Nova Scotia Temporary Workplace Traffic Control Manual 2009

NOVA SCOTIA

2012.06.01

Reference # 2012.06.01

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F O R E W O R D

New: 2012

The Nova Scotia Temporary Workplace Traffic Control Manual 2009, as published with reference number 2012.06.01, is approved for use on roads in Nova Scotia by the Minister of Transportation and Infrastructure Renewal. It sets minimum standards for construction, maintenance, and utility work on or by roads. The Manual is 'permissive' which means that permitted things are described. Things that are not stated or described in the Manual are not permitted (e.g. there is no permission to place advertising on signs or devices, therefore it is not permitted).

The Minister has chosen to 'publish' the Manual by making the current legal edition available on the Internet. The current legal edition is available linked from: www.gov.ns.ca/tran/tcm.

Copies of the Manual may be purchased on disk by contacting Service Nova Scotia and Municipal Relations using the following information:

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It is anticipated that the Manual will be revised periodically. When changes occur, the Minister will update the Web copy noted above. As soon as 'published' on the Web, the newer edition will become the current legal edition. The Department may not broadcast notifications of changes. It is therefore the sole responsibility of Manual users to check periodically to make sure they have the latest and legal edition.

The Department of Transportation and Infrastructure Renewal is eager to engage in a process of continual improvement. Those with Manual improvement suggestions may forward them to the Department by E-mail to: tcm@gov.ns.ca. Thank you in advance.

In the electronic version of the Manual numerous entries are 'linked' to information they relate to. For example, entries in tables of content link to the listed topic. Several entries where Application Guides are mentioned, link to the table of contents page for these Application Guides. Standards listed in a table at the front of Section 13.3 link to the page where the standard is written. Use a left mouse click over an item to navigate to the information of interest.

Summary of the 2012.06.01 Revisions to the
Temporary Workplace Traffic Control Manual 2009

The 2012.06.01 changes in the 2009 Manual reflect the input of stakeholders who have recommended improvements.

This symbol draws attention to a Manual entry that has either been added or amended. The year adjusted symbol is added when changes are published, and will be removed at the next instance of publishing the Manual. Where substantial changes have been made to an entry the symbol has been placed at the top of the page or beside the heading for the entry. Where change is localized, the symbol may be placed close to the actual change. Where changes are in an Application Guide the symbol has been placed toward the top right hand side of the page. It should be noted that the symbol has not been used in every instance of change, instead it is used only for significant changes.

The Manual pages containing changes to standards or significant content changes, have had the page footer updated to "2012" to differentiate them from earlier versions of the Manual. Where in the opinion of the Department, changes made in 2012 were minor (no change to standards, or very minor changes to content), the footer has not been changed. As always, the complete and current edition of the Manual is the one the Minister has published on the Web, as explained earlier in this foreword.

A list of new entries and information that has changed is printed below. Editorial changes that don't affect standards, or minor changes made for clarifications may not be listed but may be marked within the Manual.

Throughout the Manual, all "**New: 2010**" symbols have been removed. This is a housekeeping item, therefore a log of pages affected is not included.

Manual Cover

The new Manual publication reference number appears on the outside cover (2012.06.01).

Inside Front Cover

This page shows the new publication reference number 2012.06.01. This may be used to verify that you have the latest published edition of the Manual.

Foreword (this foreword)

The foreword has been rewritten. It contains the changes made with the 2012.06.01 Manual publication.

The FOREWORD has had text added explaining that, unless a permission is specified in the Manual, permission is not granted. This is not a change; the text clarifies the Department's longstanding approach.

Changes to Section D (definitions)

A new definition has been added for **AASHTO.** AASHTO is the designation of the American Association of State Highway and Transportation Officials. Page affected: D-1.

A new definition has been added for **"Climbing Lane."** It is a lane added, usually on an upgrade section of road, to accommodate vehicles traveling at different speeds. Page affected: D-1.

A new definition has been added for "**Department of Labour** or in context **Labour**". The Department of Labour and Workforce Development has changed its name to the Department of Labour and Advanced Education; the new definition will make future Manual edits easier. Pages affected: D-2, 2-1, 12-3, 13-3.

The definitions for **Downstream** and **Upstream** have been modified by the addition of the word "many". This clarifies that not all Application Guides show the Downstream direction toward the top of the page. The new definition takes into account Application Guides at intersections where the traffic flow is shown as crossing the page instead of flowing from the bottom to the top. Page affected: D-2.

A new definition has been added for "**Elevated Work Platform**". The definition replaces the term "scaffolding" and has a broader meaning. Pages affected: D-2, 9-14, Application Guides A 65, A 66, and B 65**.**

A new definition has been added for **FHWA.** FHWA is the designation of the US Department of Transportation Federal Highway Administration. Page affected: D-2.

A new definition has been added for **MASH.** MASH is the acronym for the Manual for Assessing Safety Hardware which is administered by the American Association of State Highway and Transportation Officials. MASH standards affect devices like truck mounted attenuators, stationary attenuators and F-shape barriers. Page affected: D-3, D-5, 9-13, 9-14, 9-17, 9-18.

A new definition for **Mechanized Work** has been added. It is work performed from on, or from within a Work Vehicle; the vehicle provides a measure of worker protection. Page affected: D-3.

The definition for "**Shall**" has been removed; it has been replaced by "**Must**".

The three methods for erecting signs have been consolidated under one term and now appear together under the definition '**sign support**'. The three types are low mount portable, high mount portable, and post mount. Page affected: D-4.

Changes to Section 2

The Department of Labour and Workforce Development has changed its name to the Department of Labour and Advanced Education. Page affected 2-1.

Changes to Section 5

Figure 5.1 has been updated to make reference to the "Traffic Control Person Zone" and the "Temporary Workplace". Both definitions are in section "D", but previously didn't appear on this drawing.

Changes to Section 8

A statement requiring continuing effectiveness for signs has been added at the front of Section 8. Page affected: 8-1.

The minimum level of reflectivity for white sheeting used on temporary condition warning signs has been set to ASTM Type I (Engineer Grade). A Sunset clause is in effect until 2014.12.31. Page affected: 8-1.

The sign series TC-11 Detours has been expanded by adding a R 45^0, a L 45^0, and 90^0 left and right signs suitable for barricade mounting. Sign sizes have been amended to align with conventions for other signs on Streets and Highways. Various barricade and Application Guide drawings have been adjusted using the new signs. Pages affected: 8-9. 9-11, Application Guides A 77, A 78, B 77, C 77, C 114, C 119, C 139.

A new TC-11E, Detour Ends sign has been added to the detour signing set. The current detour "ENDS" sign (TC-12S) will continue to be used on TC-64B non-directional Heavy Barricades to indicate the end of the road. Pages affected: 8-9, Application Guides C 77.

Application Guide B 80 has been added. It shows a road closure signing sequence in advance of a barricade. The Application Guide uses a new sign, TC-113 (NS), ROAD ENDS. Pages affected B 80 and 8-17.

Sign TC-116 (NS) has had the minimum width lowered to make the Manual entry consistent with inter provincial agreements and standardized sign stock widths. Page affected: 8-19.

Sign TC-117 (NS) has had an entry added indicating that where it is unsafe to use a TC-165 (NS) sign, a modified TC-117 (NS) must be used. Page affected: 8-19, 8-21, 13-9, 13-15, Application Guides A 96 and B 96.

Sign TC-165 (NS) has had an 'Ahead Arrow' added. This makes the sign consistent with other advance warning 'ahead' signs. Sign TC-165 (NS) has had an entry added indicating that where it is unsafe to use a TC-165 (NS) sign, a modified TC-117 (NS) must be used. Page affected: 8-19, 8-21, 13-9, 13-15, Application Guides A 96 and B 96.

The regulatory sign page has had left and right turn prohibition signs added to those previously approved for use. The turn probation signs have been added to some detour signing Application Guides. Page affected: 8-24, Application Guides C 114, C 119.

Changes to Section 9

An entry has been added at the front of Section 9 requiring devices to provide continuing effectiveness. Previously within this section, individual items had a 'continuing effectiveness' clause. Individual entries on device effectiveness have been removed in favour of an overarching statement applicable to all devices. Pages affected include: 9-1 (addition), 9-2, 9-3, 9-4 (deletions).

Standards for display of company names or logos on devices has been improved. A sunset date of 2013.04.01 has been set for existing marks that will be affected by the change. Page affected: 9-1.

Standards have been defined for Retro Reflective paint, tape and pavement markers that are used to provide temporary traffic guidance. Page affected: 9-4.

The TC-64C, TC-64D and TC-64E Barricade drawing and text have been changed to reflect that new TC-11 signs now have a wider selection of directional arrows. Pages affected: 9-10, 9-11.

The term scaffolding has been changed in preference for 'Elevated Work Platform'. The term 'Elevated Work Platform' has been defined and added to Section "D" Definitions. Pages affected: D-2, 9-14, Application Guides A 65, A 66, and B 65.

The F-shape Barrier entry has changes describing a new testing and acceptance process. Barriers seeking approval after 2011.01.01 require approval as per standards in the Manual for Assessing Safety Hardware which is administered by the American Association of State Highway and Transportation Officials. Barriers previously approved under NCHRP 350 do not require recertification. Page affected: 9-12.

The F-shape Barrier entry has changes describing the MASH attenuator standards for blunt end protection. Page affected: 9-13.

The F-shape Barrier entry has had requirements to communicate deflection hazards to workers strengthened. Pages affected: 9-13, 9-14.

Changes to Section 11

CSA Z96-02 Standard for Safety Apparel has been upgraded to CSA Z96-09. The term Hi-Visibility Safety Apparel is used, rather than vest, jacket, or coverall. Hi-Visibility Safety Apparel meeting Manual standards in place on 2010.12.31 may be used until 2014.12.31. Page affected: 11-1.

The requirement for Traffic Control Persons to know the contact information of the Temporary Workplace Signer has been repeated in this section, once in the Traffic Control Person's section and again in the Temporary Workplace Signer's section . Pages affected: 11-3 and 11-5.

For night work a retro reflective material is required on Traffic Control Person's hard hats. If lighting a Traffic Control Person at night, guidance now says to light the front face instead of from above. Page affected: 11-3.

The list of forbidden TCP behaviors has been updated. It now contains a permission to support a Stop Slow paddle provided it won't stand without human support and the support won't be a hazard. Other improvements to the 'forbidden behavior' list are also included. Page affected: 11-4.

Changes to Section 12

The exemption from the requirement to have a copy of the planning and preparation checklist at the workplace has been extended to include Off Shoulder Work. Page affected 12-3.

Changes to Section 13.3

The Rule numbers in Section 13.3 have been regrouped to permit easier expansion of this section in future. Some rule titles have been changed to strengthen the link between the rule and the intent. Throughout the Manual, where a rule number from Section 13.3 was referenced, its new number has been used. Pages affected: 8-1, 13-9 through 13-24, 13-34, 13-37, 13-46, 13-49, 13-52, 13-55, 13-64, 13-67.

Rule 1.6 (formerly Rule 6), dealing with double posting, has been amended by the addition of the word "undivided". Pages affected: 13-9, 13-13.

Rule 1.7 (formerly Rule 7) has been amended to permit some ramp work that would normally require double posting on the through road to be single posted on the right on through section of road. Pages affected: 8-2, 13-13.

Rule 1.16, has been added. It deals with using a modified TC-117 (NS) sign as an alternative for the TC-165 (NS), in some circumstances. Page affected: 8-19, 8-21, 13-9, 13-15, Application Guides A 96 and B 96.

Rule 4.7, dealing with parking vehicles at temporary workplaces has been expanded. A new section specifies warning light standards for workers' vehicles. Pages affected: 13-11, 13-21, 13-24.

Changes to Application Guides

The legend of symbols for Application Guides A, B and C have been updated to show centreline paint trucks with amber instead of red lights.

Application Guides "A" "B" and "C" 71 have been amended to clarify that, when using Traffic Control Persons **or Police Officers** to control traffic, the signs shown in the Application Guide are to be combined with an appropriate signing sequence from another Application Guide, such as "A", "B", "C" 35.

Application Guide B 64D and A 64U are new guides for on and off ramps (U = upstream , D = downstream.) They deal with signing at on and off ramps on multi-lane highways.

Application Guides A 65, A 66, and B 65 have had the word 'scaffolding' replaced by 'Elevated Work Platform.'

Application Guides A 66 have been modified to show that for long duration work, F-shape barriers are needed based on conditions. Previous versions of the Manual always required them.

Application Guides A 77, A 78, B 77, C 77, C 114, C 119, C 139 have been adjusted to show new TC-11 signs.

Application Guides "A"and "B" 96 now show the TC-165 (NS) signs with the 'ahead arrows'; a note has been added making reference to conditional use of a modified TC-117 (NS) sign.

Application Guides A 91, A 92, B 91, and C 91 have had high mount lighting standards changed from flashing red to flashing amber. New standards become effective with the publication of the Manual. A corresponding change has been made to the 'Legend of Symbols' for "A", "B" and "C" Series Application Guides. Page affected: 13-21, Application Guides A 91, A 92, B 91, and C 91.

Application Guide B 65 has been updated by removing the reference to work in a 50 km/h speed zone.

Application Guide B 80 has been added. It shows a road closure signing sequence in advance of a barricade. The Application Guide uses a new sign, TC-113 (NS), ROAD ENDS. Pages affected B 80 and 8-17.

Application Guide C 22 has had an error in the table corrected.

Application Guides C 114 and C 119 have had turn restriction signs added.

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Definitions

Words and phrases used in the ***Nova Scotia Temporary Workplace Traffic Control Manual*** are defined as follows for the purpose of this Manual.

100 Series Highway: a road classified under the Nova Scotia road naming convention and falling within the numbers from 101 to 199, including their ramps, merging and diverging areas. They are a system of (mainly) controlled access highways that function as freeways for the purpose of traffic operations and traffic control signs and devices.

New: 2012

AASHTO: designation of the American Association of State Highway and Transportation Officials.

Active Work Area: the specific portion of roadway where construction, maintenance, or utility operations are being carried out; the area occupied by workers and work vehicles and where work is actually in progress.

Advance Warning Area: the area of a roadway in advance of an active or inactive work area in which motorists are given advance warning that they are approaching construction, maintenance or utility activities or abnormal roadway conditions.

Altered Centreline: a traffic lane is temporarily moved across an existing centreline; there is no reduction in the number of lanes, and traffic self regulates.

Application Guide or Typical Application: when combined with rules from Sections D through 13, the prescribed minimum traffic control treatment for a particular construction, maintenance, or utility temporary workplace. Application Guides in this Manual are divided into "A", "B", and "C" Series, based on road classes. Unique situations may require more than the minimum signs, devices, protection, or warning distances.

Approach Area: the area of a roadway between the Advance Warning and Transition Areas in which motorists are given the site specific information needed to safely pass the temporary workplace.

Arrow Mode: one of the Flashing Light Unit displays, consisting of an arrow shape formed by flashing lights; it warns approaching motorists to change lanes in the direction of the arrow; arrow mode is displayed only on multi-lane roads.

ASTM: designation of American Society for Testing and Materials.

Bar Mode: One of the modes displayed by a Flashing Light Unit (FLU) consisting of a single horizontal row of flashing lights displayed as a warning to approaching motorists to increase their vigilance or to direct their attention to a warning sign.

Blocker Vehicle: A truck used to protect workers by blocking the path of errant vehicles. It has a minimum weight of 5000 kg and should be equipped with a high backed seat; it does not have a Truck Mounted Attenuator (TMA).

Buffer Area: the area of a roadway between the transition area and the Work Area. It provides a recovery area for errant vehicles.

Channelization: the separation of traffic from work areas using delineation devices.

New: 2012

Climbing Lane: a lane added, usually on an upgrade, to accommodate vehicles traveling at different speeds.

Construction Zone: a temporary workplace.

Controlled Access Highway: a highway on which access to or from the highway is prohibited except at specific locations established by public authority.

CSA: designation of the Canadian Standards Association; used to indicate the necessary requirements for safety related clothing, equipment and devices.

Current Edition: Refers to the most recent edition or revision of the ***Nova Scotia Temporary Workplace Traffic Control Manual*** as issued or amended from time to time by the Minister of Transportation and Infrastructure Renewal.

Delineation Devices or **Delineators:** devices that provide vehicle tracking and guidance information to motorists, such as drums, cones and high delineators.

Department: the Nova Scotia Department of Transportation and Infrastructure Renewal.

Department of Labour or in context **Labour:** the Nova Scotia Department of Labour and Advanced Education.

Divided: a portion of road where traffic travels on two physically separated parallel roadways.

Double Posted: the same signs are erected twice and are positioned on opposite sides of the road (as shown on some "A" Series Application Guides).

New: 2012

Downstream: relative to the lane containing the Work Area, the direction in which traffic flows. Also, as shown on many Application Guides, in the direction of the top of the page.

New: 2012

Elevated Work Platform: a platform, not including a bucket truck bucket, temporarily installed or positioned on a road to enable work that could not normally be reached by standing on the ground or by standing on the part of a structure used to support vehicles or pedestrians.

Excavation: a hole or trench more than 300 mm in depth. Trenching for curb and gutters should be treated as a low shoulder rather than an excavation.

New: 2012

FHWA: designation of the US Department of Transportation Federal Highway Administration.

Flashing Amber Light 360°: a light that emits an amber flash pattern visible from 360° around the light; normally mounted on the cab of equipment to provide a warning of its presence.

Flashing Light Unit: A warning lighting unit with a matrix of lights capable of flashing a horizontal bar or a pattern of lights forming directional arrows.

FLU: See 'Flashing Light Unit'

High Shoulder: a shoulder that is higher than the travel lane by an amount sufficient to be an unexpected hazard to an unaware motorist striking the raised shoulder with a tire; generally caused by cold planing operations.

Highway: a road that has a speed zone greater than 50 km/h; it is not a 100 Series Highway, unless it is numbered in the range of 101 to 199.

Impact Attenuator: traffic barrier of energy absorbing material used to safely shield fixed objects from impacts of errant vehicles.

Inactive Work Area: the portion of the roadway or right-of-way on which work has commenced but has temporarily ceased and the roadway has not been returned to normal operating conditions. This is the same portion of a temporary workplace as an active work area.

Lane Closure: the closing of a travel lane by blocking it in some manner and directing traffic around it.

Liability: the legal responsibility for damages or injuries arising from a temporary workplace motor vehicle collision.

Long Duration Work: work at a site that will take longer than 24 hours to complete and the road condition will not be restored to normal condition at the end of each day. (>24h.)

Low Shoulder: a shoulder 'drop off' that is lower than the travel lane by 100 mm or is not fully functional by being covered with loose uncompacted gravel; generally caused by re-surfacing operations.

Low Volume Highway: a non 100 Series Highway with an hourly traffic volume of less than 30 vph during the period of time the work will be done.

Low Volume Street: a street having an hourly traffic volume of less than 200 vph during the period of time the work will be done; the volume may be estimated by conducting a typical 3 minute count and multiplying the volume by 20.

New: 2012

MASH: the Manual for Assessing Safety Hardware administered by the American Association of State Highway and Transportation Officials.

Manual or *Manual*: current edition of the ***Nova Scotia Temporary Workplace Traffic Control Manual***.

Maintenance Zone: a temporary workplace.

May: a permissive condition; not a requirement.

New: 2012

Mechanized Work: is work performed from on, or from within a Work Vehicle; the vehicle provides a measure of worker protection.

Median: the portion of the right-of-way separating opposing lanes of travel on a divided road.

Median Barrier: a non-traversable barrier intended to prevent vehicles from crossing the median; F-shape Barriers are a common type.

Median Crossover: a traversable location purposely constructed across a median on a divided road to permit vehicles to cross to change direction.

Minister: is the Minister of the Nova Scotia Department of Transportation and Infrastructure Renewal, unless stated otherwise.

Mobile Continuous: work that is carried out while moving continuously, usually using a moving vehicle operating at slow speeds.

Mobile Operation: a term that includes both Mobile Continuous and Mobile Short Stops.

Mobile Short Stops: work that is mostly carried out using a moving vehicle, but may include periodic short stops. The duration of stops must be taken from the Application Guide in use.

Motor Vehicle Act: current edition of the ***Motor Vehicle Act of Nova Scotia*** Chapter 293 of the Revised Statutes, 1989.

Multi-Lane: a road on which two or more connected lanes of traffic travel in the same direction.

Must: a mandatory condition; requirements have to be met.

NCHRP: designation of the US National Cooperative Highway Research Program.

Night Work: work performed from a half hour after sunset to a half hour before sunrise.

Observer: a worker assigned the responsibility of watching for and warning of approaching traffic when another worker is on the travel lane of a road.

Off Shoulder Work: work that is carried out within the right-of-way but is completely clear of the travel lanes and the shoulder of the road; no workers, equipment, or vehicles are permitted to encroach on the shoulder. An expanded explanation of the terms used to describe levels of encroachment exists in Section 7.0 for roads in urban areas where there may be no clearly defined shoulders.

One-Way: a road on which traffic is permitted to flow in one direction only.

Park Lane: a paved lane beside a travel lane and intended for parked vehicles; provided on some streets instead of shoulders. An expanded explanation of the levels of encroachment exists in Section 7.0 for roads in urban areas where there may be no clearly defined shoulders.

Partial Lane Closure: the narrowing of a lane to not less than 2.5 m. An expanded explanation of this term is included in Section 7.0.

Pilot Vehicle: a vehicle used to lead motorists through a temporary workplace in accordance with the requirements of Section 9.3.

Protection Vehicle: a truck with a Truck Mounted Attenuator (TMA) positioned in advance of an active work area to block a travel lane to protect workers from errant vehicles entering the work area.

Road: a generic term that includes all types of freeways, highways, and streets whether divided or undivided, multi-lane or two-lane two-way.

Roll-up Sign: a portable temporary condition warning sign of a 'roll-up' design having a fabric substrata with a reflectorized orange face.

Route: a collector highway; routes are numbered from 201 to 399.

Service Vehicle: a vehicle used to support a project by transporting workers and / or equipment but not used to perform a primary work function; may be used to assist sign and device placement.

Short Duration Work: is work at a location that takes more than 30 min but not more than 24 hours.

- Work continues within the time-frame and is completed; or,
- Work continues within the time-frame and at the end of each day the work ends and the road is restored to normal operational condition.
  (>30 min to 24h.)

Should: an advisory condition; recommended but not mandatory.

Shoulder Work: work that is carried out on the shoulder of a road completely clear of the travel lanes; no workers, equipment, or vehicles are permitted to encroach on the travel lanes. An expanded explanation of the terms used to describe levels of encroachment exists in Section 7.0 for roads in urban areas where there may be no clearly defined shoulders.

New: 2012

Sign Support: a mounting device for displaying temporary condition signs. There are three types:

- **Low Mount Portable Sign Support:** a mounting device for displaying rigid signs that may place the bottom of the sign at or near the pavement or shoulder elevation.
- **High Mount Portable Sign Support:** a mounting device for displaying fabric 'roll up' 75 cm x 75 cm signs. The base of the sign must be at least 50 cm from the pavement.
- **Post Mount or Post Mounting:** an upright post on which temporary signs are displayed. (See rule 1.10 in Section 13.3 for post mounting standards.)

Special Operation: a construction or maintenance project that has some unique feature that is not fully compatible with Typical Applications based solely on road class, encroachment, and work duration.

Street: a road that is not a 100 Series Highway and that has a maximum speed limit of 50 km/h.

Survey Crew: is a person or group whose work is done on the ground (not using an aerial device, or involving climbing) and primarily on, from, or beyond the shoulder of the road in accordance with, "Survey Crew" Application Guide standards, and is limited to:

- a surveyor performing a land survey, without respect for whether or not the surveyor is using surveying instruments.
- a person performing land survey support functions such as, rod work, measuring, shoulder staking, spot marking, assessing, recording. Survey support functions may be performed with or without the presence of a surveyor.
- a person performing a visual qualitative review, or a quantitative review, or a visual inspection, and including the associated tasks of measuring and recording.

TAC: the Transportation Association of Canada.

TCP: see 'Traffic Control Person'.

Temporary Work Area or **Work Area:** is the place where the primary work will be done. The Temporary Workplace may contain an Active Work Area or an Inactive Work Area depending on the work schedule of the project.

Temporary Workplace: is the area of a roadway which is directly affected by construction, maintenance, or utility operations. Where temporary condition devices are used at a Temporary Workplace, it is the entire portion of roadway between the first temporary condition device and the place beyond the Work Area where normal roadway conditions resume.

Temporary Workplace Signer (TWS): a person qualified and accredited by the Provincial Traffic Authority to assess conditions, prepare, implement and review traffic control plans for construction, maintenance, and utility temporary workplaces; they are responsible for ongoing compliance with the Temporary Workplace Traffic Control Manual and for ensuring the safe regulation of traffic and safe passage of pedestrians at temporary workplaces.

Termination Area: the area of a roadway immediately following a work area in which traffic returns to its normal alignment.

TMA: see 'Truck Mounted Attenuator'.

Traffic Control Person (TCP): a person qualified and accredited by the Provincial Traffic Authority to direct the movement of traffic at a construction, maintenance, or utility temporary workplace.

Traffic Control Person Zone: is the portion of roadway under the direction of, and between active Traffic Control Persons.

Trail Vehicle: a vehicle used to 'trail' a Mobile Operation to provide advance warning to traffic overtaking the operation; trail vehicles must be equipped with appropriate advance signs and a Flashing Light Unit (FLU).

Transition Area: the area of a roadway in which traffic is guided from its normal alignment to the path around the work area.

Transition Area Taper: a smooth alignment of approved devices placed in the transition area to guide traffic from its normal alignment to the path around the work area.

New: 2012

Truck Mounted Attenuator (TMA): an energy absorber mounted on the rear of a Protection Vehicle; Truck Mounted Attenuators approved before 2011.01.01 must satisfy the requirements of NCHRP 350 Level TL-3 (100 km/h impact speed). Those approved after 2011.01.01 must meet MASH TL-3 standards. It is acceptable for attenuators to be trailer mounted, provided the same standards are met.

Trunk Highway: an arterial highway; trunks are numbered from 1 to 99.

TWS: See 'Temporary Workplace Signer'.

Typical Application or Application Guide: when combined with rules from Sections "D" - 13, the prescribed minimum traffic control treatment for a particular construction, maintenance or utility temporary workplace. Application Guides in this Manual are divided into "A" "B" and "C" Series based on road classes.

Under-ride protection: is a mechanism to limit the probability that a small car will be driven under the Blocker Vehicle during an impact; typically provided by a low vehicle bumper, or bars installed to prevent the under-ride.

New: 2012

Upstream: relative to the lane containing the Work Area, the direction opposite to that in which traffic flows. Also, as shown on many Application Guides, in the direction of the bottom of the page.

Urban Residential Street or Street: where the term Urban Residential Street is used it means the same as "Street".

Uneven Lanes: a section of road on which one travel lane is higher (or lower) than the other lane by an amount sufficient to be an unexpected hazard to an unaware motorist crossing the longitudinal joint between the lanes; caused by cold planing or resurfacing operations.

Utility Operation or Utility Work: the primary work is directly on overhead electrical or communications cables, or on their overhead delivery hardware (e.g. overhead switches, luminaires, or transformers). Where the primary activities are not directly on overhead cable systems or hardware, such as vegetation management or working on traffic signals, the work type is not Utility Work.

Variable Message Signs: are programable signs capable of displaying one or a sequence of messages.

Very Short Duration Work: is work at a location that takes not more than 30 min., not including sign or traffic control equipment set-up and take-down time. (0 to 30 min.)

vph: vehicles per hour.

Work Activity: the specific task being carried out as part of a construction, maintenance or utility project.

Work Area, or Temporary Work Area: is the place where the primary work will be done. The Temporary Workplace may contain an Active Work Area or an Inactive Work Area depending on the work schedule of the project.

Work Vehicle: a vehicle used to facilitate construction, maintenance, or utility operations at a temporary workplace.

1.0 Introduction

The purpose of the *Nova Scotia Temporary Workplace Traffic Control Manual* is to provide a traffic control standard for construction, maintenance and utility operations on highways and streets in Nova Scotia. It is applicable to all temporary workplaces and all roads under the administration and control of the Department.

When construction, maintenance or utility activities interrupt the normal operating conditions of a street or highway, temporary traffic control provides for the continuity of movement of motor vehicle, bicycle, and pedestrian traffic and access to property and utilities.

The function of temporary workplace traffic control is to:

- Provide for the safe and efficient movement of motor vehicles, bicycles, and pedestrians around or through temporary workplaces.
- Protect workers in temporary workplaces from errant vehicles.

The safety of workers is of equal importance to the safety of the public travelling through a temporary workplace. Temporary traffic control zones present constantly changing roadway conditions that are not expected by the road users. This presents a high degree of risk to workers. This risk must be mitigated. Never start or continue work if the safety of either motorists or workers is jeopardised. Stop work until safety is ensured.

Every temporary workplace traffic control zone must be designed considering worker safety, road user safety, and the efficiency of traffic flow at all stages of the project, from planning through to completion. Efficient construction and maintenance of street, highway, or utility projects are equally important.

The ***Nova Scotia Temporary Workplace Traffic Control Manual*** provides uniformity in temporary workplace traffic control procedures by stating principles of temporary workplace traffic control and by schematically presenting a number of traffic control applications and procedures (Application Guides).

This Manual uses the words 'may', 'should' and 'must' in a specific manner to convey a specific meaning:
may - a permissive condition; no requirement for design or application is intended.
should - an advisory condition; recommended but not mandatory.
must - a mandatory condition; requirements have to be met.

Unless otherwise stated, the Manual depicts the **minimum** level of traffic control for a particular application.

The Manual cannot provide solutions for all variables. Traffic volume and speed, roadway and workplace conditions may vary from the 'typical' condition shown or those anticipated when the plan was prepared. If needed to assure worker, motorist or pedestrian safety, Temporary Workplace Signers may use blended solutions consistent with the principles in the Manual. Limitations on blending solutions are outlined in Section 13.1 of the Manual. Exercise good technical judgement designing the traffic control plan; it must be thorough and meet actual current needs.

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2.0 Legal Authority

The Minister has the responsibility and legal authority under the Public Highways Act and the Motor Vehicle Act to regulate and control traffic on public highways in Nova Scotia.

This edition of the *Nova Scotia Temporary Workplace Traffic Control Manual* has been approved by the Minister under Section 4 of the Public Highways Act and Section 88 of the Motor Vehicle Act. The Manual describes the minimum standard for construction, maintenance, and utility activities on public highways in Nova Scotia.

New: 2012

The Minister of Labour has the legal authority under the Occupational Health and Safety Act to prescribe standards relative to workplace health and safety. The Director of the Occupational Health and Safety Division has the authority to initiate codes of practice and to enforce an acceptable code of practice to regulate worker occupational health and safety in Nova Scotia. This authority, under the Occupational Health and Safety Act, extends not only to employees at a workplace, but also to persons at or near the workplace. The current edition of the *Nova Scotia Temporary Workplace Traffic Control Manual* is an acceptable code of practice under the *Temporary Workplace Traffic Control Regulations*. The Department of Labour enforces its provisions concerning workplace occupational health and safety.

Highway signs, pavement markings, traffic control signals, and any other devices or persons intended or employed to regulate, warn, or direct traffic in a temporary workplace must operate under the authority of the agency that has jurisdiction over the affected section of road only.

In compliance with the provisions of the Manual, Temporary Workplace Signers may install or direct the installation of temporary condition signs, markings, or devices, and assign Traffic Control Persons to direct and regulate traffic to protect workers, motorists and pedestrians.

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3.0 Legal Liability

The purpose of temporary workplace traffic control is to provide for the safe and efficient movement of traffic through or around temporary workplaces and to protect workers from errant vehicles. Its purpose is not to reduce legal liability in the courts. However, taking care to help traffic flow and prevent collisions will also reduce liability for a collision.

The necessary elements of care include:

- Designing and carrying out an appropriate traffic control plan.
- Making an on-site review of the plan once set up.
- Inspecting the site frequently to ensure all signs and devices are in place and functioning properly.
- Amending the traffic control plan as the site requires.

The critical issue in deciding liability when a collision occurs is the care with which the defendants carried out their responsibilities. Therefore, if there is a collision at a site, you must be able to show that you exercised a reasonable standard of care. If you cannot show a reasonable standard of care, you may be liable for damages. The poorer your standard of care, the greater your share of the damages.

You must also be able to prove your standard of care in court. To do so, you will need careful record keeping.

- Keep a record of all traffic control devices used on the project. On large projects, keep a separate field book. On small projects, it may be sufficient to keep a signed copy of the traffic control plan or to make reference to the typical application used.
- Record the daily status of traffic control devices and the times of any changes to the devices.
- Record the status of the traffic control devices as soon as practical after any incident. Take appropriate measurements and photographs and mark them with the date and time.

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4.0 Fundamental Principles

The regulation and control of traffic through a temporary workplace is an essential part of construction, maintenance and utility work on roads.

All traffic control signs, markings, devices, and procedures used for construction, maintenance, and utility operations must conform to the applicable specifications of this Manual.

Traffic, pedestrian, and worker safety must be an integral part of every project, from assessment, planning through design and construction.

Temporary Workplace Signers (TWS) must be trained and accredited in the principles and practices of safe traffic control before being assigned responsibility for traffic guidance and control at temporary workplaces. The training and accreditation programs are under the authority of the Department.

Implementation Process

Temporary Workplace Signers must use the following process for every project, keeping in mind the fundamental principles listed above:

- Assess the site.
- Prepare a traffic control plan with detail appropriate to the complexity of the project.
- Discuss the plan with the workplace personnel involved with implementation. Make sure workplace personnel understand the work plan before the work is started.
- Act to implement the plan.
- Continue to review the effectiveness of the solution; amend the plan as required.

Implementation Principles

Temporary Workplace Signers must use the following principles when preparing and implementing the traffic control plan:

- Avoid frequent or abrupt changes in alignment that require rapid maneuvers.
- The length of road affected by work must be minimized. Public traffic has priority.
- Control traffic movement through a temporary workplace as little as practical; maintain safe working and driving conditions.
- Provide for the safe operation of work vehicles.
- Guide traffic in a clear and positive manner while it approaches and travels through temporary workplaces:
  - provide adequate warning, delineation, and channelization.
  - place signs and devices where they do not pose a hazard; message must be able to be understood and be able to be reacted to safely and comfortably.
  - aim signs and devices so that they present the best viewing angle for approaching traffic, whatever the road position or passing manoeuver.
  - cover or remove inappropriate signs.
  - remove inappropriate pavement markings unless the project is short term and it is reasonable to leave them and compensate for their presence with delineation or other devices.
  - inspect signs and devices in a temporary workplace frequently, relocating or replacing them if required.

Implementation Requirements

Temporary Workplace Signers must meet the following requirement while implementing and managing the traffic control plan:

- Start work only after appropriate traffic controls are in place.
- Modify traffic controls as required to meet changing conditions at the workplace.
- Cover or remove temporary traffic control devices that are no longer applicable due to changes in the work pattern or job shut down at the end of the work day.
- Cover or remove all temporary traffic control devices when traffic conditions have been returned to normal.
- At the completion of the work, install or re-erect permanent:
  - regulatory and warning signs.
  - pavement markings.
  - guide and information signs.
  - traffic signals and / or beacons.

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5.0 Components of a Temporary Workplace

A plan for temporary workplace traffic control must consider the six components of a Temporary Workplace. The Temporary Workplace is the entire section of road between the first advance warning sign and the resumption of normal roadway conditions. The six component areas shown on Figure 5.1 are:

- Advance Warning Area
- Approach Area
- Transition Area
- Buffer Area
- Work Area
- Termination Area.

The component areas will be present in some form in most Temporary Workplaces. Some may be combined if traffic volume, speed, and visibility permit. The component areas of a Temporary Workplace are described below.

Advance Warning Area begins at the first advance warning sign used to inform drivers to expect road work ahead. The advance warning may be a single sign or a series of signs beginning up to several kilometres before the Approach Area signing.

Approach Area begins at the first warning sign used to give drivers the information necessary to safely negotiate the temporary workplace, such as lane changes, passing restrictions, speed changes, or the presence of traffic control persons or signals. The information is normally conveyed by a series of signs.

Transition Area begins with the delineation devices used to channelize traffic from its normal alignment to the path required to move around the work area.

The transition area contains the channelizing devices used to form the approach transition taper. The path must be clear for drivers. For long duration work, existing pavement markings may have to be removed and new markings placed. Operational traffic control devices may be positioned in the Transition Area, including Flashing Light Units. The Transition Area must be kept clear of unnecessary obstructions:

- Do not store material or equipment in the Transition Area.
- Do not park vehicles in the Transition Area. (This does not apply to vehicles active in performing a traffic management function.)

Buffer Areas are established between the Approach Transition Area Taper and the Work Area to provide a recovery area for errant vehicles and a margin of safety for motorists and workers. Use channelization devices to delineate the Buffer Area except:

- During Mobile Operations. The Buffer Area is the space between the Trail Vehicle and the work vehicles.

Keep the Buffer Area clear of obstructions. Do not store material, or park equipment or vehicles in the Buffer Area except:

- Operational traffic control devices may be positioned in the Buffer Area, including Flashing Light Units.
- When a Protection, Blocker or Service Vehicle is used as stationary worker protection it is typically positioned close to the boundary between the Approach Transition Taper and the Buffer Area.

Work Area is the specific portion of roadway where construction, maintenance, or utility operations are being or have been carried out. The area occupied by workers and work vehicles. A Work Area can be:

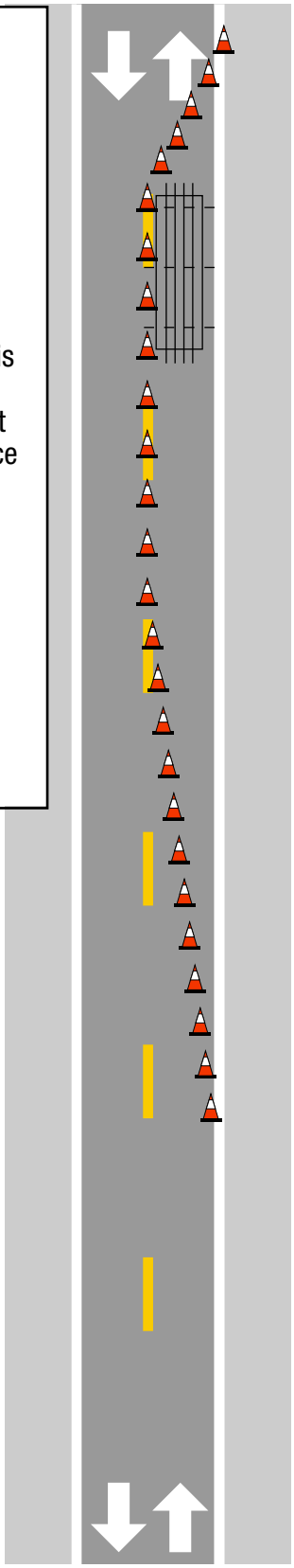
- 'Active' with work being carried out at the present time.
- 'Inactive' with work having started but temporarily stopped and the roadway not returned to normal operating conditions.

Termination Area provides a short distance for traffic to clear the work area and return to its normal path and roadway conditions. A short taper may be provided in the Termination Area.

New: 2012

Not shown graphically:

- Temporary Workplace: Is the area of a roadway which is directly affected by construction, maintenance, or utility operations. Where temporary condition devices are used at a Temporary Workplace, it is the entire portion of roadway between the first temporary condition device and the place beyond the Work Area where normal roadway conditions resume.
- Traffic Control Person Zone: Is the portion of roadway under the direction of, and between active Traffic Control Persons.



TERMINATION AREA
traffic returns to normal

workers
equipment
materials

WORK AREA
workers and/or equipment on road

protection equipment and warning devices only

BUFFER AREA
provides protection for workers

warning, protection and delineation equipment only

no vehicle parking (except warning and protection)

no storage

TRANSITION AREA
moves traffic away from work area

traffic control person

warning signs

APPROACH AREA
informs drivers of required action

warning signs

ADVANCE WARNING AREA
informs drivers to expect work area

NOT TO SCALE

6.0 Work Duration

The duration of the work is a major factor in deciding the number and types of signs and other temporary traffic control devices required to efficiently establish a safe temporary workplace.

The duration of a temporary workplace is defined by the length of time the work operation occupies a single location or several adjacent locations that are so close together that they effectively are a single location and are signed as a single location.

The four categories of work duration are:
- Mobile Operations
  (Mobile Continuous and Mobile Short Stops.)
- Very Short Duration Work
  (Up to 30 minutes.)
- Short Duration Work
  (More than 30 min., up to 24 hours.)
- Long Duration Work
  (More than 24 hours.)

Mobile Operations

Mobile Continuous consists of work carried out while equipment and workers are:
- Moving continuously, usually at slow speeds.
- Workers must not enter a travel lane on foot.
- Vehicles must not back up.

Employers must equip and train employees before assigning them to work on Mobile Continuous crews.

As defined in the Application Guides, for Mobile Continuous Operations on low volume roads where speed is low and visibility is good, a well-marked and / or a well-signed vehicle may provide enough warning. Specific requirements must be taken from Application Guides.

Except as permitted in Section 13.4, if traffic volume is higher, a trail vehicle with a flashing light unit must follow the work vehicle. If both traffic volume and speed are high, the trail vehicle must have a flashing light unit and should be equipped with a truck mounted attenuator. Specific requirements must be taken from Application Guides.

Mobile Short Stops is work that is mostly carried out using a moving vehicle, usually at slow speeds, but may include periodic short duration stops. The maximum duration of stops permitted depends on risks. Standards for maximum stopping times, and other site specific limitations must be taken from the Application Guide in use.

Very Short Duration Work: is work at a location that takes not more than 30 min., not including sign or traffic control equipment set-up and take-down time. (0 to 30 min.)

Short Duration Work: is work at a location that takes more than 30 min but not more than 24 hours.
- Work continues within the time-frame and is completed; or,
- Work continues within the time-frame and at the end of each day the work ends and the road is restored to normal operational condition.
  (>30 min to 24h.)

Long Duration Work is work at a site that will take longer than 24 hours to complete and the road condition will not be restored to its normal condition at the end of each day. (>24h.)

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7.0 Encroachment, Altered Centrelines and Temporary Roads

Standards for traffic control are established in part by combining the applicable rules from this section with standards in the Application Guide in use.

The level of encroachment onto a road is a primary risk assessment tool used in developing traffic management solutions. There are four stages or levels of encroachment:

- Off Shoulder Work.
- Shoulder Work.
- Partial Lane Closure.
- Lane Closure.

Roads in urban areas differ from rural roads in that they may have Park Lanes, curbs, and road shoulders that are not clearly defined. An explanation of how to apply the encroachment terms (above) in both situations is presented below under the headings, "Levels of Encroachment - Rural", and, "Levels of Encroachment - Urban."

Urban areas may have rural conditions, and vice versa. Therefore, Temporary Workplace Signers must apply the best use of encroachment principles to their workplace to create safe conditions, without respect to which heading (Rural or Urban) they are presented under.

Levels of Encroachment - Rural

Off Shoulder Work - Rural - is work within the right-of-way, but completely beyond the shoulder of the road.

- Workers, equipment, or vehicles do not encroach on the shoulder.

- Off Shoulder Work requires no traffic control signs or devices if the work area is beyond the shoulder and all work vehicles and equipment are beyond the shoulder.

Off shoulder work that takes a portion of the road shoulder out of service to support off shoulder work may need to be signed for shoulder work. See the entry below for requirements (Shoulder Work - Rural).

Shoulder Work - Rural - is work on the shoulder of a road.

- Workers, equipment, and vehicles do not encroach on the travel lanes.

- Shoulder Work requires traffic control signs and / or warning devices.

Short and Long Duration Shoulder Work normally needs two signs on each approach. Very Short Duration Shoulder Work may need a vehicle, flashing lights, or a flashing light unit.

Standards for Shoulder Work apply in the following cases:

- The Work Area is on the shoulder and does not encroach onto the travel lane.
- Equipment sits on the shoulder to serve an off-shoulder work area. Support vehicles are parked on the shoulder.
- Support vehicles cross the shoulder, in an area other than a driveway, to reach an active work area. (This is not intended to apply to isolated trips across the shoulder to access an off shoulder workplace (e.g. to reach a mower). It is intended to apply where ongoing use of the shoulder interferes with the public use of the shoulder.)

Partial Lane Closure - Rural - closes part of a travel lane and guides traffic in the narrowed lane. A minimum of 2.5 metres of usable lane must be available to traffic.

To permit work to be done directly on or above the lane line, work above or on the outermost line marking the edge of a closed lane is not a partial lane closure but may require delineators to be placed just outside the closed lane.

A Partial Lane Closure is allowed:

- On Streets that are not Multi-Lane.
- On Two-lane two-way non 100 Series Highways.
- On One-lane one-way Roads.
- On Single lane interchange ramps.
- For Utility work, on 100 Series Highways that are not Controlled Access Highways provided the conditions listed in Section 13.4 are met.
- On Roads matching Application Guides which have text permitting them, and where conditions specified in the Application Guide have been met.
- If approved by a Traffic Authority.

Except as noted above, a Partial Lane Closure is NOT allowed on:

- 100 Series Highways.
- Multi-lane Roads.

Lane Closure - Rural - closes a travel lane by blocking it and directing traffic around the lane blockage. Lane Closures require warning signs and traffic control devices. Lane Closures on two-lane two-way roads except those on Low Volume Streets require active traffic control to regulate traffic. The traffic control may be provided by Traffic Control Persons or traffic signals.

Levels of Encroachment - Urban

Off Shoulder Work - Urban

- **On a road with a raised curb**, Off Shoulder Work is work done within the right-of-way completely beyond the curb. Workers, equipment, or vehicles do not encroach on the travel lane.

- **On a road with a Park Lane, with or without a curb**, Off Shoulder Work is work done within the right-of-way, but completely beyond the Park Lane. Workers, equipment, or vehicles do not encroach on the Park Lane.

- **On a road with no Park Lane and no raised curb**, Off Shoulder Work is work within the right-of-way completely beyond that portion of road that would reasonably be expected to be used by traffic that needed to pull off the travel portion of the road. Workers, equipment, or vehicles do not encroach onto that portion of the road that would be used by traffic needing to pull off the road.

  Off Shoulder Work normally requires no traffic control signs or traffic control devices if the work area is beyond the shoulder and all work vehicles and equipment are beyond the shoulder.

Shoulder Work - Urban

- **On a road with a raised curb and no Park Lane**, the term Shoulder Work does not apply.

- **On a road with a Park Lane with or without a raised curb**, Shoulder Work is work done in the Park Lane completely beyond the travel lane.

- **On a road with no Park Lane and no raised curb**, Shoulder Work is work done completely beyond the travel lane on that portion of road that would reasonably be expected to be used by traffic that needed to pull off the travel portion of the road.

Principles of Shoulder Work:

- Workers, equipment, and vehicles do not encroach on the travel lanes.
- Shoulder Work requires traffic control signs and / or warning devices.
- Short and Long Duration Shoulder Work normally needs two signs on each approach.
- Very Short Duration Shoulder Work may need a vehicle, flashing amber lights, or a flashing light unit.

Standards for Shoulder Work apply in the following cases:

- The Work Area is on the shoulder and does not encroach onto the travel lane.
- Equipment sits on the shoulder to serve an off-shoulder work area. Support vehicles are parked on the shoulder.
- Support vehicles cross the shoulder, in an area other than a driveway, to reach an active work area. (This is not intended to apply to isolated trips across the shoulder to access an off shoulder workplace (e.g. to reach a mower). It is intended to apply where ongoing use of the shoulder interferes with the public use of the shoulder.)

Standards for shoulder work are taken from the Application Guide in use.

Partial Lane Closure - Urban - closes part of a travel lane and guides traffic in the narrowed lane. A minimum of 2.5 metres of usable lane must be available to traffic.

To permit work to be done directly on or above the lane line, work above or on the outermost line marking the edge of a closed lane is not a partial lane closure but may require delineators to be placed just outside the closed lane.

It is permitted by some Low Volume "C" Series Application Guides to have a partial lane closure where the overall shared road width available to traffic is 5m, but the position of the marked centreline appears to provide less than 2.5 m for traffic travelling in one direction. Under these Low Volume urban circumstances, there is an expectation that vehicles travelling in opposing directions can self regulate by using the combined 5 m total width. This is not inconsistent with the principle of providing a minimum of 2.5 m per travel lane.

A Partial Lane Closure is allowed:

- On Streets that are not Multi-Lane.
- On Two-lane two-way non 100 Series Highways.
- On One-lane one-way Roads.
- On Single lane interchange ramps.
- For Utility work, on 100 Series Highways that are not Controlled Access Highways provided the conditions listed in Section 13.4 are met.
- On Roads matching Application Guides which have text permitting them, and where conditions specified in the Application Guide have been met.
- If approved by a Traffic Authority.

Except as noted above, a Partial Lane Closure is NOT allowed on:

- 100 Series Highways.
- Multi-lane Roads.

Lane Closure - Urban - closes a travel lane by blocking it and directing traffic around the blockage. Lane Closures require warning signs and traffic control devices. Lane Closures on two-lane two-way roads, except those on Low Volume Streets, require active traffic control to regulate traffic. The traffic control may be provided by Traffic Control Persons, or traffic signals. Traffic control standards are taken from the Application Guide in use.

Altered Centrelines

As required by Application Guides, centrelines and / or lane lines need to be marked with delineators to guide traffic through temporary workplaces. Altered centrelines are permitted on highways and streets provided that:

- On 100 Series Highways and on Multi-Lane Roads there is no reduction in lane width, unless the reduction is authorized by the Traffic Authority.

- On Highways other than 100 Series or Multi-Lane, for each two lanes, 5.5 m overall lane width is maintained throughout and no lane width is less than 2.5 m.

- For Highways, a safety inspection of the altered path is performed by the site supervisor. A representative of the Traffic Authority must approve the realignment.

- On Streets, no lane width is less than 2.5 m.

- The riding surface within the new alignment is stable and safe for the traffic type and their expected speeds.
- The new alignment does not put public traffic, workers, or those at the edge of the road at risk.
- Taper and delineator values must match the table values from an Application Guide for a road of the same type and speed.
- For Utility work, the conditions in Section 13.4 are not violated.

Roads Temporarily Constructed for a Detour

Where traffic is diverted from its normal path onto a temporary road constructed to move traffic around or through a temporary workplace, the new temporary roadway must meet standards that a reasonable driver would expect to encounter.

Design Standards

Temporary roads and detours at temporary workplaces must accommodate the size (length, width, height) and weight of vehicles detoured; turning movements for trucks must be checked.

Where traffic is moved from a multi-lane road to a road with less lanes, reduce the number of lanes within the multi-lane section to balance the number of lanes provided by the detour.

Roads temporarily constructed for a detour must be designed and built to ensure the safety of all road users and be inspected periodically to ensure that they continue to meet design standards.

A road temporarily constructed for a detour must not be used until approval is granted by a person of authority acting on behalf of the agency with jurisdiction for the road. For guidance, the person providing the approval should consult standards in the latest edition of the Transportation Association of Canada (TAC) Manual, Geometric Design Guide for Canadian Roads.

8.0 Temporary Condition Signs

Temporary Condition Sign Standards

All temporary condition signs must meet the standards shown in this Manual for appearance, size, shape, colour, and level of reflectivity. They must show the same shape and appearance by night as by day.

New: 2012

Continuing Effectiveness - Temporary condition devices that lose effectiveness through reduced structural integrity, functionality, reflectivity, general appearance or other means, must not be used.

Sign Reflectivity

The minimum level of reflectivity for orange sheeting used on temporary condition warning signs is ASTM Type III (high intensity).

New: 2012

The minimum level of reflectivity for white sheeting used on temporary condition warning signs is ASTM Type I (Engineer Grade).

Sunset clause: White temporary condition warning signs meeting sheeting standards in place on 2011.12.31 may be used until 2014.12.31.

Fluorescent orange sheeting may be used for:

- Advance Signs:
  - TC-1A Construction Ahead (with distance)
  - TC-115 (NS) Wet Paint Ahead
  - TC-131 (NS) TCP Ahead / Be Prepared to Stop
  - TC-132 (NS) Signals Ahead / Be Prepared to Stop
  - TC-161 (NS) Right Lane Closed Ahead
  - TC-165 (NS) Road Work Ahead / Be Prepared to Stop
  - all signs used in a Special Operation.

Standards for Roll-up Signs

'Roll-up' signs must meet the same standards published in this Manual for other temporary condition warning signs.

Use of Roll-up Signs

All temporary condition warning signs may be a 'roll-up' design.

Double Fines For Speeding

Fines are doubled for speeding:

- between TC-2, and TC-4 signs (Road Work & Construction Ends), and
- between TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends.)

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs, as shown on the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2, and TC-114 (NS) signs immediately when the workplace becomes inactive.

Minimum Number of Signs in Advance of a Traffic Queue

Where temporary warning signs are required to be posted at a fixed location on a highway by an Application Guide, approaching traffic must pass at least two signs (or two sets of double posted signs) before being required to stop at the back of queued traffic. On a street, traffic should pass two signs (or sets) before being stopped. Add signs as needed. See rule # 1.4, in Section 13.3 for more details.

New: 2012

Minimum Sign Size

The minimum sign sizes are specified in Section 8.3. Section 8.3 supports that, on all roads, 75 X 75 cm 'Roll-up' signs displayed on high mount portable sign supports may be used in place of 90 X 90 cm signs required to be post mounted, or 90 X 90 cm signs permitted on low mount portable sign supports.

Double Posting Signs

New: 2012

Except as provided for in Rule 1.7 of Section 13.3 and in Section 13.4, the following roads must be double posted:

- 100 Series Highways.
- Multi-Lane Highways, both divided and undivided, including Multi-Lane sections of Two-Lane Two-Way Highways.
- Multi-Lane on and off ramps.
- Multi-Lane Streets, both divided or one-way.

Multi-lane undivided Streets (50 km/h), do not require double posting.

New: 2012

Single Posting Signs on Ramps

For single lane on and off ramps, single post signs on the right. See Rule 1.7 of Section 13.3 for single posting some through roads.

Posting Signs on One or Two Approaches to the Work Area

On Divided or One-Way roads, and Multi-Lane undivided Streets (50 km/h), where the work is done entirely in the right lane or on the right shoulder, workplaces with TC-2, or TC-114 (NS) signs (Road Work & Utility) must display only TC-4 (Construction Ends) signs downstream of the Work Area. When a TC-2 or TC-114 (NS) sign is not required, downstream signing is not needed for these roads types.

Other roads must be signed on both approaches.

Posting Signs on Intersecting Approaches Within a Workplace

Roads that intersect a temporary workplace along its length must have signs posted, and if necessary, devices and Traffic Control Persons positioned so that motorists entering the workplace are provided with sufficient notice and guidance. The standard of care must be taken from the Application Guide. Where entrances to homes or businesses pose a hazard, notifications and control measures must be put in place.

Post Mounting or Portable Sign Supports

Temporary condition signs installed for a Temporary Workplace, and expected to be at a stationary location for greater than three (3) days, must be post mounted, except that:

- Signs mounted on F-shape Barrier or engineered barrier of similar height need not be post mounted.
- Signs in use in an urban area, where post mounting is impractical, need not be post mounted.
- Roll-up signs may be displayed on high mount portable sign supports instead of being post mounted.

New: 2012

Other than described above, signs may be displayed on portable sign supports. Note: See entry, 2 below or rule 1.10 in Section 13.3 for post mounting standards.

Visibility vs Application Guide Placement

Signs must be positioned so that approaching motorists can interpret their message and react safely and comfortably. Where the position of a sign is specified by an Application Guide and violates this principle, expand the placement distance by the minimum needed to make the sign effective.

Signs - Position, Angle and Height

Position - Signs must be placed on or by the edge of the road where they are the most effective, but do not pose a hazard to traffic.

Angle - Signs must be aimed and their alignment maintained so that they have the best viewing angle for oncoming traffic.

Mounting height - For post mounting, the distances from the road surface to the bottom of the signs are:

- For 90 X 90 cm signs, 1.0 to 2.5 m.
- For smaller signs, such as 75 X 75 cm signs, 1.5 to 2.5 m.

Human Activity Signs - Red Orange Flags

Except as described below, signs depicting 'human activity' mounted on high or low mount portable sign supports must display two red orange flags. This includes 75 X 75 cm Roll-up signs on high mount portable sign supports.

Three red orange flags must be displayed on top of TC-131 (NS) and TC-165 (NS) signs unless these signs are displayed with a Flashing Light Unit. There are rules limiting the use of flags on these signs during night. See the entries (TC-131 (NS) and TC-165 (NS)) in Section 8.3 for the sign in use.

Description - Flags must consist of a bright red orange cloth or cloth-like material securely mounted on a short staff so that the bottom of the flag hangs just above the sign.

Size - Flags must be a minimum of 300 X 300 mm.

'Human Activity' signs mounted on F-shape Barrier, or similar engineered barrier, need not display red orange flags. (For more information on F-shape Barriers, see Section 9.)

The following are the human activity signs:

- TC- 2 Road Work
- TC-3 Survey Crew
- TC-21 Traffic Control Person
- TC-21A (NS) Traffic Control Person Ahead
- TC-114 (NS) Overhead Bucket Work
- TC-131 (NS) TCP Ahead / Be Prepared to Stop (unless displayed with a Flashing Light Unit)
- TC-165 (NS) Road Work Ahead / Be Prepared to Stop (unless displayed with a Flashing Light Unit)

Condition Specific Signs

Some signs are commonly used in Application Guides on the approach to a Work Area, and may be general in nature. Other signs are 'condition specific' and are used only when it is necessary to warn motorists of a temporary condition. These 'condition specific' signs are not typically shown on Application Guides, because every workplace is different.

During their site assessment Temporary Workplace Signers should identify temporary conditions for which a sign has been approved. Application Guides should be adapted to integrate the 'condition specific' signs when the condition cannot be removed and it is prudent to warn motorists of the temporary condition.

The following are 'condition specific' signs that may not appear on Application Guides:

- TC-18 (NS) One Lane Ahead
- TC- 27 Curve
- TC-47 Grooved Pavement
- TC-49 Low Shoulder
- TC-51 Bump
- TC-54 Truck Entrance
- TC-62 Hazard Marker
- TC-101 (NS) High Shoulder
- TC-102 (NS) Uneven Lanes
- TC-104 (NS) Tar Ahead
- TC-108 (NS) Flying Stones

Duty to Remove Temporary Condition Warning Signs

All temporary condition signs must be removed or covered immediately after they are no longer applicable.

Duty to Install Permanent Signs, Signals, Beacons and Lane Markings

At a project's completion, the permanent regulatory, warning, guide, and information signs impacted by the Temporary Workplace must be restored. Also restore signals, beacons and lane markings.

8.1 Introduction to Schedule of Signs

The schedule of Temporary Condition Warning Signs (see sign descriptions at 8.3) has been approved for use in Nova Scotia. Temporary workplace signs must be of the shape, colour, and minimum dimensions, and bear the message or lettering indicated in Sections 8.3 and otherwise comply with these specifications.

8.2 Section 8.2 has intentionally been left blank, to preserve numbering continuity from previous versions of the Manual.

8.3 Sign Descriptions

TC-1

TC-1 Construction Ahead is used to provide advance warning of a major work area. This sign is generally used on long-term construction projects where drivers may encounter construction activities.

The TC-1 Construction Ahead sign is used on Streets and Highways, as directed by Application Guides, and may be added to a signing sequence when additional warning is necessary.

Where temporary warning signs are required to be posted at a fixed location on a Street, approaching traffic should pass two signs (or sets) before being required to stop at the back of queued traffic. Unless directed otherwise by an Application Guide, the Temporary Workplace Signer may add TC-1 signs, as required. The TC-171(NS) sign may have to be moved upstream to make room for the additional signs.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-1A

TC-1A Construction Ahead Advance (with distance) is used to provide additional advance warning of construction projects.

The TC-1A Construction Ahead Advance sign is used on Streets and Highways, as directed by Application Guides, and may be added to a signing sequence when additional warning is necessary.

Where temporary warning signs are required to be posted at a fixed location on a Highway, approaching traffic must pass at least two signs (or two sets of double posted signs) before being required to stop at the back of queued traffic. Unless directed otherwise by an Application Guide, add TC-1A signs at 500 m intervals as needed. The distance shown on the sign is to be changed to show the actual distance to the work area by placing overlays or tabs in 500 m increments on the face of the sign. The TC-171(NS) sign may have to be moved upstream to make room for the additional signs.

Minimum size. . . . . 120 cm x 120 cm

TC-2

TC-2 Road Work is used to indicate that work area activities are occurring on or near the traveled portion of the road and that workers or equipment may be at risk or may pose a risk to the driver.

TC-2 must not be displayed when work is not in progress.

When TC-2 is mounted on a portable sign support it must display two red orange flags mounted on the top of the sign.

Double Fines For Speeding
Fines are doubled for speeding between:
- TC-2 and TC-4 signs (Road Work & Construction Ends), and between
- TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs as shown in the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2, and TC-114 (NS) signs immediately when the workplace becomes inactive.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-3

TC-3 Survey Crew is used to indicate that a survey crew is working on or near the traveled portion of the road.

TC-3 must not be displayed when work is not in progress.

TC-3 should not be used where the crew is part of a larger work force as the work area would be covered by TC-2.

When TC-3 is mounted on a portable sign support it must display two red orange flags mounted on the top of the sign.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-4

TC-4 Construction Ends is used to indicate to drivers that they have reached the end of a workplace and that they can expect normal roadway conditions on the remainder of the roadway.

Double Fines For Speeding
Fines are doubled for speeding between:
- TC-2 and TC-4 signs (Road Work & Construction Ends), and between
- TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs as shown in the Application Guide in use.

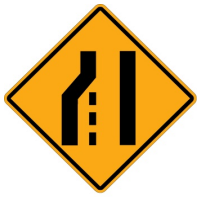
To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2, and TC-114 (NS) signs immediately when the workplace becomes inactive.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-5R

TC-5 Lane Closed Ahead is used to indicate that a lane is closed for road work. TC-5 must only be used on a multi-lane highway or street or on a highway or street with a multi-lane approach to the work area. The appropriate L (Left Lane) or R (Right Lane) version of the sign must be used.

Where lane closures involve the closure of multiple lanes TC-5A (NS) is repeated in advance of the Taper for each successive lane closure.



TC-5L

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-5LA (NS)

TC-5RA (NS)

TC-5A (NS) Lane Closed Ahead Advance is used to give advance warning of lane closure(s) on 100 Series Highways and other roads and streets where advance warning is deemed appropriate.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-6

TC-6 Lane Closure Taper is erected at the beginning of a taper on ***Multi-Lane*** highways as a final warning to drivers that a lane change is necessary.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-10

TC-10 Detour Ahead is used to indicate that traffic will be required to follow another road to detour around the work area.

TC-10 is erected in advance of detours on all streets and highways.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-10A

TC-10A Detour Ahead Advance (with distance) is erected 1 kilometre in advance of all detours on *100 Series* or all other highways with high approach speeds or high traffic volumes.

Minimum size. . . . . 120 cm x 120 cm

New: 2012

TC-11E (NS)

TC-11

TC-11L 45 (NS)

TC-11R 45 (NS)

TC-11L

TC-11R

TC-11LB 90 (NS)

TC-11RB 90 (NS)

TC-11RLB 90 (NS)

TC-11 Detour Direction Markers are used alone and as part of a Barricade to lead traffic to its destination when normal traffic routing has been interrupted by road work.

Detour signing should be tabbed with route markers or street name signs to make each detour distinct.

TC-11 is available in Detour Ends (TC-11E (NS)), Straight Through (TC-11), Right Turn (TC-11R), Left Turn (TC11L), Left Turn 45° (TC-11L 45 (NS)), and Right Turn 45° (TC-11R 45 (NS)) These TC-11 signs are suitable for stand-alone installations or barricade mounting; the appropriate arrow must be used.

The TC-11LB 90 (NS) and TC-11RB 90 (NS) are suitable for use on a barricade where drivers will be expected to make a 90 degree turn at the barricade in the direction of the arrow. TC-11RLB (NS) is used on a barricade for 90 degree turns in either direction.

Minimum size:
for *Streets* . . . . . 60 cm x 45 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 60 cm
When mounted on a barricade. . . . . 120 cm x 60 cm

New: 2012

TC-12S

TC-12S End Detour is used on a barricade to indicate that the usable portion of roadway ends. Sunset clause: The TC-12S sign is being phased out as an indicator of the end of a detour in favour of the TC-11E (NS). It may be used to indicate the end of a detour until 2014.12.31.

Minimum size:
for *Streets* . . . . . 60 cm x 45 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 60 cm
When mounted on a barricade. . . . . 120 cm x 60 cm

TC-13R

TC-13R Road Diversion is used to indicate a brief right, “TC-13R” or left, “TC-13L” change in the road alignment, but with no reduction in the number of lanes.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-14R

TC-14R Lane Diversion is used to indicate a brief right, "TC-14R" or left, "TC-14L" change in alignment of two lanes, but with no reduction in the number of lanes.
Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-17 (NS)

TC-17 (NS) Yield to Oncoming Traffic is used to indicate to a driver that their lane is closed for road work and that traffic through the work area is self regulating with no Traffic Control Persons present. Approaching drivers are warned that they must yield to traffic approaching and already in the one-lane section and must not proceed until the lane is clear and it is safe to do so.

TC-17 (NS) is only used to control traffic approaching the closed lane.

TC-17 (NS) is only used if it is possible for an approaching motorist to clearly see the entire one lane section.

Minimum size. . . . . 75 cm x 75 cm

TC-18 (NS)

TC-18 (NS) One Lane Traffic Operation Ahead is used to indicate to a driver that they are approaching a one-lane section in which traffic is self regulating with no Traffic Control Persons present.

Minimum size. . . . . 75 cm x 75 cm

TC-21

TC-21 Traffic Control Person is used to indicate the presence of Traffic Control Persons directing traffic using a stop / slow paddle. Motorists are warned that they must obey their directions.

TC-21 is displayed only when traffic control persons are actively directing traffic; otherwise it must be removed or covered.

When TC-21 is mounted on a portable sign support it must display two red orange flags positioned on the top of the sign.

Minimum size:
for *Streets*. . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane*. . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-21A (NS)

TC-21A (NS) Traffic Control Person Ahead is used to provide additional advance warning of the presence of Traffic Control Persons.

When TC-21A (NS) is mounted on a portable sign support it must display two red orange flags positioned on the top of the sign.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-27R

TC-27R (right) or TC-27 L (left) Curve Sign is used to indicate a change in the road alignment in the direction of the arrow. Motorists are warned to adjust their path for the upcoming curve.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-27L

TC-34

TC-34 Road Narrows is used to indicate a reduction in the width of the road but not a reduction in the number of lanes. Motorists are warned to expect a narrowing of their driving lane or a reduction in the shoulder clearance.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-34A (NS)

TC-34A (NS) Road Narrows Ahead is used to provide additional advance warning of a reduction in the roadway width.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-36S

TC-36S Distance Tab (NEXT x km) Tab Sign
is used to indicate the length of road that a condition exists.

Minimum size:
for *Streets* . . . . . 60 cm x 30 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 75 cm x 40 cm

TC-47

TC-47 Grooved Pavement is used to indicate road surface conditions in work areas which require extra care and attention by cyclists and motorcyclists.

TC-47 must be erected in advance of a section of roadway where construction procedures such as milling, grinding, scarifying or cold planing create a surface condition which may affect the control and stability of motorcycles and similar vehicles. TC-47 must remain in place until re-surfacing is completed.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-49

TC-49 Low Shoulder is used to indicate a section of road that has an appreciable "drop" in elevation between the travel lane and the shoulder caused by work activities.

TC-49 must be erected in advance of and every 1 kilometre throughout a section of roadway where work procedures have created a "low shoulder".

TC-49 must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-51

TC-51 Bump is used to indicate a change in the profile of the road that is sufficiently abrupt that it will cause discomfort to passengers or a deflection of the vehicle from its course. TC -51 must be erected in advance of every isolated "bump" caused by construction procedures. TC -51 may also be used to indicate that a section of road has numerous "bumps" by using the supplementary tab sign TC-36S indicating the length of the rough section.

TC-51 must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-54R

TC-54 Truck Entrance is used to indicate a location where trucks are entering, exiting, or crossing the road and where there is no other construction activity in the area, such as entrances to gravel pits or asphalt mix plants.

TC-54 should not be used at locations where construction or paving work is actually in progress as this information would be conveyed by TC-2.

TC-54 must be displayed only when trucks are working; otherwise the sign must be removed or covered.

TC-54L

TC-54 is available in R (Right Entrance), and L (Left Entrance). The appropriate version of the sign must be used.

TC-117 (NS) is often used with TC-54.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-62

TC-62 Hazard Marker is used to indicate a hazard at the edge of a travel lane, or may be placed at the edge of a lane to warn of a hazard in the lane. Either size may be used. Hazard markers are not required to be post mounted after 3 days.

Size . . . . . 20 cm x 60 cm
Size . . . . . 30 cm x 90 cm

TC-101 (NS)

TC-101 (NS) High Shoulder is used to indicate a section of road that has an appreciable increase in elevation between the travel lane and the shoulder due to construction activities.

TC-101 (NS) must be erected in advance of and every 1 kilometre throughout a section of roadway where construction procedures have created a "high shoulder".

TC-101 (NS) must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-102 (NS)

TC-102 (NS) Uneven Lanes is used to indicate a section of road that has adjacent lanes at different elevations when cold planing or resurfacing operations has not reached the same point in all lanes by the end of the work day.

TC-102 (NS) must be erected in advance of and every 1 kilometre throughout a section of roadway where construction procedures have created "uneven lanes".

TC-102 (NS) must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-103 (NS)

TC-103 (NS) Construction Zone is erected in advance of a construction zone as a general warning sign when a specific warning sign is not required and to remind drivers that they are in an area where they will encounter construction activities. It also advises drivers that although they may be in an area where construction activities have temporarily stopped, the roadway has not been returned to normal operating conditions.

TC-103 (NS) must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-104 (NS)

TC-104 (NS) Tar Ahead is used to indicate a section of road that has been primed or tack coated for resurfacing. Motorists are advised of the possibility of temporary pavement slipperiness or objectionable splashing.

TC-104 (NS) must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-105 (NS)

TC-105 (NS) Temporary Pavement Marking is erected 250 m in advance of the beginning of a temporarily marked section of highway.

TC-105 (NS) must be used to indicate a section of highway that has been recently resurfaced and that does not have permanent centreline markings.

TC-105 (NS) must remain in place until the permanent centreline has been painted.

Minimum size . . . . . 90 cm x 120 cm

TC-106 (NS)

TC-106 (NS) End Temporary Pavement Marking is placed at the end of a temporarily marked section.

TC-106 (NS) must be used to indicate a section of highway that has been recently resurfaced and that does not have permanent centre-line markings.

TC-106 (NS) must remain in place until the permanent centre-line has been painted.

Minimum size . . . . . 90 cm x 120 cm

TC-107 (NS)

TC-107 (NS) Traffic Control Signals is used to indicate the presence of traffic control signals directing traffic using standard red amber green signal displays. Motorists are warned that they must obey the signals.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-107A (NS)

TC-107A (NS) Traffic Control Signals Ahead is used to provide additional advance warning of the presence of traffic control signals.

TC-107A (NS) may also be combined with TC-112 (NS) to provide additional advance warning of a temporary work area.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-108 (NS)

TC -108 (NS) Flying Stones is used to indicate the presence of loose stone chips on the roadway from chip seal resurfacing operations.

TC-108 (NS) must be erected in advance of the resurfaced roadway section with loose stone chips.

TC-108 (NS) must remain in place until the roadway is restored to its normal condition.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-109 (NS)

TC-109 (NS) Danger Blasting Ahead is used to inform motorists that a blasting zone is near enough the road to be a hazard.

A temporary workplace that involves blasting on or near the roadway must be treated normally, as required by the Application Guide. In addition, the special signs for "blasting zones", that have been developed for the safety of motorists and workers, must be used.

The "blasting zone" must be long enough so that there is no danger to motorists from firing a charge and no danger to workers of a charge being fired through a motorist's use of a radio transmitter.

If traffic must be stopped on a 100 Series Highway or a Multi-Lane Road for blasting, police officers must be used. For roads other than 100 Series Highways and Multi-Lane Roads, the appropriate Application Guide and Traffic Control Persons, or police officers may be used. When there is no hazard to workers or motorists the "blasting zone" signs must be removed.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-110 (NS)

TC-110 (NS) Shut Off Your Radio Transmitter is erected in advance of the blasting zone.

Minimum size . . . . . 120 cm x 90 cm

TC-111 (NS)

TC-111 (NS) End Blasting Zone is erected at the end of the blasting zone.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-112 (NS)

TC-112 (NS) Be Prepared To Stop is used as part of the work area signing for a lane closure on *low volume streets* when traffic control persons are not used to direct traffic. It must be used in the approach to the one-lane section to advise drivers of on-coming traffic.

TC-112 (NS) may be combined with TC-21A(NS) (Traffic Control Person Ahead) or TC-21 (Traffic Control Person) to provide additional warning.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

New: 2012

TC-113 (NS)

TC-113 (NS) Road Ends indicates that the road ahead has been closed. TC-113 (NS) is normally erected with a TC-169 (NS), Barricade Ahead sign, to provide notice in advance of a barricade.

Minimum size . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-114 (NS)

TC-114 (NS) Overhead Bucket Work indicates that aerial work is being performed over or beside the road from a bucket truck. Motorists are warned to watch for hazards associated with this work type.

Sign TC-114 (NS), Overhead Bucket Work, may be used in place of sign TC-2, Road Work, where the primary work activity is performed overhead using a bucket truck.

If the primary work activity does not involve overhead bucket work, the TC-2 sign must be used. If the work activity involves an excavation, the TC-2 sign must be used.

TC-114 (NS) must not be displayed when work is not in progress.

When TC-114 (NS) is mounted on a high or low portable sign support it must display two red orange flags mounted on the top of the sign.

Double Fines For Speeding
Fines are doubled for speeding between:
- TC-2 and TC-4 signs (Road Work & Construction Ends), and between
- TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs as shown in the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2, and TC-114 (NS) signs immediately when the workplace becomes inactive.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

Sunset clause: 75 cm by 75 cm TC-114 (NS) signs mounted on a rigid backing and in service before 2010.06.30 may be used on any road until 2013.12.31.

TC-115 (NS)

TC-115 (NS) Wet Paint Ahead is used to indicate that line painting is occurring ahead of the trail vehicle displaying the TC-115 (NS) and that both the trail vehicle and the line paint truck should be passed with caution.

TC-115 (NS) must be attached to the trail vehicle in a manner that does not obscure any of the vehicle's warning lights or tail lights.

TC-115 (NS) must be removed or covered when the trail vehicle is travelling but line painting is not being carried out.

Minimum size . . . . . 240 cm x 120 cm

TC-116(NS)

TC-116 (NS) Over-dimensional Load is used to indicate that a work vehicle is encroaching upon an adjacent lane. Drivers are warned to exercise care when meeting or overtaking the vehicle(s).

On two-lane two-way, or multi-lane undivided roads, when a mobile operation work vehicle 'train' encroaches over the centreline: the lead vehicle must display the TC-116 (NS) on the front; work vehicles must display the TC-116 (NS) on the front and rear; the trail vehicle must display the TC-116 (NS) on the rear. For specific configurations, refer to Application Guides.

On multi-lane, or one-way roads, when a mobile operation work vehicle 'train' encroaches on more than one lane but does not cross a centreline: work vehicles must display the TC-116 (NS) on the rear; the trail vehicle must display the TC-116 (NS) on the rear. For specific configurations, refer to Application Guides.

New: 2012

Minimum size . . . . . 240 cm x 30 cm

TC-117 (NS)

TC-117 (NS) Slow Moving Vehicles Ahead is used to warn drivers of the possible presence of slow moving construction project trucks that have entered the highway and require some distance to reach a reasonable highway speed.

TC-54 is often used with TC-117 (NS).

New: 2012

In some circumstances a modified TC-117 (NS) sign must be used instead of a TC-165 (NS). See the TC-165 (NS) entry in this Section and Rule 1.16 in Section 13.3 for details.

Minimum size (except as noted below) . . . . . 240 cm x 120 cm
Section 13.3, Rule 1.16, minimum size . . . . . 165 cm x 90 cm

TC-118 (NS)

TC-118 (NS) Follow Me Do Not Pass is used to advise drivers that a pilot vehicle will lead traffic through a temporary workplace and that the pilot vehicle must be followed.

TC-118 (NS) is displayed on the rear of the pilot vehicle.

Minimum size . . . . . 120 cm x 60 cm

TC-131 (NS)

TC-131 (NS) TCP Ahead / Be Prepared to Stop is used to warn drivers of the presence of a lane closure and the possibility of a queue of stopped vehicles extending back from the closure. Drivers are expected to pay increased attention and be ready to stop if needed.

TC-131 (NS) must be displayed with three red orange flags on the sign or in combination with a Flashing Light Unit. The TC-131 (NS) sign must be used with a Flashing Light Unit at night and when a Flashing Light Unit is shown on the Application Guide in use. Flags may only be used when shown on the Application Guide in use, and only during the day. If flags are shown on the Application Guide in use, a Flashing Light Unit may be used as a substitute at any time.

TC-131 (NS)

Where it is impractical to use a TC-131 (NS) sign safely within the specified placement range (for example, due to the width of available shoulder), during daytime only, it is permissible to use the TC-21A (NS) in combination with the TC-112 (NS), instead of the TC-131 (NS). (Temporary Workplace Signers must consider clearance to traffic, shoulder widths, and use of driveways, etc.)

Minimum size . . . . . 240 cm x 120 cm

TC-132 (NS)

TC-132 (NS) Signals Ahead / Be Prepared To Stop is used to warn drivers of the presence of a lane closure and the possibility of a queue of stopped vehicles extending back from the closure. Drivers are expected to pay increased attention and be ready to stop if needed.

TC-132 (NS) must be displayed in combination with a Flashing Light Unit.

Minimum size . . . . . 240 cm x 120 cm

TC-141 (NS)

TC-141 (NS) Street Closed is used as an acceptable sign for Municipal Barricades (TC-64D and TC-64E) to warn drivers that a road is closed. TC-141 (NS) must only be displayed in combination with a Municipal Barricade. The alternative wording, "Road Closed" is acceptable.

Minimum size . . . . . 120 cm x 60 cm

TC-142 (NS)

TC-142 (NS) Local Traffic Only is used as an acceptable sign for Municipal Barricades (TC-64D and TC-64E) to warn drivers that a road is closed, but traffic with a destination on the closed portion, may use the road. TC-142 (NS) must only be displayed in combination with a Municipal Barricade.

Minimum size . . . . . 120 cm x 60 cm

TC-144L (NS)

TC-144 (NS) Sidewalk Closed Use Other Sidewalk is used to advise pedestrians that a sidewalk is closed and to continue their journey they must cross the street and use the sidewalk on the other side. To the extent practical, sidewalks should not be closed mid-block. The appropriate L (Cross to the Left Sidewalk) or R (Cross to the Right Sidewalk) version of the sign must be used.

Minimum size . . . . . 100 cm x 60 cm

TC-161R (NS)

TC-161 (NS) Right Lane Closed Ahead
Left Lane Closed Ahead
Center Lane Closed Ahead
is used to advise motorists that a lane is closed ahead and that a lane change may be required.

The appropriate R (Right Lane Closed), L (Left Lane Closed), or C (Center Lane Closed) version of the sign must be used. The word, "AHEAD" may be replaced with specific distance information if the sign is erected at a stationary location in advance of the lane drop, e.g. 1 km.

Minimum size:
for *Streets* . . . . . 180 cm x 90 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 240 cm x 120 cm

New: 2012

TC-165 (NS)

TC-165 (NS)

TC-165 (NS) Road Work Ahead / Be Prepared To Stop
is used to advise motorists that road work is being done ahead that may cause traffic to back up. Drivers are expected to pay increased attention and be ready to stop if needed.

TC-165 (NS) must be displayed with three red orange flags on the sign or in combination with a Flashing Light Unit. The TC-165 (NS) sign must be used with a Flashing Light Unit at night and when a Flashing Light Unit is shown on the Application Guide in use. Flags may only be used when shown on the Application Guide in use, and only during the day. If flags are shown on the Application Guide in use, a Flashing Light Unit may be used as a substitute at any time.

Sunset clause: TC-165 (NS) signs without the 'ahead arrow' may be used until 2014.12.31.

In some circumstances a modified TC-117 (NS) sign must be used instead of a TC-165 (NS). See the TC-117 (NS) entry in this Section and Rule 1.16 in Section 13.3 for details.

Minimum size:
for *Streets* . . . . . 180 cm x 90 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 240 cm x 120 cm

TC-169 (NS)

TC-169 (NS) Barricade Ahead is used to provide additional advance warning of a barricade ahead. The TC-169 (NS) should be inserted into the advance warning signing sequence when a barricade is placed in a travel lane and the barricade would have a reasonable expectation of causing an approaching driver to change speed or direction.

Minimum size:
for *Streets* . . . . . 75 cm x 75 cm
for *Highways* and *100 Series* and *Multi-Lane* . . . . . 90 cm x 90 cm
Signs that are a 75 cm x 75 cm roll-up design on a high mount portable sign support may be used instead of 90 cm x 90 cm signs.

TC-171 (NS)

TC-171 (NS) Speed Fines Double in Work Areas is used to notify motorists that between the TC-2 and TC-4 signs and between the TC-114 (NS) and the TC-4 signs, fines for speeding are doubled. The combination of TC-171 (NS), TC-2 and TC-4, or TC-171 (NS), TC-114 (NS) and TC-4 signs must not be displayed when workplaces are inactive.

Double Fines For Speeding
Fines are doubled for speeding between:
- TC-2 and TC-4 signs (Road Work & Construction Ends), and between
- TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs as shown in the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2, and TC-114 (NS) signs immediately when the workplace becomes inactive.

Minimum size:
for posted speeds equal to or less than 80 km/h . . . . . 90 cm x 60 cm
for posted speeds greater than 80 km/h . . . . . 120 cm x 90 cm

8.4 Regulatory Signs in Use at Temporary Workplaces

Regulatory Sign Standards

Regulatory signs used at Temporary Workplaces must conform with signs shown in the ***Province of Nova Scotia Schedule of Official Highway Signs*** published by the Minister under the authority of Section 88 of the ***Motor Vehicle Act*** of Nova Scotia, and otherwise meet standards set by the Minister.

Where a difference exists between signs shown in this Manual and regulatory signs shown in the Traffic Signs Regulation, the Traffic Signs Regulations will govern.

The "***Province of Nova Scotia Schedule of Official Highway Signs*** " is available on-line as a link at the end of the Traffic Sign Regulations: gov.ns.ca/just/regulations/regs/mvtrafic.htm

Offence for Unauthorized Use of Regulatory Signs

The unauthorized use of regulatory signs is potentially dangerous and is a punishable offence under Section 94(1) of the Motor Vehicle Act.

Permission to Use Regulatory Signs at Temporary Workplaces

Regulatory Sign use by an accredited Temporary Workplace Signer, in a manner prescribed by this Manual, is authorized, except as noted below under, "Speed Zone Restrictions", and "RA-1 Stop Sign Restriction".

Speed Zone Restrictions

Temporary speed zones must only be established following authorization by the Traffic Authority responsible for the road. The Traffic Authority may adapt an Application Guide and will provide speed zone sign placement information with approval of the temporary speed zone reduction plan.

As defined by the Traffic Authority, temporary speed zone signs must only be displayed during periods of work, or where conditions continue to exist that make the reduction of speed necessary.

RA-1 Stop Signs Restrictions

Temporary Workplace Signers are not permitted to permanently erect a stop sign without Traffic Authority approval. They may cover an existing stop sign temporarily, provided that the stop sign message is misleading, and other means of regulating traffic are provided. The status of the stop sign must be restored immediately after the temporary conditions cease.

Duty to Remove Regulatory Signs

The Temporary Workplace Signer must ensure that all Regulatory Signs are removed or covered immediately after they are no longer applicable.

Duty to Install Permanent Signs, Signals, Beacons, and Lane Markings

At a project's completion, the permanent regulatory, warning, guide, and information signs impacted by the Temporary Workplace must be restored. Also restore signals, beacons and lane markings.

Double Fines For Speeding

Fines are doubled for speeding:
- between TC-2, and TC-4 signs (Road Work & Construction Ends), and
- between TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs as shown in the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2 and TC-114 (NS) signs immediately when the workplace becomes inactive.

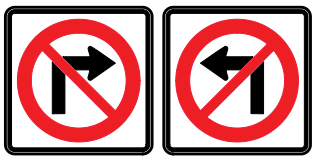
Regulatory Sign Descriptions

RA-1

RA-1 Stop Sign indicates to drivers that they must stop their vehicles completely before entering the intersection.

Minimum size . . . . . 60 x 60 cm

New: 2012



RB-11 **RB-12**

RB-11 and RB-12 Turn Prohibited Sign (R and L) indicates to drivers that they must not turn in the direction of the arrow.

Minimum size . . . . . 60 x 60 cm

RB-25

RB-25 Keep Right Sign indicates that traffic must pass to the right of obstructiions.

Minimum size . . . . . 60 x 75 cm

RB-31

RB-31 Passing Prohibited Sign indicates to drivers that they must not overtake another vehicle.

Minimum size . . . . . 60 x 60 cm

RB-34

RB-34 Keep Right Except to Pass Sign indicates to drivers that they must use the right lane, except when they are passing a slower vehicle.

Minimum size . . . . . 60 x 75 cm

RC-4

RC-4 Stop Line Sign indicates the point at which drivers approaching a traffic control device must stop their vehicles.

The RC-4R (right), or the RC-4L (left) version should be used depending on whether the sign is erected on the left or right side of the road.

Minimum size . . . . . 60 x 75 cm

9.0 Temporary Condition Devices

Introduction - Temporary condition devices have three functions for drivers and pedestrians:

- They warn them that construction, maintenance or utility work is being carried out on or near the road immediately ahead.
- They advise them of the appropriate response.
- They guide their passage through the Temporary Workplace.

Device Standards - All temporary condition devices must meet the standards shown in this *Manual* for appearance, size, shape, colour, and level of reflectivity and luminance.

New: 2012

Continuing Effectiveness - Temporary condition devices that lose effectiveness through reduced structural integrity, functionality, reflectivity, general appearance or other means, must not be used.

New: 2012

Company Name or Logo - Except as noted below for F-shape Barriers and vehicles, company names or logos may only be placed on the back or underside of Temporary Condition Devices. The maximum size of a name or logo is 1000 cm².

On F-shape barriers, a 100 mm X 100 mm symbol located 305 mm from the top and 305 mm from the left end may be placed on both outward facing sides. The symbol is for owner identification only and must not be glaring or eye-catching for passing motorists. Where an ownership mark is recessed into the surface of the barrier, it must not pose a snagging or shearing hazard. For guidance, see NCHRP Report 554.

For the back and front of vehicles used to display a sign or Flashing Light Unit or one used with an attenuator, vehicles must only display a message required by the Manual (no name, logo or non mandated message text facing to the front or rear).

Other than described above, on any vehicle used for traffic control and on any surface of the vehicle, ownership information and graphic designs may be displayed and are unrestricted as to size or design provided they do not distract or confuse road users or interfere with the effectiveness of the traffic control function performed by the vehicle.

Sunset clause: Where a company has installed vehicle marking that are in conflict with the preceding standards before 2012.06.01 the marks may remain until 2013.04.01.

Duty to Remove Temporary Condition Devices - All temporary condition devices must be removed or covered immediately after they are no longer applicable.

Approved Temporary Condition Devices - The following temporary condition devices have been approved for use in Nova Scotia:

9.1 Delineation Devices
9.2 Warning Devices
9.3 Guidance Devices
9.4 Protection Devices
9.5 Regulatory Devices

9.1 Delineation Devices

Delineators (Cones, High Delineators and Drums) - Equivalency

Use the lightweight delineators shown on the Application Guide, except that approved equivalent or higher standard delineators may be substituted.

Drums are the highest standard of the lightweight delineators. High Delineators and 700 mm Traffic Cones are equal to each other and a lower standard than Drums.

See also 9.1, "Delineators, Prohibited Use" (below), for a prohibition applicable to all lightweight delineators.

Delineators have night use standards which are described below in the entries for the specific device.

Delineators - Prohibited Use

Except as required for excavations (see below), different types of delineators must not be mixed, for the same purpose, on the same job, even when a higher standard delineator is used. (For example: do not intermix drums and cones in a Buffer Area, etc.)

Delineators (Cones, High Delineators and Drums) - Excavations

Except as provided for in section 13.4, for excavations, the edge of the Work Area beside the excavation must be delineated with drums, and additionally, before and after the excavation as described below.

Excavations must be delineated with drums both before and after the excavation an equivalent distance to an Application Guide table L/2 value matched to the workplace conditions. (Where the Application Guide in use does not have a table with "L" values, choose an Application Guide from the same Series that does have "L" values, and one which also matches the workplace road type and speed zone.)

Excavations at inactive workplaces on or near travel lanes must be backfilled, covered with Engineer approved steel plate, or protected by F-shape Barriers. Excavations unattended at other locations must be provided enough protection to prevent entry.

TC-61 Traffic Cones

700 mm tall.

For night use, 100 mm white ASTM Type III retroreflective stripe 100 mm from the top.

Weighted Base

Traffic Cones - Traffic Cones must be made from light weight, solidly coloured, bright orange material that is U.V. stabilized, and will not pose an injury hazard if struck.

Use - Traffic Cones may be used to delineate work areas, buffer areas, and transition area and termination area tapers when their use is indicated on an Application Guide.

Where Traffic Cones are specified by an Application Guide, High Delineators may be used instead of the cones.

Prohibited Use - Traffic Cones must not be used in place of Drums, or to delineate the traffic edge of a Work Area at an excavation, except as provided for in Section 13.4.

Except as required for excavations (see 9.1, Excavations), different types of delineators must not be mixed, for the same purpose, on the same job, even when a higher standard delineator is used. (For example: do not intermix drums and cones in a Buffer Area, etc.)

Night Use - Traffic Cones used at night must have a 100 mm reflectorized white stripe 100 mm from the top of the cone. The white stripe must be

reflectorized with ASTM Type III (high intensity) material.

Cone Stability - Traffic Cones must have bases heavy enough to keep them upright and in position during all conditions of use. Their weight must not present a hazard if the cone is struck by a vehicle.

Cones that are tipped, should not roll or migrate, causing a traffic hazard.

TC-62 Hazard Markers

100 mm stripe of orange ASTM Type III retroreflective material.

100 mm stripe of black non-retroreflective material.

Size - Either 200 X 600 mm, or 300 X 900 mm hazard markers may be used.

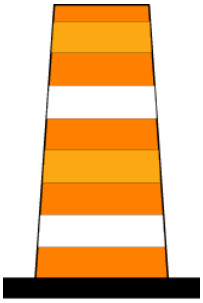
Markings - Hazard Markers must be marked with 100 mm reflectorized (ASTM Type III - high intensity) horizontal orange stripes alternating with 100 mm non-reflectorized horizontal black stripes.

Use - Hazard Markers must be used when a riding surface hazard is created at the edge of a travel lane. Hazard markers may be placed outside a travel lane adjacent to a hazard located within the travel lane; hazard markers need not be post mounted.

Spacing - For a continuous riding surface hazard created at the edge of the travel lane, the maximum hazard marker spacings are:

200 X 600 mm Hazard Marker - 50 m.
300 X 900 mm Hazard Marker - 100 m.

TC-63 Drums



900 mm high.

100 mm orange ASTM Type III retroreflective stripe.
100 mm white ASTM Type III retroreflective stripe.

Weighted base

Use - Drums must be used as shown on Application Guides and as described in text. They are a higher standard than, and except as prohibited at the beginning of this section (9.1, Delineators, Prohibited Use), may be substituted for cones, or high delineators.

Prohibited Use - Except as required for excavations (see 9.1, Excavations), different types of delineators must not be mixed, for the same purpose, on the same job, even when a higher standard delineator is used. (For example: do not intermix drums and cones in a Buffer Area, etc.)

Size - Drums must be a minimum diameter of 380 mm at the base and may taper to no less than 310 mm at the top. The minimum height is 900 mm.

Drum Construction - Drums must be made from light weight, solidly coloured, bright orange material that is U.V. stabilized, and will not pose an injury hazard if struck.

Markings - Drums must be marked with at least two 100 mm orange and two 100 mm white horizontal stripes of ASTM Type III (high intensity) retroreflective material. Striping must alternate between orange and white, starting with orange on top, and should be equally spaced over the entire height of the drum.

Drum Stability - Drums must have bases heavy enough to keep them upright and in position during conditions reasonably expected to be encountered at the workplace.

Drums and / or drum bases must be shaped so that, if the drum is tipped, it will not roll or migrate, causing a traffic hazard.

Drums must not be weighted on top.

Drum weighting must not be a hazard if the drum is struck.

High Delineators

1000 mm high.

100 mm white ASTM Type III retroreflective stripe 100 mm from the top.

Weighted base.

High Delineator Construction - High Delineators must be made from light weight, solidly coloured, bright orange material that is U.V. stabilized, and will not pose an injury hazard if struck..

Use - Where Traffic Cones are specified by an Application Guide, High Delineators may be used instead of the cones.

Prohibited Use - High Delineators must not be used in place of Drums, or to delineate the traffic edge of a Work Area at an excavation, except as provided for in Section 13.4.

Except as required for excavations (see 9.1, Excavations), different types of delineators must not be mixed, for the same purpose, on the same job, even when a higher standard delineator is used. (For example: do not intermix drums and cones in a Buffer Area, etc.)

Size - High Delineators must be a minimum of 1000 mm in height.

Markings - High Delineators must be marked with at least one 100 mm wide, white, horizontal stripe. The stripe must be 100 mm from the top and be reflectorized with ASTM Type III (high intensity) material.

High Delineator Stability - high delineators must have bases heavy enough to keep them upright and in position during all conditions of use.

High Delineator weighting must not be a hazard if the delineator is struck by a vehicle.

High Delineators that are tipped, should not roll or migrate, causing a traffic hazard.

Retro Reflective Paint, Retro Reflective Pavement Marking Tape and Retro Reflective Pavement Markers

New: 2012

Use - Where a road in a temporary workplace will be marked with permanent lanes lines upon completion of the project and the road is open to public use during periods of inactivity, lane lines must be marked with delineators, Retro Reflective Pavement Marking Tape, Retro Reflective Pavement Markers, or Retro Reflective Paint marks.

Placement - Temporary line markings intended to be used as a guide for the installation of permanent markings should be laid with the assistance of a surveyor.

Colour - Where traffic is travelling in opposing directions on a Multi-Lane divided road, the line on the left between opposing traffic lanes is yellow, the rest of the lane lines are white.

On Two-Lane Two-Way and Multi-Lane undivided roads the centreline between opposing traffic lanes is yellow, the rest of the lines are white.

(There are exceptions to the above rules for one way ramps and intersections, contact the Traffic Authority for guidance in these cases.)

Tape Size and Spacing - When Pavement Marking Tape is used, it must consist of 100 X 300 mm strips of reflective tape at 20 m intervals.

Retro Reflector Spacing - When Retro Reflective Pavement Markers are used, centerline markers must be installed at 10 m intervals and lane line markers at 20 m intervals.

Longitudinal Barrier Retro Reflectors
100 mm x 200 mm

Use - Retro reflectors must be placed on the top of Longitudinal Barrier sections to provide night time guidance.

Colour - The retro reflectors must consist of yellow reflective material if the barrier is on the left and white reflective material if the barrier is on the right.

Reflectivity - The retro reflectors must meet the specifications for ASTM Type III (high intensity) material.

Spacing - retro reflectors spacing for a temporary workplace is significantly less than that recommended for a permanent barrier installation. At temporary workplaces the spacing for Traffic Cones and Drums (Spacing 'D' in Table 10.1) should be followed for Longitudinal Barrier retro reflectors with the further stipulation that five retro reflectors should always be visible to a motorist on horizontal curves. This may require a further reduction in spacing on the entrance and exit to the curve as well as on the curve itself.

9.2 Warning Devices

Flags (on Signs)

Use -Except as described below, two red orange flags must be displayed on signs depicting 'human activity' mounted on portable sign supports to compensate for their lower mounting height (this applies to high and low mount portable supports).

Three red orange flags must be displayed on top of TC-131 (NS) and TC-165 (NS) signs unless these signs are displayed with a Flashing Light Unit. There are rules limiting the use of flags on these signs during night. See the entries (TC-131 (NS) and TC-165 (NS)) in Section 8.3 for the sign in use.

Description - Flags must consist of a bright red orange cloth or cloth-like material securely mounted on a short staff so that the bottom of the flag hangs just above the sign.

Size - Flags must be a minimum of 300 X 300 mm.

Variable Message Signs

Description - Variable Message Signs are signs that are capable of displaying a number of fixed messages that are displayed one at a time. The messages can be changed manually, by remote control, or by automatic control.

Use - Variable Message Signs warn motorists of work operations that are outside their expectations, such as lane closures associated with Mobile Operations and Special Operations. Messages displayed using Variable Message Signs must provide motorists with a legible, concise message directly relevant to the roadway condition they are approaching.

