Technical Circular T-04/25
October 28th, 2025

To: All HQ Directors: Operations, Planning and Major Projects
All Regional Directors
All Engineering Directors
All Ministry Traffic Engineers
All District Managers Transportation
All Project Managers
All Area Managers
Manager Provincial Sign Program
All MoTT Maintenance Contractors
BC Road Builders and Heavy Construction Association
WorkSafeBC
BC Construction Safety Alliance
BC Municipal Safety Association
Utility Groups – Telus, BC Hydro & Fortis BC
ACEC – BC

Subject: **Additions and revisions to *Automated Flagger Assistance Devices (AFAD)* currently described for use within the 2020 Traffic Management Manual for Work on Roadways (TMM). The additions and revisions cover new AFAD devices, AFAD timings, AFAD mounting systems and revised AFAD layouts. This Technical Circular supplements the 2020 TMM, and those Technical Circular(s) T-04/20, T-04/21, and T-03/24 currently in use for Ministry work on roadways.**

Purpose:
To update and enhance equipment, policy and guidelines for AFAD use described in the 2020 TMM and those Ministry Technical Circulars released on the AFAD subject matter. The update to AFADs does update some sections currently written in the 2020 TMM, primarily 4.7 and the layout sections.

Background:
The Ministry, as a road owner and operator of highways regularly monitors its work sites to maintain the goals of delivering a safe and efficient highway system for both 1) the public it serves who traverse its work zones, and 2) the workers who carry out activities within those same work zones. To achieve these goals within work zones, the Ministry does review technologies as they become available, and the standards and policies it has in place. This process allows the Ministry to stay up to date with new and changing technologies and make enhancements to its existing practices to maintain and operate its highway system.

Policy:
This Technical Circular provides the following updates on the subject matter covered by the 2020 TMM on ***Automated Flagger Assistance Devices (AFAD),*** and any subsequent additions introduced through the release of Ministry technical circulars. The primary goal of the Ministry's AFAD update is to 1) update signing practices in zones controlled by AFADs, 2) take advantage

of controller upgrades for AFAD devices to reduce gate arm strikes, and 3) introduction of a 3 colour (RED, YELLOW, & GREEN) AFAD. The 3 colour AFAD is essentially a traffic signal, whose operation is controlled manually by a TCP, and not automated. There is a long history of 3-colour traffic control signals in BC, where driver response requirements are well discussed in the BC Motor Vehicle Act.

The TMM does not illustrate all situations that can be encountered in work zone activities. All situations encountered where an AFAD is a traffic control device considered to be an option for deployment may fall outside of anything discussed in Ministry policy. Alternative deployments not discussed in Ministry policy may be presented to the Ministry's Traffic Engineering Standards and Policy section for review, consideration, and possible acceptance.

Definitions:

direct traffic control and indirect traffic control are defined as:

- **Direct traffic control** - The control of traffic by a traffic control person (TCP) using a manually operated STOP/SLOW paddle.
- **Indirect traffic control** – The control of traffic by a traffic control person (TCP) using an alternative device such as an automated flagger assistance device (AFAD).

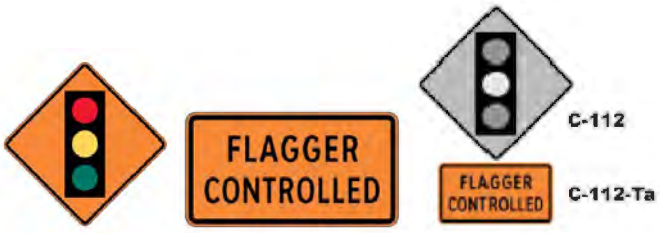
flagging:

- The control/direction of traffic using Automated Flagger Assistance Devices (AFADs) or Traffic Control Persons (TCPs) See Direct and Indirect Traffic Control.

