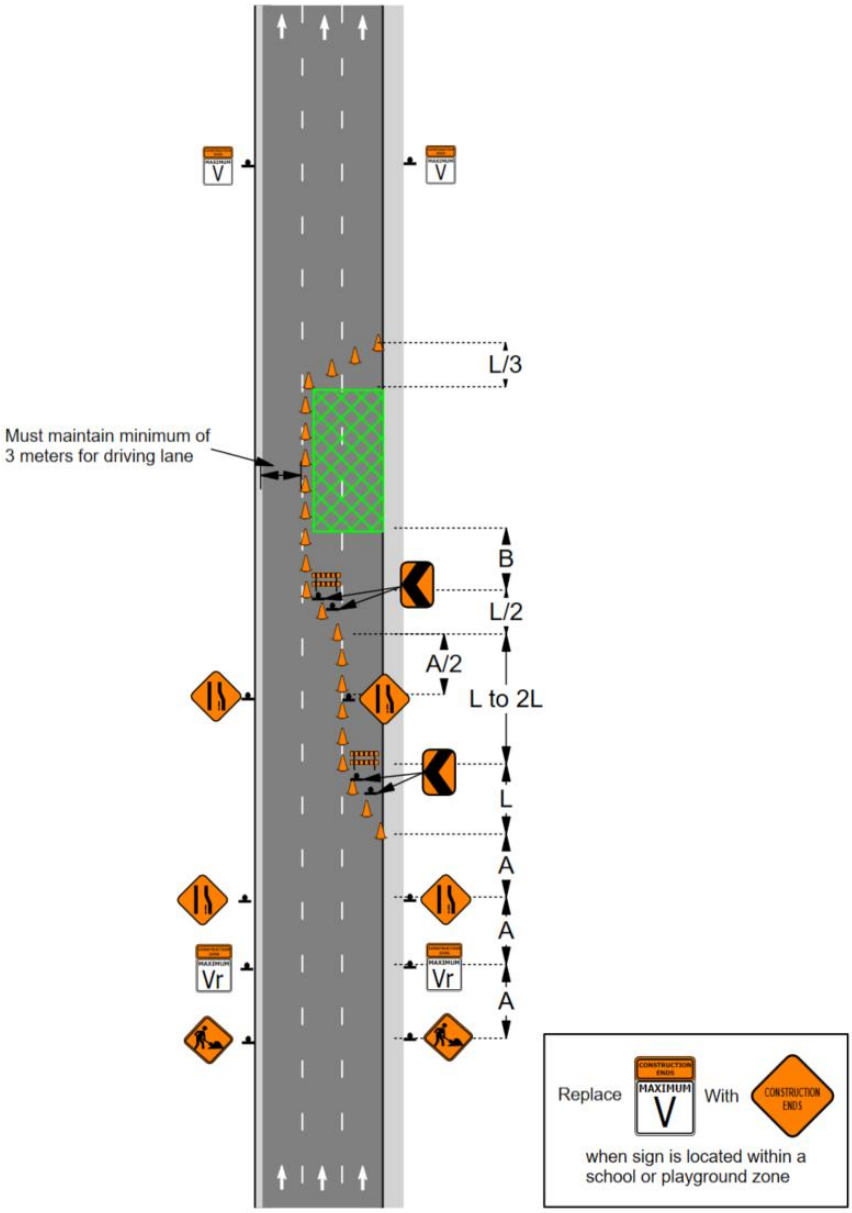
Drawing 6: Left Lane Closure



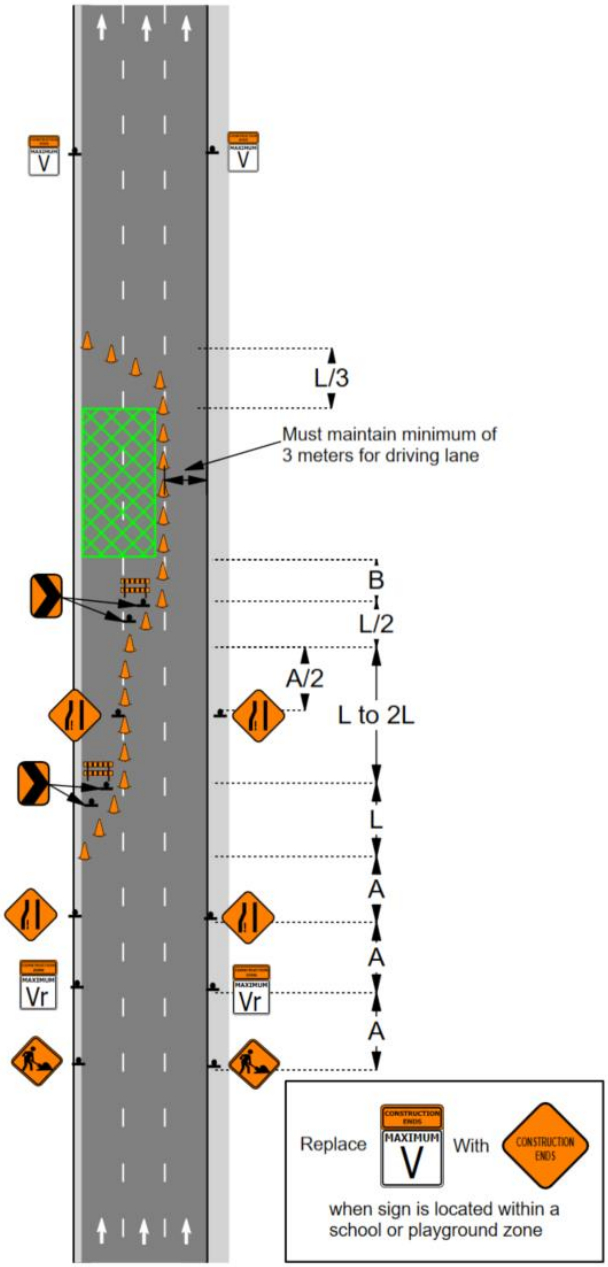
Drawing 7: Parking Lane Closure



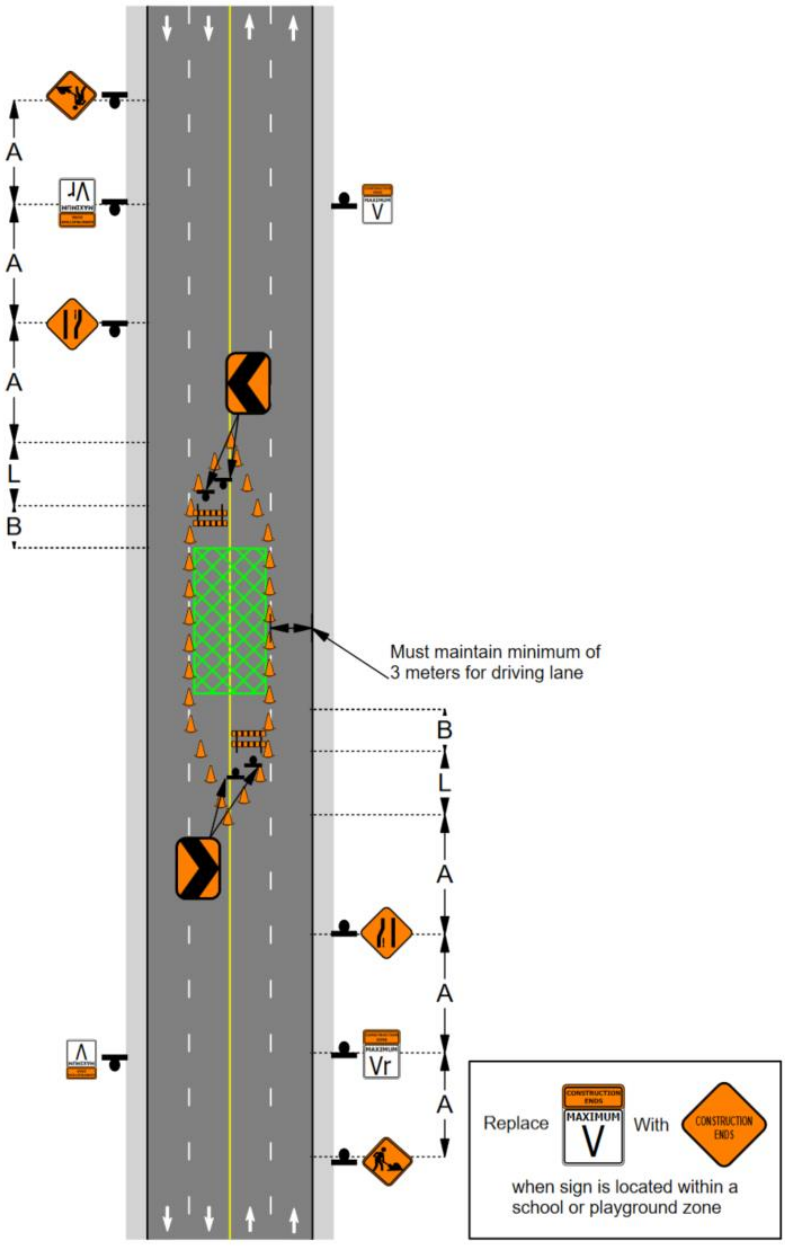
Drawing 8: Multiple Right Lane Closure



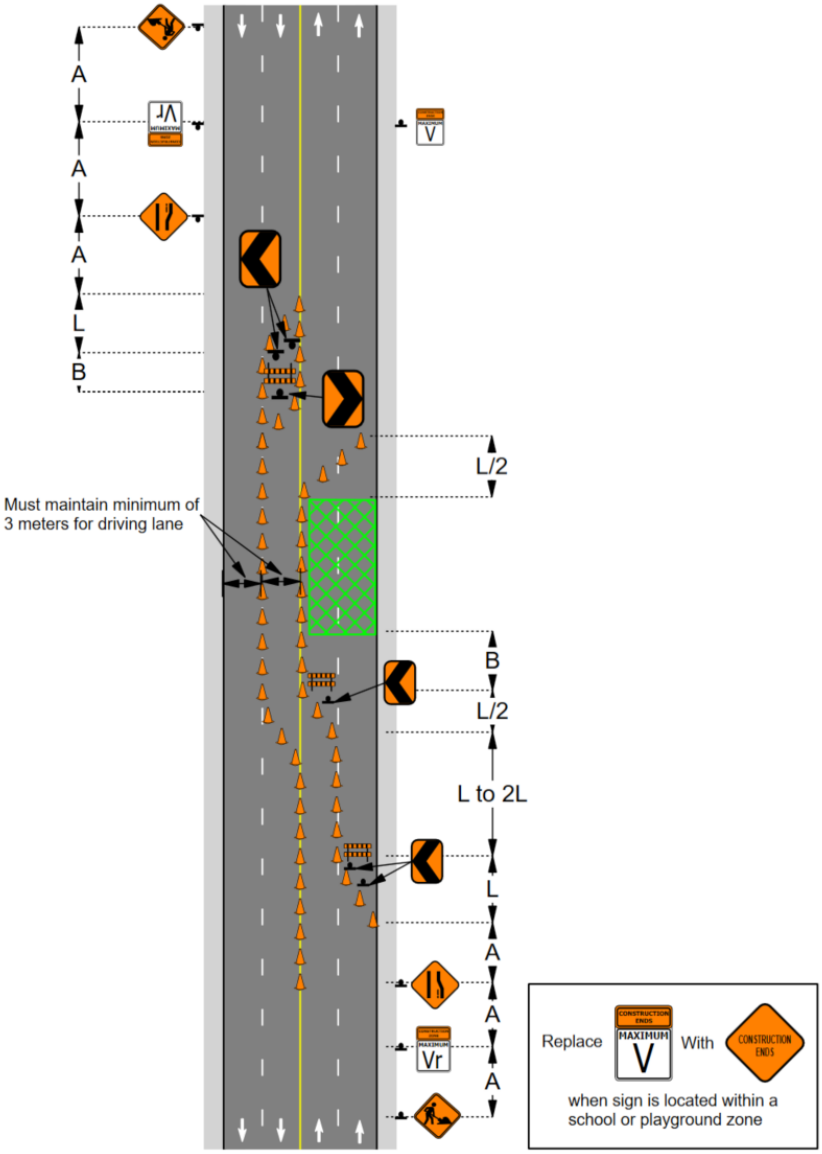