Trail Vehicle

Use - A Trail Vehicle is used to 'trail' a Mobile Operation to provide advance warning to traffic overtaking the operation.

Trail Vehicles are to operate on the shoulder as much as practical with limited encroachment on the travel lane.

Prohibited Use - A Trail Vehicle must not carry passengers.

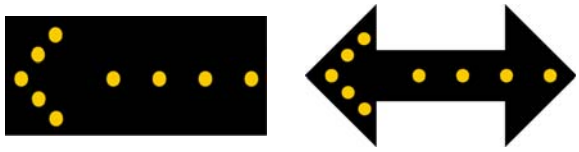
A Trail Vehicle is not fitted with a truck mounted attenuator and should not be placed in a position in which it is attempting to block a travel lane in advance of a Mobile Operation.

Description and Size - Trail Vehicles should not be smaller than a full sized pick-up truck and must display the warning lights and signs specified on the Application Guide in use.

Operators - Operators of Trail Vehicles must receive training from their employers for their duties. They must remain in constant radio contact with the operators of other Trail Vehicles, Protection Vehicles, and Work Vehicles.

Operators of Trail Vehicles must maintain an established distance between their vehicle and the vehicle ahead. The distance will depend upon the type of road, the prevailing speed, and the number of Trail Vehicles used in the operation.

TC-9 FLU or Flashing Light Unit



Flashing Light Unit

Description and Size - Flashing Light Units may be vehicle or trailer mounted. When complete with arrow display capability, Flashing Light Units must be a minimum of 1450 X 600 mm.

Mounting Height - Except as described below, the height from the pavement to the centreline of the Flashing Light Unit must be approximately 2.2 m when it is in the upright position. Where a Flashing

Light Unit must be mounted on a vehicle or piece of equipment, and the 2.2 m mounting height blocks the operator's view, or is otherwise impractical or unsafe due to limitations imposed by the vehicle, the Flashing Light Unit may be mounted within the range of 1.8 - 2.8 m from the pavement surface to the centreline of the unit.

Approved Displays - Flashing Light Units have a group of lights capable of flashing a horizontal bar (Bar Mode) or a directional arrow(s) (Arrow Mode). The approved displays are:

- Left Arrow (TC-9L.)
- Right Arrow (TC-9R.)
- Left and Right Arrow (TC-9LR.)
- Warning Bar (TC-9B.)

The displays must have a minimum of:

- Six working lights in Warning Bar mode.
- Nine working lights in Left or Right Arrow mode (one arrowhead lit).
- Twelve working lights in Left and Right Arrow mode (both arrowheads lit).

Alternative Standards for Flashing Light Units - Subject to the conditions that follow, where a vehicle or piece of work equipment is required to display a Flashing Light Unit in Bar Mode only (such as a mower working only off shoulder), it is permissible to use a Flashing Light Unit without the arrow display capability (with no arrow heads).

The alternative lighting equipment must meet the minimum width standards of a fully featured Flashing Light Unit, but may have the height reduced by a proportional amount to compensate for the missing arrow heads. The alternative lighting must have the same light distribution (six lights, in bar mode), colour, intensity, and flash rate standards as for Flashing Light Units that have arrow display capabilities; they must be equipped with a backboard that produces lighting contrast equivalent to that of a fully featured Flashing Light Unit.

Night Operation -The intensity of the Flashing Light Unit display must be reduced during night operations.

Prohibited Displays - No other displays, such as sequential arrow or 'four corner' warning lights, are permitted.

Flash Rate - Flashing Light Units must maintain a flash rate of 25 - 35 flashes per minute. Lights must be lit for approximately 50% of the cycle.

Bulbs - Flashing Light Units using 35 watt incandescent bulbs are the standard against which other displays must be measured. Other Flashing Light Units must maintain the same flash rate, angularity, and apparent brightness as the 35 watt incandescent bulb units.

For each Flashing Light Unit, all bulbs must show the same yellow or amber colour, and all must display the same light intensity.

9.3 Guidance Devices - (Pilot Vehicles)

Pilot Vehicles

Description - A Pilot Vehicle is used to lead motorists through a temporary workplace, when circumstances require it. A Pilot Vehicle must prominently display sign **TC-118 (NS)** on the rear of the vehicle and a 360° Flashing Amber Light or a Flashing Light Unit in Bar Mode.

Requirement to Use a Pilot Vehicle - On roads where traffic is regulated by Traffic Control Persons, a Pilot Vehicle must be used if the Work Area is longer than 1 km.

Where traffic is regulated by Traffic Control Persons, and the Work Area is less than 1 km, Temporary Workplace Signers must evaluate safety and determine the need for a Pilot Vehicle. Temporary Workplace Signers should consider traffic volume, speed, road alignment and access points within the workplace when making their determinations.

Length of Work Area - Where a Pilot Vehicle is used to lead motorists past a Work Area, the Work Area may be a maximum of 2 km. A Traffic Authority may extend the Work Area beyond 2 km.

Pilot Vehicle Operation - The pilot vehicle must:

- Be operated in a way that assures the greatest safety for motorists and workers.
- Travel at a speed that does not permit gaps to develop between vehicles being led.

Communication - Before the start of the project, the Temporary Workplace Signer must ensure that:

- Every business, residence, institution, etc within the affected area receives:
  - Written notification of the dates and times when work will take place.
  - Written instructions for safely joining and leaving the traffic stream when entering and leaving their property.
  - Contact information for the contractor and / or Temporary Workplace Signers.
- During work, Traffic Control Persons and Pilot Vehicle Operators must remain in radio communication.

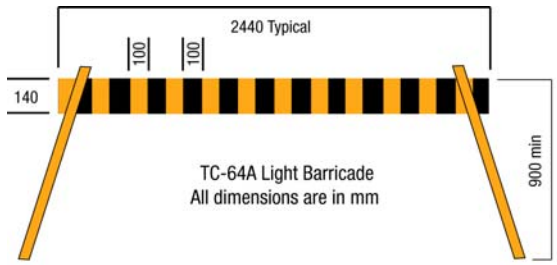
Traffic Control Persons Needed With Pilot Vehicle - Traffic Control Persons must regulate traffic at:

- Each end of the workplace.
- Every business location between Traffic Control Persons that routinely has customers stopping.
- Every intersection between Traffic Control Persons.
- Every other location, where needed to assure safety.

Delineators Needed - When a pilot vehicle is used, to standards defined in the Application Guide in use, Traffic Cones, High Delineators or Drums are required to separate the edge of the Buffer and Work Areas from the adjacent traffic lanes. For exceptions, see the rules for excavations in Section 13.3, and the procedures for "Resurfacing" at Section 13.5.20.

9.4 Protection Devices

TC-64A Light Barricade



Description -TC-64A Light Barricades must be constructed of lightweight material.

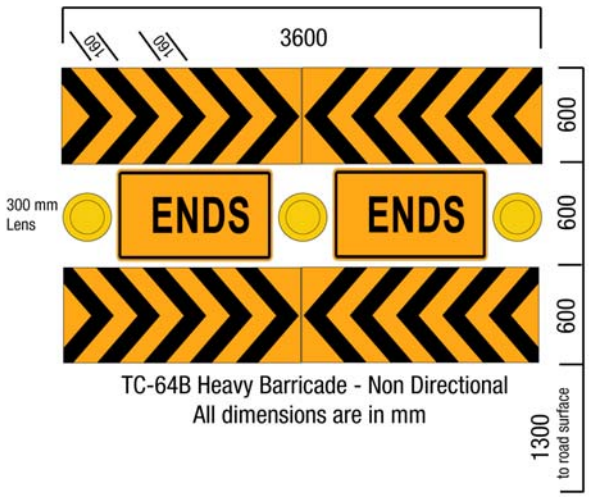
The Light Barricade rail must be marked with 100 mm reflectorized vertical orange stripes alternating with 100 mm non-reflectorized vertical black stripes. The orange stripes must be reflectorized with ASTM Type III (high intensity) sheeting. The rail must be a minimum of 900 mm from the road surface.

Use - TC-64A Light Barricades may be used:

- To close shoulders at, or in advance of a Work Area.
- To mark a hazard within a delineated area, or at the edge of the road.
- Along with a Municipal barricade on the shoulder of the road to establish more clearly defined restrictions at the sides of the Municipal barricade (See: TC-64D and TC-64E).

Prohibited Use - TC-64A Light Barricades must not be used as delineation devices.

TC-64B Heavy Barricade, Non-Directional



Description - TC-64B Heavy Barricades must be constructed of:

- Four barricade sections.
- Two TC-12S signs, 120 cm x 60 cm.
- Three 300 mm flashing yellow (amber) lights.
  - Lights must meet the requirements of the Institute of Transportation Engineers', "*Equipment and Material Standards*" - Chapter 2 Vehicle Traffic Control Signal Heads, and when Light Emitting Diodes (LED) are used, the requirements of the Institute of Transportation Engineers', *"Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement."*
  - Lights must flash 50 - 60 times per minute and be lit for 50% of the cycle, all flash together, and be of uniform colour and intensity.

Heavy Barricades must be marked with 160 mm reflectorized orange chevrons (arrows) made from ASTM Type III (high intensity) sheeting alternating with 160 mm non-reflectorized black chevrons.

The TC-64B Heavy Barricade chevrons must point towards the centre to indicate no directional information.

Use -When required by an Application Guide, and when used along with temporary condition signs, TC-64B barricades are used where it is necessary to

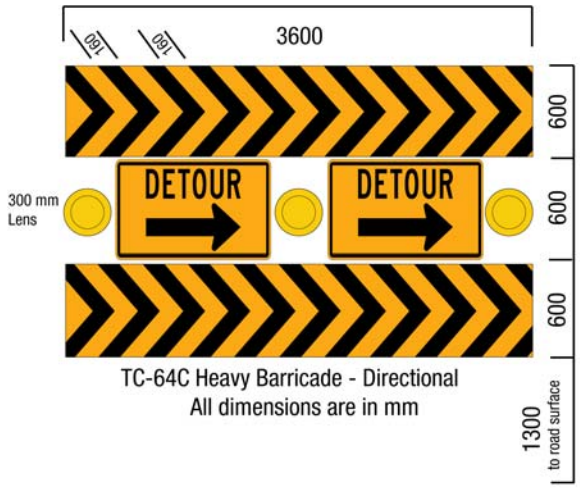
close a road in advance of a Work Area, or where an ongoing danger to motorists exists ahead, such as a bridge failure. The TC-64B presents a significant physical barrier but does not direct motorists to the left or right.

TC-64D or E barricades may be used instead of the TC-64B or C, under some conditions. See the entries in this section under TC-64D and TC-64E for guidance.

Position - Barricades must be positioned at an approximate angle of 90º to the traffic lane to display the largest target area to motorists.

New: 2012

TC-64C Heavy Barricade, Directional



TC-64C Heavy Barricade - Directional
All dimensions are in mm

Description - TC-64C Heavy Barricade Directional must be constructed of:

- Four barricade sections.

New: 2012

- Two TC-11 detour signs showing the most appropriate arrow, 120 cm x 60 cm.
- Three 300 mm flashing yellow (amber) lights.
  - Lights must meet the requirements of the Institute of Transportation Engineers', "*Equipment and Material Standards*" - Chapter 2 Vehicle Traffic Control Signal Heads, and when Light Emitting Diodes (LED) are used, the requirements of the Institute of Transportation Engineers, *"Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement."*
  - Lights must flash 50 - 60 times per minute and be lit for 50% of the cycle, all flash together, and be of uniform colour and intensity.

Heavy Barricades must be marked with 160 mm reflectorized orange chevrons (arrows) made from ASTM Type III (high intensity) sheeting alternating with 160 mm non-reflectorized black chevrons.

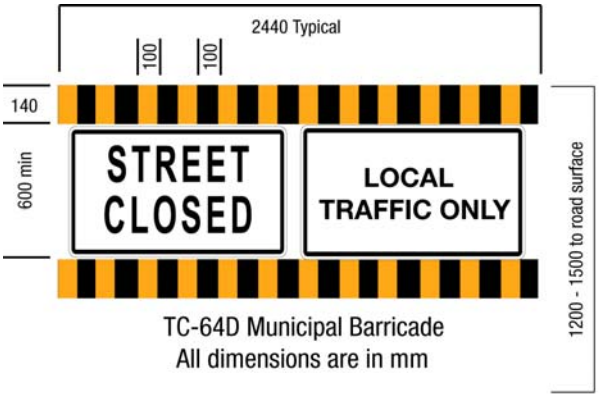
The TC-64C Heavy Barricade chevrons must point toward the detour, to indicate the direction of traffic movement.

Use - When required by an Application Guide, and when used along with temporary condition signs, TC-64C barricades are used where it is necessary to close a road in advance of a Work Area, or where an ongoing danger to motorists exists ahead, such as a bridge failure. The TC-64C presents a significant physical barrier and directs motorists to the left or right.

TC-64D or E barricades may be used instead of the TC-64B or C, under some conditions. See the entries in this section under TC-64D and TC-64E for guidance.

Position - Barricades must be positioned at an approximate angle of 90º to the traffic lane to display the largest target area to motorists.

TC-64D Municipal Barricade, With Twin Rails



TC-64D Municipal Barricade
All dimensions are in mm

Description - TC-64D Municipal Barricades must be constructed of two lightweight rails which must be marked with 100 mm reflectorized vertical orange stripes alternating with 100 mm non-reflectorized vertical black stripes. The orange stripes must be reflectorized with ASTM Type III (high intensity) sheeting. The top rail must be between 1200 mm and 1500 mm from the road surface.

Municipal Barricades may contain two of three signs:

New: 2012

- TC-11 Detour detour sign showing the most appropriate arrow, 120 cm x 60 cm.
- TC-141(NS) Street / Road Closed.
- TC-142 (NS) Local Traffic Only.

Where a municipal barricade is used to completely close a road and it is not feasible to offer a detour (e.g. dead end road), the barricade must show two TC-141 (NS) signs.

Use - Subject to conditions that follow, when used along with temporary condition signs, TC-64D Municipal Barricades may be used for road closures or detours on low volume non 100 Series Highways, or Streets, both high or low volume.

Where necessary to control traffic movement, use two TC-64D barricades, or supplement a single TC-64D with TC-63 drums to create safe conditions. TC-64A barricades may be used on the shoulder of the road.

Prohibited Use - TC-64D barricades must not be used on 100 Series Highways, or High Volume Highways.

TC-64D barricades are highly mobile, therefore must not be left unsupervised as the primary means of notifying motorists of a critical hazard ahead. A critical hazard would be one where, should motorists pass the barricade, there would be a reasonable expectation of death, serious injury, or substantial property damage.

Restricted Use On Low Volume Non - 100 Series Highways - TC-64D barricades may be used instead of TC-64B or C barricades to indicate closure of a lane on a Non - 100 Series Low Volume Highway if the following conditions are met:

- The use of TC-64D barricades must be restricted to temporary emergency conditions.
- If it is anticipated that the temporary emergency conditions will take longer than 1 day to resolve, provisions to install a TC-64B or C barricade, as appropriate, must be made as soon as practical.
- TC-64D barricade use should be restricted to daytime, or locations where overhead lighting provides illumination. Alternatively, TC-64D barricades should be illuminated with floodlights.
- Where more than one lane is closed, as soon as practical, a municipal barricade is installed for each closed lane.
- TC-63 drums at 1 m spacing may be used at the side of the barricade to restrict vehicle movements and increase visual impact.

Position - Barricades should be positioned at an approximate angle of 90º to the traffic lane to display the largest target area to motorists.

TC-64E Municipal Barricade, With Flashing Light Unit

TC-64E Municipal Barricade

Description -TC-64E Municipal Barricade must be made from a standard Flashing Light Unit and must display two of three signs:

New: 2012

- TC-11 Detour detour sign showing the most appropriate arrow, 120 cm x 60 cm.
- TC-141(NS) Street / Road Closed.
- TC-142 (NS) Local Traffic Only.

Where a municipal barricade is used to completely close a road and it is not feasible to offer a detour (e.g. dead end road), the barricade must show two TC-141 (NS) signs.

TC-64E Municipal Barricades must consist of a Flashing Light Unit with appropriate signs. The Flashing light Unit must only display the Bar Mode. Directional information, if any, must come from the attached signs. The height from the pavement to the centreline of the Flashing Light Unit head must be approximately 2.2 m.

Use - Subject to conditions that follow, when used along with temporary condition signs, TC-64E Municipal Barricades may be used for road closures, or detours on Highways and Streets.

At night, Temporary Workplace Signers must ensure that the TC-64E Flashing Light Unit lamp intensity is reduced to prevent glare.

Measures must be taken to prevent barricades from being tampered with.

Where necessary to control traffic movement, use two TC-64E barricades, or supplement a single TC-64E with TC-63 drums to create safe conditions. TC-64A barricades may be used on the shoulder of the road.

Prohibited Use - TC-64E barricades are highly mobile, therefore must not be left unsupervised as the primary means of notifying motorists of a critical hazard ahead. A critical hazard would be one where, should motorists pass the barricade, there would be a reasonable expectation of death, serious injury, or substantial property damage.

Restricted Use On 100 Series Highways - TC-64E barricades may be used instead of TC-64B or C barricades to indicate closure of a lane(s) on a 100 Series Highway if the following conditions are met:

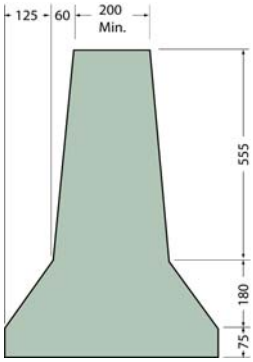
- The closure is required because of temporary emergency conditions.
- If it is anticipated that the temporary emergency conditions will take longer than 1 day to resolve, provisions to install a TC-64B or C barricade, as appropriate, must be made as soon as practical.
- Where more than one lane is closed, as soon as practical, a municipal barricade is installed for each closed lane.
- TC-63 drums at 1 m spacing may be used at the side of the barricade to restrict vehicle movements and increase visual impact.

Restricted Use On Non - 100 Series Highways - TC-64E barricades may be used instead of TC-64B or C barricades to indicate closure of a lane on a Non - 100 Series Highway if the following conditions are met:

- The use of TC-64E barricades should be restricted to temporary emergency conditions, or short duration work.
- If it becomes evident that the emergency or short duration work will extend beyond 1 day, provisions to install a TC-64B or C barricade, as appropriate, should be made as soon as practical.
- TC-63 drums at 1 m spacing may be used at the side of the barricade to restrict vehicle movements and increase visual impact.

Position - Barricades should be positioned at an approximate angle of 90º to the traffic lane to display the largest target area to motorists.

F-shape Barrier



Drawing dimensions are in mm

New: 2012

Approved Barrier Designs - The only pre-approved portable anti-intrusion barrier in Nova Scotia is the Portland Cement Concrete F-shape Barrier. F-shape Barriers with designs approved before 2011.01.01 must be constructed and installed copying a design certified as meeting Test Level 3 of the NCHRP Report 350 (NCHRP 350), or if the design was approved after 2011.01.01, Test Level 3 standards of the American Association of State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH).

Other barrier types may be approved if:

- For the speed zone at the workplace, the barrier design is supported by a NCHRP 350 or MASH acceptance letter issued by the FHWA and the barriers are installed to standards equivalent to those used during testing.

- The barriers were designed prior to 2011.01.01 and detailed analysis by a registered Professional Engineer proves the installed performance characteristics are equivalent to those recommended in NCHRP 350 for the speed zone at the workplace.

- The barriers were designed after 2011.01.01 and detailed analysis by a registered Professional Engineer proves the installed performance characteristics are equivalent to those recommended in MASH for the speed zone at the workplace.

Approval of other barrier types will be by the Department.

Primary Uses - F-shape Barriers have three primary uses, they:

New: 2012

- Provide workplace protection by preventing errant vehicle entry. They protect workers, elevated work platforms, etc.
- Provide protection to errant drivers by redirecting them from a hazard (e.g. object or excavation).
- Separate two-way traffic.

Excavations at inactive workplaces on or near a travel lane must be backfilled, covered with Engineer approved steel plate, or be protected by F-shape Barriers. Excavations left unattended at other locations must provide enough protection to prevent entry.

Retroreflectors on Barriers - see entry at 9.1.

F-shape Barrier Tapers - If the angle of approach is too abrupt, drivers may suffer from an increased impact, or the barrier may be pushed onto workers.

Speed Zone Greater Than 50 km/h - Figure 9.1 (at the end of this entry) shows required F-shape Barrier placement values for approach transition tapers where:

- The lane width is 3.6 m.
- The F-shape Barrier sections are 2.5 m long.

Should lane widths or barrier lengths change, Temporary Workplace Signers must design the taper so that the vehicle approach angle is not greater than 10 degrees.

Speed Zone 50 km/h - For speed zones not greater than 50 km/h, an approach transition taper for a 3.6 m wide lane may be made by using five 2.5 m long F-shape Barrier sections. Additional barrier may be needed if the road has a shoulder. Should lane widths or barrier lengths change, Temporary Workplace Signers must design the taper so that the vehicle approach angle is not greater than 17 degrees.

F-shape Barrier Termination Tapers - The approach angle for barrier termination tapers must not be more abrupt than for approach transition tapers.

Barrier Installations - F-shape Barrier:

- Must have no gaps.
- Sections must be securely fastened together in accordance with design provisions, so that the barrier acts as a unit under impact.
- Tapers must be long enough to prevent vehicles from entering the work area around the ends.
- Termination tapers may have an access opening closest to the edge of the road, provided the opening does not permit errant vehicle entry into the workplace and does not present a blunt barrier end collision risk to errant drivers.
- Must have end points positioned to:
  - Minimize the probability of blunt end collisions (e.g. continuous across the shoulder), or
  - Have blunt ends protected by an impact attenuator with installed performance characteristics equivalent to those recommended for the speed zone at the workplace in NCHRP 350 if the attenuator was approved prior to 2011.01.01, or MASH if the attenuator was approved after 2011.01.01.

New: 2012

- Approach transition tapers must have a taper of drums meeting speed zone standards from Table 10.2 in advance of the barriers.

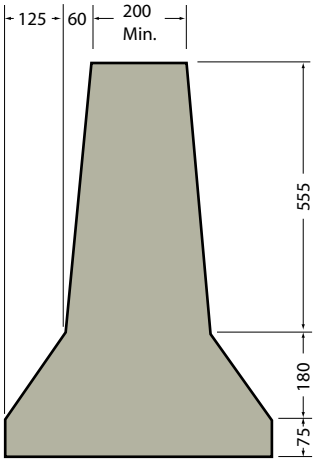
New: 2012

Temporary Workplace Signers should:

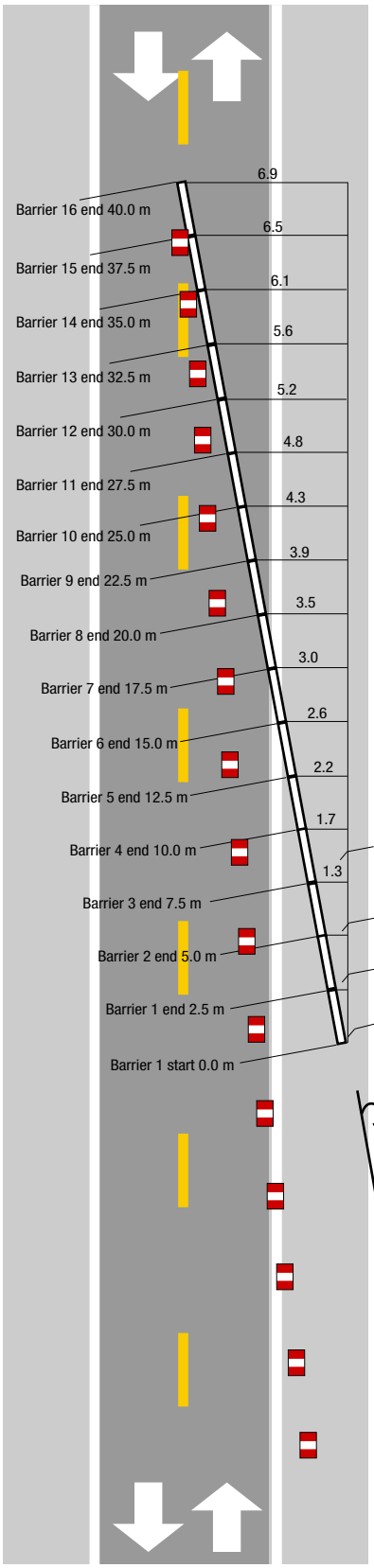
- consider deflection values for barriers in use when workers will be required to work behind barriers or when the barrier is protecting a critical hazard
- as needed, increase the safety space behind barriers and / or employ methods to minimize barrier deflections (e.g. anchoring, etc.)
- inform the workers' employer of the potential for the barrier to deflect when struck.

When workers are required to work within the anticipated deflection zone of a longitudinal barrier installation, their employer should make them aware how far the barriers could move, if struck.

Barrier Section Number	Distance to End of Barrier Section Measured From the Beginning of The Taper in Metres	Offset From Taper Beginning Measured At The Barrier End in Metres
1	2.5	0.4
2	5.0	0.9
3	7.5	1.3
4	10.0	1.7
5	12.5	2.2
6	15.0	2.6
7	17.5	3.0
8	20.0	3.5
9	22.5	3.9
10	25.0	4.3
11	27.5	4.8
12	30.0	5.2
13	32.5	5.6
14	35.0	6.1
15	37.5	6.5
16	40.0	6.9



F-shape Barrier
Dimensions are in mm
Not to scale



- F-shape Barrier sections must be fixed together
- There must be no gaps between barrier sections in the Transition Area taper
- Traffic approach angle must not be greater than 10 degrees
- Drums must be used in advance of Transition Area taper
- The lane width in this example is 3.6 m
- Different barrier lengths will have different offset values

NOT TO SCALE

Blocker Vehicle

Description - A truck used to protect workers by blocking the path of errant vehicles. It has a minimum weight of 5000 kg and should be equipped with a high backed seat; it does not have a Truck Mounted Attenuator (TMA).

A Blocker Vehicle must be equipped with a 360 degree flashing amber light, and may require a Flashing Light Unit under some conditions.

Under-ride Protection - A Blocker Vehicle in use and facing away from oncoming traffic must be equipped with rear under-ride protection.

During the day, a parked Blocker Vehicle with a low front bumper, and without under-ride protection on the rear, may be used provided it is turned to face oncoming traffic.

Note: Under-ride protection is a typical low vehicle bumper, or bars installed to limit the probability that a small car will be driven under the Blocker Vehicle during an impact.

Use - Blocker Vehicles don't provide crash protection for striking vehicles. Without respect for standards in Application Guides, they should be limited to situations where a Protection Vehicle is unavailable or impractical.

Prohibited Use - A Blocker Vehicle in use at a temporary workplace must not be loaded with materials that would have a reasonable expectation of causing a fire or a chemical hazard, if the vehicle is struck.

Precautions When Parked - Blocker Vehicles in a stationary location in advance of a Work Area, must:
- Be positioned to protect the workers.
- Have the vehicle's brakes set.
- Have the wheels angled away from the open travel lane and workers.
- Be placed in 'park' or in a low gear.
- Be left unoccupied while performing the stationary blocking function.

Protection Vehicle

Description - A Protection Vehicle is a truck of suitable weight with a truck mounted attenuator (TMA) used to block a travel lane to protect workers on a roadway. The Protection Vehicle with its Truck Mounted Attenuator, if approved before 2011.01.01, must meet the requirements of NCHRP 350 Level TL-3 (100 km/h impact speed). Those approved after 2011.01.01 must meet MASH TL-3 standards.

A Protection Vehicle must be fitted with a high-back seat and a head rest for the operator.

A Protection Vehicle must be fitted with a Flashing Light Unit (FLU) to provide warning and guidance to overtaking traffic.

Prohibited Use - A Protection Vehicle in use at a temporary workplace must not be loaded with materials that would have a reasonable expectation of causing a fire or a chemical hazard, if the vehicle is struck.

A Protection Vehicle must not carry passengers while actively providing protection.

Operator Requirements - Operators of Protection Vehicles used in Mobile Operations must receive training from their employers for their duties. They must remain in constant radio contact with the operators of Trail Vehicles and Work Vehicles.

Precautions When Stationary - Protection Vehicles in a stationary location in advance of a Work Area, must:
- Be positioned to protect the workers.
- Display the correct Flashing Light Unit message.
- Have the vehicle's brakes set.
- Have the wheels angled away from the open travel lane and workers.
- Be placed in 'park' or in a low gear.
- Be left unoccupied while performing the stationary blocking function.

Truck Mounted Attenuator (TMA)

Description - A Truck Mounted Attenuator (TMA) is an energy absorbing device attached to the rear of a truck used as a Protection Vehicle. (It is also acceptable for these attenuators to be trailer mounted, provided the same standards are met.)

New: 2012

Truck Mounted Attenuators approved before 2011.01.01 must satisfy the requirements of NCHRP 350 Level TL-3 (100 km/h impact speed). Those approved after 2011.01.01 must meet MASH TL-3 standards.

Impact Attenuator

Description - An Impact Attenuator is a stationary energy-absorbing device.

New: 2012

Impact Attenuators approved before 2011.01.01 must meet the requirements of NCHRP 350 for the speed zone at the workplace. Those approved after 2011.01.01 must meet MASH standards for the speed zone at the workplace.

Use - An Impact Attenuator may be installed to shield the exposed end of fixed objects such as F-shape Barriers that may be struck by an errant motorist.

Impact Attenuators may also be installed to shield permanent objects that are being constructed, or those that become a hazard during a project.

9.5 Regulatory Devices

Regulatory Device Standards
Regulatory devices must meet standards set by the Minister.

Stop / Slow Paddle

Approved Use - A Stop / Slow Paddle used by an accredited Traffic Control Persons at a Temporary Workplace, and in a manner prescribed by this Manual, is an approved regulatory device.

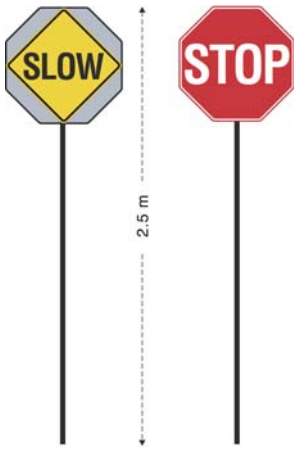
Description - The Stop / Slow Paddle must consist of a 600 X 600 mm Stop sign and a 450 X 450 mm Slow sign mounted back to back on the top of a pole so that the top of the signs are at least 2.5 m from the bottom of the pole.

The Stop sign must be an octagon in shape with white letters on a red background.

The Slow sign must be a diamond in shape with black letters on a yellow background.

The Stop and Slow signs must be reflectorized with ASTM Type III (high intensity) sheeting.

It is acceptable to use retroreflective sheeting applied to both sides of a single sign blank rather than using two sign blanks. When mounting a single sign blank on a pole, the sign's retroreflective sheeting must not be covered or obscured. Retroreflective sheeting must only be in the shape of the sign being presented.



Temporary Traffic Control Signals

Authorization Needed - Temporary Traffic Control Signal installations require Traffic Authority authorization by the Traffic Authority responsible for road, before the signals are erected.

Description and Use - Temporary Traffic Control Signals may be pole mounted or portable. Subject to approval, they may be used at a temporary workplace to regulate traffic.

Design and Installation Standards - Temporary Traffic Control Signals must meet the standards set by the Traffic Authority responsible for the road, and must be designed based on standards contained in, Part "B", "Traffic Control Signals", of the Manual of Uniform Traffic Control Devices for Canada.

Stability and Alignment - Temporary Traffic Control Signals must be installed so that the signal heads remain in position and properly aligned under all conditions of use.

Inspections - The Temporary Workplace Signer responsible for the installation of the Temporary Traffic Control Signals must ensure that the signals are inspected regularly to verify correct operation. The inspection periods must be defined in writing, and records of inspections must be kept.

Failure Response - The Temporary Workplace Signer responsible for the installation of the Temporary Traffic Control Signals must develop a plan to ensure safe regulation of traffic should a failure occur. The plan must include keeping equipped and mobile Traffic Control Persons on call, in the immediate area of the installation.

10.0 Sign and Device Placement - Buffer Area and Taper Values

Design Principles

Temporary workplace sign and device spacing depend on vehicle approach speed and what is expected of drivers. Drivers need clear information, the correct amount of it, and the message delivered at the right time.

- If given too early, it may be forgotten.
- If delivered too late, it can't be acted upon. (Drivers must not have to perform rapid manoeuvres. This is very important on 100 Series Highways when travelling long distances without driving pattern changes.)
- Too much information may be ignored, or will divide the driver's attention between the messages and the driving tasks.

Manual Practices

The general practice followed in this Manual is to give the driver:

- A minimum of three pieces of information if the work area is in the travelled lane.
- A minimum of two pieces of information if the work area is not in the travelled lane, but may be a hazard.

Buffer Area Values - Table 10.1

For speed zones that do not exceed 70 km/h, Buffer Areas are only required when a Protection Vehicle, Blocker Vehicle, Service Vehicle, or FLU is used to provide worker protection. Where one of these devices is used, the Buffer Area becomes the length of the device, plus a safety space between the device and the workers. Where stationary work is, "Mechanized Work, Bucket Truck Permitted", as per Section 13.3, Buffer Area lengths must be taken from that entry.

At all workplaces where a Protection Vehicle, Blocker Vehicle, Service Vehicle or FLU is used, a safety space must be provided between the workers and the device, so that the device will not be pushed forward onto workers in the event that it is struck. When setting the safety space, Temporary Workplace Signers must consider vehicle weights, speeds, road grade, alignment and visibility, braking distances and surface conditions.

Buffer Area values are shown in Table 10.1; "B" values are minimum; "D" values are maximum.

Table 10.1 - Buffer Area Values

Symbol	Spacing Description	"A" Series Application Guides				"B" or "C" Series Application Guides		
V	speed zone, km/h	50	60 - 70	80	90 - 110	50	60 - 70	80 - 90
B	buffer area length, m / number of delineators	Note 1	Note 1	50 / 4+ Note 2	60 /4 Note 2	Note 1	Note 1	30 / 4 Note 2
D	delineator spacing m (cone, drum, or high delineator)	5 Note 1	5 Note 1	15	20	5 Note 1	5 Note 1	10

Notes:

1. When a Protection, Blocker, or Service Vehicle, or a Flashing Light Unit is used between oncoming traffic and workers to provide protection. The Buffer Area length is the length of the device plus a safety space between the device and the workers. The safety space must be long enough to prevent the device being pushed onto workers, if struck. Where stationary work is, "Mechanized Work, Bucket Truck Permitted", as per Section 13.3, Buffer Area lengths must be taken from that entry.

2. Where a buffer area is a continuation of a transition area taper, the last delineator in the approach transition taper is also the first delineator in the buffer area.

Sign, Delineator and Taper Values - Table 10.2

Table 10.2 shows:

- "V", the speed zone in km/h.
- "A", the sign spacing in metres.
- "L", the minimum lane closure approach taper length in metres, and the number of delineators required.
- "L/2", the minimum partial lane closure approach taper length in metres, and the number of markers required.
- "D", the maximum distance between cones, high delineators, or drums.
- "T", the minimum distance between two approach transition tapers (used only when moving approaching traffic over more than once, e.g. closing two lanes).

Visibility

If the exact position for a sign, as determined by an Application Guide, provides poor visibility, then "A" values as shown in Table 10.2 must be increased by the minimum needed to achieve good visibility. Where an approach transition taper placement would result in poor visibility, increase the length of the buffer area to establish good visibility for those approaching the taper.

Termination Tapers

Typical Two-Lane Two-Way Termination Tapers are half the length of approach transition tapers, and contain half the number of delineators (cones, etc). The number of delineators is rounded up if the division does not result in a whole number.

Delineator Offset

Figure 10.1 (at the end of Section 10) shows delineator offset values for 13 and 7 delineator tapers, each with a lane width of 3.6 m.

Table 10.2 - Sign, Delineator and Taper Values

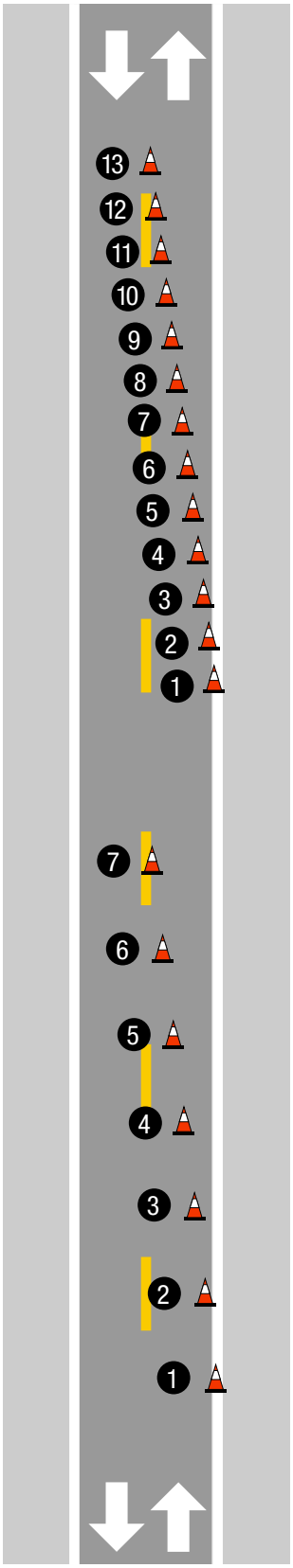
Symbol	Spacing Description	"A" Series Application Guides				"B" or "C" Series Application Guides		
V	speed zone km/h	50	60 - 70	80	90 - 110	50	60 - 70	80 - 90
A	sign spacing m	50	100	150	200	50	100	150
L	taper length (closure) m / number of delineators	30 / 7	60 / 13	180 / 13	240 / 13	30 / 7	60 / 13	120 / 13
L/2	taper length (partial) m / number of delineators	15 / 4	30 / 7	90 / 7	120 / 7	15 / 4	30 / 7	60 / 7
D	delineator spacing m (cone, drum or high delineator)	5	5	15	20	5	5	10
T	distance between approach tapers m (used when closing more than one lane)	50	100	250	300	50	100	150

Transition Area Taper
13 Delineators
3.6 m Wide Lane
> Than 50 km/h Speed Zone

Delineator Number	Offset From Lane Edge (m)
1	0.0
2	0.3
3	0.6
4	0.9
5	1.2
6	1.5
7	1.8
8	2.1
9	2.4
10	2.7
11	3.0
12	3.3
13	3.6

Transition Area Taper
7 Delineators
3.6 m Wide Lane
50 km/h Speed Zone

Delineator Number	Offset From Lane Edge (m)
1	0.0
2	0.6
3	1.2
4	1.8
5	2.4
6	3.0
7	3.6



- Offset values in this example are for a 3.6 m wide lane.
- Should the lane width change, so will the offset values.

NOT TO SCALE

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11.0 Temporary Workplace Personnel

11.1 Traffic Control Persons

Traffic Control Persons have a unique and important position on construction, maintenance, and utility projects. They regulate the flow of traffic through temporary workplaces to maintain maximum safety for workers, motorists and pedestrians.

Physical and Mental Requirements

Persons employed as Traffic Control Persons must be alert, conscientious, trained, accredited, and properly equipped. They must possess:

- Good physical health, good vision, and good hearing.
- Good physical and mental alertness.
- Mature judgement.
- A pleasant, cooperative manner.

Responsibilities

Traffic Control Persons regulate traffic flow to provide for the safety of both workers and motorists. Their role is to:

- Direct traffic safely through temporary workplaces.
- Allow work to proceed safely and efficiently.
- Ensure that public traffic has priority over work-related traffic.
- Stop traffic whenever required by the progress of the work.
- Warn workers of impending danger.

Training

Traffic Control Persons working on any highway, road, or street in the Province of Nova Scotia must be accredited. This means that they must receive approved training and pass an examination. They must:

- Have a valid accreditation certificate issued by the Provincial Traffic Authority.
- Carry the accreditation certificate at all times while on the job.
- Present the accreditation certificate on demand to appropriate authorities.

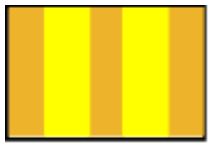
Clothing and Equipment

Traffic Control Persons must wear the following clothing and protective equipment:

- Full-length pants and a shirt with sleeves; short sleeves are acceptable. White coveralls may be used for increased night visibility.
- Hard hat CSA compliant, Class G or E, Type 2. Reflective material should be added for night work.
- Safety footwear, CSA compliant Grade 1 (green triangular CSA patch on the outside, green rectangular label on the inside)
- New: 2012 Except as detailed below, Hi-Visibility Safety Apparel may be any style of garment provided it meets CSA Z96-09 Class 2, Level 2 and fluorescent background material standards. The apparel must cover the entire upper torso to the waist and be worn over all clothing.

  The following marks on the garment label show compliance with the standard:
  - "CSA Z96"
  - "Fluorescent"
  - "Class 2"
  - "Level 2"

  Sunset clause: Hi-Visibility Safety Apparel meeting Manual standards in place on 2012.06.01 may be used until 2015.12.31.
- New: 2012 Arm cuffs must be made from materials meeting the same CSA standard as the Hi-Visibility Safety Apparel above. Dimensions and material configuration must be as per this drawing.



Cuffs must be 175 mm long and have two 50 mm wide evenly spaced retroreflective strips.

The following protective equipment must be used in response to site conditions and as deemed necessary by the Traffic Control Person and / or the Temporary Workplace Signer:

- Eye protection. Safety sunglasses in conditions of blinding sun and safety goggles for where there is a hazard to the eyes, such as chip seal operations.

Optional equipment:

- Rain wear when needed should be highly visible orange or yellow.

Stop / Slow Paddle

The Stop / Slow Paddle to be used by Traffic Control Persons must meet the following requirements:
Stop sign:
- 600 X 600 mm.
- Octagonal in shape.
- White letters on a red background.

Slow sign:
- 450 X 450 mm.
- Diamond in shape.
- Black letters on a yellow background.

The Stop and Slow signs must be mounted back to back on the top of a pole so that the top of the signs are at least 2.5 m from the bottom of the pole. Both signs must be reflectorized with ASTM Type III (high intensity) sheeting.

It is acceptable to use retroreflective sheeting applied to both sides of a single sign blank rather than using two sign blanks. When mounting a single sign blank on a pole, the sign's retroreflective sheeting must not be covered or obscured. Retroreflective sheeting must only be in the shape of the sign being presented.

Position on the Roadway

The Traffic Control Person's Control Position by the roadway is important. The correct position:
- Allows the Traffic Control Person to see oncoming traffic, and if using visual signals, to see the other Traffic Control Person.
- Allows drivers time to safely and comfortably see and react to the paddle signs.
- Provides an avenue of escape from the path of errant drivers.
- Is just outside the travel lane, with the sign paddle resting on the edge line.
- Is never in a group.
- Is one-half the distance between the beginning of the Approach Transition Taper and the Traffic Control Person sign, or half way between the Traffic Control Person sign and the end of the Termination Taper.

A third active Traffic Control Person required on a job to relay signals should stand outside the travel lanes at a location visible to both other Traffic Control Persons.

Signalling Procedures

Correct and easily understandable traffic control signals are vital to move traffic safely. Appropriate methods and procedures for many situations are taught in the Traffic Control Person accreditation course. An overview of signals and procedures follows.

To stop traffic, the Traffic Control Person:
- Stands just outside the travel lane.
- Places the sign paddle on the edge of the lane with the Stop sign facing approaching traffic.
- Uses hand signals to signal the desired stopping point.
- Gives full attention to the approaching vehicle until it has stopped.

Traffic Control Persons must give motorists adequate warning. Display the Stop sign only when approaching traffic can stop safely and comfortably:
- At 50 km/h it may require 65 m (13 car lengths) to stop on dry pavement.
- At 100 km/h it may require 200 m (40 car lengths) to stop on dry pavement.
- Stopping distances increase greatly on wet and icy surfaces, with heavy vehicles, and on downhill sections of road.

To move traffic from a stopped position the Traffic Control Person:
- Ensures that the other Traffic Control Person has stopped traffic from entering the traffic control person zone.
- Ensures that all opposing traffic has cleared the traffic control person zone.
- Performs a safety check.
- Turns the sign paddle so that the Slow sign faces traffic.

- Uses hand signals to wave traffic forward, as needed.

To allow traffic to proceed at a reduced speed the Traffic Control Person:

- Displays the Slow sign to approaching traffic. **Do not** slow traffic by showing the Stop sign then flipping to the Slow!
- Uses hand signals to wave traffic forward or to reduce traffic speed, as needed.

Communications

New: 2012

Traffic Control Persons must know the contact information for their designated Temporary Workplace Signer.

Traffic Control Persons must work together to regulate traffic through a temporary workplace. They must communicate with each other to accomplish their task.

When the Traffic Control Persons are in sight of each other:

- Use pre-arranged visual signals to communicate. Effective signals include raising and lowering or waving the sign paddle before changing from Slow to Stop, or vice versa.
- Wait until signals are acknowledged by the other Traffic Control Person before changing traffic flow.

When the Traffic Control Persons are not in sight of each other, use two-way radios, or:

New: 2012

- Station an additional Traffic Control Person between the end two so that signals can be visually relayed.
- Equip the intermediate Traffic Control Person with a Stop / Slow paddle. This person will relay the signals of the end Traffic Control Persons.
- Ensure that all three Traffic Control Persons understand and acknowledge the pre-arranged signals.

When the Traffic Control Persons are not in sight of each other and are using two-way radios to communicate:

- Test radios before starting traffic control.
- Carry spare batteries for the radio.
- Establish clear pre-arranged voice signals for every situation and do not deviate from them.
- Speak crisply and distinctly.
- Ask that any unclear messages be repeated.
- Avoid unnecessary talk.
- Remember that everything said on a radio can be picked up by other radios and scanners. Avoid unnecessary and inappropriate comments.
- Do not use two-way radios in blasting areas.
- Do not use a head set or receiver covering both ears.

Night Operations

Traffic Control Persons working at night must be highly visible to be seen by approaching motorists in time for them to recognize and respond. To increase visibility, Traffic Control Persons:

- Must use a flashlight with a red cone attachment.
  - If using two-way radios they should be equipped with voice activated microphones so that the flashlight is in a free hand.
- Must have retroreflective material on their hard hat so that it is clearly visible to drivers approaching from any angle. (If there are concerns with adhesives affecting hard hat materials, mount the retroreflective material by some other means e.g. elasticized band.)

New: 2012

- Should wear white or light coloured coveralls for increased night visibility.
- Should illuminate the Traffic Control Person's Control Position with overhead lighting.
  - If street lighting is available, the Traffic Control Person should stand beside the light to maximize the illumination on their front.
  - If using temporary overhead lighting, ensure that approaching motorists are not subjected to excessive glare.

New: 2012

Note: Except as provided for in Section 13.4, a traffic control plan involving Night Work and that closes a lane on a numbered Highway, must be approved by the Department before work begins. Contact should be via the Department's Area Manager at the local district office.

Legal Issues

Motorists may fail to obey a Traffic Control Person's directions. This affects the safety of everyone at a Temporary Workplace, including the motorists. It is an offence under the Motor Vehicle Act for a motorist to fail to obey the directions of a Traffic Control Person directing traffic within a Temporary Workplace.

Training courses for Traffic Control Person accreditation may deal with how to help enforce this provision of the act.

Emergency Vehicles

The approach of an emergency vehicle displaying emergency red flashing lights presents a special challenge to Traffic Control Persons.

Do not attempt to direct the driver of an emergency vehicle. Directing such a vehicle is potentially dangerous and exceeds the Traffic Control Persons' legal authority.

Experience has shown that the best method of passing an emergency vehicle through a Temporary Workplace is for Traffic Control Persons to:

- Stop all other traffic by holding the Stop /Slow paddles in the 'Stop' position (both directions).
- Allow the driver of the emergency vehicle to decide upon the best course of action:
  - The driver has the legal authority to pass the 'Stop' sign.
  - Any approaching traffic should yield and give the emergency vehicle the right-of-way.

Forbidden Behaviour

Traffic Control Persons actively regulating traffic must not:

- Be assigned or attempt to carry out any other work.
- Regulate traffic when a Traffic Control Person sign is not displayed.
- Regulate traffic except by using a Stop Slow Paddle.
- Sit down.
- Lean on a post or other object.
- Stand near any other persons. Stand near a vehicle or sit in a vehicle. Stand near any object that could make them less visible to approaching drivers, such as standing too close to cones or drums in the taper (they must be out by themselves, alone).
- Carry on a conversation, including a telephone conversation or radio conversation, that is not work related; all work related conversations must be both necessary and brief.
- Use any device that impairs sight, hearing, or diverts attention, such as a text messaging device, MP3 player, tv or radio.
- Use a support or device that could permit the Stop Slow Paddle to stand vertically without active hands-on support from the Traffic Control Person. A device used to assist with Stop Slow paddle support must be designed and used such that it will not pose a hazard to those at the workplace (e.g. impact / projectile hazard, or block escape route).
- Turn their back on approaching traffic.
- Become impatient or enraged.
- Attempt to slow traffic by displaying the Stop sign rather than the Slow sign.
- Leave their control position without being replaced. Arrange meal, coffee, toilet, and rest breaks with the Temporary Workplace Signer or other supervisor before work starts.
- Regulate traffic if their judgment is impaired in any way, or if for any reason they have suffered a reduction in their performance that could increase the hazard to themselves, road workers, or road users.

11.2 Temporary Workplace Signers

Responsibilities

Temporary Workplace Signers are responsible for:
- Assessing job sites where temporary workplaces will be set up.
- Developing traffic control plans that regulate traffic through temporary workplaces safely.
- Implementing traffic control plans.
- Reviewing the effectiveness of traffic control plans in operation and making changes as required.

The goal of all such traffic control plans is to maintain maximum safety for workers, motorists and pedestrians.

Whether carrying out a plan prepared by others or one of their own, Temporary Workplace Signers must make sure that the plan is adequate for the particular work site under consideration. Frequently, they must modify the plan to optimize safety and efficiency.

New: 2012

Temporary Workplace Signer must give Traffic Control Persons working for them their name and contact information.

Traffic Control Plans

Temporary Workplace Signers must prepare and carry out traffic control plans that do the following:
- Guide traffic safely through Temporary Workplaces.
- Provide for the safety of workers, motorists and those within the affected area.
- Allow work to proceed safely and efficiently.

Temporary Workplace Signers must consider all variables for workplaces they are responsible for, including:
- Traffic volume.
- Traffic speed.
- Type of road and roadway conditions, e.g. grade, alignment, visibility, surface friction.
- Level of encroachment.
- Work type and duration.
- Equipment needs and standards.
- Human resource needs and management, including Traffic Control Persons.
- Work environment, e.g. night, fog, rain, ice, snow, lightning.

The Manual cannot provide solutions for all variables. These variables may change from the 'typical' shown or those anticipated when the plan was prepared. If needed, and consistent with the principles in the Manual, provide additional signs, markings, or devices to assure worker, motorist and pedestrian safety. Exercise good technical judgement designing the traffic control plan; it must be thorough and meet actual current needs.

The Temporary Workplace Signer must conduct an on-site review of the setup soon after implementation. They must ensure the ongoing effectiveness of the solution by arranging periodic reviews by a qualified person; needed adjustments must be made promptly.

Physical and Mental Requirements

Temporary Workplace Signers must be alert, conscientious, trained and accredited. They should possess all of the following:
- Good physical health, good vision, good hearing.
- Good physical and mental alertness.
- Mature judgement.
- A pleasant cooperative manner.

Training

Temporary Workplace Signers must be accredited before they prepare or set up a traffic control plan for a Temporary Workplace that falls under the jurisdiction of this Manual. That means they must receive approved training and pass an examination. They must:
- Have a valid accreditation certificate issued by the Provincial Traffic Authority.
- Carry their accreditation certificate at all times while on the job.
- Present their accreditation certificate on demand to the appropriate authorities.

Clothing

Temporary Workplace Signers must meet the same safety clothing standards as temporary workplace support personnel (see Section 11.3).

11.3 Temporary Workplace Support Personnel

Personnel who provide traffic control support services at a temporary workplace must be highly visible, for their safety.

Clothing

The same daytime and nighttime safety clothing standards that apply to Traffic Control Persons apply to Temporary Workplace Signers and support personnel associated with setting up, taking down, or adjusting signs or delineators at a temporary workplace, with the following exception:

- Support personnel are not required to wear safety cuffs.

(Traffic Control Person safety clothing standards appear in Section 11.1.)

12.0 Planning Temporary Workplaces and Preparation Checklist

12.1 Planning and Implementing Temporary Workplace Traffic Control Solutions

Planning is a fundamental tool used by traffic control professionals to achieve compliance success.

For all projects, planning traffic control should be an integral part of project management, and for larger projects, may be done months in advance.

The following steps will aid with compliance:

- Assess the site ...
- Plan the response ...
- Act to implement the plan ...
- Assess again, ... repeat the cycle as necessary.

Assess

During the assessment determine how the following impact the temporary workplace:

- Type of work to be performed.
- Road class (e.g. 100 Series Highway)
- Duration of the work to be performed.
- Level of encroachment.
- Expected weather conditions.
- Perform a site review to identify:
  - Road type.
  - Speed zone in effect at the site.
  - Road alignment (curves), grades (hills).
  - Sign and taper visibility distances (their visibility must permit drivers time to react safely and comfortably).
  - Traffic volumes. If the project will be active at night, week-day peaks or on weekends, review traffic patterns for these periods.
  - Requirements for Traffic Control Persons, or temporary signals.
  - Pedestrian walking routes and school zones.
  - If there will be conflicts between existing traffic control devices and the anticipated traffic control plan.
  - Overhead and underground wires, cables, and pipelines.
- If night work will be part of the project, review existing lighting and lighting requirements.
- Consider contacting the local police or traffic authority to see if the proposed site has a history of problems.

Plan

- Become familiar with applicable regulations, comply with Nova Scotia Provincial standards.
- As applicable, a traffic control plan must include provisions to:
  - Make the site safe for workers, motorists, pedestrians (including bussed school children) and those living or doing business within a workplace.
  - Identify the Application Guides from the Temporary Workplace Traffic Control Manual that will be used.
  - Identify procedures for laying out and picking up signs and delineators.
  - Record the project details and the distribution and placement of traffic control devices for the temporary workplace. (Drawing and text.)
  - Allow for the safe and efficient passage of emergency vehicles.
  - Allow workers and work vehicles to enter and exit the Work Area safely.
  - Identify necessary traffic control signs and devices; ensure their availability and that they meet standards.
  - Manage Traffic Control Persons.
    - Ensure they are accredited, equipped, and competent.
    - Ensure that there are enough to spell-off for breaks
    - Watch for weather extremes and lightning.
    - Arrange wash and toilet facilities.
    - Ensure that Traffic Control Persons know the contact information for the designated Temporary Workplace Signer.
  - Identify necessary personal protective equipment; ensure availability.

- Communication plan:
  - Provide information to the public concerning the extent of the project, the timing of any phases, and the expected impact.
  - Advise occupants of abutting properties of parking or access limitations, and tell them how to join the traffic stream safely. Give them the work schedule and contact information for the Temporary Workplace Signers and / or contractor.
  - Advise police, fire, and other emergency service providers and other agencies that may be affected by the work.
  - Inform workers and those directly involved in the project (pre-job meeting).
- Identify requirements for permits, approvals, and authorizations.
- Ensure that workers' vehicles and support equipment do not create a hazard and are parked and stored properly.
- Identify the need to remove human activity signs when workplaces become inactive.
- For night work:
  - Dim Flashing Light Units.
  - Check cones and / or High Delineators for retroreflective material.
  - Site lighting.
  - Control Position lighting.
  - Nighttime equipment for Traffic Control Persons.
- For excavations:
  - Drums along the Work Area edge of the excavation, and as per Section 9.1, TC-63.
  - Backfill, steel plate, or F-shape Barriers when inactive.
- Remove and store unnecessary signs and other traffic control devices and equipment when work is not being performed. They must not pose a hazard.
- Arrange an inspection schedule that will ensure control devices and Traffic Control Persons remain in place and effective.
- Ensure that a Workplace Checklist for the job, is available at the Temporary Workplace, if needed. See Section 12.2 for requirements to complete a checklist.

Implement

- Hold a pre-job meeting. Advise everyone of their responsibilities.
- Execute the plan.

Review

- The Temporary Workplace Signer must conduct an on-site review of the setup soon after implementation.
- The Temporary Workplace Signer must ensure the ongoing effectiveness of the traffic control solution by arranging periodic reviews by a qualified person. (It is advisable to maintain records of inspections and adjustments to the control devices, especially at more complex workplaces.)
- The Temporary Workplace Signer must ensure that a qualified person(s) is available and equipped to make necessary changes promptly.

12.2 Workplace Checklist

(The Department has prepared a generic checklist in pdf format. It is available as a download from: www.gov.ns.ca/tran/tcm . There is no requirement to use this checklist, it has been provided for convenience only. Temporary Workplace Singers must ensure the checklist used is sufficient and correct for their workplace.)

In the 24 hour period before work starts, the Temporary Workplace Signer must review items in Section 12.1 that pertain to the workplace.

Where upon review it is found that an item would have a reasonable expectation of impacting the traffic control plan outcomes or safety, Temporary Workplace Signers must react to the item by taking whatever actions are necessary to make the workplace safe and compliant.

Where upon review it is found that an item would not reasonably be expected to impact the traffic control plan outcomes or safety, it is sufficient for the Temporary Workplace Signer to have reviewed the item (no direct action is required).

New: 2012 Except for Mobile Work, Off Shoulder Work, and work of Very Short Duration, a checklist based on items in Section 12.1 that pertain to the workplace must be completed and kept in hard copy at all active temporary workplaces.

The checklist must contain sufficient detail to show that proper consideration has been given to the relevant items from Section 12.1.

The checklist must be presented to officials from the Departments of Labour and Transportation and Infrastructure Renewal, if requested.

New: 2012 Checklists created as a result of this section must be kept until the project is complete. Thereafter, checklists should be kept following the document retention policy of the checklist's owner.

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13.0 Application Guides and Procedures

Introduction

Section 13 is divided as follows:

Section 13.0: Application Guides and Procedures

- Describes how Section 13 is structured (this introduction).

Section 13.1: Matching Application Guides to Road Classes

- Describes how rules and standards from Section "D" through 13 are used with Application Guides.
- Describes the road classes to which "A" Series Application Guides apply.
- Describes the road classes to which "B" Series Application Guides apply.
- Describes the road classes to which "C" Series Application Guides apply.
- Provides information on using Application Guides for work that falls into the category of "Special Operations."

Section 13.2: Selecting Application Guides and Procedures

- Describes a step by step approach to planning traffic control solutions using Application Guides.
- Describes how to select an Application Guide.
- Describes how to select a procedure for laying out and picking up signs.
- Describes how to select a procedure for laying out and picking up delineators.
- Describes how to select a procedure for changing over from one lane closed to another lane closed, on bridges where F-shape barriers are used.
- Describes how to select a procedure for road resurfacing.

Section 13.3: Application Guides - Operational Requirements and Standards

- In Section 13.3 there are additional rules and standards. Typically, these are not contained in earlier sections of the Manual, but are necessary to support the procedures that will follow later in Section 13.5. (For example, rules on Levels Of Encroachment are in Section 7, rules on signs are in Section 8, rules on devices are in Section 9, rules for Traffic Control Persons are in Section 11, etc., and rules in support of procedures are in Section 13.3.)

Section 13.4: Utility Work

- Describes how rules in other sections of the Manual are affected when the work type is Utility.

Section 13.5: Procedures

- Procedures for laying out and picking up signs.
- Procedures for laying out and picking up delineators.
- A procedure for changing over from one lane closed to another lane closed, on bridges where F-shape barriers are used.
- A procedure for road resurfacing.

13.1 Matching an Application Guide Series to a Class of Road

Rules and Standards for All Application Guides

Roadway and Temporary Workplace conditions for a particular location may vary significantly from the 'typical' condition depicted in the Application Guides. Temporary Workplace Signers must comply with the rules and standards in Sections "D" through 13, and those contained in the Application Guide(s) in use when developing compliant solutions.

The "A" Series Application Guides apply to the following road classes:

- 100 Series Highways, including their ramps, merging and diverging areas.
- Multi-Lane Roads, including their ramps, merging and diverging areas.
- Multi-Lane portions of Two-Lane Two-way roads (climbing lane sections).
- One-Way Roads.

The "B" Series Application Guides apply to the following road classes:

- Two-Lane Two-Way non 100 Series Highways (For example: Trunks, and Routes).

The "C" Series Application Guides apply to the following road classes:

- Two-Lane Two-Way Streets.
- Intersections on Streets. This includes intersections with multi-lane approaches.

New: 2012

(**Street:** a road that is not a 100 Series Highway and that has a maximum speed limit of 50 km/h.)

For intersections on "A" and "B" Series roads, see the entry, "Traffic Control Standards for Intersections" later in this Section.

Adapting or Blending Application Guides

It is possible that one Application Guide will not adequately address all conditions at a workplace. In these cases, it may be necessary to combine or blend two (or more) Application Guide solutions to meet safety requirements.

A Manual solution may be adapted to a workplace that differs from the Manual entries provided that the principles from the Manual match or are directly applicable to the new workplace, and:

- The adapted solution provides a comparable level of safety to that provided in the Manual.
- No Manual rules are broken.
- Signs, markings, and devices follow Manual conventions, and are of the type and quantity required to assure worker, motorist, cyclist and pedestrian protection at the workplace.
- Where a Temporary Workplace Signer determines that a sign, device or marking that is not included in the Manual is required for a workplace, it may only be used at that workplace if approved by the Traffic Authority.

Where a blended solution is developed, the highest standard from among all Application Guides in use must be used. As well, standards matched to the road and work type must be used. Exercise good technical judgement in the design of the temporary workplace traffic control plan.

Where there is no Manual solution, or where an adapted or blended solution based on the traffic engineering principles in the Manual is impractical, Temporary Workplace Signers must apply for a Code of Practice approval from the Department of Labour prior to undertaking the work. The application should be accompanied by a professionally developed traffic control plan.

Restrictions on Blending Application Guides - It is not permissible to create a new solution to replace an existing solution. The permission to blend and

adapt Application Guides is intended to provide for some operational flexibility using existing guides, standards and principles, not to circumvent existing solutions.

It is not permissible to create a blended solution from a lower class road, or lower class of Application Guide, that will be used on a higher class of road, or a higher class of Application Guide, where doing so creates a solution that is not allowed. For example, it is not permissible to create a blended partial lane closure using a "C" Series Application Guide as the foundation, and use it on an "A" Series class of road, if a partial lane closure is not permitted for that road type. Similarly, blended solutions must not violate any rules or restrictions that would normally be applicable to the road class and workplace. In order of highest to lowest, the Application Guide order is: "A", "B", then "C" Series.

New: 2012

Temporary Workplaces Signers are advised that if in any doubt about the need for a Code of Practice approval, they should consult with the Department of Labour, in advance.

Traffic Control Standards for Intersections

Where an intersection is on an "A" or "B" Series Application Guide class of road, Temporary Workplace Signers must choose an intersection Application Guide from the "C" Series and adapt it by applying all "A" or "B" Series Application Guide standards (as applicable).

Where an Application Guide from the "A" or "B" Series would typically have more or different warning signs in the approach sequence, or a higher standard of delineator, or vehicle, etc, Temporary Workplace Signers must always apply the higher standard to the **adapted** solution.

Application Guides, Special Operations

"Special Operations" exist within the "A", "B", and "C" Series of Application Guides.

The Application Guides for Special Operations provide a safe method of carrying out work using methods or equipment that do not easily fit into the system of Road Class, Roadway Encroachment, Work Duration, etc., as used elsewhere throughout the Manual.

The Special Operations Application Guides provide for Mobile Operations and Survey Crew Work. In some cases they allow limited work in a travel lane from a Work Area on the shoulder, using an observer.

Lane line painting from a continuously moving paint truck is an example included in this category, because it uses a unique set of signs and some traffic regulation can be provided from the work vehicle (the paint truck).

Use of an Observer with Special Operations Application Guides - When permitted by a Special Operations Application Guide, an Observer watches for and warns of approaching traffic when another worker(s) is on the travel lane of a road. The worker(s) enters the travel lane from the shoulder and performs a brief task using only hand tools.

13.2 Selecting Application Guides and Procedures

Follow these steps when planning to set up traffic control signs and devices (the methods for choosing Application Guides and procedures are described in more detail following this introductory entry):

- Perform a site assessment.
- Determine the class of highway and select an Application Guide.
- Select a procedure to use when laying out and picking up signs.
- Select a procedure to use when laying out and picking up delineators.
- Determine your material inventory needs.
- Determine your human resource needs.

Determining the Class of Highway and Selecting an Application Guide

Selecting the correct Application Guide is a three step process:

- Establish which Series ("A", "B", or "C") of Application Guides to use.
- Turn to the table of contents for that Series of Application Guides.
- Using the table of contents for the correct Series ("A", "B", or "C"), select the Application Guide that is the best match for your workplace.

The Application Guide selected may provide a complete solution for the workplace, or may only provide a foundation that is in need of further development. The three steps introduced above are described in more detail below.

***(Note:** In the electronic version of the Manual, users may use the left mouse button on the bolded Application Guide entries below, to move to the Application Guide table of contents. From there, users may select the Application Guide of interest and mouse click on the entry to be redirected to the guide.)*

Step One. Using an Understanding of Road Classes as Described in Section 13.1, Determine the Application Guide Series

- 100 Series Highways. **Application Guide "A" Series**.

- Multi-Lane or One-Way Roads. **Application Guide "A" Series**.

- Two-Lane Two-Way Highways, other than 100 Series Highways. **Application Guide "B" Series**.

- Streets, except Multi-Lane and One-Way Roads. **Application Guide "C" Series**.

- Intersections, including those with Multi-Lane approaches. **Application Guide "C" Series**.

  ("C" Series Intersection Application Guides may need to be adapted if work is being conducted on an "A" or "B" class road. See the entry, "Traffic Control Standards for Intersections" in Section 13.1.)

Step Two. Turn to the Table of Contents for The Correct Application Guide Series.

Step Three. Using the Table of Contents for the Correct Series of Application Guides ("A", "B" or "C"), Select the Application Guide That is the Best Match for the Workplace by Following These Steps:

- **Determine if an Intersection is Involved**

  If an intersection is involved, choose from among the Application Guides in the range of C 100 through C 140. As described in Section 13.1, intersection Application Guides may need to be adapted to a higher standard if used on an "A" or "B" class road.

If an intersection is not involved, continue below.

- **Determine if the Work is a "Special Operation"**

  - Mobile - Continuous, or Mobile - Short Stops
  - Survey Crew

  If the work type is a Special Operation, using the correct series, select the best matched Application Guide from the group marked Special Operations on the table of contents. (See Application Guides in the range 90 - 99.)

  If the work type is not a Special Operation, continue below.

- **Determine if There is an Application Guide Based on The Type of Work to be Performed**

  - Blasting Warning.
  - Planed Surface Conditions.
  - Paving Surface Conditions.
  - Temporary Markings.
  - Temporary Haul Road.
  - Detour.
  - Temporary Connector.
  - Low Shoulder.

  If the work type has an Application Guide in this group, using the correct series, choose the one that is the best match for your workplace. (See Application Guides in the range 70 - 79.)

  Application Guides in this range sometimes have to be combined with other Application Guides to create a complete solution. For guidance on blending Application Guides see, "Combining or Blending Application Guides" in Section 13.1.

  If the work type is not in this group, or if a more complete solution is needed, continue to narrow your choice as described below.

- **Determine The Level of Encroachment / Impact on the Road**

  - Off Shoulder Work. Choose an Application Guide in the range of 0 - 9.
  - Shoulder Work. Choose an Application Guide in the range of 10 - 19.
  - Partial Lane Closure. Choose an Application Guide in the range of 20 - 29.
  - Lane Closures and Altered Centrelines. Choose an Application Guide in the range of 30 - 69.

  So far, based on the level of encroachment, there may be either a single solution, or a narrower range of possible Application Guides to choose from.

  If needed, continue to narrow your choice as described below.

- **Determine The Work Duration**

  - Very Short Duration Work. Up to 30 minutes.
  - Short Duration Work. Greater than 30 min, up to 24 hours.
  - Long Duration. More than 24 hours continuous work.
  - All Durations. Application Guides in this category may be applied to every work duration.

  By applying the work duration to the remaining list of Application Guides, it is possible to further narrow down the Application Guides that may apply to the workplace.

  Continue by determining all the remaining factors that influence Application Guide choice, as described below.

Take into Consideration the Following:

- **The Road Type**

  - Multi-Lane.
  - Two-Way.
  - Climbing Lane (centre, downhill, right lane closed).
  - Altered Centreline.

- **Where On the Road the Work Will Take Place**

  - Left Lane.
  - Right Lane.

- **When the Work Will Take Place**

  - Day Work.
  - Night Work.

- **Traffic Volumes**

  - Low Volume.
  - High Volume.
  - Long line ups (no long line ups).

- **Other Conditions**

  - Work on a Bridge or Under a Bridge.
  - Work Involving Traffic Signals.

Using the correct series, choose from the list of remaining Application Guides, the one(s) that best address the actual conditions that will be present at the workplace.

Roadway and Temporary Workplace conditions for a particular location may vary significantly from the 'typical' condition depicted in the Application Guides. Temporary Workplace Signers must comply with the rules and standards in Sections "D" through 13, and those contained in the Application Guide(s) is use.

It is possible that one Application Guide will not adequately address all conditions at the workplace. In these cases, it may be necessary to combine or blend Application Guides, or adapt an existing Application Guide to meet safety requirements and assure worker, motorist and pedestrian protection. (For guidance, see Section 13.1, "Adapting or Blending Application Guides".)

Exercise good technical judgement in the design of the temporary workplace traffic control plan.

Continue by selecting a procedure to use when laying out and picking up signs (see below).

Selecting a Procedure to Use When Laying out and Picking up Signs

Use the matrix below to help select a procedure for laying out and picking up signs. Start at the top left and work toward the bottom right. Select in order, the road class, type, speed zone, and work location.

The applicable procedure number for laying out and picking up signs is in the right most column. Take note of the procedure number, look it up in Section 13.5. Follow the directions of the procedure, taking into account rules and standards from Sections "D" through 13.5, and those in the Application Guide(s) in use.

Table 13.1 - Matrix for Choosing a Procedure for Laying Out and Picking Up Signs

Road Class	Road Type	Speed Limit	Work Location	Procedure Number
Multi-Lane or 1 Way	Divided	Greater Than 80 km/h	Right Side	13.5.1
			Left Side	13.5.2
		80 km/h or Less	Right Side	13.5.3
			Left Side	13.5.4
	Undivided	Greater Than 80 km/h	Right Side	13.5.5
			Left Side	13.5.6
		Greater than 50 km/h but Not Greater than 80 km/h	Right Side	13.5.7
			Left Side	13.5.8
		50 km/h	Right Side	13.5.9
			Left Side	13.5.10
Two-Lane Two-Way	100 Series	Greater Than 80 km/h	Right or Left Side	13.5.11
		80 km/h or Less	Right or Left Side	13.5.13
	Non-100 Series	Greater Than 80 km/h	Right or Left Side	13.5.12
		80 km/h or Less	Right or Left Side	13.5.14

Continue by selecting a procedure to use when laying out and picking up delineators (see below).

Selecting a Procedure for Laying out and Picking up Delineators, for Changing over from One Lane Closed to Another Lane Closed on Bridges Where F-shape Barriers are Used, or a Procedure for Road Resurfacing.

Use the table below to help select a procedure for laying out and picking up delineators. Choose the delineator procedure that matches the road type and speed zone, one for barrier change over, or one for resurfacing work. The procedure number is in the right most column. Take note of the procedure number, look it up in number order in Section 13.5. Follow the directions of the procedure, taking into account rules and standards from Sections "D" through 13.5, and those in the Application Guide(s) in use.

Table 13.2 - Procedures for Delineators, Bridge Barrier Changeover and Resurfacing Work

Procedure Description	Procedure Number
Multi-Lane or One-Way Highway, Speed Limit Greater Than 80 km/h	13.5.15
Multi-Lane or One-Way Road, Speed Limit Not Greater Than 80 km/h	13.5.16
Two-Lane Two-Way Highway, Speed Limit Greater Than 80 km/h	13.5.17
Two-Lane Two-Way Road, Speed Limit Not Greater Than 80 km/h	13.5.18
Barrier Change Over, Bridge Work, Multi-Lane	13.5.19
Resurfacing, (and Pulverizing)	13.5.20

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13.3 Operational Requirements and Standards

Introduction

This Section contains rules and standards that are mainly focused on operational requirements and standards. In other words, those that will mostly be used on the road. Some of the rules and standards in this Section are strongly connected to Sections appearing earlier in the Manual, and some rules are repeated in both locations.

The Section is organized in the following way:

- A table of the numbered rules that appear in this section.
- Operational rules and standards that relate to or complement signs, Section 8.
- Operational rules and standards that relate to or complement devices, Section 9.
- Operational rules and standards that relate to vehicles or their use.
- Operational rules and standards that are miscellaneous (they relate to a topic or Manual Section not mentioned above).

When preparing a traffic control plan, Temporary Workplace Signers must consider all rules and procedures in Sections "D" through 13, and those in the Application Guide in use.

Table 13.3, Summary of Standards or Rules Contained in Section 13.3

New: 2012

1. Signs, Manual Section 8	Description of Standard or Rule
1.1 Signs	- Crossing an Open Lane to Lay out, Pick up or Adjust Signs
1.2 Signs	- Offloading, Loading and Handling
1.3 Signs	- Double Fines For Speeding
1.4 Signs	- Minimum Number of Signs in Advance of a Traffic Queue
1.5 Signs	-Visibility vs Application Guide Placement
1.6 Signs	- Double Posting Signs
1.7 Signs	- Single Posting Signs on Ramps
1.8 Signs	- Posting Signs on One or Two Approaches to the Work Area
1.9 Signs	- Posting Signs on Intersecting Approaches Within a Workplace
1.10 Signs	- Position, Angle and Height
1.11 Signs	- Human Activity Signs - Red Orange Flags
1.12 Signs	- Condition Specific Signs
1.13 Signs	- Duty to Remove Temporary Condition Warning Signs
1.14 Signs	- Duty to Install Permanent Signs, Signals, Beacons and Lane Markings
1.15 Signs	- Speed Zone Restrictions
1.16 Signs	- Using TC-117 (NS) as Alternative for TC-165 (NS) Sign

2. Devices, Manual Section 9	Description of Standard or Rule
2.1 All Devices	- Duty to Remove Temporary Condition Devices
2.2.1 Delineators	- Equivalency of Cones Drums and High Delineators
2.2.2 Delineators	- Mixing Different Types of Delineators Prohibited
2.2.3 Delineators	- Excavations
2.2.4 Delineators	- Termination Taper Not Required, Divided and One-Way Roads
2.2.5 Delineators	- Crossing an Open Lane to Lay out, Pick up or Adjust Delineators
2.2.6 Delineators	- Laying Out and Picking Up Lightweight Delineation Devices, Upstream / Downstream
2.2.7 Delineators	- Requirement to Provide Worker Protection at Approach Transition Taper
2.2.8 Delineators	- Laying Out and Picking Up Lightweight Delineators (a) Working with a Service Vehicle (b) Loading and off loading delineators (c) Carrying, placing or retrieving delineators (d) Carrying, placing or retrieving delineators behind a vehicle about to reverse
2.2.9 Delineators	- Driving Forward or in Reverse
2.3.1 Flashing Light Unit	- Substitution On Multi-Lane Undivided Road
2.3.2 Flashing Light Unit	- Optional Standards at Termination Taper with "B" Series Application Guides
2.3.3 Flashing Light Unit	- Substitution On "C" Series Application Guides
2.3.4 Flashing Light Unit	- Display
2.3.5 Flashing Light Unit	- Night Operation
2.3.6 Flashing Light Unit	- Position
2.4.1 Barricades	- Standards When Work Area is Beyond Barricades
2.4.2 Barricades	- Providing Motorist Information Beyond a Barricade

3. Vehicle Standards	Description of Standard or Rule
3.1 Vehicle Standards	- Substituting Alternative Vehicle Types
3.2 Vehicle Standards	- Type of Vehicle for Laying Out and Picking up Signs or Delineators
3.3 Vehicle Standards	- Using One or Two Vehicles for Laying Out, Picking up, or Maintaining Signs or Delineators
3.4 Vehicle Standards	- Warning Lights on Vehicles (a) Warning Lights on Vehicles Shown on Application Guides (b) Warning Lights on Vehicles Not Shown on Application Guides
3.5 Vehicle Standards	- Warning Lights on a Divided or One-Way Road
3.6 Vehicle Standards	- Backing Up
3.7 Vehicle Standards	- Working From a Moving Vehicle
3.8 Vehicle Standards	- Encroachment on the Travel Lane
3.9 Vehicle Standards	- Safety Space Between Protection, Blocker, Work or Service Vehicle
3.10 Vehicle Standards	- Placement of Protection Vehicles (Also the Flashing Light Units and Truck Mounted Attenuators)
3.11 Vehicle Standards	- Mechanized Work, Use of One or Two Vehicles at a Stationary Location in Advance of Workers (a) Mechanized Work, No Bucket Truck (b) Mechanized Work, Bucket Truck Permitted
4. Miscellaneous Other Standards	**Description of Standard or Rule**
4.1 Median Crossovers	- Use of Median Crossovers
4.2 Night Work	- Night Work
4.3 Aerial Device	- Aerial Device Prohibition
4.4 Workplace Review	- Requirements to Perform a Workplace Review
4.5 Gravel Road Standards	- Alternative Standards on Low Volume Gravel Roads
4.6 Multiple Speed Zones	- Workplaces Spanning More than One Speed Zone
4.7 Parking	- Parking and Management of Workplace Vehicles and Equipment

Operational Requirements and Standards Related to Section 8 and Signs

1.1 Signs - Crossing an Open Lane

A person must not cross over an open travel lane on foot to lay out, pick up, or adjust a sign.

1.2 Signs - Offloading, Loading and Handling

While laying out and picking up signs, workers must:

- Offload and load signs from the side of the vehicle that is farthest from the open traffic lane. Signs should be walked forward along the non-traffic side of the Service Vehicle, and positioned on the side of the road in front of the Service Vehicle, or;

If it is not practical to follow the first rule, due to restrictions at the site:

- Signs may be offloaded and loaded from the back of the vehicle. Signs should be walked forward along the non-traffic side of the Service Vehicle, and positioned on the side of the road in front of the Service Vehicle, or;

If it is not practical to follow either of the two rules above, due to restrictions at the site:

- Signs may be offloaded and loaded from side of the vehicle closest to the open traffic lane, provided always, that work is done under supervision of a dedicated observer. Signs may be walked forward along the traffic side of the Service Vehicle, and positioned on the side of the road in front of the Service Vehicle.

1.3 Signs - Double Fines For Speeding

Fines are doubled for speeding:
- between TC-2 and TC-4 signs (Road Work and Construction Ends), and
- between TC-114 (NS) and TC-4 signs (Overhead Bucket Work & Construction Ends).

As well, TC-171 (NS) (Speed Fines Double in Work Area) signs must be positioned in advance of the other temporary condition warning signs, as shown on the Application Guide in use.

To make the law enforceable and provide continuing worker protection, it is very important to erect all these signs and in the correct order. It is equally important to remove the TC-171 (NS), TC-2 and TC-114 (NS) signs immediately when the workplace becomes inactive.

1.4 Signs - Minimum Number of Signs in Advance of a Traffic Queue

Where temporary warning signs are required to be posted at a fixed location on a highway, approaching traffic must pass at least two signs (or two sets of double posted signs) before being required to stop at the back of queued traffic. Unless directed otherwise by an Application Guide, add TC-1A signs as needed. See the TC-1A entry in Section 8 for installation guidelines. The TC-171(NS) sign may have to be moved upstream to make room for the additional signs.

Where temporary warning signs are required to be posted at a fixed location on a street, approaching traffic should pass two signs (or sets) before being required to stop at the back of queued traffic. Unless directed otherwise by an Application Guide, the Temporary Workplace Signer may add TC-1 signs, as required. The TC-171(NS) sign may have to be moved upstream to make room for the additional signs.

1.5 Signs - Visibility vs Application Guide Placement

Signs must be positioned so that approaching motorists can interpret their message and react safely and comfortably. Where the position of a sign is specified by an Application Guide and violates this principle, expand the placement distance by the minimum needed to make the sign effective.

New: 2012

1.6 Signs - Double Posting Signs

Except as provided for in Section 13.4, and in Rule 1.7 immediately below, the following roads must be double posted:

- 100 Series Highways.
- Multi-Lane Highways, both divided and undivided, including Multi-Lane sections of Two-Lane Two-Way Highways.
- Multi-Lane on and off ramps.
- Multi-Lane Streets, both divided or one-way.

Multi-lane undivided Two-Way Streets (50 km/h), do not require double posting.

1.7 Signs - Single Posting Signs on Ramps

For single lane on and off ramps, single post signs on the right.

New: 2012

Where work is done entirely on an off-ramp downstream from where the ramp physically divides from the through road (commonly called the 'gore') and the signing sequence extends onto the through road, the through road should be single posted with signs only on the right side, even if doubled posting would normally be required.

1.8 Signs - Posting Signs on One or Two Approaches to the Work Area

On:
- Divided or One-Way roads, and
- Multi-Lane undivided Streets (50 km/h), where the work is done entirely in the right lane or on the right shoulder,

workplaces with TC-2 or TC-114 (NS) signs (Road Work & Overhead Bucket Work) must display only TC-4 (Construction Ends) signs downstream of the Work Area. When a TC-2 or TC-114 (NS) sign is not required, downstream signing is not needed for these roads.

Other roads must be signed on both approaches.

1.9 Signs - Posting Signs on Intersecting Approaches Within a Workplace

Roads that intersect a temporary workplace along its length must have signs posted and, if necessary, devices and Traffic Control Persons positioned so that motorists joining the workplace are provided with sufficient notice and guidance. The standard of care must be taken from the Application Guide matched to conditions. Where entrances to homes or businesses pose a hazard, notifications and control measures must be put in place.

1.10 Signs - Position, Angle and Height

Position - Signs must be placed on or by the edge of the road where they are the most effective, but do not pose a hazard to traffic.

Angle - Signs must be aimed and their alignment maintained so that they have the best viewing angle for oncoming traffic.

Mounting height - For post mounting, the distances from the road surface to the bottom of the signs are:

- For 90 X 90 cm signs, 1.0 to 2.5 m.
- For smaller signs, such as 75 X 75 cm signs, 1.5 to 2.5 m.

1.11 Signs - Human Activity Signs - Red Orange Flags

Except as described below, signs depicting 'human activity' mounted on high or low mount portable sign supports must display two red orange flags.

This includes 75 X 75 cm roll-up signs on high mount portable sign supports.

Three red orange flags must be displayed on top of TC-131 (NS) and TC-165 (NS) signs unless these signs are displayed with a Flashing Light Unit. There are rules limiting the use of flags on these signs during night. See the entries (TC-131 (NS) and TC-165 (NS)) in Section 8.3 for the sign in use.

Description - Flags must consist of a bright red orange cloth or cloth-like material securely mounted on a short staff so that the bottom of the flag hangs just above the sign.

Size - Flags must be a minimum of 300 X 300 mm.

'Human Activity' signs mounted on F-shape Barrier, or similar engineered barrier, need not display red orange flags. (For more information on F-shape Barriers, see Section 9.)

The following are the human activity signs:

- TC- 2 Road Work
- TC-3 Survey Crew
- TC-21 Traffic Control Person
- TC-21A (NS) Traffic Control Person Ahead
- TC-114 (NS) Overhead Bucket Work
- TC-131 (NS) TCP Ahead / Be Prepared to Stop (unless displayed with a Flashing Light Unit)
- TC-165 (NS) Road Work Ahead / Be Prepared to Stop (unless displayed with a Flashing Light Unit)

1.12 Signs - Condition Specific Signs

Some signs are commonly used in Application Guides on the approach to a Work Area, and may be general in nature. Other signs are 'condition specific' and are used only when it is necessary to warn motorists of a temporary condition. These 'condition specific' signs are not typically shown on Application Guides, because every workplace is different.

Temporary Workplace Signers, during their site assessment, should identify temporary conditions for which a sign has been approved. They should integrate the 'condition specific' signs into their traffic control plan when the condition cannot be removed and it is prudent to warn motorists of the temporary condition.

The following are 'condition specific' signs that may not appear on Application Guides:

- TC-18 (NS) One Lane Ahead
- TC- 27 Curve
- TC-47 Grooved Pavement
- TC-49 Low Shoulder
- TC-51 Bump
- TC-54 Truck Entrance
- TC-62 Hazard Marker
- TC-101 (NS) High Shoulder
- TC-102 (NS) Uneven Lanes
- TC-104 (NS) Tar Ahead
- TC-108 (NS) Flying Stones

1.13 Signs - Duty to Remove Temporary Condition Warning Signs

All temporary condition signs must be removed or covered immediately after they are no longer applicable.

1.14 Signs - Duty to Install Permanent Signs, Signals, Beacons and Lane Markings

At a project's completion, the permanent regulatory, warning, guide, and information signs impacted by the Temporary Workplace must be restored. Also restore signals, beacons and lane markings.

1.15 Signs - Speed Zone Restrictions

Temporary speed zones must only be established following authorization by the Traffic Authority responsible for the road. The responsible Traffic Authority will provide speed zone sign placement information with approval of the temporary speed zone reduction plan.

As defined by the Traffic Authority, temporary speed zone signs must only be displayed during periods of work, or where conditions continue to exist that make the reduction of speed necessary.

New: 2012

1.16 Alternative for TC-165 (NS) Sign

A modified TC-117 (NS) sign must be used instead of a TC-165 (NS) if:

- It is unsafe to use the TC-165 (NS) because it unavoidably encroaches into the travel lane farther than the Service Vehicle.
- The TC-165 (NS) is vehicle mounted and it is unsafe to use because it unavoidably blocks the vehicle driver's view of traffic approaching from the rear.
- The TC-165 (NS) is vehicle mounted and it is unsafe to use because it unavoidably blocks the approaching driver's view of the rear lights.

In the instances above, a modified TC-117 (NS) meeting the following standards must be used:

- The TC-117 (NS) sign must be a minimum of 1.65 m wide and 0.9 m tall and have a FLU mounted above it (see TC-165 (NS) for configuration).
- The TC-117 (NS) sign must have a minimum letter height of 15 cm.
- When used on a pickup truck, the sign must be mounted such that the bottom of the sign rests on or near the top of the rear bumper of the tuck. The sign must be mounted so that it does not interfere with the FLU display, or the truck's rear lights. (Typically this will eliminate the use of smaller vehicles, such as compact pickup trucks.)

Note: Every reasonable effort should be made to use the TC-165 (NS) when it is specified.

Operational Requirements and Standards Related to Section 9 and Devices

2.1 Duty to Remove Temporary Condition Devices

All temporary condition devices must be removed or covered immediately after they are no longer applicable.

2.2.1 Delineators (Cones, High Delineators and Drums) - Equivalency

Use the lightweight delineators shown on the Application Guide, except that approved equivalent or higher standard delineators may be substituted.

Drums are the highest standard of the lightweight delineators. High Delineators and 700 mm Traffic Cones are equal to each other and a lower standard than Drums.

See also“Delineators, Prohibited Use” (copied below), for a prohibition applicable to all lightweight delineators.

2.2.2 Delineators - Mixing Types Prohibited

Except as required for excavations (see below), different types of delineators must not be mixed, for the same purpose, on the same job, even when a higher standard delineator is used. (For example: Do not intermix drums and cones in a Buffer Area, etc.)

2.2.3 Delineators (Cones, High Delineators and Drums) - Excavations

Except as provided for in section 13.4, for excavations, the edge of the Work Area beside the excavation must be delineated with drums, and additionally, before and after the excavation as described below.

Excavations must be delineated with drums both before and after the excavation an equivalent distance to an Application Guide table L/2 value matched to the workplace conditions. (Where the Application Guide in use does not have a table with “L” values, choose an Application Guide from the same Series that does have “L” values, and one which also matches the workplace road type and speed zone.)

Excavations at inactive workplaces on or near travel lanes must be backfilled, covered with Engineer approved steel plate, or protected by F-shape Barriers. Excavations unattended at other locations must be provided enough protection to prevent entry.

2.2.4 Delineators - Termination Taper Not Required, Divided and One-Way Roads

On Divided or One-Way Roads, where there is no danger from public traffic entering the Work Area from the downstream end, a Termination Taper is not required.

2.2.5 Delineators - Crossing an Open Lane

A person must not cross over an open travel lane on foot to lay out, pick up or adjust a delineation device.

2.2.6 Delineators - Laying Out and Picking Up Lightweight Delineation Devices, Upstream / Downstream

On a road not closed to public traffic, lightweight delineation devices must:

- Be laid out starting at the upstream end of the Approach Transition Taper, or where no taper exists, at the first upstream delineator. End at the last downstream delineator.

- Be picked up beginning at the downstream end of the Termination Taper, or where no taper exists, at the last downstream delineator. End at the delineator furthest upstream.

2.2.7 Delineators - Requirement to Provide Worker Protection at Approach Transition Taper

A Service Vehicle, or if required by the Application Guide or a procedure, a Protection or Blocker Vehicle, must be positioned in the travel lane in advance of workers to provide protection while laying out and picking up delineators in an Approach Transition Taper.

2.2.8 Delineators - Laying Out and Picking Up Lightweight Delineators

Working with a Service Vehicle

- To the greatest extent practical, the vehicle should be positioned between the workers and the traffic that poses the greatest risk.

Loading and off loading delineators

- Delineators should be offloaded from and loaded onto the vehicle from the side (or rear) that results in the greatest safety.
- They must be offloaded from and loaded onto a vehicle that is stopped.
- If there is a 2.5 m safety space between an open traffic lane and the Service Vehicle, or if there is room to work safely between the vehicle and the edge of the road, delineators may be offloaded from and loaded onto these sides of the vehicle, or from the rear. Otherwise delineators must be offloaded from and loaded onto the rear of the vehicle.

Carrying, placing or retrieving delineators

Where workers on foot are laying out or picking up delineators supported by a vehicle, and delineators need to be walked past the side of a stopped vehicle to take advantage of the protection the vehicle can provide**,** comply with the following:
Carry delineators only when:
- The vehicle is stopped; or,
- No person is in the vehicle's immediate path (forward or reversing).

Walking with delineators:
- Delineators should be walked past the stopped vehicle on the non-traffic side. If it is not practical to follow this first rule due to restrictions at the site;
- If there is 2.5 m between the side of the vehicle and the open lane, delineators should be walked past the stopped vehicle on the traffic side while taking into consideration the danger posed by traffic in the open lane. If it is not practical to follow these two rules due to restrictions at the site;
- Delineators should be walked past the stopped vehicle, via the traffic side, under the direction of a dedicated observer.

Where high traffic volumes and / or restricted space make it unsafe to walk delineators past the vehicle (such as may happen on a multi-lane undivided road where the left lane is closed), Temporary Workplace Signers must develop and use safe procedures for laying out and picking up the delineators, taking into consideration risks present under current workplace conditions.

Carrying, placing or retrieving delineators behind a vehicle about to reverse

In addition to the rules for delineators (above), when working behind a vehicle that must reverse:

- The vehicle operator must only reverse when instructed by a guide.
- The vehicle must not reverse until every person in the immediate path is at a safe distance from the vehicle and is looking at the vehicle.
- When it is necessary to lay out or pick up delineators behind a vehicle that will be operated in reverse, immediately before doing the work, all workers and vehicle drivers must participate in a 'tool box talk' to discuss the hazards and communicate the methods to prevent injuries that could result from working behind the vehicle that will reverse.

2.2.9 Delineators - Laying Out and Picking Up Lightweight Delineation Devices - Driving Forward or in Reverse

Where workers on foot are laying out delineators supported by a vehicle, the vehicle must drive forward with the flow of traffic (relative to the Work Area lane), unless:

- The vehicle is within an area segregated from public traffic by delineators (in this case the vehicle may drive forward or in reverse), and;
- Measures are taken not to confuse oncoming traffic. (For example, headlight use at night.)

Where workers on foot are picking up delineators supported by a vehicle, the vehicle must drive in reverse against the flow of traffic (relative to the Work Area lane), unless:

- The vehicle is within an area segregated from public traffic by delineators (in this case the vehicle may drive forward or in reverse), and;
- Measures are taken not to confuse oncoming traffic. (For example, headlight use at night.)
- When it is necessary to lay out or pick up delineators behind a vehicle that will be operated in reverse, immediately before doing the work, all workers and vehicle drivers must participate in a 'tool box talk' to discuss the hazards and communicate the methods to prevent injuries that could result from working behind the vehicle that will reverse.

2.3.1 Flashing Light Unit - Substitution On Multi-Lane Undivided Road

Where permitted by an Application Guide, on a multi-lane undivided road with a speed zone of 80 km/h or less, when working in the left lane beside a solid yellow line (whether double or single), and where a Flashing Light Unit is required by an Application Guide at the Termination Taper, a Service Vehicle with a 360 degree flashing amber light may replace the downstream Flashing Light Unit (the one at the Termination Taper).

2.3.2 Flashing Light Unit - Optional Standards at Termination Taper with "B" Series Application Guides

When using a "B" Series Application Guide and a Flashing Light Unit is shown at the Termination Taper, if the speed zone is 80 km/h or less, the Flashing Light Unit at the Termination Taper is not required.

2.3.3 Flashing Light Unit - Substitution On "C" Series Application Guides

On roads with speed zones of 50 km/h, where a "C" Series Application Guide requires the use of a single vehicle to be parked in advance of an active Work Area to provide worker protection, and that vehicle is not a Protection or Blocker Vehicle, or a vehicle required to display a sign, a Flashing Light Unit showing the correct display (bar or arrow), may be used instead.

2.3.4 Flashing Light Unit - Display

When required by an Application Guide or a procedure, a Flashing Light Unit must display a bar (caution):

- To draw motorist's attention to a hazard.

- On Two-Lane Two-Way roads, when positioned at Approach Transition or Termination Tapers.

Except as provided for in a specific procedure or Application Guide:

- A Flashing Light Unit must display an arrow only when it blocks a lane on a Multi-Lane Road and it is safe for traffic to change lanes in the direction of the arrow.

- Where a single lane is closed on a multi-lane road and more than one Flashing Light Unit is used, the first Flashing Light Unit displays an arrow, second and subsequent units in the same lane display a bar (caution). (The arrow is normally used to indicate the need for a forced lane change on a multi-lane road.)

2.3.5 Flashing Light Unit - Night Operation

The intensity of the Flashing Light Unit display must be reduced during night operations.

2.3.6 Flashing Light Unit - Position

Flashing Light Units must be positioned to obtain optimum motorist visibility.

When required in advance of a Work Area by an Application Guide, Flashing Light Units should be positioned close to the boundary of the Approach Transition Taper and the Buffer Area, but may be moved slightly upstream into the Approach Transition Taper, if the lane width permits.

When required downstream of a Work Area by an Application Guide, Flashing Light Units are typically positioned close to the boundary of the Termination Taper and the Work Area, but with a safety space between the Flashing Light Unit and workers.

For a lane closure, Flashing Light Units must be positioned in the middle of the closed lane. For partial lane closures they should encroach approximately the same amount as the work.

2.4.1 Barricades - Standards When Work Area is Beyond Barricades

On roads where public traffic has access beyond a barricade, every effort reasonable must be made to position barricades far enough away from the Work Area to permit a properly scaled traffic control solution to be used beyond the barricade.

Where public traffic has access beyond a barricade, workers beyond the barricade must be protected by signs, delineators, devices, and Traffic Control Persons, to the same standards defined for workplaces where no barricades are used, except that:

- On Streets where the Work Area is within sight of the barricade, traffic control signs are not required beyond the barricade. (All other Manual standards remain in effect, e.g. delineators and Traffic Control Persons.)
- On Highways, where a properly scaled traffic control solution cannot be used beyond a barricade, the distance between signs may be shortened the minimum required, but not to less than A/3 values. Signs must maintain their effectiveness. (All other Manual standards remain in effect, e.g. delineators and Traffic Control Persons.)
- On Streets and Highways, where the barricade must be placed too close to the Work Area to permit safe traffic regulation beyond the barricade, traffic regulation must be provided in advance of the barricade.

Note: If limiting access to local traffic only changes a road's classification to "Low Volume", a solution based on a Low Volume Application Guide may be used. Guide B 80 shows a road closure example.

2.4.2 Barricades - Providing Motorist Information Beyond a Barricade

When it is necessary to deliver information to motorists beyond a barricade, consideration should be given to using additional warning signs, or site specific information via a portable variable message sign positioned beyond the barricade, instead of using a person.