Signs:
C-113 and C-113-Ta/C-113-Tb



C-112 and C-112-Ta



Updated TMM Sections:

4.7 Automated Flagger Assistance Devices (AFADs)

An Automated Flagger Assistance Device (AFAD) is a self-contained, portable traffic control system used to direct traffic, but it is not a portable traffic signal (see *Section 4.8: Temporary and Portable Traffic Signals*).

1. There are two types of AFADs controlled by TCPs:
   - Two Colour Automated Flagger Assistance Devices (2C-AFAD) and,
   - Three Colour Automated Flagger Assistance Devices (3C-AFAD),

2. AFADs (2C-AFAD, and 3C-AFAD) may be truck-mounted or trailer-mounted devices. AFADs are operated remotely by a TCP. AFADs function as an extension of the TCP's arm. AFADs, both Two Colour Automated Flagger Assistance Devices (2C-AFAD), and Three Colour Automated Flagger Assistance Devices (3C-AFAD), shall only be controlled by TCPs who have received adequate training on the specific device's operation and use.

3. The TCP operates the AFAD by remote control rather than directly controlling vehicle operations as is typical of a TCP by using a handheld paddle to control traffic movement(s). This enables the TCP to be positioned outside the travel lane. Two AFADs can be operated by a single TCP at one end of the work activity or at a central location, or multiple AFADs can be operated by multiple TCPs, each positioned near an AFAD. When an AFAD is placed in the field:

   - The height between the lowest part of the signal lens and the traveled lane should be positioned for optimum visibility for the approaching road user.
   - For optimum visibility, the AFAD should be positioned free from clutter or any distractions for the approaching road user.
   - The AFAD and its fixtures should be uniform. (e.g. If visors are used, they should be applied on all signal lenses. If housing or back boards are used, they should be uniform in colour and design).

4.7.1 Two Colour Automated Flagger Assistance Devices (2C-AFAD)

A Two Colour Automated Flagger Assistance Device (2C-AFAD) is an automated flagging machine that features a circular red lens, a circular yellow lens, and a gate arm.



Figure 4.21: 2C-AFAD (Trailer-Mount) in STOP Position

4.7.2 2C-AFAD Operation Modes

1. For road users to stop, the 2C-AFAD shall display a steady illuminated red lens with the gate arm in the down/horizontal position.
2. For road users to proceed, the 2C-AFAD shall display a flashing illuminated yellow lens with the gate arm in the upright/vertical position.
3. For the change interval between flashing yellow and steady red, the 2C-AFAD shall display a steady illuminated yellow lens with the gate arm remaining in the up/vertical position. The steady yellow change interval should be from 3 to 5 seconds in length. A longer change interval (4 – 5 seconds) will provide more time for slower vehicles (e.g. trucks) to clear the 2C-AFAD before the steady illuminated red lens is displayed.
4. Once the steady illuminated red lens is again displayed from steady yellow, the gate arm should remain in the upright/vertical for an additional 5 seconds before it starts its descent to the down/horizontal position. This delay in gate arm decent time will reduce the arm from being struck by longer/slower vehicles (e.g. trucks).
5. To reinforce the requirement for road users to stop, the 2C-AFAD shall display a steady illuminated red lens with the gate arm in the down/horizontal position.
6. Return to step 1 to repeat the cycle again. Note: There is no change interval (steady illuminated yellow lens) when moving from steady red (step 4) to flashing yellow display (step 2).