Drawing 9: Multiple Left Lane Closure



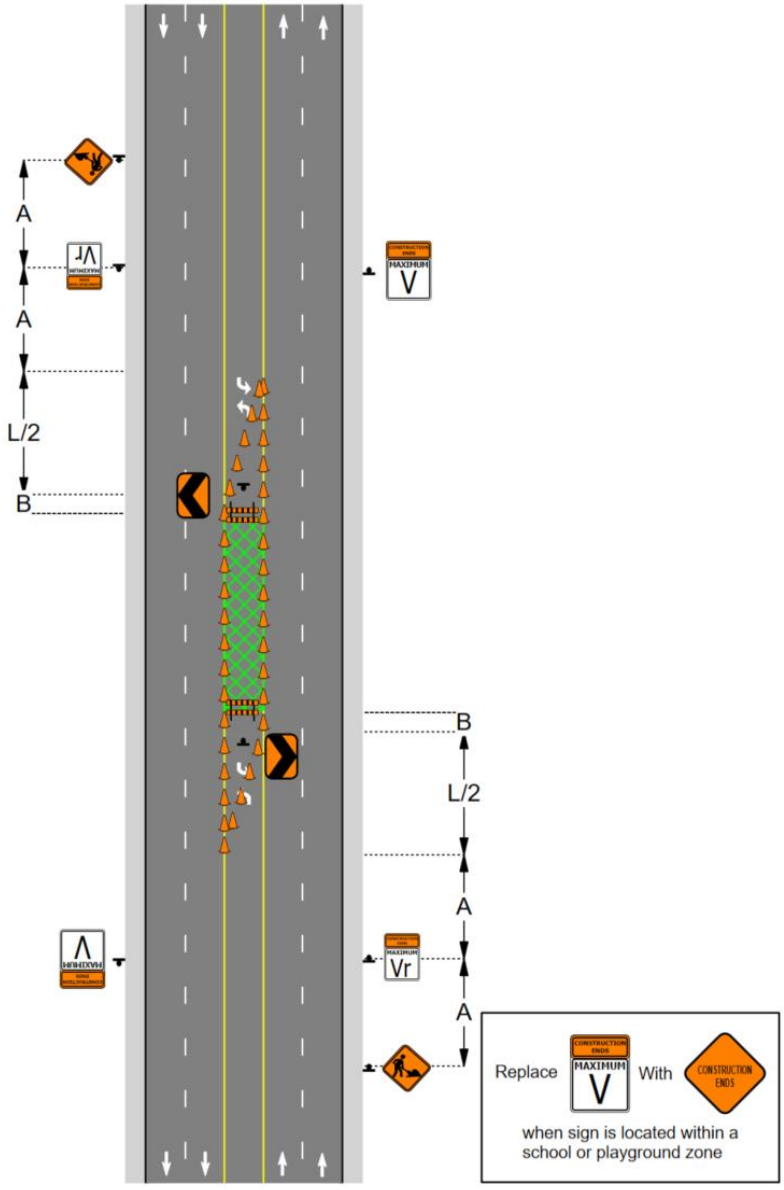
Drawing 10: Multiple Centre Lane Closure



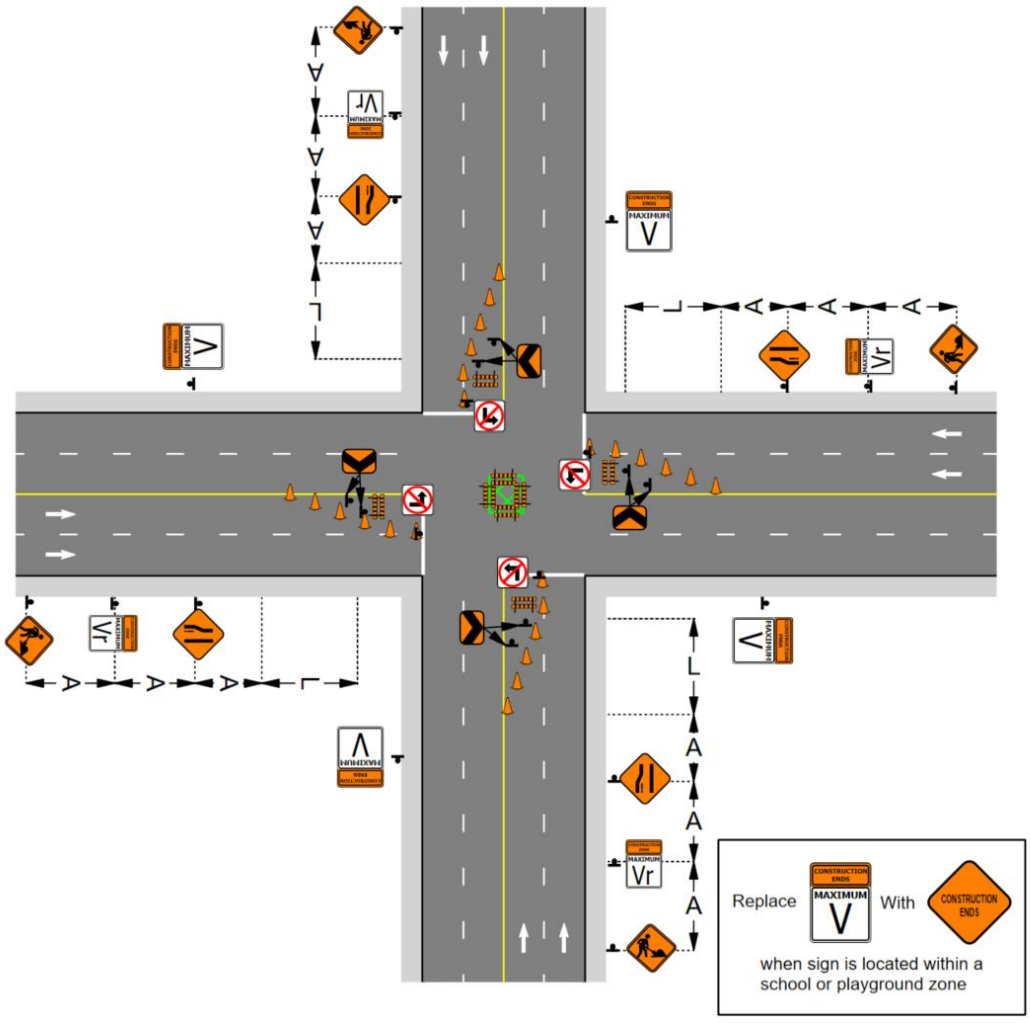
Drawing 11: Half Road Closure Two-way Traffic



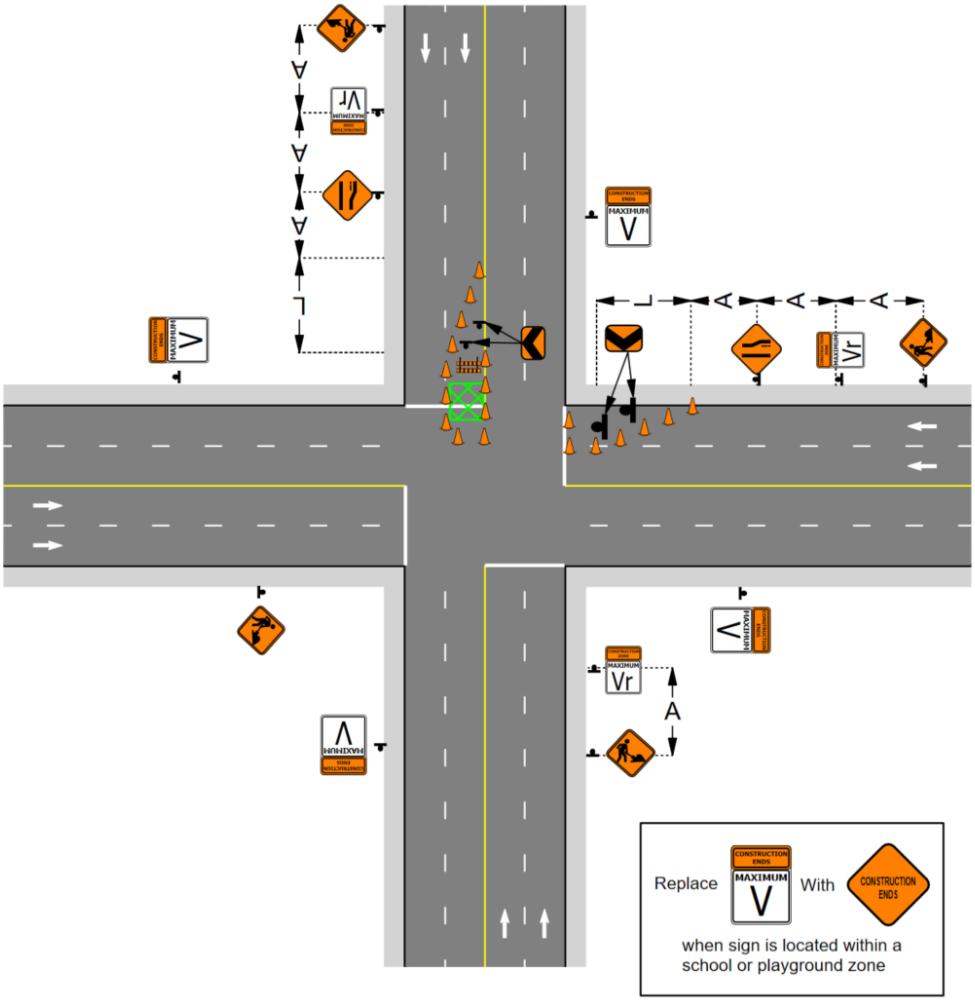
Drawing 12: Two Way Left Turn Lane Closure