While providing information to motorists beyond a barricade is not a true Traffic Control Person function, it is recognized that those performing the service would benefit from the workplace safety training provided to Traffic Control Persons. In consideration of this, where public traffic has access beyond a barricade, and it is beneficial to position someone beyond the barricade to provide information to motorists, the person providing the information must:

- Be accredited as a Traffic Control Person, and use clothing and equipment meeting the same standards as required for a Traffic Control Person, except that a Stop Slow Paddle is not required.
- Be trained by their employer to recognize and avoid hazards present at the site.
- Be made familiar with the traffic issues.
- Stand off the travel lane at the side of the road, and at a location with an escape route.
- Talk to motorists from the edge of the road, and not from within the travel lane.
- Never sit or lean on a barricade.

The person stationed beyond a barricade to provide information to motorists should:

- Stand 10 - 20 m beyond the barricade. (They should be far enough from the barricade to prevent vehicles that stop from becoming a hazard.)

The employer of a person stationed beyond a barricade to provide information to motorists should:

- Provide that person with whatever support is needed to create and maintain safe conditions (e.g. adequate supervision and periodic relief).

Operational Requirements and Standards Related to Vehicle Selection and Vehicle Standards

3.1 Vehicle Standards - Substituting Alternative Vehicle Types

In all cases, where a vehicle substitution is made using the following guidelines, the replacement vehicle must display warning lights and signs equivalent to those required for the original vehicle, with the exception of Utility or Survey crew vehicles, which are permitted alternative lighting standards as per sections 13.4 (Utility), and 13.3 (Survey Crew, under, "Vehicle Standards - Warning Lights on Vehicles").

Where an Application Guide, or a procedure from Section 13 requires the use of a Protection Vehicle, only a Protection Vehicle may be used.

Where an Application Guide, or a procedure from Section 13 requires the use of a Blocker Vehicle, a Protection Vehicle will provide greater protection, therefore may be used instead of the Blocker Vehicle. Blocker Vehicle use should be limited to situations where a Protection Vehicle is not available, or is impractical. Only a Protection Vehicle may be substituted for a Blocker Vehicle.

Where an Application Guide, or a procedure from Section 13 requires the use of a Trail Vehicle, only a vehicle meeting the warning lighting and signing requirements as defined by the Application Guide, and this Section may be used. Additional Trail Vehicle requirements from Section 9.2 must be met.

Where an Application Guide, or a procedure from Section 13 requires the use of a Service or Work Vehicle, a Protection, Blocker, Service, or Work Vehicle may be used. An exception is that, vehicles presenting an obvious elevated hazard to errant drivers, because of their shape (e.g. protruding backhoe arm, etc), should not be used as a 'first strike' target for errant vehicles.

On roads with speed zones of 50 km/h, where a "C" Series Application Guide requires the use of a single vehicle to be parked in advance of an active Work Area to provide worker protection, and that vehicle is not a Protection or Blocker Vehicle, or a vehicle required to display a sign, a Flashing Light Unit showing the correct display (bar, or arrow), may be used instead.

3.2 Vehicle Standards - Type of Vehicle for Laying Out and Picking up Signs or Delineators

Where a single vehicle is required to accompany workers laying out, picking up, or maintaining signs or delineators, a Service Vehicle is the minimum standard.

Where two vehicles are required, use a second Service Vehicle, except if specified by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Where more than one vehicle type is readily available for use, Temporary Workplace Signers should choose the one that provides the best combination of protection for motorists and workers. In choosing, Temporary Workplace Signers should consider local conditions such as, road alignment, hills, surface conditions, traffic speed and volume, working in areas with restricted escape routes (working against a guardrail or barrier).

3.3 Vehicle Standards - Using One or Two Vehicles for Laying Out, Picking up, or Maintaining Signs or Delineators

On a road open to public traffic the standard is to have one or two vehicles accompany workers, based on conditions. The rules for deciding between one vehicle or two are as follows:

A single Service Vehicle or a two vehicle combination must always accompany workers when a procedure from Section 13.5 specifically states the requirement.

Other than described above, a single Service Vehicle must accompany workers:

- Laying out, picking up, or maintaining signs.
- Laying out, or picking up delineators within a travel lane; except,

  On a road with a speed zone of 80 km/h or less, workers laying out or picking delineators must only be accompanied until one of the following is positioned in the travel lane ahead of workers:
  - A Flashing Light Unit, or
  - An Approach Transition Taper, or
  - Where no taper is required by the Application Guide, a Protection, Blocker, or Service Vehicle.

Except as described below, two vehicles must accompany workers:

- When laying out, picking up, or maintaining signs against a longitudinal barrier that has a height similar to or higher than F-shape barriers.
- When laying out, picking up, or maintaining signs against a longitudinal barrier that is used to separate two traffic lanes.

The two bullets immediately above do not apply when maintaining signs and the single supporting Service Vehicle pulls off the travel lane (no lane encroachment).

Except as described below, two vehicles must accompany workers:

- On Highways with posted speeds greater than 80 km/h when laying out, picking up, or maintaining signs.
- On Highways with posted speeds greater than 80 km/h when laying out or picking up delineators.

The two bullets immediately above don't apply to:

- Utility Work.
- Survey Crew Work.
- Every work type, when maintaining signs and the single supporting Service Vehicle pulls off the travel lane (no lane encroachment).

3.4 Vehicle Standards - Warning Lights on Vehicles

The vehicle warning light standards in this section also apply to vehicles laying out or picking up signs or delineators.

New: 2012

See rule 4.7 in this Section for warning light standards for worker's transport vehicles while parking.

For vehicles used exclusively in survey crew Application Guides the minimum warning lighting

on a vehicle is a 360° Flashing Amber Light. Warning light standards for survey crew work take precedence over the light standards that follow.

The warning light standards for vehicles used exclusively in Utility Work are contained in Section 13.4. Warning light standards for Utility Work take precedence over the light standards that follow.

Other than described above for Utility and Survey work:

Warning Lights on Vehicles Shown on Application Guides

New: 2012

- Protection, Blocker, Service, Work and Trail Vehicles shown on an "A", "B" or "C" Series Application Guide must display a 360° Flashing Amber Light, and if a Flashing Light Unit or high mount amber flashing lights are shown for the vehicle on the Application Guide in use, these warning lights must be displayed in addition to the 360° Flashing Amber Light.

Warning Lights on Vehicles Not Shown on Application Guides

- Where a Work Vehicle is in use with an "A", "B" or "C" Series Application Guide, but the warning light standard for that vehicle type is not shown or described on the Application Guide, the vehicle must display a 360° Flashing Amber Light.

- Where Protection, Blocker, Service, or Trail Vehicles are in use on a Highway, but the warning light standard for that vehicle type is not shown or described on the Application Guide, the vehicle must display a 360° Flashing Amber Light, and a Flashing Light Unit.

- Where Protection, Blocker, Service, or Trail Vehicles are in use on a Street, but the warning light standard for that vehicle type is not shown or described on the Application Guide, the vehicle must display a 360° Flashing Amber Light.

3.5 Vehicle Warning Lights on a Divided, or One-Way Road

On a Divided, or One-Way Road, a vehicle displaying a Flashing Light Unit to approaching traffic need not activate the 360° Flashing Amber Light, or amber hi-intensity halogen mini-bar light.

3.6 Vehicle Standards - Backing Up

Vehicles must not back up when any person is in the immediate path of the reversing vehicle, or when it cannot be done safely. Where a hazard exists behind a vehicle, it must only reverse when directed by a competent guide person. (See "Laying Out and Picking Up Lightweight Delineation Devices - Driving Forward or in Reverse", for a requirement to conduct a 'tool box talk' when working behind a vehicle that will reverse.)

3.7 Vehicle Standards - Working From a Moving Vehicle

The operator of a vehicle must not permit workers to place, adjust, or remove signs or devices from within the vehicle if it is moving, unless the vehicle is operated in compliance with the Motor Vehicle Act, and workers are provided with protection. In these cases, vehicles and procedures must be approved by the Department.

3.8 Vehicle Standards - Encroachment on the Travel Lane

When providing worker protection at a Temporary Workplace, the Protection, Blocker or Service Vehicle must encroach into the travel lane the least amount needed to assure the safety of workers and motorists.

3.9 Vehicle Standards - Safety Space Between Protection, Blocker, Work or Service Vehicle

When two vehicles are used together, such as to lay out, pick up, or maintain signs or devices, the upstream vehicle operator and/or Temporary Workplace Signers must establish and maintain a safety space between it and the downstream vehicle.

The space should be large enough so that a rear end collision will not damage the downstream vehicle or harm workers. It should be small enough so that traffic will not enter between the two vehicles. When setting the safety space, vehicle weights, speeds, road grade, alignment and visibility, braking distances and surface conditions must be considered.

3.10 Vehicle Standards - Placement of Protection Vehicles (Also the Flashing Light Units and Truck Mounted Attenuators)

Where an Application Guide, or a procedure from Section 13, requires the use of a Protection Vehicle with a 360° flashing amber light and a Flashing Light Unit at a stationary location, the Protection Vehicle must be positioned to provide the greatest protection to workers, but must not be less than Application Guide table "B" value in front of workers.

Where an Application Guide shows the Protection Vehicle positioned at the Approach Transition Taper, but the Work Area is separated from the Approach Transition Taper, position a Flashing Light Unit at the Approach Transition Taper to assist drivers with the lateral lane change, and the Protection Vehicle at the optimal position for worker protection. A Protection Vehicle separated from, and in position downstream from a Flashing Light Unit, need not display a second Flashing Light Unit provided another lateral lane change is not required at that location.

3.11 Vehicle Standards - Mechanized Work, Use of One or Two Vehicles at a Stationary Location in Advance of Workers

Mechanized Work, No Bucket Truck - Where a "B" or "C" Application Guide requires the use of a vehicle to be positioned at a stationary location between oncoming traffic and workers to provide physical protection, and work will be mechanized (performed from on, or from within the Work Vehicle), the vehicle required to be between oncoming traffic and workers is optional if the following conditions are met:

- Workers are not permitted to work from a bucket or other aerial device.
- The speed zone at the workplace must not be greater than 70 km/h.
- A Protection or Blocker Vehicle must not be replaced.
- Except to enter or exit the Work Vehicle, workers are not permitted in the travel lane.
- Warning lights and signs required to be on the vehicle providing the original protection must instead be on the Work Vehicle. Standards and variances from other sections of the Manual continue to apply.

Mechanized Work, Bucket Truck Permitted - Where a "B" or "C" Application Guide requires the use of a vehicle to be positioned at a stationary location between oncoming traffic and workers to provide physical protection, and work will be performed using a bucket truck (no scissor lifts or other aerial devices), the vehicle required to be between oncoming traffic and workers is optional if the following conditions are met:

- The speed zone at the workplace must not be greater than 70 km/h.
- A Protection or Blocker Vehicle must not be replaced.
- Workers are not permitted in the travel lane except to enter or exit the Work Vehicle or bucket.
- The Work Vehicle must be entirely segregated from public traffic by 700 mm Traffic Cones meeting Night Work standards. The Traffic Cones must form an Approach Transition Taper of L length, a Buffer Area of L/2 length, a Work Area, and a Termination Taper of L/2 length. (L values are taken from the Application Guide in use, or from table 10.1.)
- Warning lights and signs required to be on the vehicle providing the original protection must instead be on the Work Vehicle. Standards and variances from other sections of the Manual continue to apply (e.g. Utility and Survey Crew variances).

Operational Requirements and Standards, Miscellaneous

4.1 Use of Median Crossovers

Only vehicles authorized by Section 112 of the Motor Vehicle Act are permitted to use median crossovers. Those include:

- Police.
- Fire.
- Emergency vehicles.
- Vehicles operated by employees of the Department while acting in the course of their employment and other vehicles as permitted by regulation.

Vehicles not permitted by the Motor Vehicle Act to use crossovers must use interchanges.

4.2 Night Work

Except as provided for in Section 13.4, a traffic control plan involving Night Work and that closes a lane on a numbered Highway, must be approved by the Department before work begins. Contact should be via the Department's Area Manager at the local district office.

4.3 Aerial Device Prohibition

A person must not operate an aerial bucket or man-lift over a lane open to traffic, or allow the boom of an aerial bucket or man-lift to project over an open lane.

4.4 Requirements to Perform a Workplace Review

The Temporary Workplace Signer must conduct an on-site review of the traffic control setup soon after implementation. They must ensure the continuing effectiveness of the setup by periodic review. Where a workplace has a person of greater overall authority at the workplace, that person must also ensure that the traffic control plan complies with the *Manual* and continues to function correctly.

4.5 Alternative Traffic Control Standards on Low Volume Gravel Roads

On Low Volume gravel roads, an accredited Temporary Workplace Signer may set a standard for traffic control that differs from that contained in the Manual, provided the safety of public road users and road workers can be assured.

4.6 Temporary Workplaces Spanning More than One Speed Zone

Where a temporary workplace spans more than one speed zone, the traffic control standards for the higher speed zone(s) must be applied within the higher speed section(s). Temporary Workplace Signers should consider applying the standards from the higher speed zone to the lower speed zone, if necessary to increase safety.

4.7 Parking and Management of Workplace Vehicles and Equipment

Vehicles and equipment, including those used to transport workers to or from the workplace, must be parked safely.

During the site assessment, identify existing safe parking locations, or develop plans, seek approvals and have parking facilities constructed.

Vehicles and equipment at an active workplace:

- Must not be parked close to active Traffic Control Persons or where drivers are required to change lanes or make turns.

- Must be parked at a safe location away from the traffic lanes where they will not interfere with traffic, or add complexity or visual confusion for drivers.

Vehicles and equipment at an inactive workplace:

- Must be removed to a safe storage area beyond the shoulder of the road where they do not pose an impact hazard for road users; except,

- Where it is impractical to park vehicles and equipment beyond the shoulder of the road they may be stored in a safe location within a temporary workplace that meets Manual standards, provided the workplace is situated so that it has the least impact practical on road users.

New: 2012

A vehicle that is used to transport workers to or from a temporary workplace parking location does not need to display a 360 degree flashing amber light while at the temporary workplace if:

- The vehicle is driven to or from its safe parking location at the workplace using the safest and most direct route.
- The vehicle remains stationary at the parking location for greatest portion of its stay at the workplace.
- The vehicle does not perform another function at the workplace (e.g. assisting workers laying out signs).

Worker transport vehicles already equipped with a 360 degree flashing amber light should activate them while moving to and from their parking location within a workplace.

The driver of a worker transport vehicle must consider:

- Choosing a route to and from the parking location that avoids active construction vehicles and equipment.
- When leaving a public traffic stream to park, watch for and avoid leading public traffic into the workplace (use four way flashers if necessary).
- Drive safely, taking into consideration people at the workplace, the vehicle's speed, and workplace conditions.

13.4 Utility Work

Introduction

This section deals with how rules in other sections of the Manual are affected when the work type is Utility.

Rules and standards in Sections "D" through 13, including all subsections, and the Series "A", "B", and "C" Application Guides apply to Utility Work, unless explicitly stated otherwise in this Section. When the work type is Utility, the rules and standard in this Section supersede all other Sections whether stated in these Sections or not.

This Section is organized into the following primary information groups:

- Utility Standards that apply to "A", "B" and "C" Series Application Guides.
- Utility Standards that apply only to "A" Series Application Guides.
- Utility Standards that apply only to "B" and "C" Series Application Guides.

The vehicle warning light standards in this section also apply to vehicles laying out or picking up signs or delineators at Utility workplaces.

Utility Work - Standards That Apply to "A", "B" and "C" Series Application Guides

Utility Work - Closing a Highway at Night

Utility companies need not seek Department approval to close a lane on a numbered highway at night for work that cannot be foreseen 24 h in advance.

Utility Work - Sign TC-114 (NS) (Overhead Bucket Work)

Sign TC-114 (NS) (Overhead Bucket Work), may be used in place of sign TC-2 (Road Work), for Utility Work that does not include an excavation.

Utility Work - TC-171 (NS) Sign (Speed Fines Double in Work Areas)

Utility workplaces must display TC-171 (NS) (Speed Fines Double in Work Areas) and TC-4 (Construction Ends) signs when TC-2 (Road Work) or TC-114 (NS) (Overhead Bucket Work) signs are used. When the workplace becomes inactive the TC-171 (NS), TC-2, and / or TC-114 (NS) signs must be removed or covered.

Utility Work - Drum Variance

700 mm Traffic Cones meeting Night Work standards or High Delineators meeting Night Work standards may be used instead of Drums, except as described below under the heading, "Utility Work - Standards for Excavations."

Utility Work - Standards for Excavations

Utility companies digging a hole for a pole may use cones or high delineators instead of drums along the entire Work Area traffic edge, provided the delineators meet nighttime standards and the hole is off shoulder and does not present an entry hazard to public road users.

If the excavation does not meet the standards above, the edge of the Work Area beside the excavation must be delineated with drums, and additionally, before and after the excavation as described below.

Excavations must be delineated with drums both before and after the excavation an equivalent distance to an Application Guide table L/2 value matched to the workplace conditions. (Where the Application Guide in use does not have a table with "L" values, choose an Application Guide from the same Series that does have "L" values, and one which also matches the workplace road type and speed zone.)

Excavations at inactive workplaces on or near travel lanes must be backfilled, covered with Engineer approved steel plate, or protected by F-shape Barriers. Excavations unattended at other locations must be provided enough protection to prevent entry.

Utility Work - Variance for Second Vehicle Laying out Picking up or Maintaining Signs and Delineators

A second vehicle is not required to accompany a Service Vehicle laying out, picking up or maintaining signs or delineators.

Utility Work - Vehicle Warning Lights on a Divided or One-Way Road

A vehicle displaying a Flashing Light Unit to approaching traffic need not activate the 360° Flashing Amber Light, or amber hi-intensity halogen mini-bar light.

Utility Work - Vehicle 360° Warning Light Standards

For Utility Work, an amber hi-intensity halogen mini-bar visible for 360° is an acceptable substitute for a 360° Flashing Amber Light. (This also applies to those vehicles directly supporting Utility Work.)

Utility Work - Standards That Apply Only to "A" Series Application Guides

- Double Posting of signs on uncontrolled sections of Highway 103 is not required.

- Partial Lane Closures are permitted on 100 Series Highways if:
  - The highway is not multi-lane.
  - The highway is not a Controlled Access Highway.
  - The centreline is not altered.
  - For the work duration, a partial lane closure Application Guide from Series "B", is adapted (instead of using an "A" Series Application Guide).

- On roads that are not Controlled Access, Utility work moving from pole to pole that requires a partial lane closure or shoulder work, may expand the distance between signs on opposite sides of the Work Area to 2 km. Where the road is only signed on the upstream approach to the Work Area, the 2 km stretches between the last sign and the end of the affected area.
- Trail Vehicles may be omitted on 100 Series Highways that are not Controlled Access Highways.

Utility Work - Standards That Apply Only to "B" and "C" Series Application Guides

- Trail Vehicles may be omitted.

- Utility work moving from pole to pole that requires a partial lane closure or shoulder work may:
  - Expand the distance between signs on opposing sides of the Work Area to 2 km.
  - Omit Traffic Cones, as normally required by Application Guides, except that they are required when workers are on the travel lane portion of the road.

- For Utility Work using "B" and "C" Series Application Guides, an amber hi-intensity halogen mini-bar visible for 360° is an acceptable substitute for a Flashing Light Unit required to be displayed on a vehicle (or FLU trailer). It is not an acceptable substitute for a Flashing Light Unit required to be displayed with a sign erected at a stationary location or on a barricade (e.g., TC-131 (NS), or TC-64E).

13.5 Procedures

Introduction to Procedures

Procedures in Sections 13.5 set minimum standards for laying out and picking up signs and delineators, and for performing bridge lane change, and resurfacing procedures.

Use Section 13.1 and 13.2 for selecting procedures.

To develop a safe and fully compliant traffic control solution, Temporary Workplace Signers must be familiar with all rules and standards from Sections "D" through 13, and those in the Application Guide in use.

The procedures in Section 13.5 dealing with laying out and picking up delineators, do not apply where the delineators are laid out or picked up from a moving vehicle. In these cases, equipment and procedures must be approved by the Department.

Choosing the Correct Variables For The Procedure

Procedures in this section may apply to more than one Application Guide. Within these Application Guides, standards for devices that have to be used may change. For example, some Application Guides may use cones, while others use drums, some may require different vehicles to be used and with different warning lighting, some will use Traffic Control Persons, while others won't, etc. In presenting the procedures, one set of variables must be chosen, because it is not practical to represent them all within a single procedure. The procedures presented are typical.

When using procedures, Temporary Workplace Signers must follow the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used.

As well, procedures may be adapted to the extent permitted by a variance (e.g. Survey Crew and Utility Work variances).

In response to workplace conditions Temporary Workplace Signers may choose to apply higher standards than those shown in the procedures.

Application Guide variables may include:

- Vehicles used to lay out and pick up signs and delineators, and those providing worker protection. They include: Protection, Blocker, Work and Service Vehicles.
- The number of vehicles being used within a procedure.
- Warning lights on vehicles, including: Flashing Light Units (arrow(s) or bar), 360° Flashing Amber Lights and mini-bar lights.
- The Work Area position on the road (left or right lane).
- Levels of encroachment, including: Lane Closure, Partial Lane Closure, Shoulder Work and Off Shoulder Work.
- Double or single posting signs.
- Signing on one or both approaches to the Work Area.
- Traffic Control Person use.
- Approach Transition and Termination Taper use.
- Drum, cone or high delineator use.
- The speed zone in place at the workplace.
- Divided or undivided roadway.

13.5.1 Laying Out and Picking Up Signs, Multi-Lane - Divided or One-Way Highway, Speed Zone Greater Than 80 km/h, Right Lane or Right Shoulder Work Area

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.1.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Signs For a Right Lane Closure

Figure 13.5.1, Drawing # 1, shows this part of the procedure.

Beginning on the left shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away the Work Area) laying the signs required by the Application Guide on the left shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the left shoulder laying out signs required by the Application Guide.
- Pass the Work Area.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the right shoulder laying out signs required by the Application Guide.
- Pass the Work Area.
- Lay out the sign downstream of the Work Area, on the right shoulder, so that all signs are double posted.

The signs are now set up.

If traffic volumes permit it to be done safely, signs may be laid out as per Figure 13.5.1, Drawing #3.

Order of Picking Up Signs For a Right Lane Closure

Figure 13.5.1, Drawing # 2, shows this part of the procedure.

Beginning on the right shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic away from the Work Area) picking up the sign on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the right shoulder. Pick up the signs on the right shoulder.
- Pass the Work Area.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the left shoulder. Pick up the signs on the left shoulder.
- Pass the Work Area.
- Pick up the remaining sign on the left shoulder.

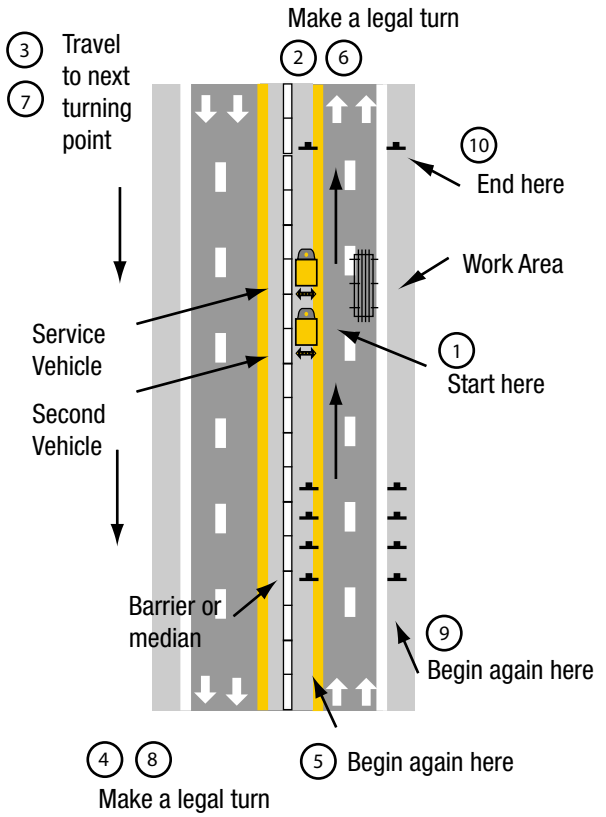
All signs are now off the road.

If traffic volumes permit it to be done safely, signs may be picked up as per Figure 13.5.1, Drawing #4.

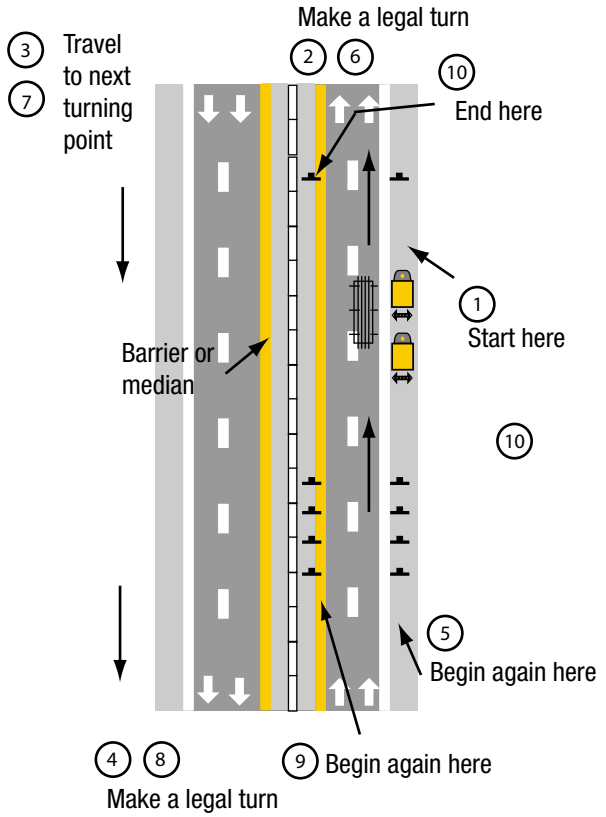
Laying Out and Picking Up Signs

Multi-Lane - Divided or One-Way, > 80 km/h, Right Lane or Right Shoulder **Figure 13.5.1**

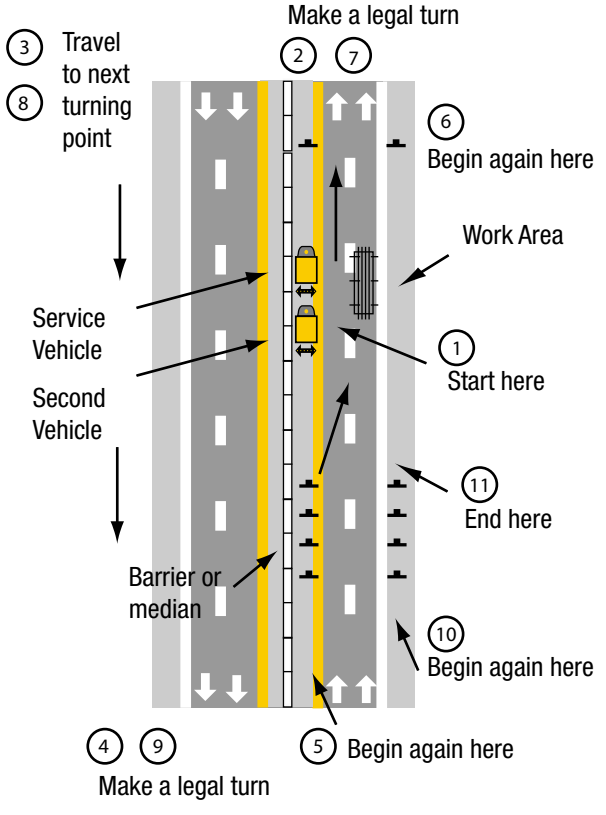
Drawing 1, Laying Out, Right Lane, Right Shoulder



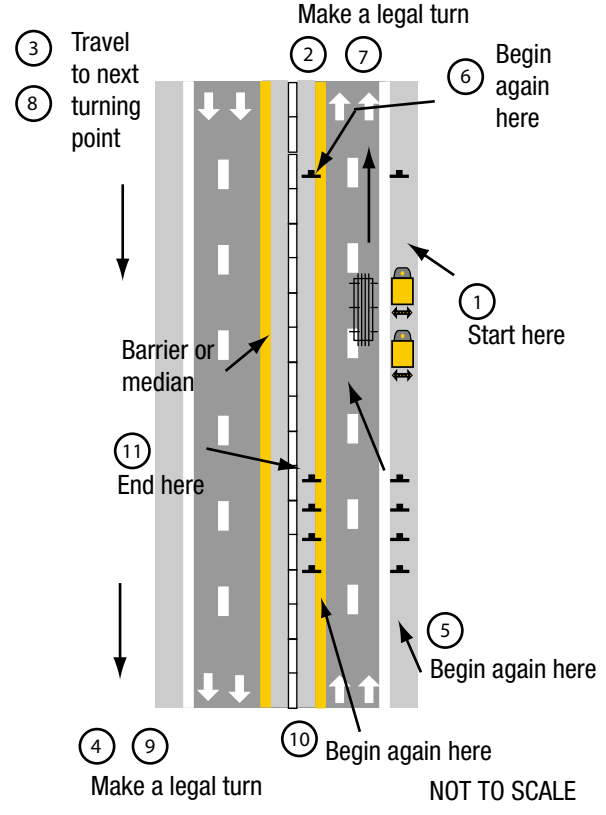
Drawing 2, Picking Up, Right Lane, Right Shoulder



Drawing 3, Laying Out, Right Lane, Right Shoulder



Drawing 4, Picking Up, Right Lane, Right Shoulder



NOT TO SCALE

13.5.2 Laying Out and Picking Up Signs, Multi-Lane - Divided or One-Way Highway, Speed Zone Greater Than 80 km/h, Left Lane or Left Shoulder Work Area

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.2.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Signs For a Left Lane Closure

Figure 13.5.2, Drawing # 1, shows this part of the procedure.

Beginning on the right shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the right shoulder laying out signs required by the Application Guide.
- Pass the Work Area.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the left shoulder laying out signs required by the Application Guide on the left shoulder.
- Pass the Work Area.
- Lay out the sign downstream of the Work Area, on the left shoulder, so that all signs are double posted.

The signs are now set up.

If traffic volumes permit it to be done safely, signs may be laid out as per Figure 13.5.2, Drawing #3.

Order of Picking Up Signs For a Left Lane Closure

Figure 13.5.2, Drawing # 2, shows this part of the procedure.

Beginning on the left shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the left shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the left shoulder picking up the signs on the left shoulder.
- Pass the Work Area.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approaching the Work Area along the right shoulder, pick up the signs on the right shoulder.
- Pass the Work Area.
- Pick up the last sign downstream of the Work Area, on the right shoulder.

All signs are now off the road.

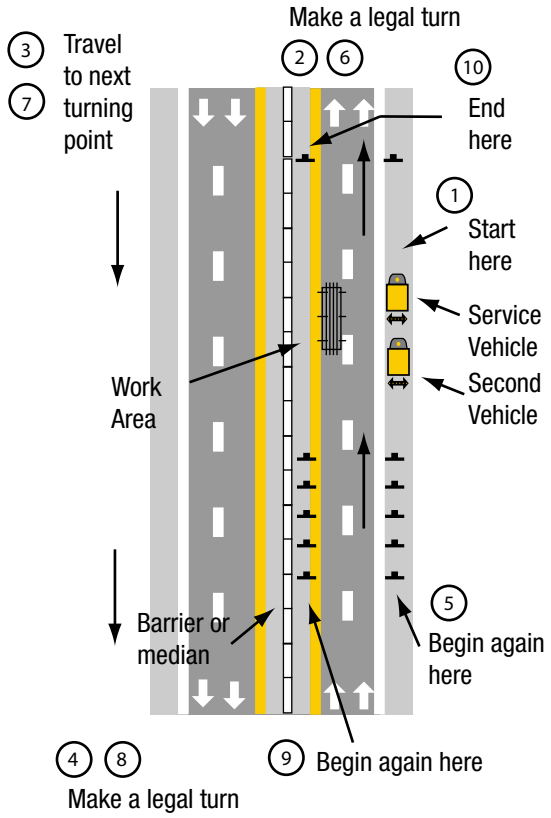
If traffic volumes permit it to be done safely, signs may be picked up as per Figure 13.5.2, Drawing #4.

Laying Out and Picking Up Signs

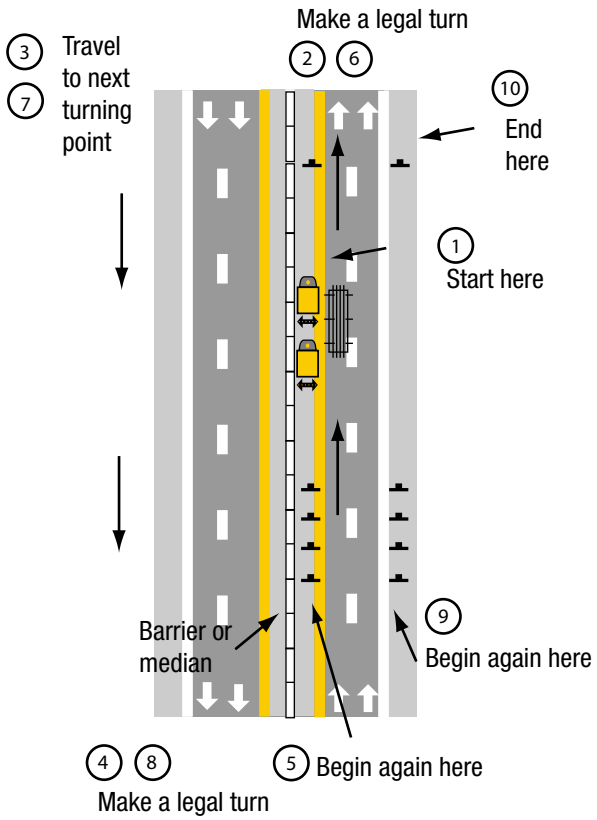
Multi-Lane - Divided or One-Way, > 80 km/h, Left Lane or Left Shoulder

Figure 13.5.2

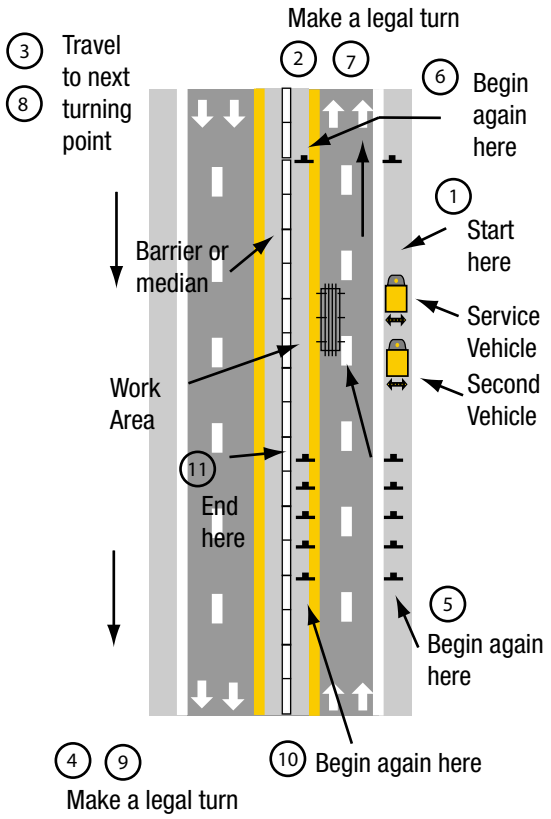
Drawing 1, Laying Out, Left Lane, Left Shoulder



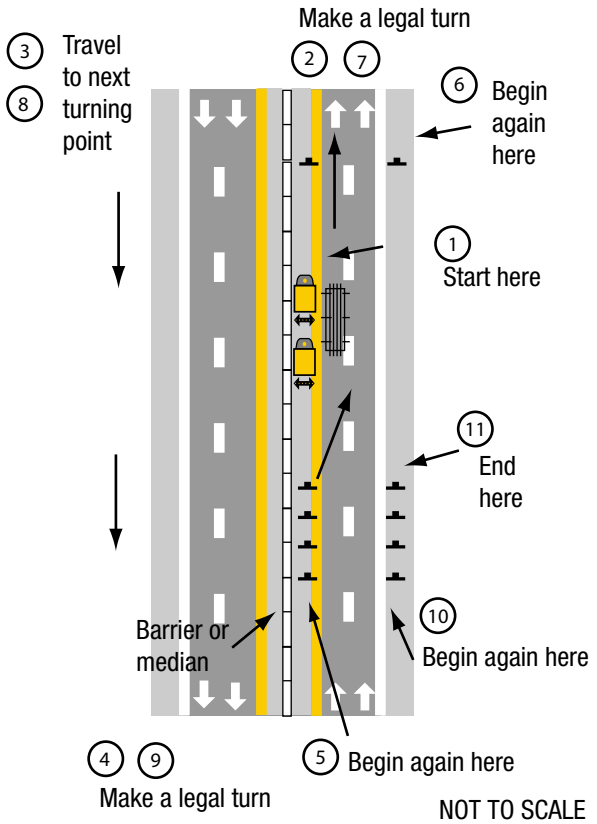
Drawing 2, Picking Up, Left Lane, Left Shoulder



Drawing 3, Laying Out, Left Lane, Left Shoulder



Drawing 4, Picking Up, Left Lane, Left Shoulder



NOT TO SCALE

13.5.3 Laying Out and Picking Up Signs, Multi-Lane - Divided or One-Way Roads, Speed Zone 80 km/h or Less, Right Lane or Right Shoulder Work Area

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.3.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Right Lane Closure

Figure 13.5.3, Drawing # 1, shows this part of the procedure.

Beginning on the left shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away the Work Area) laying the signs required by the Application Guide on the left shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the left shoulder laying out signs required by the Application Guide.
- Pass the Work Area.
- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the right shoulder laying out signs required by the Application Guide.

- Pass the Work Area.

- Lay out the sign downstream of the Work Area, on the right shoulder, so that all signs are double posted.

The signs are now set up.

If traffic volumes permit it to be done safely, signs may be laid out as per Figure 13.5.3, Drawing #3.

Order of Picking Up Signs For a Right Lane Closure

Figure 13.5.3, Drawing # 2, shows this part of the procedure.

Beginning on the right shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic away from the Work Area) picking up the sign on the right shoulder of the road.

- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the right shoulder. Pick up the signs on the right shoulder.

- Pass the Work Area.

- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the left shoulder. Pick up the signs on the left shoulder.

- Pass the Work Area.

- Pick up the remaining sign on the left shoulder.

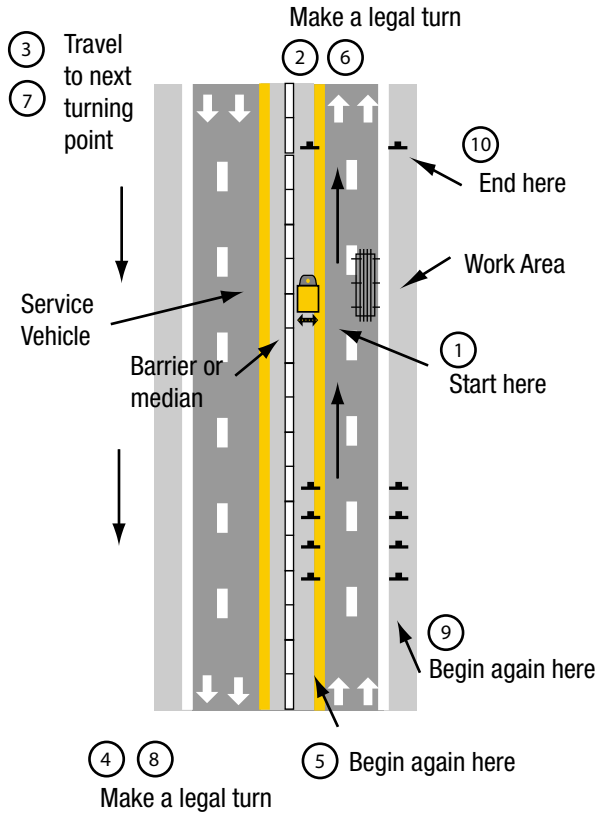
All signs are now off the road.

If traffic volumes permit it to be done safely, signs may be picked up as per Figure 13.5.3, Drawing #4.

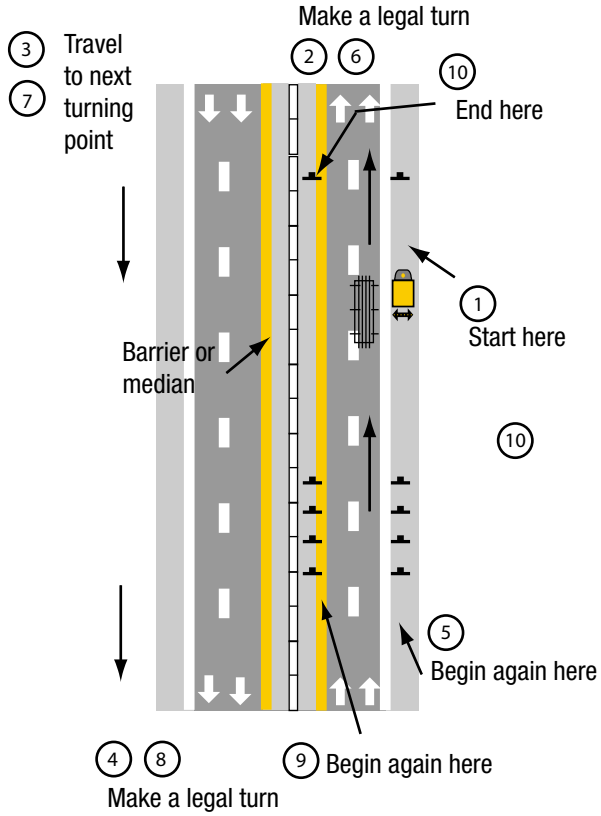
Laying Out and Picking Up Signs

Multi-Lane - Divided or One-Way, 80 km/h or Less, Right Lane or Right Shoulder **Figure 13.5.3**

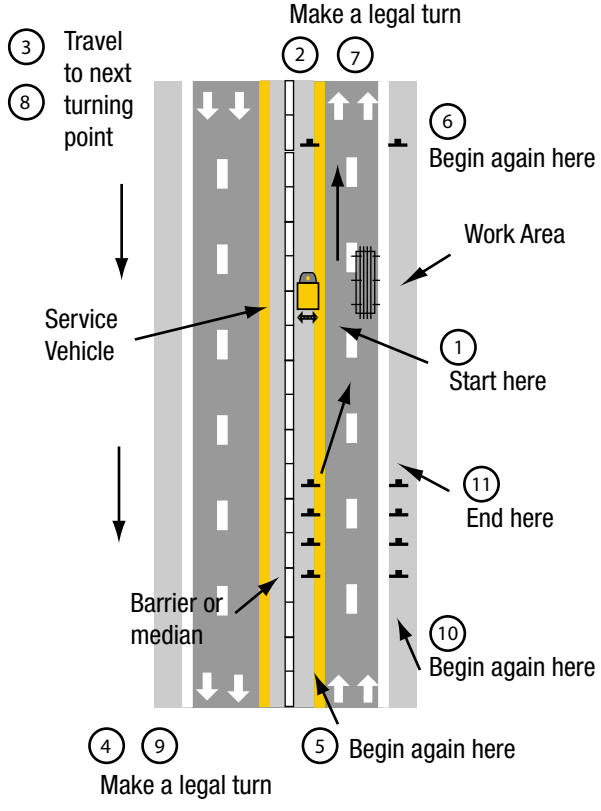
Drawing 1, Laying Out, Right Lane, Right Shoulder



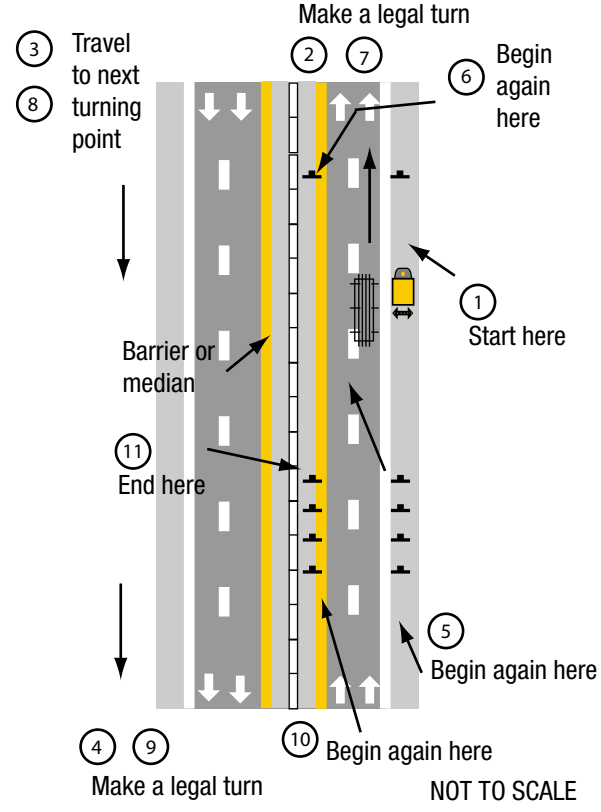
Drawing 2, Picking Up, Right Lane, Right Shoulder



Drawing 3, Laying Out, Right Lane, Right Shoulder



Drawing 4, Picking Up, Right Lane, Right Shoulder



13.5.4 Laying Out and Picking Up Signs, Multi-Lane - Divided or One-Way Road, Speed Zone 80 km/h or Less, Left Lane or Left Shoulder Work Area

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.4.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Left Lane Closure

Figure 13.5.4, Drawing # 1, shows this part of the procedure.

Beginning on the right shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.
- Approach the Work Area along the right shoulder laying out signs required by the Application Guide.
- Pass the Work Area.
- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the left shoulder laying out signs required by the Application Guide on the left shoulder.

- Pass the Work Area.

- Lay out the sign downstream of the Work Area, on the left shoulder, so that all signs are double posted.

The signs are now set up.

If traffic volumes permit it to be done safely, signs may be laid out as per Figure 13.5.4, Drawing #3.

Order of Picking Up Signs For a Left Lane Closure

Figure 13.5.4, Drawing # 2, shows this part of the procedure.

Beginning on the left shoulder of the road, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the left shoulder of the road.

- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approach the Work Area along the left shoulder picking up the signs on the left shoulder.

- Pass the Work Area.

- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back to the next legal and safe turning point, make the turn.

- Approaching the Work Area along the right shoulder, pick up the signs on the right shoulder.

- Pass the Work Area.

- Pick up the last sign downstream of the Work Area, on the right shoulder.

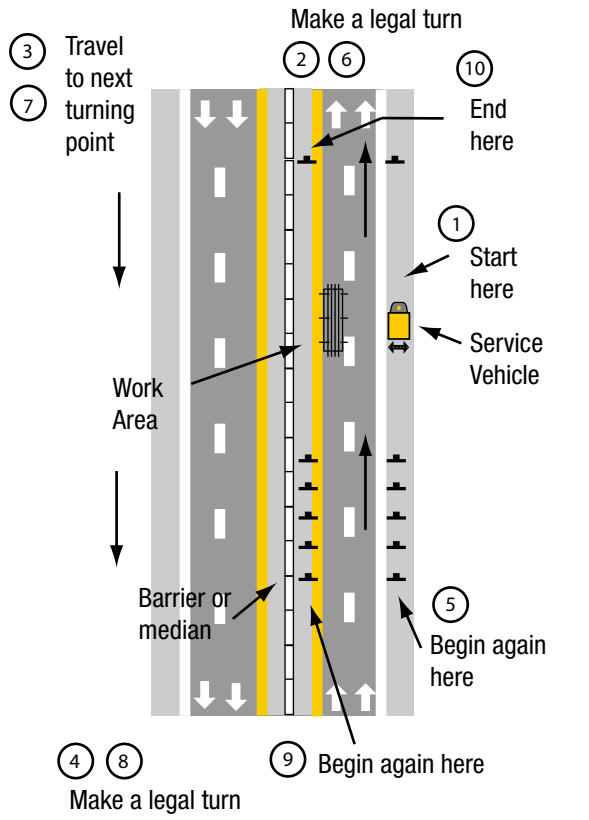
All signs are now off the road.

If traffic volumes permit it to be done safely, signs may be picked up as per Figure 13.5.4, Drawing #4.

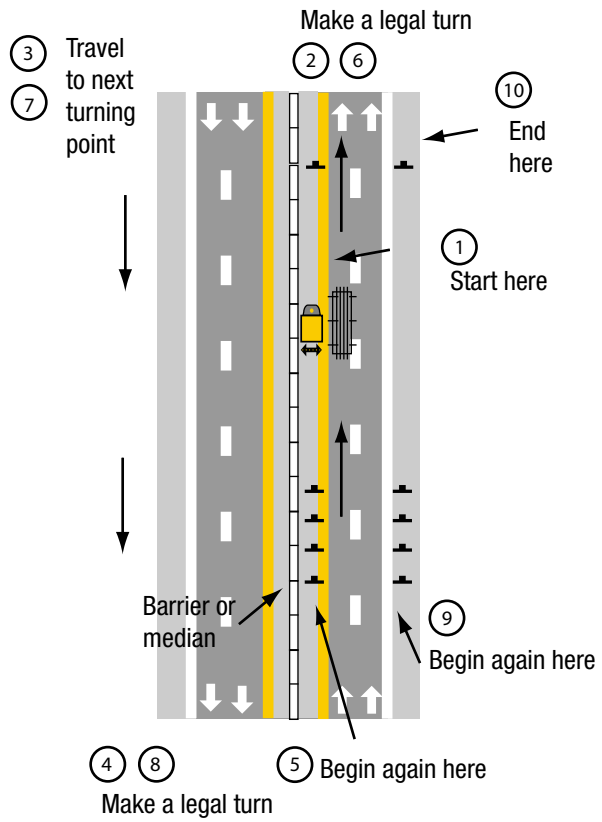
Laying Out and Picking Up Signs

Multi-Lane - Divided or One-Way, 80 km/h or Less, Left Lane or Left Shoulder **Figure 13.5.4**

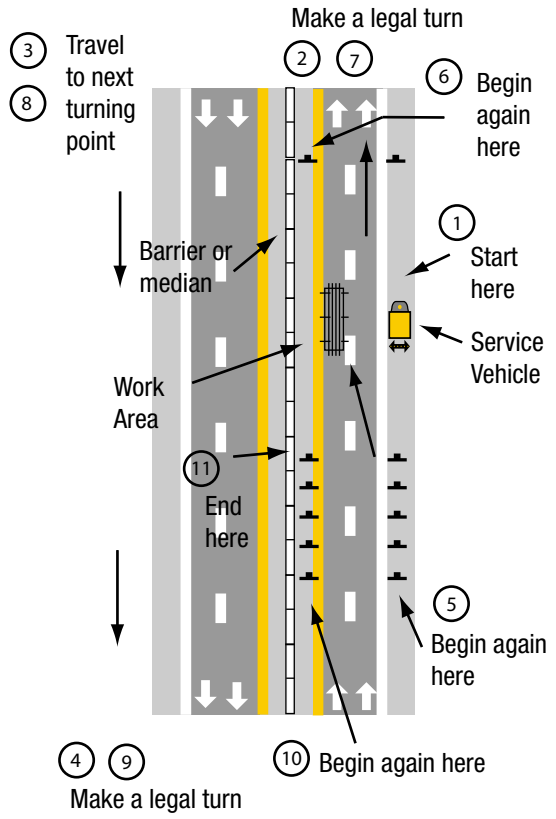
Drawing 1, Laying Out, Left Lane, Left Shoulder



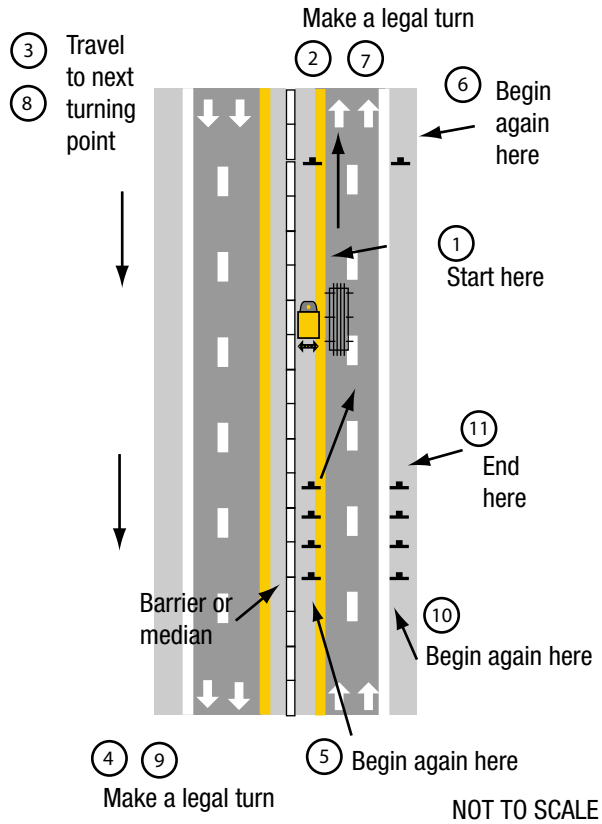
Drawing 2, Picking Up, Left Lane, Left Shoulder



Drawing 3, Laying Out, Left Lane, Left Shoulder



Drawing 4, Picking Up, Left Lane, Left Shoulder



NOT TO SCALE

13.5.5 Laying Out and Picking Up Signs, Multi-Lane Undivided Highway, Speed Zone Greater Than 80 km/h, Right Lane or Right Shoulder Work Area (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.5.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Sign Lay Out For Right Lane Closure

Figure 13.5.5, Drawing # 1, shows this part of the procedure.

Beginning on the right shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Pass the Work Area and continue to lay out the signs along the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and approaching the Work Area, lay out the same signing sequence on the right shoulder.
- Pass the Work Area and continue to lay out the signs required by the Application Guide along the right shoulder. All signs erected are double posted.

The signs are now set up.

Order of Sign Pick Up For Right Lane Closure

Figure 13.5.5, Drawing # 2, shows this part of the procedure.

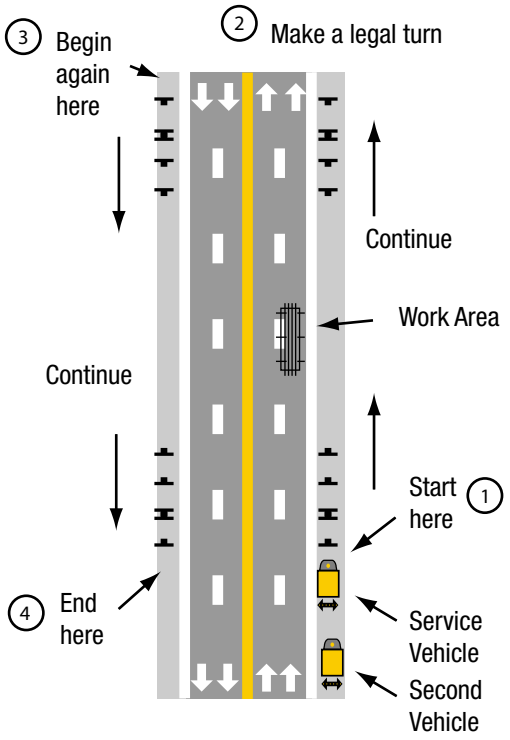
Beginning on the right shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and beginning in advance of the Work Area, pick up the signs along the right shoulder.
- Pass the Work Area and continue to pick up the signs along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.

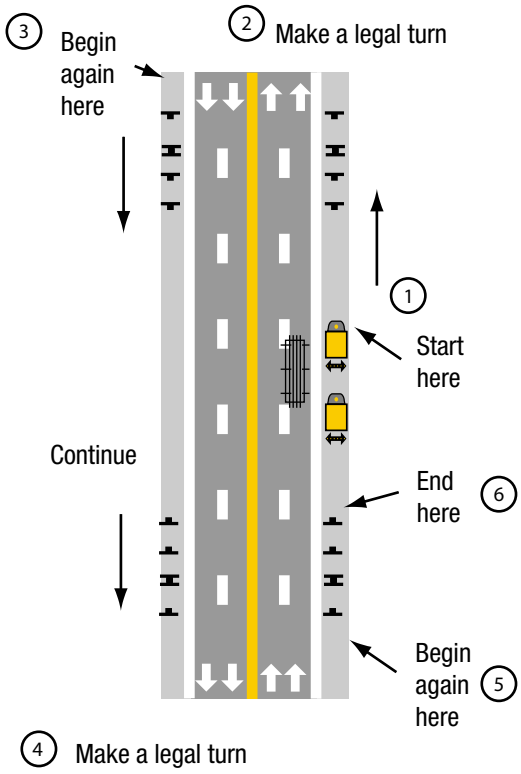
All signs are now off the road.

Multi-Lane - Undivided, Greater Than 80 km/h, Right Lane or Right Shoulder (Double Posted) **Figure 13.5.5**

Drawing 1, Laying Out, Right Lane, Right Shoulder



Drawing 2, Picking Up, Right Lane, Right Shoulder



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NOT TO SCALE

13.5.6 Laying Out and Picking Up Signs, Multi-Lane - Undivided Highway, Speed Zone Greater Than 80 km/h, Left Lane (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.6.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Signs For Left Lane Closure

Figure 13.5.6, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and approaching the Work Area, lay out the same signing sequence on the right shoulder.
- Pass the Work Area and continue to lay out the signs required by the Application Guide along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, lay out the signs required by the Application Guide so that all signs are double posted.

The signs are now set up.

Order of Picking Up Signs For Left Lane Closure

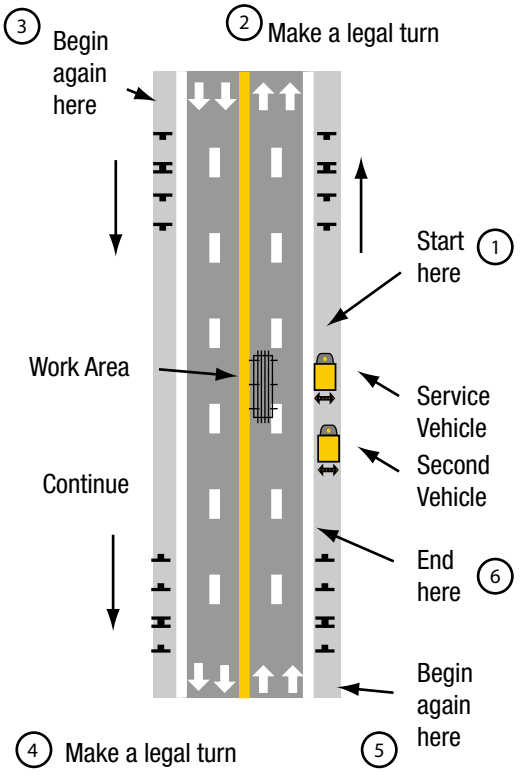
Figure 13.5.6, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the opposite side of the road from, and in advance of the Work Area:

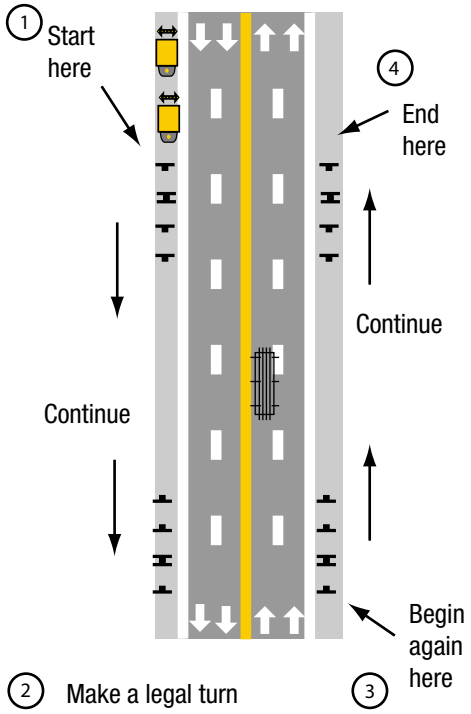
- Drive forward with the flow of traffic (toward the Work Area) picking up the signs on the right shoulder of the road.
- Pass the Work Area and continue to pick up the signs along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the signs.
- Pass the Work Area, continue to pick up the remaining signs along the right shoulder.

All signs are now off the road.

Drawing 1, Laying Out, Left Lane



Drawing 2, Picking Up, Left Lane



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NOT TO SCALE

13.5.7 Laying Out and Picking Up Signs, Multi-Lane - Undivided Road, Speed Zone Greater Than 50 km/h and Not Greater Than 80 km/h, Right Lane or Right Shoulder Work Area (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.7.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Right Lane Closure, ≤ 80 km/h

Figure 13.5.7, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Pass the Work Area and continue to lay the signs along the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and approaching the Work Area, lay out the same signing sequence on the right shoulder.
- Pass the Work Area and continue to lay out the signs required by the Application Guide along the right shoulder, so that all signs are double posted.

The signs are now set up.

Order of Picking Up Signs For a Right Lane Closure

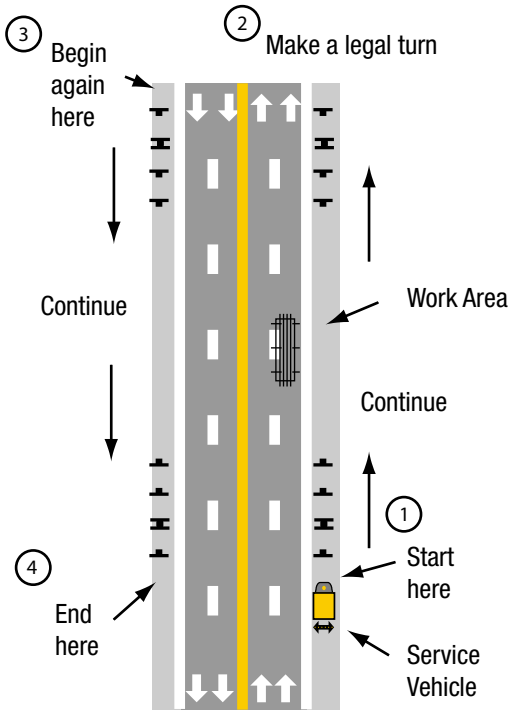
Figure 13.5.7, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road on the same side of the road as, and beside the Work Area:

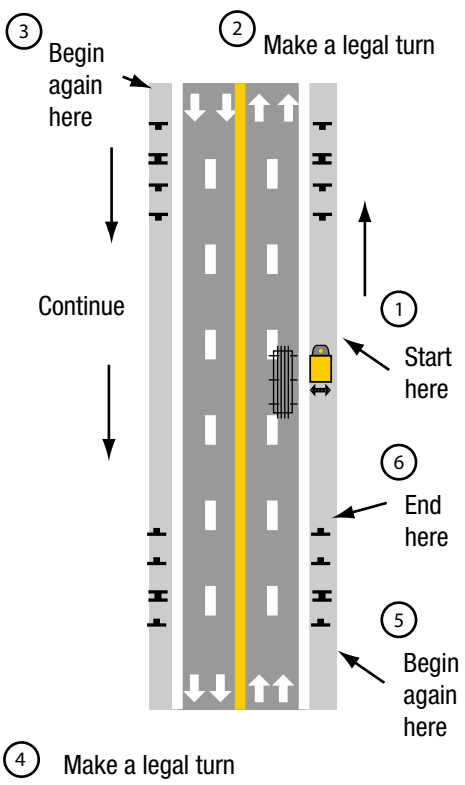
- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and approaching the Work Area, pick up the signs along the right shoulder.
- Pass the Work Area and continue to pick up the remaining signs along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.

All signs are now off the road.

Drawing 1, Laying Out, Right Lane, Right Shoulder



Drawing 2, Picking Up, Right Lane, Right Shoulder



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NOT TO SCALE

13.5.8 Laying Out and Picking Up Signs, Multi-Lane - Undivided Road, Speed Zone Greater Than 50 km/h and Not Greater Than 80 km/h, Left Lane (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.8.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Left Lane Closure

Figure 13.5.8, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, lay out the same signing sequence on the right shoulder.
- Pass the Work Area and continue to lay out the signs required by the Application Guide along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, lay out the remaining signs, so that all signs are double posted.

The signs are now set up.

Order of Picking Up Signs For a Left Lane Closure

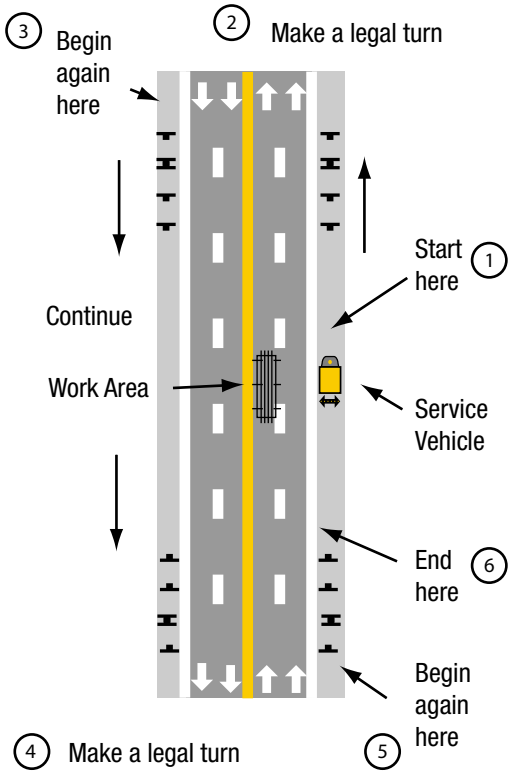
Figure 13.5.8, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the opposite side of the road from, and in advance of the Work Area:

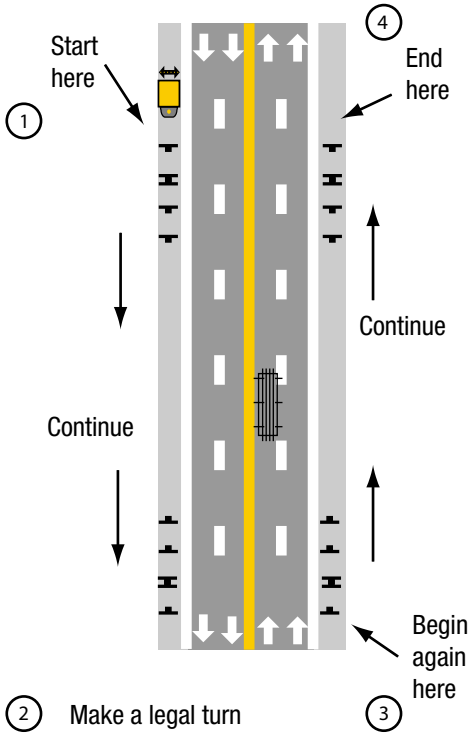
- Drive forward with the flow of traffic (toward the Work Area) picking up the signs on the right shoulder of the road.
- Pass the Work Area and continue to pick up the signs along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the signs.
- Pass the Work Area and continue to pick up the remaining signs along the right shoulder.

All signs are now off the road.

Drawing 1, Laying Out, Left Lane



Drawing 2, Picking Up, Left Lane



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NOT TO SCALE

13.5.9 Laying Out and Picking Up Signs, Multi-Lane - Undivided Street, Speed Zone 50 km/h, Right Lane or Right Shoulder (Single Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.9.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Right Lane Closure

Figure 13.5.9, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.

The signs are now set up.

Order of Picking Up Signs For a Right Lane Closure

Figure 13.5.9, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the sign on the right shoulder of the road.

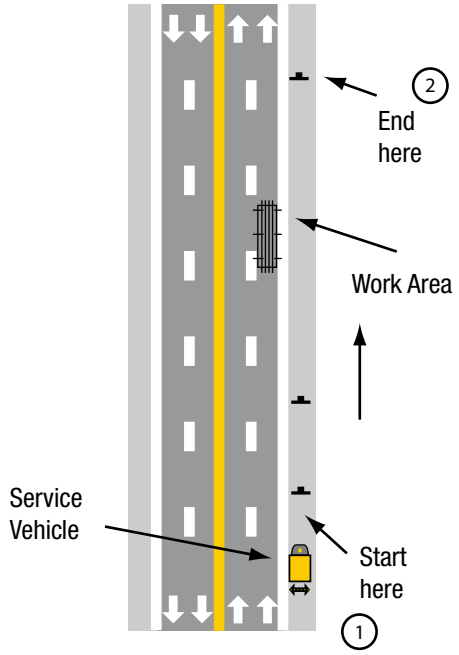
- Make a safe and legal turn.

- On the opposite side of the road from the Work Area, travel back past the Work Area and make a safe and legal turn.

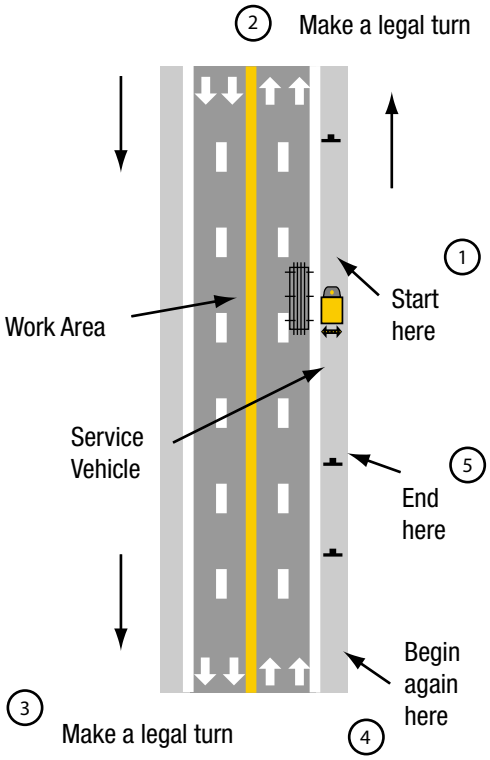
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.

All signs are now off the road.

Drawing 1, Laying Out, Right Lane, Right Shoulder



Drawing 2, Picking Up, Right Lane, RIght Shoulder



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NOT TO SCALE

13.5.10 Laying Out and Picking Up Signs, Multi-Lane - Undivided Road, Speed Zone 50 km/h, Left Lane (Single Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.10.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs For a Left Lane Closure

Figure 13.5.10, Drawing # 1 shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) laying the signs required by the Application Guide on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from the Work Area, and approaching the Work Area along the right shoulder, lay out the signs required by the Application Guide.
- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.
- Make a safe and legal turn.

- On the same side of the road as, and approaching the Work Area along the right shoulder, lay out the remaining signs required by the Application Guide.

The signs are now set up.

Order of Picking Up Signs For a Left Lane Closure

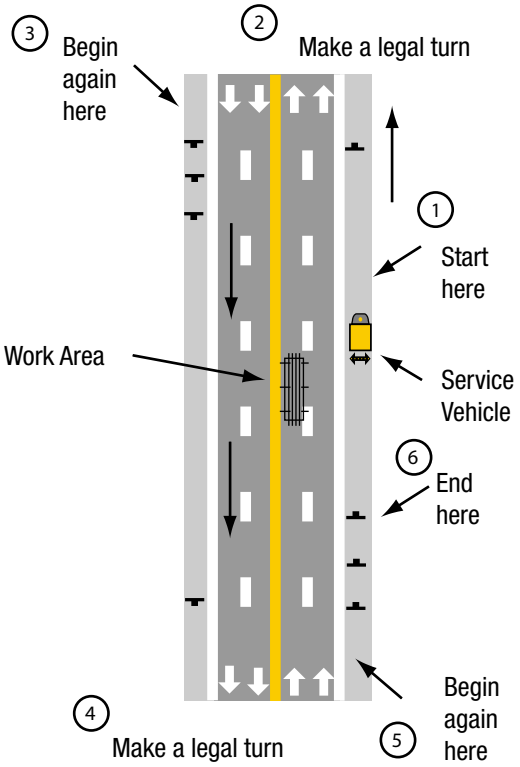
Figure 13.5.10, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the opposite side of the road from, and in advance the Work Area:

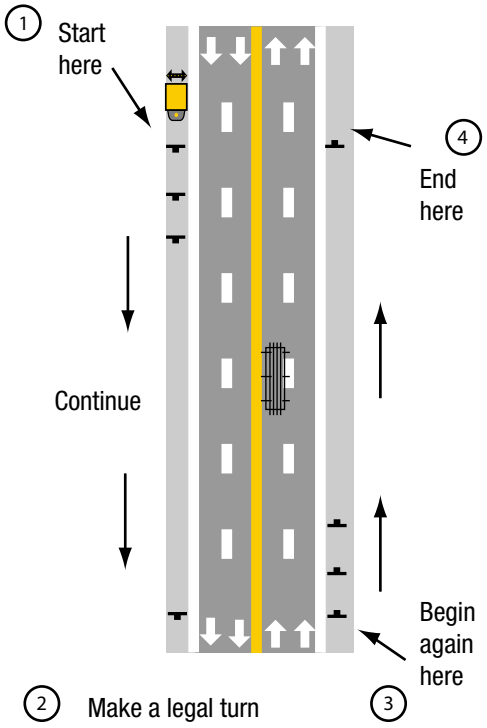
- Drive forward with the flow of traffic (toward the Work Area) picking up the signs on the right shoulder of the road.
- Pass the Work Area.
- Pick up the remaining sign on the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the signs.
- Pass the Work Area.
- Pick up the remaining sign on the right shoulder.

All signs are now off the road.

Drawing 1, Laying Out, Left Lane



Drawing 2, Picking Up, Left Lane



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NOT TO SCALE

13.5.11 Laying Out and Picking Up Signs, Two-Lane Two-Way 100 Series Highway, Greater Than 80 km/h (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.11.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Signs, Greater Than 80 km/h, Double Posted

Figure 13.5.11, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying out the signs required by the Application Guide on the right shoulder of the road.
- The first Traffic Control Person takes the Control Position in advance of the Work Area with the Stop sign directed to the ditch (or edge of road).
- Pass the Work Area.
- Continue to lay out the signs required by the Application Guide along the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, lay out the same signing sequence on the right shoulder.

- The second Traffic Control Person takes the Control Position with the Stop sign directed to the ditch (or edge of road).

- Continue past the Work Area, and lay the remaining signs along the right shoulder so that all signs are double posted.

All signs and Traffic Control Persons are now in place.

Order of Picking Up Signs, Greater Than 80 km/h, Double Posted

Figure 13.5.11, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the right shoulder of the road.

- Make a safe and legal turn.

- On the opposite side of the road from, and approaching the Work Area, pick up the signs along the right shoulder.

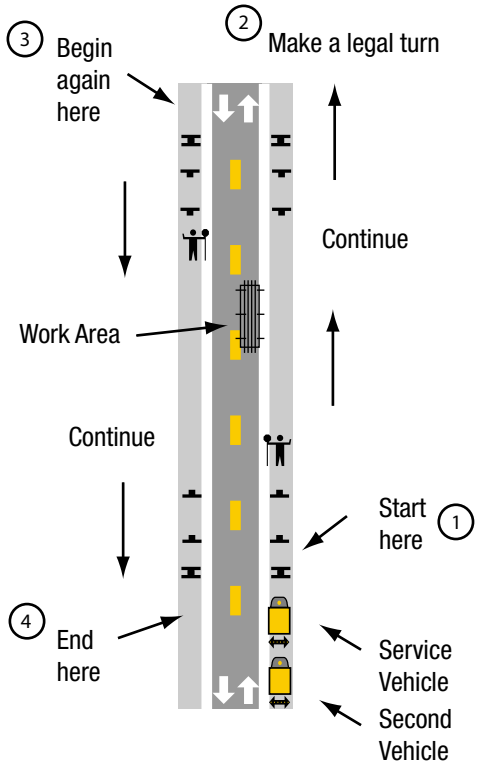
- Continue past the Work Area, and pick up the signs along the right shoulder.

- Make a safe and legal turn.

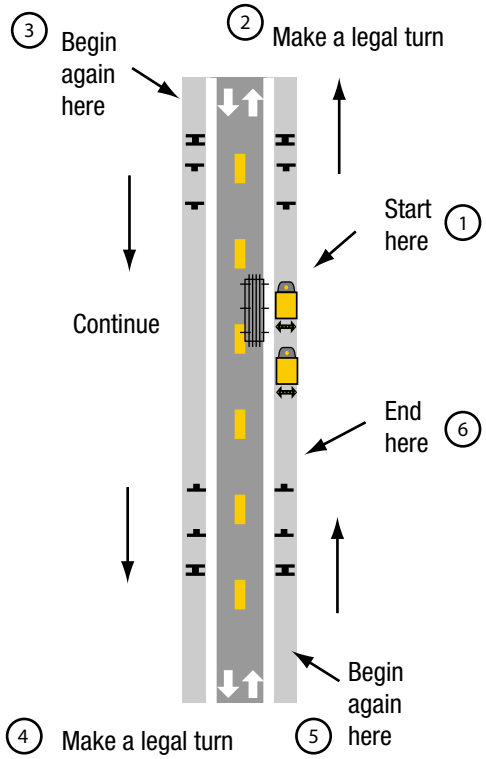
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.

All signs are now off the road.

Drawing 1, Laying Out, > 80 km/h, Double Posted



Drawing 2, Picking Up, > 80 km/h, Double Posted



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NOT TO SCALE

13.5.12 Laying Out and Picking Up Signs, Two-Lane Two-Way Non 100 Series Highways, Greater Than 80 km/h (Single Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.12.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Signs

A Service Vehicle must accompany workers while laying out, picking up, or maintaining signs; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Signs, Greater Than 80 km/h, Single Posted

Figure 13.5.12, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying out the signs required by the Application Guide on the right shoulder of the road.
- The first Traffic Control Person takes the Control Position with the Stop sign directed to the ditch (or edge of road).
- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, lay the signs required by the Application Guide.
- The second Traffic Control Person takes the Control Position in advance of the Work Area with the Stop sign directed to the ditch (or edge of road).

- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.
- All signs and Traffic Control Persons are now in place.

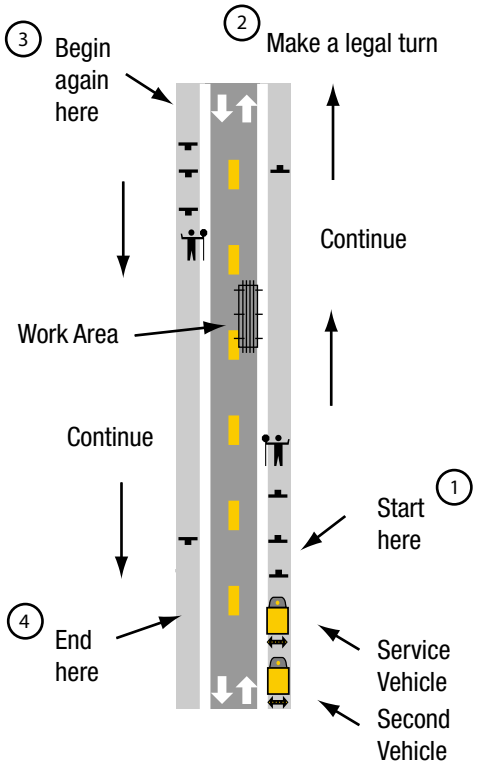
Order of Picking Up Signs, Greater Than 80 km/h, Single Posted

Figure 13.5.12, Drawing # 2, shows this part of the procedure.

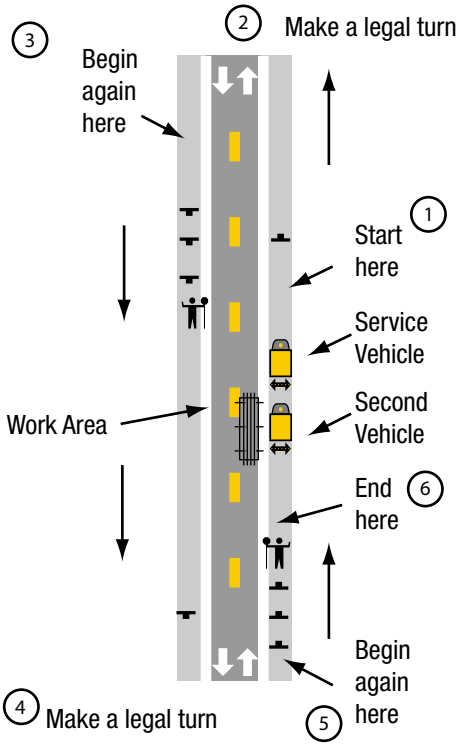
Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, pick up the signs along the right shoulder.
- Continue past the Work Area, and pick up the signs along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.
- All signs are now off the road.

Drawing 1, Laying Out, > 80 km/h, Single Posted



Drawing 2, Picking Up, > 80 km/h, Single Posted



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NOT TO SCALE

13.5.13 Laying Out and Picking Up Signs, Two-Lane Two-Way 100 Series Highway, Not Greater Than 80 km/h (Double Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.13.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs, Not Greater Than 80 km/h, Double Posted

Figure 13.5.13, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying out the signs required by the Application Guide on the right shoulder of the road.
- The first Traffic Control Person takes the Control Position in advance of the Work Area with the Stop sign directed to the ditch (or edge of road).
- Pass the Work Area.
- Continue to lay out the signs required by the Application Guide along the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, lay out the same signing sequence on the right shoulder.

- The second Traffic Control Person takes the Control Position with the Stop sign directed to the ditch (or edge of road).

- Continue past the Work Area, and lay the remaining signs along the right shoulder so that all signs are double posted.

- All signs and Traffic Control Persons are now in place.

Order of Picking Up Signs, Not Greater Than 80 km/h, Double Posted

Figure 13.5.13, Drawing # 2, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the signs on the right shoulder of the road.

- Make a safe and legal turn.

- On the opposite side of the road from, and approaching the Work Area, pick up the signs along the right shoulder.

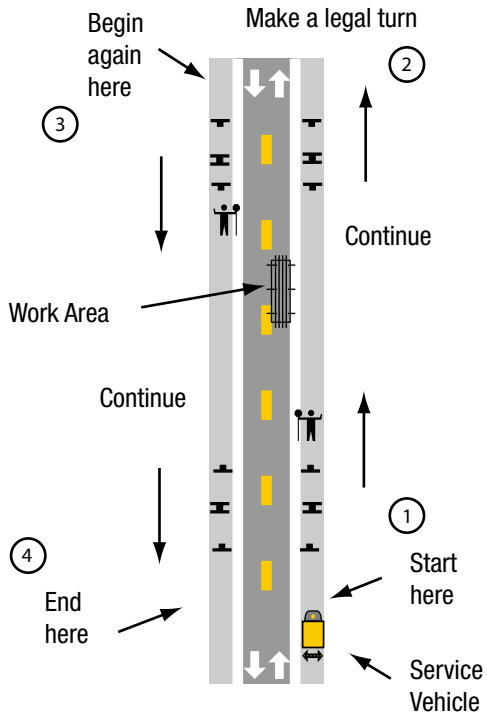
- Continue past the Work Area, and pick up the signs along the right shoulder.

- Make a safe and legal turn.

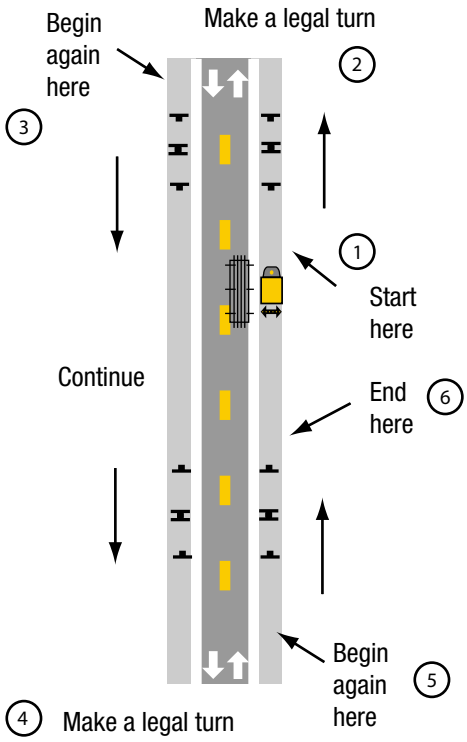
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.

- All signs are now off the road.

Drawing 1, Laying Out, 80 km/h or Less, Double Posted



Drawing 2, Picking Up, 80 km/h or Less, Double Posted



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13.5.14 Laying Out and Picking Up Signs, Two-Lane Two-Way Non 100 Series Highway, Not Greater Than 80 km/h (Single Posted)

Introduction

This procedure must be used for laying out and picking up signs on roads that meet the title description of 13.5.14.

Choosing the Correct Variables For The Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle(s) Used While Laying out and Picking up Signs

Except as described below, one Service Vehicle must accompany workers while laying out and picking up signs using this procedure.

New: 2012

When signs are being laid out, picked up, or maintained against a longitudinal barrier, as further described in Section 13.3, rule # 3.3, two vehicles must be used together to provide worker protection. Adapt this procedure to include the presence of the second vehicle (e.g. procedure 13.5.1).

Order of Laying Out Signs, Not Greater Than 80 km/h, Single Posted

Figure 13.5.14, Drawing # 1, shows this part of the procedure.

Beginning on the shoulder of the road, on the same side of the road as, and in advance of the Work Area:

- Drive forward with the flow of traffic (toward the Work Area) laying out the signs required by the Application Guide on the right shoulder of the road.
- The first Traffic Control Person takes the Control Position with the Stop sign directed to the ditch (or edge of road).
- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, lay the signs required by the Application Guide.

- The second Traffic Control Person takes the Control Position in advance of the Work Area with the Stop sign directed to the ditch (or edge of road).
- Pass the Work Area.
- Lay out the remaining sign on the right shoulder.
- All signs and Traffic Control Persons are now in place.

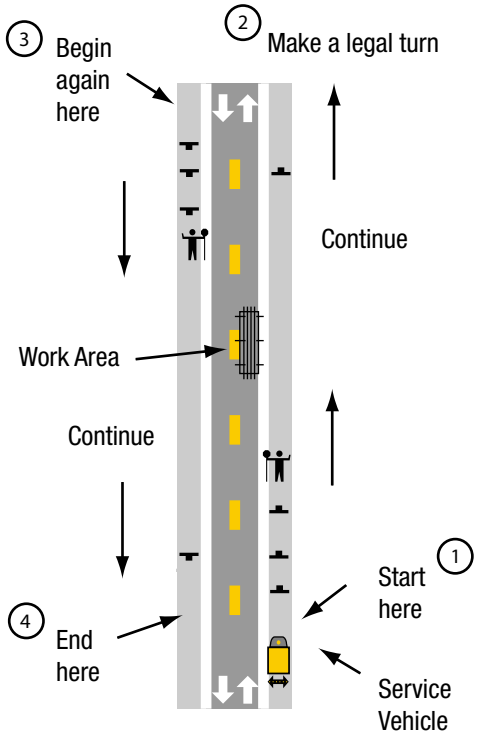
Order of Picking Up Signs, Not Greater Than 80 km/h, Single Posted

Figure 13.5.14, Drawing # 2, shows this part of the procedure.

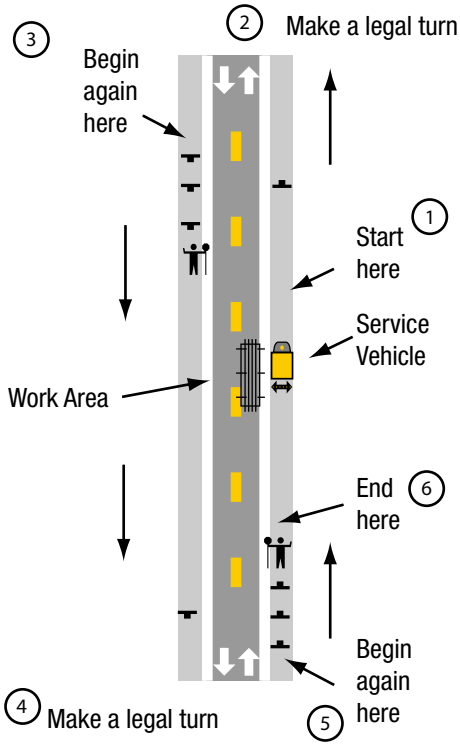
Beginning on the shoulder of the road, on the same side of the road as, and beside the Work Area:

- Drive forward with the flow of traffic (away from the Work Area) picking up the sign on the right shoulder of the road.
- Make a safe and legal turn.
- On the opposite side of the road from, and approaching the Work Area, pick up the signs along the right shoulder.
- Continue past the Work Area, and pick up the sign along the right shoulder.
- Make a safe and legal turn.
- On the same side of the road as, and approaching the Work Area along the right shoulder, pick up the remaining signs.
- All signs are now off the road.

Drawing 1, Laying Out, 80 km/h or Less, Single Posted



Drawing 2, Picking Up, 80 km/h or Less, Single Posted



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13.5.15 Laying Out and Picking Up Delineators, Multi-Lane or One-Way Highway, Greater Than 80 km/h

Introduction

This procedure must be used for laying out and picking up delineators on roads that meet the title description of 13.5.15.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

The procedure is fundamentally the same for a right and left lane closure. Only a right lane closure is shown and described. The procedure may be adapted for use with a left lane closure on a road meeting the title description. For a left lane closure on a multi-lane undivided road it may be useful to refer to procedure 13.5.16, which describes that work type using two vehicles on a road with a speed zone not greater than 80 km/h.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Delineators

A Service Vehicle must accompany workers while laying out and picking up delineators; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Cones, Drums, or High Delineators, Multi-Lane or One-Way Highway, Greater Than 80 km/h

Figure 13.5.15 L shows this part of the procedure.

At the starting point of this procedure, all signs have been placed using an approved procedure. Both Flashing Light Units on vehicles are displaying a bar (caution).

Beginning on the right shoulder of the road, on the same side of the road as the Work Area, and approximately half way between the last sign and the Approach Transition Taper:

- When safe to do so, choose a gap in traffic and position the vehicle combination in the middle of lane to be closed. They should be approximately half way between the last sign and the place where the Approach Transition Taper will start. As soon as the upstream vehicle blocks a lane, it must display an arrow.

- Lay out the TC-6, “Lane Closure Taper” sign, if required by the Application Guide.

- The downstream Service Vehicle takes a position to lay out the Approach Transition Taper.

- Under the protection of the upstream vehicle, lay out the delineators for the Approach Transition Taper; start at the road shoulder and work toward the centerline. Taper length and Delineator spacings are taken from the table on the Application Guide, and from Section 10.0.

- Maintaining the safety space between vehicles, both vehicles drive through the delineators in the taper and take up position close to the boundary between the Approach Transition Taper and the Buffer Area.

- The Flashing Light Unit, on the upstream vehicle, at the Approach Transition Taper, is aimed so that it has the best viewing angle for oncoming traffic.

- The upstream vehicle maintains its position at the Approach Transition Taper. The downstream Service Vehicle is free to move to support laying delineators.

- Starting at the last downstream delineator of the Approach Transition Taper, lay out the delineators for the Buffer Area, then Work Area. Work from the upstream end to the downstream end. If one is required, lay out delineators for the Termination Taper.

- The upstream vehicle in place at the Approach Transition Taper may be replaced by a Protection, Blocker or Service Vehicle with a Flashing Light Unit, or a stand alone Flashing Light Unit, provided this is permitted by the Application Guide. (If this is done, the new Flashing Light Unit must be aimed so that it has the best viewing angle for oncoming traffic.)

- Delineators, vehicles, and / or Flashing Light Units are now in place, work can begin.

Order of Picking up Cones, Drums, or High Delineators, Multi-Lane or One-Way Highway, Greater Than 80 km/h

Figure 13.5.15 P shows this part of the procedure.

At the start, in this procedure example, a Service Vehicle is in position at the boundary of the Approach Transition Taper and the Buffer Area. The Flashing Light Unit attached to the vehicle displays an arrow. The standard for the vehicle at this location during delineation device pick up, is a Service Vehicle, unless a Protection or Blocker Vehicle is indicated in the Application Guide.

When workers are off the road and it is safe to open it to traffic:

- Remove only the delineators in the Termination Taper (if required), Work Area, and Buffer Area, and in that order. Work from the downstream end to the upstream end. Use a Service Vehicle and approved methods from Section 13.3.

- When safe to do so, choose a gap in traffic, and position a Service Vehicle in the middle of the closed lane. It should be positioned approximately half way between the last sign and the beginning of the Approach Transition Taper.

- Remove the second vehicle in use at the boundary of the Approach Transition Taper and Buffer Area.

- Starting downstream at the centerline, and working toward the edge of the road, remove the Approach Transition Taper. Use a Service Vehicle and approved methods from Section 13.3.

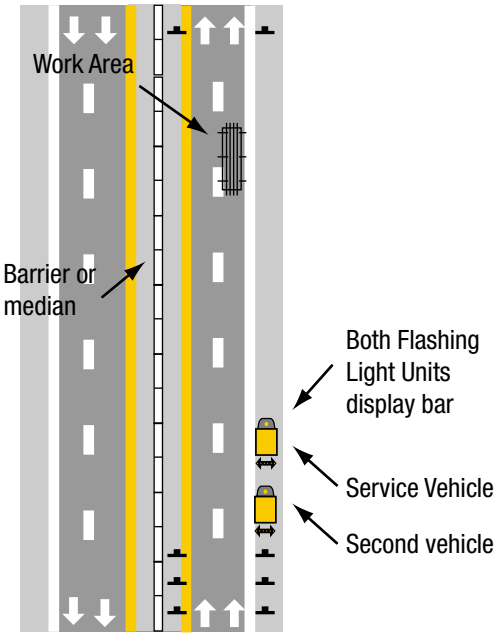
- Pick up the TC-6, “Lane Closure Taper” sign, if one was used.

- When all obstacles and workers are off the travel lane, both vehicles leave the travel lane.

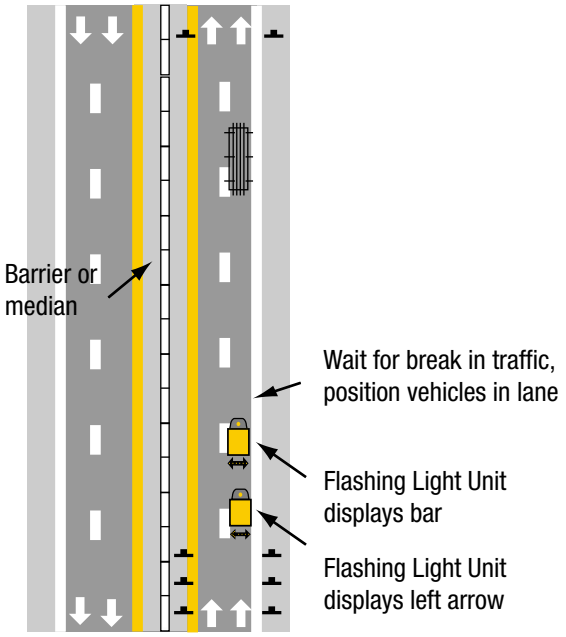
- Delineators, vehicles and Warning Lights are now off the travel lanes and normal traffic flow has been established.

- Continue by picking up the signs using an approved procedure.