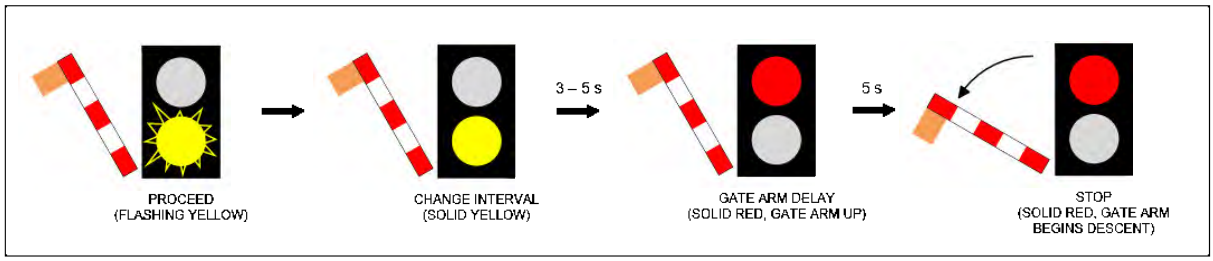


Figure 4.21: 2C-AFAD Operation Cycle

4.7.3 2C-AFAD Equipment Requirements

1. The 2C-AFAD shall have two 300 mm diameter signal lenses—i.e., a lens that displays solid red above a lens that displays flashing yellow. The flashing yellow lens shall also have solid yellow capability utilized for change intervals between steady red and flashing yellow.
2. The 2C-AFAD shall have a conflict monitor that prevents simultaneous illumination of the red and yellow lenses on the same device.
3. The 2C-AFAD shall have a gate arm with the following properties:
   - A fluorescent orange or red flag shall be installed at the end of the gate arm when the 2C-AFAD is in use
   - The gate arm shall measure no less than 2.44 m (8 feet) in length and shall have a vertical aspect (arm height) of at least 100 mm (4 in)
   - The gate arm shall lower and remain lowered on a red signal
   - The gate arm shall rise to an upright position on a flashing yellow signal
   - The gate arm shall have retroreflectivity on both sides with alternating fluorescent red and white bands. The bands shall be 200 mm (8”) long measured horizontally
4. A black-on-white R-280-R STOP HERE ON RED ● or STOP HERE ON RED sign shall be installed on the right side of the approach at the point where drivers are expected to stop. This sign is typically provided with the trailer-mount 2C-AFAD.
   - For trailer-mount devices, the sign may be installed on the device or in advance
   - For truck-mount devices, the sign should be installed in advance
5. The 2C-AFAD shall be positioned in a location where the end of the arm shall reach at least to the center of the lane being controlled. The arm, when down/horizontal, shall be positioned so it does not block the opposing flow of traffic.
6. The 2C-AFAD shall be turned off when not in use. Truck-mounted systems should also be properly stowed (folded down) or covered during transport.
7. For truck-mount devices, the 2C-AFAD shall be mounted as near as practicable to the edge of the truck box on the side of the lane which is being controlled.
8. For trailer-mount devices, the 2C-AFAD should be positioned as near as practicable to the edge of the lane which is being controlled.

4.7.4 Three-Colour Automated Flagger Assistance Devices (3C-AFAD)

A Three Colour Automated Flagger Assistance Device (3C-AFAD) is a flagging device with a three-colour (red, yellow, green) signal display (like a typical 3-colour traffic control signal located on highways) that is mounted on a truck or a trailer. The signal displays on a 3C-AFAD including their length of display timings are manually controlled by a TCP. A 3C-AFAD is different from a portable traffic signal which has timed parameters established through a traffic signal controller for the three colours.

4.7.5 3C-AFAD Operation Modes

1. The 3C-AFAD shall operate so that its sequence of displays function similar to a traffic control signal:
    - For road users to stop, the 3C-AFAD shall display a solid red lens
    - For road users to proceed, the 3C-AFAD shall display a solid green lens
    - For the change interval from a solid green to solid red, a solid yellow shall be displayed. The change interval shall be 3-5 seconds. Using a longer change interval provides more time for slower vehicles (e.g. trucks) to clear the 3C-AFAD. There is no change interval provided when moving between the solid red display to the solid green display

4.7.6 3C-AFAD Equipment Requirements

1. The 3C-AFAD shall consist of three coloured displays with 300 mm (12”) lenses – ie. solid red, yellow and green lenses
2. The 3C-AFAD shall have confirmatory lights on the back of the signal head to indicate to the TCP what the display is currently showing.
3. The R-280-R STOP HERE ON RED SIGNAL sign shall be installed on the right side of the approach at the point where drivers are expected to stop.
4. The 3C-AFAD shall be turned off when not in use. Truck-mounted systems should also be properly stowed (folded down) or covered during transport.