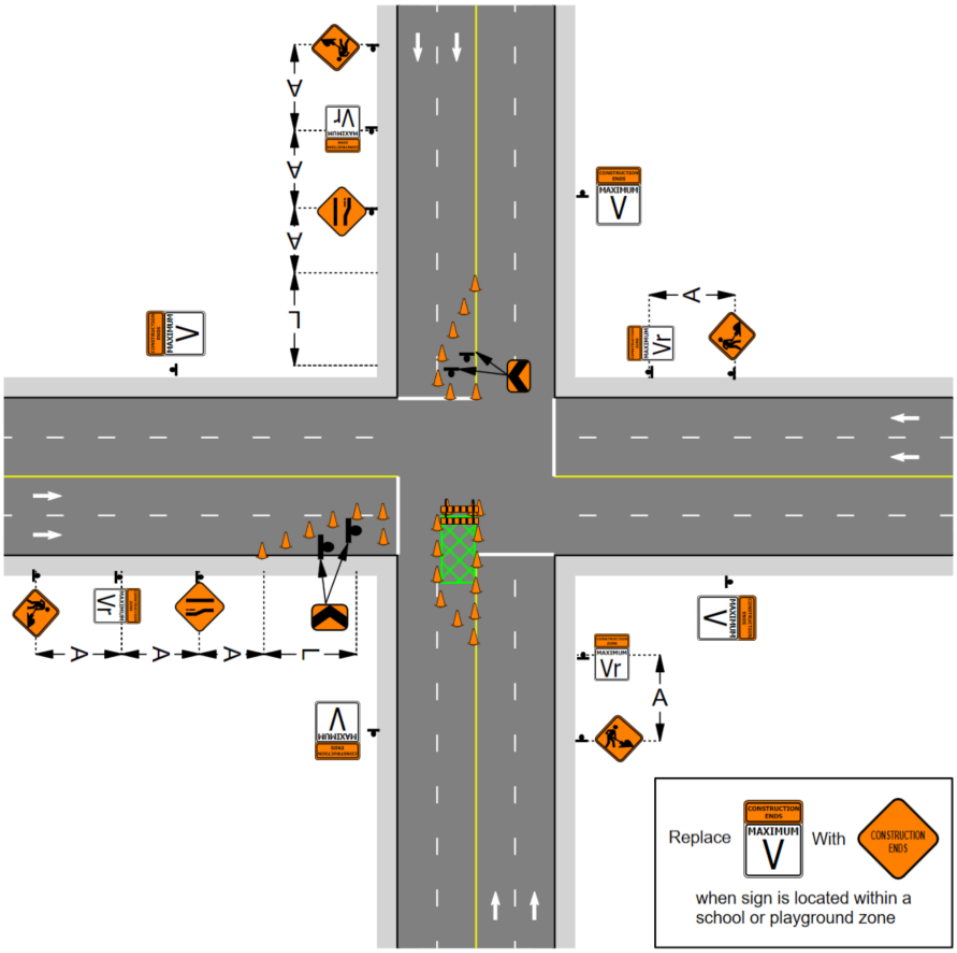
Drawing 13: Small Centre Intersection Restriction



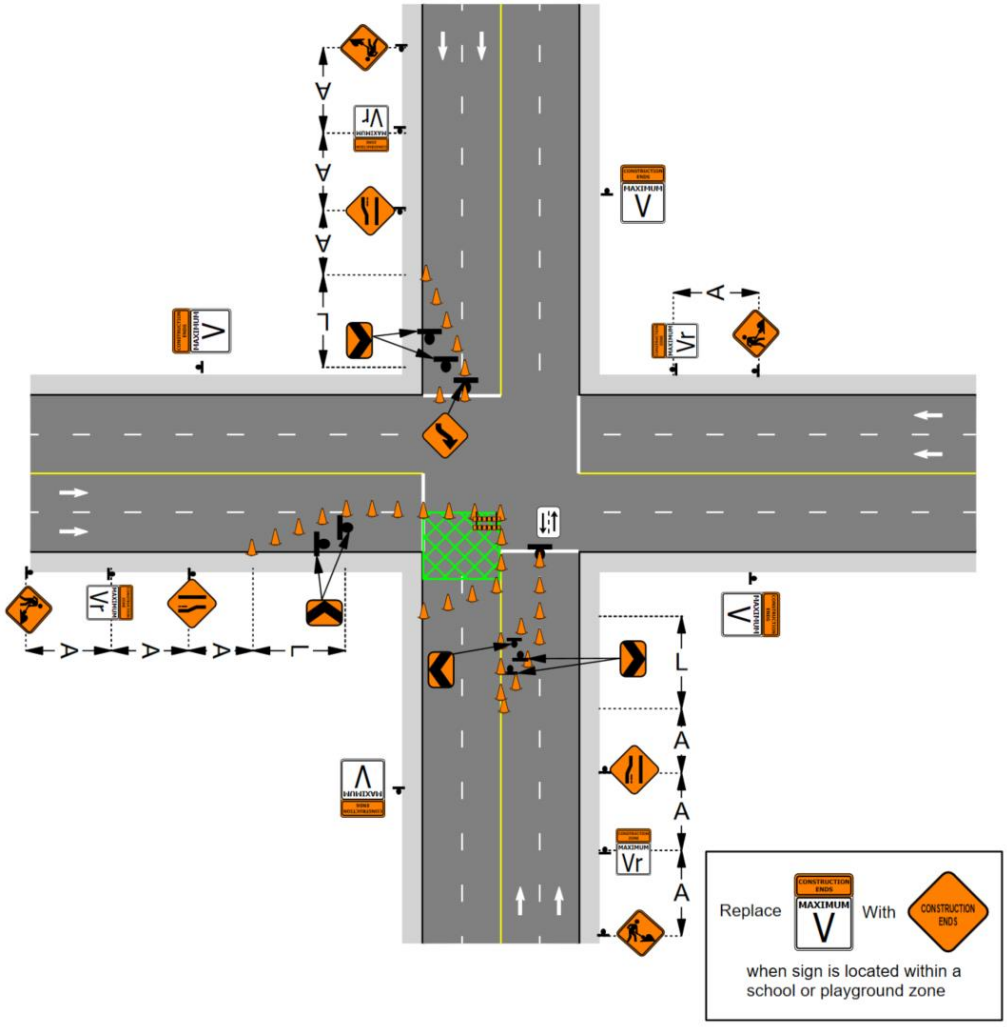
Drawing 14: Intersection Restriction Example 1



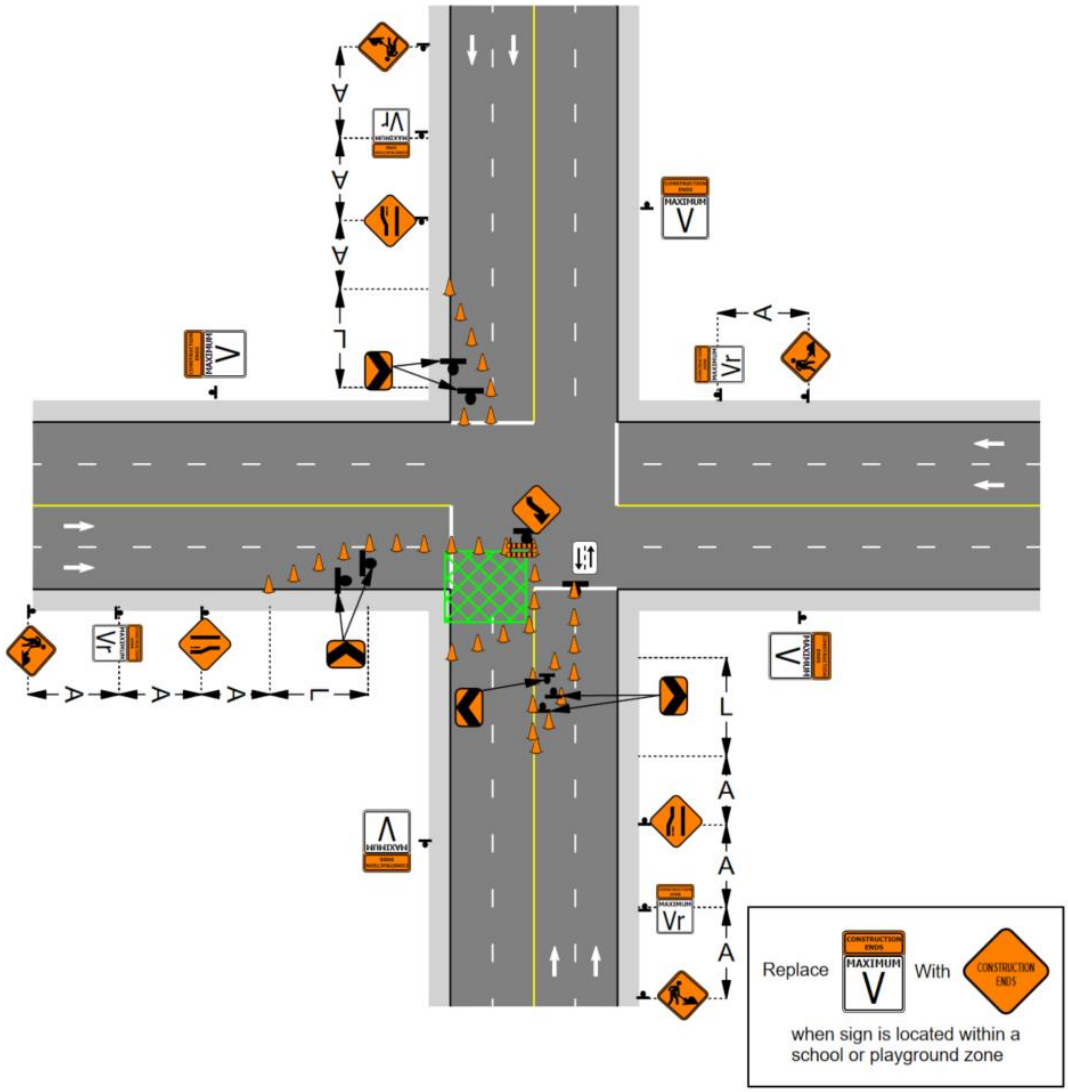
Drawing 15: Intersection Restriction Example 2