Drawing 1 of 6



Drawing 2 of 6



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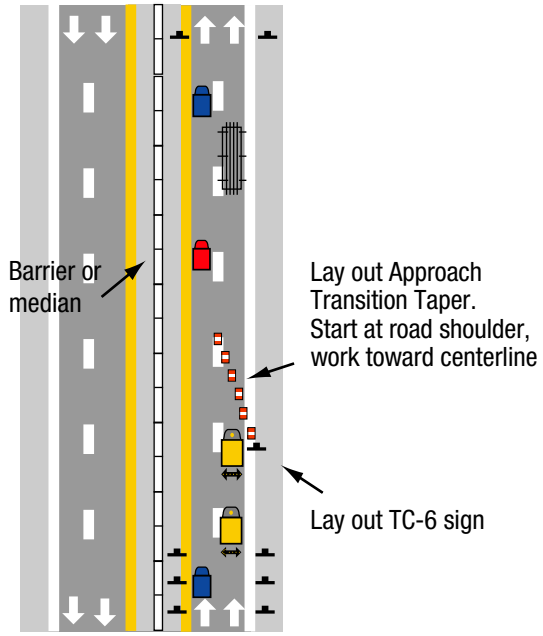

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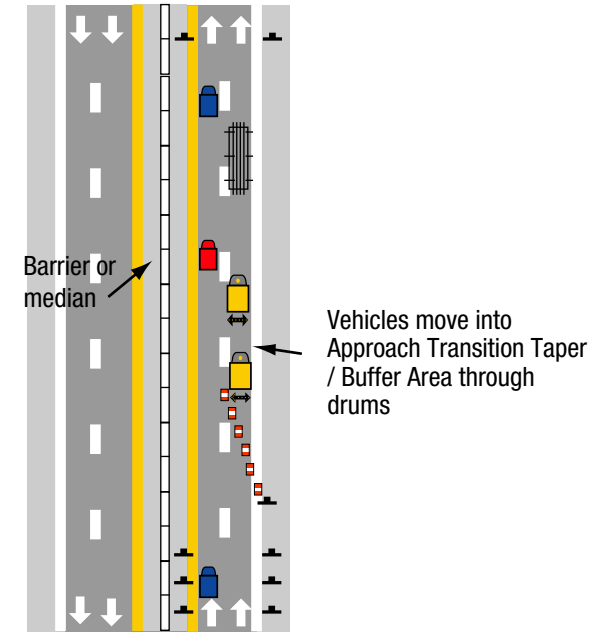

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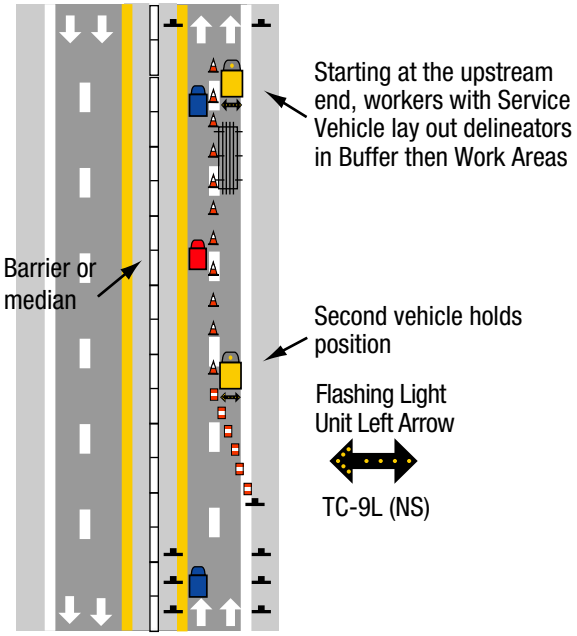
Drawing 5 of 6



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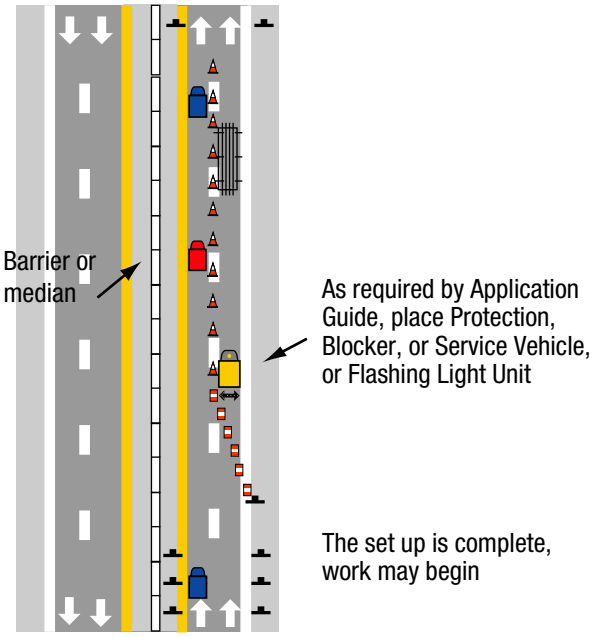

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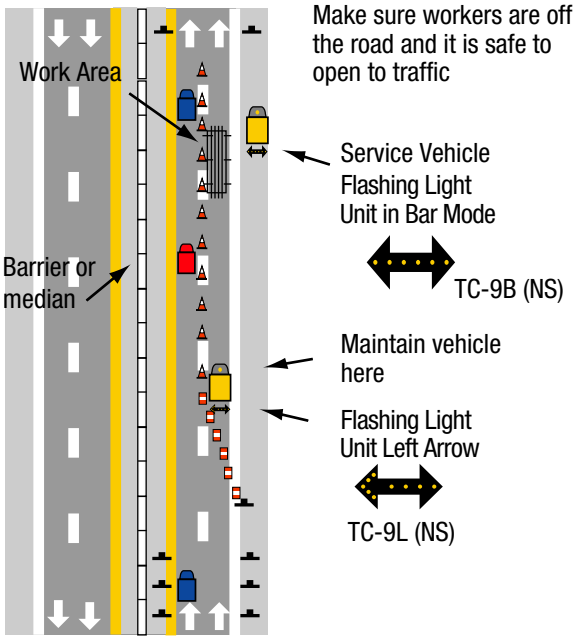
Drawing 1 of 5



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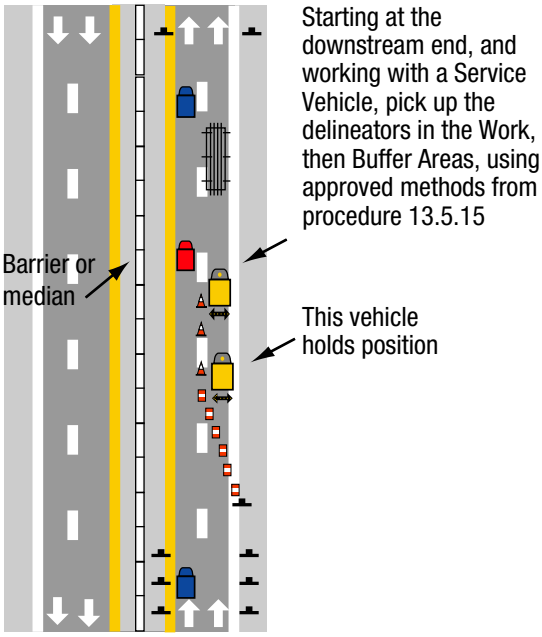

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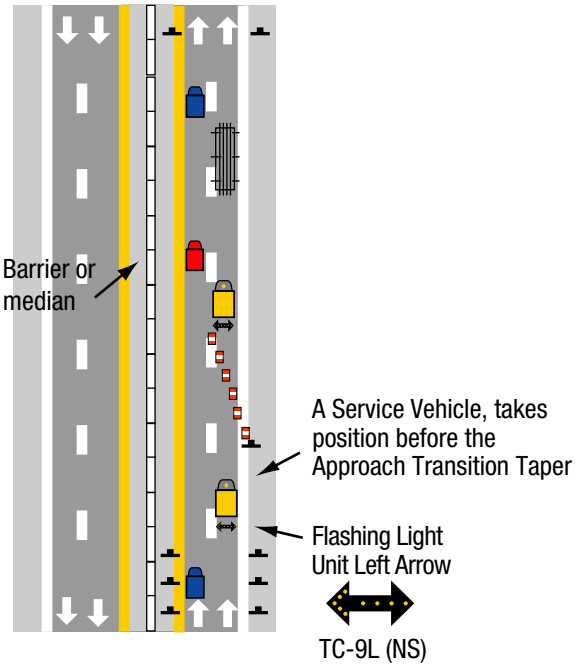

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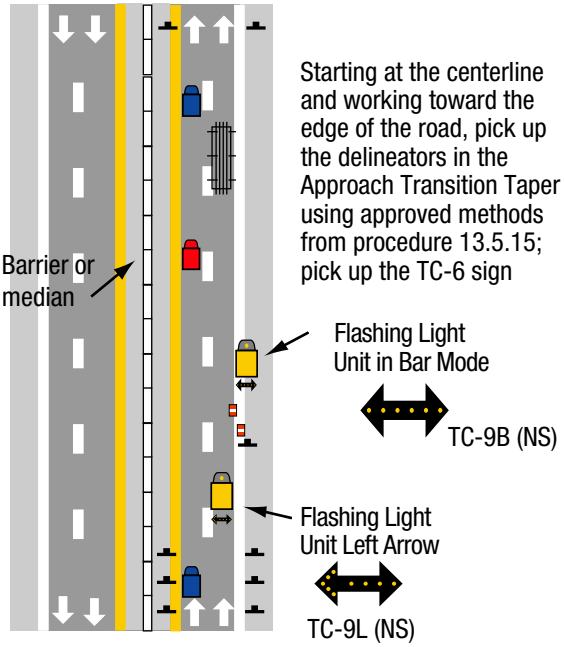

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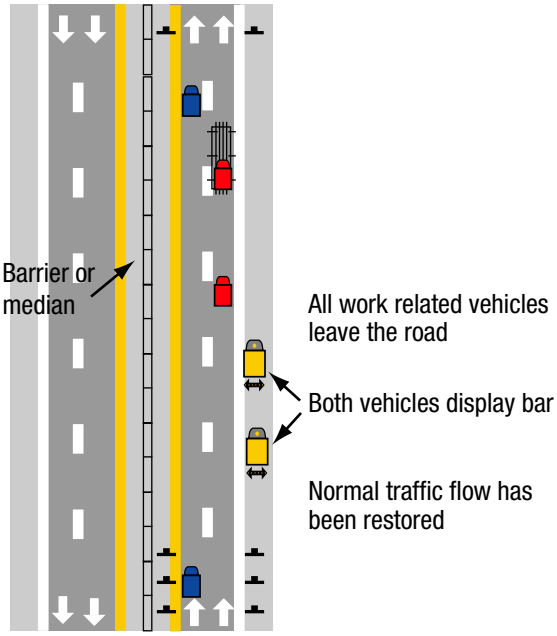

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13.5.16 Laying Out and Picking Up Delineators, Multi-Lane or One-Way Road, Not Greater Than 80 km/h

Introduction

This procedure must be used for laying out and picking up delineators on roads that meet the title description of 13.5.16.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

The procedure is fundamentally the same for a right and left lane closure except that when work is in the left lane of an undivided road, there is traffic on both sides of the lane in which work takes place. Only a left lane closure on an undivided road is shown and described in this procedure. The procedure may be adapted for use on other roads meeting the title description. For a right lane closure on a multi-lane road it may be useful to refer to procedure 13.5.15, which describes work of that type using two vehicles on a road with a speed zone greater than 80 km/h.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Delineators

A Service Vehicle must accompany workers while laying out and picking up delineators; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle in the procedure described.

Note: Normally, for speed zones of 80 km/h and less, the use of a second vehicle is optional. However, as shown in this procedure, when working in the left lane of a multi-lane undivided road, the additional protection of the second vehicle is needed. Other lane closures at this speed may be done using one vehicle, if preferred.

Order of Laying Out Cones, Drums, or High Delineators, Multi-Lane or One-Way Roads, Not Greater Than 80 km/h

Figure 13.5.16 L shows this part of the procedure.

At the start of this procedure, signs have been laid out using an approved procedure. The Flashing Light Units on the Service Vehicles at the side of

the road are displaying a bar (caution), both display a 360° flashing amber light:

- When safe to do so, choose a gap in traffic and position the two vehicles in the middle of the lane to be closed, to protect workers who will lay out the Approach Transition Taper. The upstream Service Vehicle with the FLU should be approximately half way between the last sign and where the Approach Transition Taper will start. As soon as the upstream Service Vehicle blocks a lane, it must display an arrow.

- Lay out the TC-6, "Lane Closure Taper" sign, if required by the Application Guide.

- Under the protection of the upstream vehicle, lay out the delineators for the Approach Transition Taper; start at the centreline and work downstream toward the lane line. Taper length and Delineator spacings are taken from the table on the Application Guide, or from Section 10. At approximately the same time, lay out the delineators on the centreline for a distance equivalent to the length of the Approach Transition Taper.

- The upstream Service Vehicle drives through the delineators in the taper and takes a position close to the boundary between the Approach Transition Taper and the Buffer Area.

- The Flashing Light Unit on the vehicle at the Approach Transition Taper is aimed so that it has the best viewing angle for oncoming traffic. This Service Vehicle maintains its position at the Approach Transition Taper.

- The second vehicle, displaying a 360° degree flashing amber light and Flashing Light Unit in bar mode will support workers laying out the rest of the delineators. It will drive in the downstream direction in the closed lane, in advance of workers laying out the delineators.

- Starting on both the lane line at the last downstream delineator of the Approach Transition Taper and the last downstream delineator on the centreline, lay out the delineators for the Buffer Area, Work Area, then the Termination Taper. At approximately the same time, the delineators along the centreline are laid out. Work from the upstream end to the downstream end of the workplace. Offload delineators from the back of the vehicle and work from behind the downstream vehicle. Taper standards are taken from the table on the Application Guide, or from Section 10.

- The downstream vehicle takes a position close to the boundary between the Termination Taper and the Work Area. Replace this vehicle with a Flashing Light Unit, if a Flashing Light Unit is required by the Application Guide in use.

- Signs, delineators, and vehicles are in place, work can begin.

Picking up Cones, Drums, or High Delineators, Multi-Lane or One-Way Road, Not Greater Than 80 km/h

Figure 13.5.16 P shows this part of the procedure.

At the start, in this procedure, a vehicle with a 360° degree flashing amber light and a Flashing Light Unit is in position at the boundary between the Approach Transition Taper and the Buffer Area. The Flashing Light Unit is displaying an arrow to traffic approaching the Work Area from the upstream end of the workplace. The standard for the vehicle at this location during delineation device pick up is a Service Vehicle, unless a Protection or Blocker Vehicle is indicated in the Application Guide. A Service Vehicle with a 360° Flashing Amber Light and a Flashing Light Unit in bar mode is in position at the Termination Taper.

When it is safe to open the road to traffic:

Before work begins, vehicle drivers and workers involved in this procedure must participate in a 'tool box talk' to discuss the methods that will be used to communicate hazards and prevent injuries that could result from working behind a vehicle that will reverse.

- Move the downstream Service Vehicle from the Termination Taper, into the middle of the closed lane, downstream of the Termination Taper, to protect workers who will pick up the taper.

- Supported by the downstream Service Vehicle that will reverse within the closed lane, workers (working at the back of the (stopped) Service Vehicle) pick up the delineators in the Termination Taper, Work Area, and Buffer Area, in that order. Start at the downstream end of the workplace and work upstream toward the Approach Transition Taper. At approximately the same time, pick up the delineators on the lane line.

- When safe to do so, position a Service Vehicle with 360° degree flashing amber light and a Flashing Light Unit in arrow mode in the middle of the closed lane. It should be positioned approximately half way between the last sign and the beginning of the Approach Transition Taper.

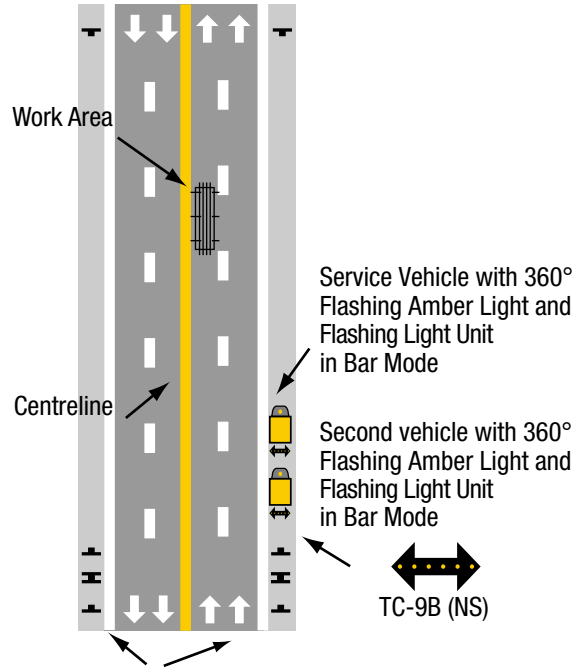
- Starting again at the last remaining downstream delineators and working upstream, pick up the delineators remaining on the centreline and those in the Approach Transition Taper. Use the Service Vehicle previously parked at the boundary between the Approach Transition Taper and the Buffer Area for worker protection.

- Pick up the TC-6 sign (Lane Closure Taper) if one was used.

- When all obstacles and workers are off the travel lane, the vehicle(s) leave the travel lane. Delineators, vehicles and Warning Lights are now off the travel lanes and normal traffic flow has been established.

Continue by picking up the signs using an approved procedure.

Drawing 1 of 8



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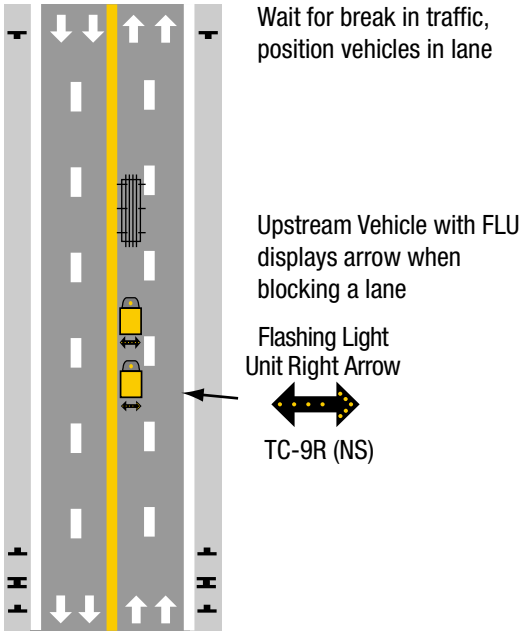

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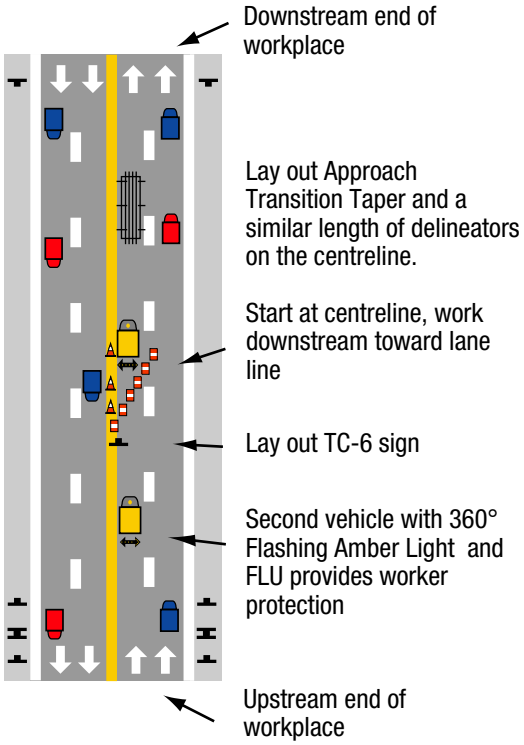

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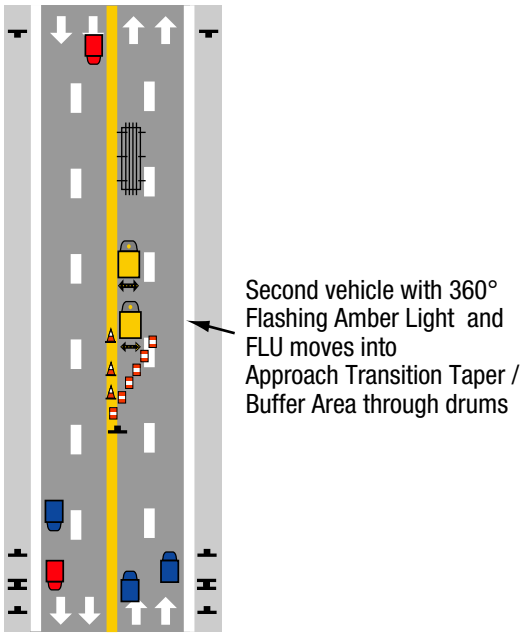

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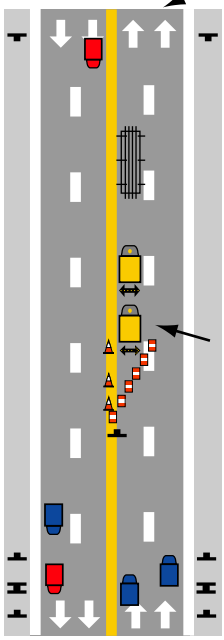


Downstream end of workplace

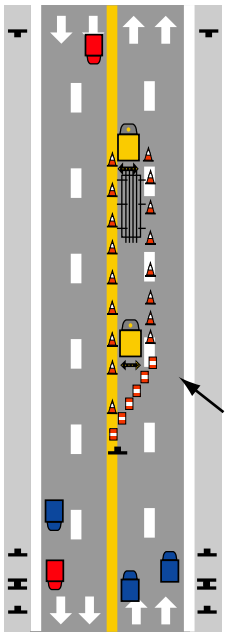
Position and maintain a vehicle with a 360° Flashing Amber Light, and a Flashing Light Unit in arrow mode at the Approach Transition Taper

Flashing Light Unit Right Arrow

TC-9R (NS)

Upstream end of workplace

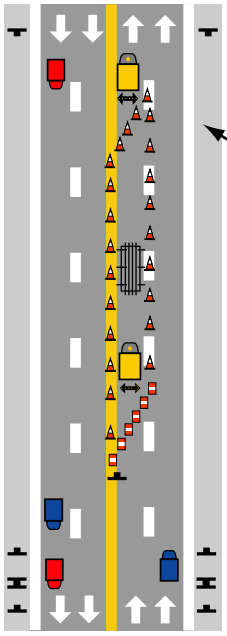
Drawing 6 of 8



Using the second Service Vehicle, with a 360° Flashing Amber Light and FLU, and starting at the upstream end, lay out delineators in Buffer then Work Areas. At the same time, lay out approx. the same number of delineators along the centreline. Work from behind the Service Vehicle

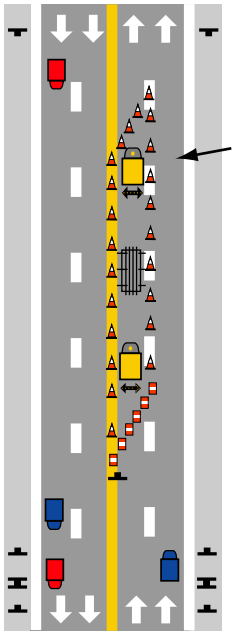
Maintain a vehicle here

Drawing 7 of 8



Continue by laying out the delineators in the Termination Taper, starting again at the upstream end and working downstream toward the lane line

Drawing 8 of 8



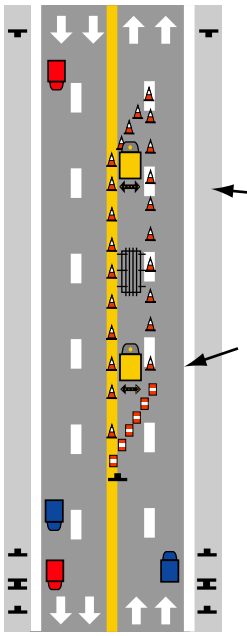
The downstream Service Vehicle takes a position at the Termination Taper cones, to protect the Work Area from the downstream end.

If required by the Application Guide in use, replace this vehicle with a Flashing Light Unit

The workplace is complete, work may begin

NOT TO SCALE

Drawing 1 of 8



Downstream end of workplace

Make sure workers are off the road and it is safe to open to traffic. Have a toolbox talk on working behind a vehicle that will reverse

Service Vehicle with a 360° Flashing Amber Light and FLU in bar mode

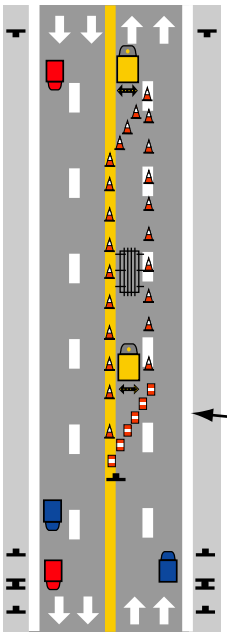
Maintain second vehicle with 360° Flashing Amber Light and Flashing Light Unit displaying right arrow here

Flashing Light Unit Right Arrow

TC-9R (NS)

Upstream end of workplace

Drawing 2 of 8



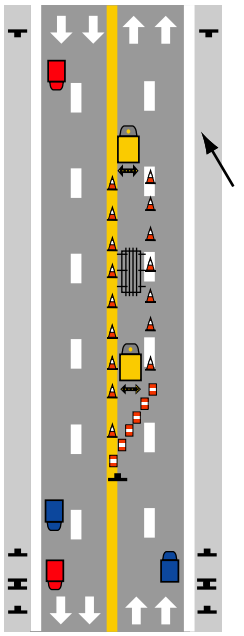
Position downstream Service Vehicle downstream of the Termination Taper

Second vehicle maintains position

Flashing Light Unit Right Arrow

TC-9R (NS)

Drawing 3 of 8

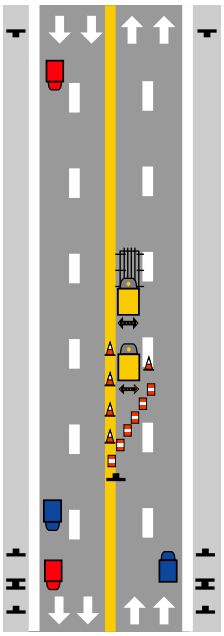


Starting at the lane line and working upstream toward the centreline, pick up the delineators in the Termination Taper and an equivalent amount on the lane line.

Work behind Service Vehicle as it backs up and stops within the delineated area.

Use approved methods to protect workers behind a vehicle that will reverse

Drawing 4 of 8



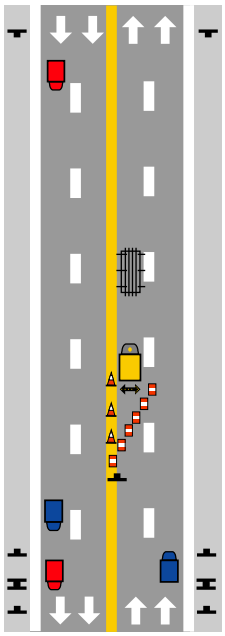
Starting again at the downstream end, pick up the delineators in the Work and Buffer Areas, and in that order. Pick up the delineators on the lane line and centreline at approx. the same time.

Work behind Service Vehicle as it backs up and stops within the delineated area.

Use approved methods to protect workers behind a vehicle that will reverse

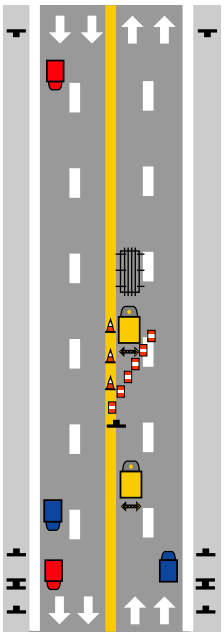
NOT TO SCALE

Drawing 5 of 8



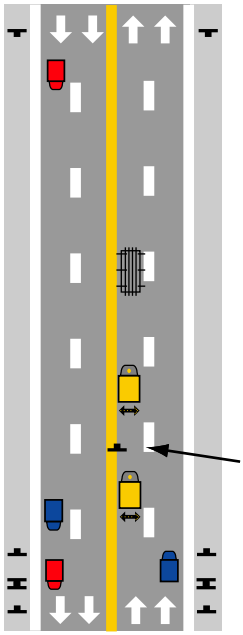
The vehicle with a 360° Flashing Amber Light and FLU maintains its positiion as the second vehicle takes a position upstream of the Approach Transition Taper

Drawing 6 of 8



Position a Service Vehicle with Flashing Light Unit upstream of the Approach Transition Taper

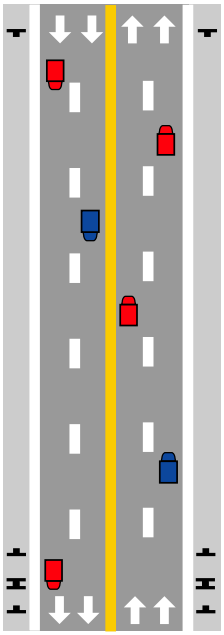
Drawing 7 of 8



Starting again at the downstream end and working upstream toward the centreline, pick up the delineators in the Approach Transition Taper and the remaining delineators on the centreline. Use the second vehicle to provide worker protection

Pick up the TC-6 sign

Drawing 8 of 8



All work related vehicles leave the road

Normal traffic flow has been restored

NOT TO SCALE

13.5.17 Laying Out and Picking Up Delineators, Two-Lane Two-Way Highway, Greater Than 80 km/h

Introduction

This procedure must be used for laying out and picking up delineators on roads that meet the title description of 13.5.17.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicles Used While Laying out and Picking up Delineators

A Service Vehicle must accompany workers while laying out and picking up delineators; and,

A second Service Vehicle, or if required by the Application Guide, a Protection or Blocker Vehicle must be used with the Service Vehicle.

Order of Laying Out Cones, Drums, or High Delineators, Two-Lane Two-Way Highway, Greater Than 80 km/h

Figure 13.5.17 L shows this part of the procedure.

At the starting point of this procedure, all signs have been placed using an approved procedure. Both Flashing Light Units on vehicles are displaying a bar (caution); in this example, Traffic Control Persons will control traffic from the Control Positions.

With all signs and Traffic Control Persons in place, and starting on the shoulder of the road approximately half way between the Traffic Control Person and the Approach Transition Taper:

- The Traffic Control Person on the same side of the road as the Work Area stops traffic flow.
- The two vehicle combination is positioned in the middle of lane to be closed and approximately half way between the last sign and point where the taper will start. At this point the vehicles continue to display a bar (caution).
- Lay out the delineators for the Approach Transition Taper; start at the road shoulder and work toward the centerline. Taper length and Delineator spacings are taken from the table on the Application Guide, and from Section 10.0.

- Maintaining the safety space between vehicles, both vehicles drive through the delineators in the taper and take up position close to the boundary between the Approach Transition Taper and the Buffer Area.

- The Flashing Light Unit on the Service Vehicle at the Approach Transition Taper is aimed so that it has the best viewing angle for oncoming traffic.

- Traffic Control Persons may now alternate traffic direction past the workplace, as conditions require.

- A vehicle maintains its position at the Approach Transition Taper. The other vehicle is free to move downstream to support laying delineators.

- Starting at the last downstream delineator of the Approach Transition Taper, lay out the delineators for the Buffer Area, Work Area, then Termination Taper, in that order. Work from the upstream end to the downstream end.

- If required by the Application Guide, a Flashing Light Unit is positioned at the Termination Taper. The Flashing Light Unit must be aimed so that it has the best viewing angle for oncoming traffic.

- The Service Vehicle in place at the Approach Transition Taper may be replaced by a Protection, or Blocker Vehicle with a Flashing Light Unit, or a stand alone Flashing Light Unit, provided this is permitted by the Application Guide. (If this is done, the new Flashing Light Unit must be aimed so that it has the best viewing angle for oncoming traffic.

- Traffic Control Persons, Delineators, vehicles, and / or Flashing Light Units are now in place, work can begin.

Order of Picking Up Cones, Drums, or High Delineators, Two-Lane Two-Way Highway, Greater Than 80 km/h

Figure 13.5.17 P shows this part of the procedure.

At the start, in this procedure example, a vehicle is in position at the boundary of the Approach Transition Taper and the Buffer Area. The attached Flashing Light Unit displays a bar (caution). The standard for the vehicle at this location during delineation device pick up, is a Service Vehicle, unless a Protection or Blocker Vehicle is indicated in the Application Guide.

A Flashing Light Unit at the Termination Taper is displaying a bar. Traffic Control Persons are alternating traffic flow, as needed.

When workers are off the road and it is safe to open it to traffic:

- Remove the Flashing Light Unit at the Termination Taper.

- Remove the delineators in the Termination Taper, Work Area, and Buffer Area, and in that order. Work from the downstream end to the upstream end. Use a vehicle and approved methods from Section 13.3.

- The Traffic Control Person on the same side of the road as the Work Area stops traffic flow.

- A Service Vehicle takes a position in the middle of the closed lane. It should be placed approximately half way between the Traffic Control Person and the beginning of the Approach Transition Taper.

- Remove the Service Vehicle in use at the boundary of the Approach Transition Taper and Buffer Area.

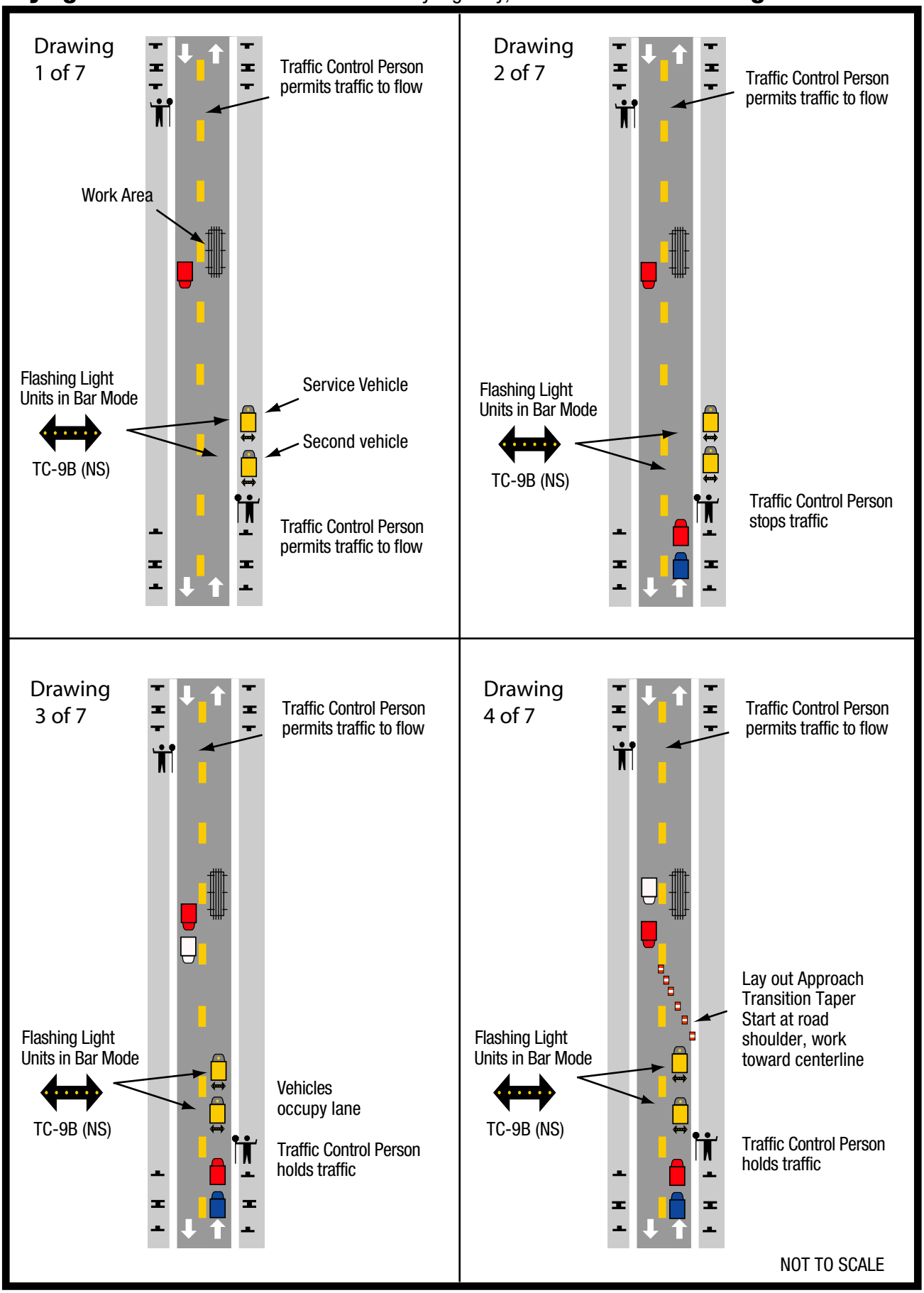
- Starting downstream at the centerline, and working toward the edge of the road, remove the Approach Transition Taper. Use a Service Vehicle and approved methods from Section 13.3.

- When all obstacles and workers are off the travel lane, the Service Vehicles leave the travel lane.

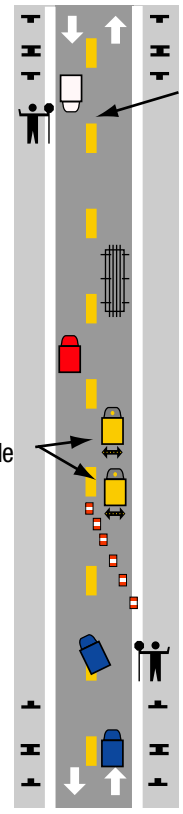
- When the lanes are cleared, the Traffic Control Persons stand down.

- Delineators, vehicles and Warning Lights are now off the travel lanes and normal traffic flow has been established.

Continue by picking up the signs using an approved procedure.


Drawing
1 of 7
Traffic Control Person
permits traffic to flow
Work Area
Flashing Light
Units in Bar Mode
TC-9B (NS)
Service Vehicle
Second vehicle
Traffic Control Person
permits traffic to flow
Drawing
2 of 7
Traffic Control Person
permits traffic to flow
Flashing Light
Units in Bar Mode
TC-9B (NS)
Traffic Control Person
stops traffic
Drawing
3 of 7
Traffic Control Person
permits traffic to flow
Flashing Light
Units in Bar Mode
TC-9B (NS)
Vehicles
occupy lane
Traffic Control Person
holds traffic
Drawing
4 of 7
Traffic Control Person
permits traffic to flow
Flashing Light
Units in Bar Mode
TC-9B (NS)
Lay out Approach
Transition Taper
Start at road
shoulder, work
toward centerline
Traffic Control Person
holds traffic
NOT TO SCALE

Drawing 5 of 7



Traffic Control Persons begin alternating traffic direction, as needed

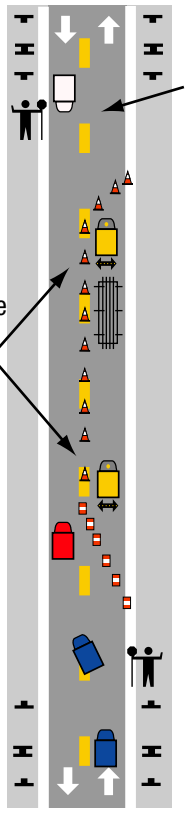
Flashing Light Units in Bar Mode

TC-9B (NS)

Vehicles move Into Approach Transition Taper / Buffer Area through drums

Traffic Control Persons begin alternating traffic direction, as needed

Drawing 6 of 7



Traffic Control Persons regulate traffic flow, as needed

Flashing Light Units in Bar Mode

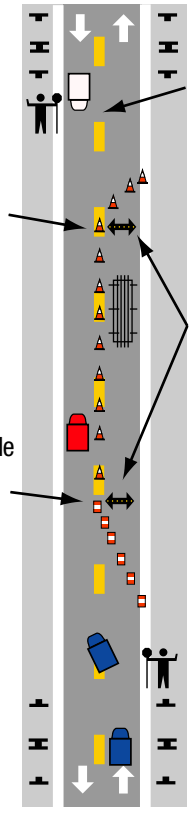
TC-9B (NS)

Starting at the upstream end, lay out delineators for Buffer Area, then Work Area, then for Termination Taper, using a Service Vehicle

Second vehicle maintains position

Traffic Control Persons regulate traffic flow, as needed

Drawing 7 of 7



Traffic Control Persons regulate traffic flow, as needed

TC-9B (NS)

As required by Application Guide, place Protection, Blocker, or Service Vehicles, or Flashing Light Units

Flashing Light Unit in Bar Mode

TC-9B (NS)

The set up is complete, work may begin

Traffic Control Persons regulate traffic flow, as needed

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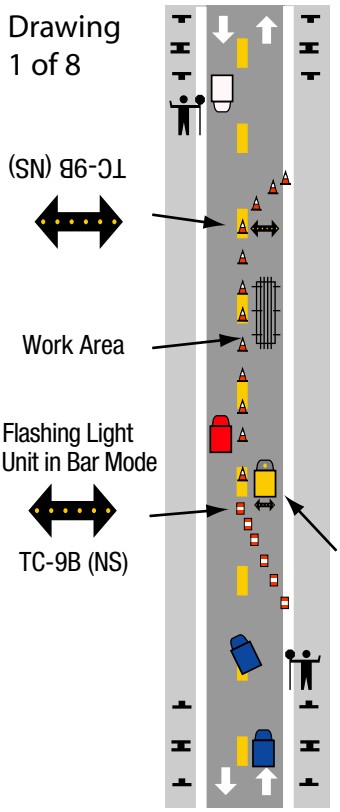
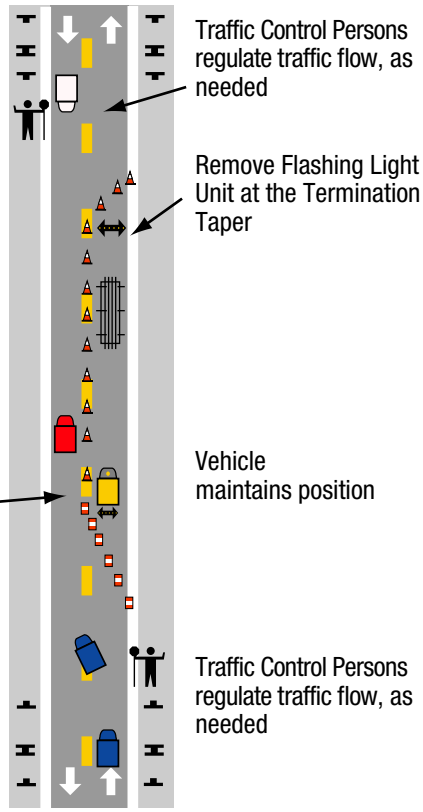
NOT TO SCALE

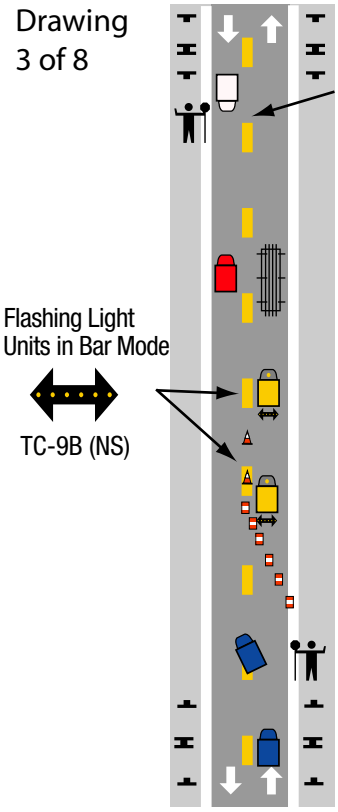
Drawing 1 of 8



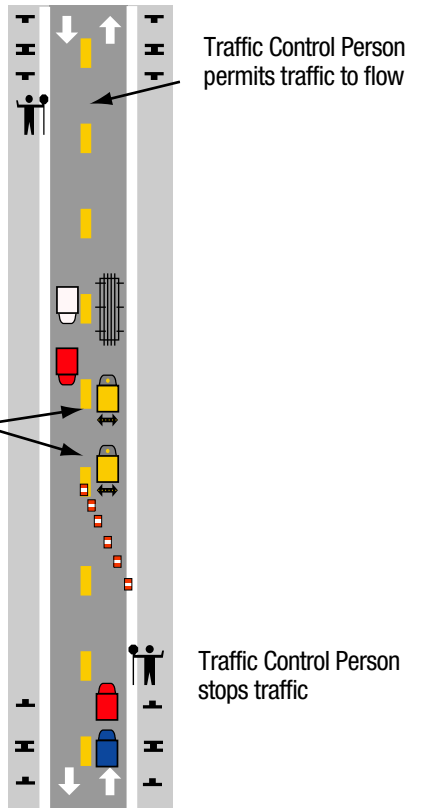
Drawing 2 of 8



Drawing 3 of 8

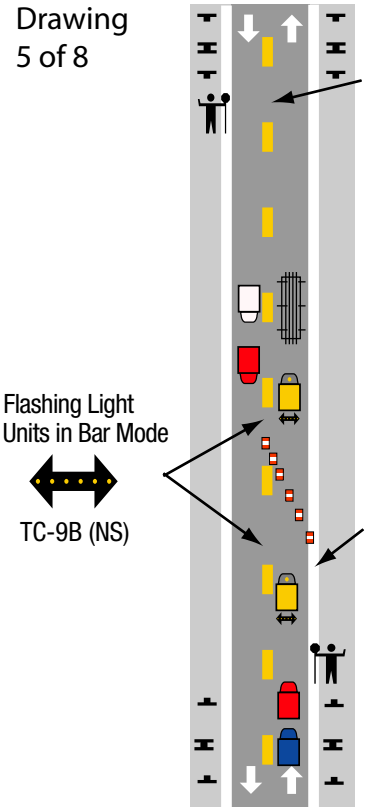


Drawing 4 of 8

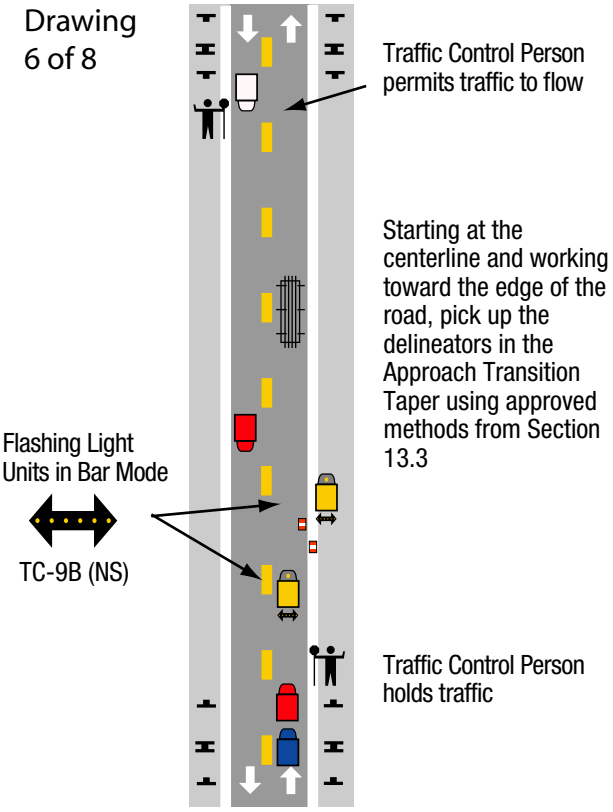


NOT TO SCALE

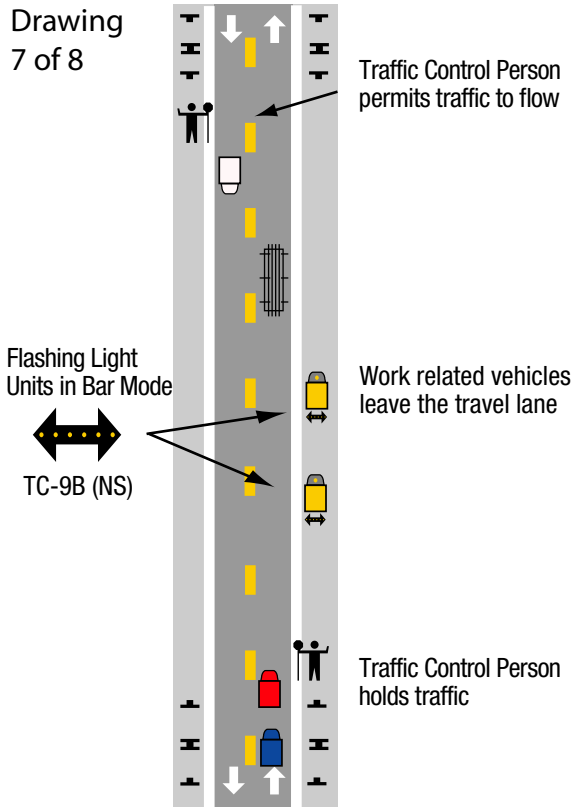
Drawing 5 of 8



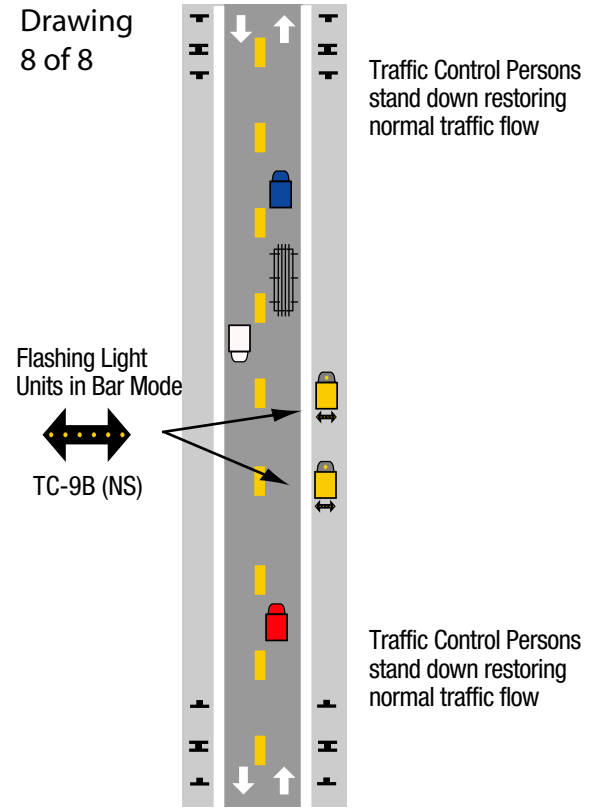
Drawing 6 of 8



Drawing 7 of 8



Drawing 8 of 8



NOT TO SCALE

13.5.18 Laying Out and Picking Up Delineators, Two-Lane Two-Way Road, Not Greater Than 80 km/h

Introduction

This procedure must be used for laying out and picking up delineators on roads that meet the title description of 13.5.18.

Choosing the Correct Variables for the Procedure

The Application Guides on which this procedure is based, have a number of variables (some may use cones, or drums, etc.) In presenting the procedure, the Department has chosen to show one set of these variables, because it is not practical to represent them all within a single procedure.

When using this procedure, Temporary Workplace Signers must use the principles presented, but must adapt the procedure by substituting the correct variables for the workplace. Standards for these variables must be taken from the Application Guide being used. For a list of variables, see Section 13.5.

This procedure may be adapted to the extent permitted in a variance (e.g. Survey Crew and Utility Work variances).

Standards and Rules From Other Sections of the Manual

Sections "D" through 13 of the Manual have standards and rules that may be applicable as this procedure is performed. Manual users must make themselves familiar with these rules, and apply them as necessary. In particular, section 13.3 of the Manual contains mandatory operational rules that must be used during the procedure. Before performing any procedure, Manual users are advised to review the applicable rules in Section 13.3.

Vehicle Used While Laying out and Picking up Delineators

A Service Vehicle must accompany workers while laying out and picking up delineators.

Order of Laying Out Cones, Drums, or High Delineators, Two-Lane Two-Way Road, Not Greater Than 80 km/h

Figure 13.5.18 L shows this part of the procedure.

At the starting point of this procedure, all signs have been placed using an approved procedure; the Flashing Light Unit on the Service Vehicle is displaying a bar (caution).

Beginning on the right shoulder of the road, on the same side of the road as the Work Area, and approximately half way between the last sign and the Approach Transition Taper:

- The Traffic Control Person on the same side of the road as the Work Area stops traffic flow.
- The Service Vehicle is positioned approximately half way between the last sign and the Approach Transition Taper in the middle of lane to be closed.
- Lay out the delineators for the Approach Transition Taper; start at the road shoulder and work toward the centerline. Taper length and Delineator spacings are taken from the table on the Application Guide, or from Section 10.
- The Service Vehicle drives through the delineators in the taper and takes up position close to the boundary between the Approach Transition Taper and the Buffer Area.

- Traffic Control Persons may now alternate traffic direction past the workplace, as conditions require.
- The Service Vehicle is free to move downstream to support laying delineators.
- Starting at the last downstream delineator of the Approach Transition Taper, lay out the delineators for the Buffer Area, Work Area, then Termination Taper, in that order. Work from the upstream end to the downstream end.
- If required by the Application Guide, a Flashing Light Unit is positioned at the Termination Taper. The Flashing Light Unit must be aimed so that it has the best viewing angle for oncoming traffic.
- If required by the Application Guide, a Protection, Blocker, or Service Vehicle with a Flashing Light Unit, or, a stand alone Flashing Light Unit, is positioned at the Approach Transition Taper. (If this is done, the new Flashing Light Unit must be aimed so that it has the best viewing angle for oncoming traffic.)
- Traffic Control Persons, Delineators, vehicles, and / or Flashing Light Units are now in place, work can begin.

Order of Picking Up Cones, Drums, or High Delineators, Two-Lane Two-Way Road, Not Greater Than 80 km/h

Figure 13.5.18 P shows this part of the procedure.

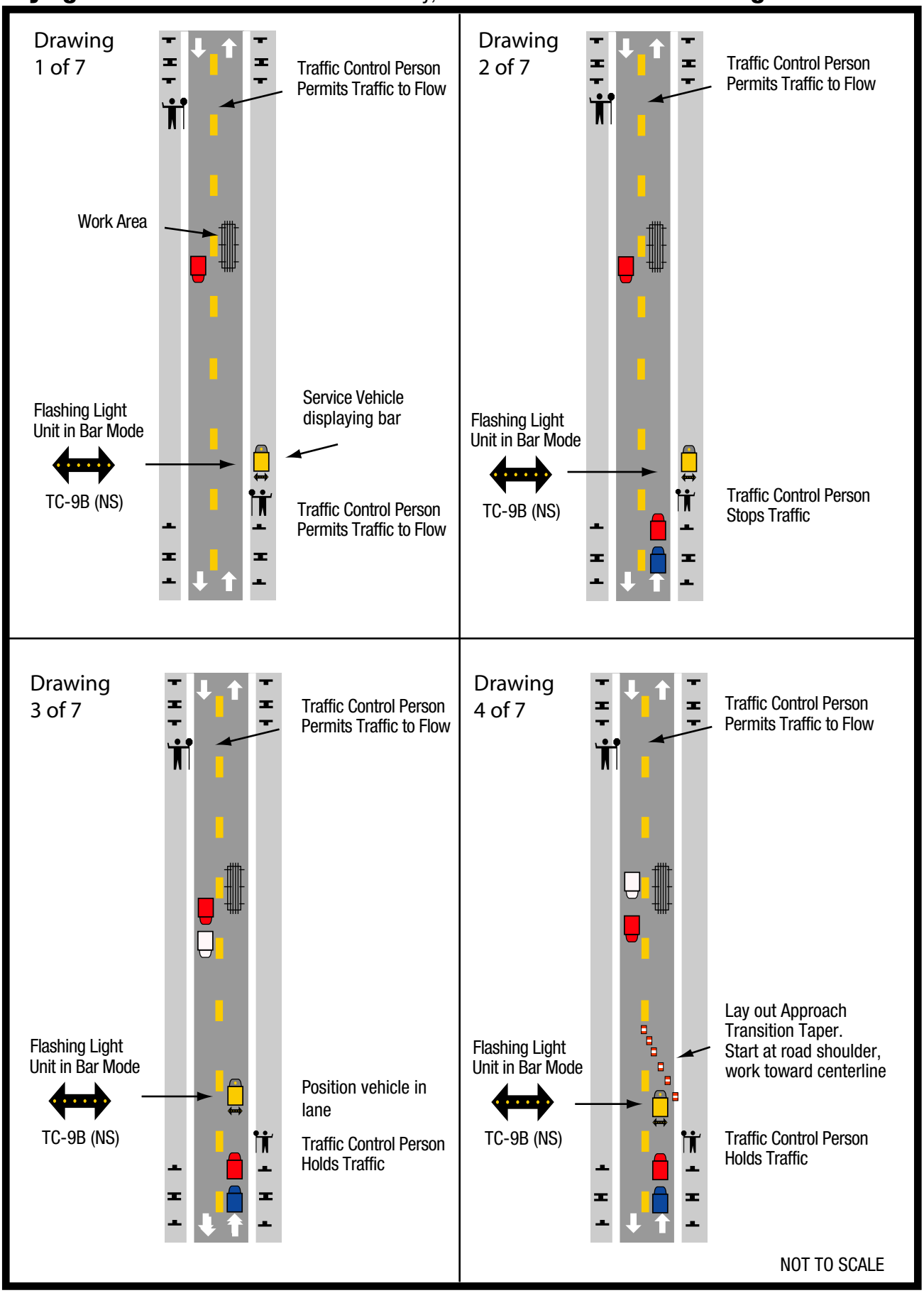
At the start, in this procedure example, a Service Vehicle is in position at the boundary of the Approach Transition Taper and the Buffer Area. The attached Flashing Light Unit displays a bar (caution). The standard for the vehicle at this location during delineation device pick up is a Service Vehicle, unless a Protection or Blocker Vehicle is indicated in the Application Guide.

A Flashing Light Unit at the Termination Taper is displaying a bar. Traffic Control Persons are alternating traffic flow, as needed.

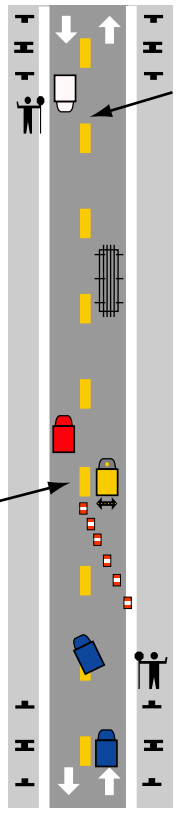
When workers are off the road and it is safe to open it to traffic:

- Remove the Flashing Light Unit at the Termination Taper.
- The Flashing Light Unit at the Approach Transition Taper, may be removed, if preferred.
- Remove only the delineators in the Termination Taper, Work Area, and Buffer Area, and in that order. Work from the downstream end to the upstream end. If preferred, use a Service Vehicle. Use approved methods from Section 13.3.
- The Traffic Control Person on the same side of the road as the Work Area stops traffic flow.
- Remove the Service Vehicle in use at the boundary of the Approach Transition Taper and Buffer Area.
- A Service Vehicle takes a position in the middle of the closed lane. It should be positioned approximately half way between the Traffic Control Person and the beginning of the Approach Transition Taper.
- Starting downstream at the centerline and working toward the edge of the road, remove the Approach Transition Taper. If preferred, use a Service Vehicle. Use approved methods from Section 13.3.
- When all obstacles and workers are off the travel lane, the Service Vehicle(s) leave the travel lane.
- When the lanes are cleared, the Traffic Control Persons stand down.
- Delineators, vehicles and Warning Lights are now off the travel lanes and normal traffic flow has been established.

Continue by picking up the signs using an approved procedure.


Drawing 1 of 7
Traffic Control Person Permits Traffic to Flow
Work Area
Flashing Light Unit in Bar Mode
TC-9B (NS)
Service Vehicle displaying bar
Traffic Control Person Permits Traffic to Flow
Drawing 2 of 7
Traffic Control Person Permits Traffic to Flow
Flashing Light Unit in Bar Mode
TC-9B (NS)
Traffic Control Person Stops Traffic
Drawing 3 of 7
Traffic Control Person Permits Traffic to Flow
Flashing Light Unit in Bar Mode
TC-9B (NS)
Position vehicle in lane
Traffic Control Person Holds Traffic
Drawing 4 of 7
Traffic Control Person Permits Traffic to Flow
Lay out Approach Transition Taper. Start at road shoulder, work toward centerline
Flashing Light Unit in Bar Mode
TC-9B (NS)
Traffic Control Person Holds Traffic
NOT TO SCALE

Drawing 5 of 7



Traffic Control Persons begin alternating traffic flow, as needed

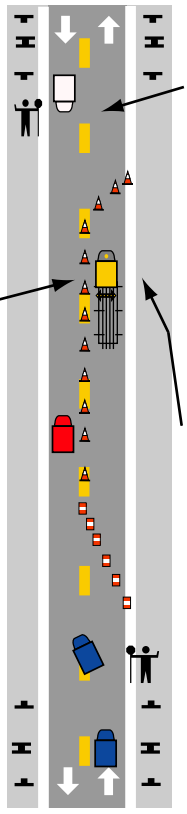
Flashing Light Unit in Bar Mode

TC-9B (NS)

Vehicle moves Into Approach Transition Taper / Buffer Area through Drums

Traffic Control Persons begin alternating traffic flow, as needed

Drawing 6 of 7



Traffic Control Persons regulate traffic flow, as needed

Starting at the upstream end, lay delineators for Buffer then Work Area, then for Termination Taper, using a Service Vehicle if preferred.

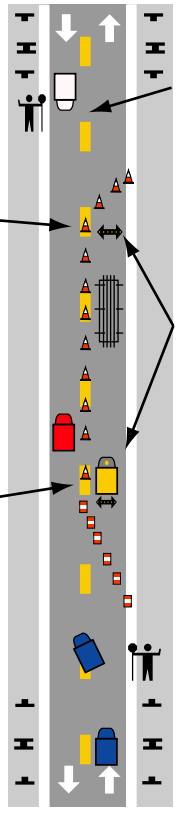
Flashing Light Unit in Bar Mode

TC-9B (NS)

Vehicle may move with workers

Traffic Control Persons regulate traffic flow, as needed

Drawing 7 of 7



Traffic Control Persons regulate traffic flow, as needed

TC-9B (NS)

As required by Application Guide, place Protection, Blocker, or Service Vehicles, or Flashing Light Units

Flashing Light Unit in Bar Mode

The set up is complete, work may begin

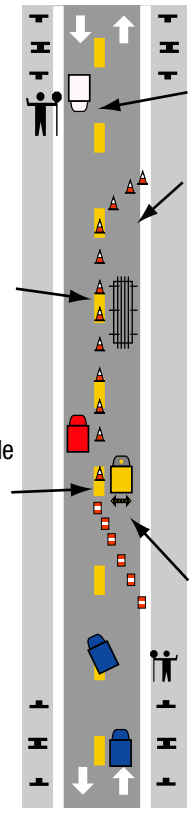
TC-9B (NS)

Traffic Control Persons regulate traffic flow, as needed

Intentionally left blank

NOT TO SCALE

Drawing 1 of 7



Traffic Control Persons continue regulating traffic

Remove Flashing Light Unit from Termination Taper

Work Area

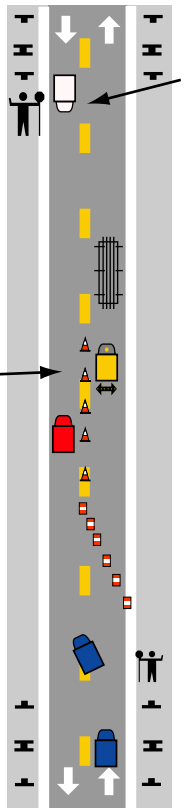
Flashing Light Unit in Bar Mode

TC-9B (NS)

Flashing Light Unit may be removed

Traffic Control Persons continue regulating traffic

Drawing 2 of 7



Traffic Control Persons continue regulating traffic

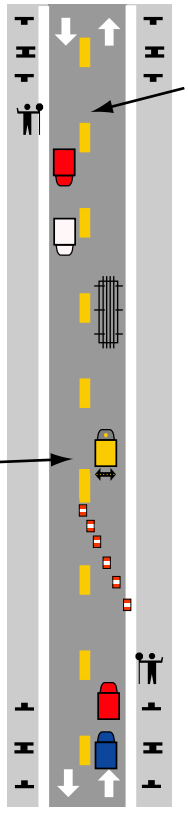
Starting at the downstream end, and working with a Service Vehicle if preferred, pick up the delineators in the Termination Taper, then Work Area, using approved methods from procedure 13.5.18

Flashing Light Unit in Bar Mode

TC-9B (NS)

Traffic Control Persons continue regulating traffic

Drawing 3 of 7



Traffic Control Person permits traffic flow

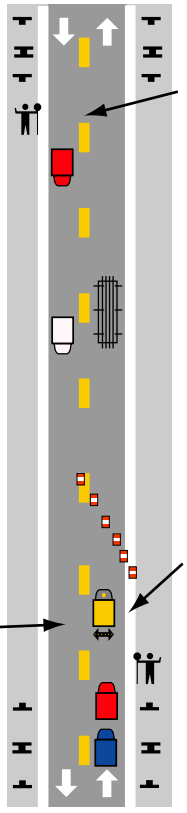
Flashing Light Unit in Bar Mode

TC-9B (NS)

Pick up delineators in Buffer Area

Traffic Control Person stops traffic

Drawing 4 of 7



Traffic Control Person permits traffic flow

Service Vehicle takes position before Approach Transition Taper

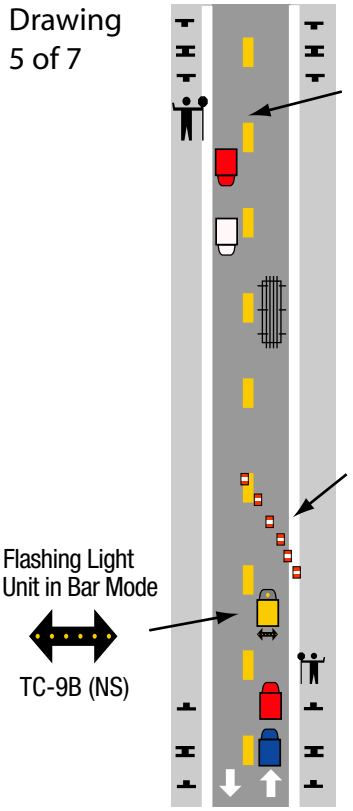
Flashing Light Unit in Bar Mode

TC-9B (NS)

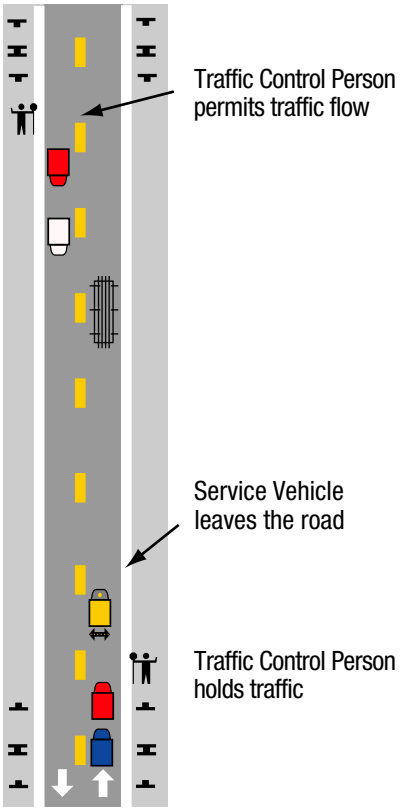
Traffic Control Person holds traffic

NOT TO SCALE

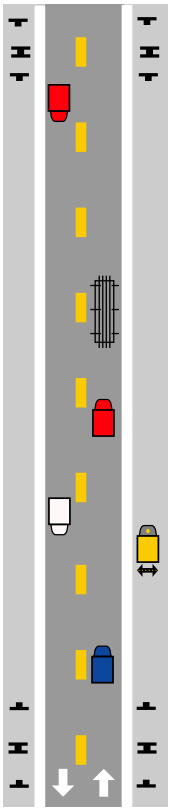
Drawing 5 of 7



Drawing 6 of 7



Drawing 7 of 7



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13.5.19 F-shape Barrier Change Over, Bridge Work, Multi-Lane Road

Introduction

On roads that meet the title description of 13.5.19, this procedure may be used for changing F-shape Barriers (New Jersey style Barriers) from a right lane closed setup to a left lane closed setup.

Limitation of Procedure Use

The procedure may only be used at temporary workplaces on bridges. This procedure describes changing from a right lane closure to a left lane closed. The procedure may be mirrored if changing from a left lane closed to a right lane closed.

Approach Transition Taper, Requirement to Provide Worker Protection

Workers must be protected by two Service Vehicles, positioned in the travel lane, in advance of workers, while performing the cross over.

A third Service Vehicle may accompany workers while laying out and picking up Delineators.

Service Vehicle Safety Spacing and Placement

The Service Vehicles working together to block the lane must establish and maintain a distance between them that will produce an apparent angle of approach similar to that of the Approach Transition Taper. “A” Series Application Guide table value “L” spacings between the vehicles are recommended.

“A” Series Table “L” values:
- 240 m at 90 - 110 km/h
- 180 m at 80 km/h
- 60 m at 60 - 70 km/h
- 30 m at 50 km/h

When placed in the right lane, the positioning of the two vehicles must prevent public traffic from passing to the right. The upstream vehicle should be aligned with the right edge of the lane. The downstream vehicle should be aligned with the left edge of the lane.

Allowing for barrier movement during the procedure, place the downstream Service Vehicle approximately 15 m in advance of the first barrier section. Both vehicles should be positioned to permit changing into the opposite lane in a single forward motion (without having to back up).

Warning Lights on Vehicles

Vehicles used in this procedure must display a 360° Flashing Amber Light and a Flashing Light Unit.

Flashing Light Unit Display

Flashing Light Units on the Service Vehicles working in combination to block the lane must display an arrow. The arrow must indicate the direction of the lane change.

The Flashing Light Unit on the Service Vehicle working downstream and under the protection of the two lane blocking Service Vehicles must display a bar (caution).

Starting Point

At the starting point of this procedure, all signs have been placed using an approved procedure. The Work Area is enclosed by approved barriers. There are Drums in advance of barriers in the Approach Transition Taper. The Flashing Light Unit inside the barriers is displaying a left arrow. All contractor’s work equipment has been removed from the closed lane to a safe storage location; it is safe to proceed.

Order of Actions to Change Over Barriers From a Right Lane Closed to a Left Lane Closed

Figure 13.5.19 shows this procedure.

Two Service Vehicles begin on the right shoulder of the road, on the same side of the road as the Work Area, and approximately half way between the last sign and the Approach Transition Taper. While on the shoulder, their Flashing Light Units display bars (caution):

- Without leaving any gaps, align the barrier sections in the Termination Taper along the centreline at the downstream end of the Work Area. Work from the upstream end to the downstream end.

- When safe to do so, choose a gap in traffic and position the two Service Vehicle combination in the right lane. As soon as the vehicles block a lane, they must display a left arrow. (See safety spacing and placement directions from earlier in the procedure.)

- Remove the Flashing Light Unit inside the barriers.

- Remove the TC-6 sign.

- Working with a Service Vehicle if preferred, and working from the upstream end to the downstream end, move the Drums to the centreline between the downstream Service Vehicle and the downstream end of the Approach Transition Taper. Delineator spacing must be taken from the table on the Application Guide. (Pick up any excess Drums.)

- Starting at the downstream end, align the barrier sections in the Approach Transition Taper with those on the centreline, in the Buffer Area. There must be no gaps between the barrier sections. At the same time, pick up the Drums from the centreline to make room for the barrier placement.

- When the last barrier section is in place on the centreline, position five (5) Drums at 1 m spacing in advance of the upstream end of the barriers. The Drums should be on the centreline, with the same approximate alignment as the barriers.

- Position the downstream Service Vehicle, which is positioned at the left lane edge, beside the first of the five Drums on the centreline.

- Make sure that the right lane is safe to open to traffic. Check that workers and equipment are off the road.

- Change the signs indicating that the right lane is closed, to signs indicating the left lane is closed.

- When safe to do so, choose a gap in traffic and position the two Service Vehicle combination in the left lane. As soon as the vehicles block the left lane, both Flashing Light Units must display right arrows. (See safety spacing and placement directions from earlier in the procedure.)

- Reconstruct the Approach Transition Taper by moving barrier sections off the centreline. Work from the downstream end to the upstream end.

  The approach angle for barrier placement must not be greater than specified in Section 10.2. (10 degrees is typical for speeds greater than 50 km/h.) Barrier sections must be securely fastened together so that they act as a single structure under impact. There must be no gaps between barrier sections in an Approach Transition Taper.

  At the same time, lay out the Drums in advance of the barrier sections, so that the barrier and Drum tapers are created together.

Important Note: If the barrier sections along the centreline must be moved out over the centreline to facilitate work from the newly closed lane, position the barrier sections in the approach transition taper far enough out to protect the blunt end of the first barrier section with the new alignment (out beyond the centreline). After the barrier and drum approach transition tapers are built, and starting at the upstream end, jog the barrier sections along the

centreline out to their new positions past the centreline. (This procedure will prevent presenting a blunt barrier end to motorists.)

- Remove the 5 Drums (at 1 m spacing) from in front of the downstream Service Vehicle.

- Position the TC-6 sign at the shoulder edge of the left lane, in advance of the Drum taper.

- Reconstruct the Termination Taper by moving barrier sections off the centreline. Work from the downstream end to the upstream end to prevent leaving exposed blunt barrier ends.

- At the boundary of the Approach Transition Taper and the Buffer Area, inside the barriers, position a Flashing Light Unit displaying a right arrow.

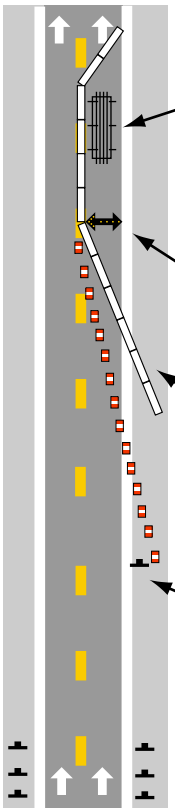
  (At this point, if desired, workers may start to move their work equipment into the newly created work area.)

- When safe to do so, remove the Service Vehicles from their position in advance of the Approach Transition Taper. At the same time, deactivate their Flashing Light Units.

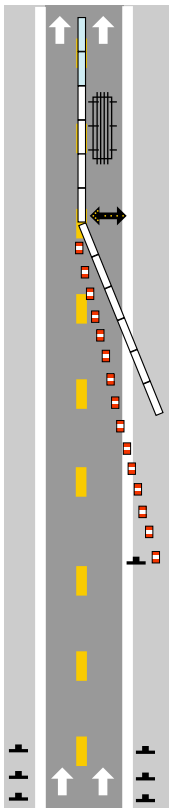
The procedure is complete.

Drawing 1 of 12

Typical bridge workplace

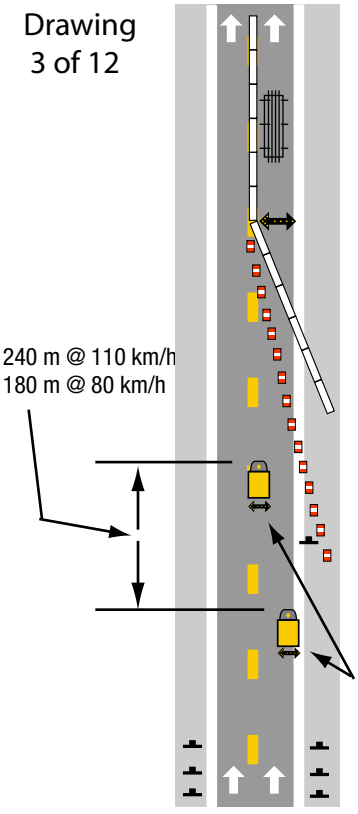


Drawing 2 of 12



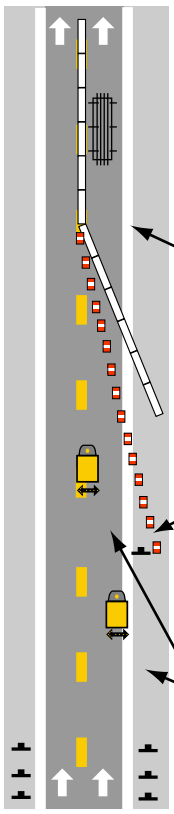
Move the barrier sections in the Termination Taper so that they are aligned on the centerline.

Drawing 3 of 12



Wait for a break in traffic, position two Service Vehicles in the closed lane. The upstream vehicle is positioned at the right edge of the lane. The downstream vehicle is positioned close to the left edge of the lane and approximately 15 m in advance of the barriers.

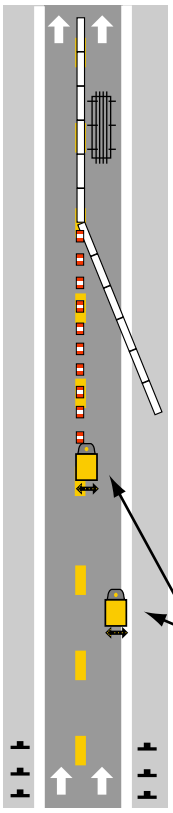
Drawing 4 of 12



Remove the Flashing Light Unit behind the barriers. Remove the TC-6 sign.

NOT TO SCALE

Drawing 5 of 12

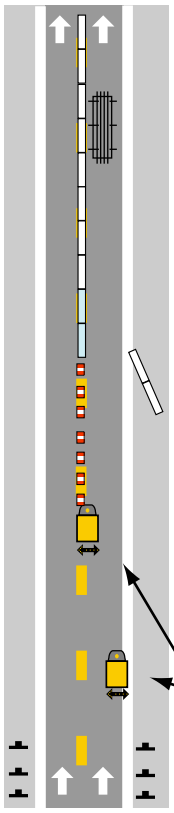


Move the Drums in the Approach Transition Taper to the centerline. Position them between the end of the Approach Transiton Taper and the first Service Vehicle. Pick up any excess Drums. Work from the upstream end to the downstream end; use a third Service Vehicle, if preferred.

Flashing Light Unit Left Arrow

TC-9L (NS)

Drawing 6 of 12

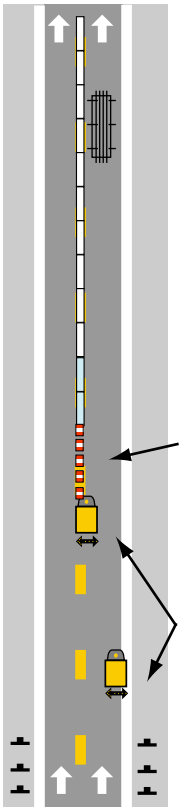


Pick up the drums while moving barrier sections to the centerline. Work from the downstream end to the upstream end.

Flashing Light Units Left Arrow

TC-9L (NS)

Drawing 7 of 12



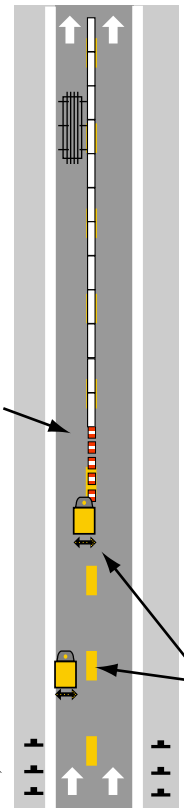
Place 5 Drums at 1 m spacing at the end of the last barrier section. Position the down-stream Blocker vehicle beside the last Drum.

5 Drums at 1 m spacing

Flashing Light Units Left Arrow

TC-9L (NS)

Drawing 8 of 12



Wait for a break in traffic, position both Service Vehicles in the left lane. Position the upstream vehicle at the left edge of the lane and the down-stream vehicle at the right edge of the lane, beside the last Drum. Change Flashing Light Unit displays to right arrow.

Maintain 5 Drums at 1 m spacing

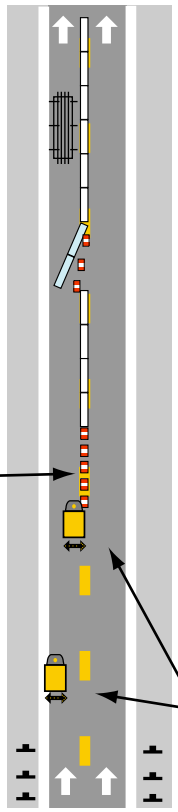
Change signs to show left lane closed

Flashing Light Units Right Arrow

TC-9R (NS)

NOT TO SCALE

Drawing 9 of 12



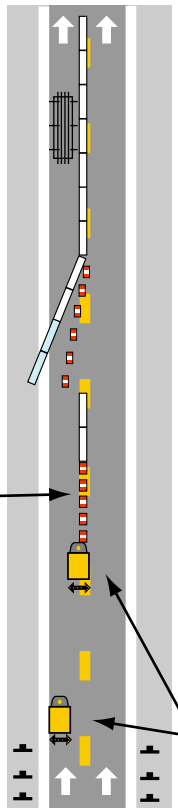
Starting at the downstream end of the Approach Transition Taper and working in the upstream direction, position barrier sections at an angle not greater than specified in Section 10.2 (10 degrees typical). Lay out Drums in advance of the barriers, as per Section 10.2 and the table in the Application Guide.

Maintain 5 Drums at 1 m spacing.

Flashing Light Unit Right Arrow

TC-9R (NS)

Drawing 10 of 12



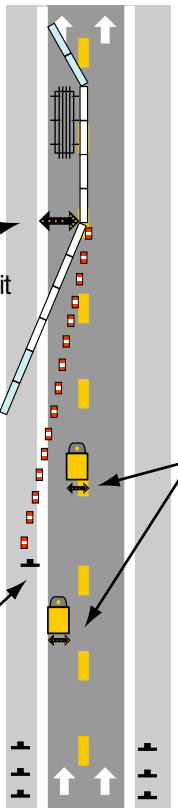
Continue to build the Approach Transition Taper, working from the downstream end.

Maintain 5 Drums at 1 m spacing.

Flashing Light Unit Right Arrow

TC-9R (NS)

Drawing 11 of 12



Replace the TC-6 sign. Rebuild the Termination Taper working from downstream to upstream. Replace the Flashing Light Unit behind the barriers. Flashing Light Unit shows a right arrow.

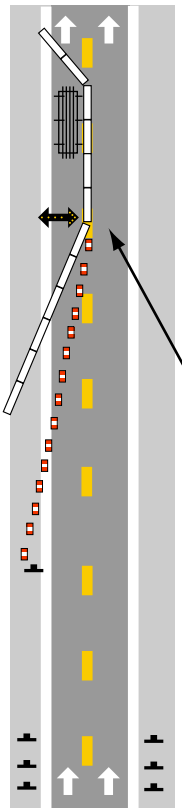
Flashing Light Unit Right Arrow

Flashing Light Unit Right Arrow

TC-9R (NS)

TC-6 sign

Drawing 12 of 12



Service Vehicles leave the roadway. The barrier cross over is complete.

Flashing Light Unit Right Arrow

TC-9R (NS)

NOT TO SCALE

13.5.20 Resurfacing Procedures

Introduction

Wide resurfacing equipment may pose a passing difficulty for public traffic. Road shoulders may have to be used. Also, equipment may need to encroach where delineators would normally be required along the centreline.

General Resurfacing Exception

Except as described in the entry below under "Gravelling, Grading or Pulverizing Exception", and subject to the conditions that follow, no delineators are required on the centreline:

- 100 m. in advance of the work vehicle train, and
- Adjacent to the work vehicle train, and
- 100 m. behind the work vehicle train.

This may create a 400 m. Work Area section that has no delineators on the centreline. The remainder of the workplace must be delineated by cones or drums, as specified by the Application Guide in use.

Gravelling, Grading or Pulverizing Exception

Subject to the conditions that follow, but excluding the entry on "Delineator Management", on full depth reclamation projects (pulverizing), the use of delineators may be omitted along the centreline while actively gravelling, or grading, and during the middle pass, where three passes are needed to pulverize the full width of a two-lane two-way road.

Procedure Limitations

Unless specifically stated otherwise, rules or conditions from other sections of the Manual that would normally apply, continue to apply.

These procedures may only be used on projects meeting all of the following:

- The work type is a road resurfacing project.
- The project is on a narrow two-lane two-way secondary road.
- The narrowness of the road and the width of construction equipment make it impractical to fully delineate the work area.

The Buffer and Work Areas must be delineated again immediately after these work types stop.

Pre-planning

Before the project, representatives of the road authority and the project manager must evaluate shoulder conditions and determine which portions of the shoulder may be used to safely support public traffic. Planning must establish a means to prevent public traffic from using shoulders that are unsafe.

Conditions to be Met

The following conditions apply when the centreline is not fully delineated:

Communications - The limitations of using shoulders for public traffic must be communicated to work vehicle and pilot vehicle operators before starting work.

Traffic Management - Public traffic must be regulated by Traffic Control Persons and be led by a pilot vehicle.

Pre-planning must ensure that only portions of the shoulder predetermined to be safe, may be used to divert traffic off the paved lane.

Work Vehicle Management - Work vehicles used in this procedure, must:

- Maintain as tight a formation as is practical, to minimize the portion of the centreline without delineators.
- Group and position themselves on the roadway to maximize safety for public road users.

Worker Safety - Within the section of road that has no delineators, during the period the pilot vehicle and public traffic are passing, no person is permitted on either travel lane on foot.

Delineator Management - As the work vehicle train moves along the road, the gap in delineators must be kept to a minimum by taking them from the centreline in front of the work vehicle train and adding them to the rear.

"A" Application Guides for
100 Series Highways, Multi-Lane and One Way Roads

Work Location	Work Duration	Highway Type (Special Conditions)	Guide
Off Shoulder Work	All Durations	Two-Way or Multi-Lane	A 1
Shoulder Work	Very Short Duration	Two-Way or Multi-Lane	A 12
Shoulder Work	Short Duration	Two-Way or Multi-Lane	A 13
Lane Closed	Very Short Duration	Two-Way	A 33
Lane Closed	Short Duration	Two-Way (Day Work)	A 35
Lane Closed	Short Duration	Two-Way (Long Queue)	A 36
Lane Closed	Short Duration	Two-Way (Night Work)	A 37
Lane Closed	Short Duration	Two-Way (Climbing Lane, Right Lane Closed)	A 45
Lane Closed	Short Duration	Two-Way (Climbing Lane, Centre Lane Closed)	A 46
Lane Closed	Short Duration	Two-Way (Climbing Lane, Downhill Lane Closed	A 47
Lane Closed	Short Duration	Two-Way (Altered Centreline)	A 48
Lane Closed	Long Duration	Two-Way (Traffic Control Signals)	A 51
Lane Closed	Long Duration	Two-Way (Traffic Control Persons (& Bridges))	A 52
Lane Closed (left)	Very Short Duration	Multi-Lane	A 62L
Lane Closed (right)	Very Short Duration	Multi-Lane	A 62R
Lane Closed (left)	Short Duration	Multi-Lane	A 63L
Lane Closed (right)	Short Duration	Multi-Lane	A 63R
New: 2012 Lane Closed (ramp)	Short Duration	Multi-Lane (on ramp, upstream)	A 64D
New: 2012 Lane Closed (ramp)	Short Duration	Multi-Lane (off ramp, downstream)	A 64U
New: 2012 Lane Closed (bridge)	Short Duration	Multi-Lane or Two-Way (On or under Bridge)	A 65
Lane Closed	Long Duration	Multi-Lane (Also Applies on or under Bridges)	A 66
Two Lanes Closed	Short Duration	Multi-Lane	A 68
Two-Way Left Turn Lane Closed	Short Duration	Multi-Lane	A 69

Signing Illustration	Work Duration	Highway Type	Guide
New: 2012 Blasting Warning	Short Duration	Two-Way or Multi-Lane	A 71
Planed Surface Condition	All Durations	Two-Way or Multi-Lane	A 72
Paving Surface Condition	All Durations	Two-Way or Multi-Lane	A 73
Temporary Markings	All Durations	Two-Way or Multi-Lane	A 74
Temporary Haul Road	All Durations	Two-Way or Multi-Lane	A 76
New: 2012 Detour	All Durations	Two-Way or Multi-Lane	A 77
New: 2012 Temporary Connector	Long Duration	Two-Way or Multi-Lane	A 78
Low Shoulder	Short or Long Duration	Two-Way or Multi-Lane	A 79

Continued on next page:-

"A" Application Guides, continued

Special Operations

	Work Type	Work Duration	Highway Type	Guide
New: 2012	Shoulder Work	Mobile Short Stops	Two-Way or Multi-Lane	A 90
	Line Painting	Mobile Continuous	Two-Way	A 91
New: 2012	Line Painting	Mobile Continuous	Multi-Lane	A 92
	Survey Crew	Short Duration	Two-Way or Multi-Lane	A 93
	Survey Crew	Short Duration/Short Stops	Two-Way or Multi-Lane	A 94
New: 2012	Lane Closed	Mobile Continuous	Two-Way	A 96
	Lane Closed	Mobile Continuous	Multi-Lane	A 97

Legend of Symbols Used in Application Guides

New: 2012

Used to indicate the position of a single sign.

Used to indicate the position of two signs displayed back to back.

Used to indicate the position of a barricade.

Used to indicate red orange flags on a sign as required by Section 8.0

Used to indicate the position of a traffic cone or high delineator.

Used to indicate the position of a traffic drum.

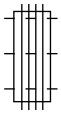
When displayed alone, used to indicate the position of a Flashing Light Unit, either vehicle or trailer mounted (in Bar Mode).

Used to indicate the position of F-shape barriers.

Used to indicate the position of traffic signals.

A yellow line is used to indicate the centreline of a road. White is used to indicate a lane line.

Used to indicate the direction of travel within a lane.

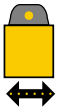


Used to indicate the position of the Work Area.

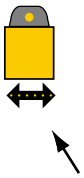
Used to indicate a break and that the drawing covers a greater distance than the scale can easily show.

Used to indicate a Traffic Control Person at the Control Position.

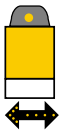
Used to indicate the position of a vehicle with a 360 degree flashing amber light. If the vehicle has a specific title or function, it will typically be labelled.



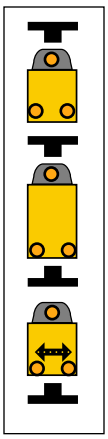
Used to indicate the position of a vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle has a specific title or function, it will typically be labelled.



When labelled as such, used to indicate the position of a Trail Vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle requires specific signs they are typically shown beside the labelled vehicle.



Used to indicate the position of a Protection Vehicle with a truck mounted attenuator, a 360 degree flashing amber light, and a Flashing Light Unit.