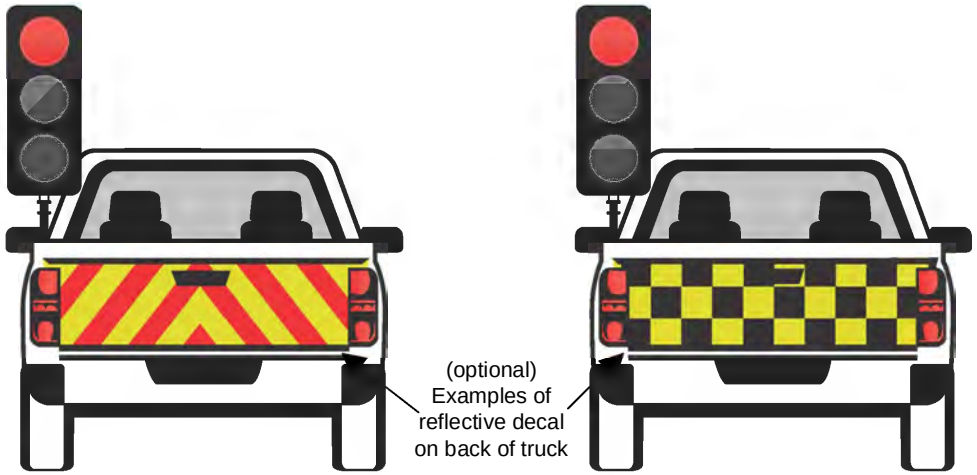


Figure 4.22: 3C-AFAD (Truck-Mount) in STOP Position – Manually Controlled by TCP

4.7.8 Deployment Guidelines for 2C-AFADs and 3C-AFADs

1. AFADs may be used on two-lane, two-way roadways or multilane roadways. When an AFAD is deployed, one AFAD is required for each lane that is to be controlled.
2. When used at night, the AFAD station shall be illuminated with overhead lighting.
3. The construction speed limit where AFADs are used shall be ≤ 70 km/h. High-speed roadways require a speed reduction.
4. Both the 2C-AFAD and the 3C-AFAD generally are not deployed for long duration work zones and therefore should not be used as replacements or substitutes for where continuously operating 3-colour temporary or portable traffic signals are suitable.
5. An AFAD can be operated only by a TCP who has received adequate training on the specific device's operation and use.
6. A TCP operating an AFAD shall not leave it unattended at any time while it is in use.
7. For positioning of TCPs while using AFADs, see:
    - *Section 5.6 Positioning and Signals, as well as the updates for TCPs covered in Technical Circular T-03/24 TCP Positioning Requirements*

4.7.9 AFAD Placement and Operating Options

AFADs are placed either at each end of the work activity area, or at one end of the work activity area with a TCP directly controlling traffic at the opposite end. Signing and AFAD placement are shown in *Section 7.9: Lane Closure with 2C-AFADs* and *Section 7.9.1 Lane Closure with 3C-AFADs.*

The preferred operating option is to have one TCP controlling each AFAD. Assigning a TCP to each device becomes more critical on high-volume roadways where there may be longer queues, and in more complex work zones where construction traffic may be entering and exiting frequently. For simpler, lower-volume situations where there are good sight lines, a single TCP may control up to two AFADs:

1. **Two-TCP Operation (Typical):**
    - One TCP operates each AFAD at either end of the work activity area; or
    - One TCP operates an AFAD at one end of the work activity area and the second TCP controls traffic with a paddle at the other end.