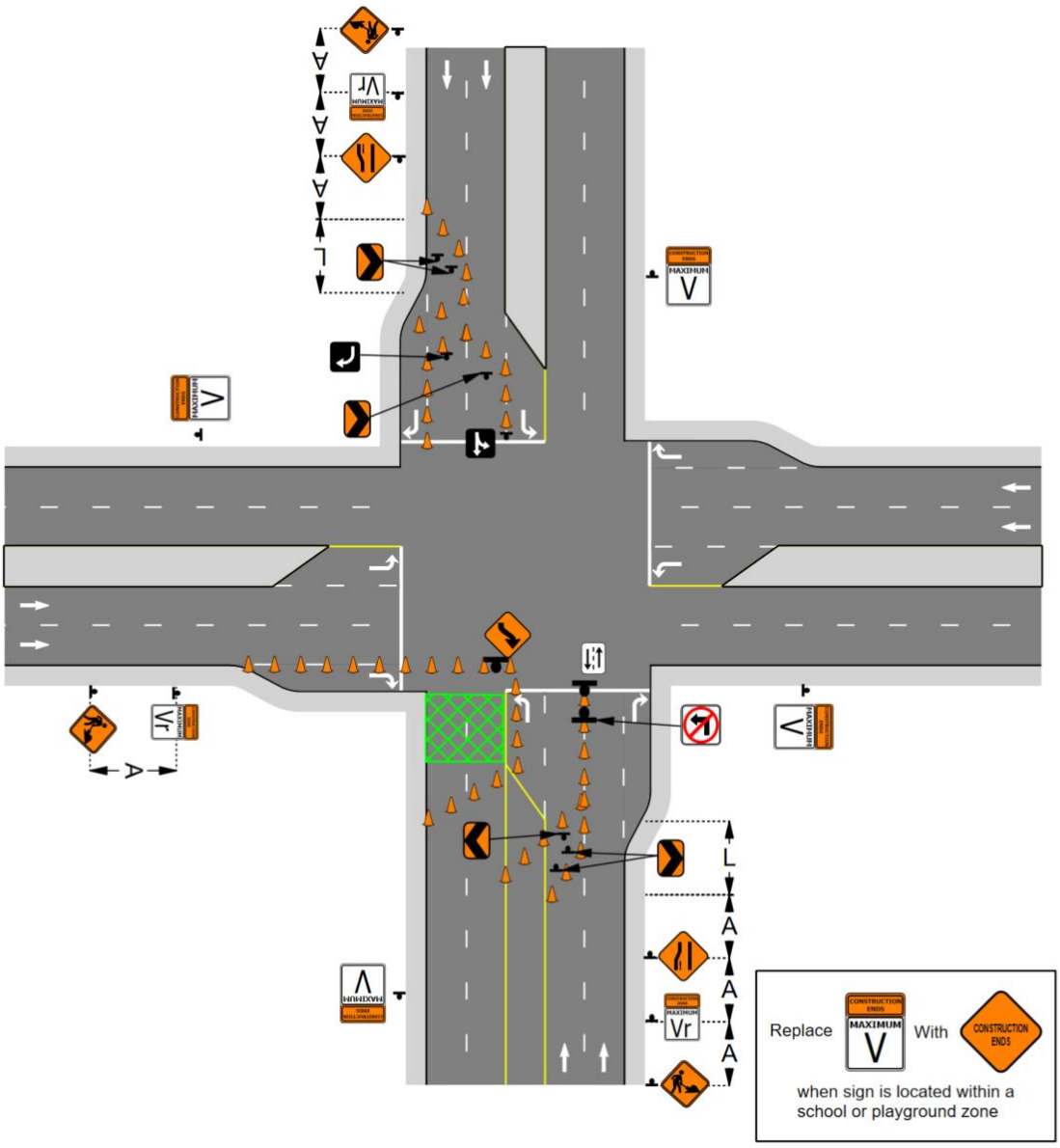
Drawing 16: Intersection Restriction Example 3



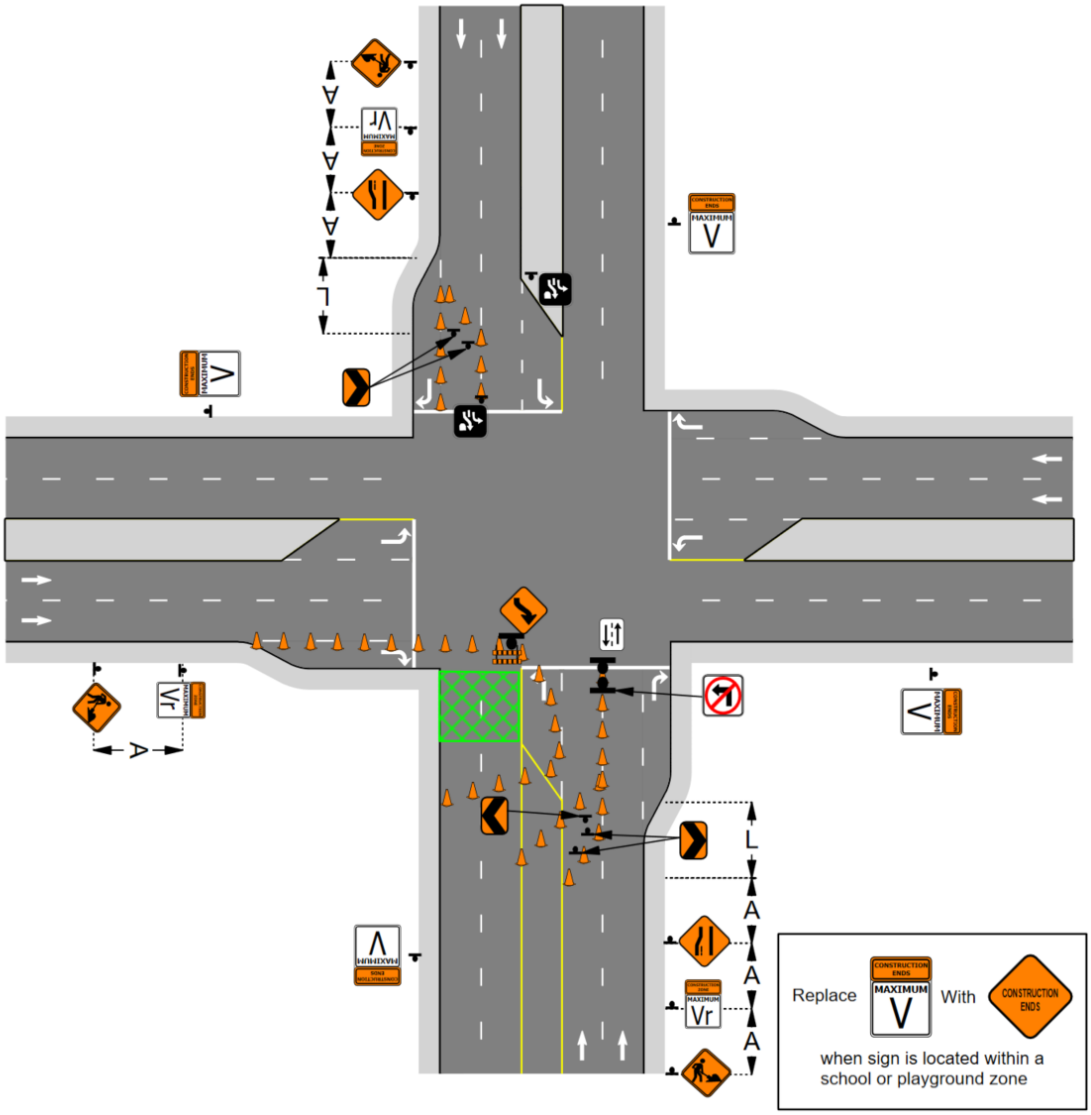
Drawing 17: Intersection Restriction Example 4



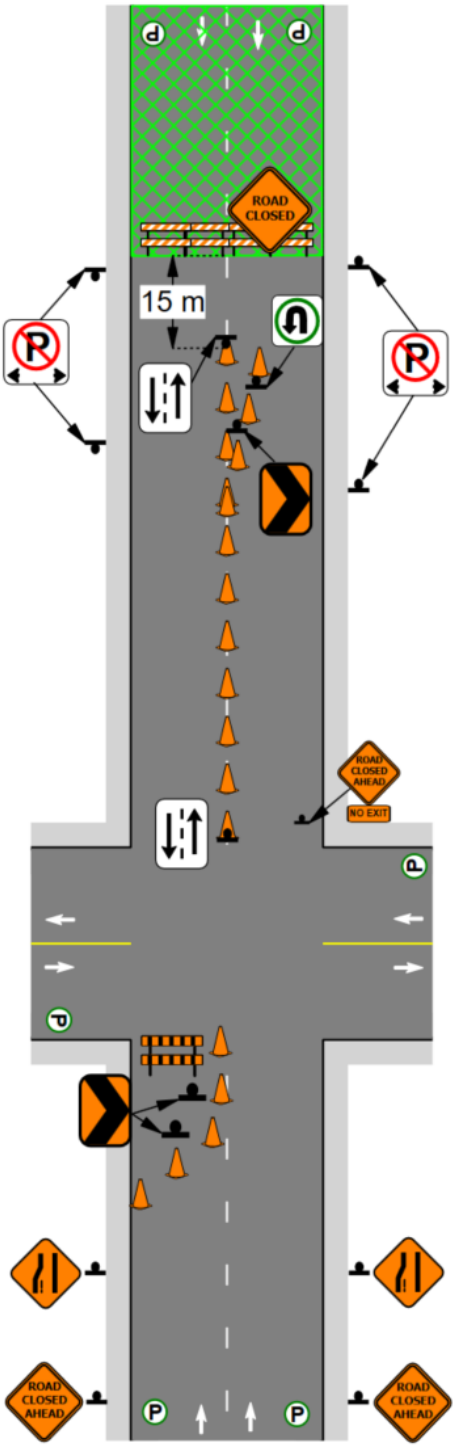
Drawing 18: intersection Restriction Example 5