Used to indicate the position of line painting vehicles with, as applicable, 360 degree flashing amber lights, high mount flashing amber lights, signs, and a Flashing Light Unit

NOT TO SCALE

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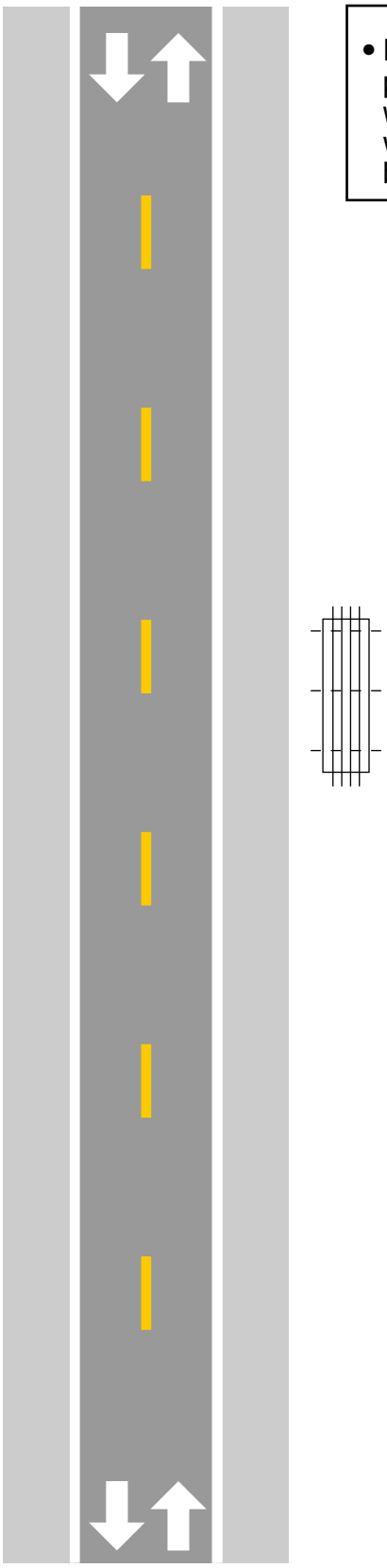
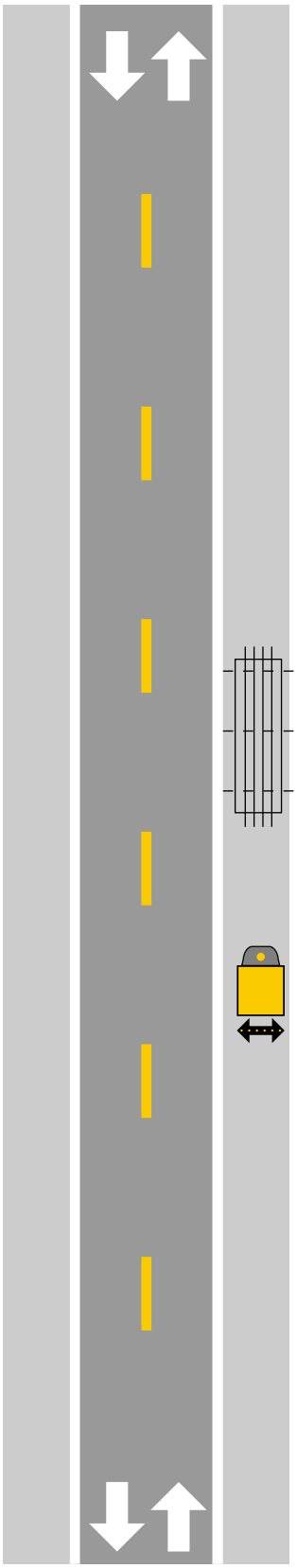


- No encroachment permitted on shoulder by workers, equipment, or vehicles while the work is being done

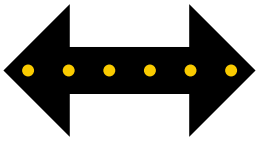
NOT TO SCALE



- No encroachment permitted on travel lane by workers, equipment, or vehicles

B

Service Vehicle with 360 degree flashing amber light and Flashing Light Unit

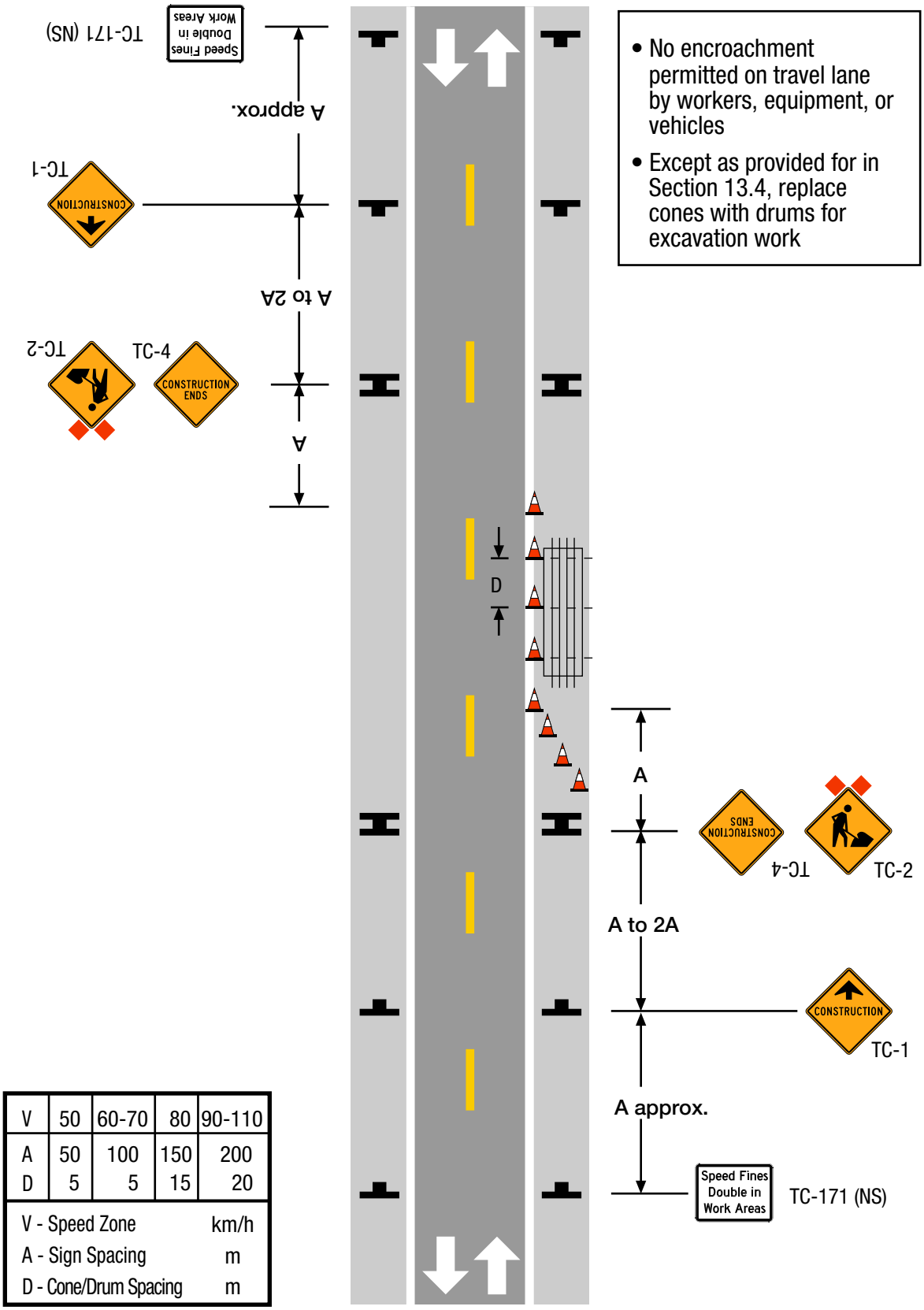


TC-9B (NS)

V	50	60-70	80	90-110
B	*	*	50	60
V - Speed Zone				km/h
B - Buffer Area Length				m

* See Note 1, at Table 10.1

NOT TO SCALE

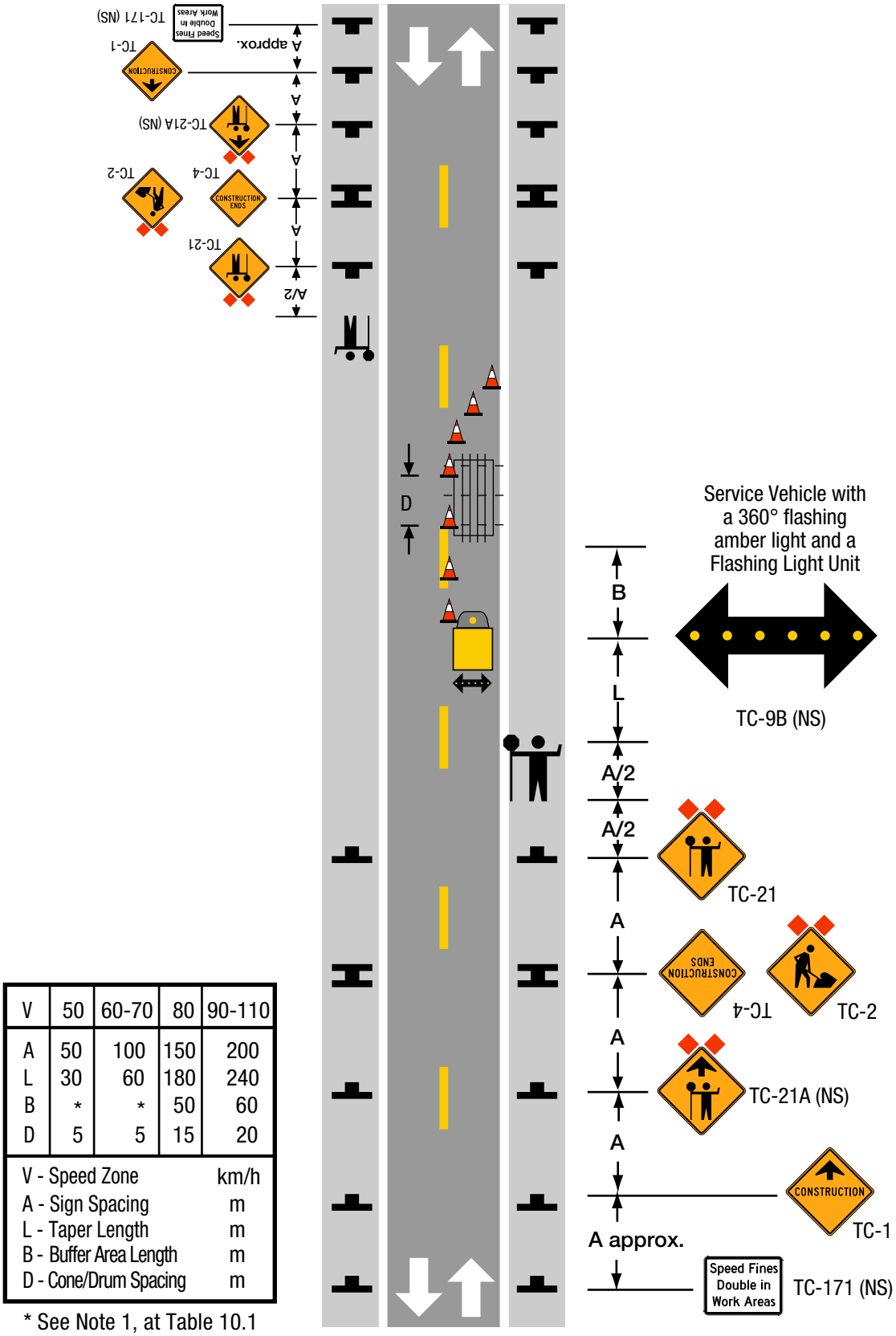


- No encroachment permitted on travel lane by workers, equipment, or vehicles
- Except as provided for in Section 13.4, replace cones with drums for excavation work

V	50	60-70	80	90-110
A	50	100	150	200
D	5	5	15	20

V - Speed Zone km/h
A - Sign Spacing m
D - Cone/Drum Spacing m

NOT TO SCALE

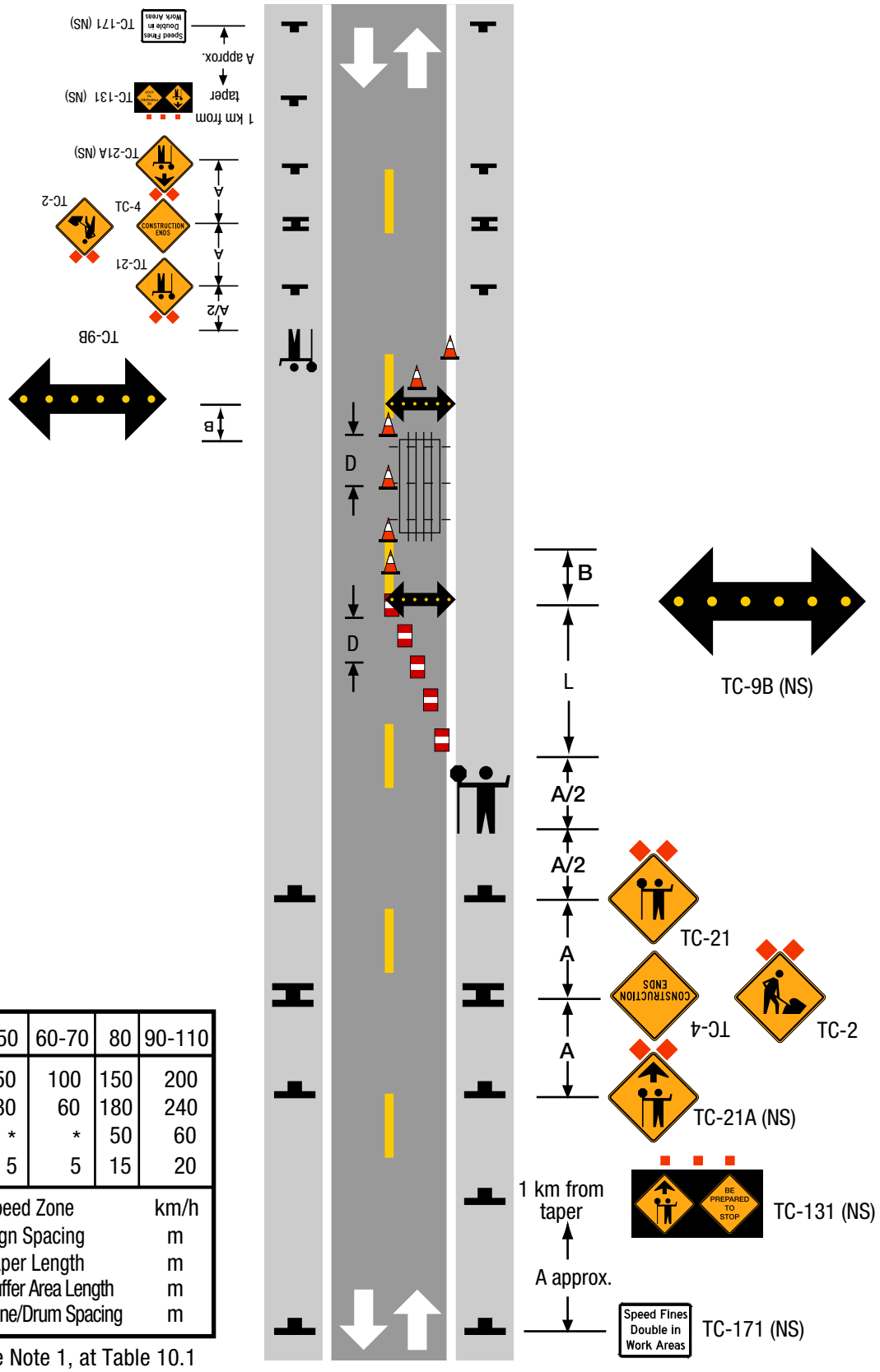


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

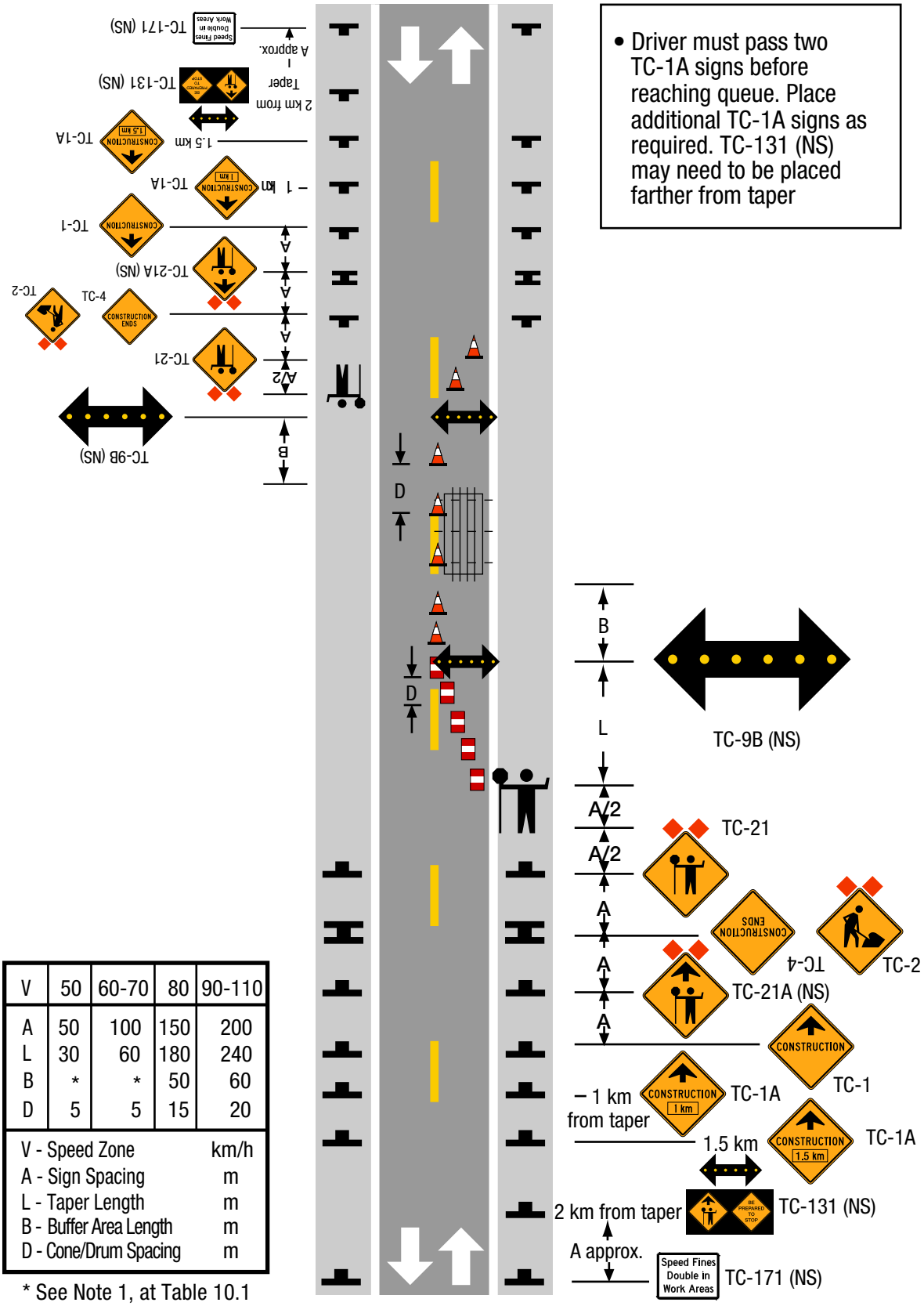


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

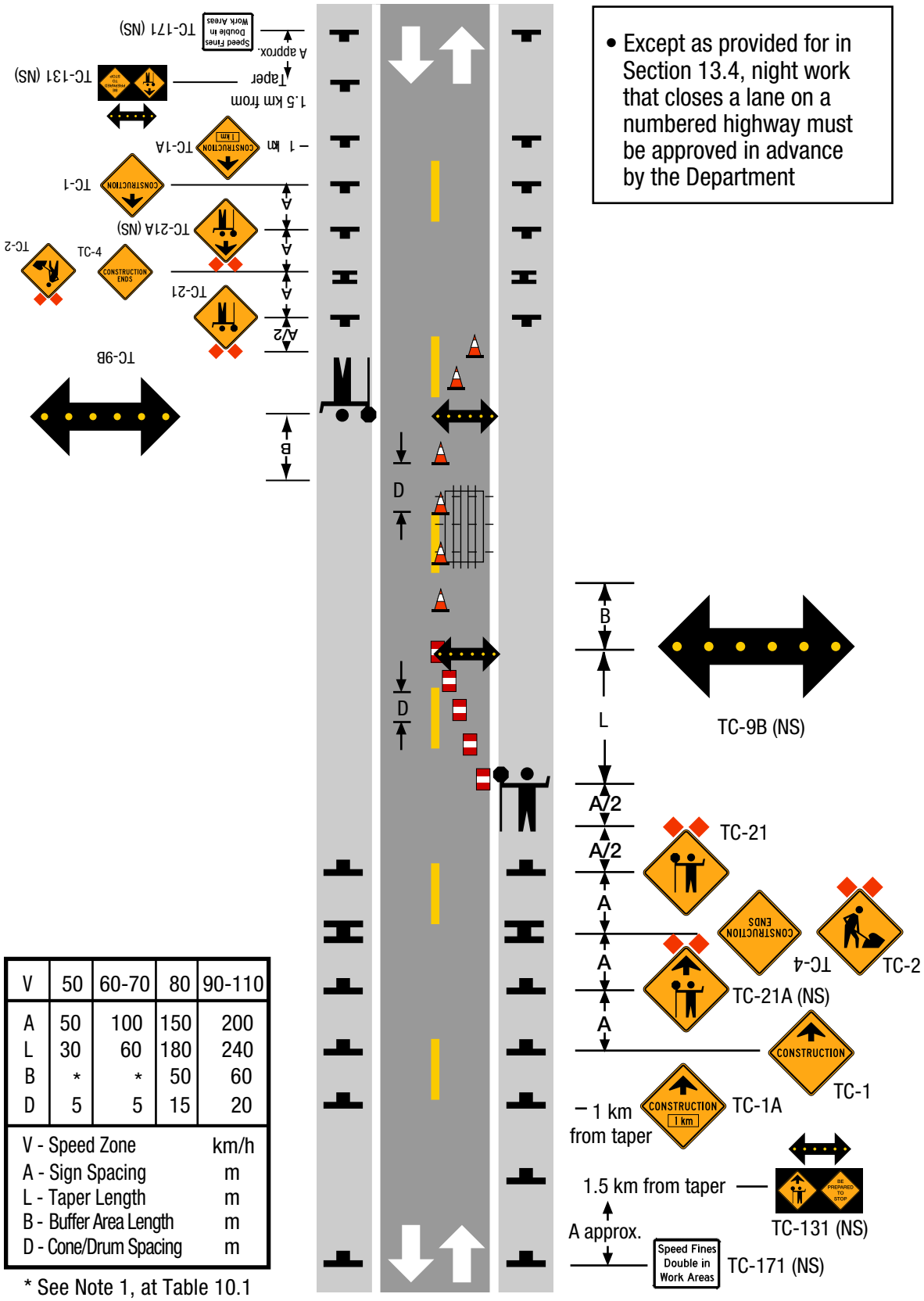


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



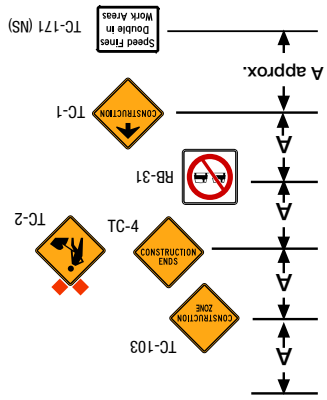
- Except as provided for in Section 13.4, night work that closes a lane on a numbered highway must be approved in advance by the Department

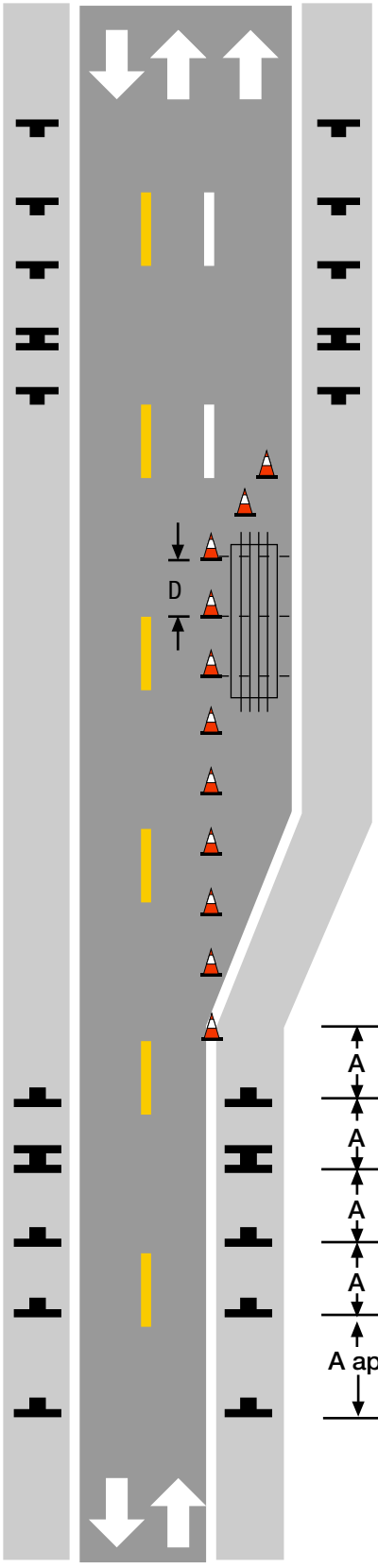
V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



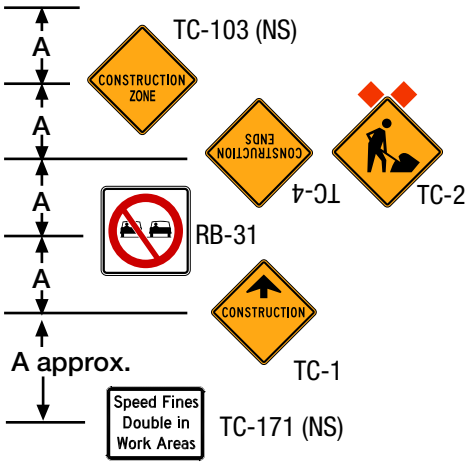


- Climbing Lane 2 km ID-23 and Keep Right Except to Pass RB-34 must be removed or covered

ID-23

RB-34

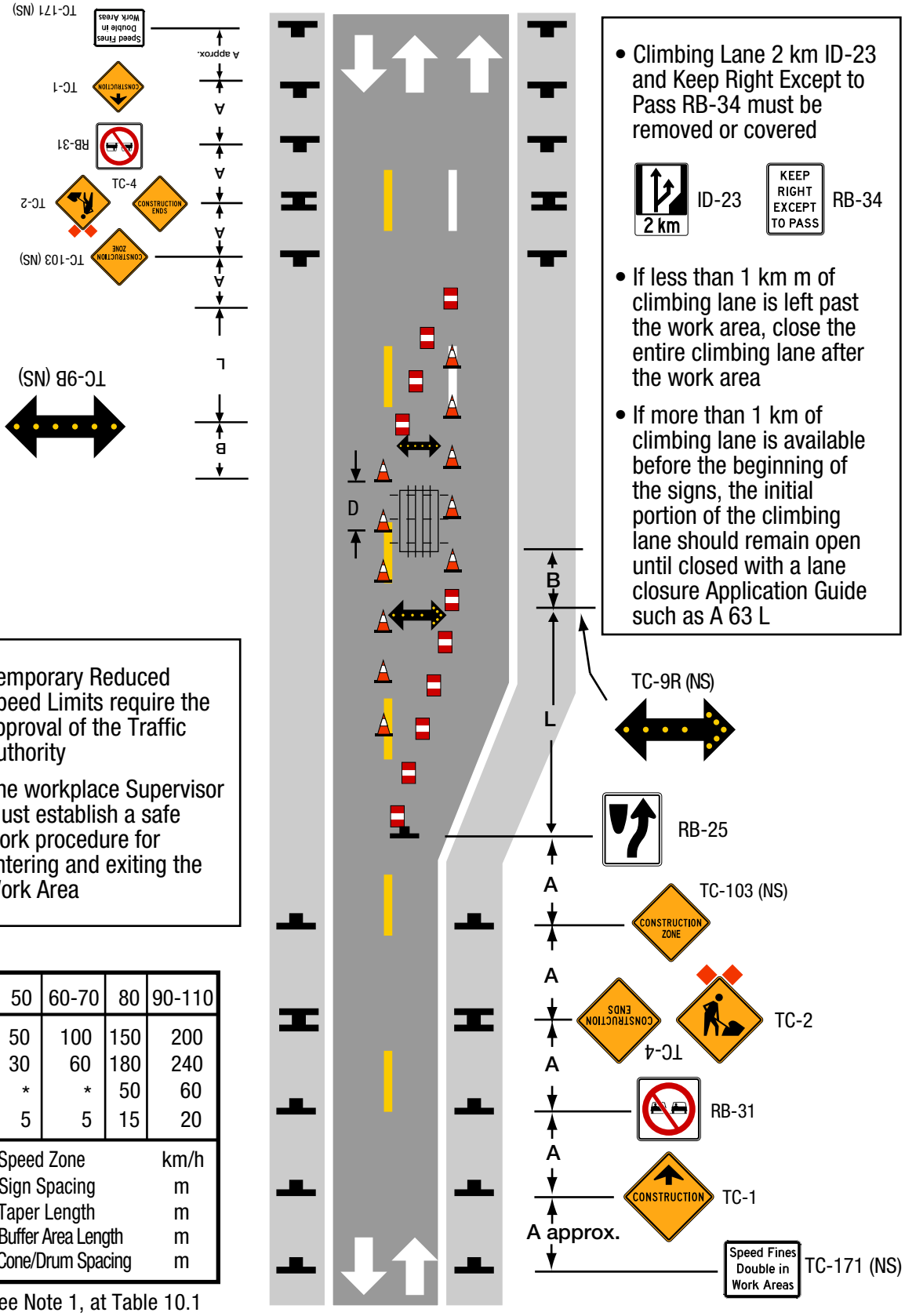
- If less than 1 km of climbing lane is left past the work area, close the entire climbing lane after the work area
- If more than 1 km of climbing lane is available before the beginning of the signs the initial portion of the climbing lane should remain open until closed with a lane closure Application Guide such as A 63 R



V	50	60-70	80	90-110
A	50	100	150	200
D	5	5	15	20

V - Speed Zone km/h
A - Sign Spacing m
D - Cone/Drum Spacing m

NOT TO SCALE



- Climbing Lane 2 km ID-23 and Keep Right Except to Pass RB-34 must be removed or covered

ID-23 (2 km) RB-34 (KEEP RIGHT EXCEPT TO PASS)

- If less than 1 km m of climbing lane is left past the work area, close the entire climbing lane after the work area
- If more than 1 km of climbing lane is available before the beginning of the signs, the initial portion of the climbing lane should remain open until closed with a lane closure Application Guide such as A 63 L

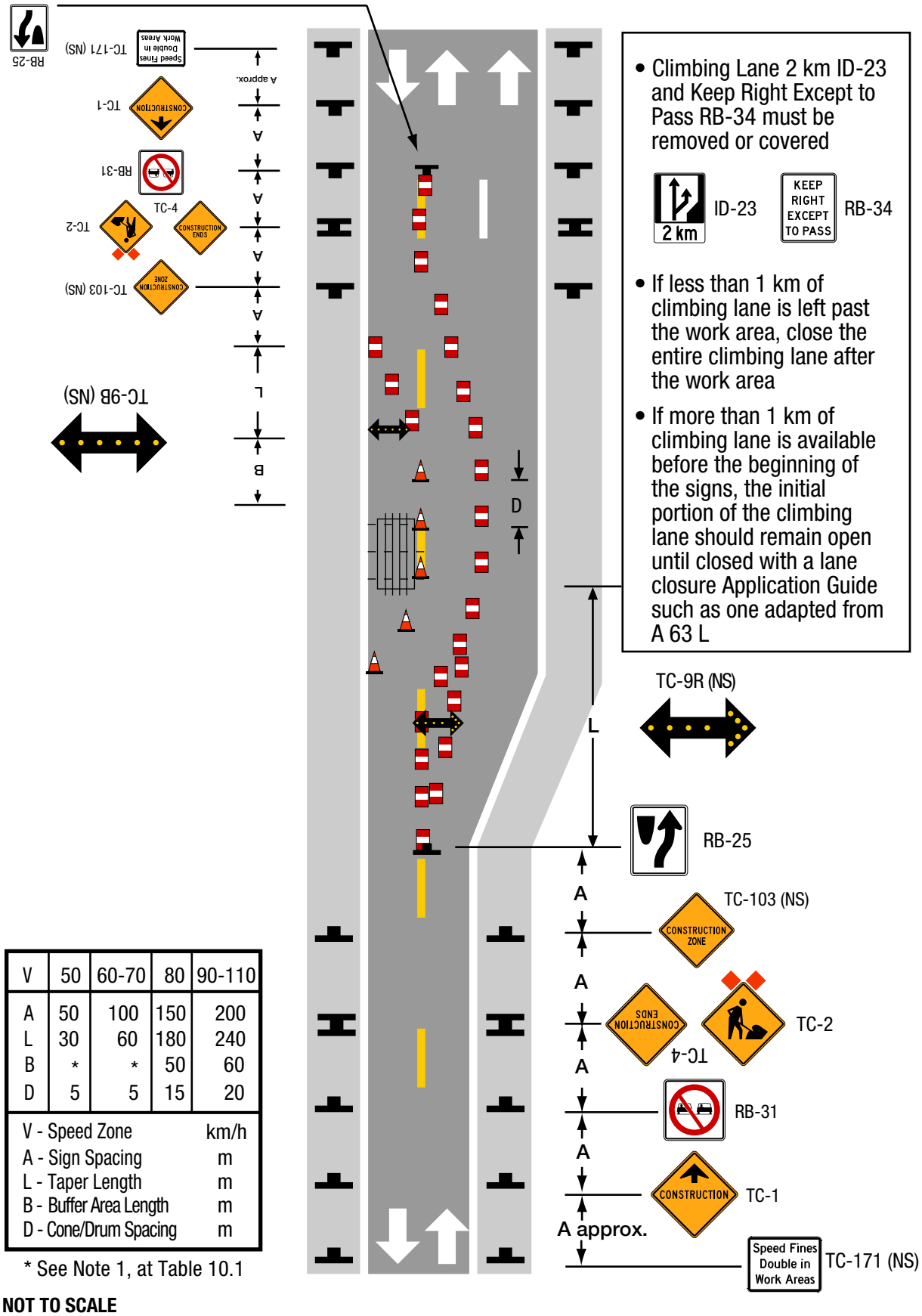
- Temporary Reduced Speed Limits require the approval of the Traffic Authority
- The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
B - Buffer Area Length m
D - Cone/Drum Spacing m

* See Note 1, at Table 10.1

NOT TO SCALE

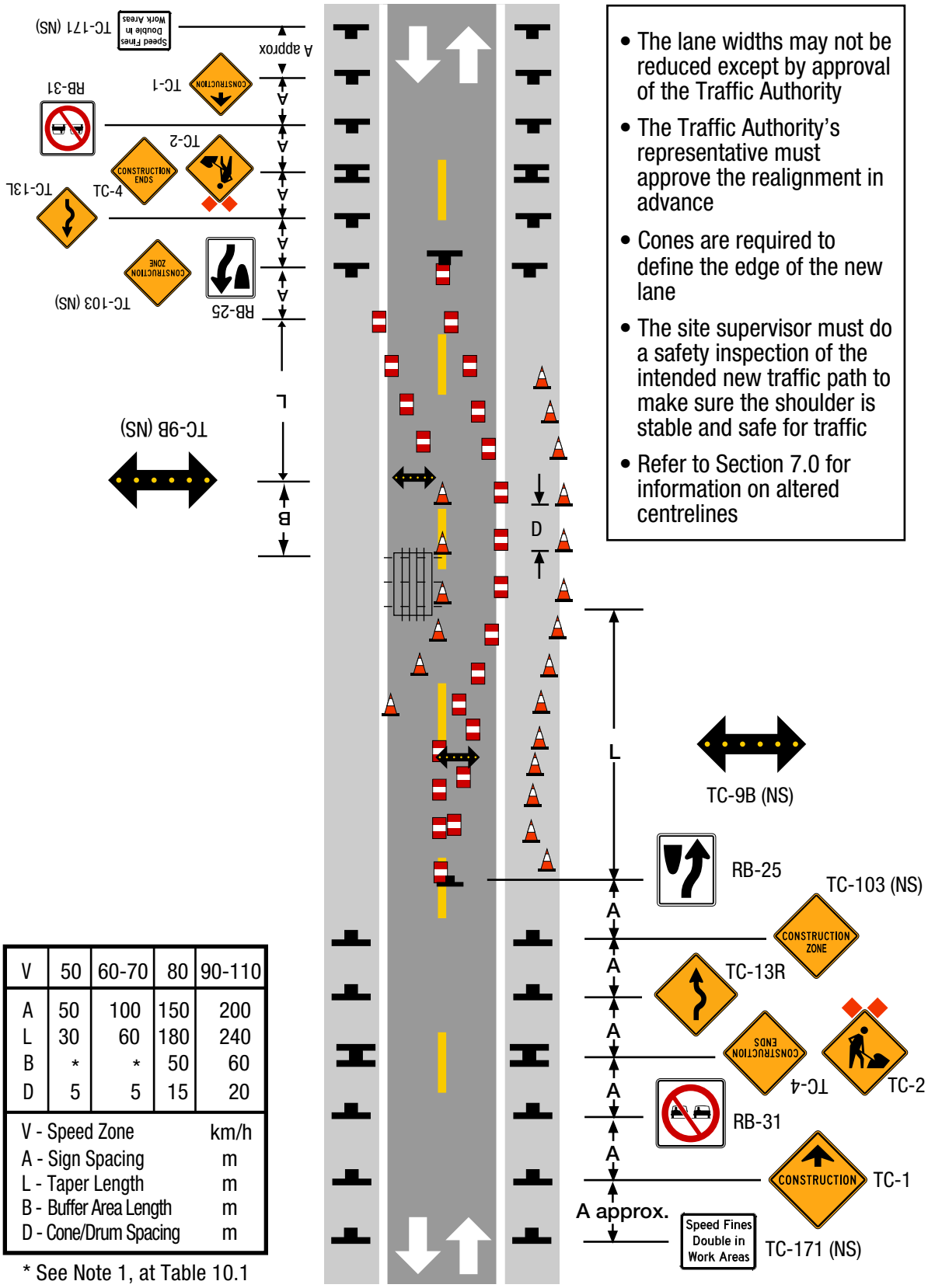


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



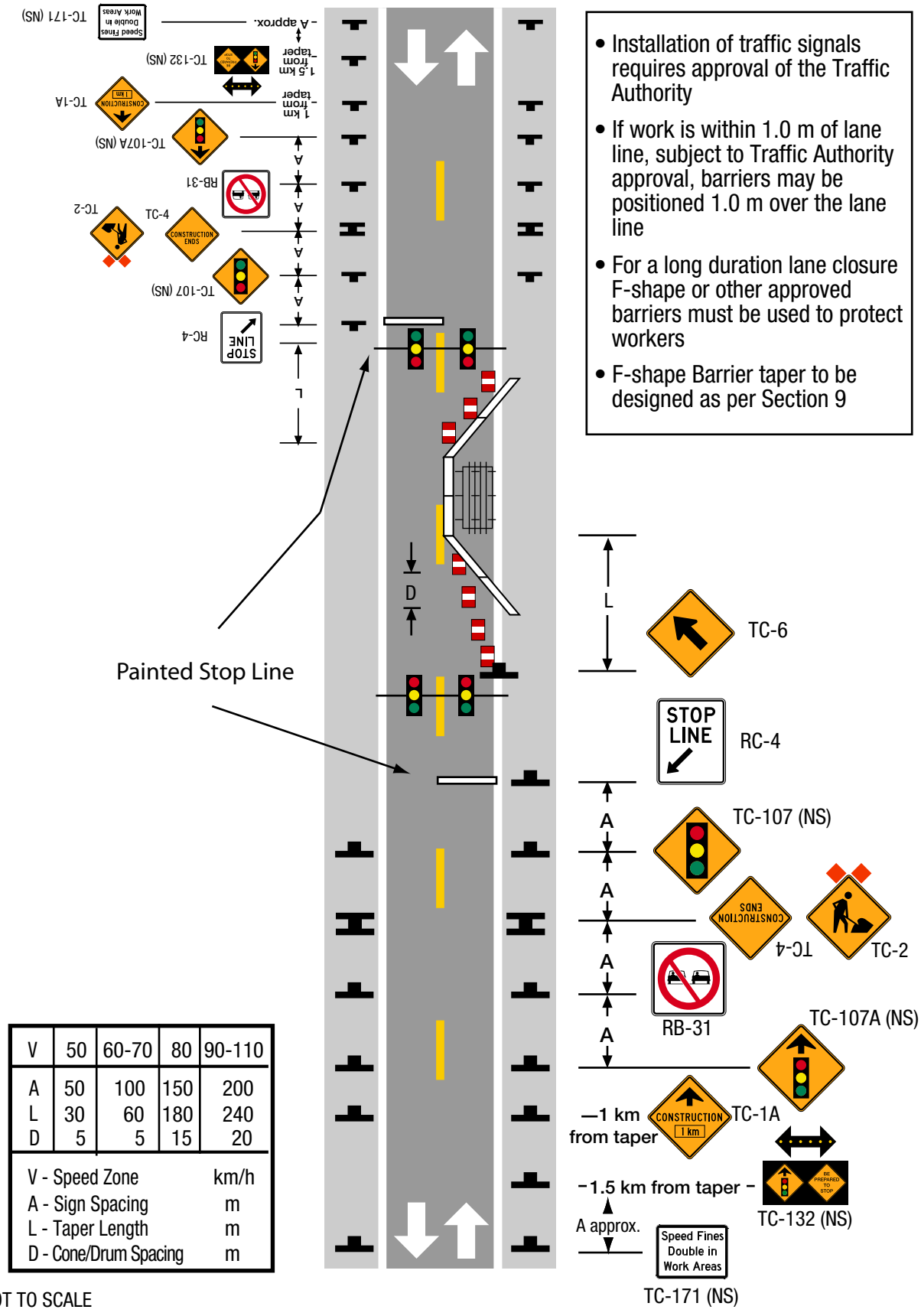
- The lane widths may not be reduced except by approval of the Traffic Authority
- The Traffic Authority's representative must approve the realignment in advance
- Cones are required to define the edge of the new lane
- The site supervisor must do a safety inspection of the intended new traffic path to make sure the shoulder is stable and safe for traffic
- Refer to Section 7.0 for information on altered centrelines

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

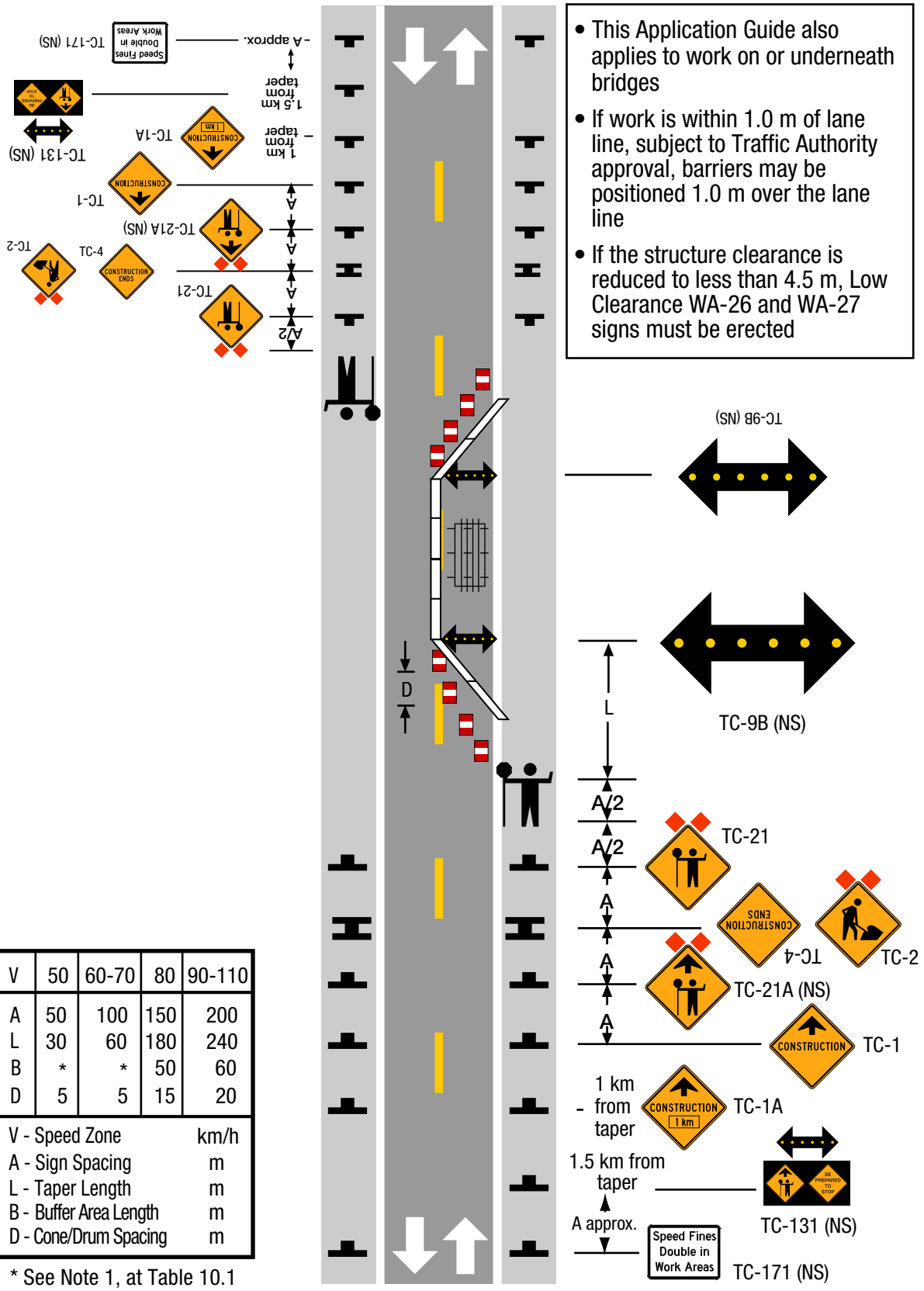


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
D	5	5	15	20

V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
D - Cone/Drum Spacing m

NOT TO SCALE

- Installation of traffic signals requires approval of the Traffic Authority
- If work is within 1.0 m of lane line, subject to Traffic Authority approval, barriers may be positioned 1.0 m over the lane line
- For a long duration lane closure F-shape or other approved barriers must be used to protect workers
- F-shape Barrier taper to be designed as per Section 9



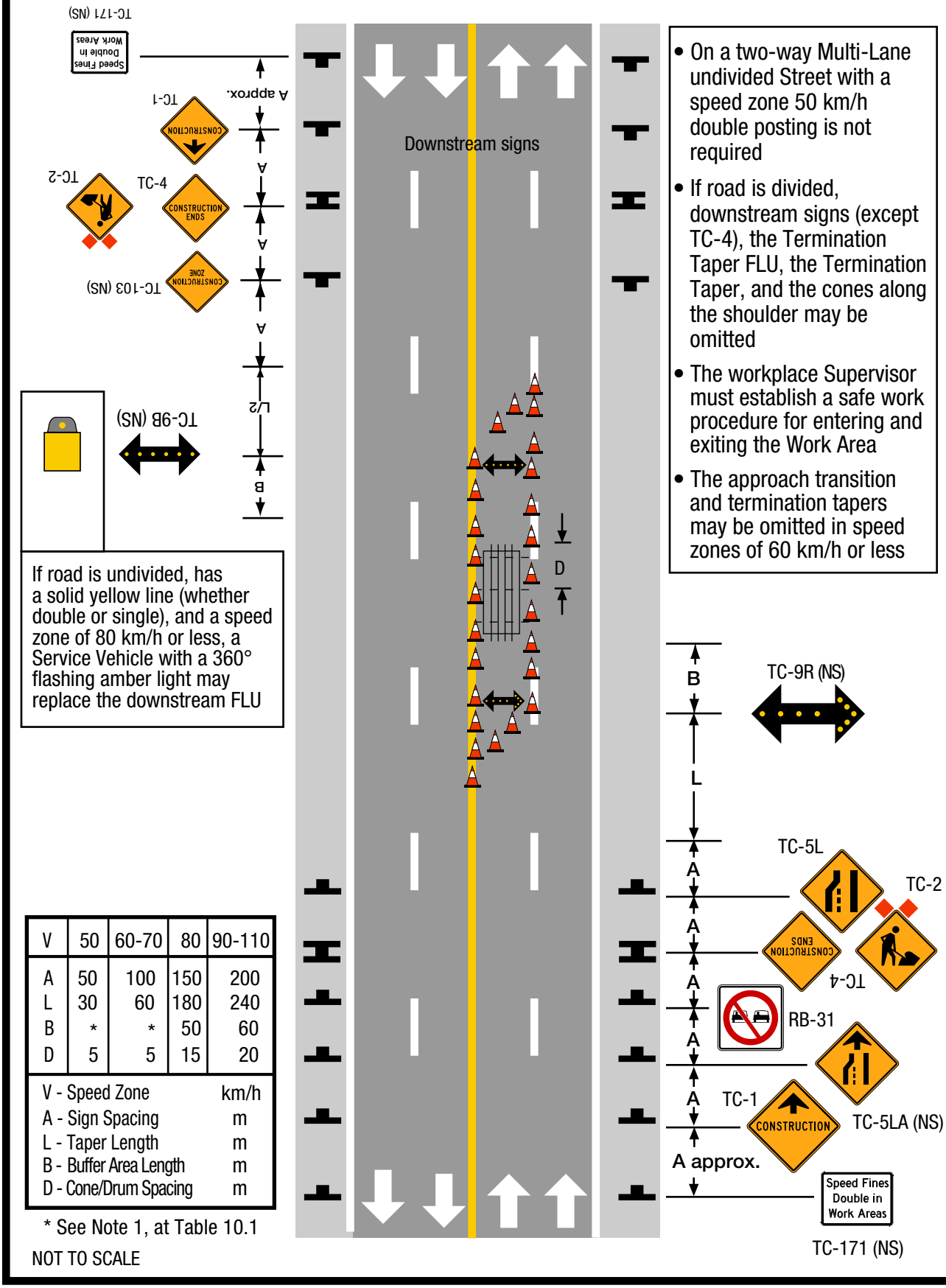
- This Application Guide also applies to work on or underneath bridges
- If work is within 1.0 m of lane line, subject to Traffic Authority approval, barriers may be positioned 1.0 m over the lane line
- If the structure clearance is reduced to less than 4.5 m, Low Clearance WA-26 and WA-27 signs must be erected

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



- On a two-way Multi-Lane undivided Street with a speed zone 50 km/h double posting is not required
- If road is divided, downstream signs (except TC-4), the Termination Taper FLU, the Termination Taper, and the cones along the shoulder may be omitted
- The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area
- The approach transition and termination tapers may be omitted in speed zones of 60 km/h or less

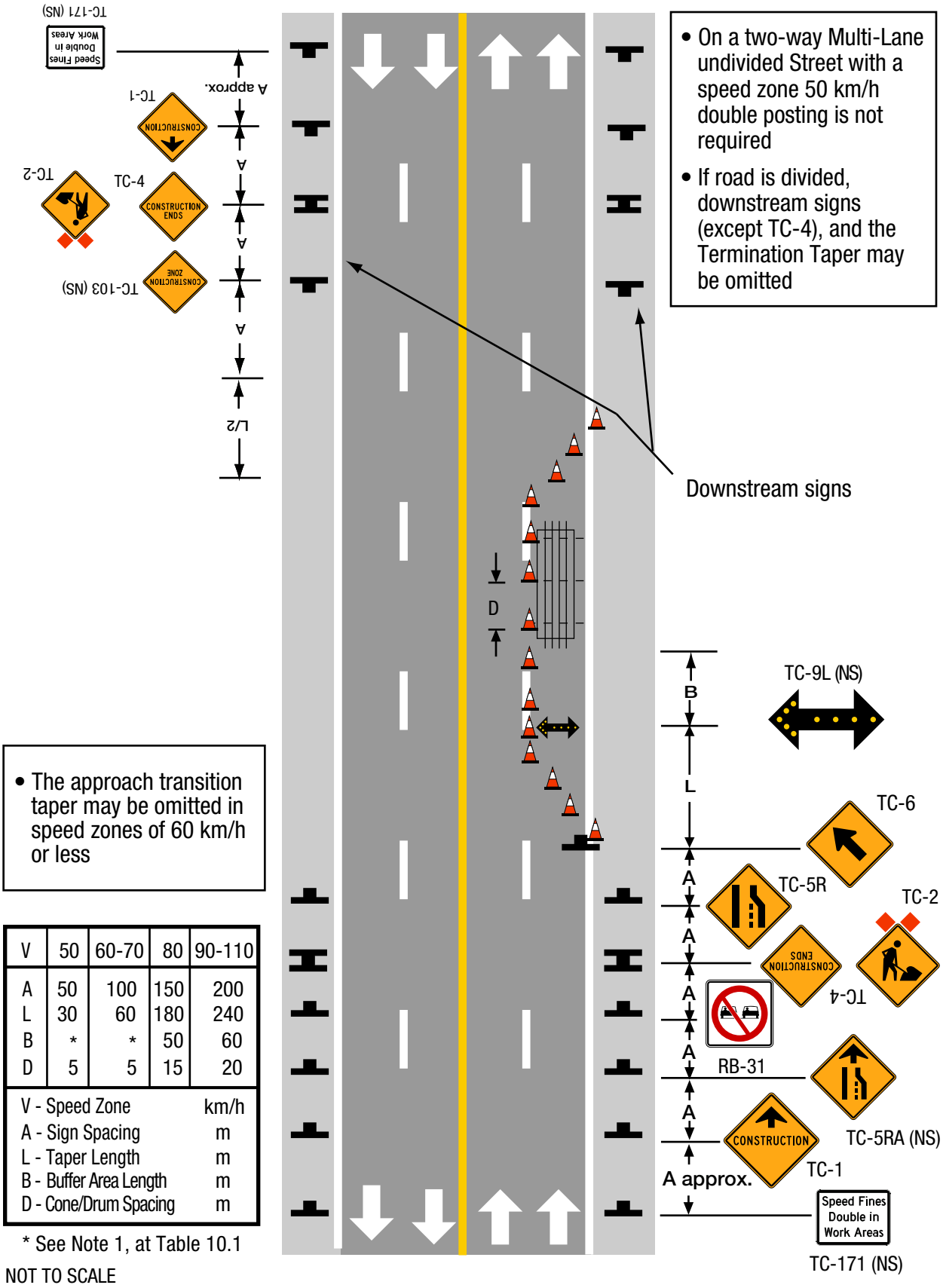
If road is undivided, has a solid yellow line (whether double or single), and a speed zone of 80 km/h or less, a Service Vehicle with a 360° flashing amber light may replace the downstream FLU

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



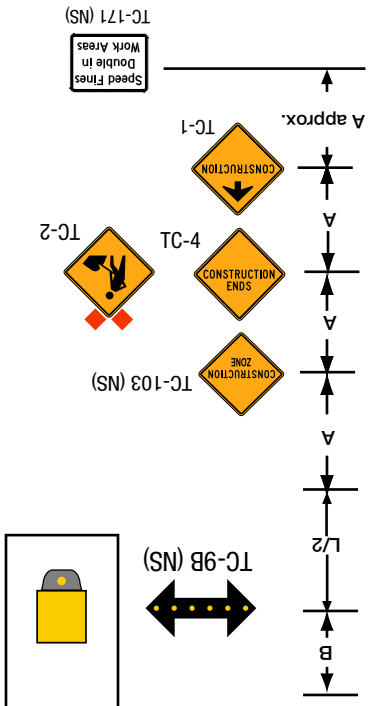
• The approach transition taper may be omitted in speed zones of 60 km/h or less

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

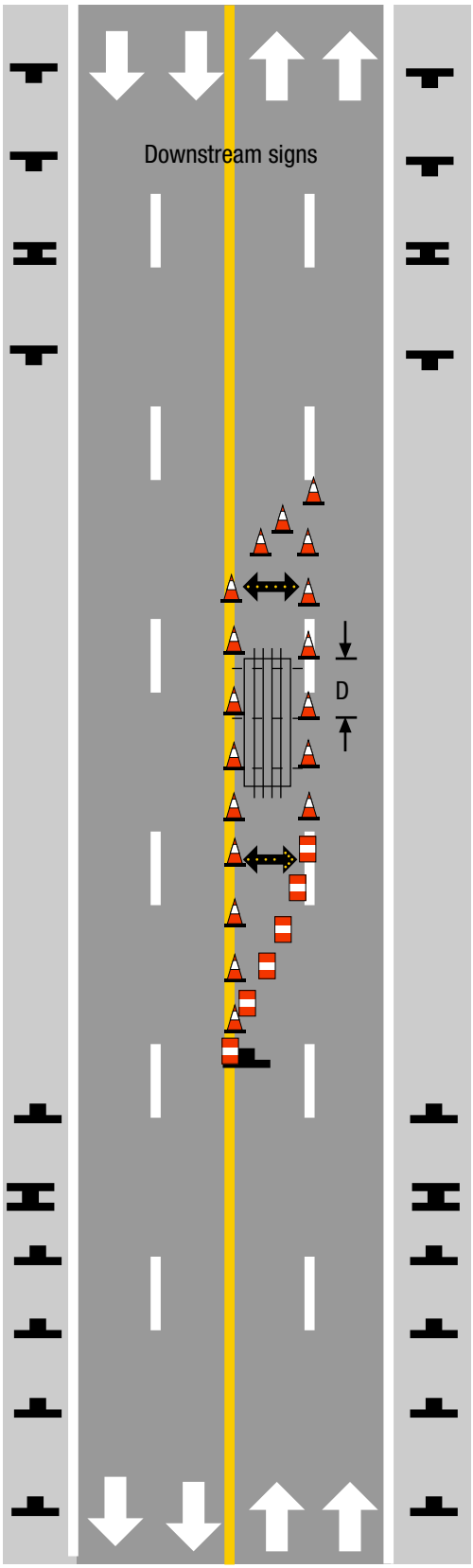
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

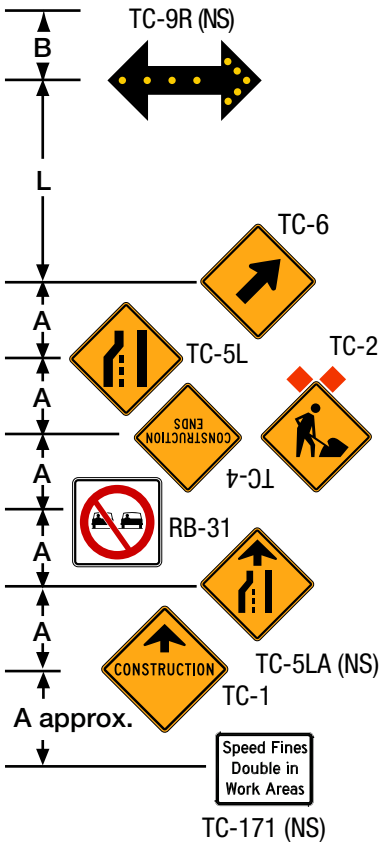
NOT TO SCALE



If road is undivided, has a solid yellow line (whether double or single), and a speed zone of 80 km/h or less, a Service Vehicle with a 360° flashing amber light may replace the downstream FLU



- On a two-way Multi-Lane undivided Street with a speed zone 50 km/h double posting is not required
- If road is divided, downstream signs (except TC-4), the Termination Taper FLU, the Termination Taper, and the cones along the shoulder may be omitted
- The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area

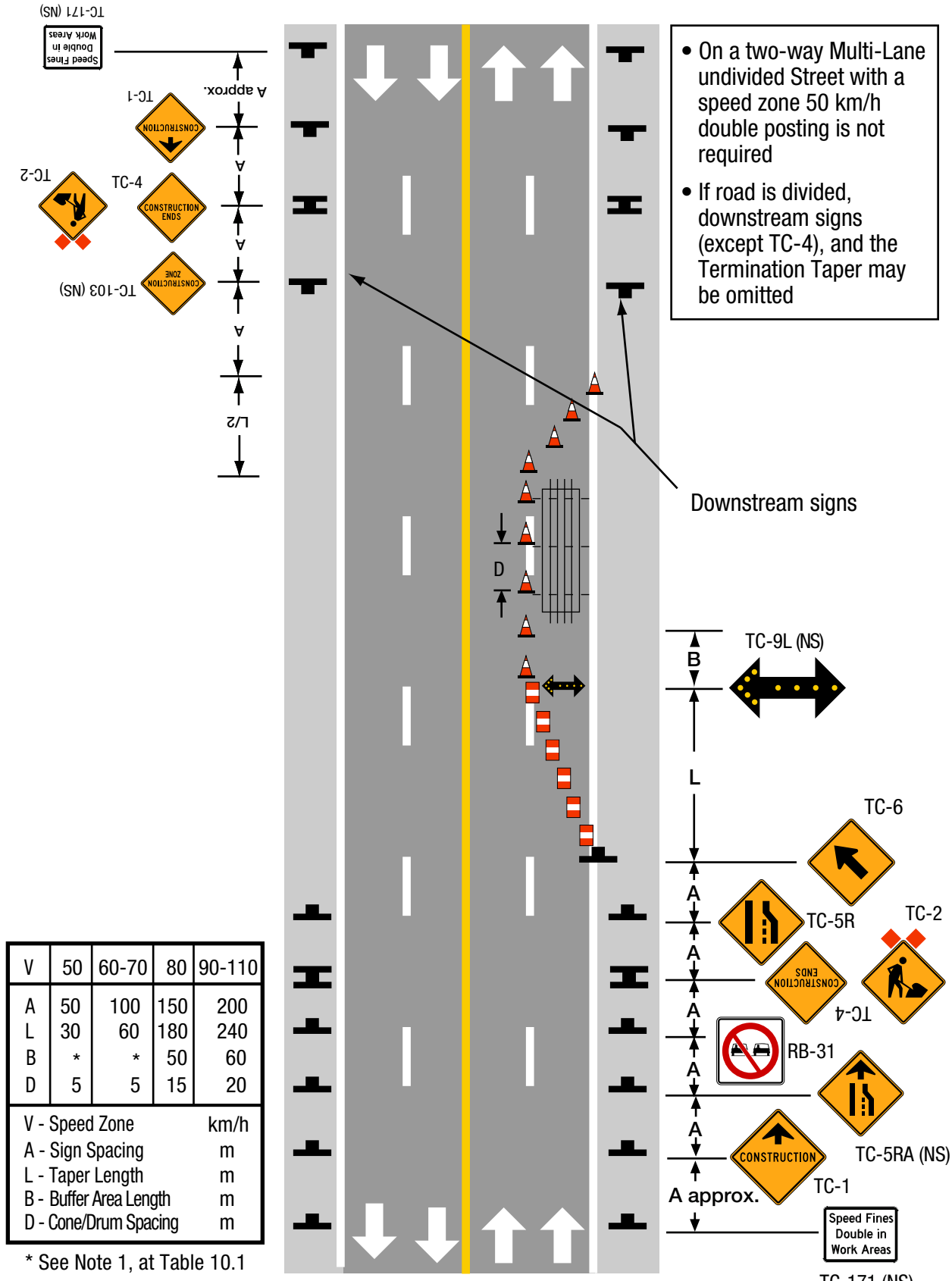


V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012

- Signs and devices in Application Guide A 64D must be blended with those from a Guide appropriate for the lane closure, such as A 45, A 47, A 62R, A 63R, or A 68

Use the downstream signs and devices from the Application Guide used to close the lane

Delineator standards on through section of road set by lane closure Application Guide, except as noted below

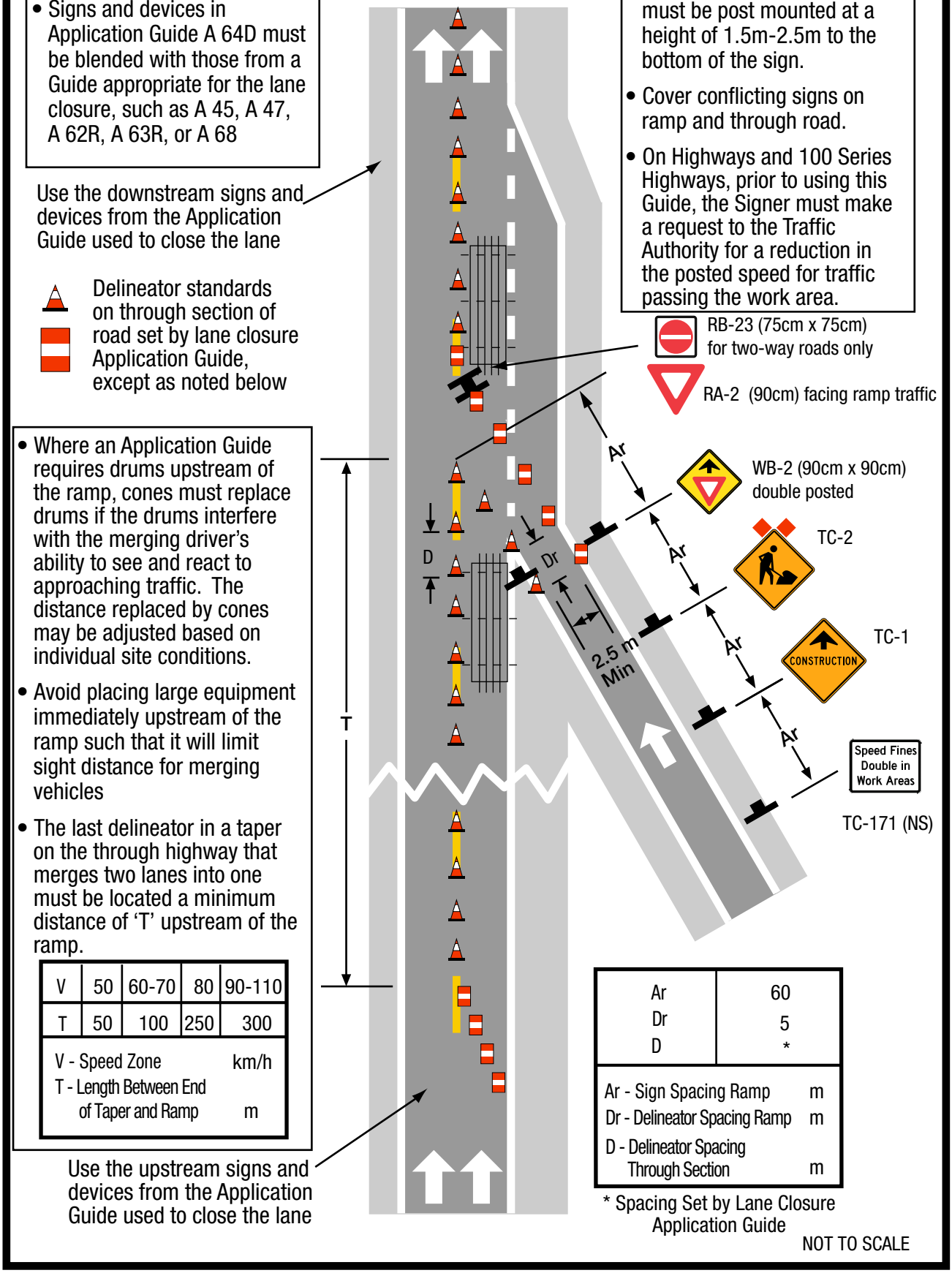
- Where an Application Guide requires drums upstream of the ramp, cones must replace drums if the drums interfere with the merging driver's ability to see and react to approaching traffic. The distance replaced by cones may be adjusted based on individual site conditions.
- Avoid placing large equipment immediately upstream of the ramp such that it will limit sight distance for merging vehicles
- The last delineator in a taper on the through highway that merges two lanes into one must be located a minimum distance of 'T' upstream of the ramp.

V	50	60-70	80	90-110
T	50	100	250	300

V - Speed Zone km/h
T - Length Between End of Taper and Ramp m

Use the upstream signs and devices from the Application Guide used to close the lane

- RA-2/RB-23 and WB-2 signs must be post mounted at a height of 1.5m-2.5m to the bottom of the sign.
- Cover conflicting signs on ramp and through road.
- On Highways and 100 Series Highways, prior to using this Guide, the Signer must make a request to the Traffic Authority for a reduction in the posted speed for traffic passing the work area.



Ar	60
Dr	5
D	*

Ar - Sign Spacing Ramp m
Dr - Delineator Spacing Ramp m
D - Delineator Spacing Through Section m

* Spacing Set by Lane Closure Application Guide

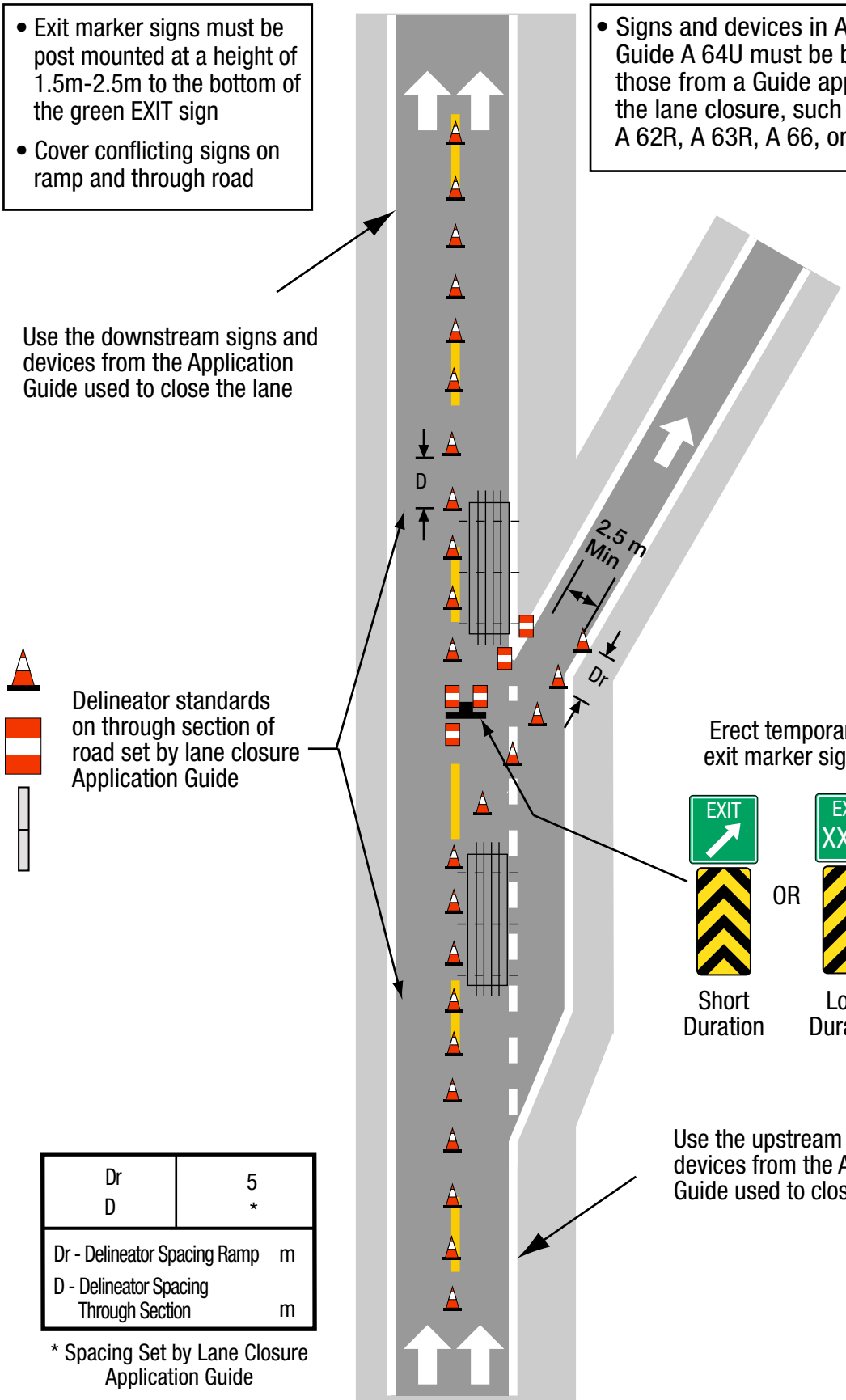
NOT TO SCALE

New: 2012

- Exit marker signs must be post mounted at a height of 1.5m-2.5m to the bottom of the green EXIT sign
- Cover conflicting signs on ramp and through road

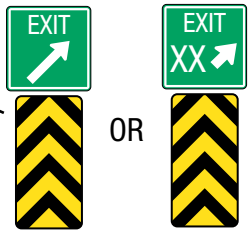
- Signs and devices in Application Guide A 64U must be blended with those from a Guide appropriate for the lane closure, such as A 45, A 47, A 62R, A 63R, A 66, or A 68

Use the downstream signs and devices from the Application Guide used to close the lane



Delineator standards on through section of road set by lane closure Application Guide

Erect temporary exit marker signs



OR

Short Duration

Long Duration

Use the upstream signs and devices from the Application Guide used to close the lane

Dr D	5 *
Dr - Delineator Spacing Ramp	m
D - Delineator Spacing Through Section	m

* Spacing Set by Lane Closure Application Guide

NOT TO SCALE

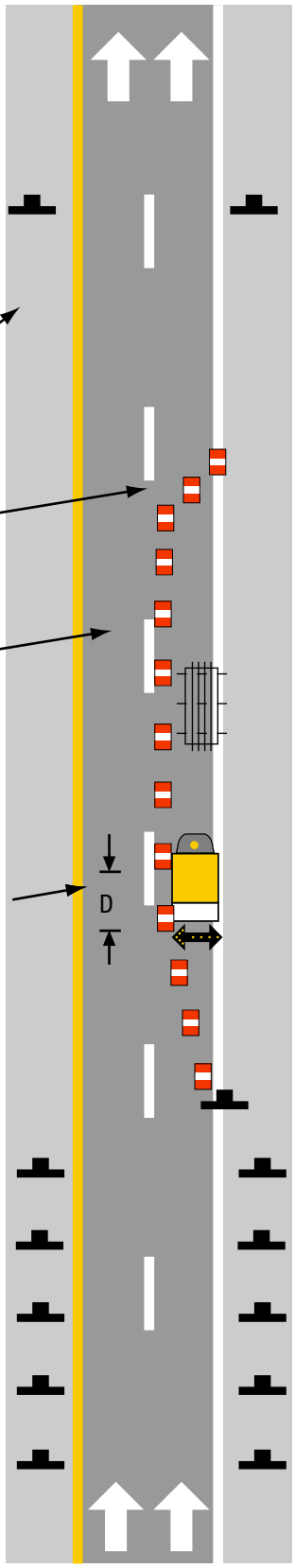
New: 2012

- These Application Guide standards apply only when the Work Area is contained completely on or under a bridge, or as described in Application Guide A 66
- If applicable these standards must be adapted for use with Application Guides A 35, 36, 37, 45, 46, 47, 48, 63, or 68

Downstream signing as per Application Guide A 35, 36, 37, 45, 46, 47, 48, 63, or 68 as applicable

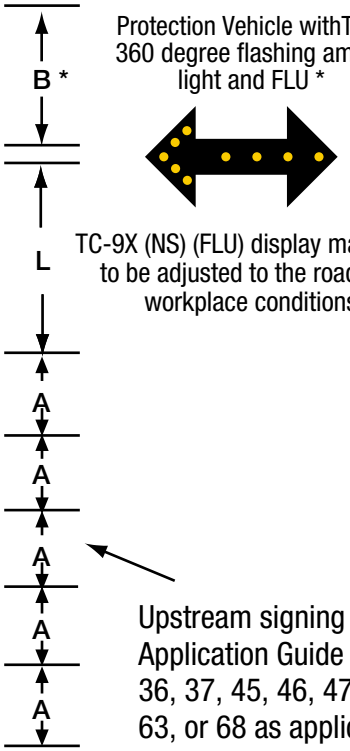
If a Termination Taper is required drums replace cones

Drums replace cones along the edge of the Buffer and Work Area



- These standards apply only if workers are on Elevated Work Platforms, or they have no escape route. They do not apply where the speed zone is 50 km/h
- If work (Elevated Work Platform, etc) is within 2.0 m of lane line, subject to Traffic Authority approval, drums may be positioned 1.0 m over the lane line
- When an Elevated Work Platform is used the Protection Vehicle must encroach into the closed travel lane a distance at least equal to the encroachment of the Platform
- If the structure clearance is reduced to less than 4.5 m, Low Clearance WA-26 and WA-27 signs must be erected

* Protection Vehicle with TMA, FLU and 360 degree flashing amber light must be used at Approach Transition Taper / Buffer Area where drivers are required to make a lateral lane change unless the Work Area is seperated from the Approach Transition Taper. In these cases, position a Flashing Light Unit at the Approach Transition Taper and the Protection Vehicle with TMA at the optimal location in advance of workers, but at a distance of not less than "B" value. The Protection Vehicle at the stationary location downstream of a FLU need not display a second FLU unless there is another lateral lane change



Protection Vehicle withTMA 360 degree flashing amber light and FLU *

TC-9X (NS) (FLU) display may need to be adjusted to the road and workplace conditions

Upstream signing as per Application Guide A 35, 36, 37, 45, 46, 47, 48, 63, or 68 as applicable

V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

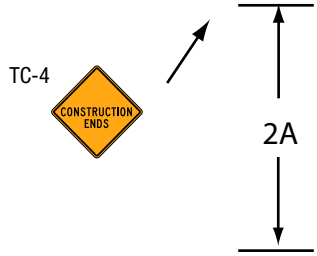
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012

Note: A critical hazard is one that, if struck, there would be a reasonable expectation of death, serious injury, or substantial property damage

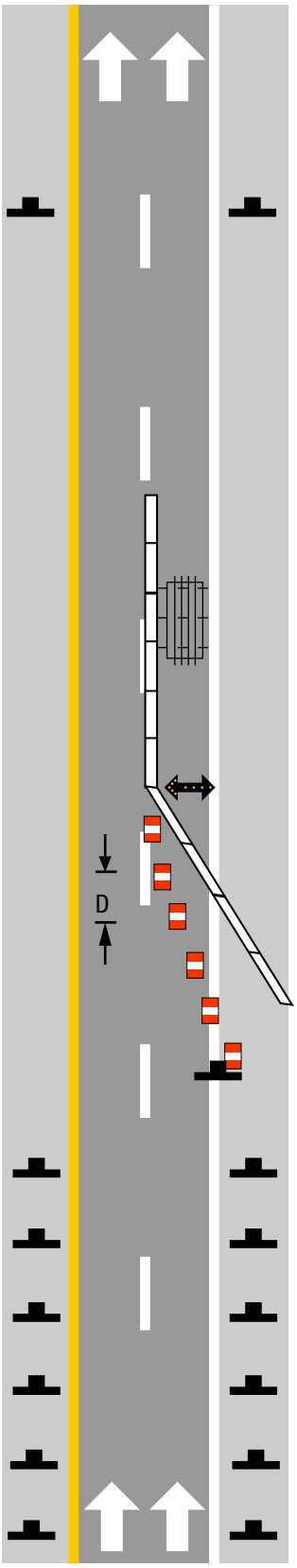


- Where barriers are excused, drums must be used to delineate the Buffer, Work and Termination Area (if any Termination Taper required)
- Where the Work Area is in the left lane of an undivided road:
  - Adapt downstream signing and termination taper from Application Guide A 63 L
  - Place a FLU in bar mode by the Termination Taper
- If work is within 1.0 m of lane line, subject to Traffic Authority approval, barriers may be positioned 1.0 m over the lane line
- If a structure clearance is reduced to less than 4.5 m, Low Clearance WA-26 and WA-27 signs must be erected

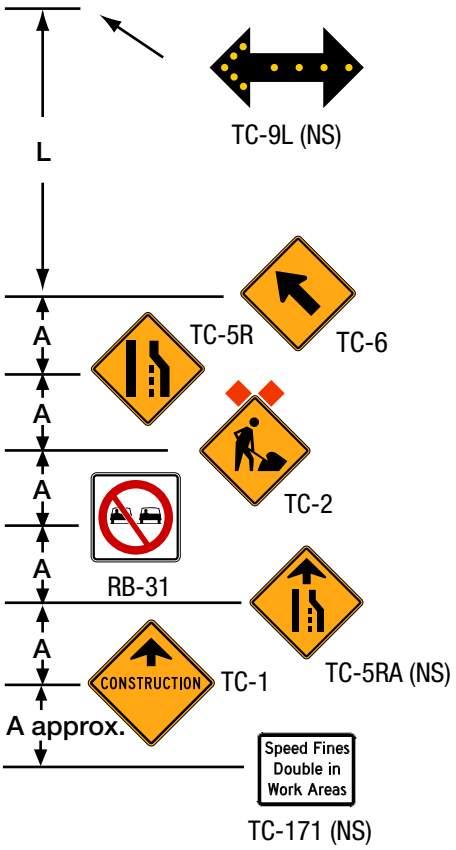
V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

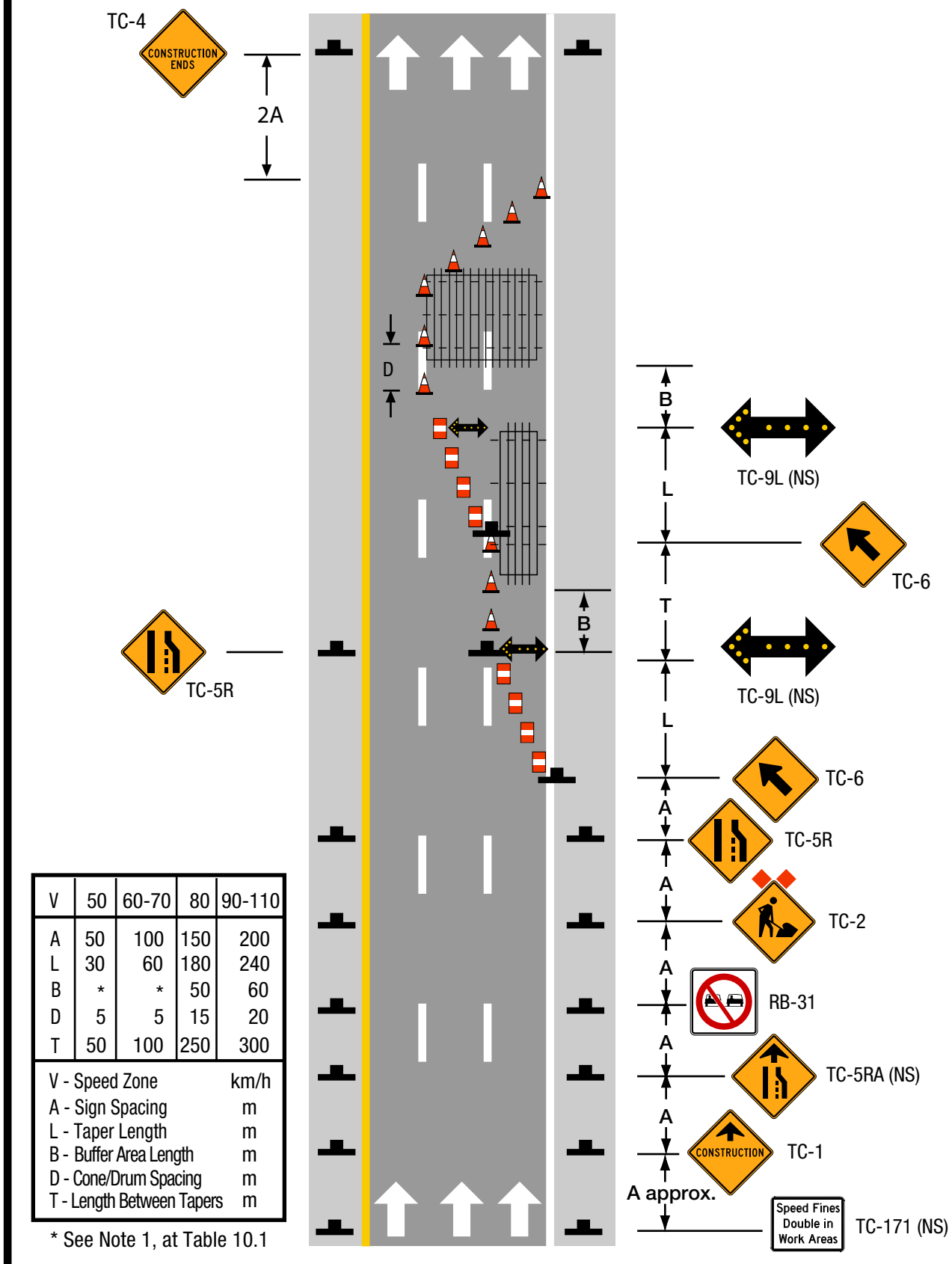
* See Note 1, at Table 10.1



- Barrier is only needed:
  - If workers are on an Elevated Work Platform, or
  - If the Work Area is in the left lane of an undivided road. Enclose the entire Work Area in F-shape Barriers, or
  - If work is incomplete after a 24 h period at a location with no escape route e.g. work > 24h beside a cliff or > 24 h on or under a bridge, etc, or
  - If workers are not present behind the barrier but there is a critical hazard within the roadway that motorists should be protected from
- If the location(s) that require(s) barrier is within a longer work area, it is permissible to install the barriers (including barrier taper) only at the location(s) requiring the barrier protection
- Unless prohibited by the road configuration or type of work, where work is done for more than 30 min but less than 24 h at a location that has no escape route, Guide A 65 TMA standards apply



NOT TO SCALE

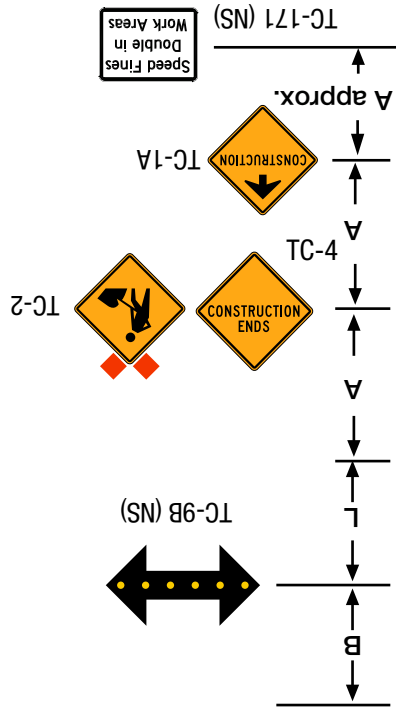


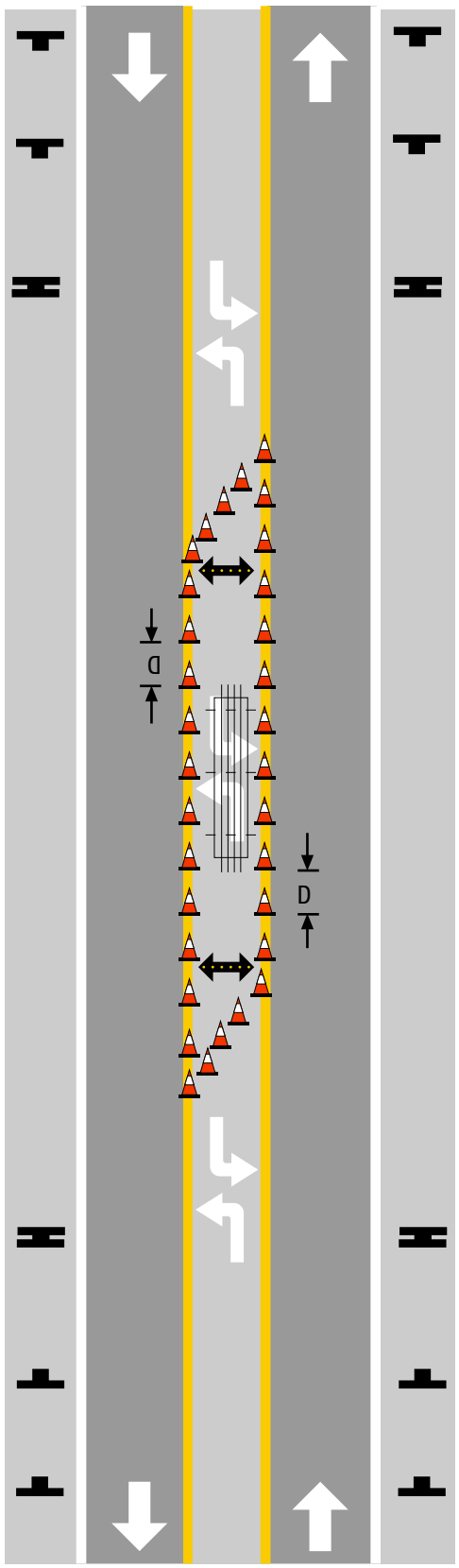
V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20
T	50	100	250	300

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m
T - Length Between Tapers	m

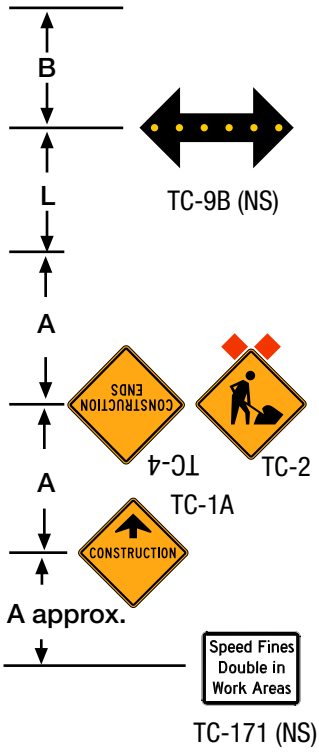
* See Note 1, at Table 10.1

NOT TO SCALE





- The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area
- Double posting is not required if the speed zone is 50 km/h



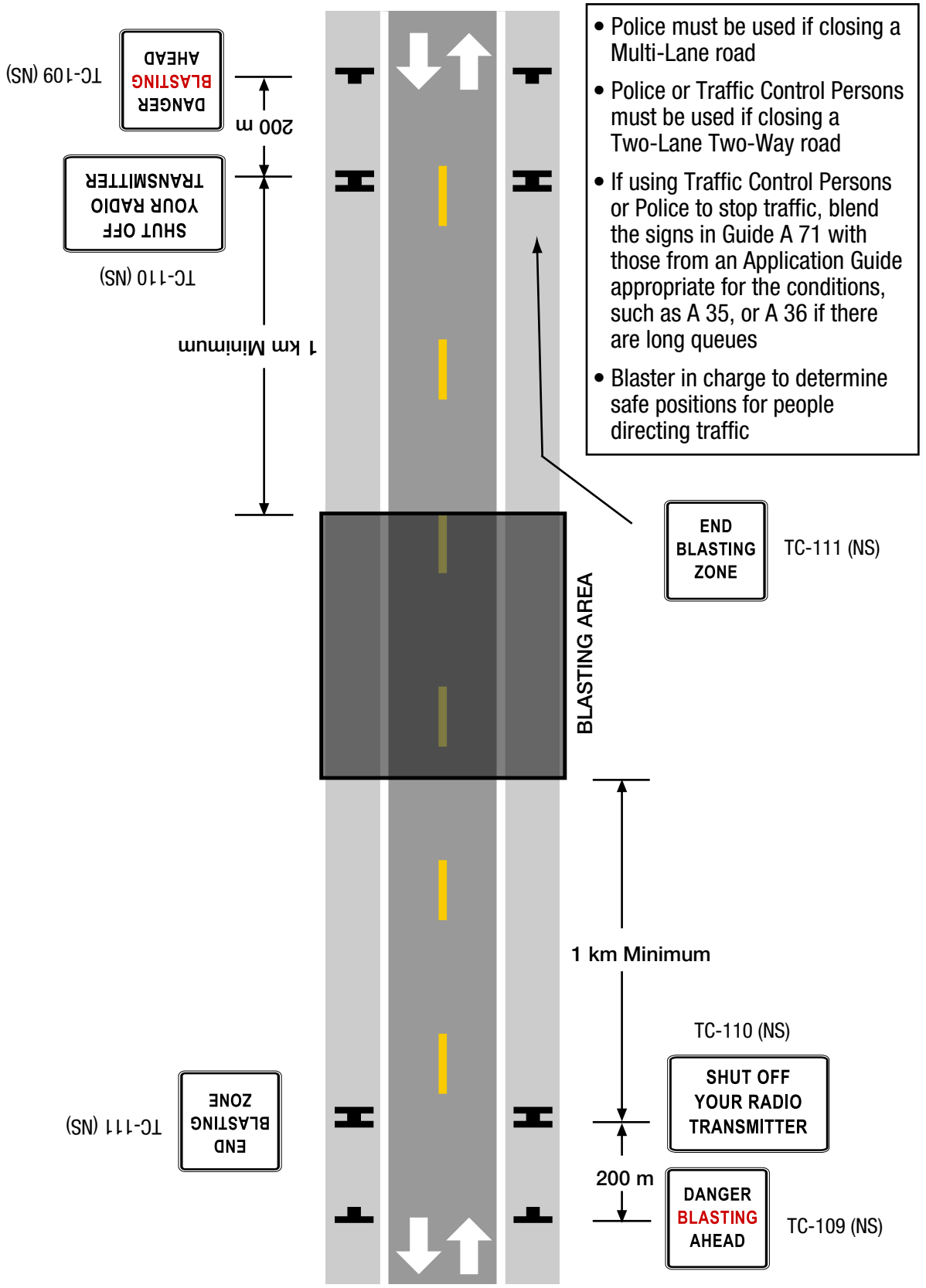
V	50	60-70	80	90-110
A	50	100	150	200
L	30	60	180	240
B	*	*	50	60
D	5	5	15	20

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

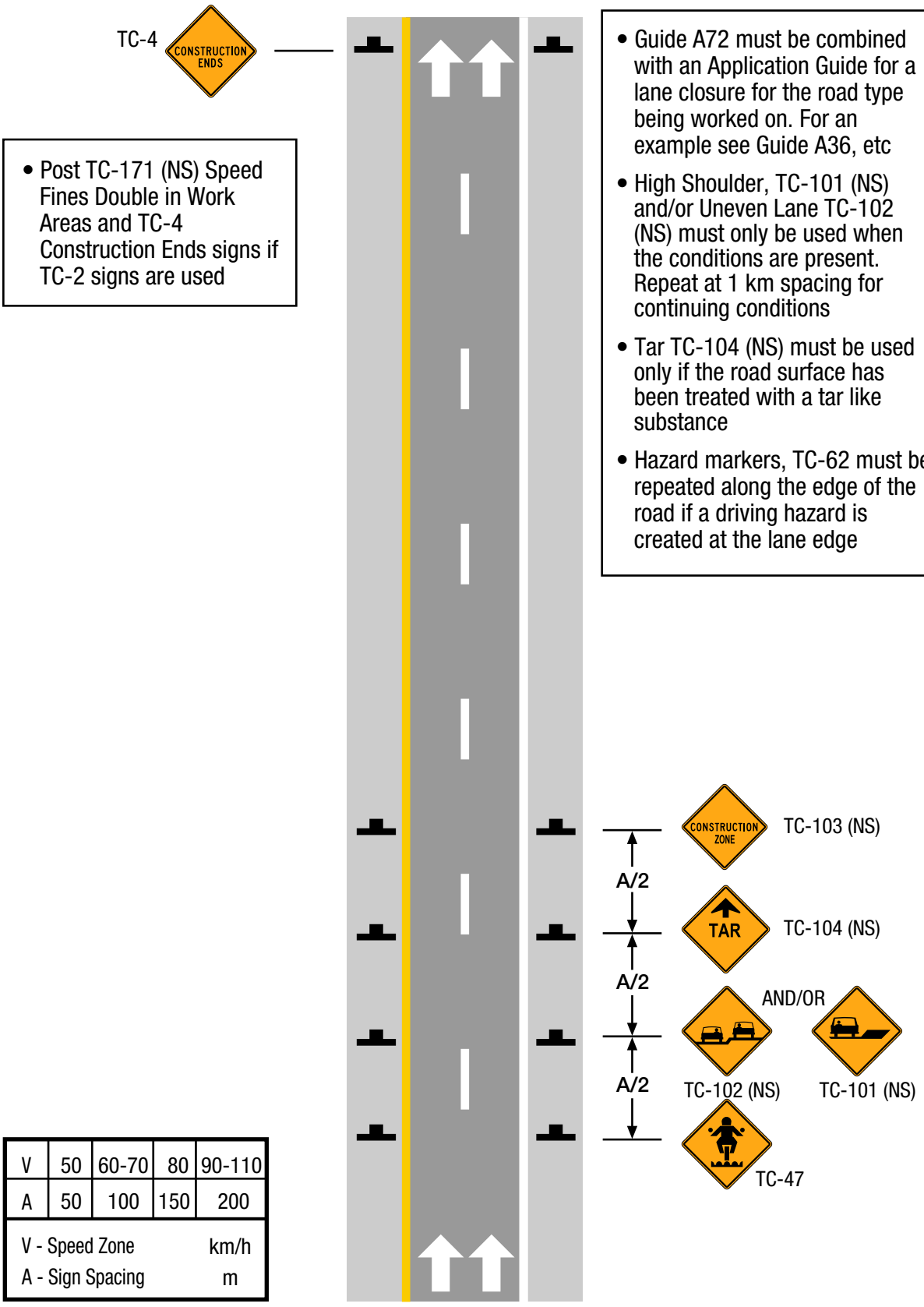
NOT TO SCALE

New: 2012



- Police must be used if closing a Multi-Lane road
- Police or Traffic Control Persons must be used if closing a Two-Lane Two-Way road
- If using Traffic Control Persons or Police to stop traffic, blend the signs in Guide A 71 with those from an Application Guide appropriate for the conditions, such as A 35, or A 36 if there are long queues
- Blaster in charge to determine safe positions for people directing traffic

NOT TO SCALE



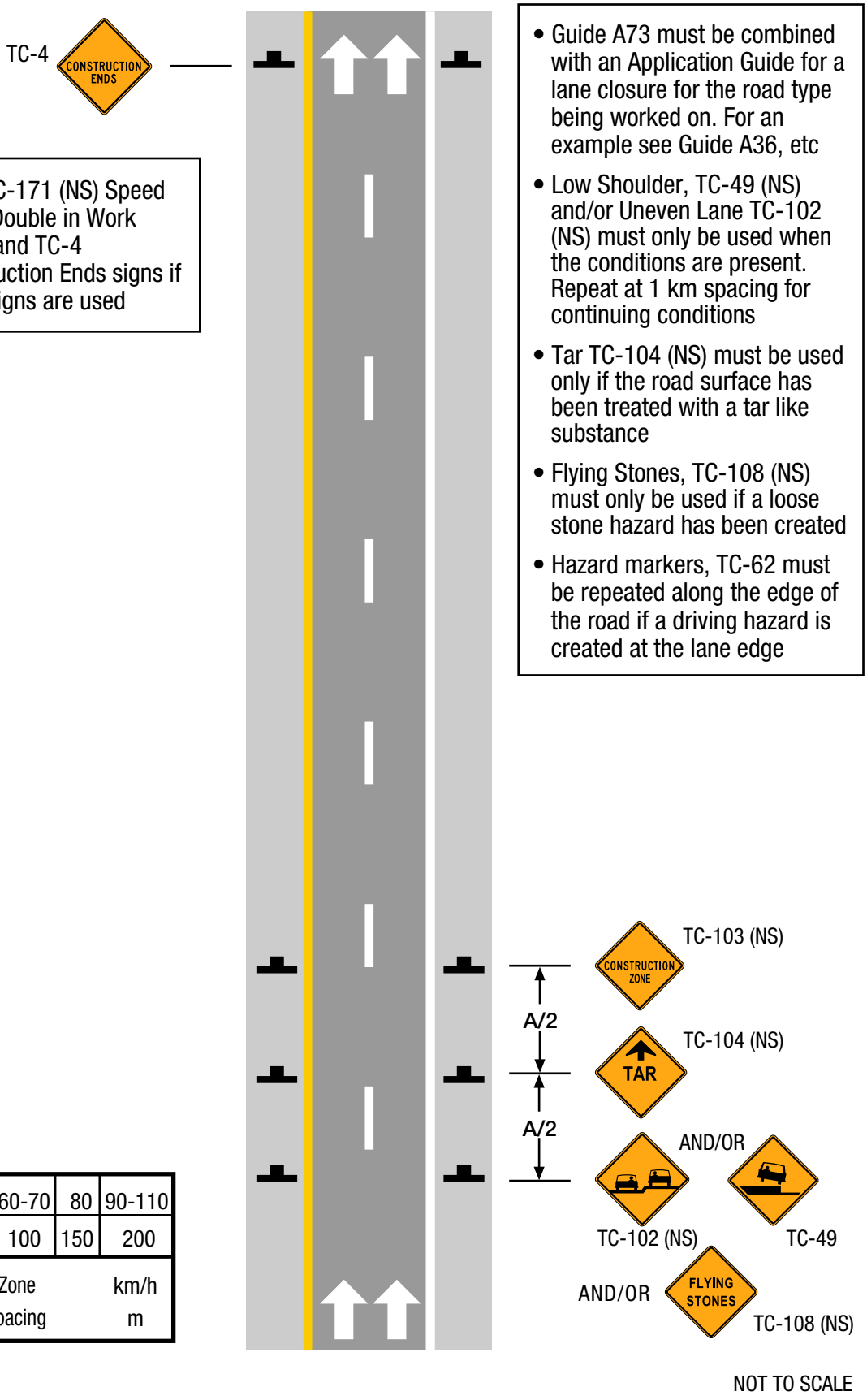
- Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends signs if TC-2 signs are used

- Guide A72 must be combined with an Application Guide for a lane closure for the road type being worked on. For an example see Guide A36, etc
- High Shoulder, TC-101 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
- Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
- Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge

V	50	60-70	80	90-110
A	50	100	150	200

V - Speed Zone km/h
A - Sign Spacing m

NOT TO SCALE

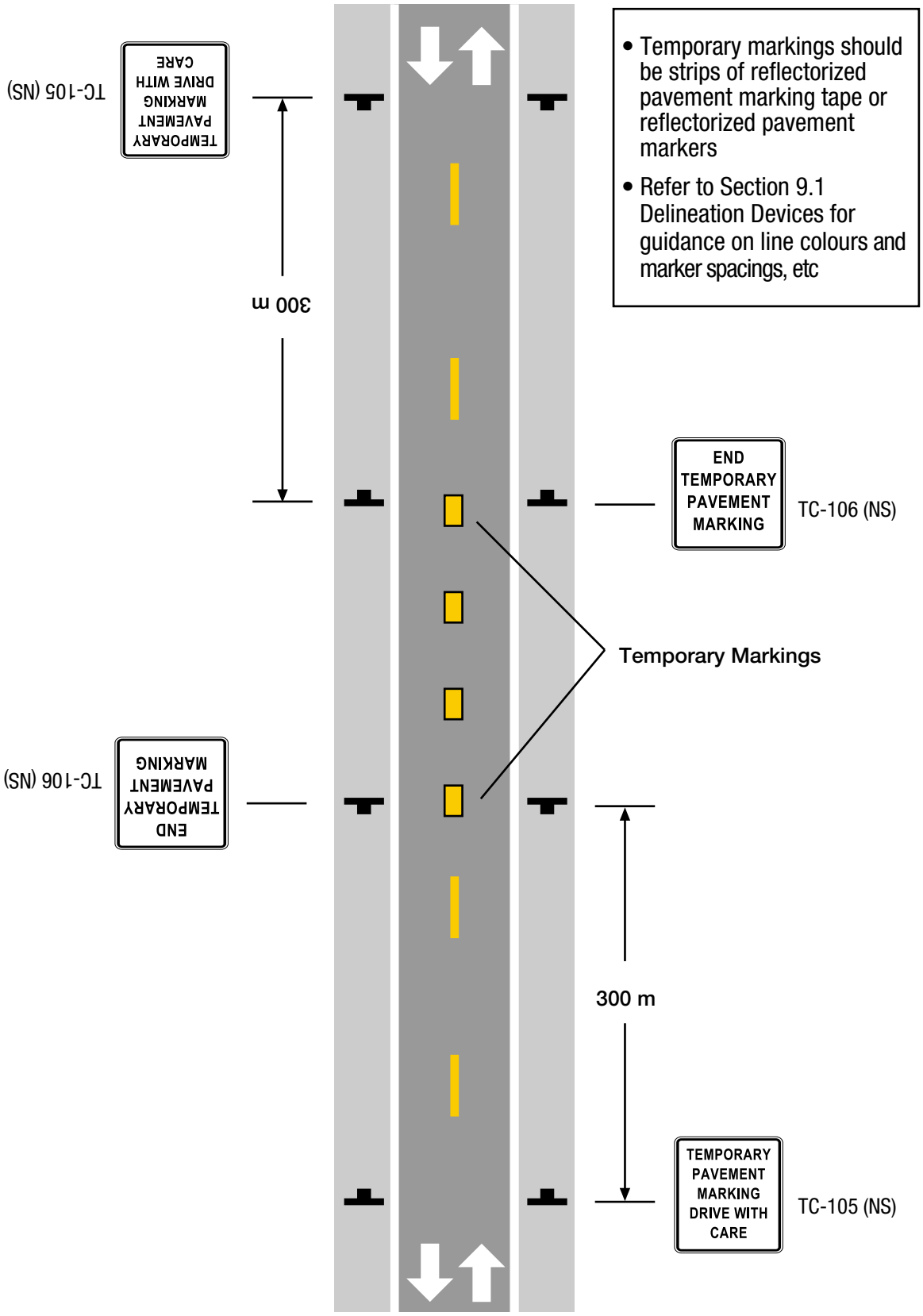


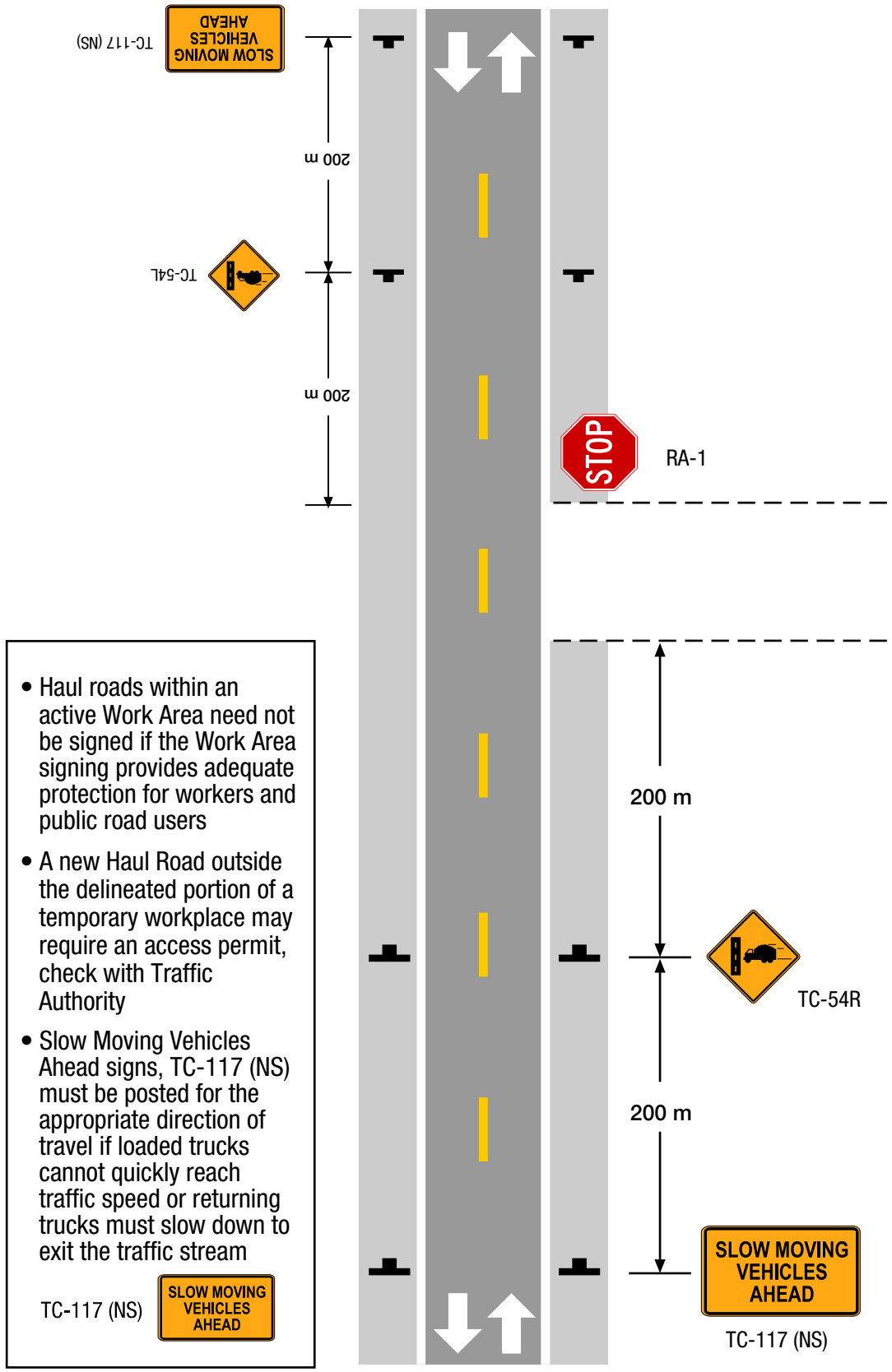
- Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends signs if TC-2 signs are used

- Guide A73 must be combined with an Application Guide for a lane closure for the road type being worked on. For an example see Guide A36, etc
- Low Shoulder, TC-49 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
- Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
- Flying Stones, TC-108 (NS) must only be used if a loose stone hazard has been created
- Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge

V	50	60-70	80	90-110
A	50	100	150	200

V - Speed Zone km/h
A - Sign Spacing m


• Temporary markings should be strips of reflectorized pavement marking tape or reflectorized pavement markers
• Refer to Section 9.1 Delineation Devices for guidance on line colours and marker spacings, etc
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
Temporary Markings
300 m
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
300 m
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
NOT TO SCALE



- Haul roads within an active Work Area need not be signed if the Work Area signing provides adequate protection for workers and public road users
- A new Haul Road outside the delineated portion of a temporary workplace may require an access permit, check with Traffic Authority
- Slow Moving Vehicles Ahead signs, TC-117 (NS) must be posted for the appropriate direction of travel if loaded trucks cannot quickly reach traffic speed or returning trucks must slow down to exit the traffic stream

TC-117 (NS)

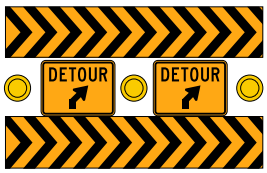
SLOW MOVING VEHICLES AHEAD

NOT TO SCALE

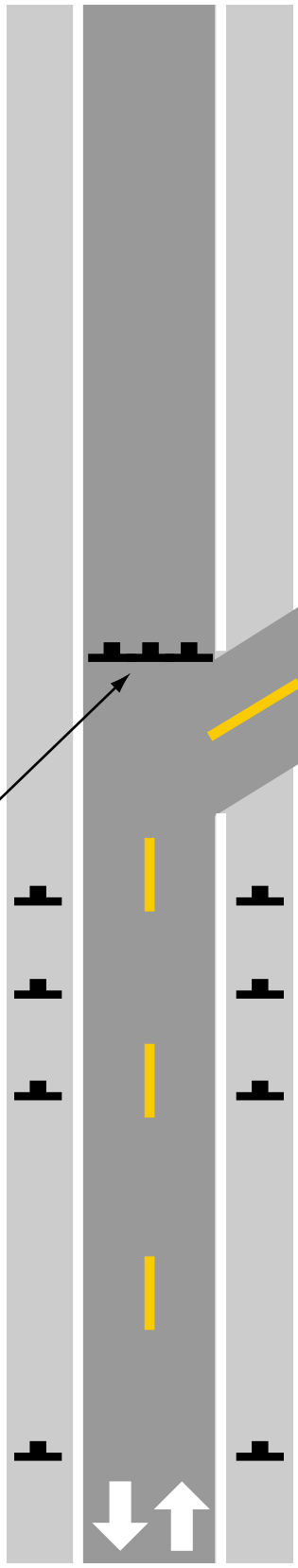
New: 2012

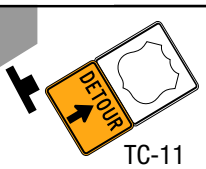
- The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination (see Guide C77 for an example)
- The detour must accommodate the size (length, width, height) and weight of vehicles detoured; turning movements for trucks must be checked
- Use the TC-11 (detour sign) with the arrow angle best matched to the road conditions
- See Municipal Barricade text at Section 9.4 for alternative barrier standards
- See Temporary Road Standards text at Section 7.0 for guidance on designing temporary roadways

- Curve warning sign with appropriate speed tab to be posted if required as determined by Traffic Authority
- Where traffic is moved from a multi-lane road to a road with less lanes, reduce the number of lanes within the multi-lane section to balance the number of lanes provided by the detour
- Detour should be signed with appropriate guide signs
- Detour must be signed with appropriate warning and regulatory signs
- Traffic Authority must be consulted prior to establishment of a detour

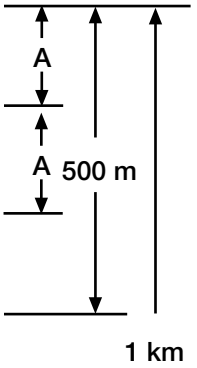


TC-64C
Heavy Barricade
(Directional)





TC-11



TC-27R

TC-11R45 (NS)

TC-10

TC-10A

V	50	60-70	80	90-110
A	50	100	150	200

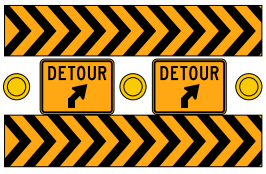
V - Speed Zone km/h
A - Sign Spacing m

NOT TO SCALE

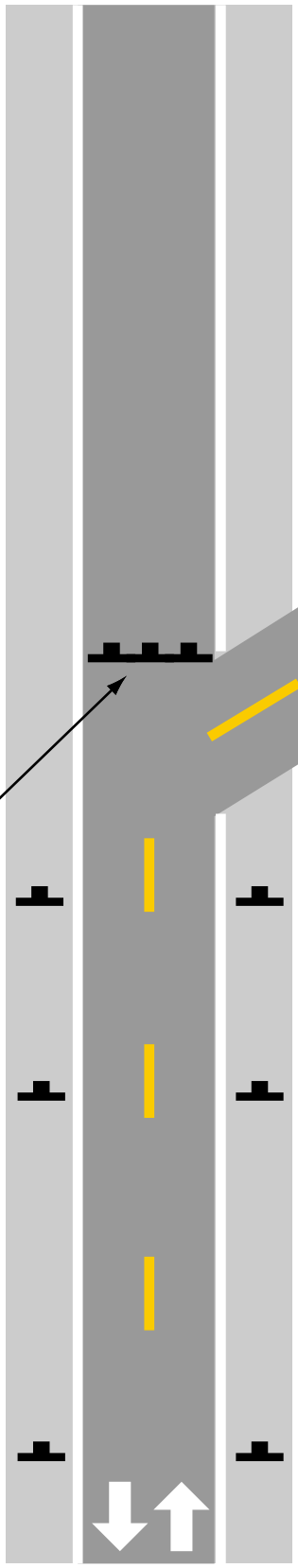
New: 2012

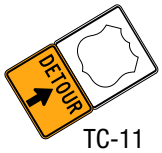
- The temporary connector must accommodate the size (length, width, height) and weight of vehicles detoured; turning movements for trucks must be checked
- See Municipal Barricade text at Section 9.4 for alternative barrier standards
- Use the TC-11 (detour sign) with the arrow angle best matched to the road conditions
- See Temporary Road Standards text at Section 7.0 for guidance on designing temporary roadways

- Where traffic is moved from a multi-lane road to a road with less lanes, reduce the number of lanes within the multi-lane section to balance the number of lanes provided by the temporary connector
- Temporary connectors should be signed with appropriate guide signs
- Temporary connectors must be signed with appropriate warning and regulatory signs

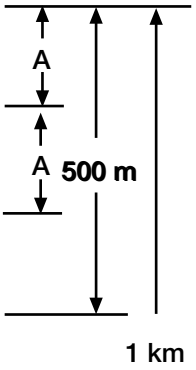


TC-64C
Heavy Barricade
(Directional)





TC-11

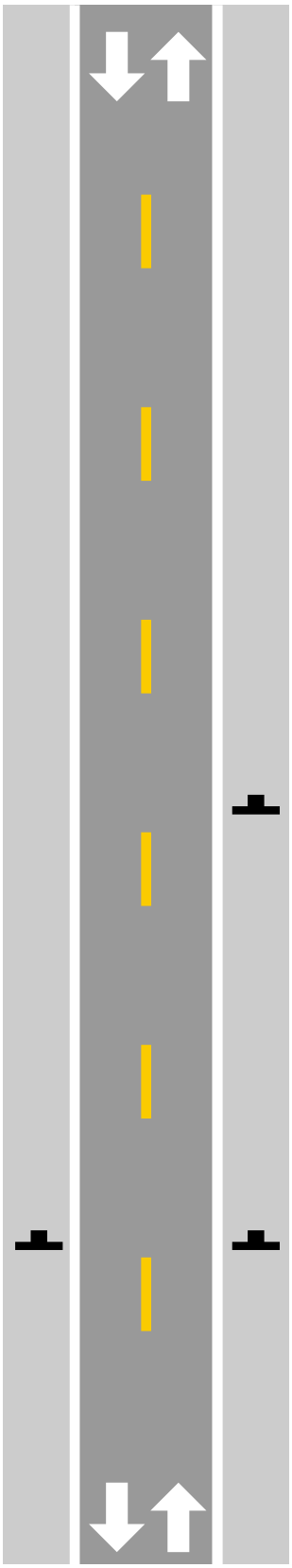


TC-11R45 (NS)

V	50	60-70	80	90-110
A	50	100	150	200

V - Speed Zone km/h
A - Sign Spacing m

NOT TO SCALE



- Low Shoulder TC-49 must be posted 200 m from the beginning of the low shoulder and must be repeated at 1 km spacing
- Hazard markers TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge. When Hazard Marker TC-62 is used:

- repeat 20 cm X 60 cm signs at 50 m intervals or repeat 30 cm X 90 cm signs at 100 m intervals
- reduce spacing of signs around short radius curves, drivers must see five signs

OR

TC-62

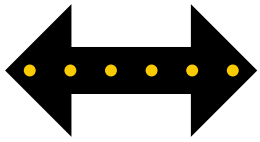
200 m

TC-49

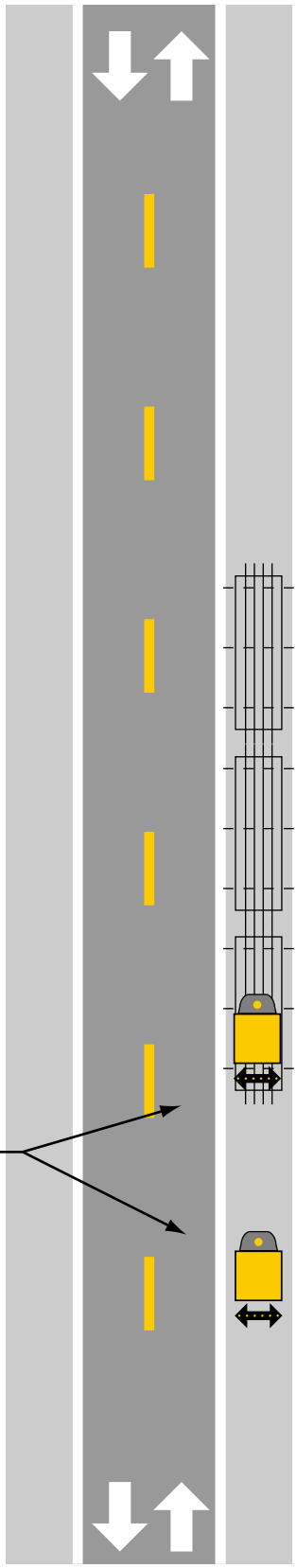
NOT TO SCALE

- This Application Guide must not be used to perform stationary work at a single location where work at that location will exceed 30 min. in duration
- On high speed high volume roads, consider using a Protection Vehicle instead of a Trail Vehicle, if one is readily available
- Where it is necessary to perform shoulder work on foot, short stops may be made and work performed downstream of the Work Vehicle
- The space between the workers on foot and the Work Vehicle must be maintained at approximately but not less than "B" value, and adjusted to maximize safety, taking into consideration traffic, and the road alignment

- No encroachment permitted on travel lane while work is performed
- Vehicles are not permitted to back up
- Where obstructions or conditions on the shoulder force vehicle encroachment onto the lane (slope, post, guardrail, etc.), work must stop while vehicles drive past the obstruction and must not start again until vehicles are completely off the travel lane
- The space between the work and trail vehicles must not be less than "B" value, but should be adjusted to maximize safety, taking into consideration traffic, and the road alignment



TC-9B (NS)



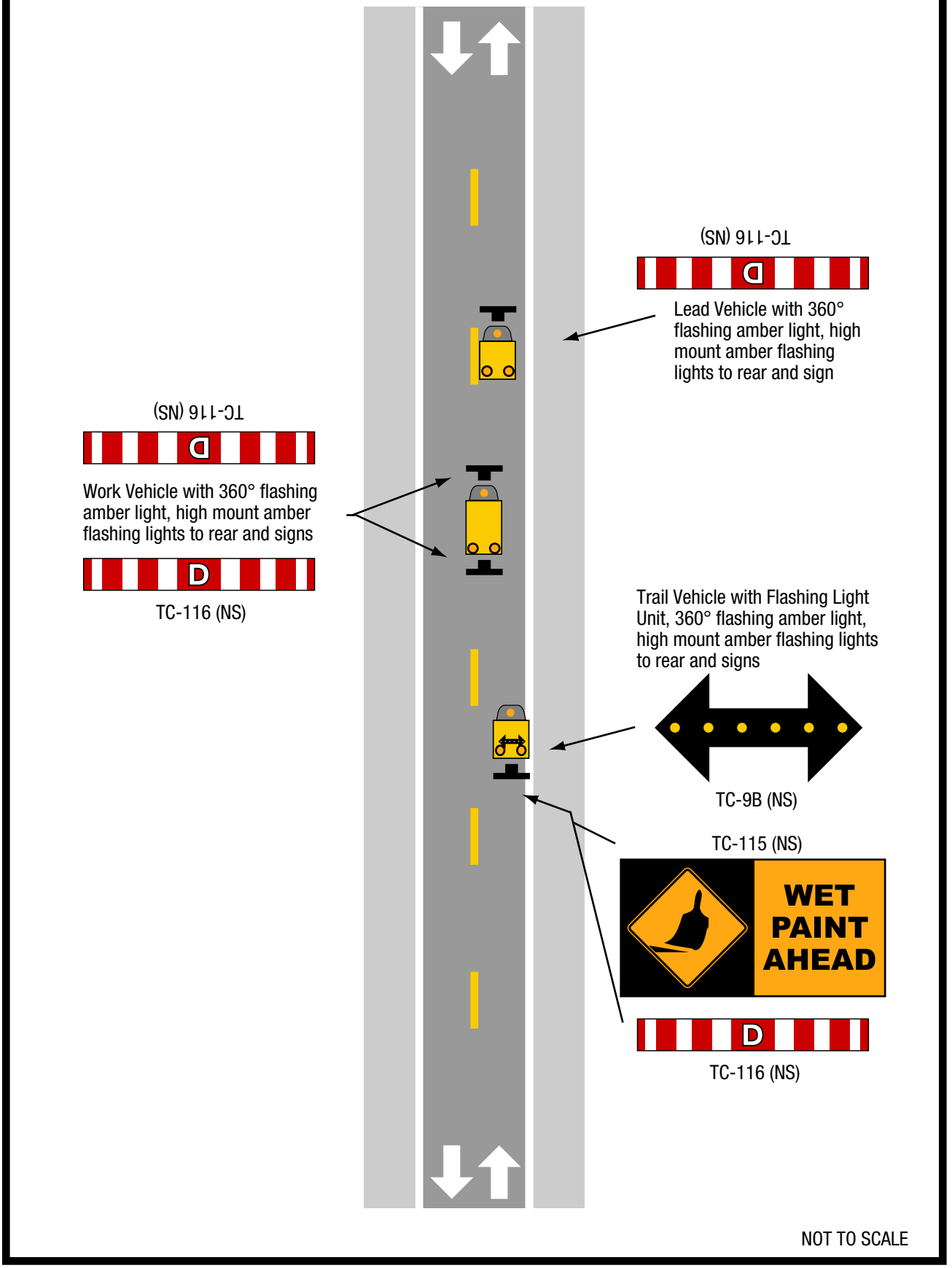
V	50	60-70	80	90-110
B	*	*	50	60

V - Speed Zone km/h
B - Buffer Area Length m

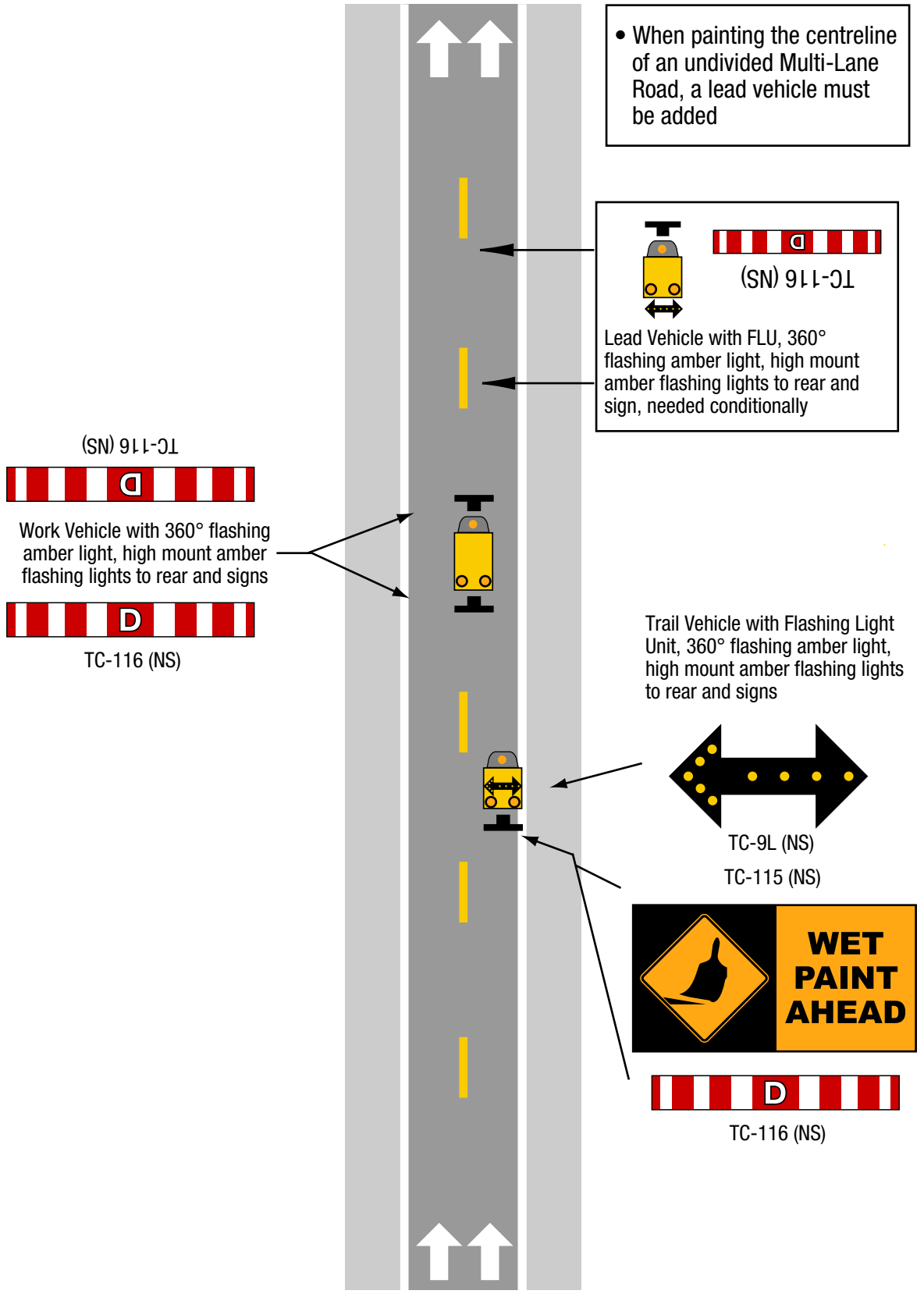
* See Note 1, at Table 10.1

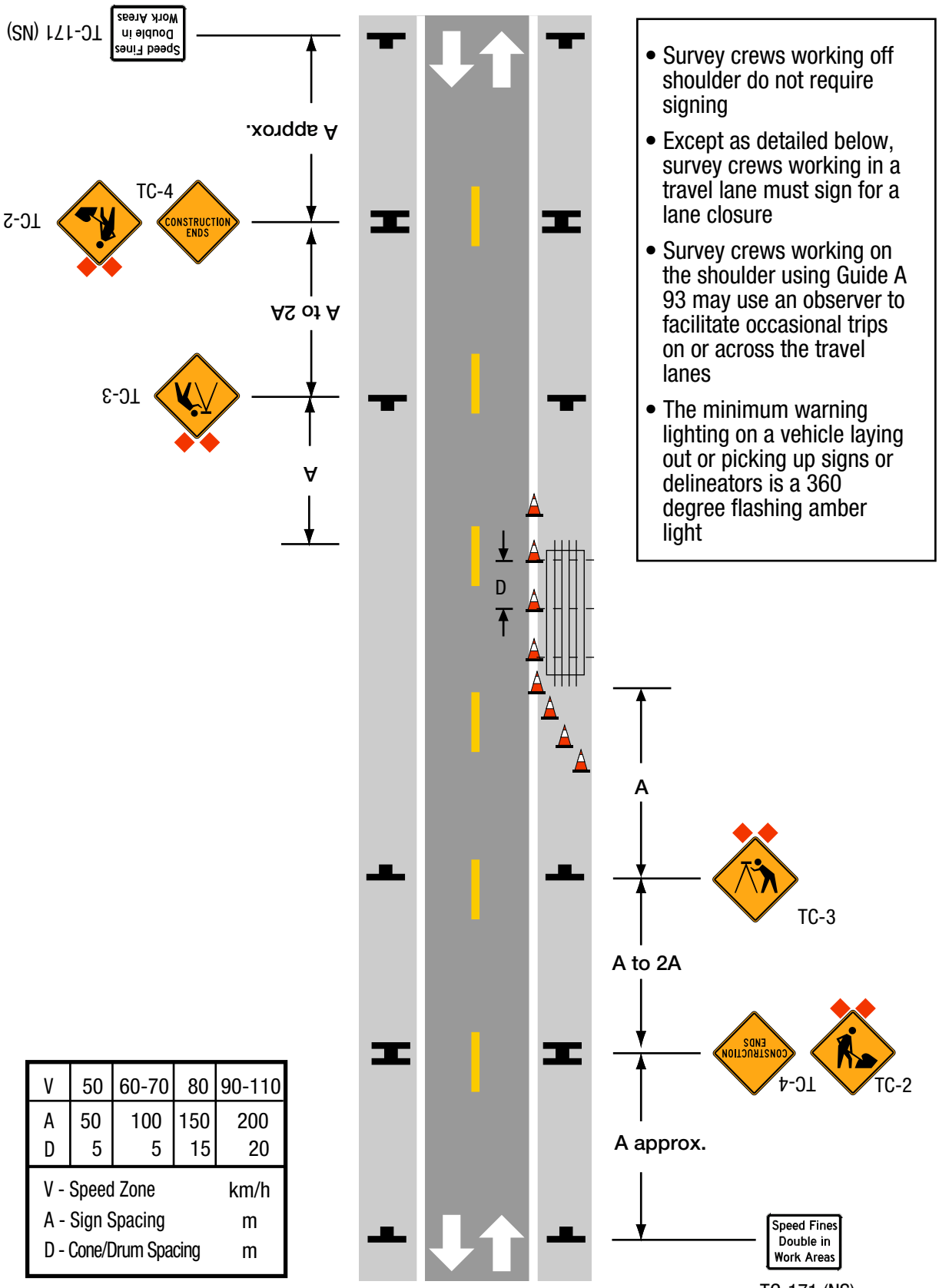
NOT TO SCALE

New: 2012


TC-116 (NS)
Lead Vehicle with 360° flashing amber light, high mount amber flashing lights to rear and sign
TC-116 (NS)
Work Vehicle with 360° flashing amber light, high mount amber flashing lights to rear and signs
TC-116 (NS)
Trail Vehicle with Flashing Light Unit, 360° flashing amber light, high mount amber flashing lights to rear and signs
TC-9B (NS)
TC-115 (NS)
WET PAINT AHEAD
TC-116 (NS)
NOT TO SCALE

New: 2012


• When painting the centreline of an undivided Multi-Lane Road, a lead vehicle must be added
D
TC-116 (NS)
Lead Vehicle with FLU, 360° flashing amber light, high mount amber flashing lights to rear and sign, needed conditionally
D
TC-116 (NS)
Work Vehicle with 360° flashing amber light, high mount amber flashing lights to rear and signs
D
TC-116 (NS)
Trail Vehicle with Flashing Light Unit, 360° flashing amber light, high mount amber flashing lights to rear and signs
TC-9L (NS)
TC-115 (NS)
WET PAINT AHEAD
D
TC-116 (NS)
NOT TO SCALE

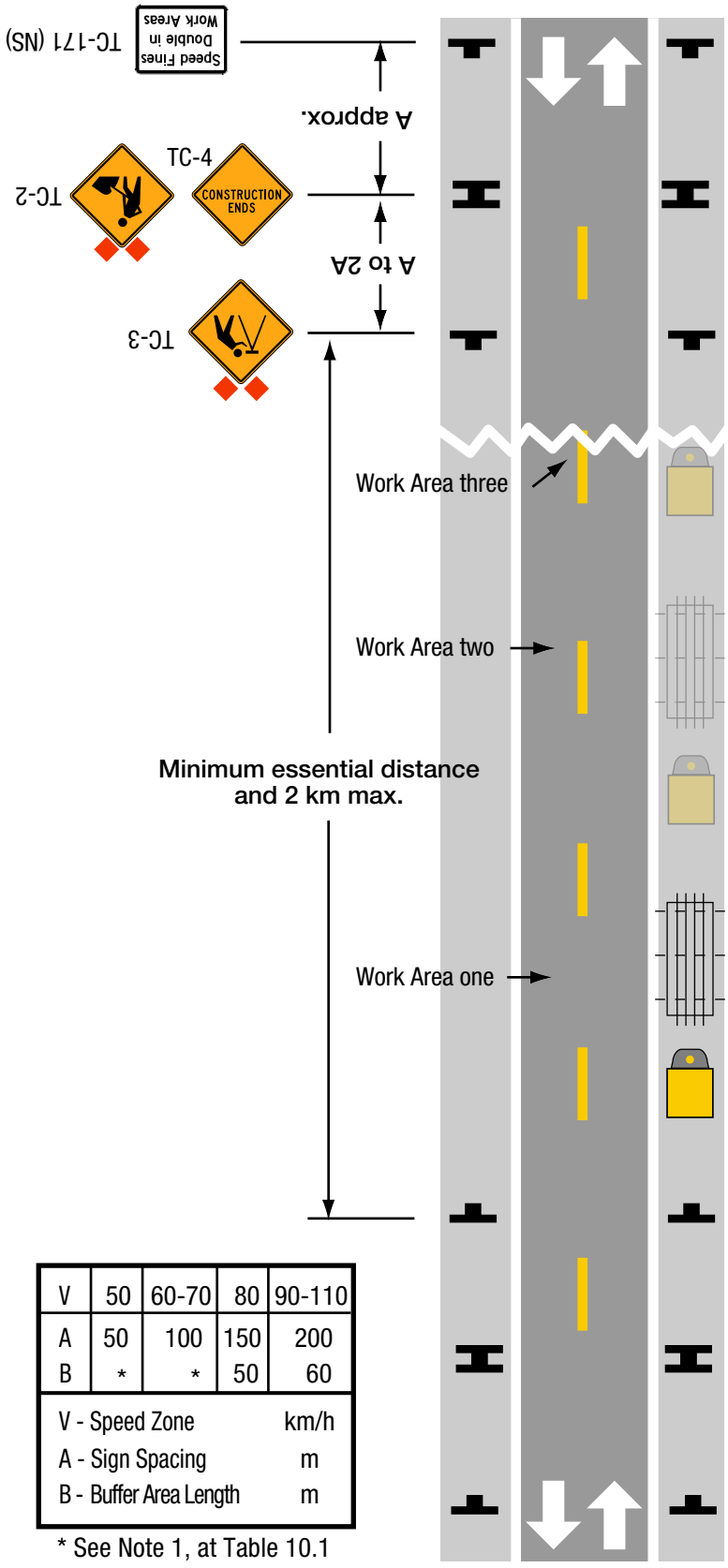


- Survey crews working off shoulder do not require signing
- Except as detailed below, survey crews working in a travel lane must sign for a lane closure
- Survey crews working on the shoulder using Guide A 93 may use an observer to facilitate occasional trips on or across the travel lanes
- The minimum warning lighting on a vehicle laying out or picking up signs or delineators is a 360 degree flashing amber light

V	50	60-70	80	90-110
A	50	100	150	200
D	5	5	15	20

V - Speed Zone km/h
A - Sign Spacing m
D - Cone/Drum Spacing m

NOT TO SCALE



- Except as described in Application Guides A, B, C 93, and A, B, C 94, survey crews working in a travel lane must sign for a partial lane closure or a lane closure, as applicable
- Survey crews working on the shoulder using Guide A 94 may use an observer to facilitate occasional trips on or across the travel lanes
- Vehicles used to support survey crews must not encroach onto the travel lane
- The space between the workers and Service Vehicle must be maintained at approximately but not less than "B" value, and adjusted to maximize safety, taking into consideration traffic, and the road alignment
- The minimum warning lighting on a vehicle laying out or picking up signs is a 360° flashing amber light

V	50	60-70	80	90-110
A	50	100	150	200
B	*	*	50	60

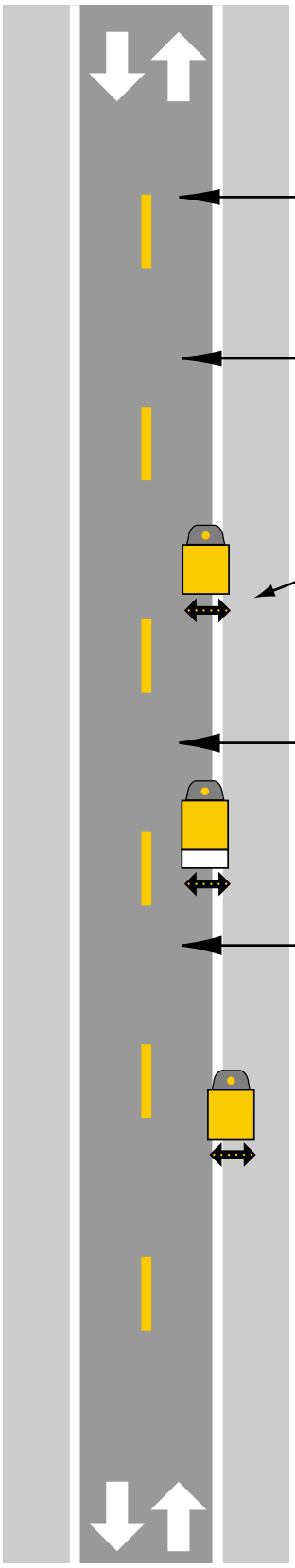
V - Speed Zone km/h
A - Sign Spacing m
B - Buffer Area Length m

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012

- Vehicles must not stop in travel lane
- Vehicles must not back up
- Trail vehicle to remain off the travel lane to the greatest extent practical
- Workers are not permitted on the travel lane on foot
- If a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3



Lead Vehicle with FLU, 360° flashing amber light, and sign, needed conditionally (see bullet list opposite)

TC-116 (NS)

Work Vehicle with 360° flashing amber light & FLU

TC-9B (NS)

- If speed zone 50 km/h this vehicle may be omitted
- If speed zone greater than 50 but not greater than 80 km/h, Protection Vehicle with 360 degree flashing amber light, TMA & FLU, or Blocker Vehicle with 360 degree flashing amber light & FLU
- If speed zone greater than 80 km/h, Protection Vehicle with TMA, 360 degree flashing amber light & FLU

Trail Vehicle with 360° flashing amber light, sign & FLU

TC-9B (NS)

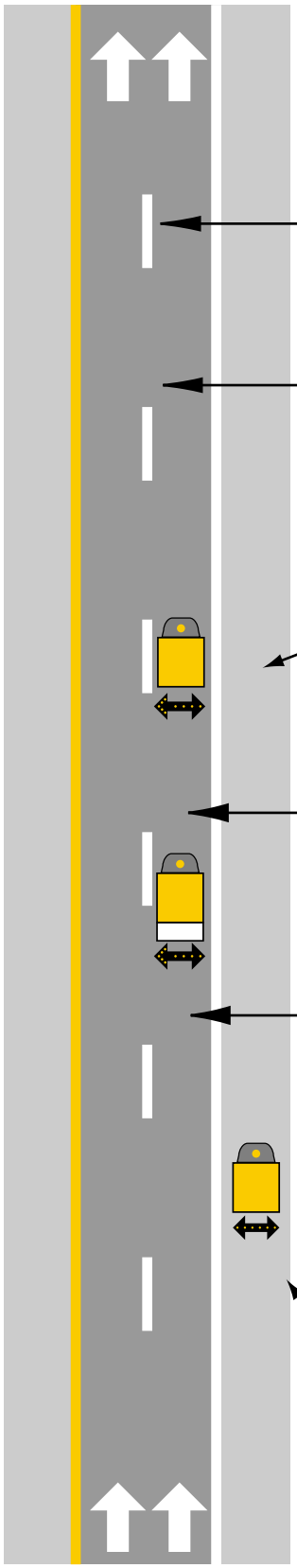
BE PREPARED TO STOP

TC-165 (NS)

(See Section 8, TC-165 (NS) entry and Section 13.3 Rule 1.6 for alternative sign standards)

NOT TO SCALE

- Vehicles must not stop in travel lane
- Vehicles must not back up
- Trail vehicle to remain off the travel lane to the greatest extent practical
- Workers are not permitted on the travel lane on foot
- Protection Vehicle must occupy same lane as Work Vehicle
- FLU on Protection Vehicle must flash left arrow or right arrow, as appropriate
- If a Work Vehicle must occupy more than one lane, add TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3
- If road is undivided and a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3



TC-116 (NS)

Lead Vehicle with FLU, 360° flashing amber light and sign, needed conditionally (see bullet list opposite)

Work Vehicle with 360° flashing amber light & FLU

TC-9L (NS)

- If speed zone 50 km/h this vehicle may be omitted
- If speed zone greater than 50 but not greater than 80 km/h, Protection Vehicle with 360 degree flashing amber light, TMA & FLU, or Blocker Vehicle with 360 degreee flashing amber light & FLU
- If speed zone greater than 80 km/h, Protection Vehicle with TMA, 360 degree flashing amber light & FLU

Trail Vehicle with 360° flashing amber light, sign & FLU

TC-9B (NS)

RIGHT LANE CLOSED AHEAD

TC-161R

NOT TO SCALE

"B" Application Guides for
Non 100 Series Two-Lane Two-Way Highways

Work Location	Work Duration	Highway Type (Special Conditions)	Guide
Off Shoulder Work	All Durations	Two-Way Two-Lane	B 1
Shoulder Work	Very Short Duration	Two-Way Two-Lane	B 12
Shoulder Work	Short Duration	Two-Way Two-Lane	B 13
Partial Lane Closure	Short Duration	Two-Way Two-Lane	B 22
Partial Lane Closure	Short Duration	Two-Way Two-Lane (Altered Centreline)	B 23
Lane Closed	Very Short Duration	Two-Way Two-Lane	B 33
Lane Closed	Short Duration	Two-Way Two-Lane (Low Volume)	B 34
Lane Closed	Short Duration	Two-Way Two-Lane (Day Work)	B 35
Lane Closed	Short Duration	Two-Way Two-Lane (Night Work or Long Queue)	B 37
Lane Closed	Short Duration	Two-Way (Altered Centreline)	B 48
Lane Closed	Long Duration	Two-Way Two-Lane (Traffic Control Signals)	B 51
Lane Closed	Long Duration	Two-Way Two-Lane (Traffic Control Persons & Bridges)	B 52
New: 2012 Lane Closed	Short Duration	Two-Way Two-Lane (On or Under a Bridge)	B 65

Signing Illustration	Work Duration	Highway Type	Guide
Blasting Warning	Short Duration	Two-Way Two-Lane	B 71
Planed Surface Condition	All Durations	Two-Way Two-Lane	B 72
Paving Surface Condition	All Durations	Two-Way Two-Lane	B 73
Temporary Markings	All Durations	Two-Way Two-Lane	B 74
Temporary Haul Road	All Durations	Two-Way Two-Lane	B 76
New: 2012 Detour	All Durations	Two-Way Two-Lane	B 77
Low Shoulder	Short or Long Duration	Two-Way Two-Lane	B 79
New: 2012 Road Closed (Barricade)	All Durations	Two-Way Two-Lane	B 80

Special Operations

Work Type	Work Duration	Highway Type (Special Conditions)	Guide
Shoulder Work	Mobile Short Stops	Two-Way Two-Lane	B 90
New: 2012 Line Painting	Mobile Continuous	Two-Way Two-Lane	B 91
Survey Crew	Short Duration	Two-Way Two-Lane	B 93
Survey Crew	Short Duration/Short Stops	Two-Way Two-Lane	B 94
Partial Lane Closure	Mobile Short Stops	Two-Way Two-Lane	B 95
New: 2012 Lane Closed	Mobile Continuous	Two-Way Two-Lane	B 96
Lane Closed	Mobile Continuous	Two-Way Two-Lane (Low Volume)	B 97

Legend of Symbols Used in Application Guides

New: 2012

Used to indicate the position of a single sign.

Used to indicate the position of two signs displayed back to back.

Used to indicate the position of a barricade.

Used to indicate red orange flags on a sign as required by Section 8.0

Used to indicate the position of a traffic cone or high delineator.

Used to indicate the position of a traffic drum.

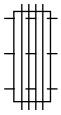
When displayed alone, used to indicate the position of a Flashing Light Unit, either vehicle or trailer mounted (in Bar Mode).

Used to indicate the position of F-shape barriers.

Used to indicate the position of traffic signals.

A yellow line is used to indicate the centreline of a road. White is used to indicate a lane line.

Used to indicate the direction of travel within a lane.

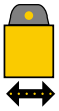


Used to indicate the position of the Work Area.

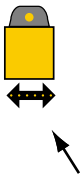
Used to indicate a break and that the drawing covers a greater distance than the scale can easily show.

Used to indicate a Traffic Control Person at the Control Position.

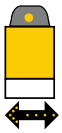
Used to indicate the position of a vehicle with a 360 degree flashing amber light. If the vehicle has a specific title or function, it will typically be labelled.



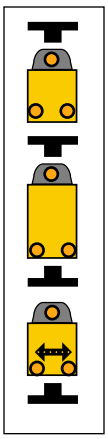
Used to indicate the position of a vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle has a specific title or function, it will typically be labelled.



When labelled as such, used to indicate the position of a Trail Vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle requires specific signs they are typically shown beside the labelled vehicle.



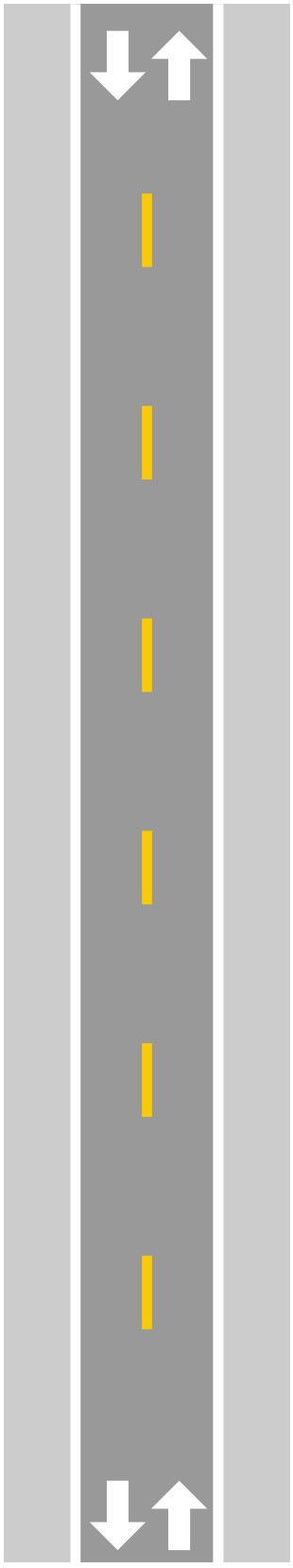
Used to indicate the position of a Protection Vehicle with a truck mounted attenuator, a 360 degree flashing amber light, and a Flashing Light Unit.



Used to indicate the position of line painting vehicles with, as applicable, 360 degree flashing amber lights, high mount flashing amber lights, signs, and a Flashing Light Unit

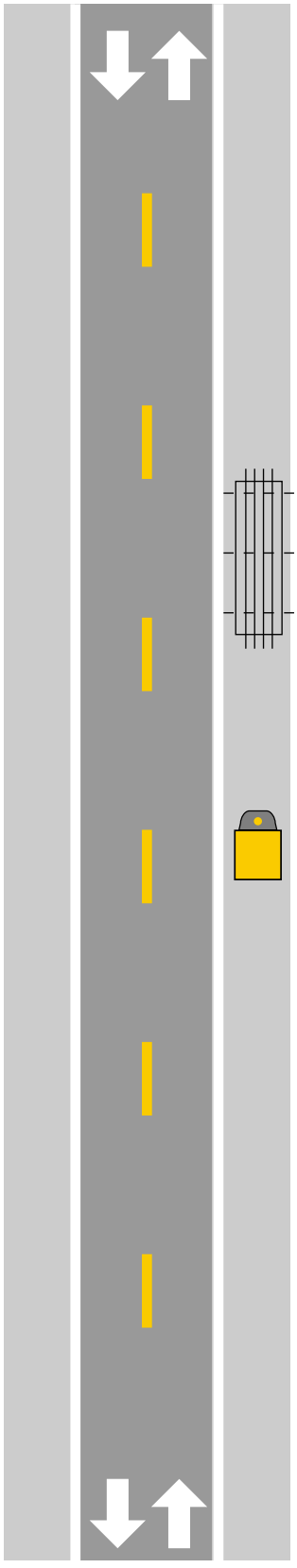
NOT TO SCALE

Left Blank for Notes



- No encroachment permitted on shoulder by workers, equipment, or vehicles while the work is being done

NOT TO SCALE



- No encroachment permitted on travel lane by workers, equipment, or vehicles

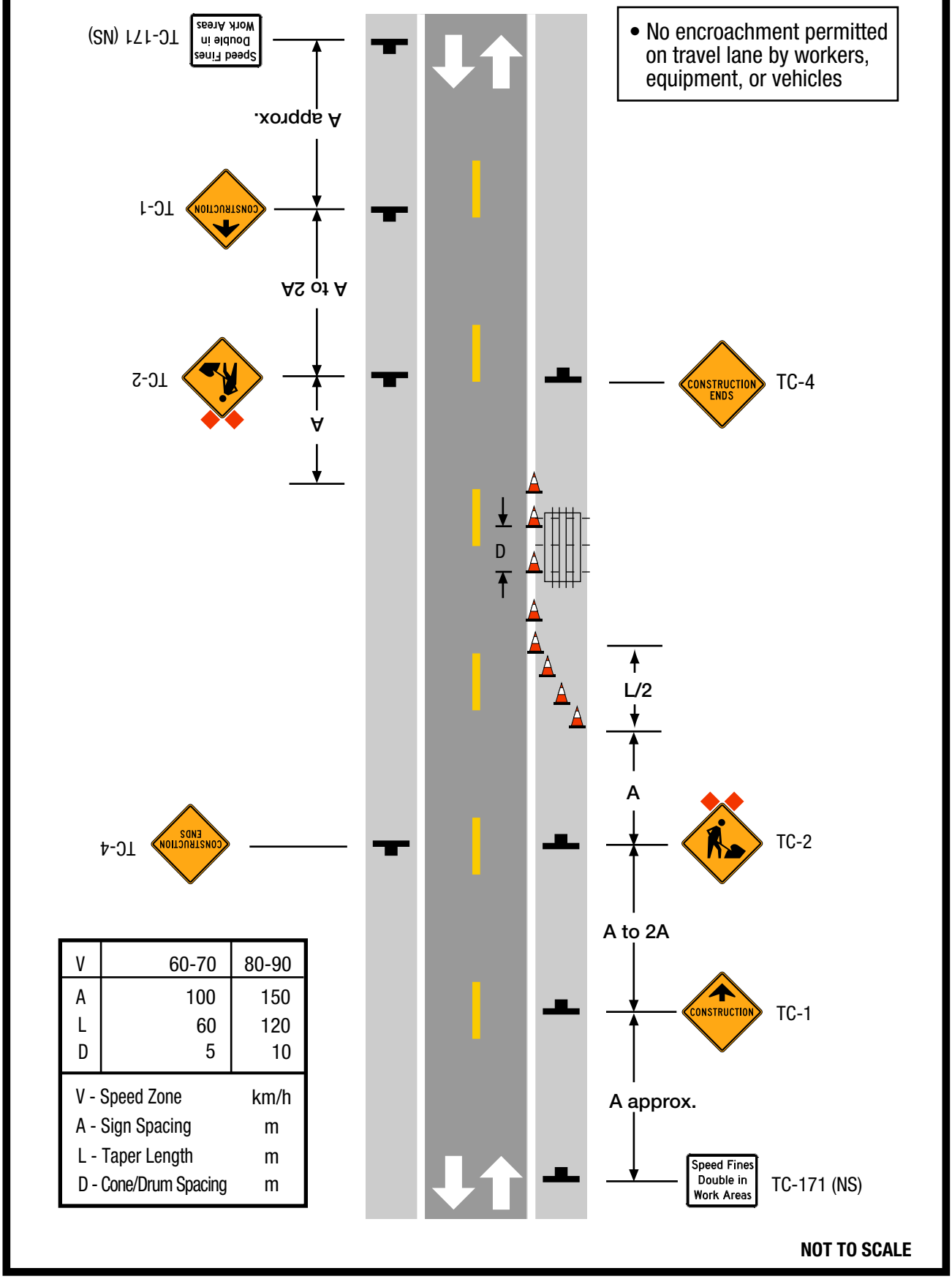
B

Service Vehicle with 360° flashing amber light

V	60-70	80-90
B	*	30
V - Speed Zone		km/h
B - Buffer Area Length		m

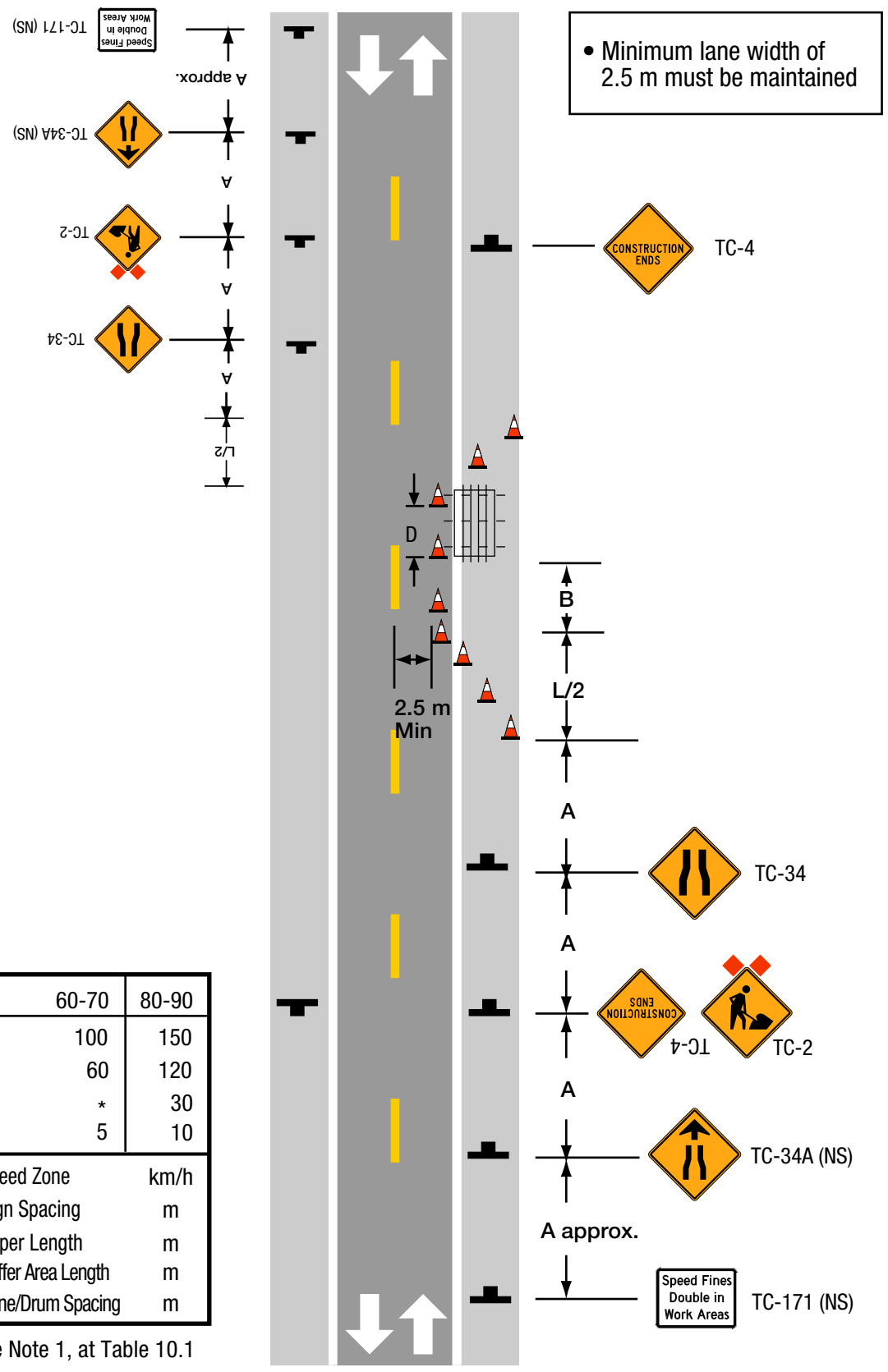
* See Note 1, at Table 10.1

NOT TO SCALE



V	60-70	80-90
A	100	150
L	60	120
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
D - Cone/Drum Spacing	m

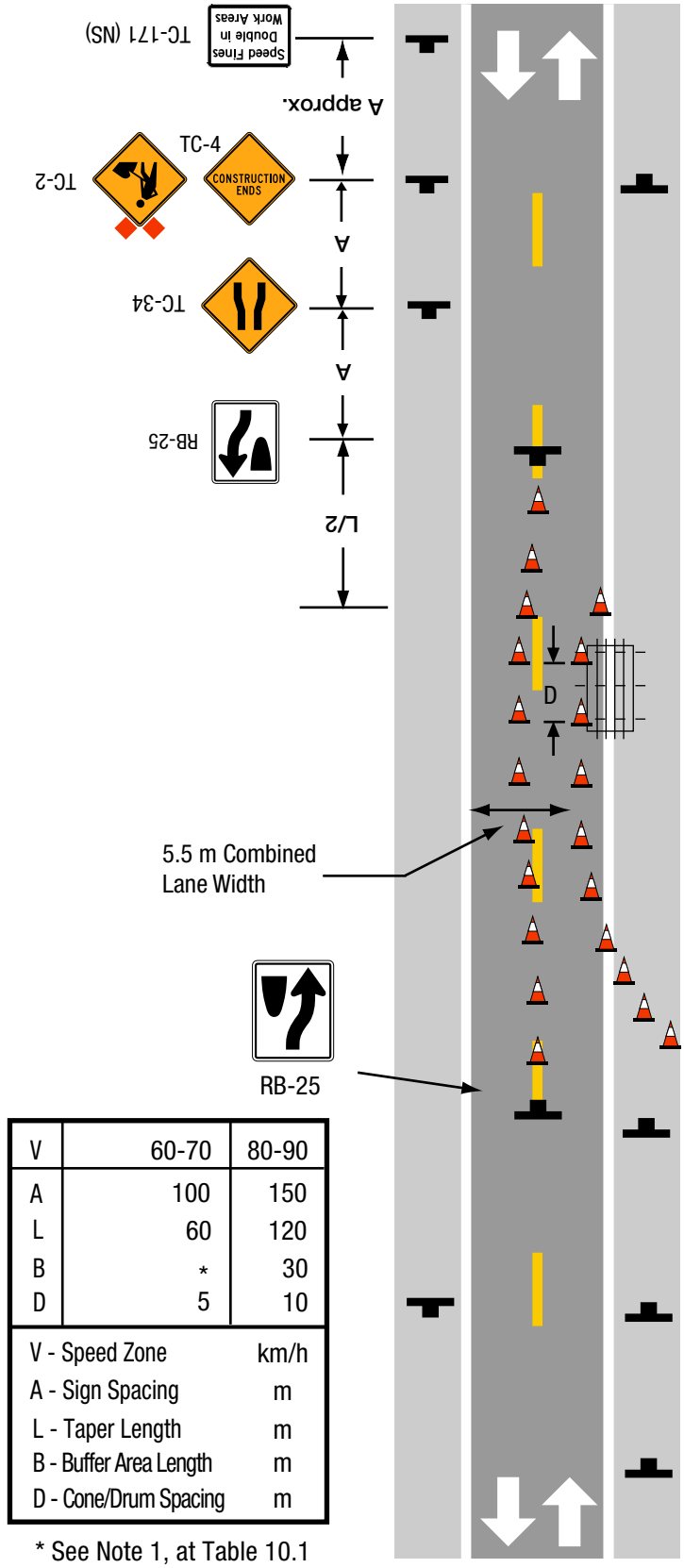


V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



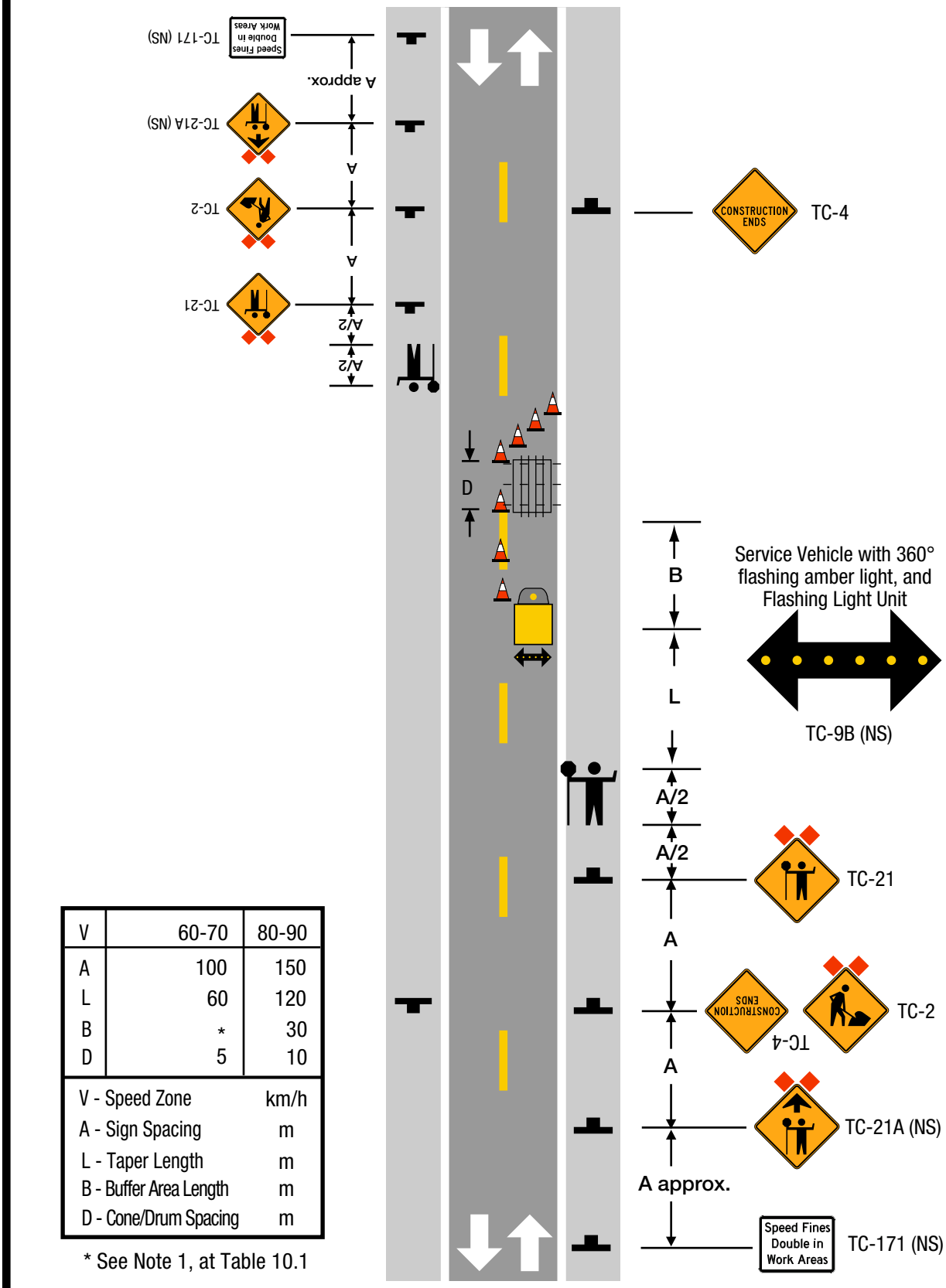
- Drums, Cones or High Delineators must be used to delineate an altered centerline
- A minimum of 5.5 m of combined travel width must be maintained
- A lane width must not be less than 2.5 m
- Refer to Section 7.0 for information on altered centrelines

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

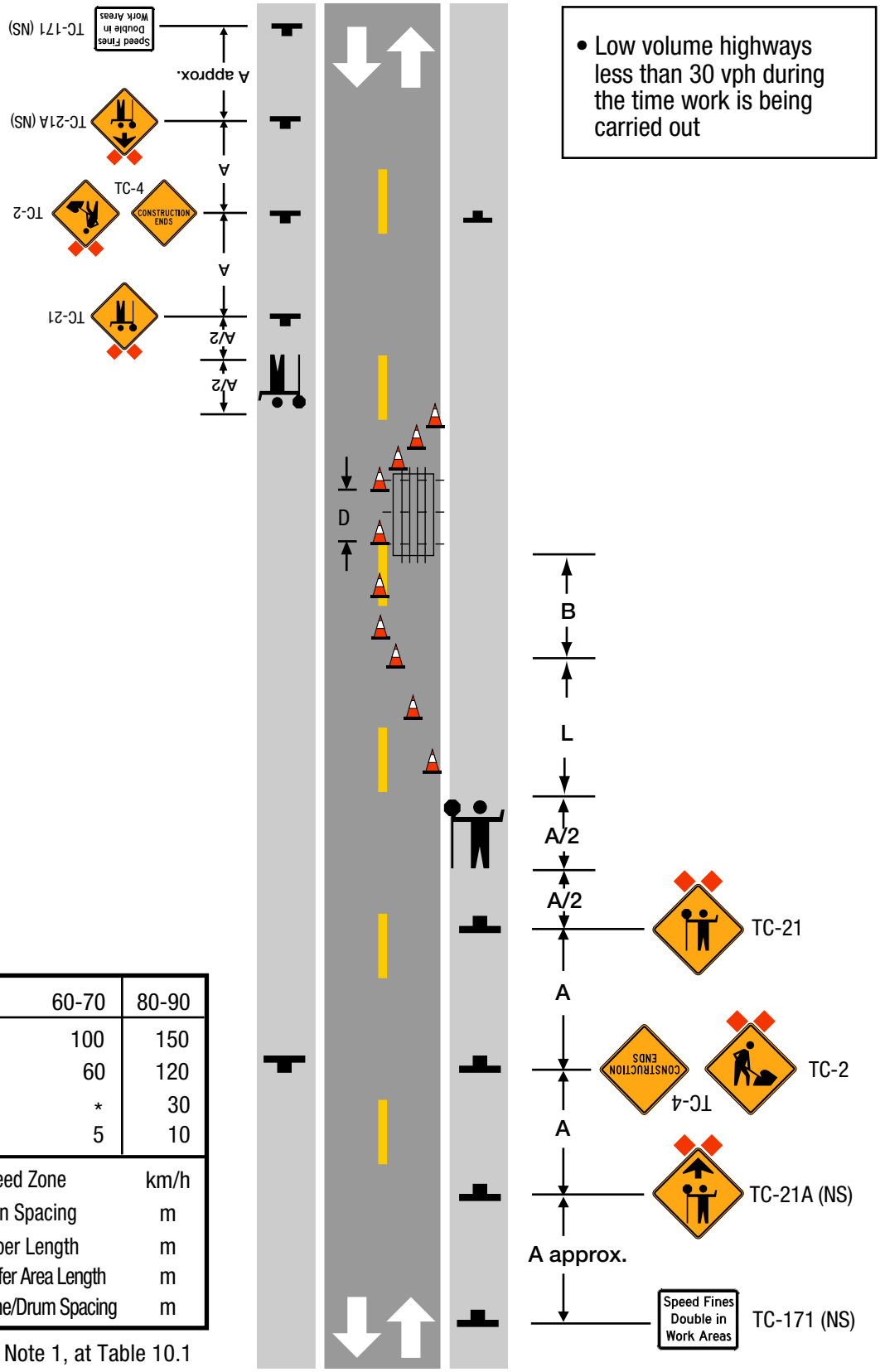


V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



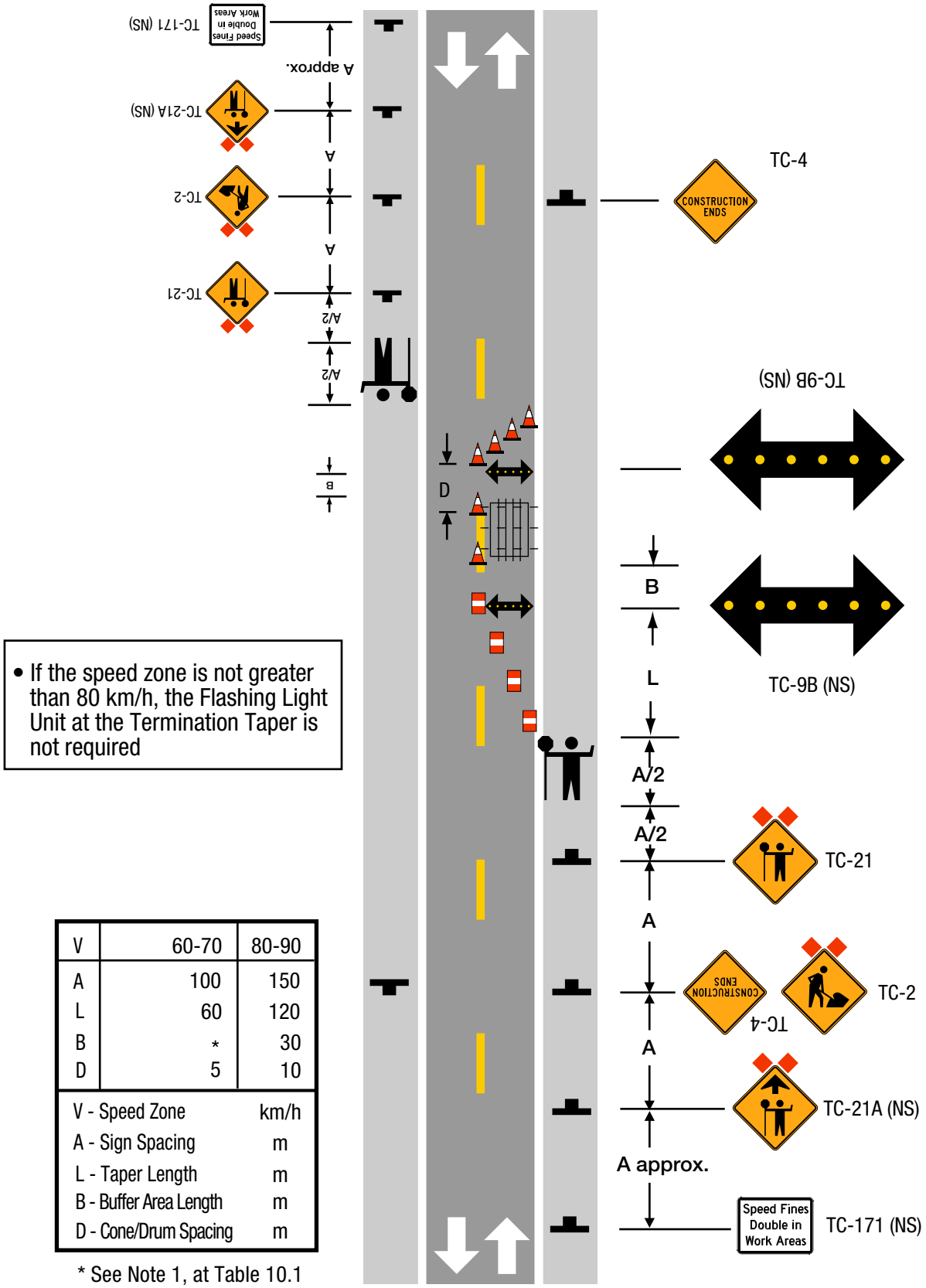
- Low volume highways less than 30 vph during the time work is being carried out

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



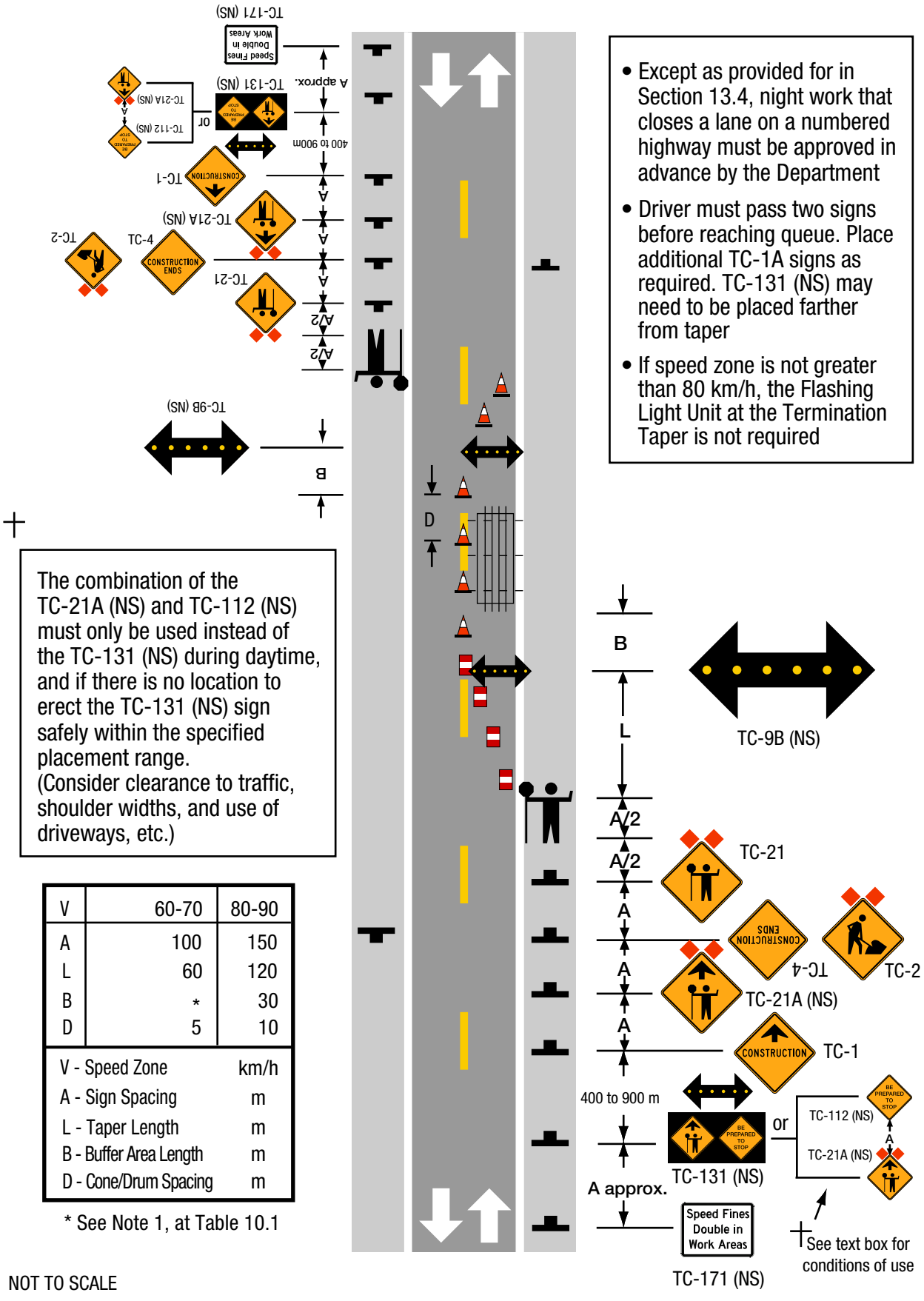
- If the speed zone is not greater than 80 km/h, the Flashing Light Unit at the Termination Taper is not required

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



- Except as provided for in Section 13.4, night work that closes a lane on a numbered highway must be approved in advance by the Department
- Driver must pass two signs before reaching queue. Place additional TC-1A signs as required. TC-131 (NS) may need to be placed farther from taper
- If speed zone is not greater than 80 km/h, the Flashing Light Unit at the Termination Taper is not required

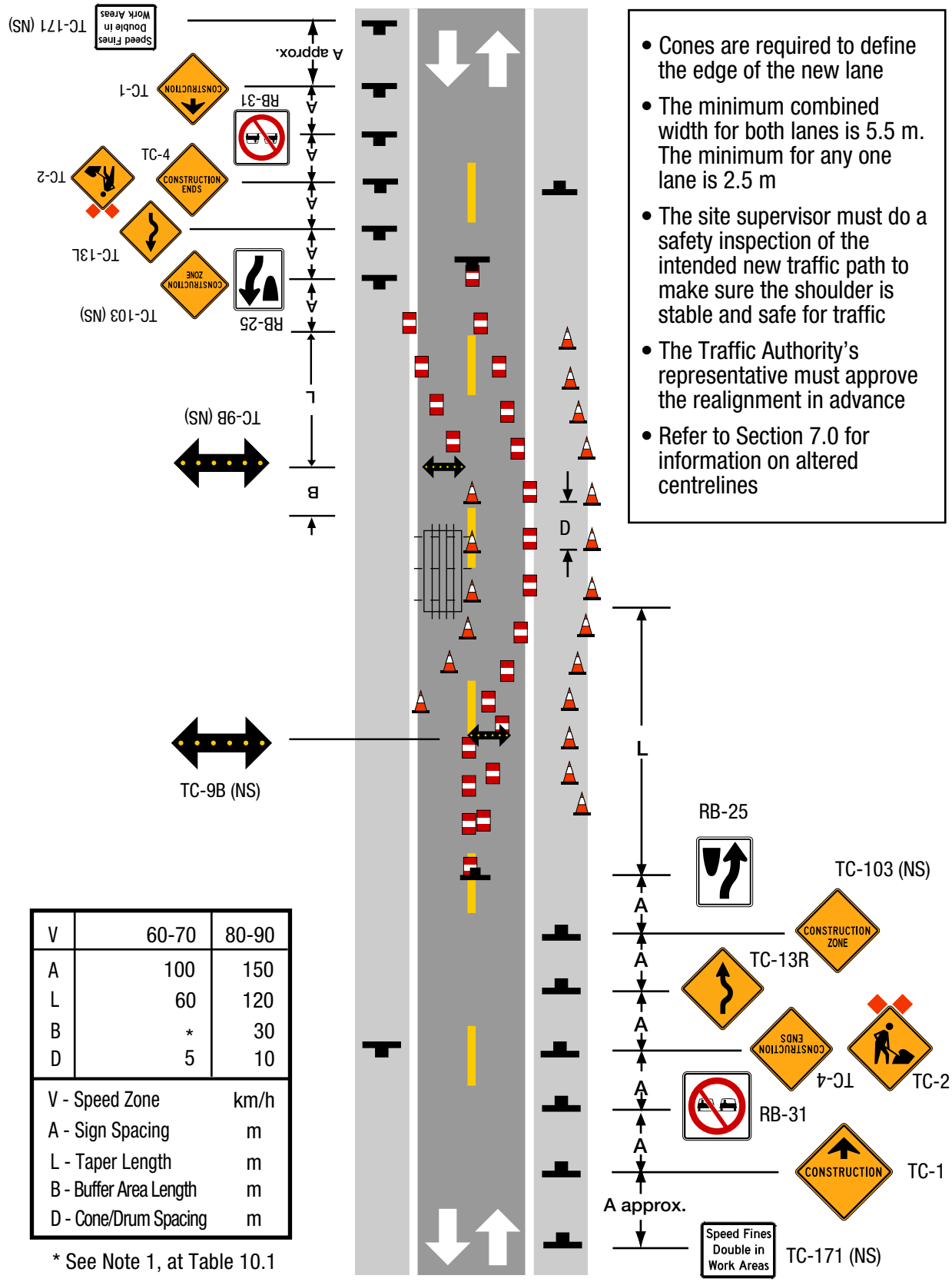
The combination of the TC-21A (NS) and TC-112 (NS) must only be used instead of the TC-131 (NS) during daytime, and if there is no location to erect the TC-131 (NS) sign safely within the specified placement range.
(Consider clearance to traffic, shoulder widths, and use of driveways, etc.)

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



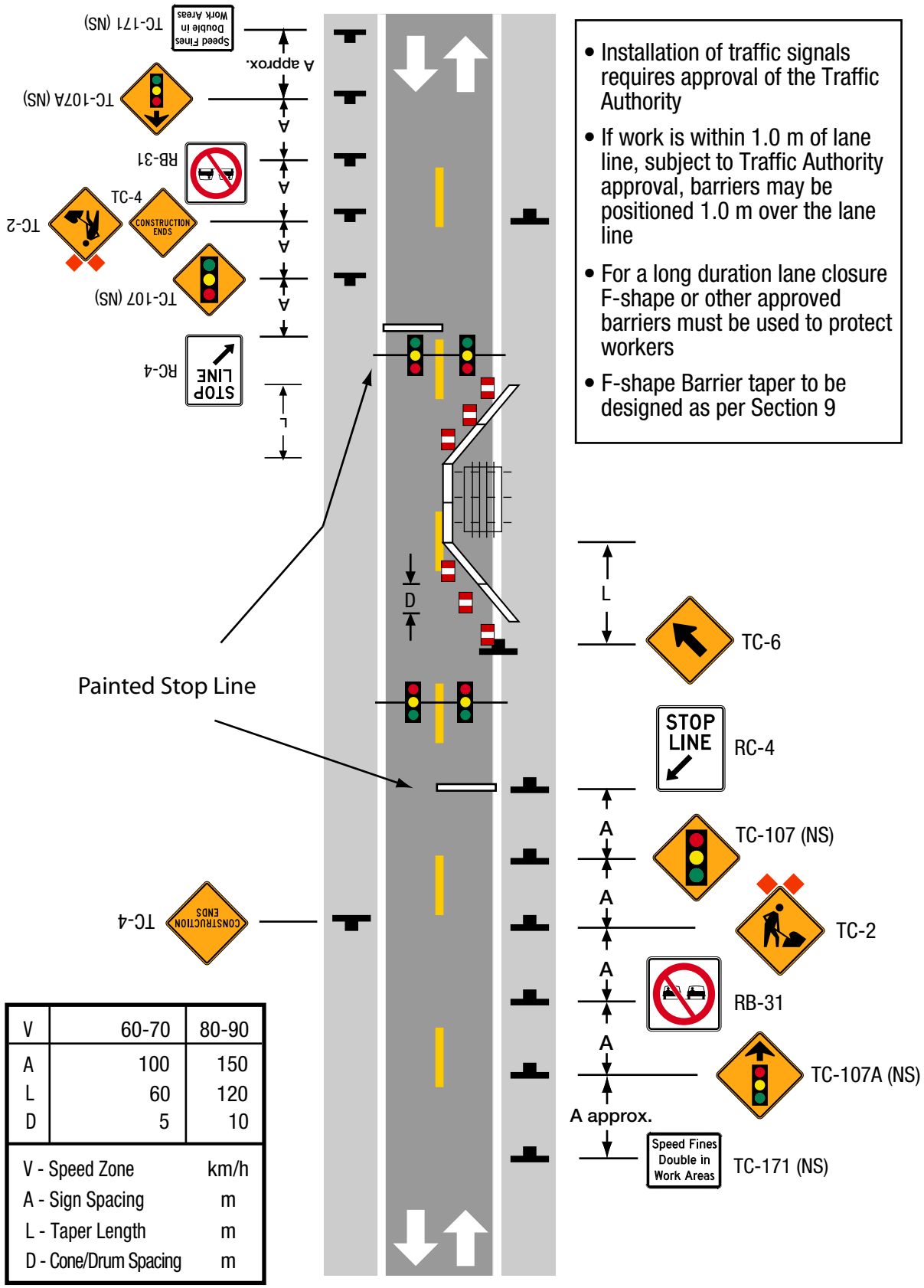
- Cones are required to define the edge of the new lane
- The minimum combined width for both lanes is 5.5 m. The minimum for any one lane is 2.5 m
- The site supervisor must do a safety inspection of the intended new traffic path to make sure the shoulder is stable and safe for traffic
- The Traffic Authority's representative must approve the realignment in advance
- Refer to Section 7.0 for information on altered centrelines

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

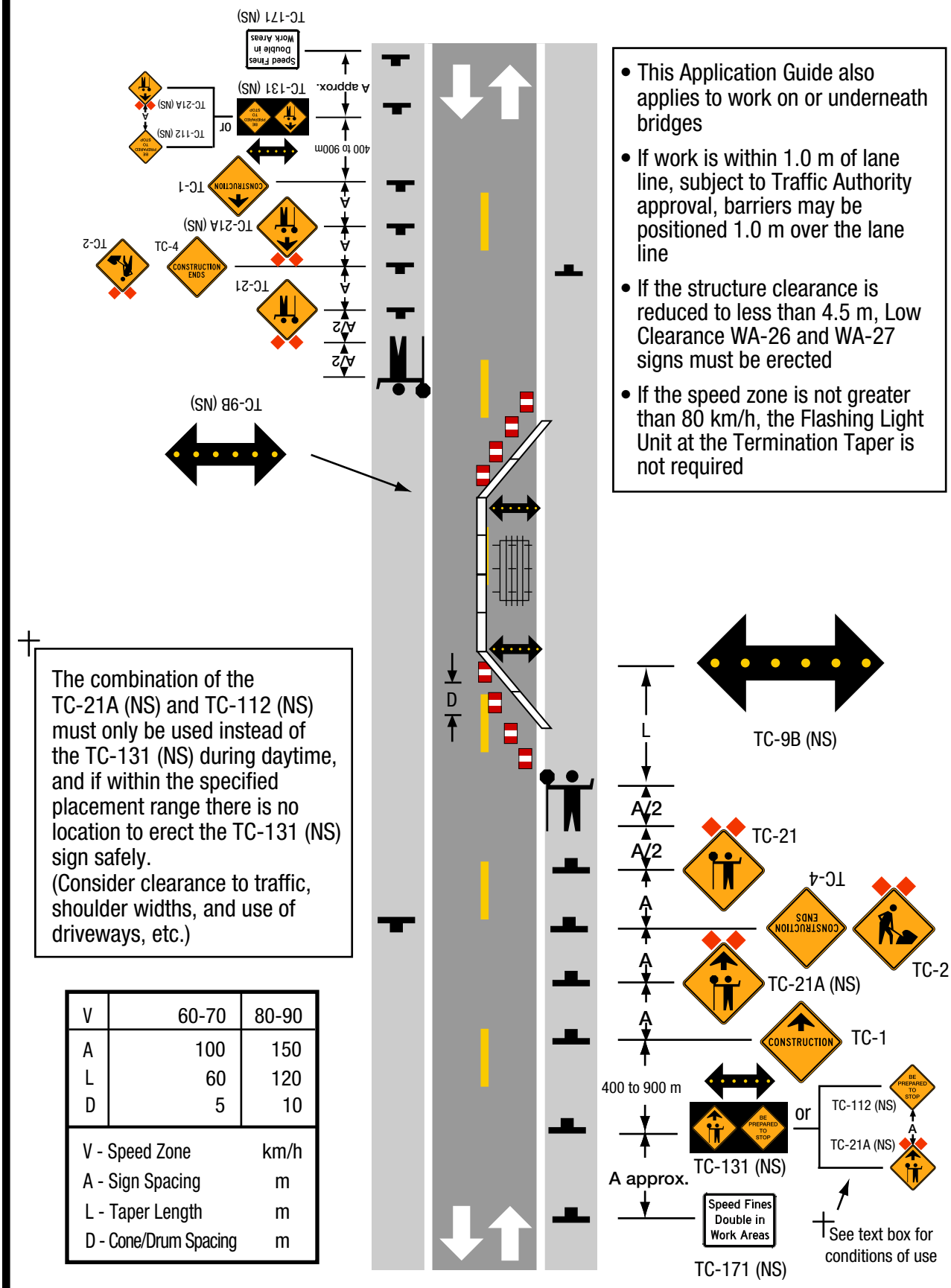


- Installation of traffic signals requires approval of the Traffic Authority
- If work is within 1.0 m of lane line, subject to Traffic Authority approval, barriers may be positioned 1.0 m over the lane line
- For a long duration lane closure F-shape or other approved barriers must be used to protect workers
- F-shape Barrier taper to be designed as per Section 9

V	60-70	80-90
A	100	150
L	60	120
D	5	10

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
D - Cone/Drum Spacing	m

NOT TO SCALE



- This Application Guide also applies to work on or underneath bridges
- If work is within 1.0 m of lane line, subject to Traffic Authority approval, barriers may be positioned 1.0 m over the lane line
- If the structure clearance is reduced to less than 4.5 m, Low Clearance WA-26 and WA-27 signs must be erected
- If the speed zone is not greater than 80 km/h, the Flashing Light Unit at the Termination Taper is not required

The combination of the TC-21A (NS) and TC-112 (NS) must only be used instead of the TC-131 (NS) during daytime, and if within the specified placement range there is no location to erect the TC-131 (NS) sign safely.
(Consider clearance to traffic, shoulder widths, and use of driveways, etc.)