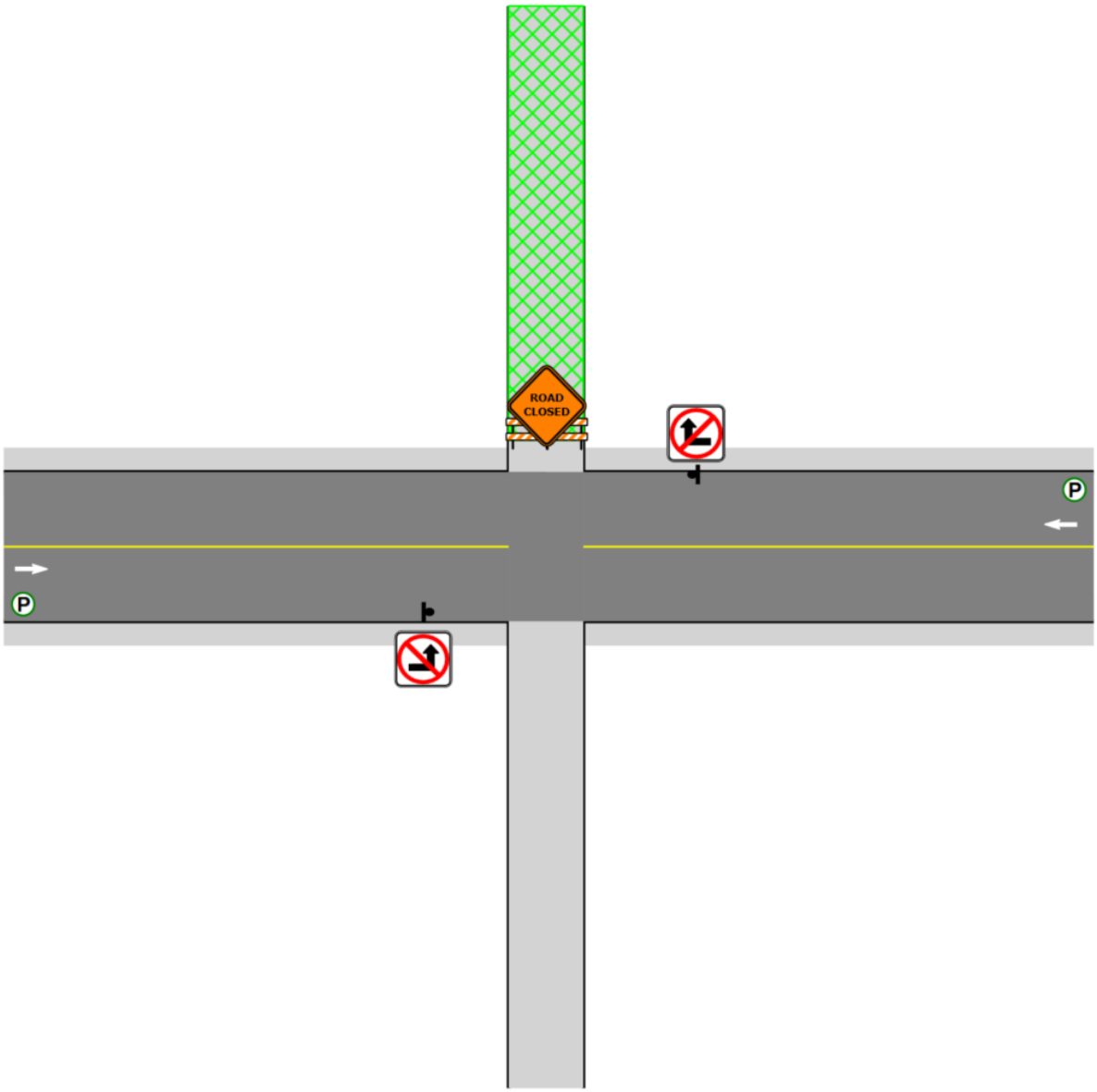
Drawing 19: Intersection Restriction Example 6



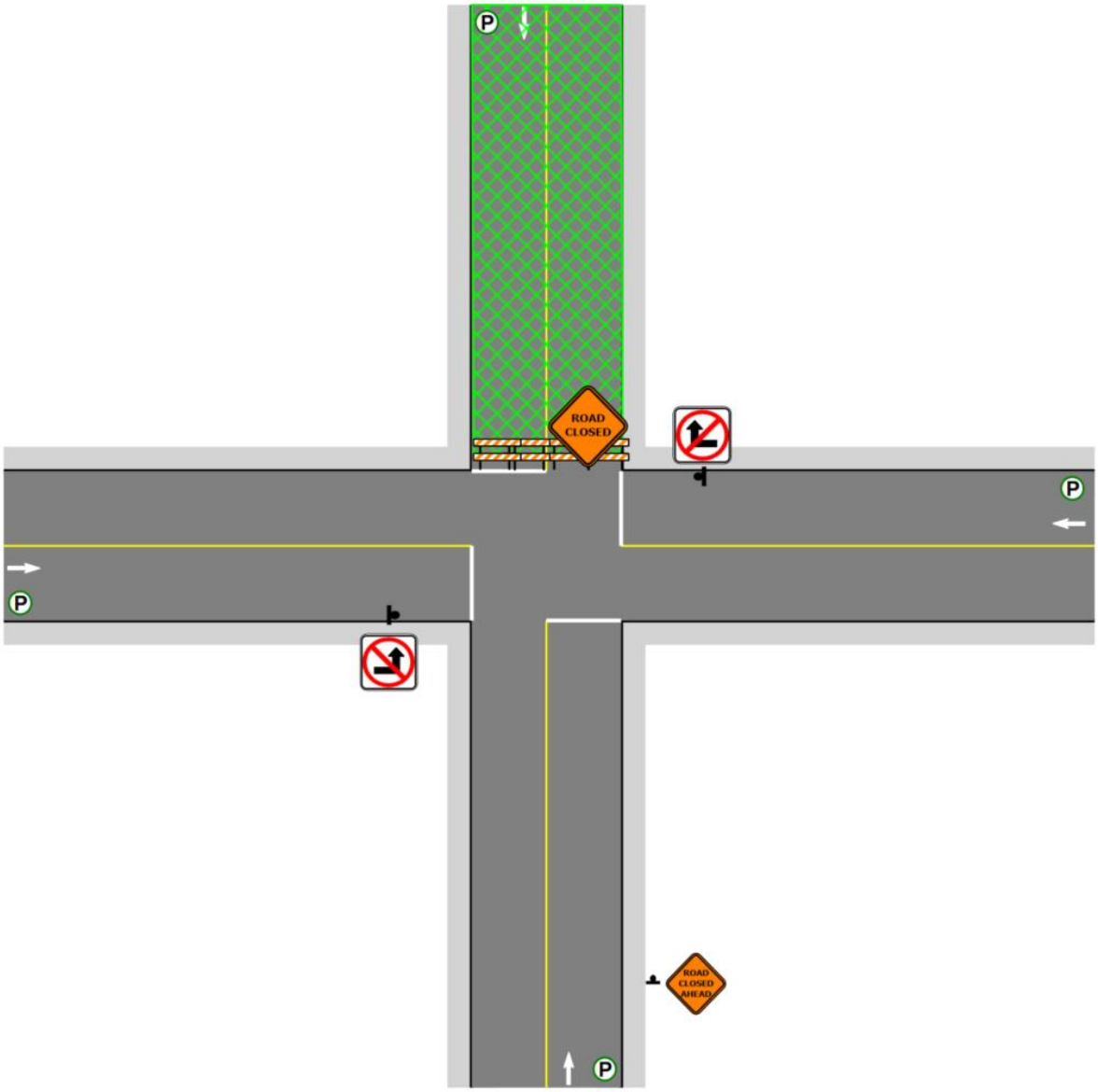
Drawing 20: One-way Conversion into Two-way