V	60-70	80-90
A	100	150
L	60	120
D	5	10

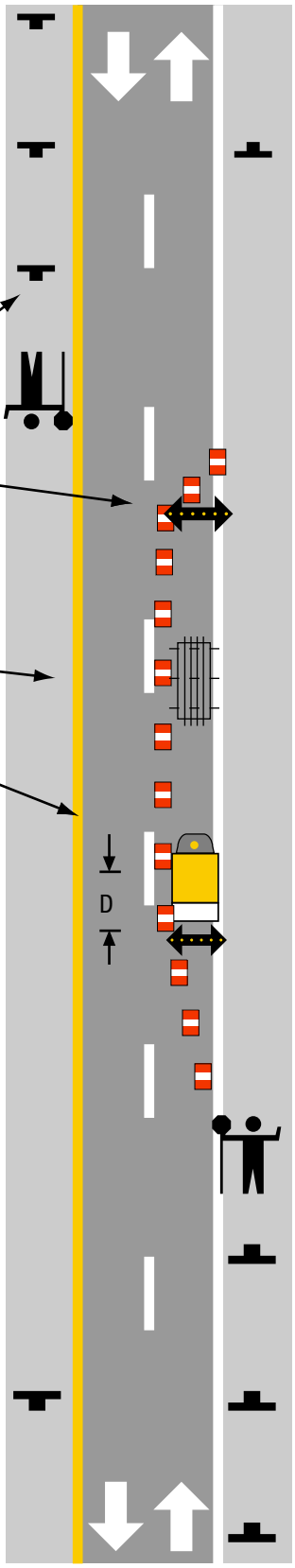
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
D - Cone/Drum Spacing	m

NOT TO SCALE

New: 2012

- These Application Guide standards apply only when the Work Area is contained completely on or under a bridge
- If applicable, these standards must be adapted for use with Application Guides B 35, 37, or 48

- These standards apply only if workers are on Elevated Work Platforms, or they have no escape route.
- If work (Elevated Work Platform, etc) is within 2.0 m of lane line, subject to Traffic Authority approval, drums may be positioned 1.0 m over the lane line
- When an Elevated Work Platform is used the Protection Vehicle must encroach into the closed travel lane a distance at least equal to the encroachment of the Platform
- If the structure clearance is reduced to less than 4.5 m, Low Clearance WA-26 and WA-27 signs must be erected



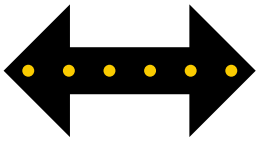
Downstream signing as per Application Guide B 35, 37, or 48, as applicable

Termination Taper FLU required only for speed zones greater than 80 km/h

Drums replace cones along the edge of the Buffer and Work Areas, and in the Termination Taper

* Protection Vehicle with TMA, FLU and 360 degree flashing amber light must be used at Approach Transition Taper / Buffer Area where drivers are required to make a lateral lane change unless the Work Area is seperated from the Approach Transition Taper. In these cases, position a Flashing Light Unit at the Approach Transition Taper and the Protection Vehicle with TMA at the optimal location in advance of workers, but at a distance of not less than "B" value. The Protection Vehicle at the stationary location downstream of a FLU need not display a second FLU

Protection Vehicle withTMA 360 degree flashing amber light and FLU *



TC-9B (NS)

Upstream signing as per Application Guide B 35, 37, or 48, as applicable

V	60-70	80-90
A	100	150
L	60	120
B	*	30
D	5	10

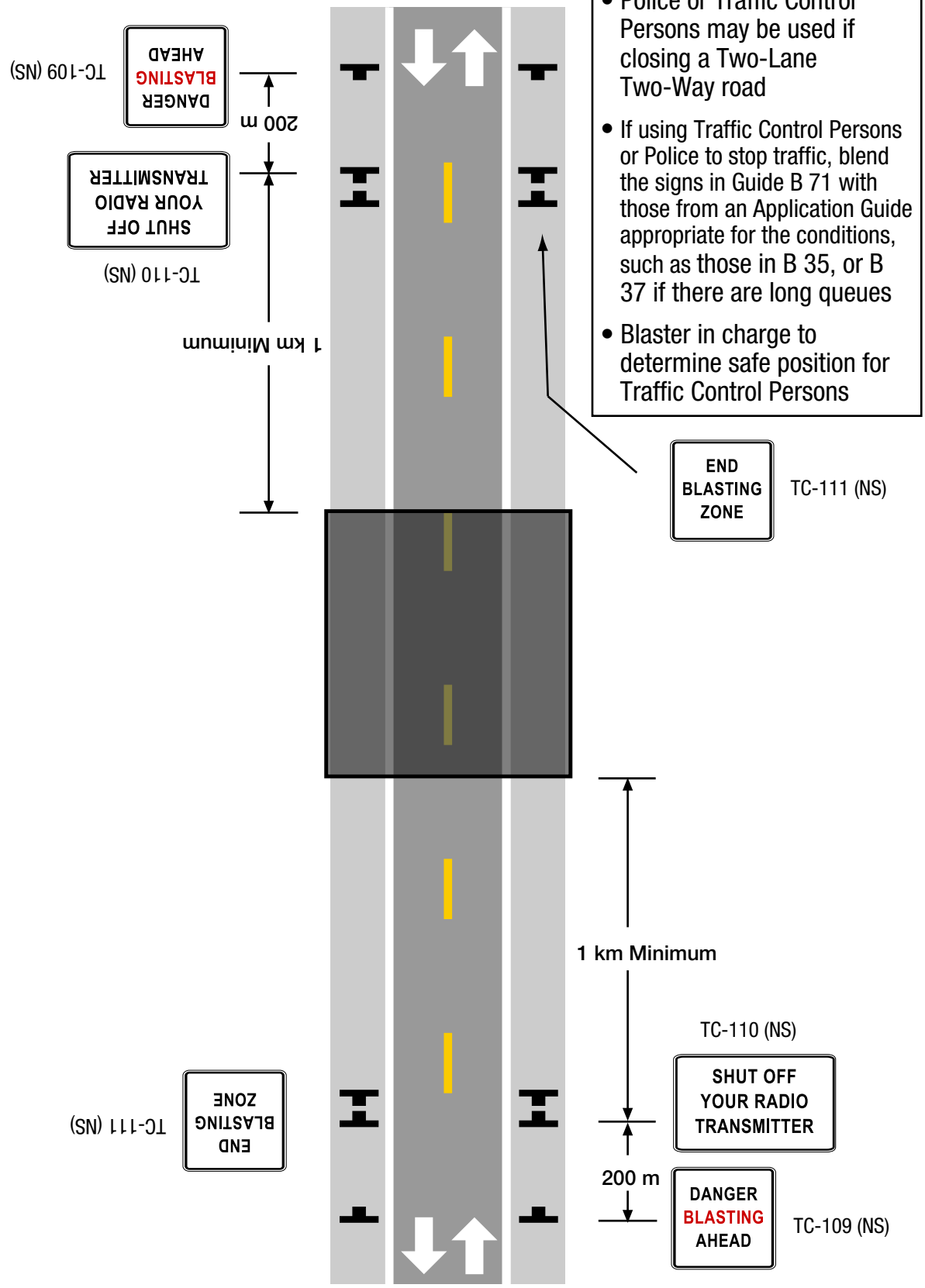
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

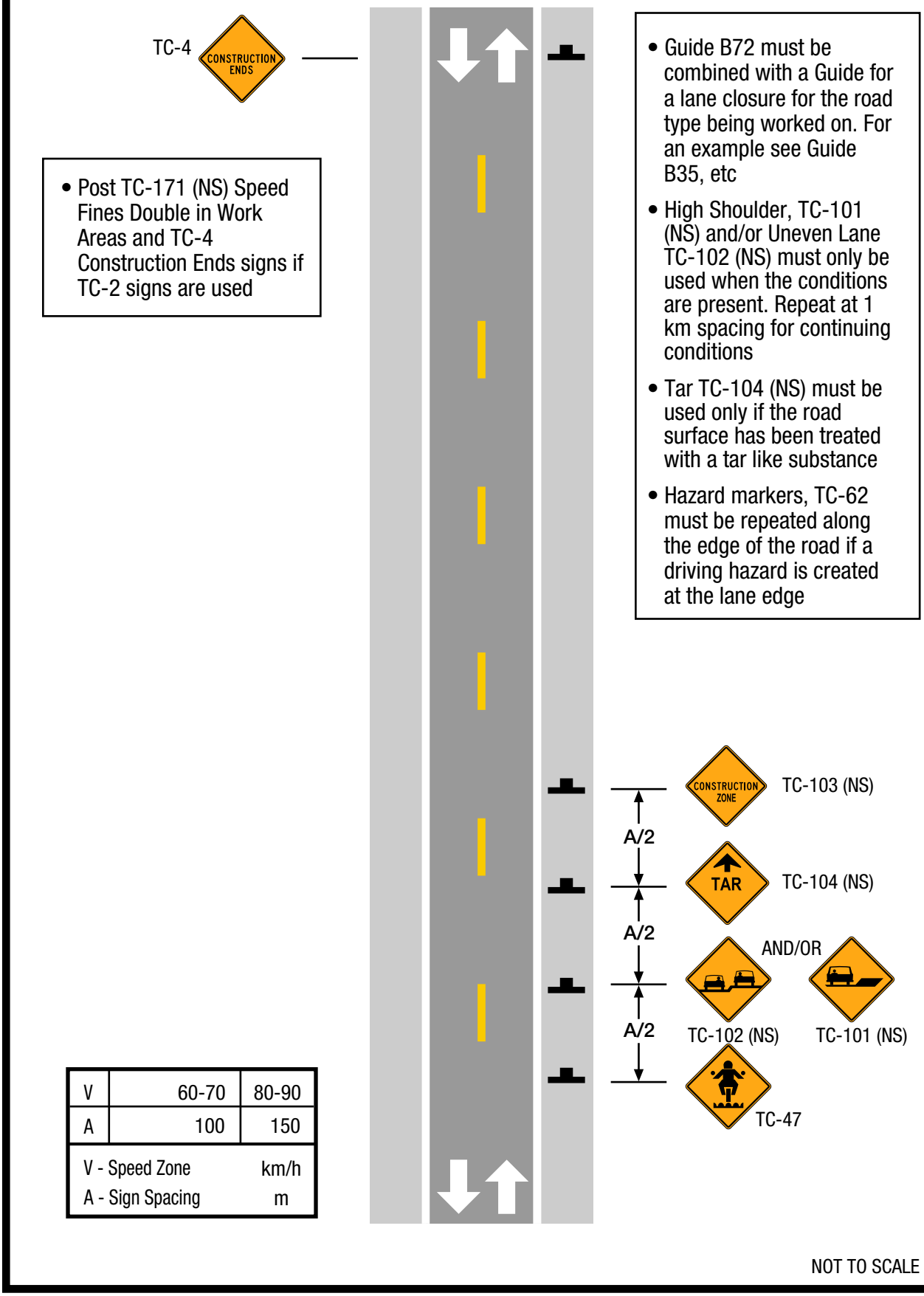
NOT TO SCALE

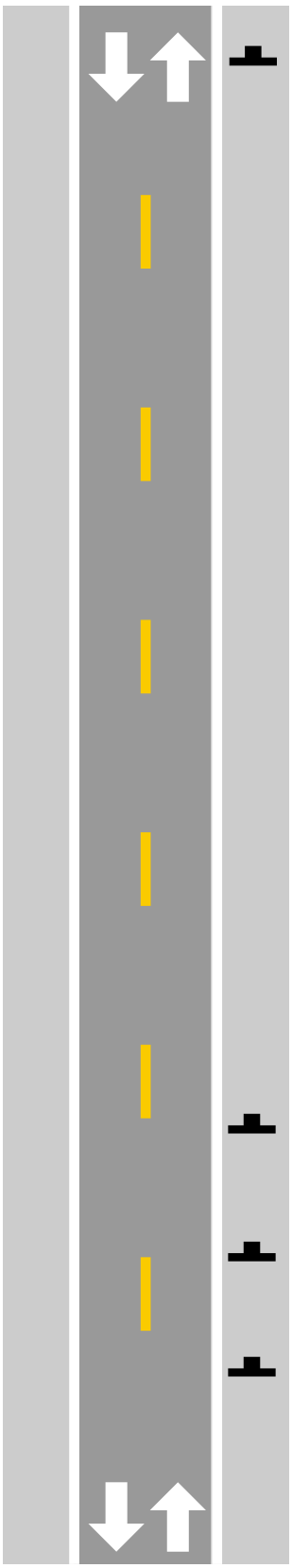
New: 2012

- Police or Traffic Control Persons may be used if closing a Two-Lane Two-Way road
- If using Traffic Control Persons or Police to stop traffic, blend the signs in Guide B 71 with those from an Application Guide appropriate for the conditions, such as those in B 35, or B 37 if there are long queues
- Blaster in charge to determine safe position for Traffic Control Persons



NOT TO SCALE


TC-4
CONSTRUCTION ENDS
• Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends signs if TC-2 signs are used
• Guide B72 must be combined with a Guide for a lane closure for the road type being worked on. For an example see Guide B35, etc
• High Shoulder, TC-101 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
• Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
• Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge
CONSTRUCTION ZONE
TC-103 (NS)
A/2
TAR
TC-104 (NS)
A/2
AND/OR
A/2
TC-102 (NS)
TC-101 (NS)
TC-47
V 60-70 80-90
A 100 150
V - Speed Zone km/h
A - Sign Spacing m
NOT TO SCALE



TC-4 CONSTRUCTION ENDS

- Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends signs if TC-2 signs are used

- Guide B73 must be combined with a Guide for a lane closure for the road type being worked on. For an example see Guide B35, etc
- Low Shoulder, TC-49 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
- Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
- Flying Stones, TC-108 (NS) must only be used if a loose stone hazard has been created
- Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge

TC-103 (NS) CONSTRUCTION ZONE

A/2

TC-104 (NS) TAR

A/2

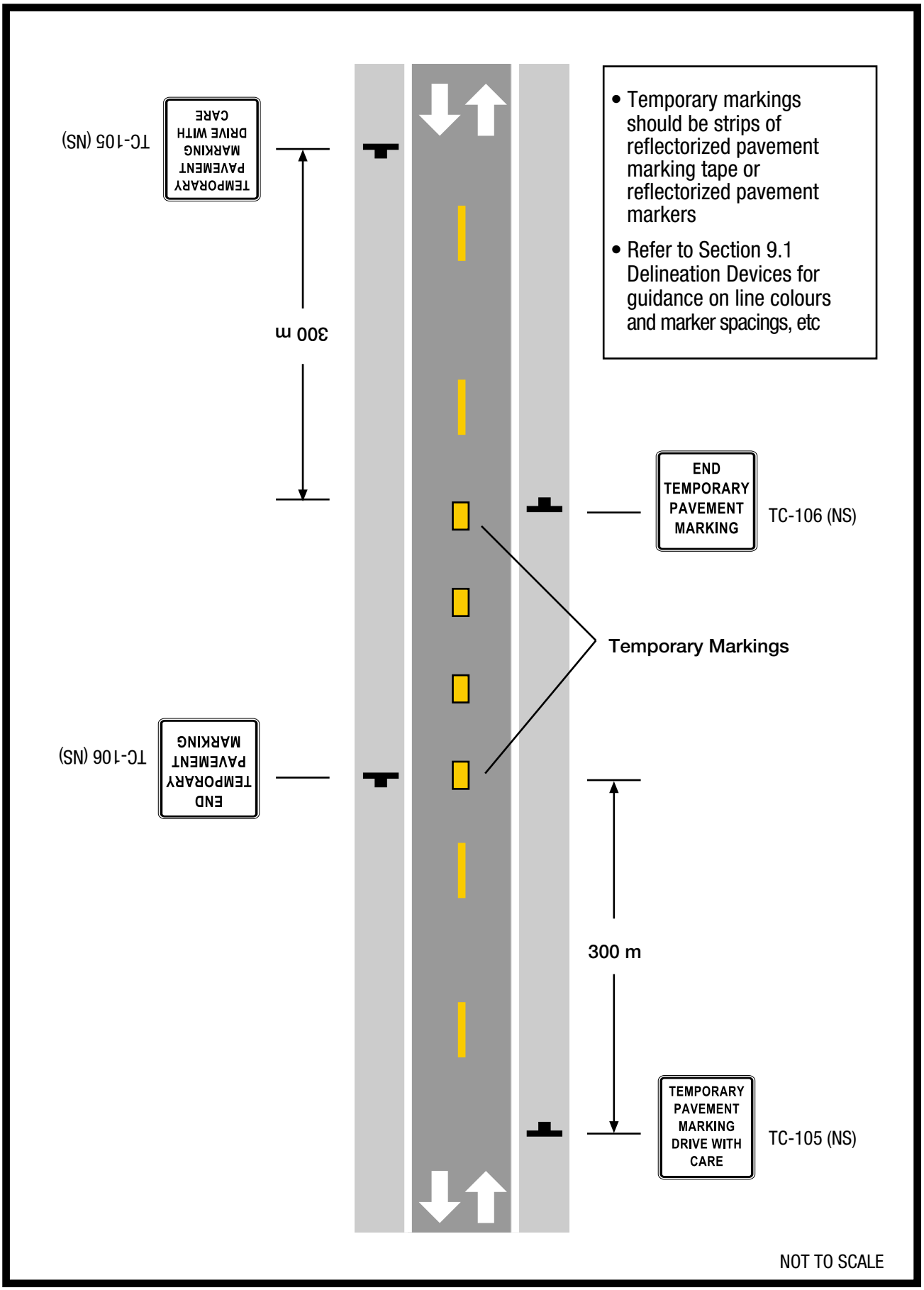
AND/OR

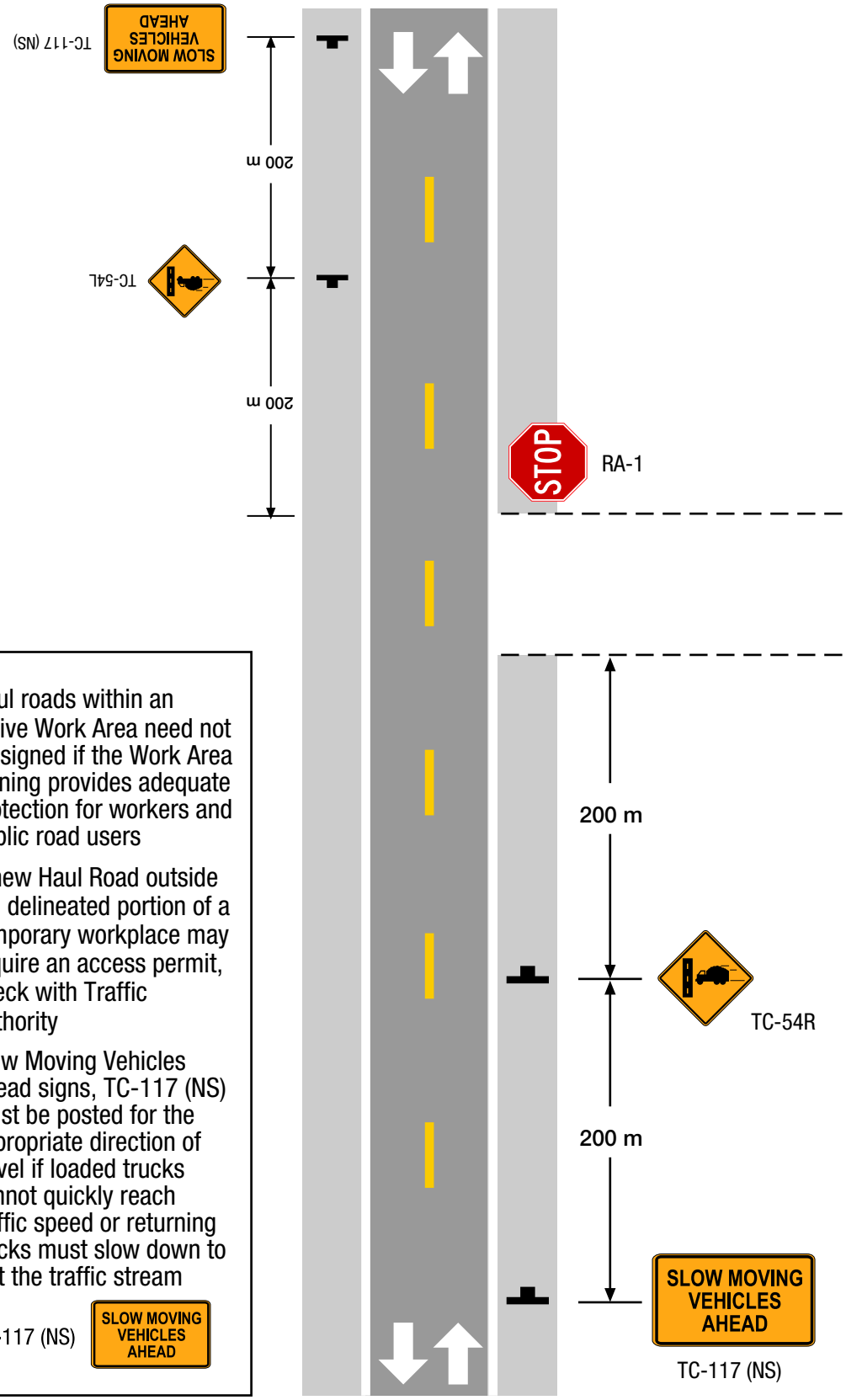
TC-102 (NS) TC-49

AND/OR FLYING STONES TC-108 (NS)

V	60-70	80-90
A	100	150
V - Speed Zone		km/h
A - Sign Spacing		m

NOT TO SCALE


• Temporary markings should be strips of reflectorized pavement marking tape or reflectorized pavement markers
• Refer to Section 9.1 Delineation Devices for guidance on line colours and marker spacings, etc
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
Temporary Markings
300 m
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
300 m
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
NOT TO SCALE



- Haul roads within an active Work Area need not be signed if the Work Area signing provides adequate protection for workers and public road users
- A new Haul Road outside the delineated portion of a temporary workplace may require an access permit, check with Traffic Authority
- Slow Moving Vehicles Ahead signs, TC-117 (NS) must be posted for the appropriate direction of travel if loaded trucks cannot quickly reach traffic speed or returning trucks must slow down to exit the traffic stream

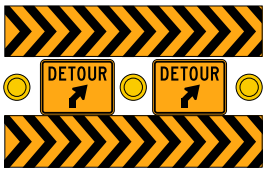
TC-117 (NS) SLOW MOVING VEHICLES AHEAD

NOT TO SCALE

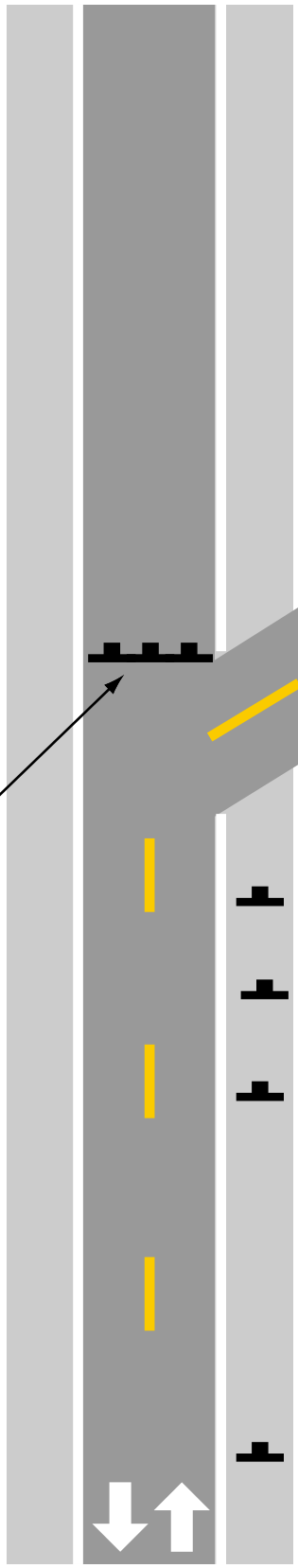
New: 2012

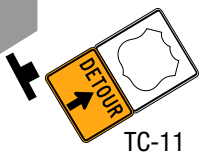
- The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination (see Guide C77 for an example)
- The detour must accommodate the size (length, width, height) and weight of vehicles detoured; turning movements for trucks must be checked
- Use the TC-11 (detour sign) with the arrow angle best matched to the road conditions
- See Municipal Barricade text at Section 9.4 for alternative barrier standards
- See Temporary Road Standards text at Section 7.0 for guidance on designing temporary roadways

- Curve warning sign with appropriate speed tab to be posted if required as determined by Traffic Authority
- Detour should be signed with appropriate guide signs
- Detour must be signed with appropriate warning and regulatory signs
- Traffic Authority must be consulted prior to establishment of a detour

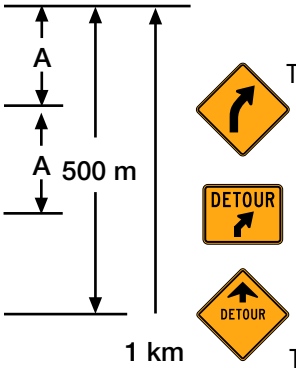


TC-64C
Heavy Barricade
(Directional)





TC-11



TC-27R

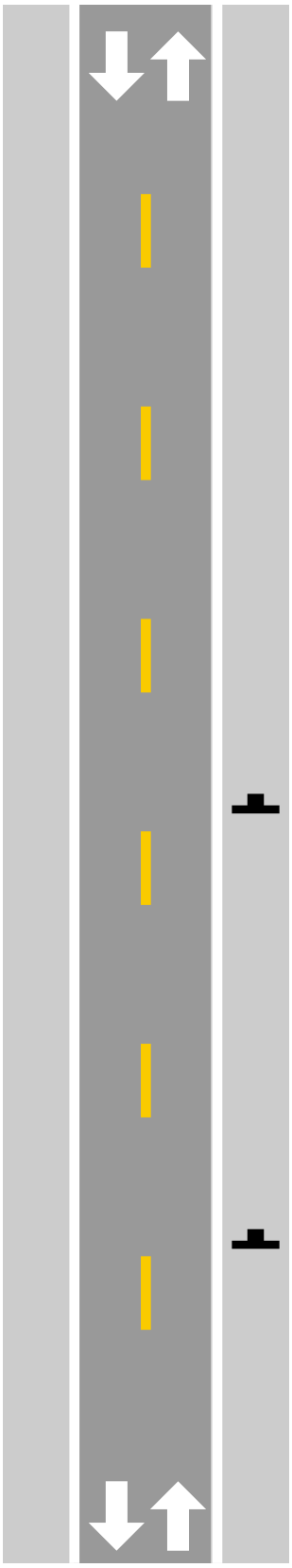
TC-11R45 (NS)

TC-10

TC-10A

V	60-70	80-90
A	100	150
V - Speed Zone		km/h
A - Sign Spacing		m

NOT TO SCALE



- Low Shoulder TC-49 must be posted 200 m from the beginning of the low shoulder and must be repeated at 1 km spacing
- Hazard markers TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge. When Hazard Marker TC-62 is used:

- repeat 20 cm X 60 cm signs at 50 m intervals or repeat 30 cm X 90 cm signs at 100 m intervals

- reduce spacing of signs around short radius curves, drivers must see five signs

TC-62

200 m

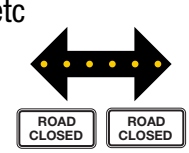
TC-49

NOT TO SCALE

New: 2012

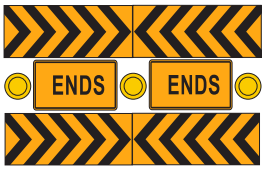
- Use a single TC-64 D or E barricade in the middle of the road. If there is a critical hazard downstream of the barricade, the barricade must be supervised. As required, ensure that vehicles can not drive around ends of barricade. Use TC-63 drums or F-shape Barriers, etc

TC-64 D
Municipal Barricade

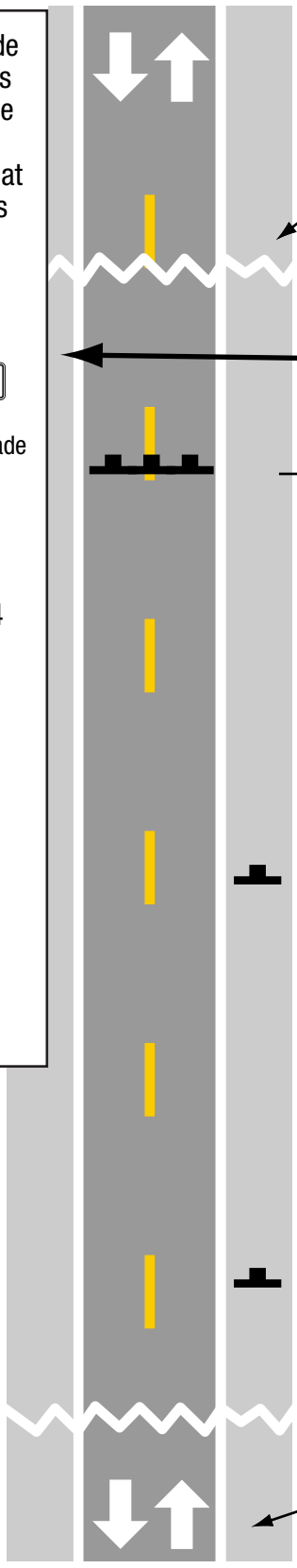


TC-64 E
Municipal Barricade

- A TC-64B barricade is a higher standard and may be used unsupervised instead of the TC-64 D or E barricade. As required, ensure that vehicles can not drive around ends of barricade. Use TC-63 drums or F-shape Barriers, etc



TC-64B
Heavy Barricade
(Non Directional)



Unusable portion of road

Standards for this location must be taken from the text box on the left

TC-64D
Municipal Barricade

A

TC-113 (NS)

This sign may be omitted if distance from the TC-169 (NS) to upstream Barricade is less than Table value "A"

A

TC-169 (NS)

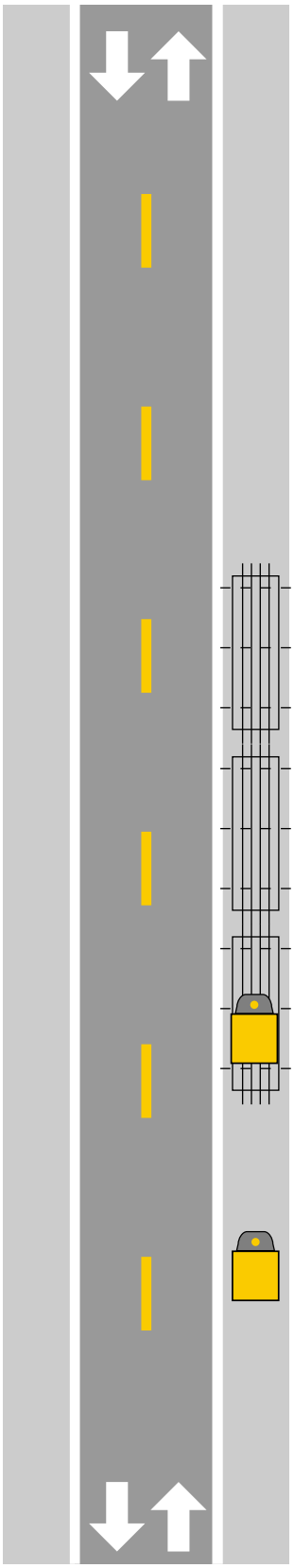
XXX replaced by distance to downstream barricade

Upstream Barricade restricting road to local traffic only, not shown. (e.g. use Guide B 77)

V	60-70	80-90
A	100	150
V - Speed Zone		km/h
A - Sign Spacing		m

NOT TO SCALE

- This Application Guide must not be used to perform stationary work at a single location where work at that location will exceed 30 min. in duration
- On high speed high volume roads, consider using a Protection Vehicle instead of a Trail Vehicle, if one is readily available
- Where it is necessary to perform shoulder work on foot, short stops may be made and work performed downstream of the Work Vehicle
- The space between the workers on foot and the Work Vehicle must be maintained at approximately but not less than "B" value, and adjusted to maximize safety, taking into consideration traffic, and the road alignment



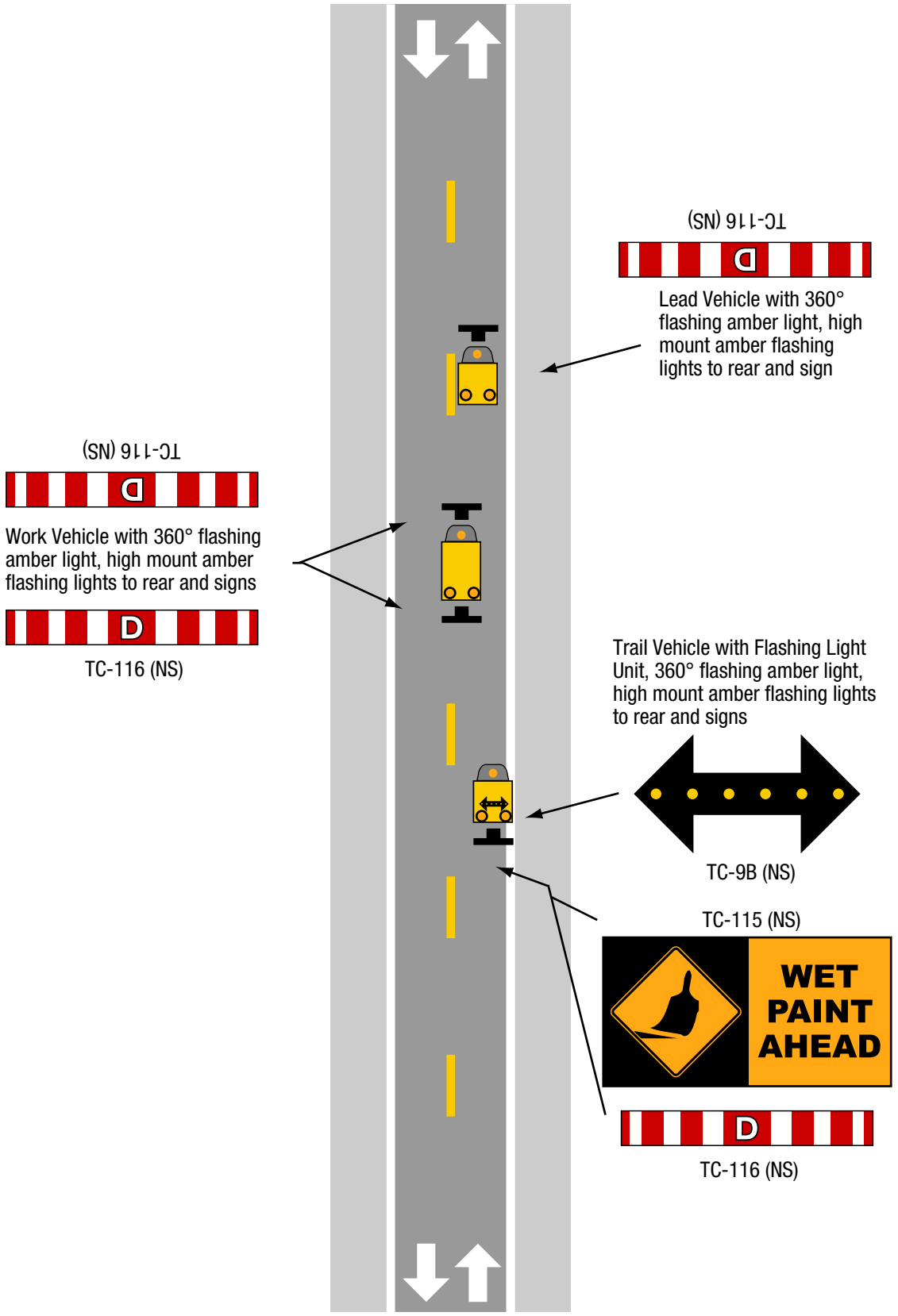
- No encroachment permitted on travel lane while work is performed
- Vehicles are not permitted to back up
- Where obstructions or conditions on the shoulder force vehicle encroachment onto the lane (slope, post, guardrail, etc.), work must stop while vehicles drive past the obstruction and must not start again until vehicles are completely off the travel lane
- The space between the work and trail vehicles must not be less than "B" value, but should be adjusted to maximize safety, taking into consideration traffic, and the road alignment

V	60-70	80-90
B	*	30
V - Speed Zone		km/h
B - Buffer Area Length		m

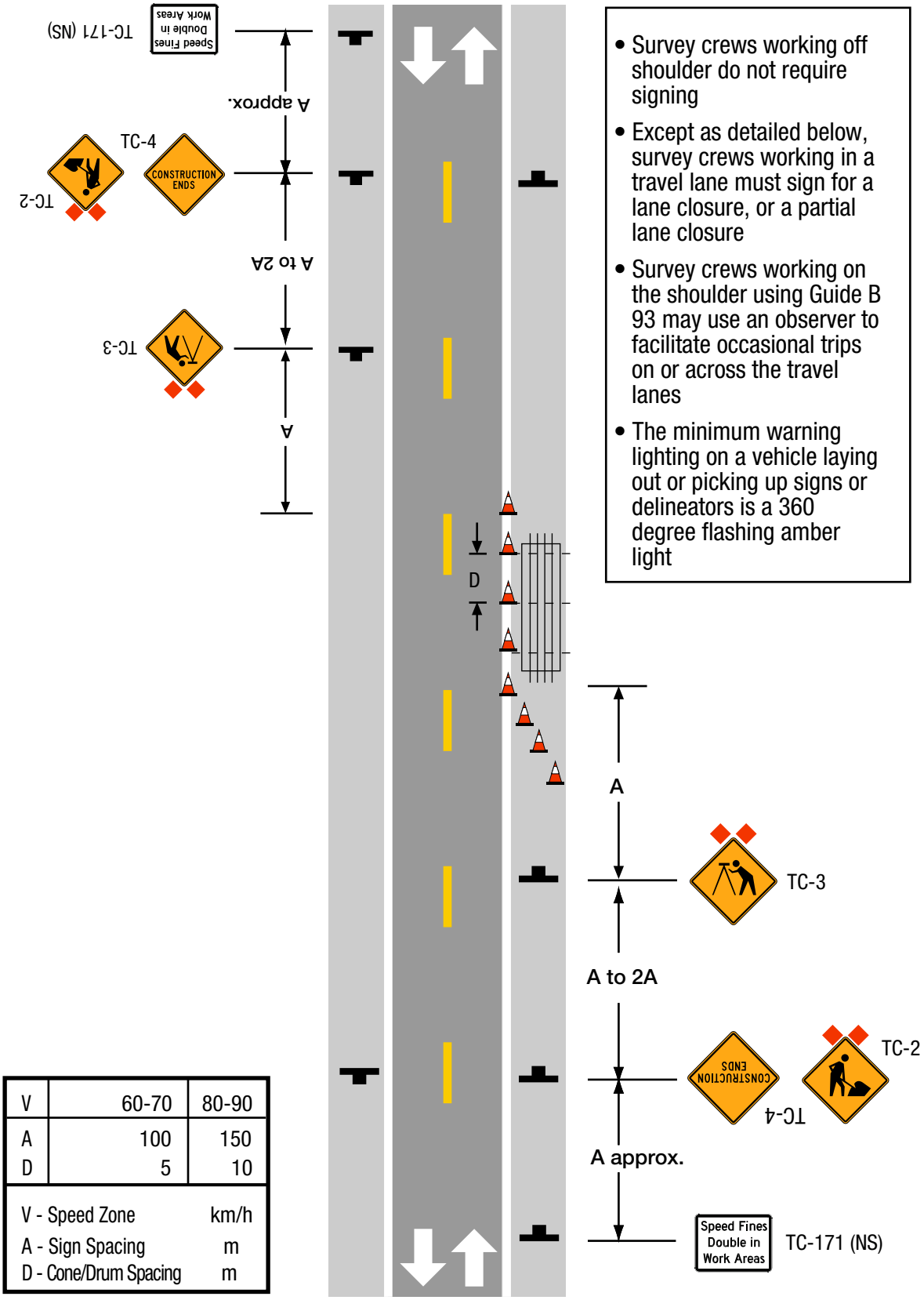
* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012



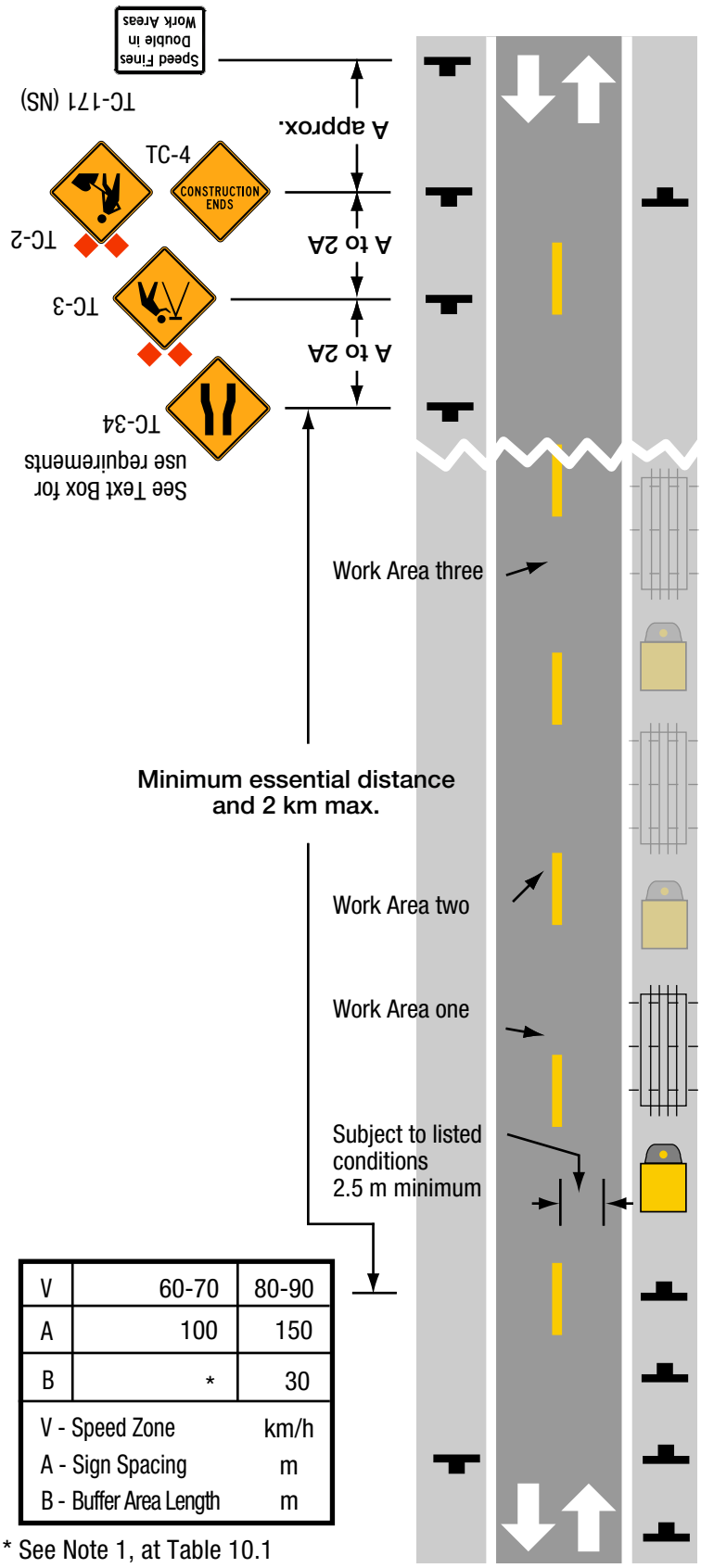
NOT TO SCALE



- Survey crews working off shoulder do not require signing
- Except as detailed below, survey crews working in a travel lane must sign for a lane closure, or a partial lane closure
- Survey crews working on the shoulder using Guide B 93 may use an observer to facilitate occasional trips on or across the travel lanes
- The minimum warning lighting on a vehicle laying out or picking up signs or delineators is a 360 degree flashing amber light

V	60-70	80-90
A	100	150
D	5	10
V - Speed Zone		km/h
A - Sign Spacing		m
D - Cone/Drum Spacing		m

NOT TO SCALE

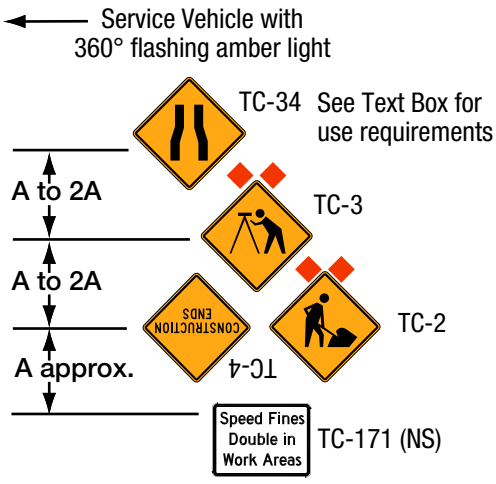


V	60-70	80-90
A	100	150
B	*	30
V - Speed Zone		km/h
A - Sign Spacing		m
B - Buffer Area Length		m

* See Note 1, at Table 10.1

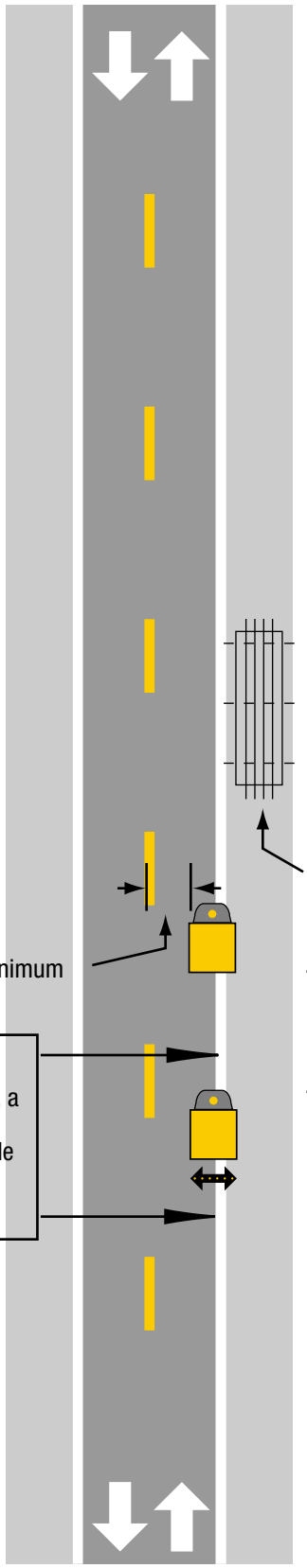
NOT TO SCALE

- Except as per guides A, B, C 93 and 94, survey crews working in a travel lane must use an Application Guide for a partial or full lane closure, as applicable
- Survey crews must work as far from the travel lane as practical, but may use an observer to facilitate occasional trips on or across the travel lanes. When walking on the shoulder, workers should stay as far from the travel lane as practical and be mindful of approaching traffic
- Where narrow shoulders don't permit the Service Vehicle to remain completely off the travel lane, the Service Vehicle may encroach the minimum needed, if the speed zone is 80 km/h or less and at least 2.5 m of travel lane remains open to traffic. When the Service Vehicle encroaches or is expected to encroach, TC-34 signs must be added to the sign sequence as shown on the guide
- The space between the workers and Service Vehicle must be maintained at approximately "B" value, but adjusted to maximize safety, taking into consideration traffic volume and speed, sight lines to approaching traffic, and the road alignment
- The minimum warning lighting on a vehicle laying out or picking up signs is a 360° flashing amber light



- Vehicles are not permitted to back up
- Only vehicles may encroach onto the travel lane (not workers on foot)
- This Application Guide must not be used to perform stationary work at a single location where work at that location will exceed 10 min. in duration
- During a short stop (not exceeding 10 min) workers on foot may perform shoulder work downstream of the Work Vehicle. No lane encroachment is permitted by workers on foot

- Both vehicles must stay off the travel lanes to the greatest extent practical
- Spacing of approx., but not less than, the “B” value must be maintained between workers on foot and the Work Vehicle, and between the two vehicles. Spacing must be adjusted to maximize safety, taking into consideration traffic and the road alignment
- When work is being done and a Work or Trail Vehicle encroaches on the travel lane,vehicles approaching the workplace from the upstream end must have an uninterrupted sight line to the Trail Vehicle for a distance that will permit sufficient time for drivers to respond safely to workplace conditions



Workers on foot restricted to shoulder and not more than 10 min.

2.5 m minimum

B

Work Vehicle with 360° flashing amber light

Trail Vehicle with 360° flashing amber light, and a FLU in bar mode

TC-9B (NS)

- If speed zone is greater than 80 km/h, a Protection Vehicle with TMA, 360° flashing amber light & FLU in bar mode must replace the Trail Vehicle

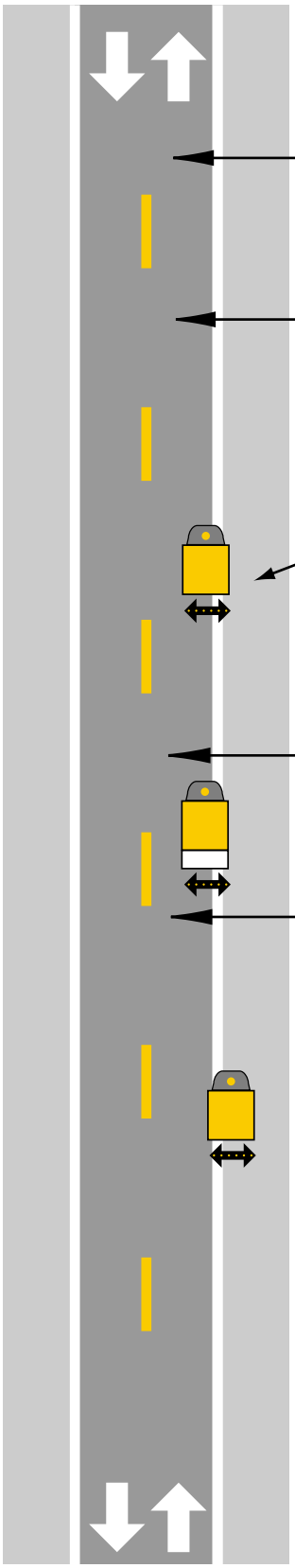
V	60-70	80-90
B	*	30
V - Speed Zone km/h B - Buffer Area Length m		

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012

- Vehicles must not stop in travel lane
- Vehicles must not back up
- Trail vehicle to remain off the travel lane to the greatest extent practical
- Workers are not permitted on the travel lane on foot
- If a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3



TC-116 (NS)

Lead Vehicle with FLU, 360° flashing amber light, and sign, needed conditionally (see bullet list opposite)

Work Vehicle with 360° flashing amber light & FLU

TC-9B (NS)

- If speed zone is not greater than 80 km/h this vehicle may be omitted
- If speed zone greater than 80 km/h, Protection Vehicle with TMA, 360 degree flashing amber light & FLU

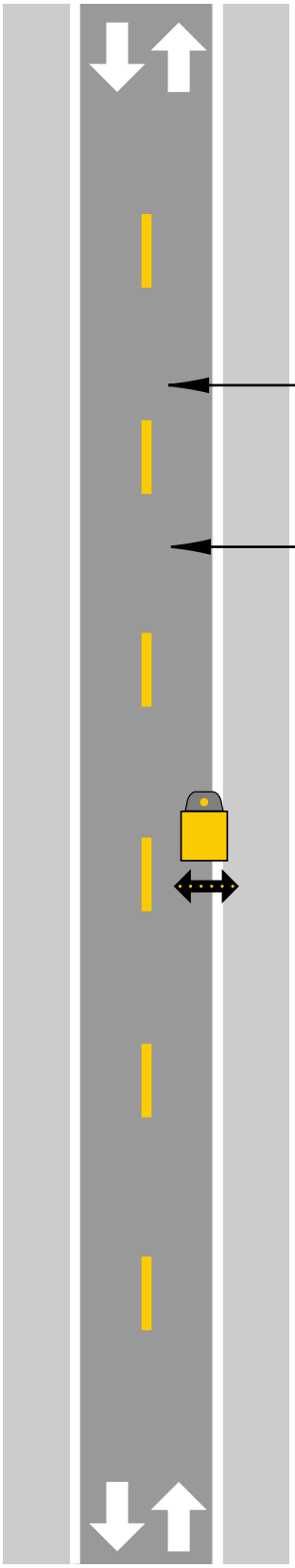
Trail Vehicle with 360° flashing amber light, sign & FLU

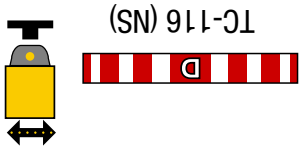
TC-9B (NS)

TC-165 (NS)
(See Section 8, TC-165 (NS) entry and Section 13.3 Rule 1.6 for alternative sign standards)

NOT TO SCALE

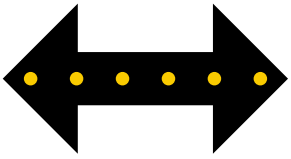
- Low volume highways less than 30 vph during the time work is being carried out
- Vehicle must not stop in travel lane
- Vehicle must not back up
- Workers are not permitted on the travel lane on foot
- If a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3





Lead Vehicle with FLU, 360° flashing amber light, and sign, needed conditionally (see bullet list opposite)

Work Vehicle with 360° flashing amber light & FLU



TC-9B (NS)

NOT TO SCALE

"C" Application Guides for Non Multi-Lane Streets and All Intersections

Work Location	Work Duration	Street Type (Special Conditions)	Guide
Park Lane / Shoulder	All Durations	Two-Way Two-Lane	C 12
Park Lane / Shoulder	All Durations	Two-Way Two-Lane (Excavation)	C 15
Partial Lane Closed	Very Short Duration	Two-Way Two-Lane (Low Volume)	C 20
Partial Lane Closed	Short Duration	Two-Way Two-Lane (Low Volume)	C 21
New: 2012 Partial Lane Closed	Short Duration	Two-Way Two-Lane	C 22
Partial Lane Closed	Short Duration	Two-Way Two-Lane (Altered Centreline)	C 23
Lane Closed	Very Short Duration	Two-Way Two-Lane (Low Volume)	C 30
Lane Closed	Very Short Duration	Two-Way Two-Lane	C 33
Lane Closed	Short Duration	Two-Way Two-Lane (Low Volume)	C 34
Lane Closed	Short Duration	Two-Way Two-Lane	C 35
Lane Closed	Short Duration	Two-Way (Altered Centreline)	C 48
Lane Closed	Long Duration	Two-Way Two-Lane (Traffic Control Signals)	C 51
Lane Closed	Long Duration	Two-Way Two-Lane (Traffic Control Persons)	C 52

Signing Illustration	Work Duration	Street Type	Guide
New: 2012 Blasting Warning	Short Duration	Two-Way Two-Lane	C 71
Planing Surface Condition	All Durations	Two-Way Two-Lane	C 72
Paving Surface Condition	All Durations	Two-Way Two-Lane	C 73
Temporary Markings	All Durations	Two-Way Two-Lane	C 74
Temporary Haul Road	All Durations	Two-Way Two-Lane	C 76
New: 2012 Detour	All Durations	Two-Way Two-Lane	C 77

Special Operations

Work Type	Work Duration	Street Type	Guide
Park Lane/Shoulder Work	Mobile/Short Stops	Two-Way Two Lane.	C 90
New: 2012 Line Painting	Mobile Continuous	Two-Way Two-Lane	C 91
Survey Crew	Short Duration	Two-Way Two-Lane	C 93
Survey Crew	Short Duration/Short Stops	Two-Way Two-Lane	C 94
Partial Lane Closure	Mobile Short Stops	Two-Way Two-Lane	C 95
Lane Closed	Mobile Continuous	Two-Way Two-Lane	C 96
Lane Closed	Mobile Continuous	Two-Way Two-Lane (Low Volume)	C 97

"C" Application Guides, continued

Intersections

Signing Illustration	Work Duration	Street Type (Special Conditions)	Guide
Partial Lane Closure	Short Duration	Intersection (Work Right, Stop Approach)	C 101
Partial Lane Closure	Short Duration	Intersection (Work Center, Stop Approach)	C 102
Left Turn Lane Closed	Short Duration	Intersection	C 103
Right Lane Shift	Short Duration	Intersection	C 111
Right Lane Closed	Short Duration	Intersection	C 112
New: 2012 Far Right Lane Detour	Short Duration	Intersection	C 114
Within Intersection	Short Duration	Intersection (Altered Centerline)	C 115
New: 2012 Near Right Lane Detour	Short Duration	Intersection	C 119
Right Lane Closed	Short Duration	Intersection (Multi-Lane Approach)	C 121
Left Lane Closed	Short Duration	Intersection (Multi-Lane Approach)	C 122
Within Intersection	Short Duration	Intersection (Multi-Lane Approach)	C 135
New: 2012 Within Intersection	Short Duration	Intersection (Multi-Lane Approach, Crossing Movement Closed)	C 139

Legend of Symbols Used in Application Guides

New: 2012

Used to indicate the position of a single sign.

Used to indicate the position of two signs displayed back to back.

Used to indicate the position of a barricade.

Used to indicate red orange flags on a sign as required by Section 8.0

Used to indicate the position of a traffic cone or high delineator.

Used to indicate the position of a traffic drum.

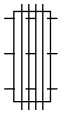
When displayed alone, used to indicate the position of a Flashing Light Unit, either vehicle or trailer mounted (in Bar Mode).

Used to indicate the position of F-shape barriers.

Used to indicate the position of traffic signals.

A yellow line is used to indicate the centreline of a road. White is used to indicate a lane line.

Used to indicate the direction of travel within a lane.

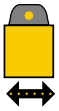


Used to indicate the position of the Work Area.

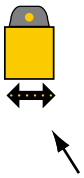
Used to indicate a break and that the drawing covers a greater distance than the scale can easily show.

Used to indicate a Traffic Control Person at the Control Position.

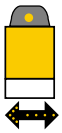
Used to indicate the position of a vehicle with a 360 degree flashing amber light. If the vehicle has a specific title or function, it will typically be labelled.



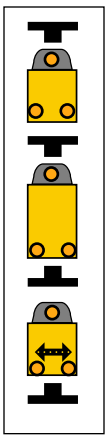
Used to indicate the position of a vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle has a specific title or function, it will typically be labelled.



When labelled as such, used to indicate the position of a Trail Vehicle with a 360 degree flashing amber light and a Flashing Light Unit. If the vehicle requires specific signs they are typically shown beside the labelled vehicle.



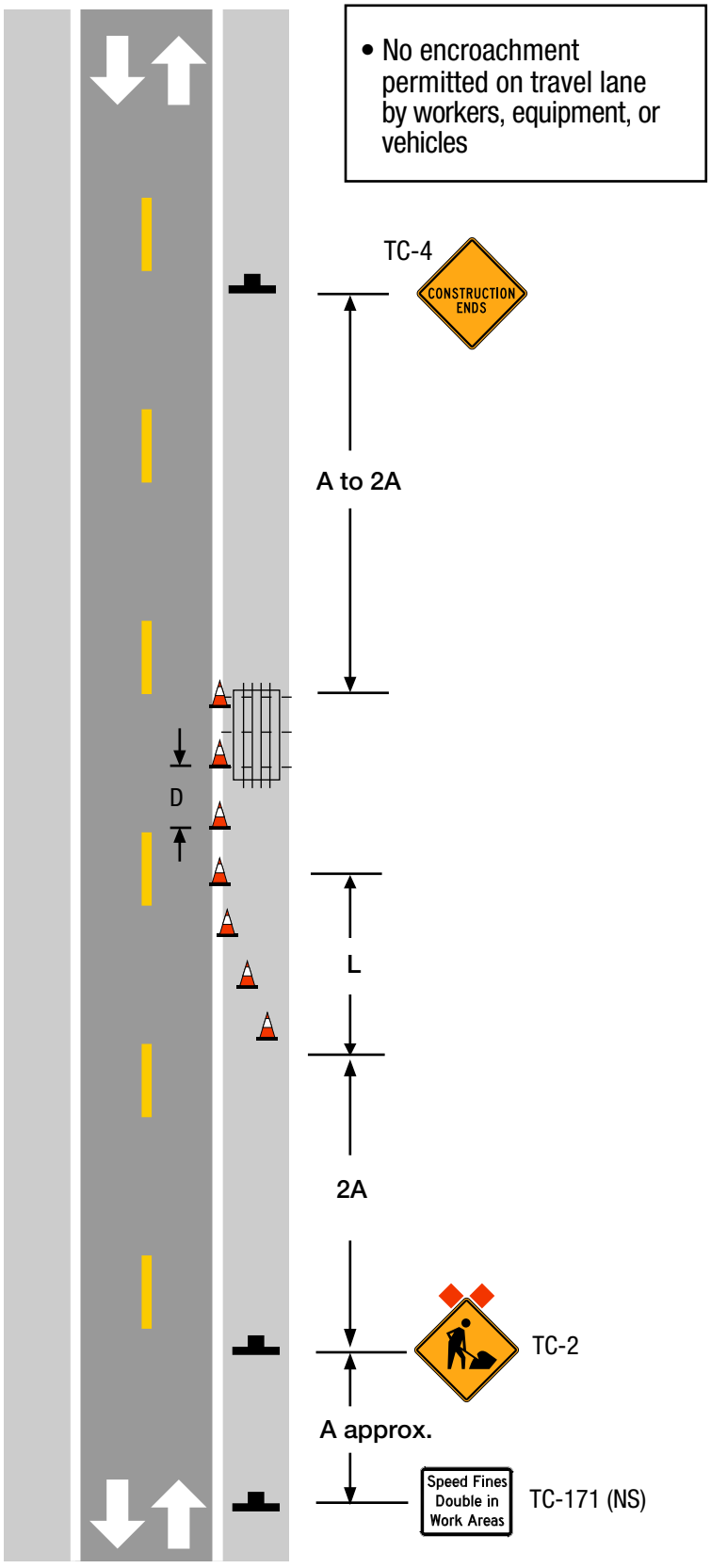
Used to indicate the position of a Protection Vehicle with a truck mounted attenuator, a 360 degree flashing amber light, and a Flashing Light Unit.



Used to indicate the position of line painting vehicles with, as applicable, 360 degree flashing amber lights, high mount flashing amber lights, signs, and a Flashing Light Unit

NOT TO SCALE

Left Blank for Notes

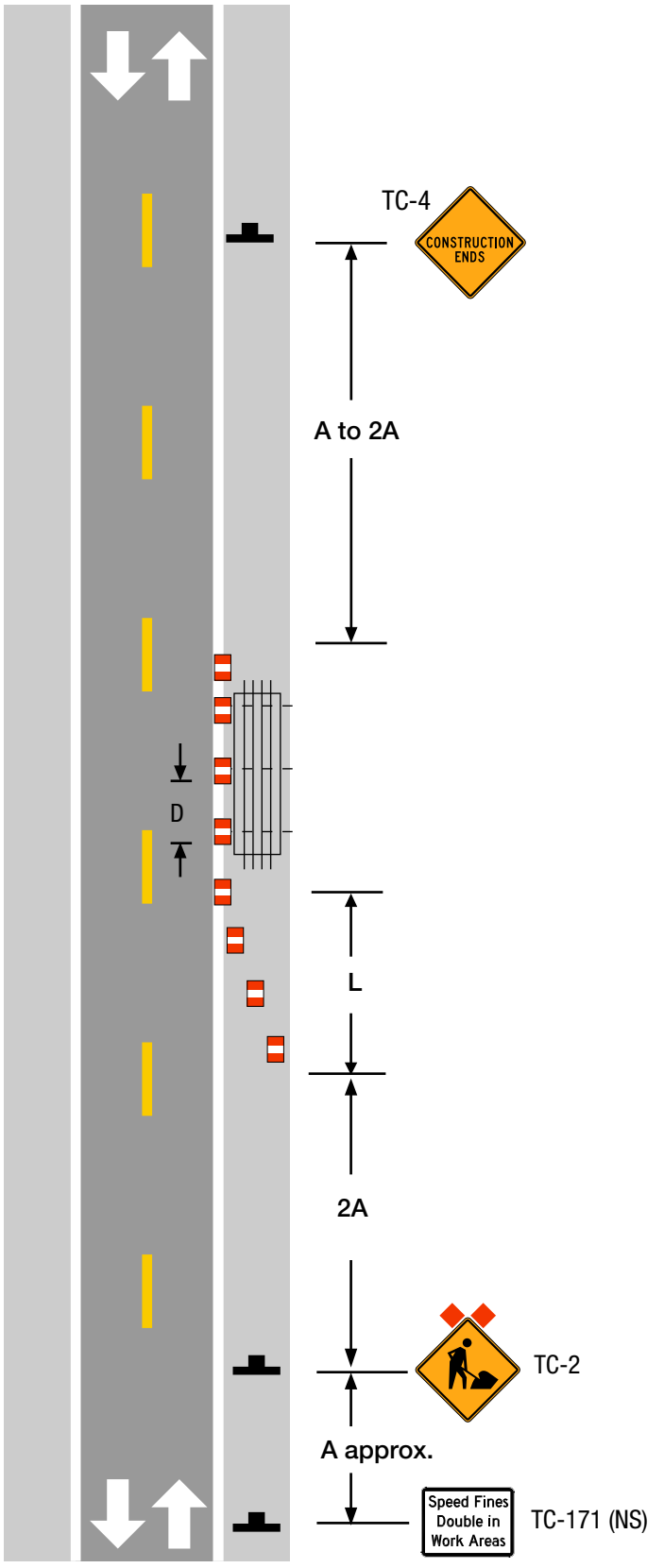


V	50
A	50
L	30
D	5

V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
D - Cone/Drum Spacing m

NOT TO SCALE

- No encroachment permitted on travel lane by workers, equipment, or vehicles
- Drums must be used to delineate the Approach Transition Taper
- Drums must be used to delineate the Work Area opposite the excavation and at least L/2 in advance of and after the excavation

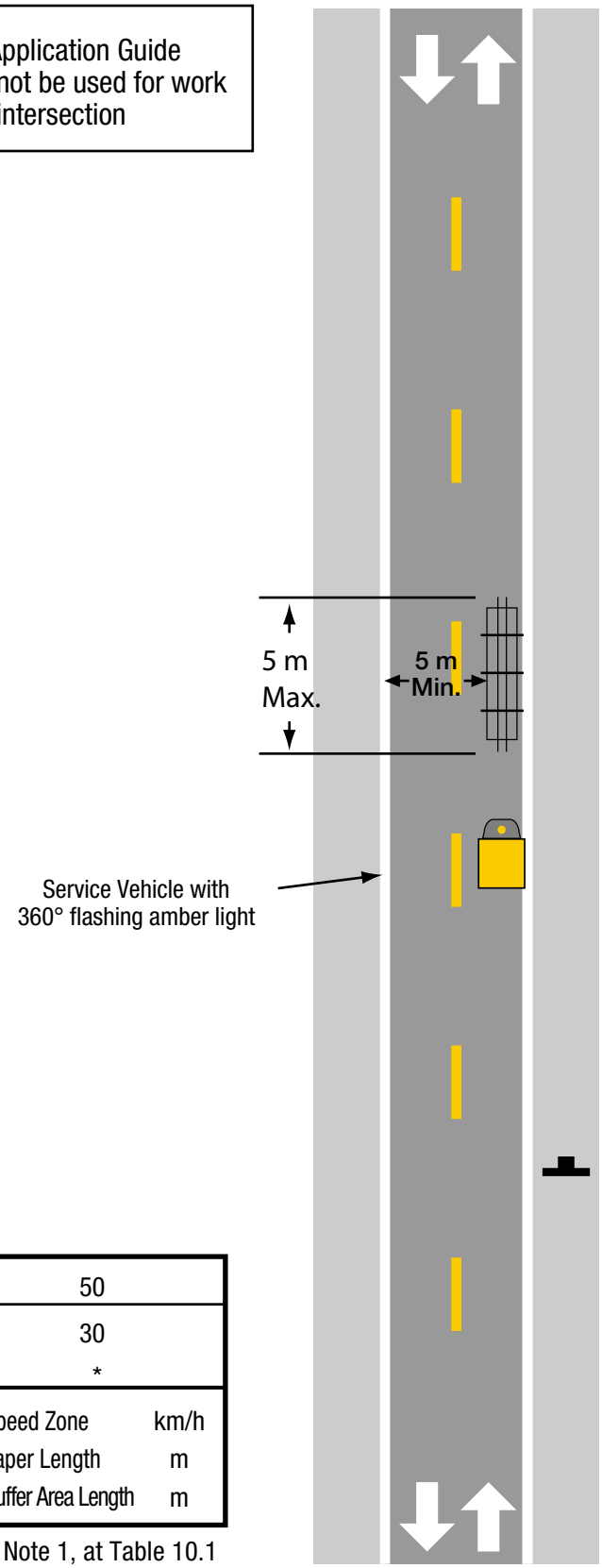


V	50
A	50
L	30
D	5

V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
D - Cone/Drum Spacing m

NOT TO SCALE

- This Application Guide must not be used for work at an intersection



- A minimum of 5 m travel width must be maintained
- If the Work Area is not positioned so that motorists from both directions have enough visibility to react safely and comfortably to passing manoeuvres, this Application Guide must not be used
- Vehicle must be positioned to protect workers
- Workers must stay close enough to the vehicle so that overtaking public traffic will not pull back into the Work Area

TC-17 (NS)

V	50
L	30
B	*

V - Speed Zone km/h
L - Taper Length m
B - Buffer Area Length m

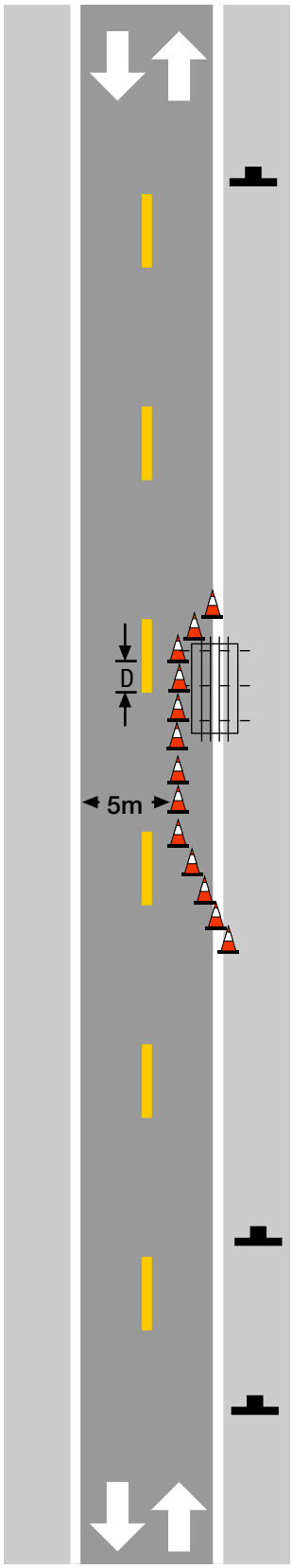
* See Note 1, at Table 10.1

NOT TO SCALE

- If the Work Area is not positioned so that motorists from both directions have enough visibility to react safely and comfortably to passing manoeuvres, this Application Guide must not be used
- Road Narrows TC-34 should be placed "A" distance before the TC-2 Road Work sign if the visibility of the TC-2 is restricted

TC-34

- A minimum of 5 m of travel width must be maintained



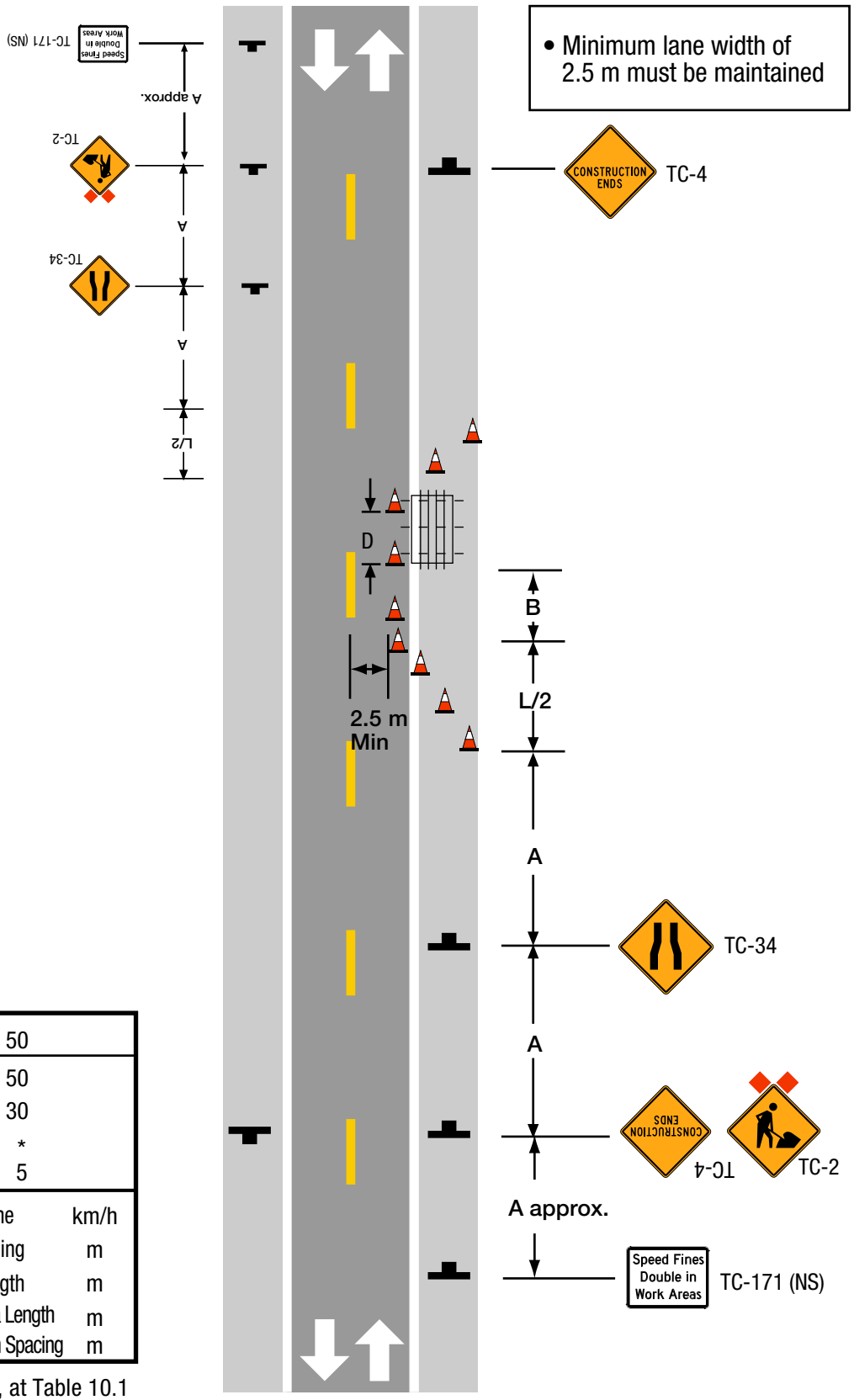
V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012

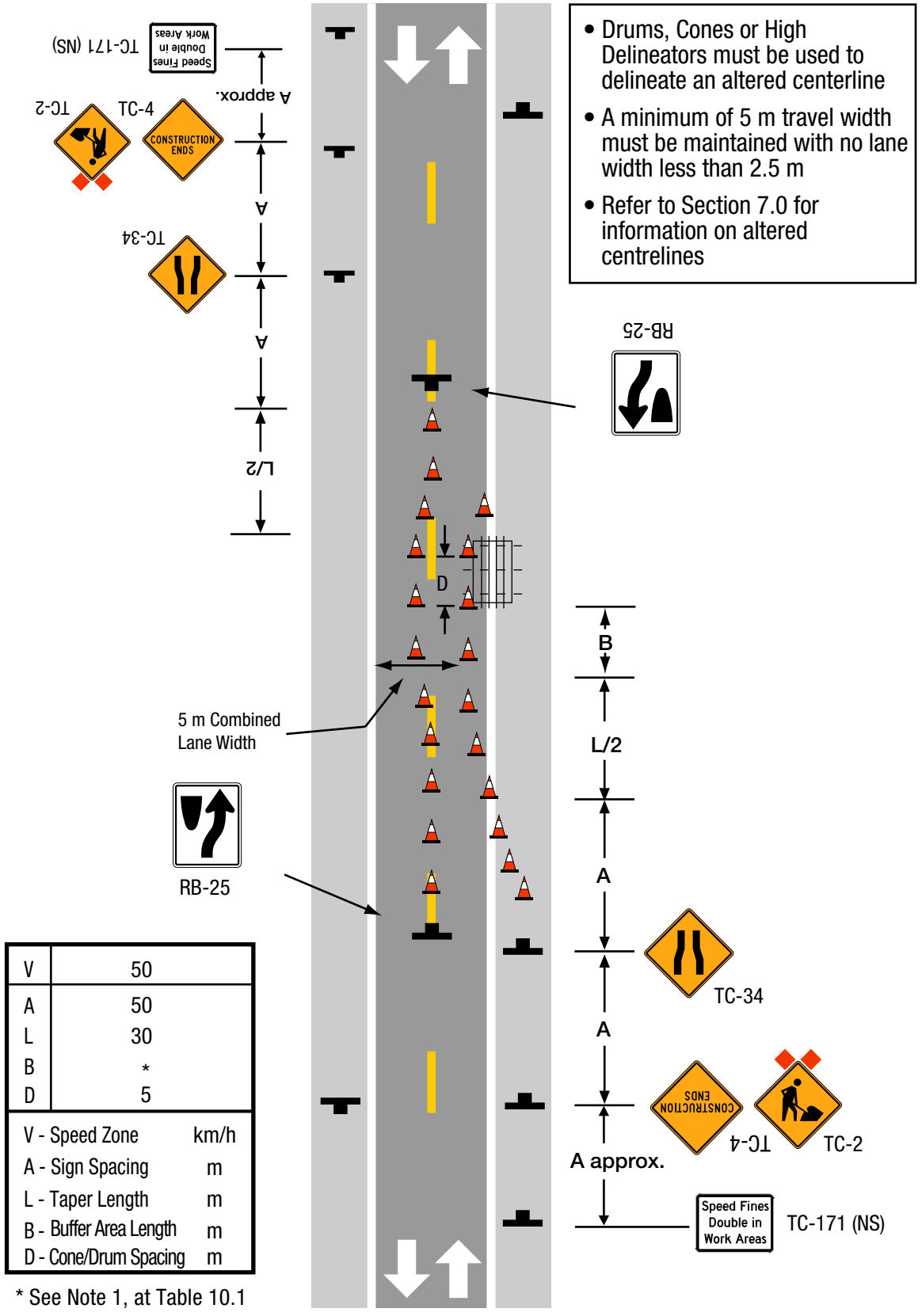


V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



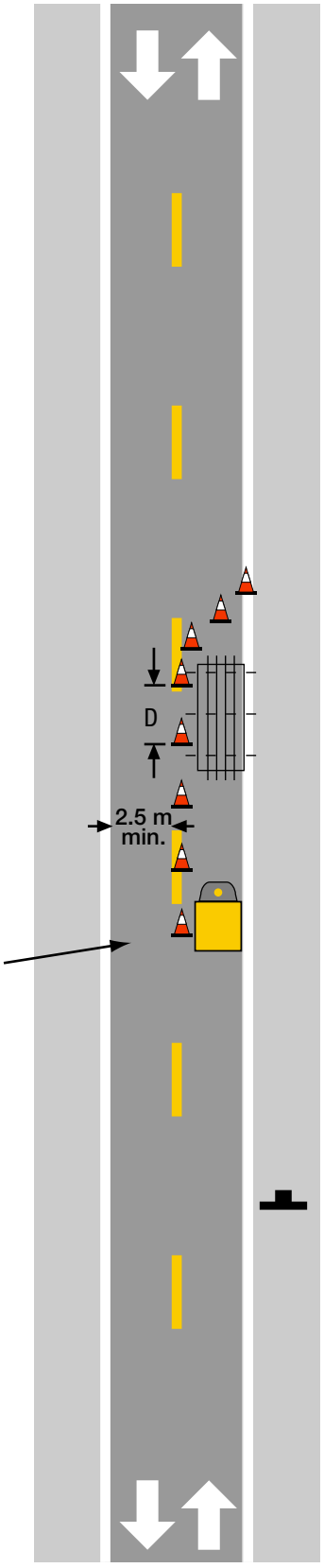
- Drums, Cones or High Delineators must be used to delineate an altered centerline
- A minimum of 5 m travel width must be maintained with no lane width less than 2.5 m
- Refer to Section 7.0 for information on altered centrelines

V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



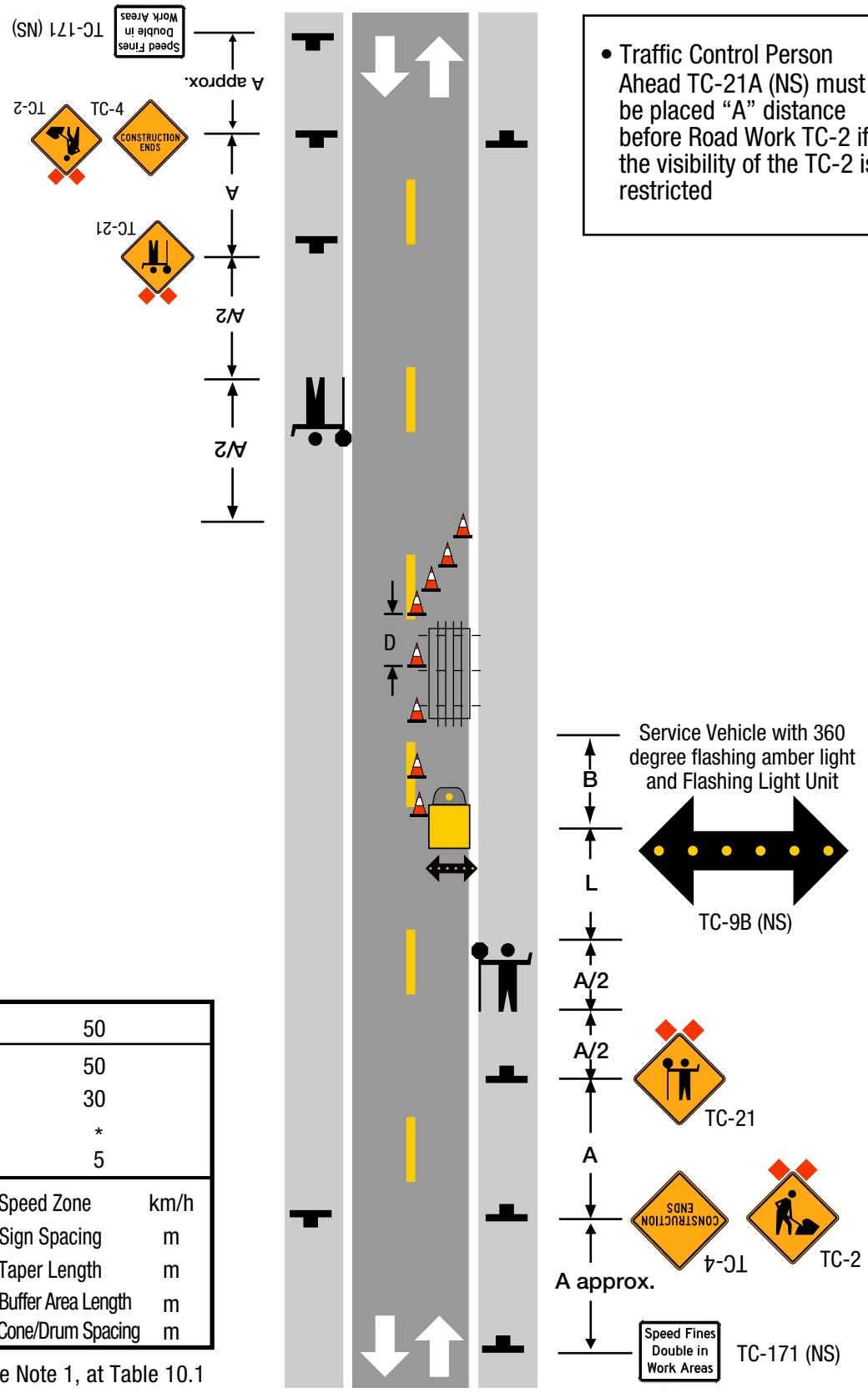
- Low volume roads less than 200 vph during the time work is being carried out
- If the Work Area is not positioned so that motorists from both directions have enough visibility to react safely and comfortably to passing manoeuvres, this Application Guide must not be used

V	50
L	30
B	*
D	5

V - Speed Zone km/h
L - Taper Length m
B - Buffer Area Length m
D - Cone/Drum Spacing m

* See Note 1, at Table 10.1

NOT TO SCALE



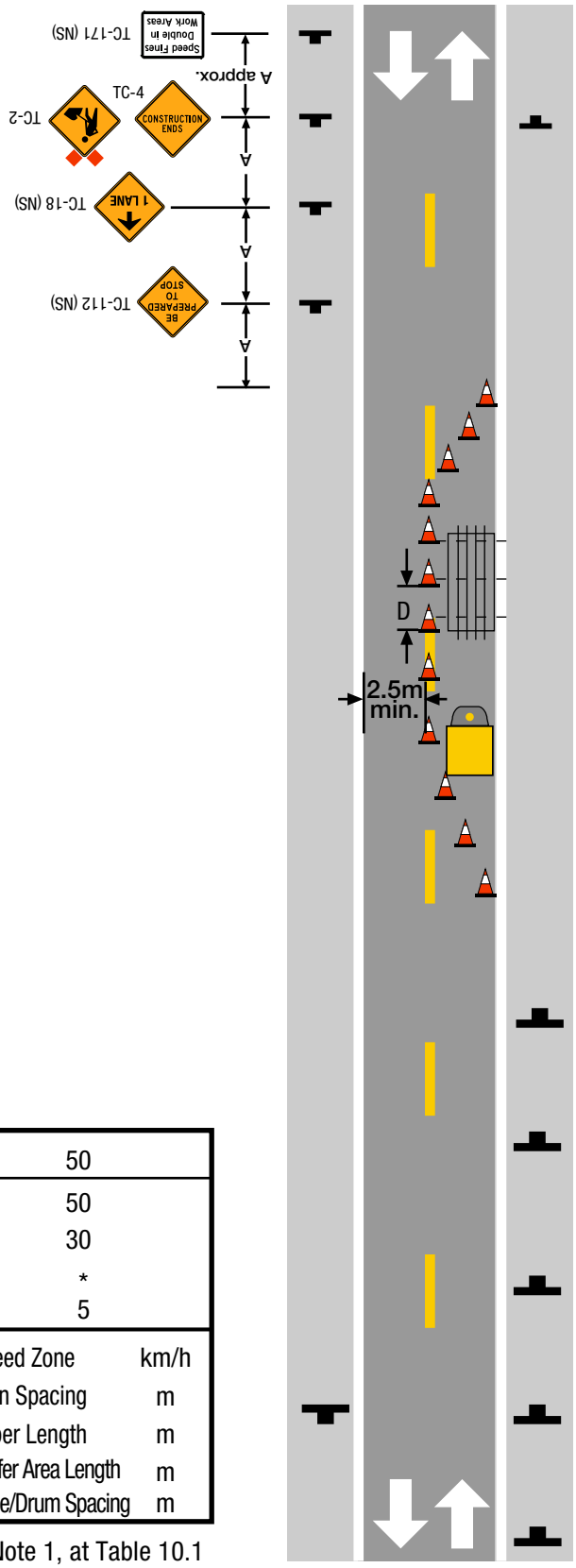
- Traffic Control Person Ahead TC-21A (NS) must be placed "A" distance before Road Work TC-2 if the visibility of the TC-2 is restricted

V	50
A	50
L	30
B	*
D	5

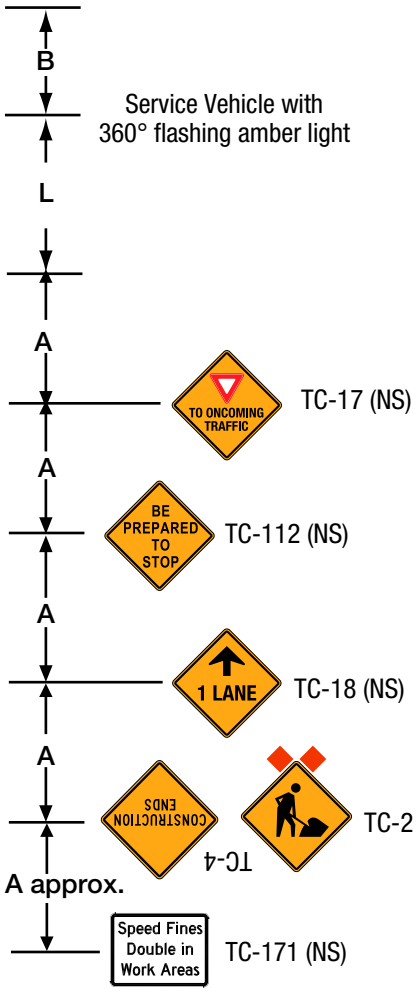
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



- Low volume roads less than 200 vph during the time work is being carried out
- Work Area has a maximum length of 50 m
- If the Work Area is not positioned so that motorists from both directions have enough visibility to react safely and comfortably to passing manoeuvres, this Application Guide must not be used

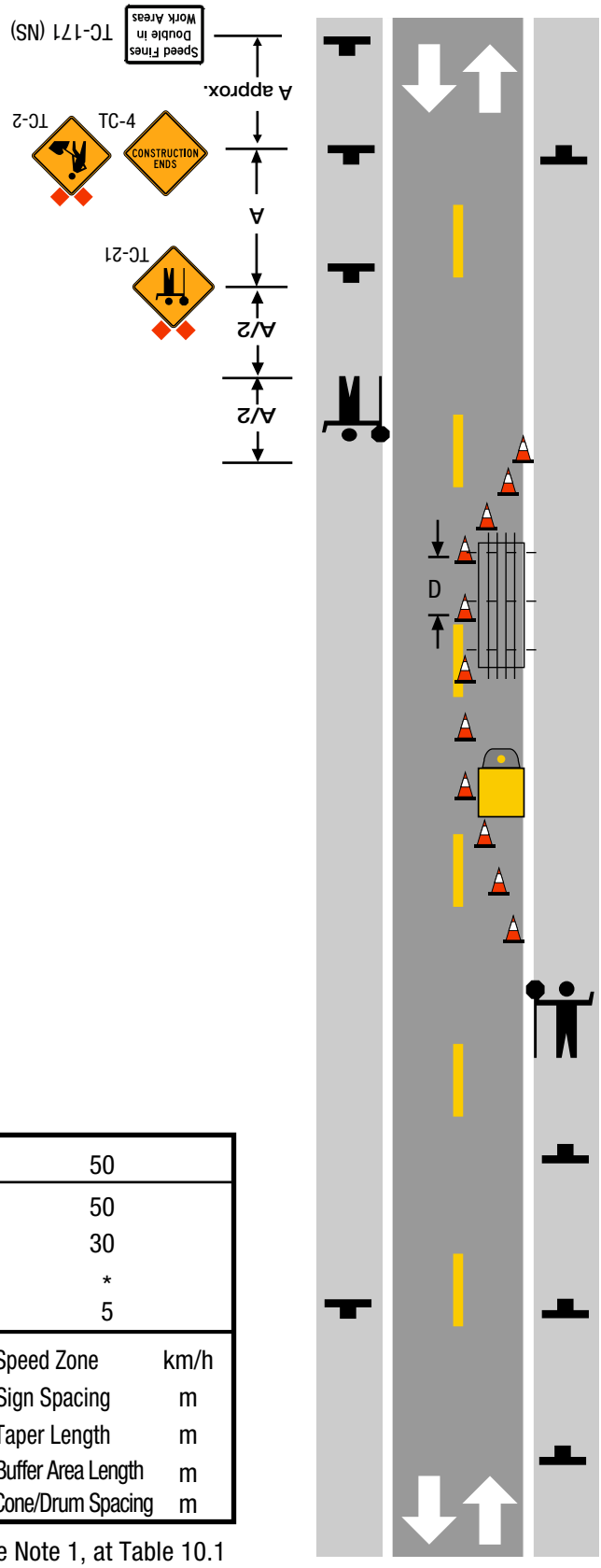


V	50
A	50
L	30
B	*
D	5

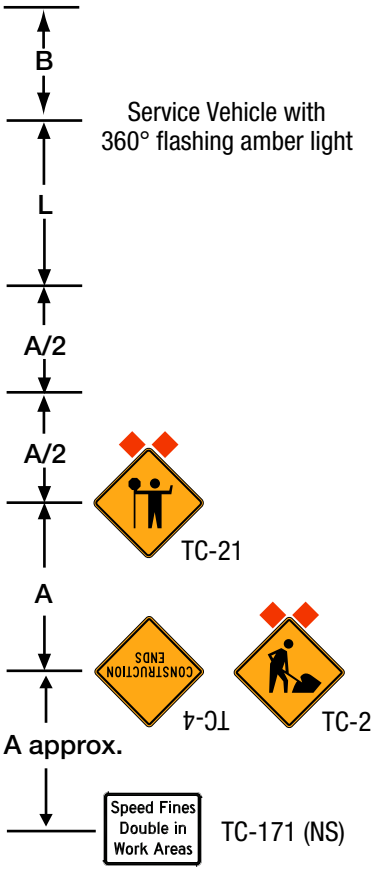
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



- Traffic Control Person Ahead TC-21A (NS) must be placed "A" distance before Road Work TC-2 if the visibility of the TC-2 is restricted



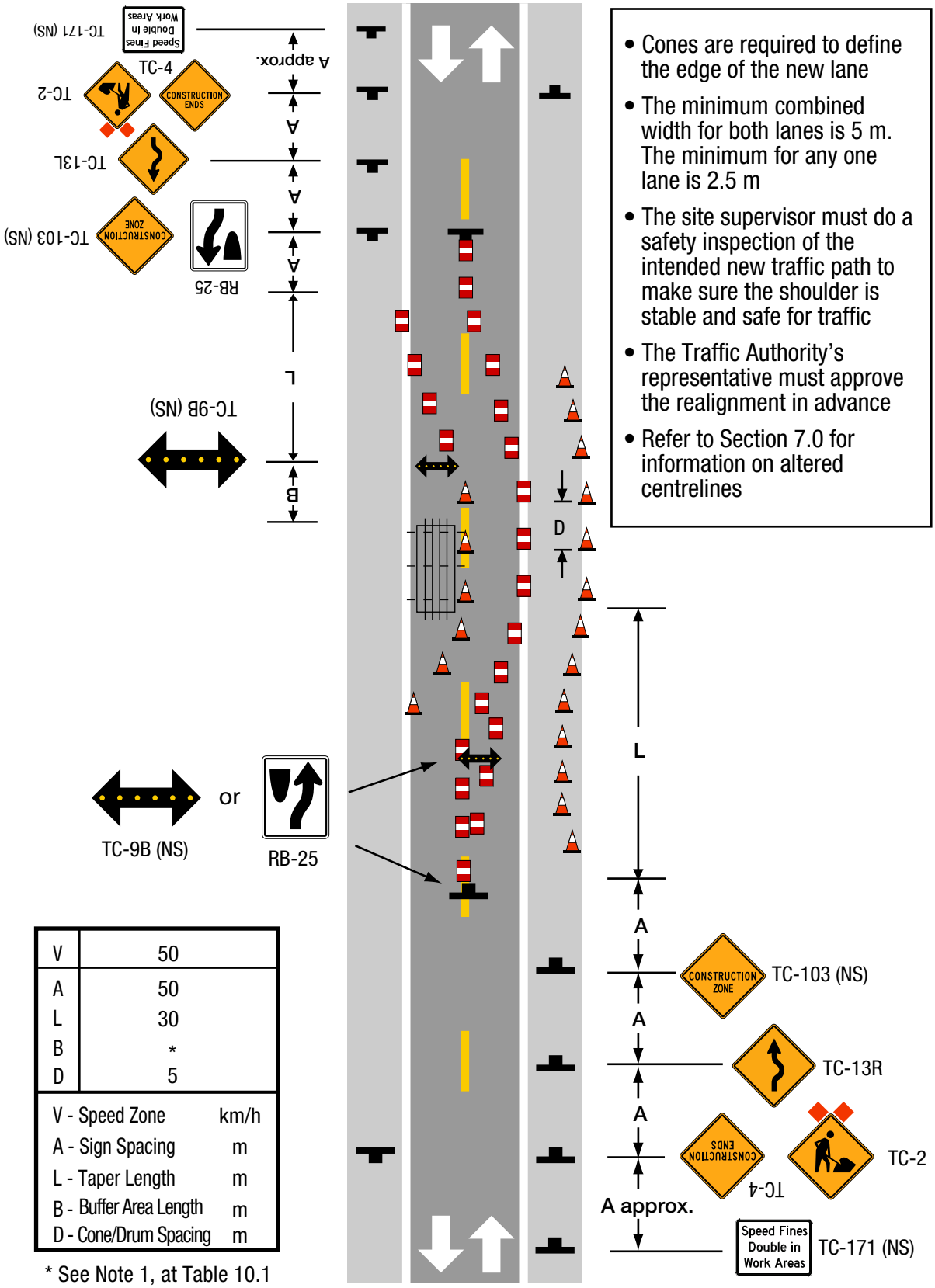
Service Vehicle with 360° flashing amber light

V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



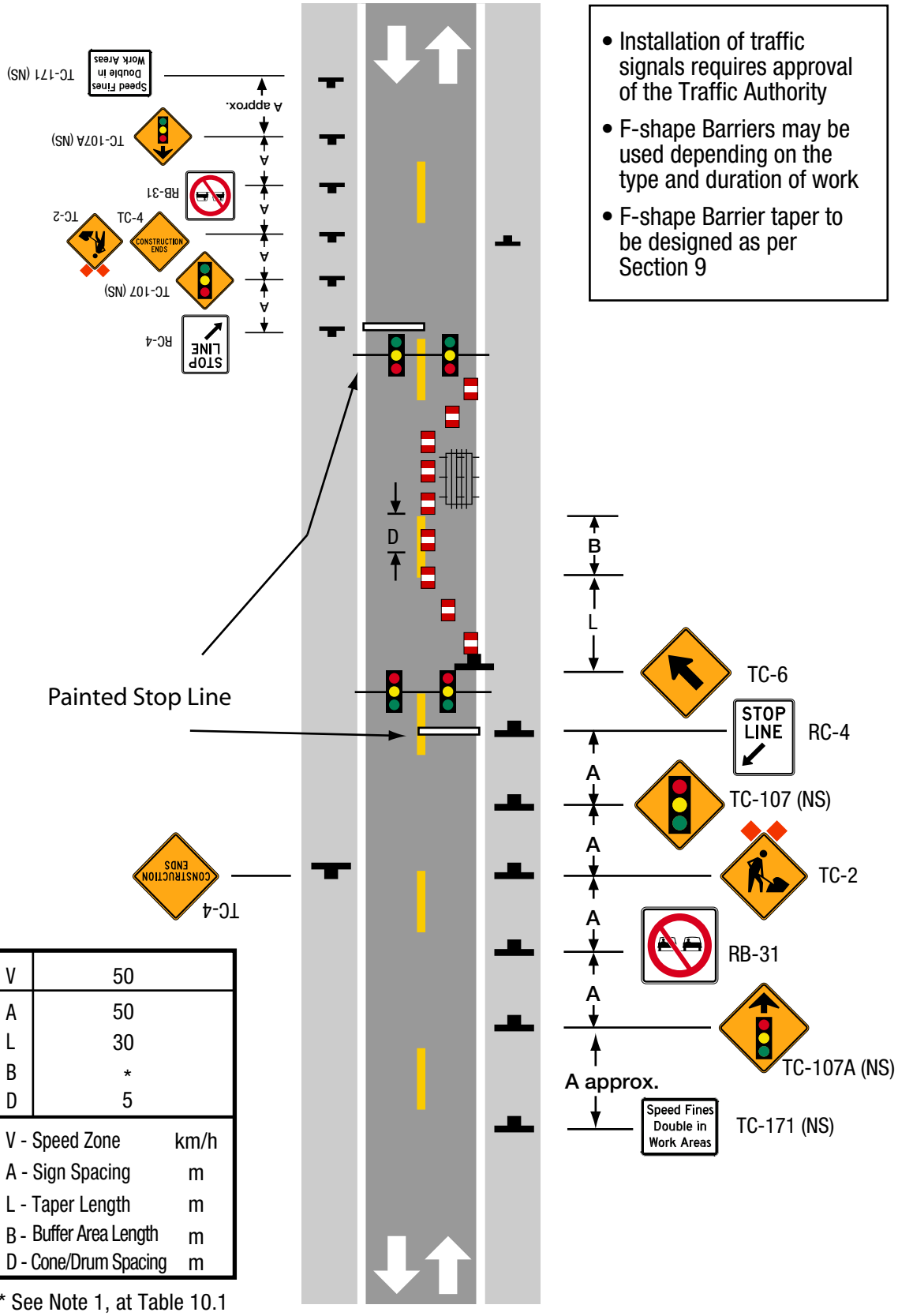
- Cones are required to define the edge of the new lane
- The minimum combined width for both lanes is 5 m. The minimum for any one lane is 2.5 m
- The site supervisor must do a safety inspection of the intended new traffic path to make sure the shoulder is stable and safe for traffic
- The Traffic Authority's representative must approve the realignment in advance
- Refer to Section 7.0 for information on altered centrelines

V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE

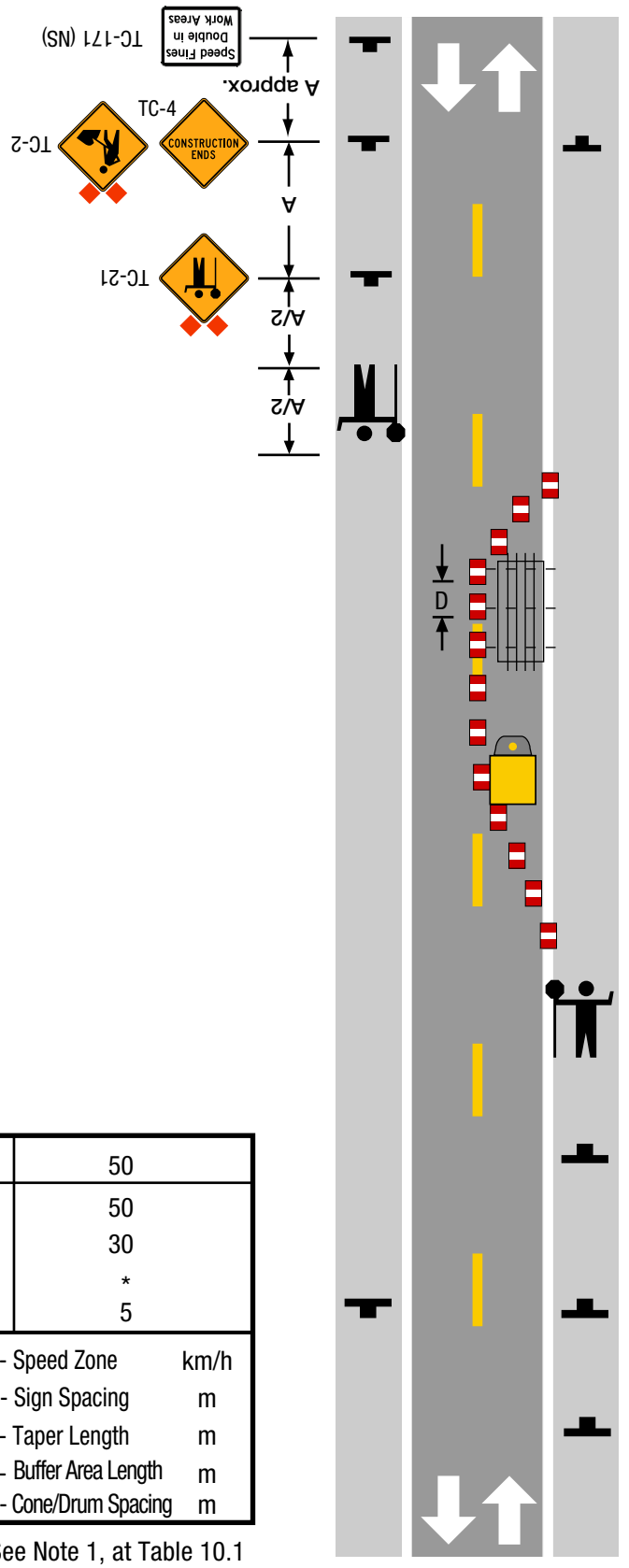


V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE



- Traffic Control Person Ahead TC-21A (NS) must be placed "A" distance before Road Work TC-2 if the visibility of the TC-2 is restricted
- F-shape Barriers may be used depending on the type and duration of work
- F-shape Barrier taper to be designed as per Section 10