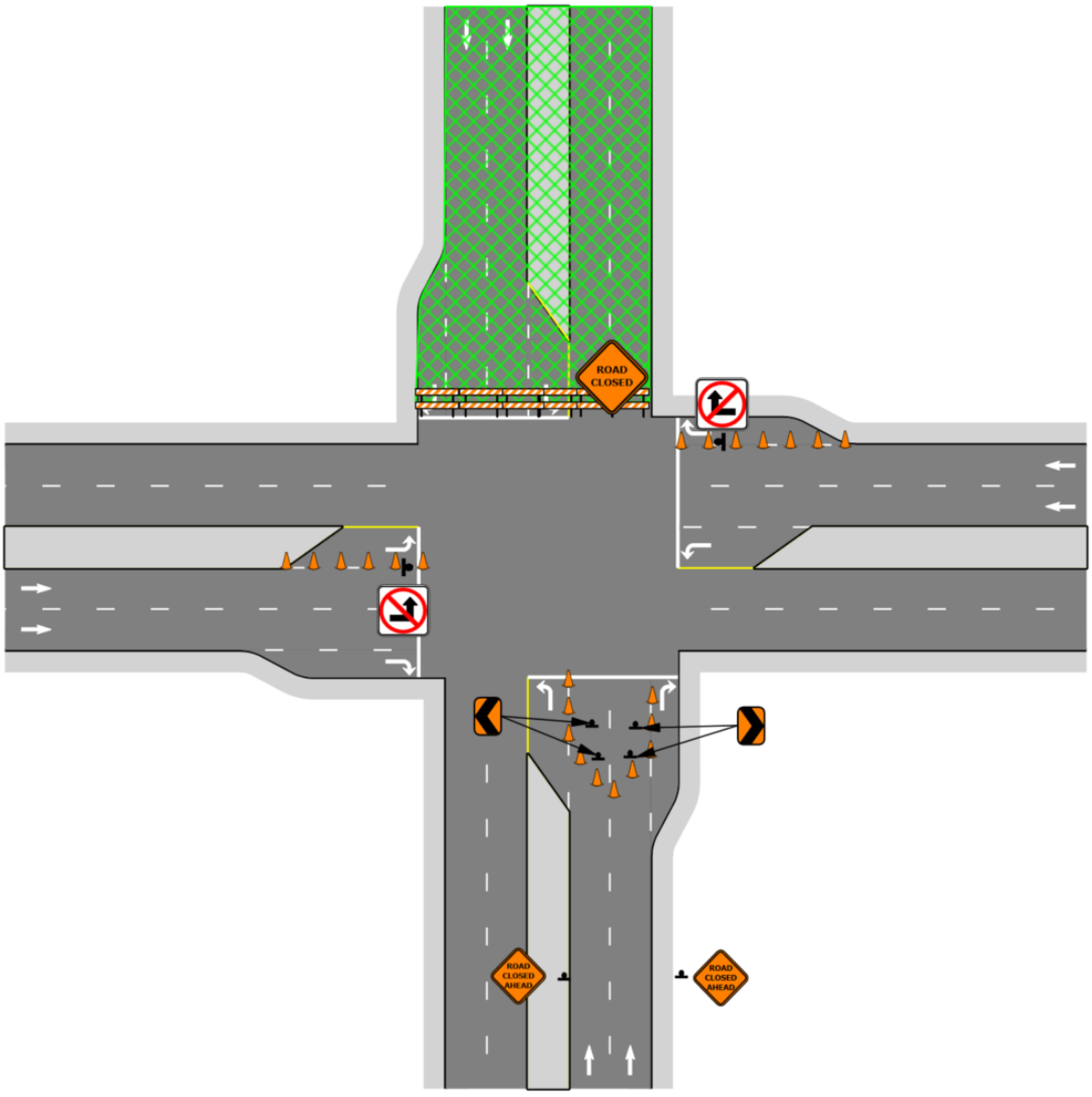
Drawing 21: Alley Closure



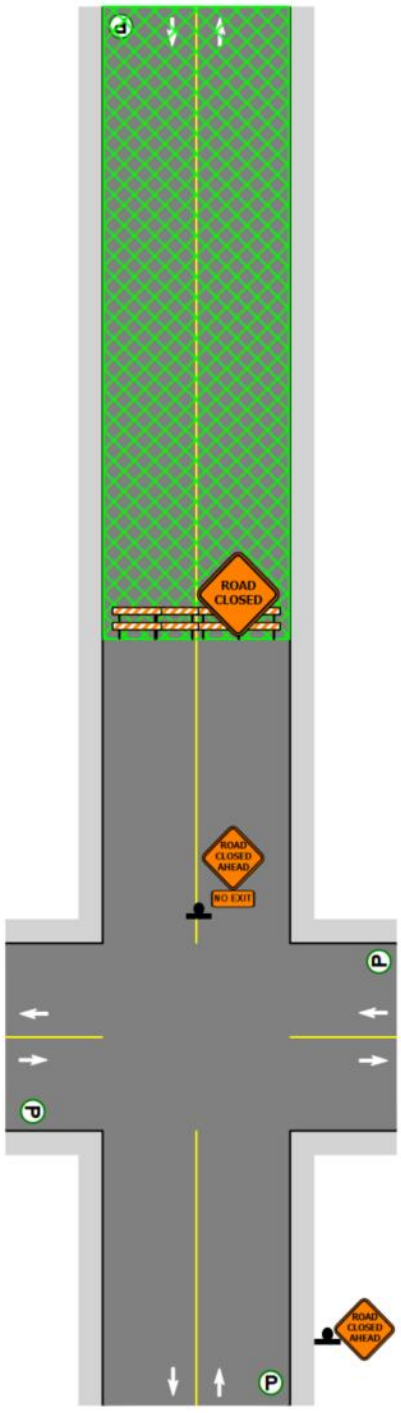
Drawing 22: Road Closure



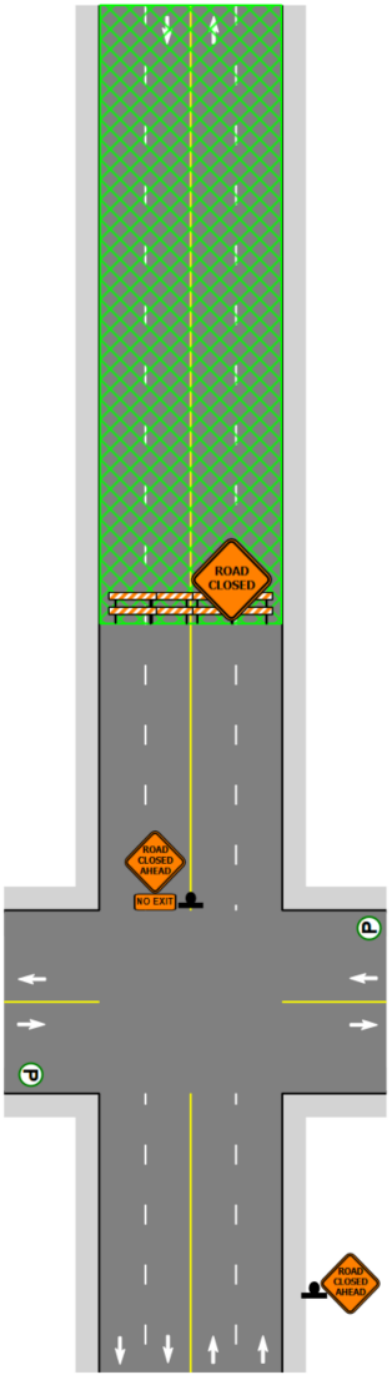
Drawing 23: Road Closure with Turn Bays



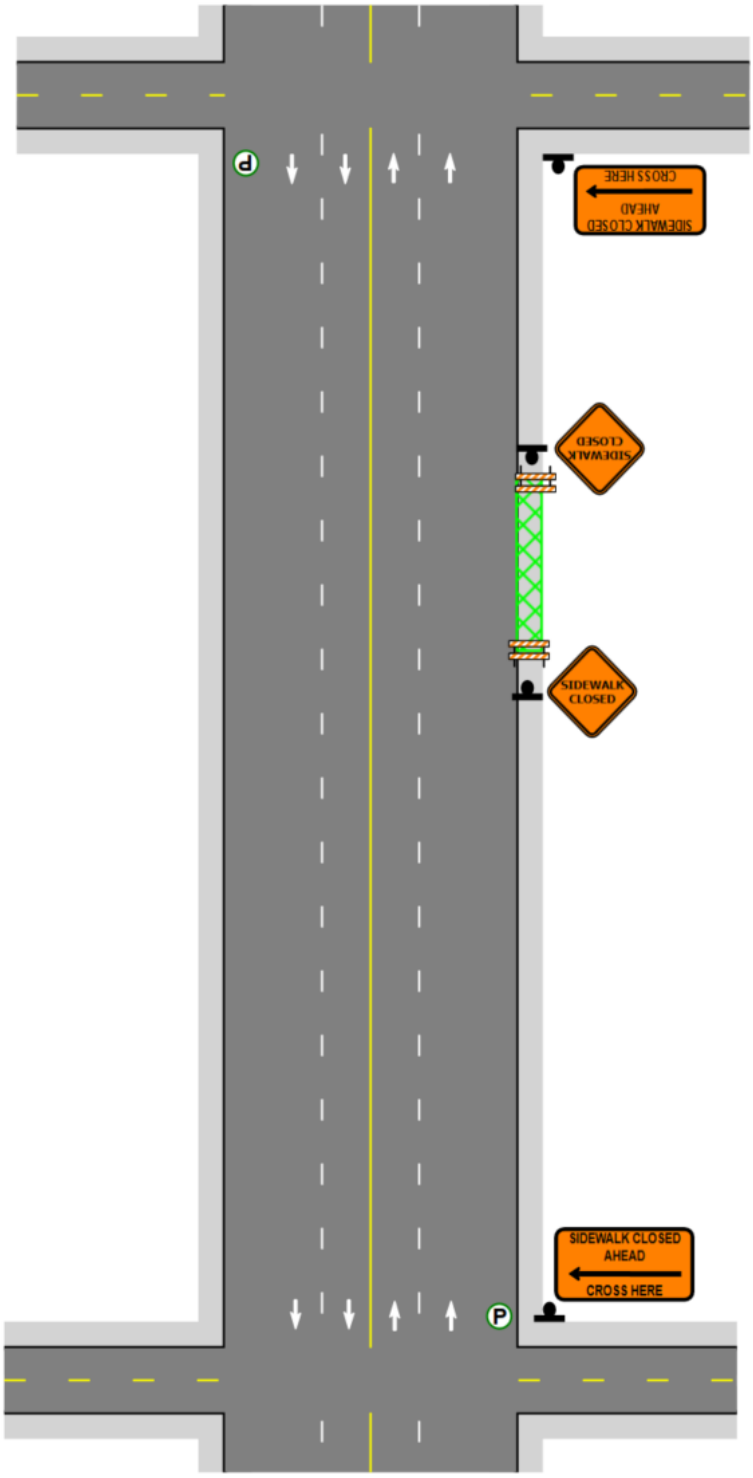
Drawing 24: Two Lane Midblock Closure



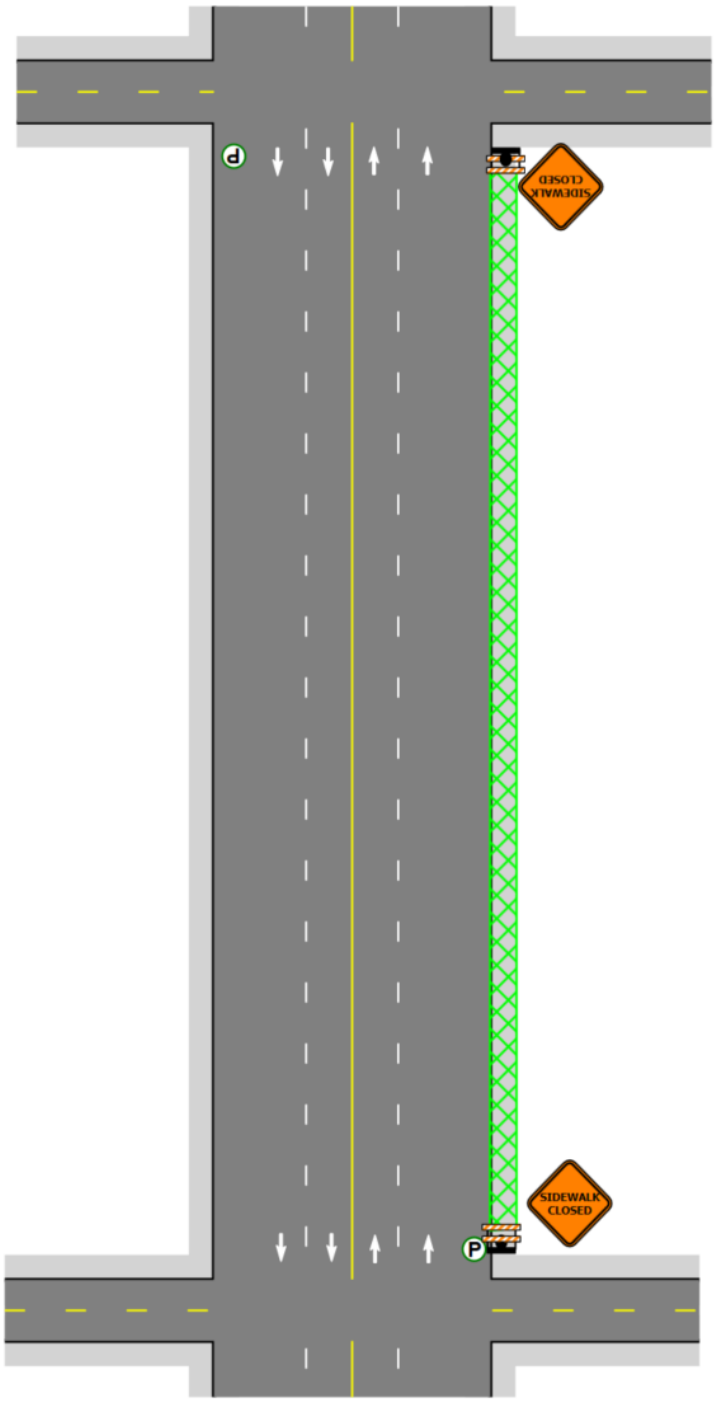
Drawing 25: Four Lane Midblock Closure



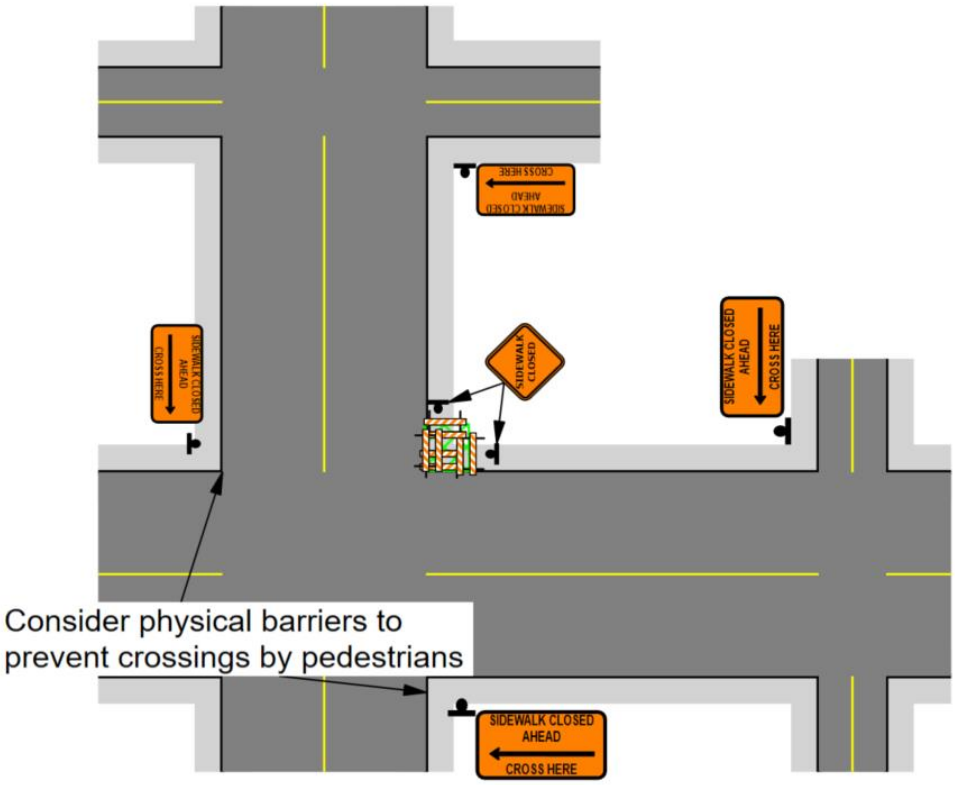
Drawing 26: Sidewalk Midblock Closure



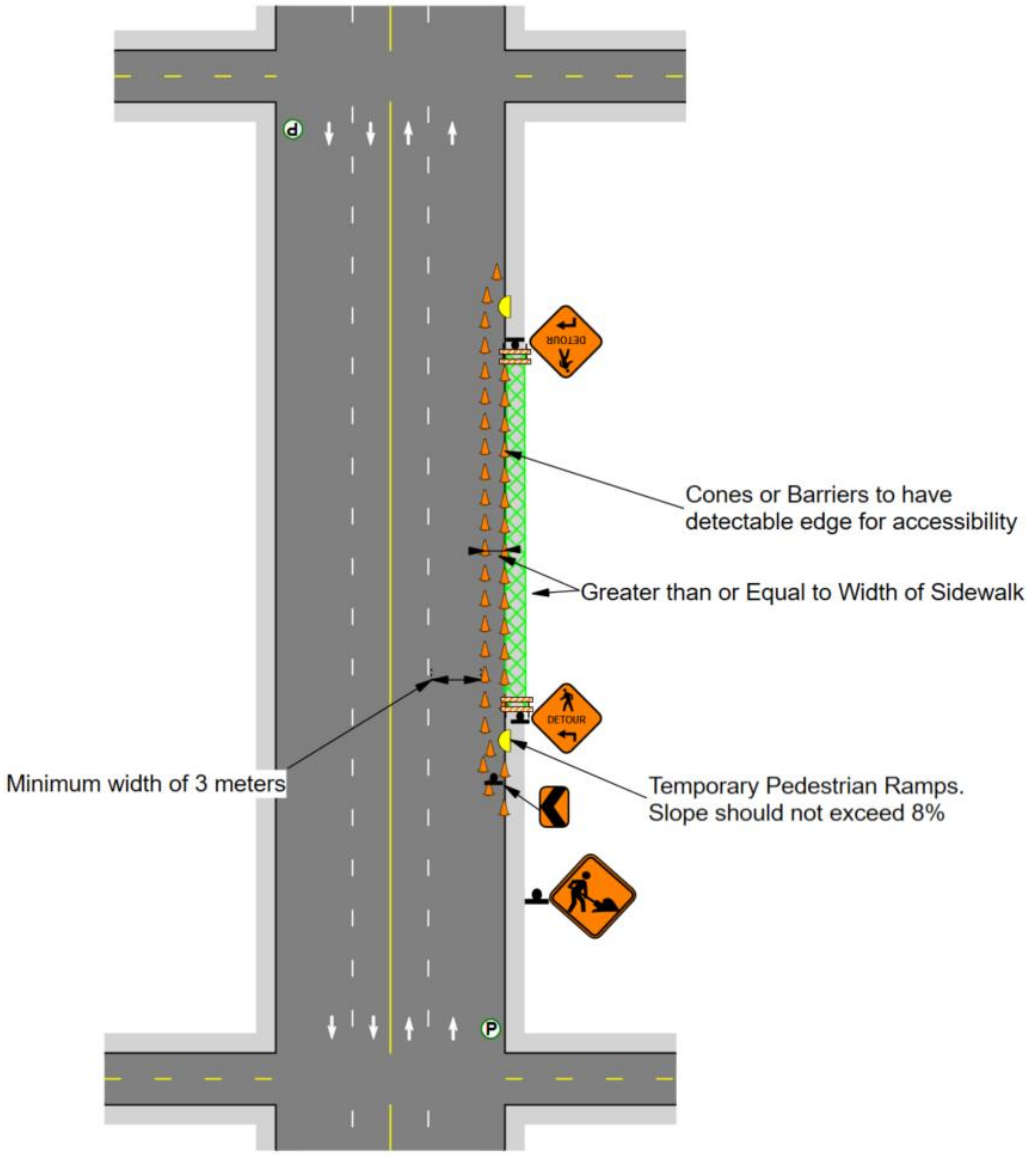
Drawing 27: Full Sidewalk Closure



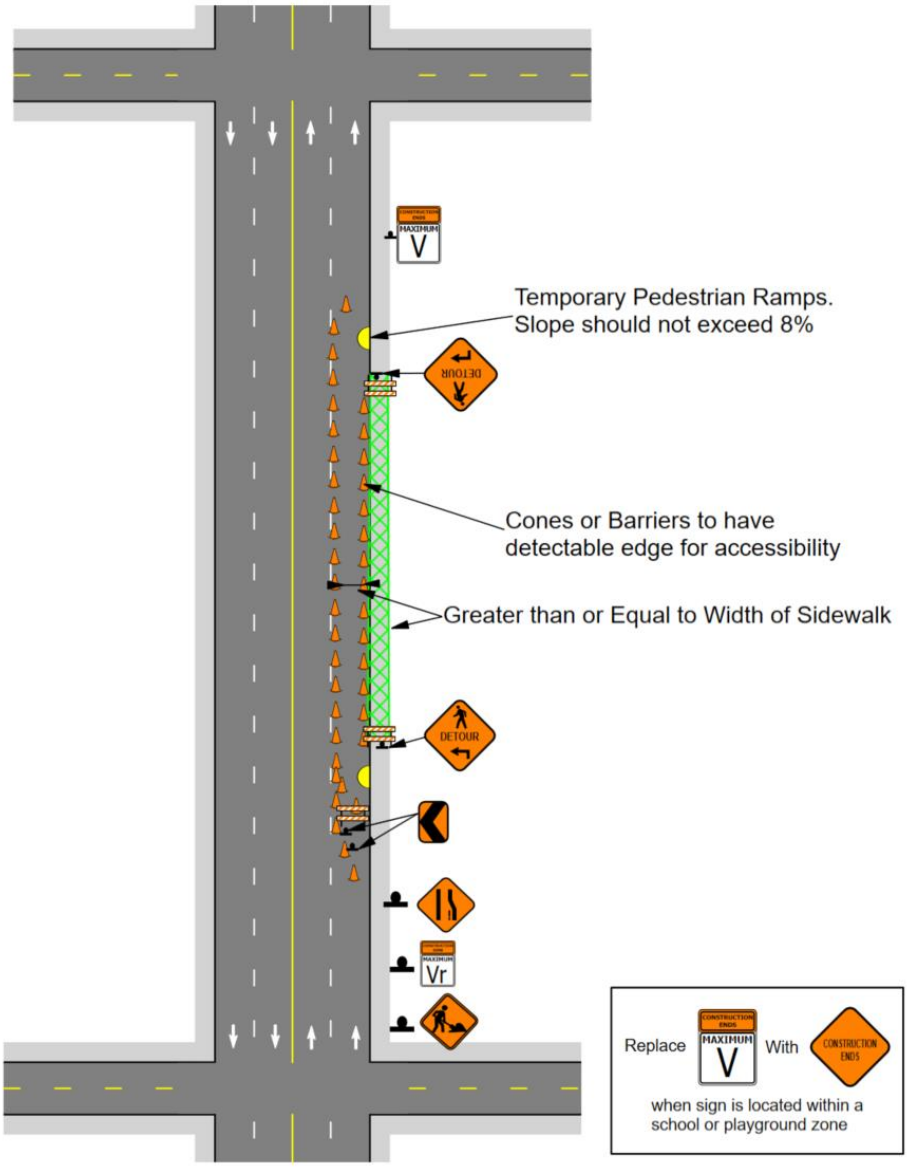
Drawing 28: Sidewalk Intersection Closure



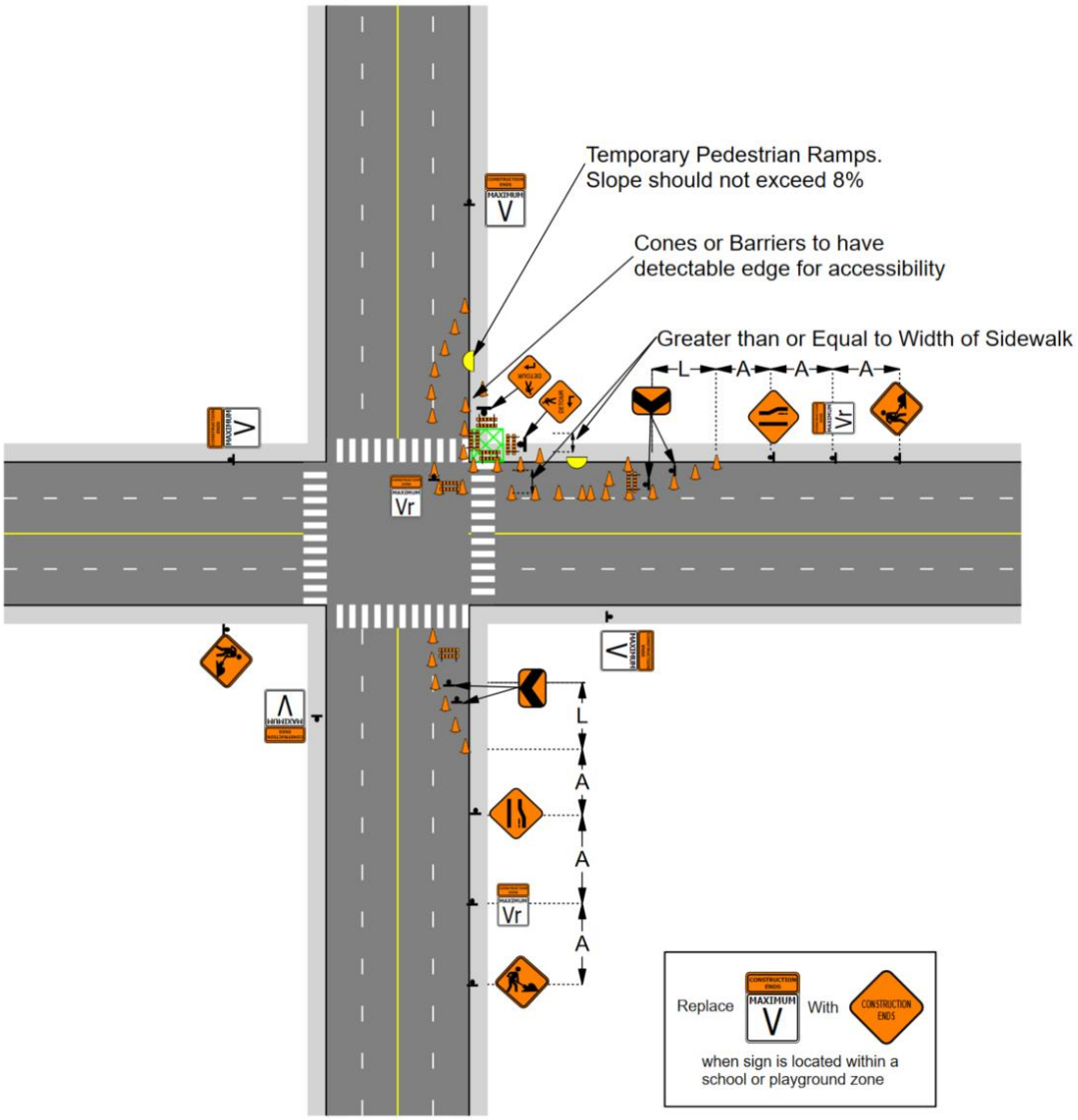
Drawing 29: Sidewalk Closure with Parking Lane Detour