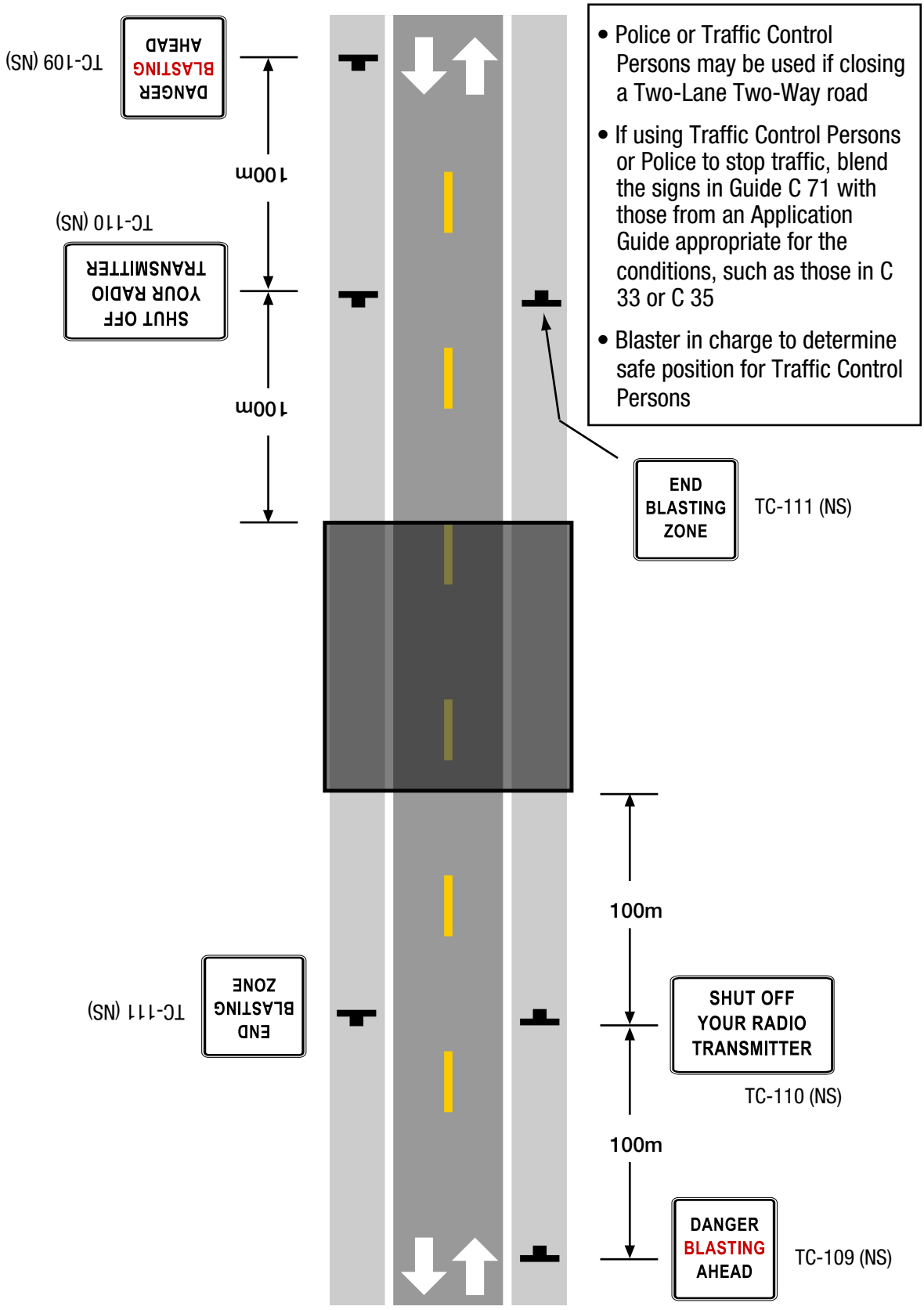
V	50
A	50
L	30
B	*
D	5

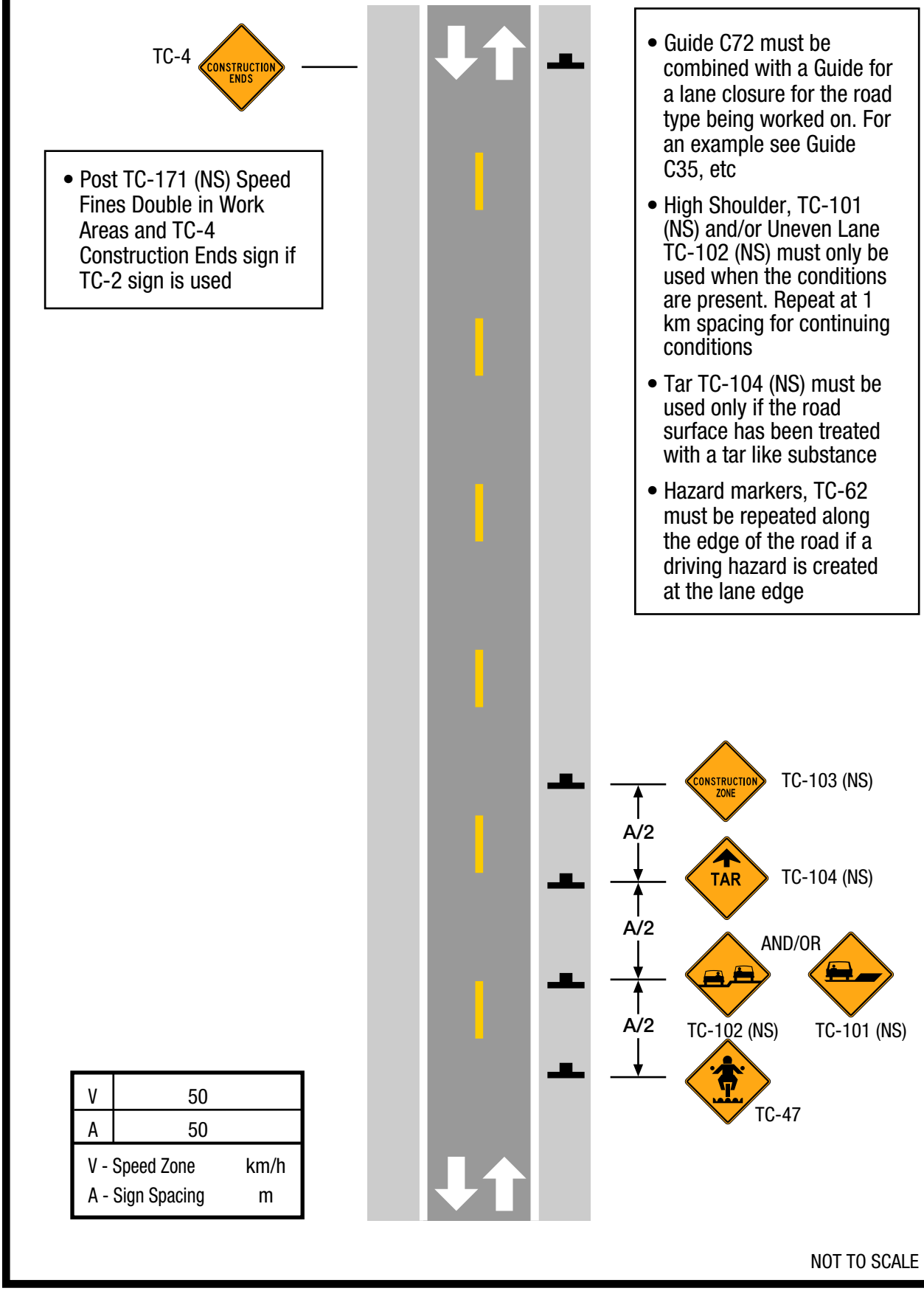
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

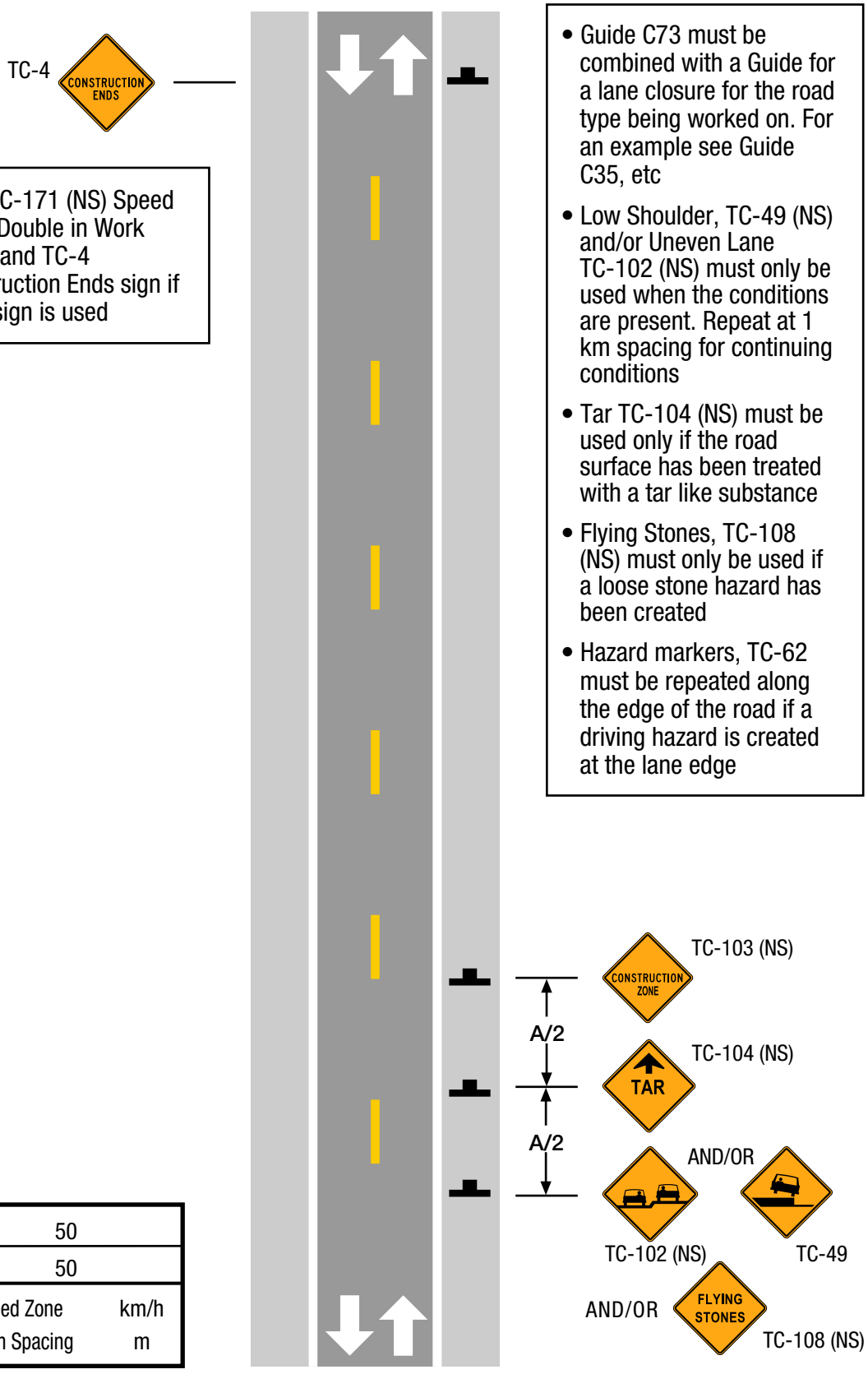
* See Note 1, at Table 10.1

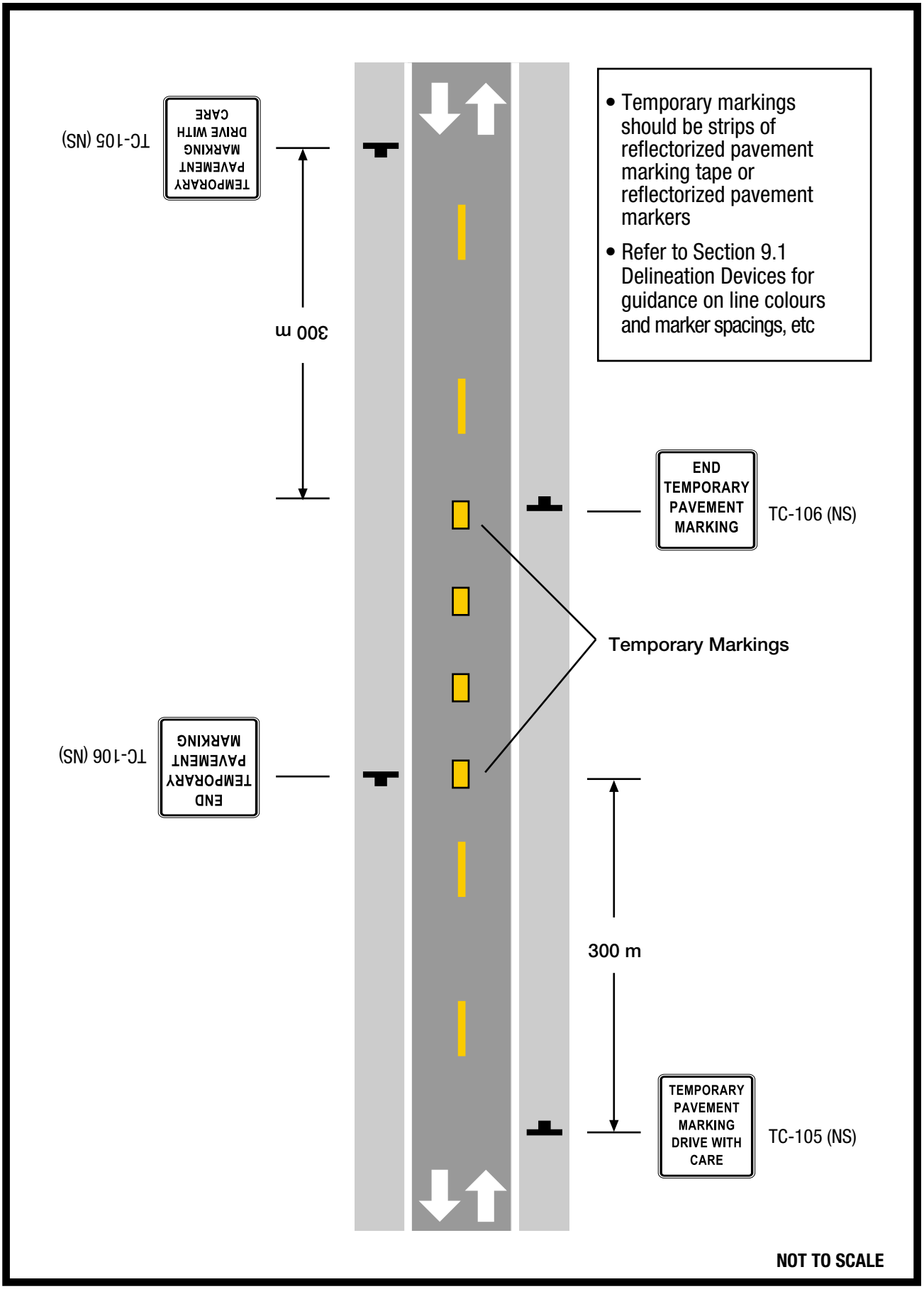
NOT TO SCALE

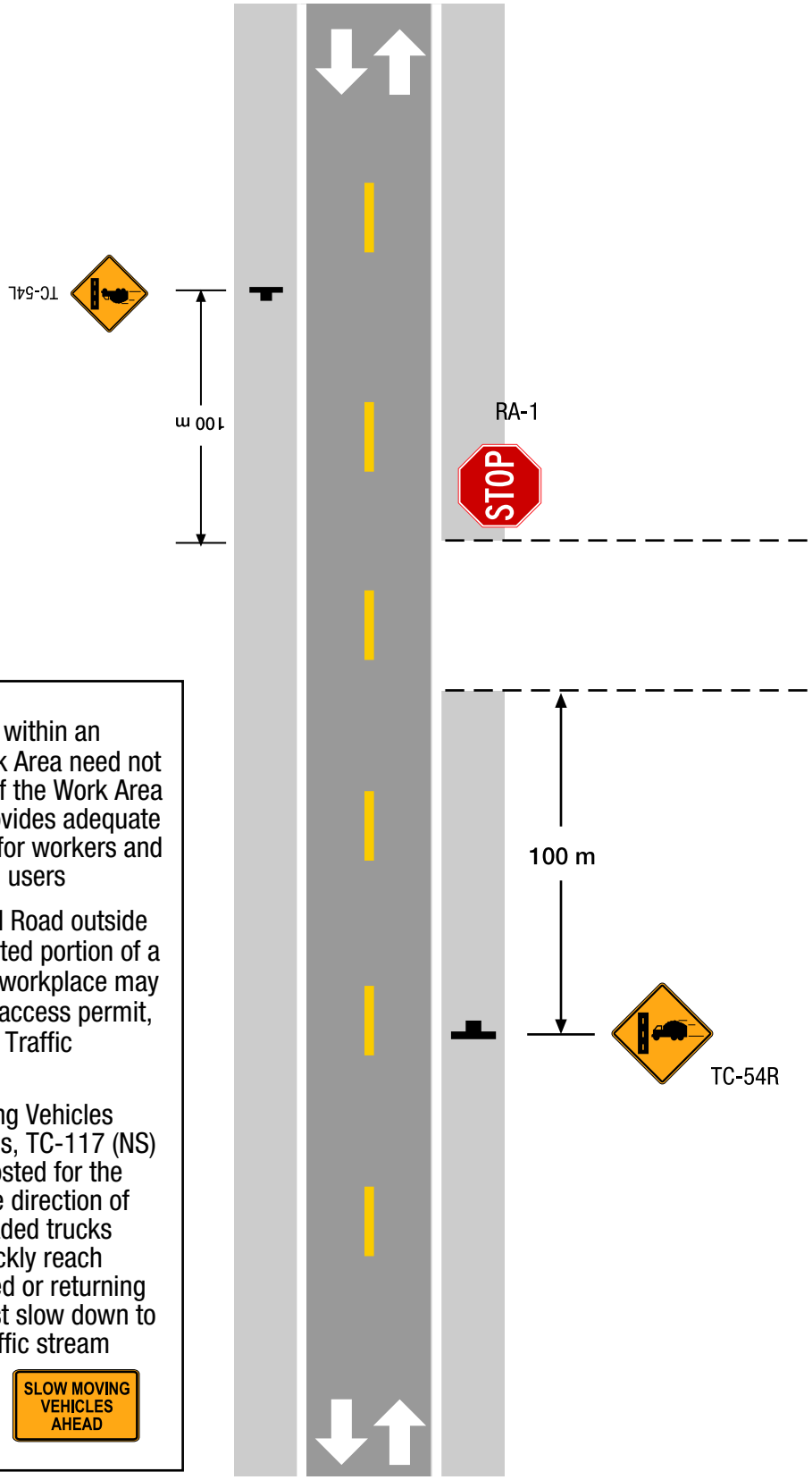
New: 2012


DANGER BLASTING AHEAD
TC-109 (NS)
100m
SHUT OFF YOUR RADIO TRANSMITTER
TC-110 (NS)
100m
END BLASTING ZONE
TC-111 (NS)
• Police or Traffic Control Persons may be used if closing a Two-Lane Two-Way road
• If using Traffic Control Persons or Police to stop traffic, blend the signs in Guide C 71 with those from an Application Guide appropriate for the conditions, such as those in C 33 or C 35
• Blaster in charge to determine safe position for Traffic Control Persons
END BLASTING ZONE
TC-111 (NS)
100m
SHUT OFF YOUR RADIO TRANSMITTER
TC-110 (NS)
100m
DANGER BLASTING AHEAD
TC-109 (NS)
NOT TO SCALE


TC-4
CONSTRUCTION ENDS
• Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends sign if TC-2 sign is used
• Guide C72 must be combined with a Guide for a lane closure for the road type being worked on. For an example see Guide C35, etc
• High Shoulder, TC-101 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
• Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
• Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge
CONSTRUCTION ZONE
TC-103 (NS)
A/2
TAR
TC-104 (NS)
A/2
AND/OR
A/2
TC-102 (NS)
TC-101 (NS)
TC-47
V 50
A 50
V - Speed Zone km/h
A - Sign Spacing m
NOT TO SCALE


TC-4
CONSTRUCTION ENDS
• Post TC-171 (NS) Speed Fines Double in Work Areas and TC-4 Construction Ends sign if TC-2 sign is used
• Guide C73 must be combined with a Guide for a lane closure for the road type being worked on. For an example see Guide C35, etc
• Low Shoulder, TC-49 (NS) and/or Uneven Lane TC-102 (NS) must only be used when the conditions are present. Repeat at 1 km spacing for continuing conditions
• Tar TC-104 (NS) must be used only if the road surface has been treated with a tar like substance
• Flying Stones, TC-108 (NS) must only be used if a loose stone hazard has been created
• Hazard markers, TC-62 must be repeated along the edge of the road if a driving hazard is created at the lane edge
TC-103 (NS)
CONSTRUCTION ZONE
A/2
TC-104 (NS)
TAR
A/2
AND/OR
TC-102 (NS)
TC-49
AND/OR
FLYING STONES
TC-108 (NS)
V 50
A 50
V - Speed Zone km/h
A - Sign Spacing m
NOT TO SCALE


• Temporary markings should be strips of reflectorized pavement marking tape or reflectorized pavement markers
• Refer to Section 9.1 Delineation Devices for guidance on line colours and marker spacings, etc
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
Temporary Markings
300 m
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
300 m
END TEMPORARY PAVEMENT MARKING
TC-106 (NS)
TEMPORARY PAVEMENT MARKING DRIVE WITH CARE
TC-105 (NS)
NOT TO SCALE

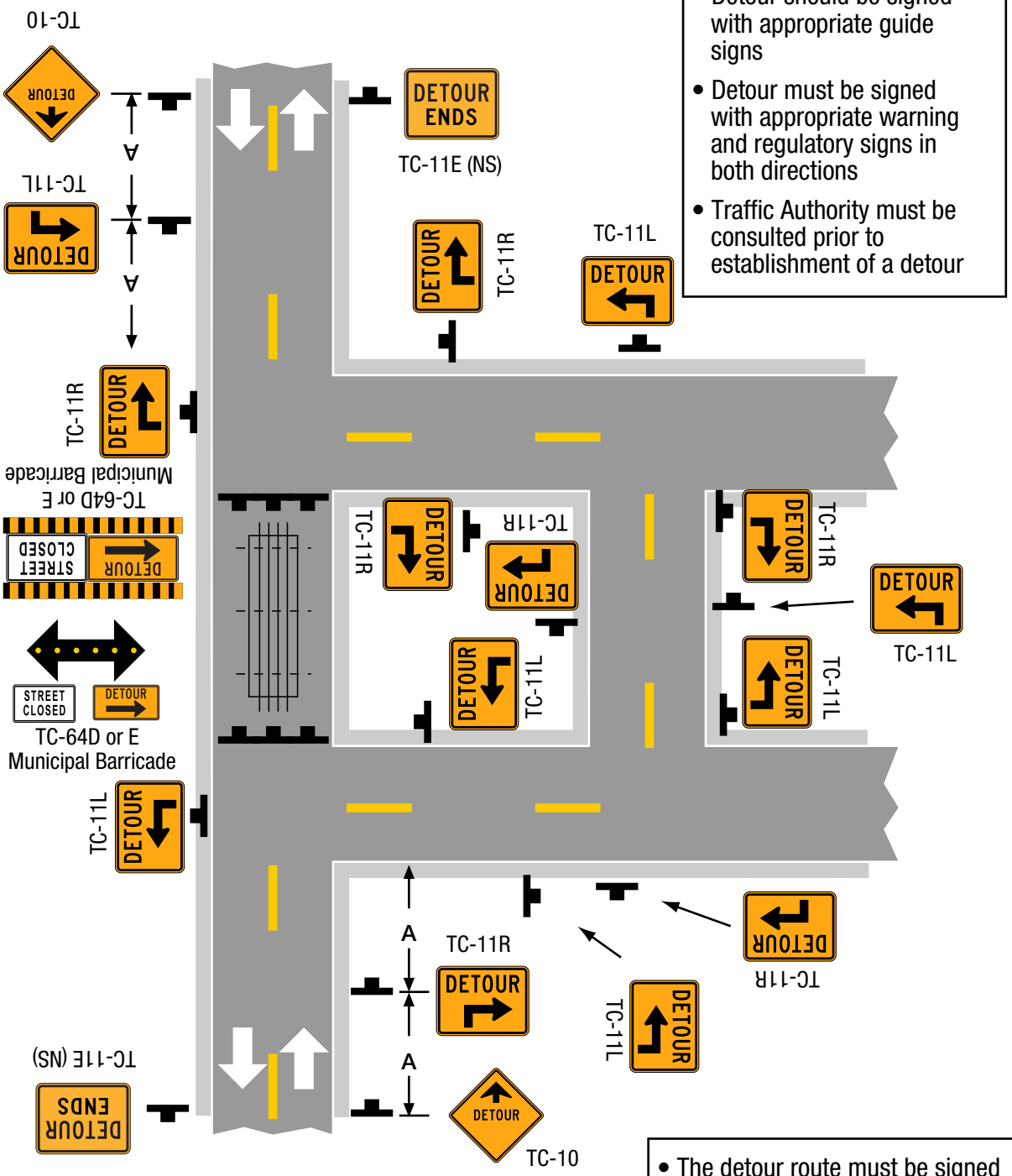


- Haul roads within an active Work Area need not be signed if the Work Area signing provides adequate protection for workers and public road users
- A new Haul Road outside the delineated portion of a temporary workplace may require an access permit, check with Traffic Authority
- Slow Moving Vehicles Ahead signs, TC-117 (NS) must be posted for the appropriate direction of travel if loaded trucks cannot quickly reach traffic speed or returning trucks must slow down to exit the traffic stream

TC-117 (NS) SLOW MOVING VEHICLES AHEAD

NOT TO SCALE

New: 2012



- Detour should be signed with appropriate guide signs
- Detour must be signed with appropriate warning and regulatory signs in both directions
- Traffic Authority must be consulted prior to establishment of a detour

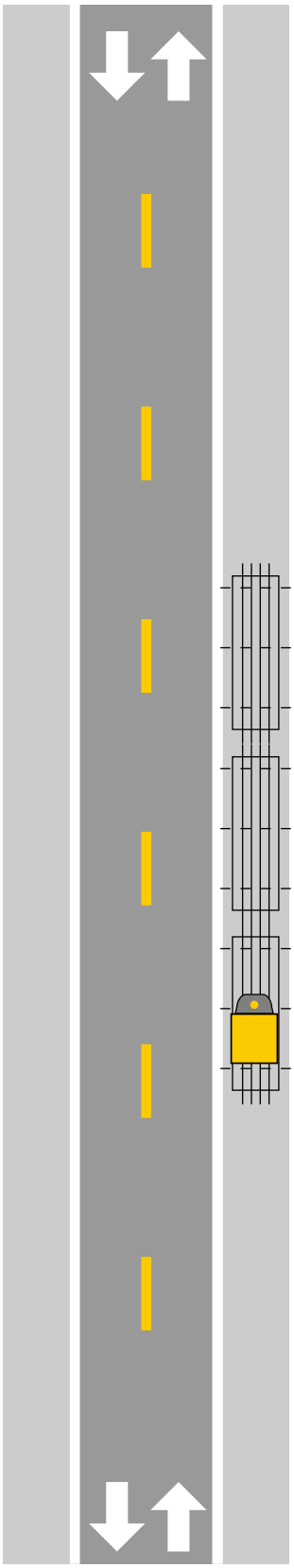
V	50
A	50
V - Speed Zone	km/h
A - Sign Spacing	m

- The detour must accommodate the size (length, width, height) and weight of vehicles detoured; turning movements for trucks must be checked

- The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination
- See text at Section 9.4 for barricade use

NOT TO SCALE

- This Application Guide must not be used to perform stationary work at a single location where work at that location will exceed 30 min. in duration
- Where it is necessary to perform park lane / shoulder work on foot, short stops may be made and work performed downstream of the Work Vehicle
- The space between the workers on foot and the Work Vehicle must be maintained at approximately but not less than "B" value, and adjusted to maximize safety, taking into consideration traffic, and the road alignment



- No encroachment permitted on travel lane while work is performed
- Vehicles are not permitted to back up
- Where obstructions or conditions on the park lane / shoulder force vehicle encroachment onto the lane (parked vehicle, slope, post, guardrail, etc.), work must stop while work vehicle drives past the obstruction and must not start again until work vehicle is completely off the travel lane

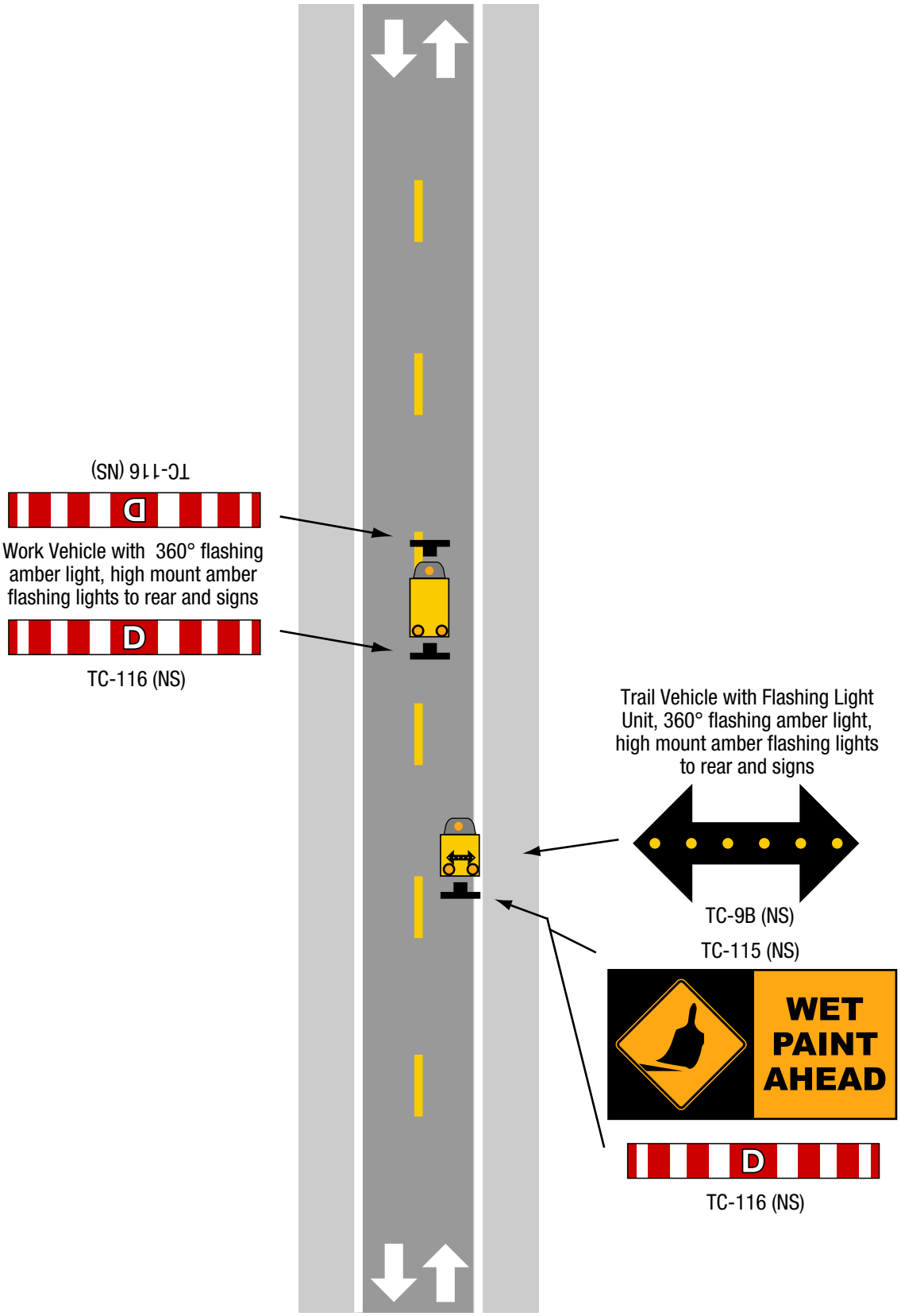
Work Vehicle
with 360° flashing amber light

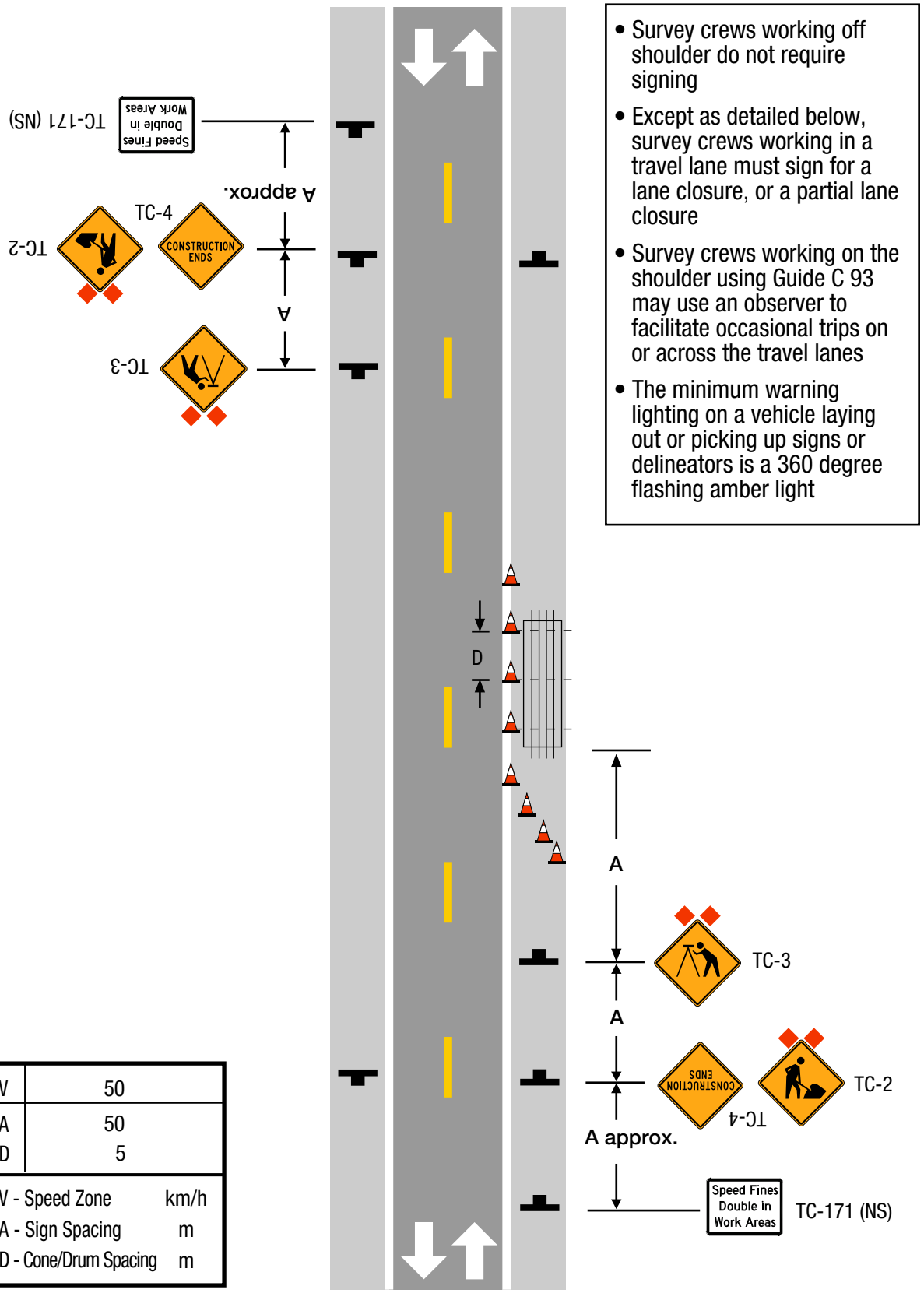
V	50
B	*
V - Speed Zone	km/h
B - Buffer Area Length	m

* See Note 1, at Table 10.1

NOT TO SCALE

New: 2012


TC-116 (NS)
Work Vehicle with 360° flashing amber light, high mount amber flashing lights to rear and signs
TC-116 (NS)
Trail Vehicle with Flashing Light Unit, 360° flashing amber light, high mount amber flashing lights to rear and signs
TC-9B (NS)
TC-115 (NS)
WET PAINT AHEAD
TC-116 (NS)
NOT TO SCALE

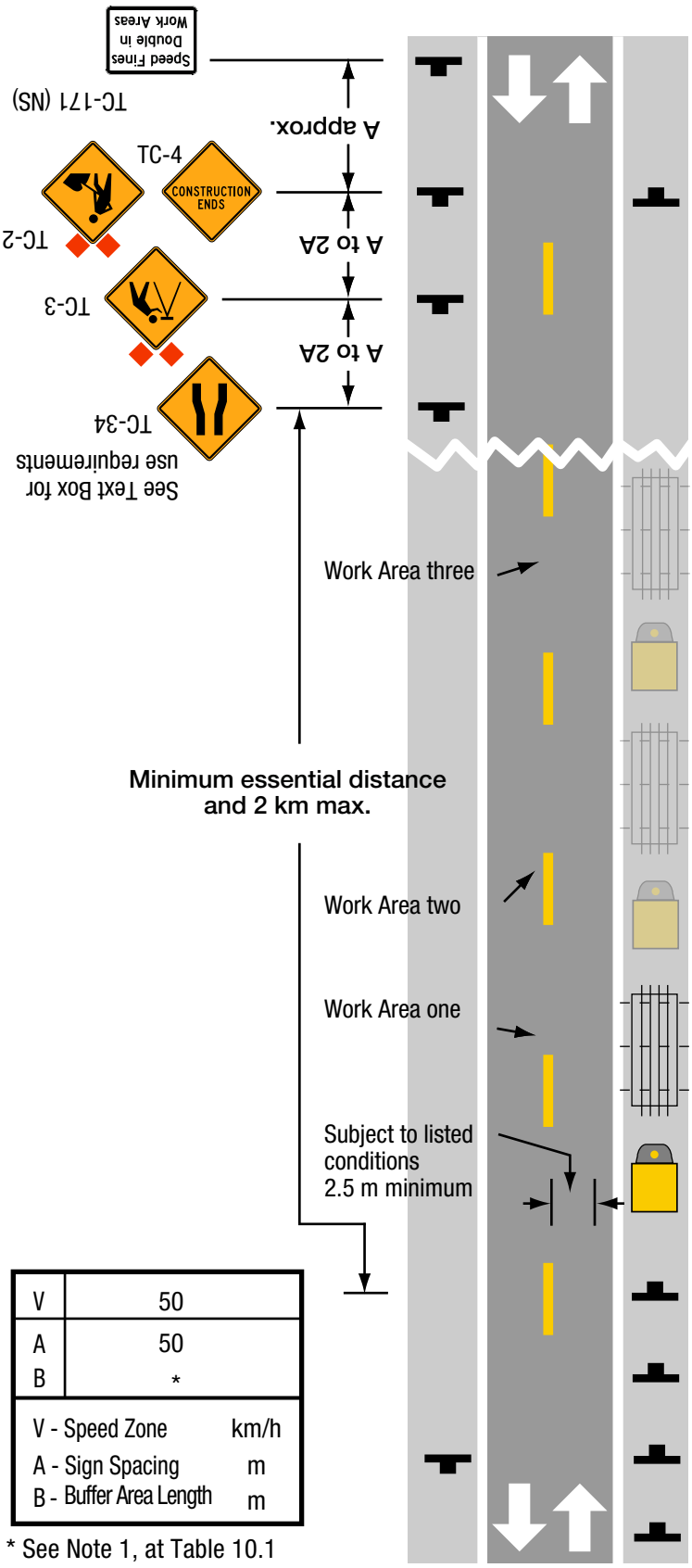


- Survey crews working off shoulder do not require signing
- Except as detailed below, survey crews working in a travel lane must sign for a lane closure, or a partial lane closure
- Survey crews working on the shoulder using Guide C 93 may use an observer to facilitate occasional trips on or across the travel lanes
- The minimum warning lighting on a vehicle laying out or picking up signs or delineators is a 360 degree flashing amber light

V	50
A	50
D	5

V - Speed Zone km/h
A - Sign Spacing m
D - Cone/Drum Spacing m

NOT TO SCALE



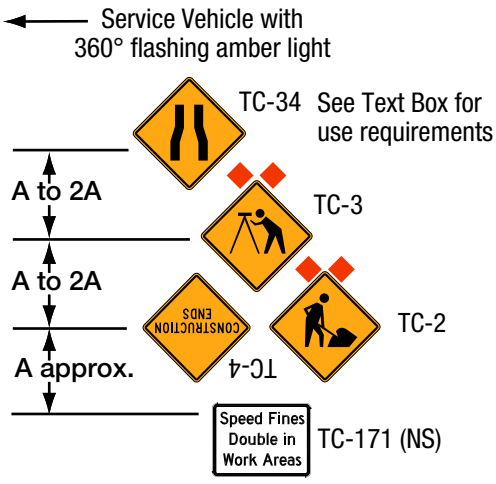
V	50
A	50
B	*

V - Speed Zone km/h
A - Sign Spacing m
B - Buffer Area Length m

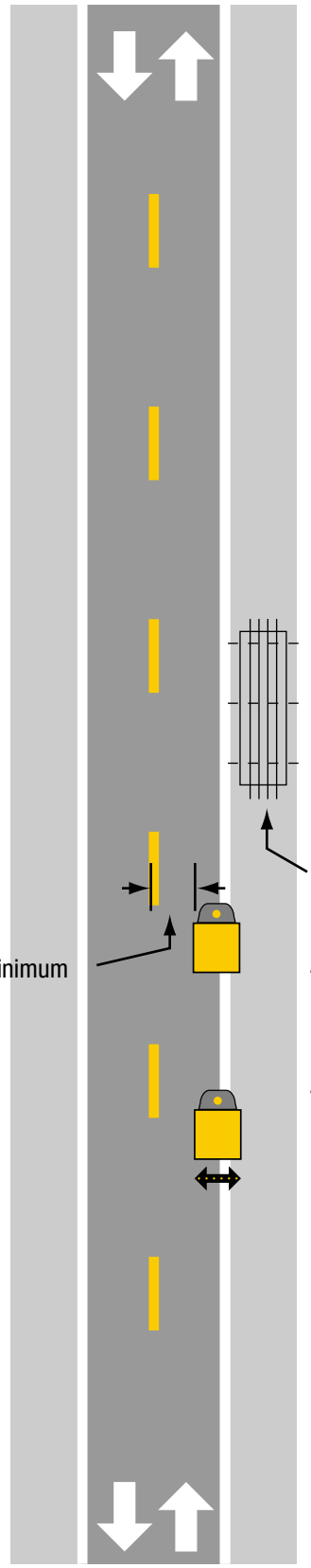
* See Note 1, at Table 10.1

NOT TO SCALE

- Except as per guides A, B, C 93 and 94, survey crews working in a travel lane must use an Application Guide for a partial or full lane closure, as applicable
- Survey crews must work as far from the travel lane as practical, but may use an observer to facilitate occasional trips on or across the travel lanes. When walking on the shoulder, workers should stay as far from the travel lane as practical and be mindful of approaching traffic
- Where narrow shoulders don't permit the Service Vehicle to remain completely off the travel lane, the Service Vehicle may encroach the minimum needed, if the speed zone is 80 km/h or less and at least 2.5 m of travel lane remains open to traffic. When the Service Vehicle encroaches or is expected to encroach, TC-34 signs must be added to the sign sequence as shown on the guide
- The space between the workers and Service Vehicle must be maintained at approximately "B" value, but adjusted to maximize safety, taking into consideration traffic volume and speed, sight lines to approaching traffic, and the road alignment
- The minimum warning lighting on a vehicle laying out or picking up signs is a 360° flashing amber light



- Vehicles are not permitted to back up
- Only vehicles may encroach onto the travel lane (not workers on foot)
- This Application Guide must not be used to perform stationary work at a single location where work at that location will exceed 10 min. in duration
- During a short stop (not exceeding 10 min) workers on foot may perform shoulder work downstream of the Work Vehicle. No lane encroachment is permitted by workers on foot



- Both vehicles must stay off the travel lanes to the greatest extent practical
- Spacing of approx., but not less than, the “B” value must be maintained between workers on foot and the Work Vehicle, and between the two vehicles. Spacing must be adjusted to maximize safety, taking into consideration traffic and the road alignment
- When work is being done and a Work or Trail Vehicle encroaches on the travel lane,vehicles approaching the workplace from the upstream end must have an uninterrupted sight line to the Trail Vehicle for a distance that will permit sufficient time for drivers to respond safely to workplace conditions

Workers on foot restricted to shoulder and not more than 10 min.

2.5 m minimum

B

Work Vehicle with 360° flashing amber light

Trail Vehicle with 360° flashing amber light, and a FLU in bar mode

TC-9B (NS)

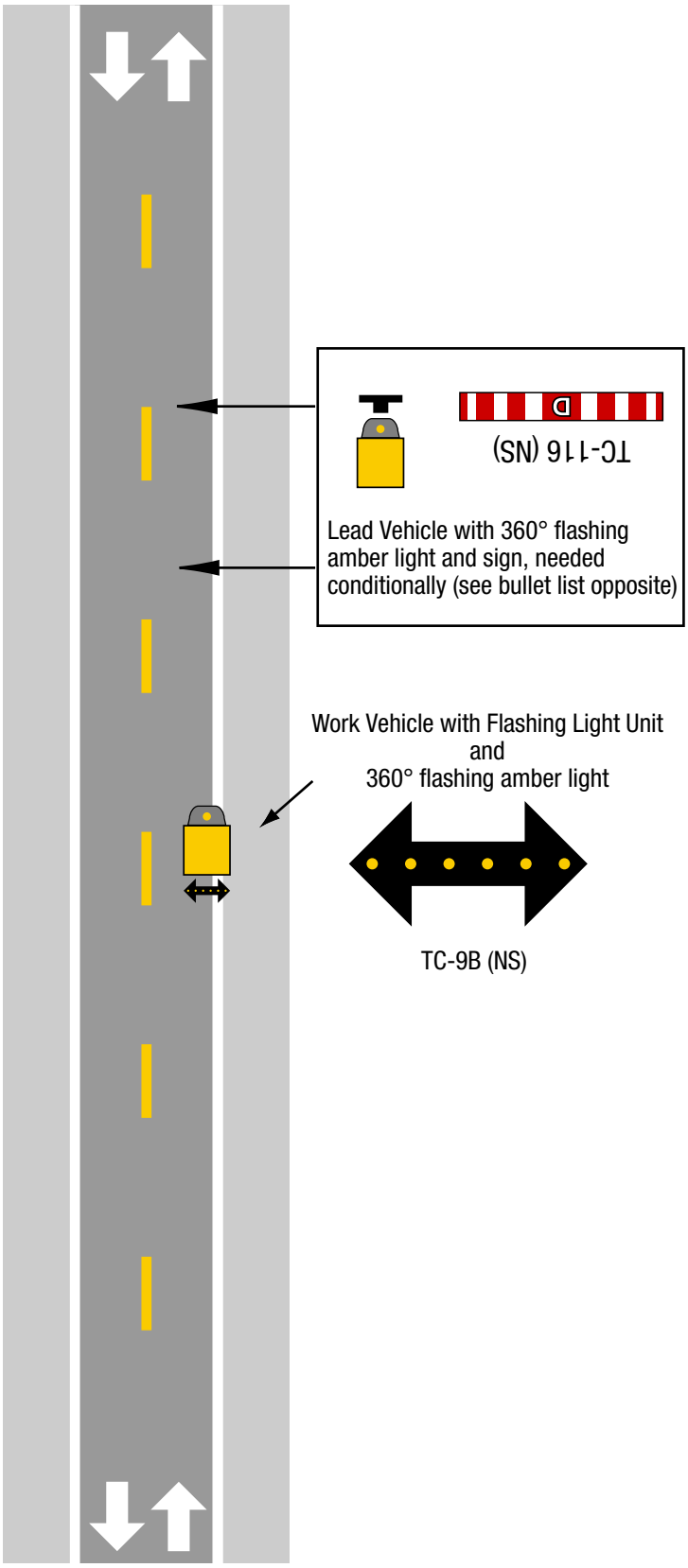
V	50
B	*

V - Speed Zone km/h
B - Buffer Area Length m

* See Note 1, at Table 10.1

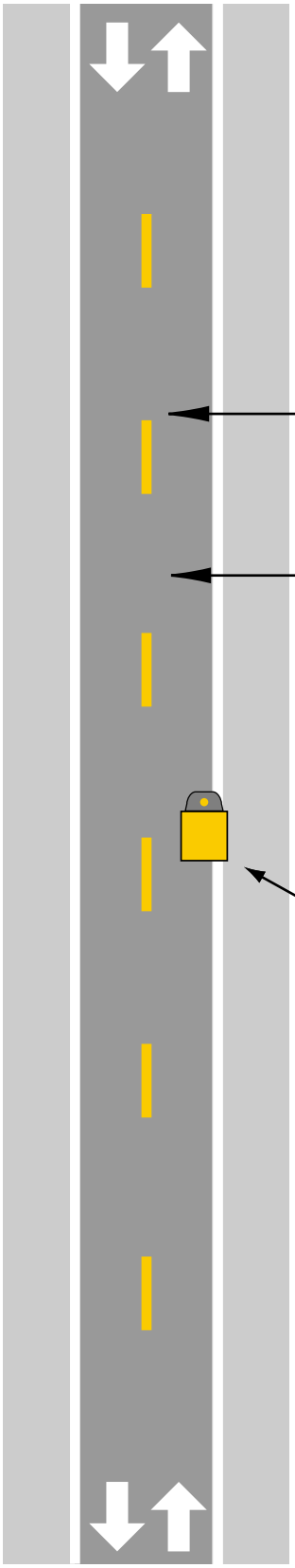
NOT TO SCALE

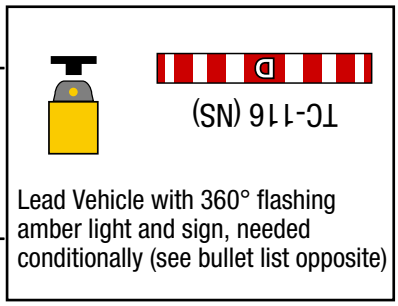
- Vehicles must not stop in travel lane
- Vehicles must not back up
- Trail vehicle to remain off the travel lane to the greatest extent practical
- Workers are not permitted on the travel lane on foot
- If a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3



NOT TO SCALE

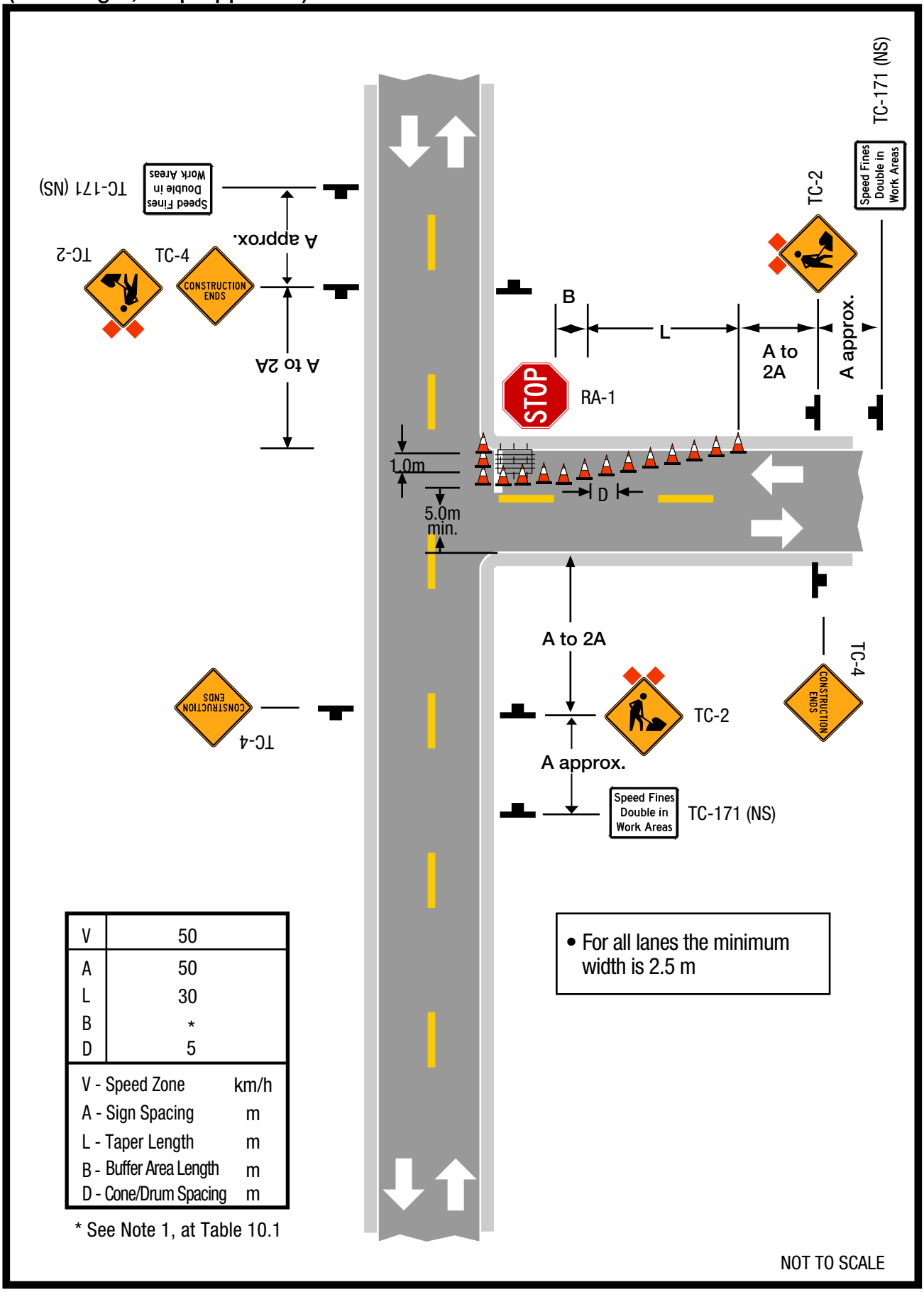
- Low volume street less than 200 vph during the time work is being carried out
- Vehicle must not stop in travel lane
- Vehicle must not back up
- Workers are not permitted on the travel lane on foot
- If a Work Vehicle must cross the centreline, add a lead vehicle and TC-116 (NS) signs to vehicles as per description of TC-116 (NS), at Section 8.3





Work Vehicle with 360° flashing amber light

NOT TO SCALE



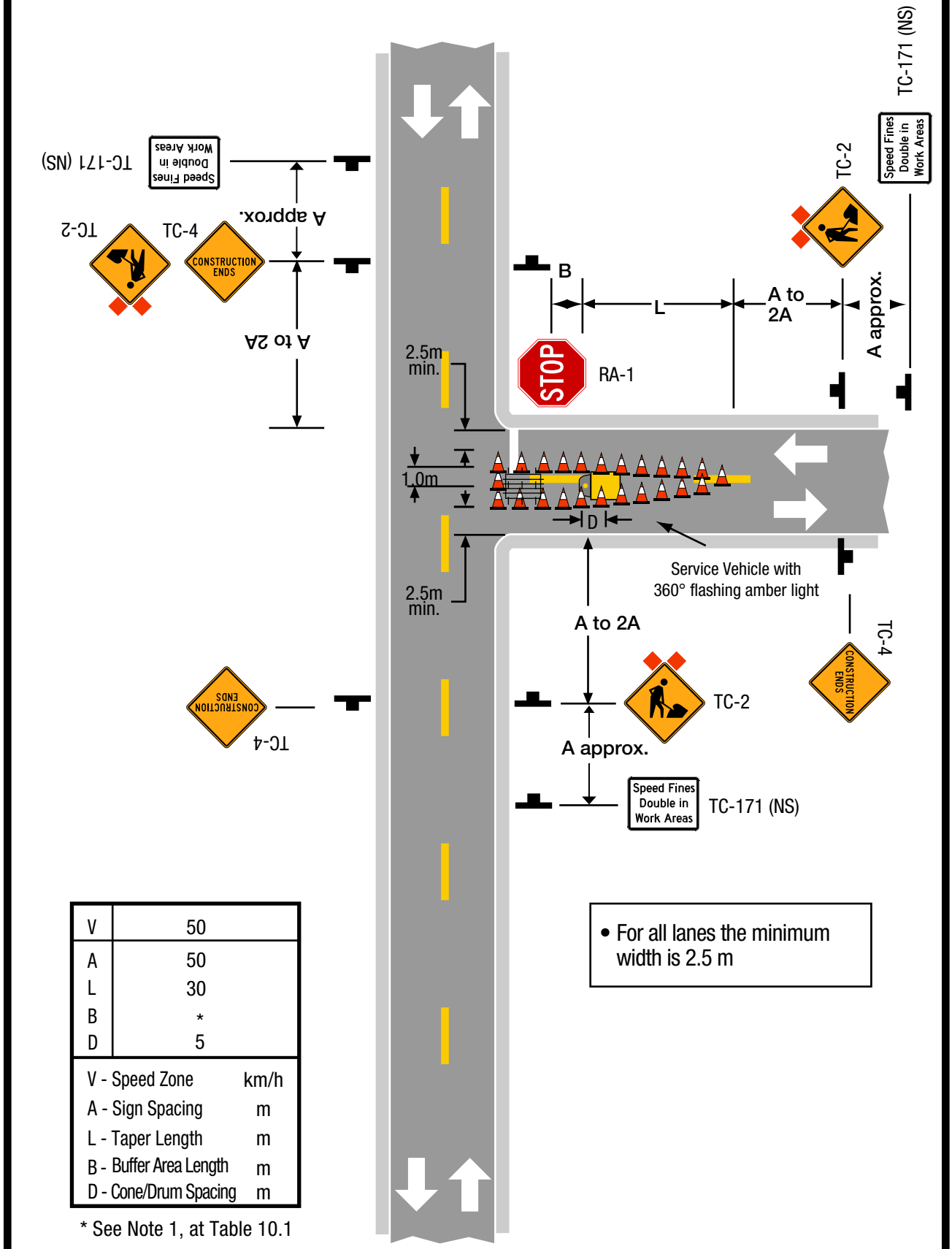
V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

- For all lanes the minimum width is 2.5 m

NOT TO SCALE



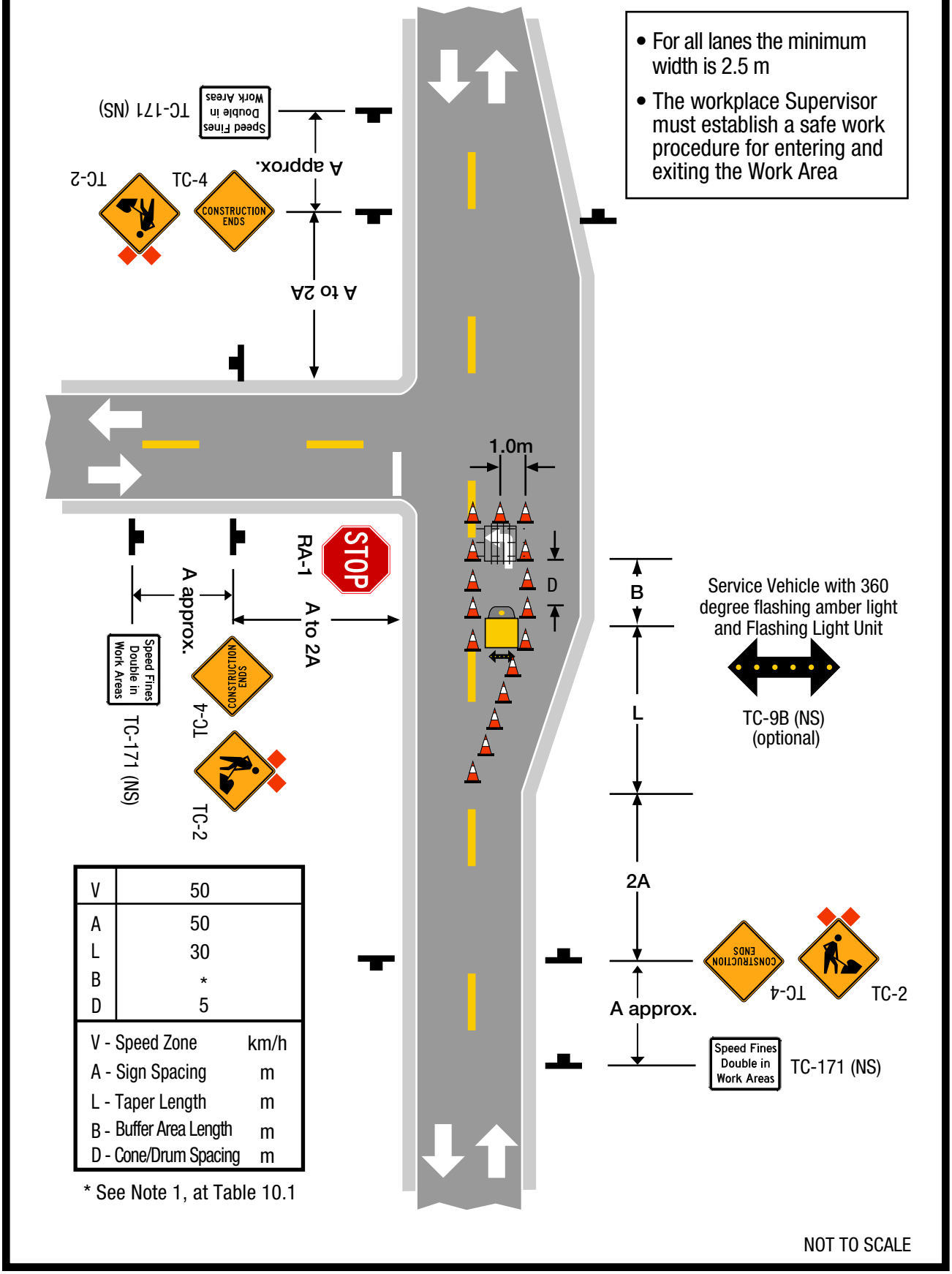
V	50
A	50
L	30
B	*
D	5

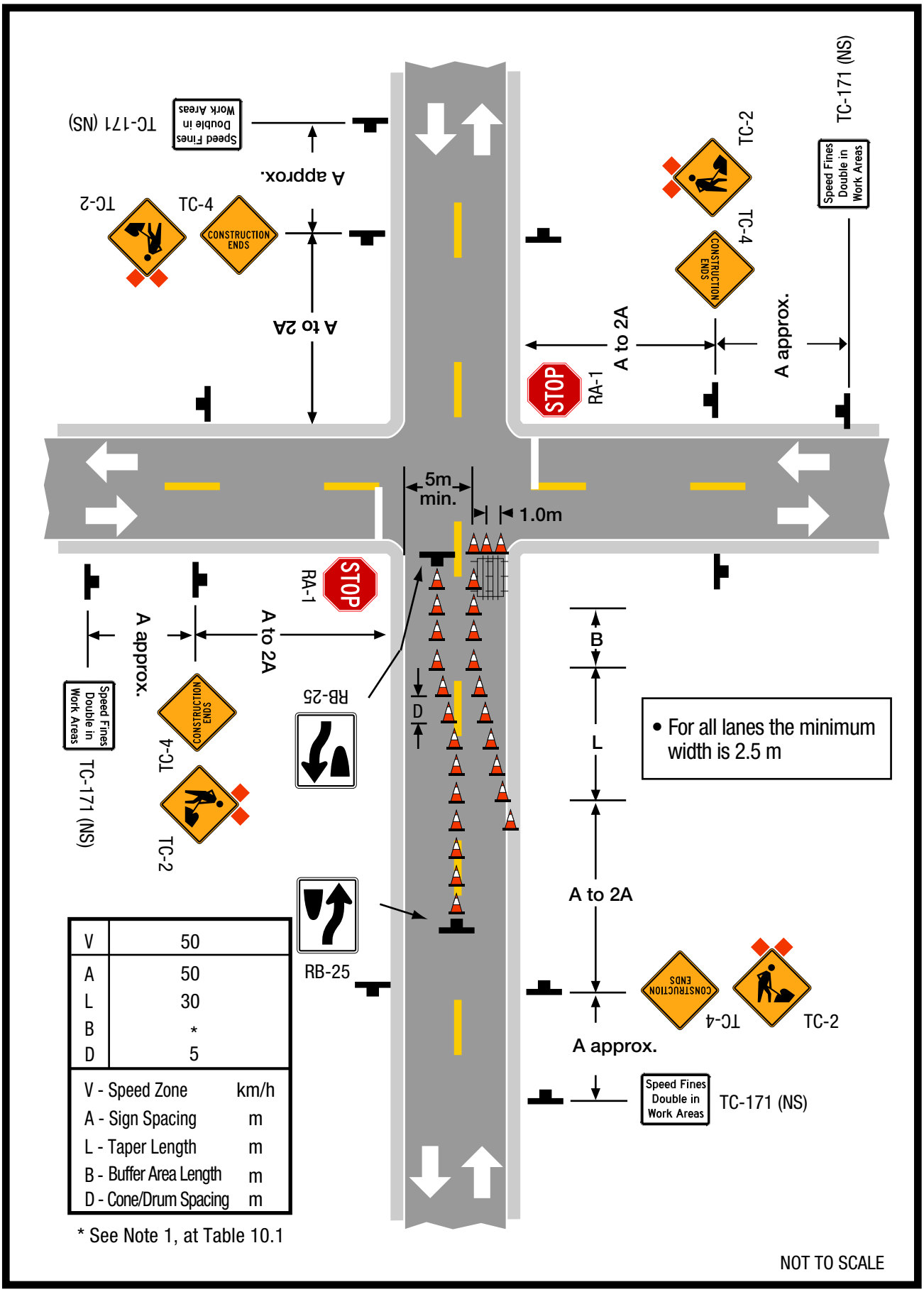
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

- For all lanes the minimum width is 2.5 m

NOT TO SCALE


• For all lanes the minimum width is 2.5 m
• The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area
TC-171 (NS)
Speed Fines Double in Work Areas
A approx.
TC-2
TC-4
CONSTRUCTION ENDS
A to 2A
1.0m
STOP
RA-1
A approx.
A to 2A
Speed Fines Double in Work Areas
TC-171 (NS)
TC-4
CONSTRUCTION ENDS
TC-2
D
B
L
2A
A approx.
Service Vehicle with 360 degree flashing amber light and Flashing Light Unit
TC-9B (NS) (optional)
TC-4
CONSTRUCTION ENDS
TC-2
Speed Fines Double in Work Areas
TC-171 (NS)
V 50
A 50
L 30
B *
D 5
V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
B - Buffer Area Length m
D - Cone/Drum Spacing m
* See Note 1, at Table 10.1
NOT TO SCALE

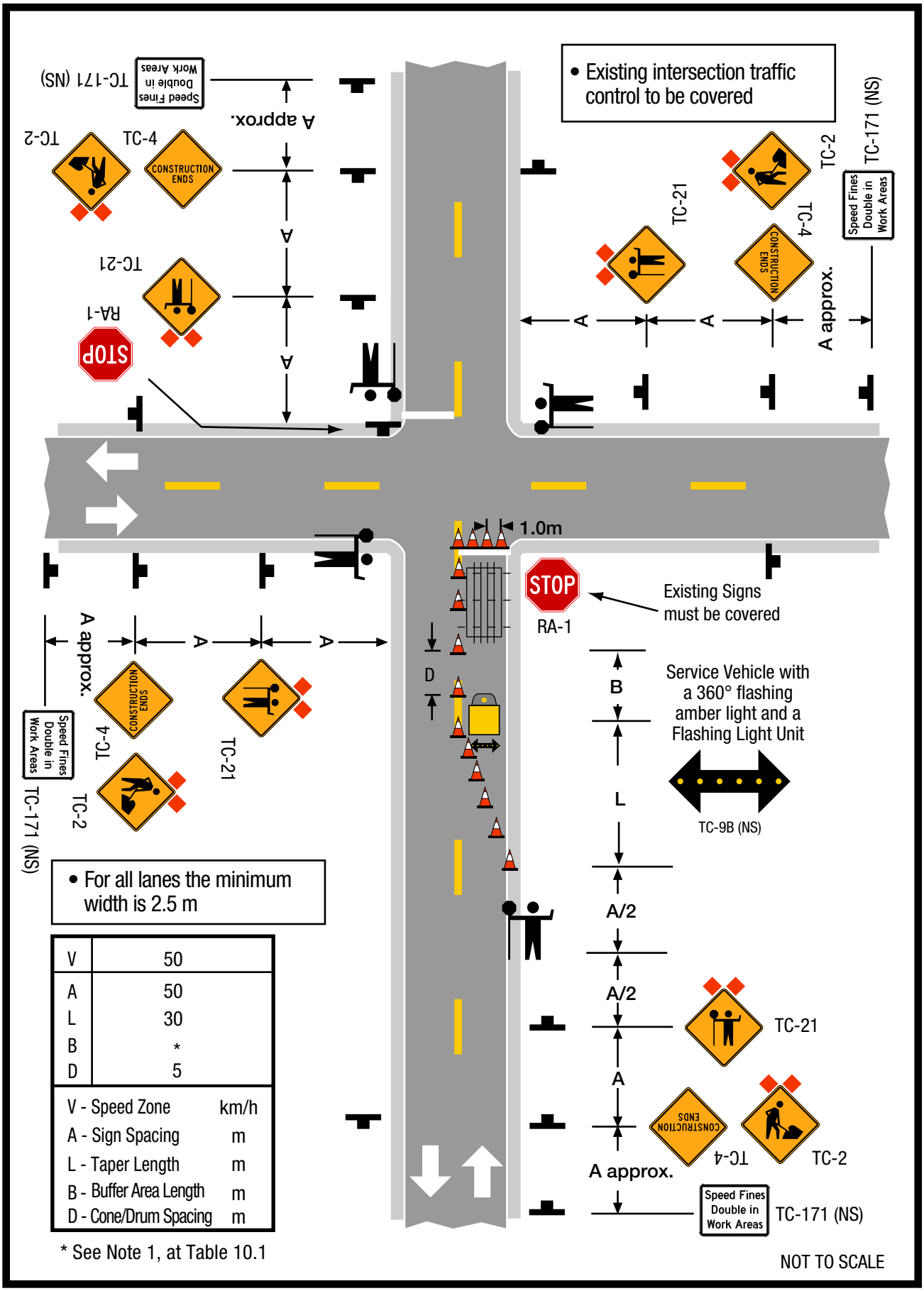


V	50
A	50
L	30
B	*
D	5

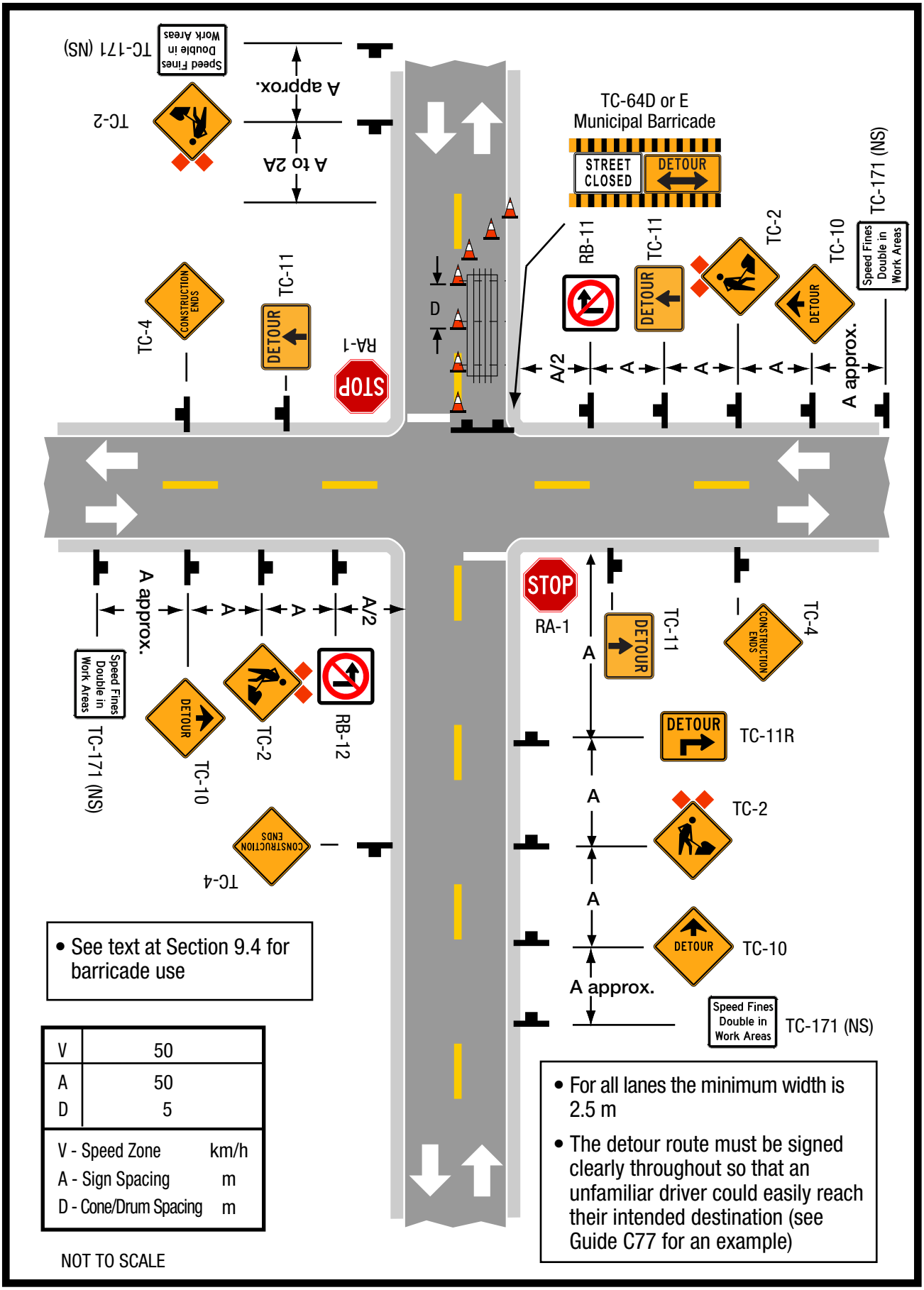
V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

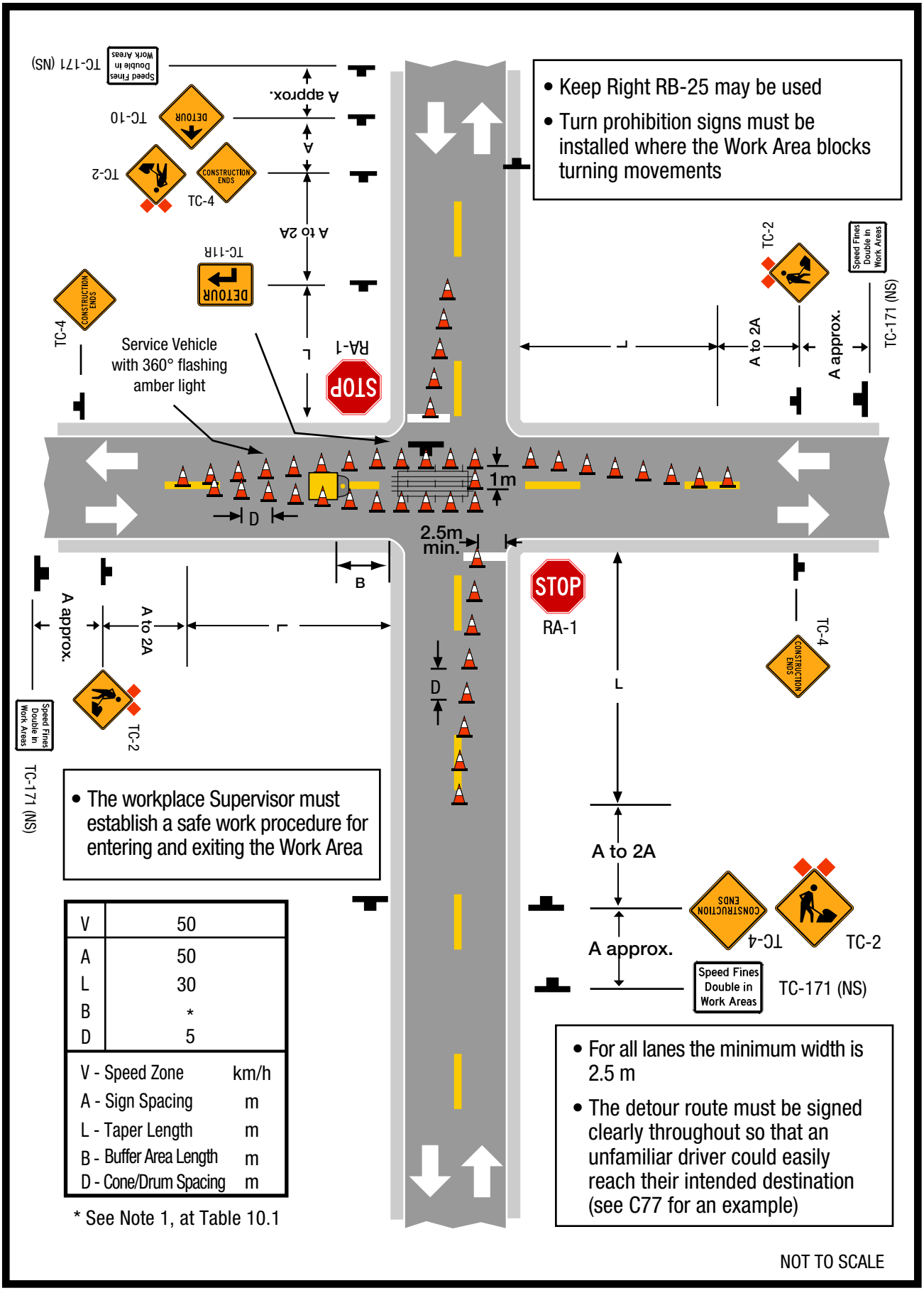
* See Note 1, at Table 10.1

NOT TO SCALE


• Existing intersection traffic control to be covered
TC-171 (NS)
Speed Fines Double in Work Areas
TC-2
TC-4
CONSTRUCTION ENDS
TC-21
A approx.
A
RA-1
STOP
1.0m
Existing Signs must be covered
D
B
L
A/2
Service Vehicle with a 360° flashing amber light and a Flashing Light Unit
TC-9B (NS)
• For all lanes the minimum width is 2.5 m
V 50
A 50
L 30
B *
D 5
V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
B - Buffer Area Length m
D - Cone/Drum Spacing m
* See Note 1, at Table 10.1
NOT TO SCALE

New: 2012


TC-64D or E
Municipal Barricade
STREET CLOSED
DETOUR
TC-171 (NS)
Speed Fines Double in Work Areas
TC-2
TC-10
RB-11
TC-11
TC-4
CONSTRUCTION ENDS
RA-1
STOP
D
A/2
A
A approx.
TC-11R
RB-12
TC-171 (NS)
TC-10
TC-2
TC-4
• See text at Section 9.4 for barricade use
V 50
A 50
D 5
V - Speed Zone km/h
A - Sign Spacing m
D - Cone/Drum Spacing m
NOT TO SCALE
• For all lanes the minimum width is 2.5 m
• The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination (see Guide C77 for an example)



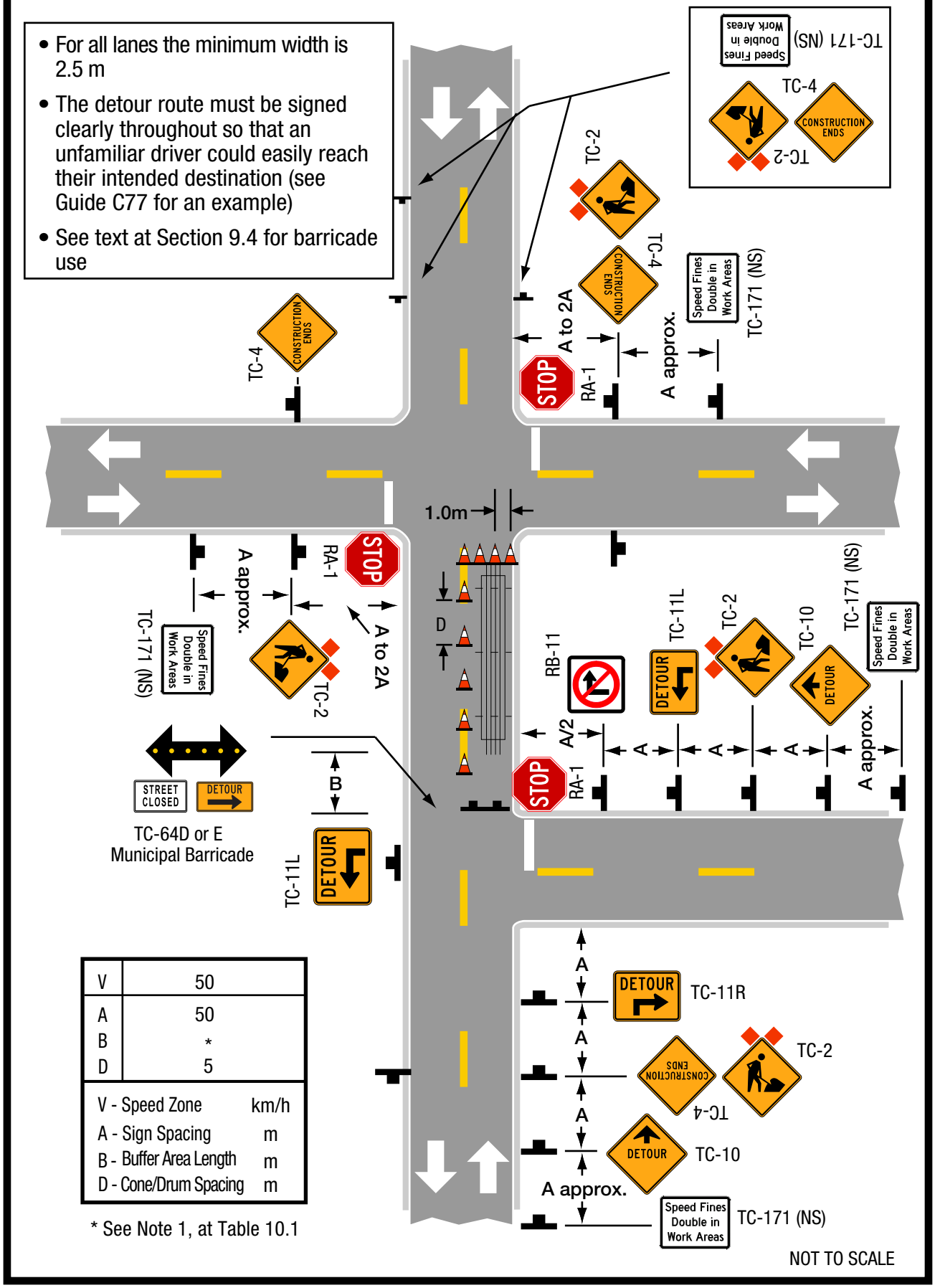
V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

New: 2012

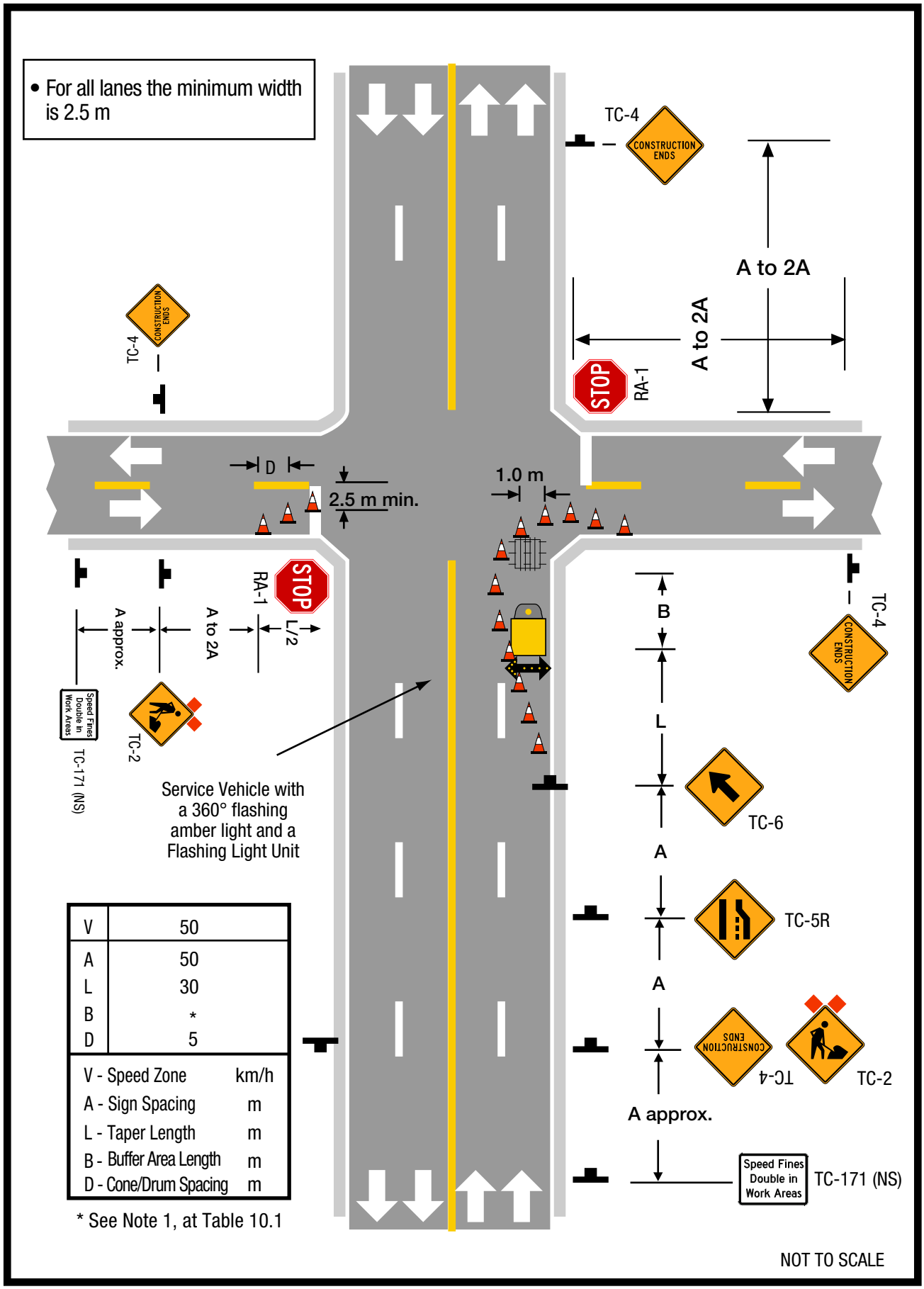
- For all lanes the minimum width is 2.5 m
- The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination (see Guide C77 for an example)
- See text at Section 9.4 for barricade use

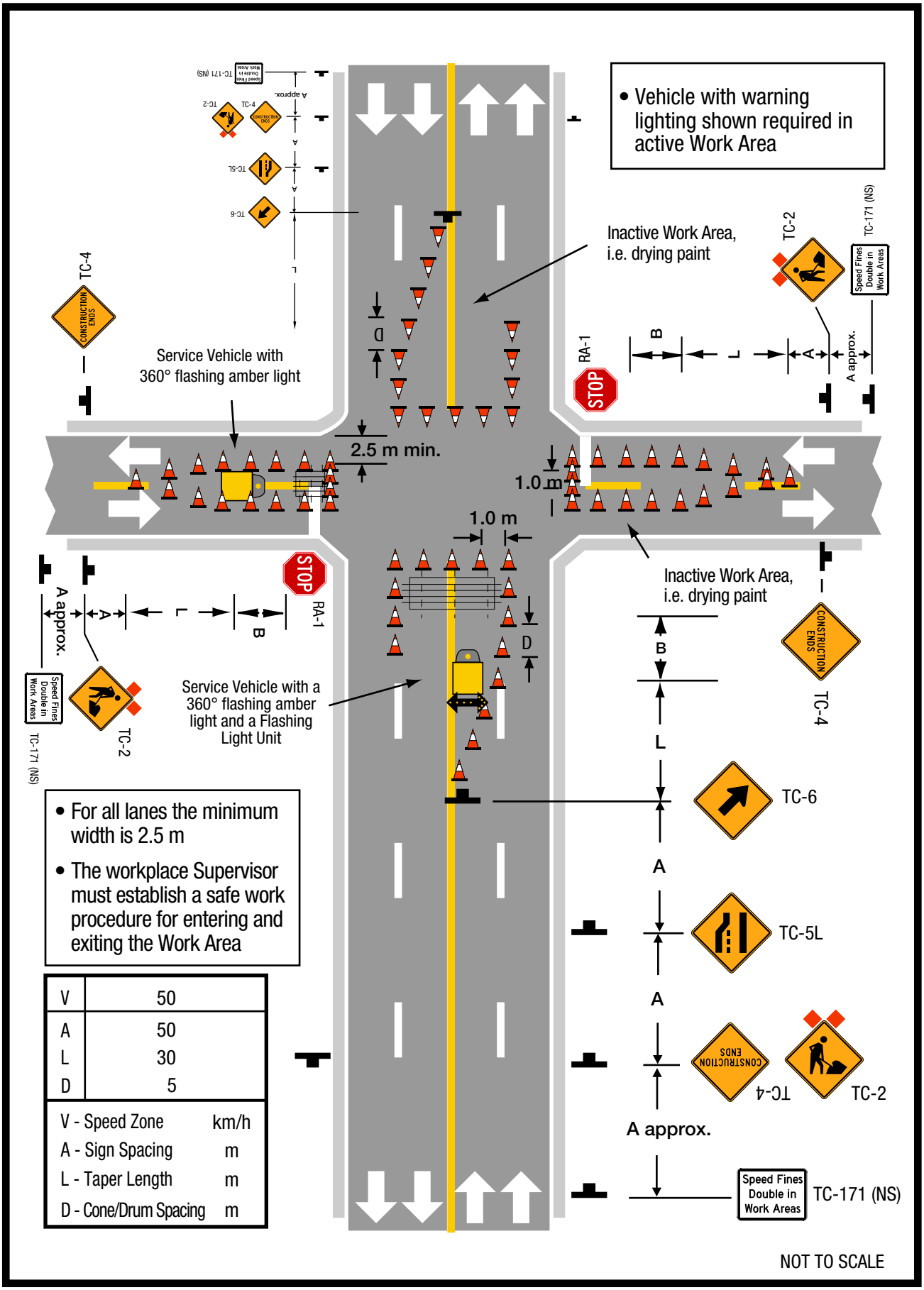


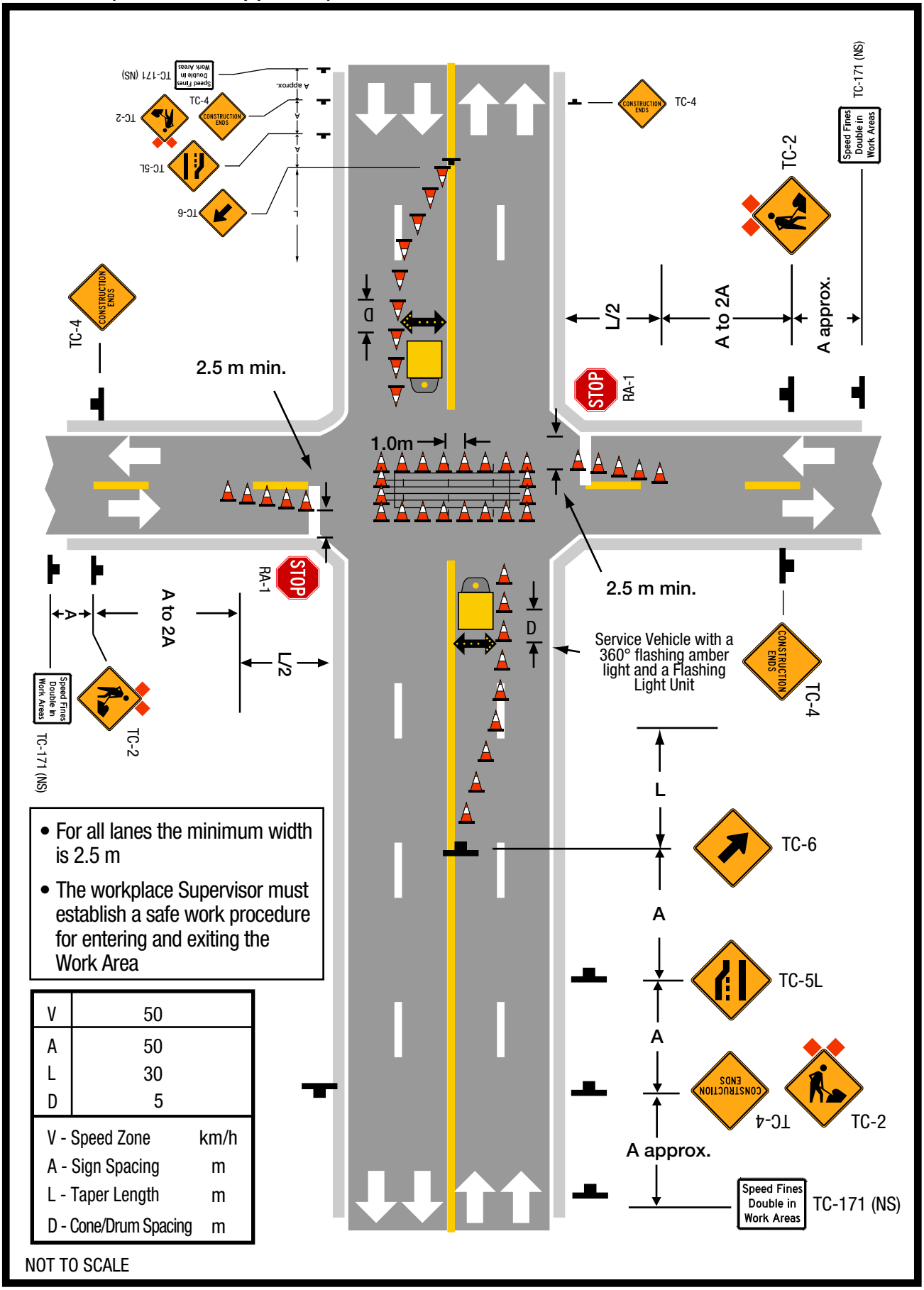
V	50
A	50
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

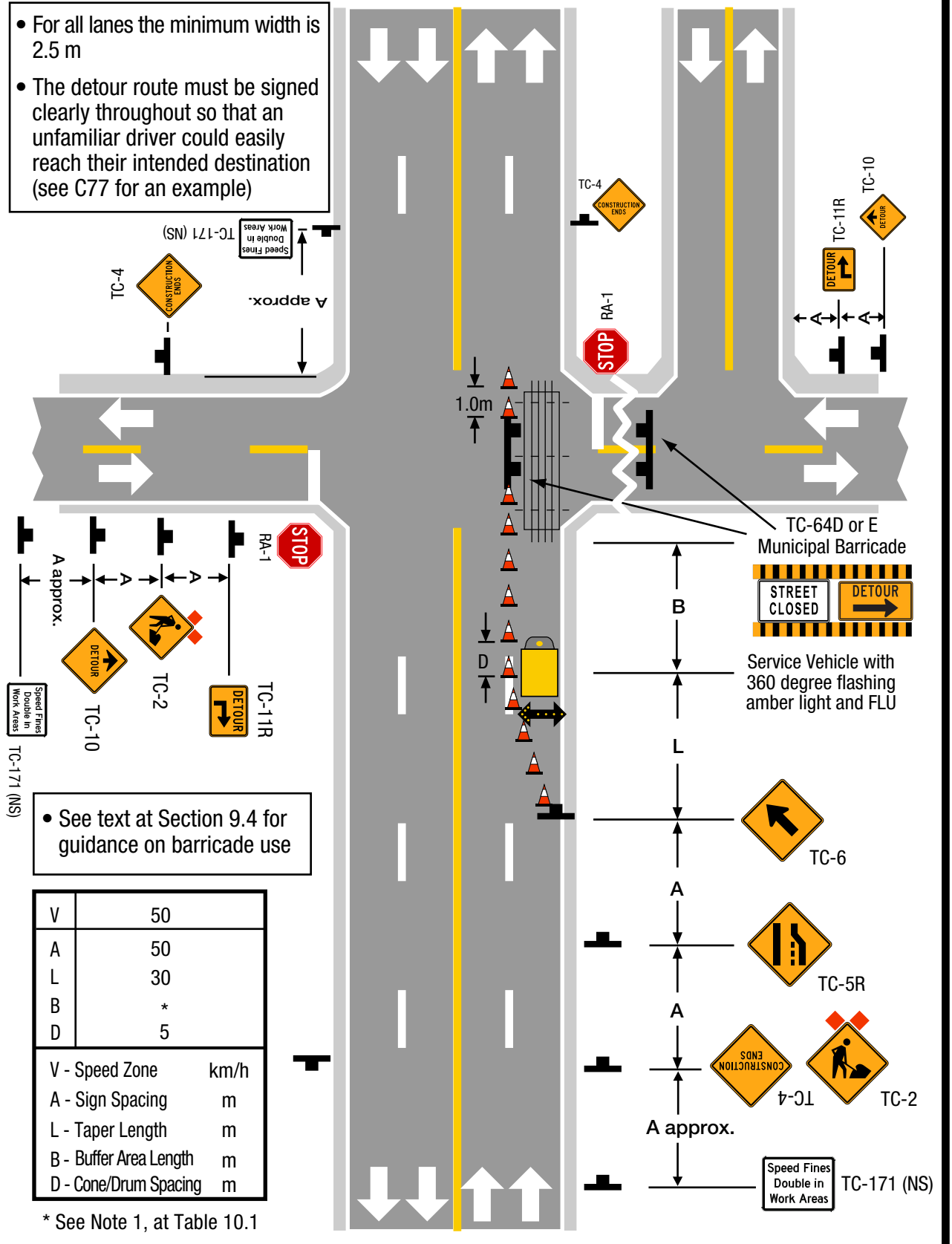

• For all lanes the minimum width is 2.5 m
TC-4
CONSTRUCTION ENDS
A to 2A
A to 2A
STOP
RA-1
D
2.5 m min.
1.0 m
A approx.
A to 2A
L/2
STOP
RA-1
TC-2
Speed Fines Double in Work Areas
TC-171 (NS)
Service Vehicle with a 360° flashing amber light and a Flashing Light Unit
B
L
A
A
A approx.
TC-6
TC-5R
TC-4
TC-2
Speed Fines Double in Work Areas
TC-171 (NS)
V 50
A 50
L 30
B *
D 5
V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
B - Buffer Area Length m
D - Cone/Drum Spacing m
* See Note 1, at Table 10.1
NOT TO SCALE


• Vehicle with warning lighting shown required in active Work Area
Inactive Work Area, i.e. drying paint
TC-2
TC-171 (NS)
Speed Fines Double in Work Areas
TC-4
CONSTRUCTION ENDS
Service Vehicle with 360° flashing amber light
RA-1
STOP
B
L
A
A approx.
D
2.5 m min.
1.0 m
Inactive Work Area, i.e. drying paint
Service Vehicle with a 360° flashing amber light and a Flashing Light Unit
TC-6
TC-5L
• For all lanes the minimum width is 2.5 m
• The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area
V 50
A 50
L 30
D 5
V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
D - Cone/Drum Spacing m
NOT TO SCALE


TC-171 (NS)
Speed Fines Double in Work Areas
TC-4
CONSTRUCTION ENDS
TC-2
TC-5L
TC-6
A approx.
L
D
L/2
A to 2A
2.5 m min.
STOP
RA-1
1.0m
Service Vehicle with a 360° flashing amber light and a Flashing Light Unit
A
• For all lanes the minimum width is 2.5 m
• The workplace Supervisor must establish a safe work procedure for entering and exiting the Work Area
V 50
A 50
L 30
D 5
V - Speed Zone km/h
A - Sign Spacing m
L - Taper Length m
D - Cone/Drum Spacing m
NOT TO SCALE

New: 2012

- For all lanes the minimum width is 2.5 m
- The detour route must be signed clearly throughout so that an unfamiliar driver could easily reach their intended destination (see C77 for an example)



- See text at Section 9.4 for guidance on barricade use

V	50
A	50
L	30
B	*
D	5

V - Speed Zone	km/h
A - Sign Spacing	m
L - Taper Length	m
B - Buffer Area Length	m
D - Cone/Drum Spacing	m

* See Note 1, at Table 10.1

NOT TO SCALE