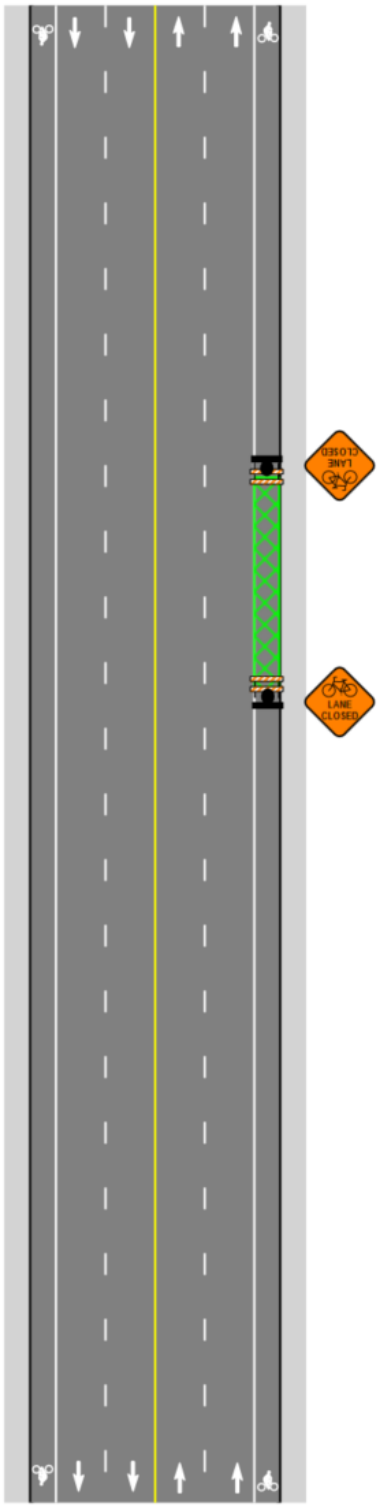
Drawing 30: Sidewalk Closure with Driving Lane Detour



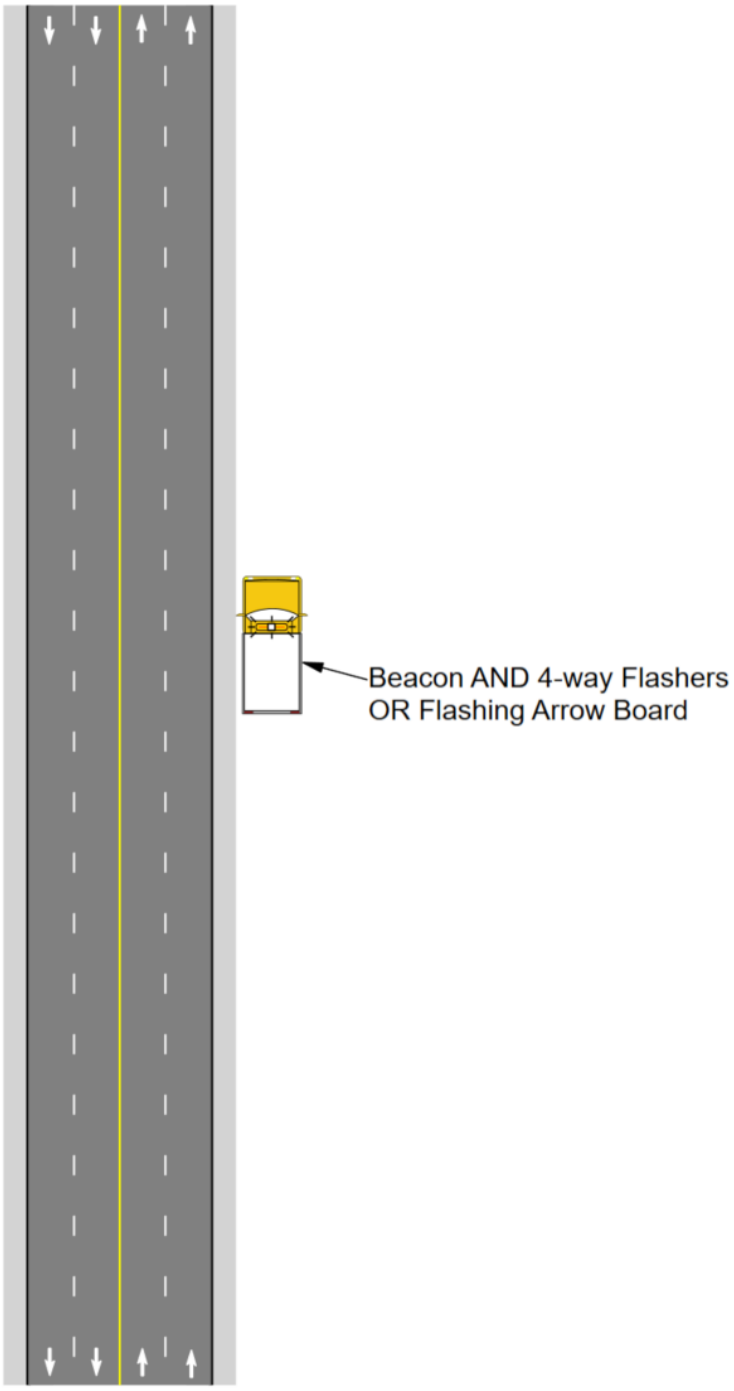
Drawing 31: Sidewalk Intersection Closure with Detour



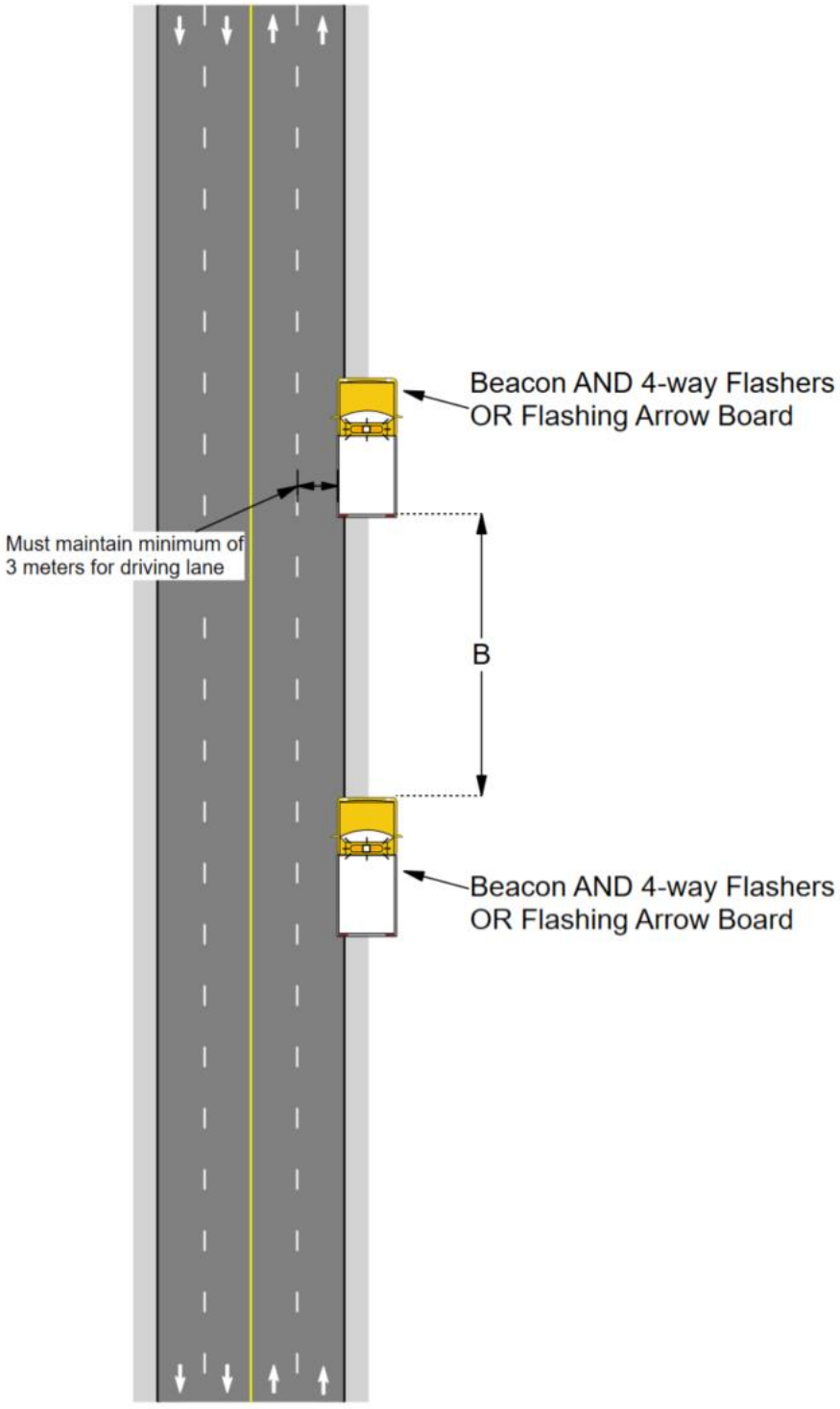
Drawing 32: Bicycle Lane Closure



Drawing 33: Mobile Restriction Adjacent to Roadway



Drawing 34: Mobile Restriction with Driving Lane Encroachment



Drawing 35: Mobile Lane Closure