2. **Single-TCP Operation:**
    - One TCP positioned in a central location simultaneously operates two AFADs that are positioned at either end of the work activity area; or
    - One TCP operates a single AFAD that is positioned at one end of the work activity area while also controlling traffic with a paddle at the opposite end.

- In a single-TCP operation, the TCP shall have an unobstructed view (or video feed) of traffic approaching the AFADs in both directions and the following conditions should also be met:
  - The TCP has an unobstructed view (or video feed) of the AFAD(s)
  - The TCP has unobstructed views of approaching traffic in both directions
  - The average daily traffic volume on the roadway is 6,000 vehicles or less
- In single-TCP operation, a plan must be in place in case one of the devices fails

3. Clear communication procedures for fail-safe operation shall be established before work commences to ensure conflicting displays that release traffic in both directions simultaneously do not occur.

4. A TCP shall not activate the flashing yellow (2C-AFAD) or green (3C-AFAD) display (proceed) until the last vehicle from the opposing queue has cleared the work activity area.

5.7.2 Management of Approaching Vehicle Speeds

1. Speed Management Delineation

Centreline or edge line delineation can be used to reduce vehicle speed in advance of the TCP or AFAD position.

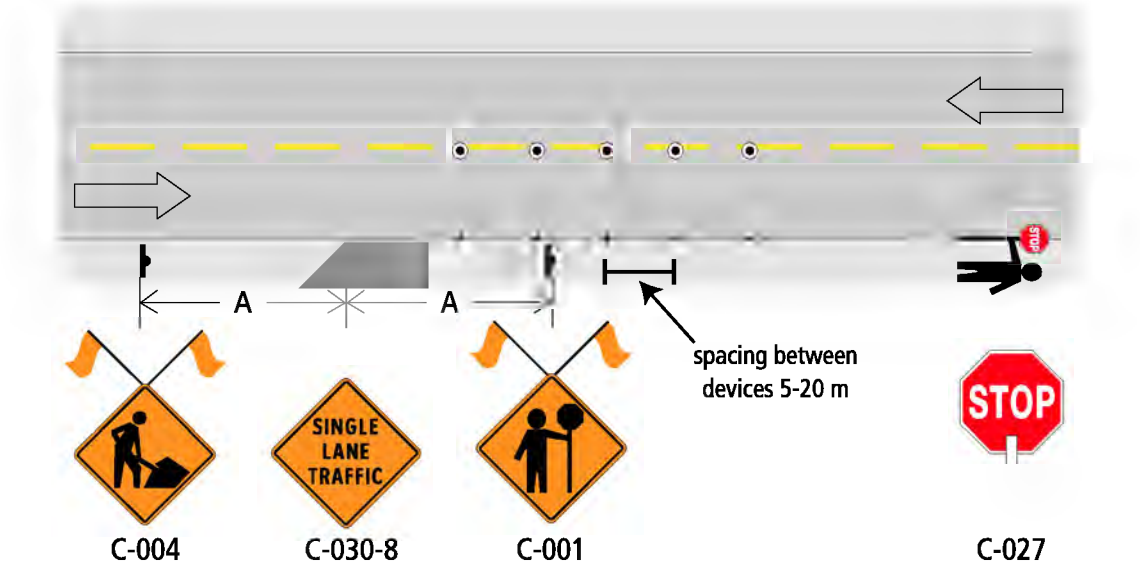


Figure 5.9: Centreline and Edge Line Delineation

7.9 Lane Closure with 2C-AFADs – Short and Long Duration

Purpose:

This layout shows the use of Automated Flagger Assistance Devices (AFADs) when they are used to control traffic for a lane closure on a two-lane, two-way roadway.

Standard:

- When used at night, the AFAD station shall be illuminated with overhead lighting
- A black-on-white STOP HERE ON RED or STOP HERE ON RED SIGNAL sign shall be installed on the right side of the approach at the point where drivers are expected to stop. It may be installed on the AFAD device itself
- When AFADs are used, the construction speed limit shall be ≤ 70 km/h

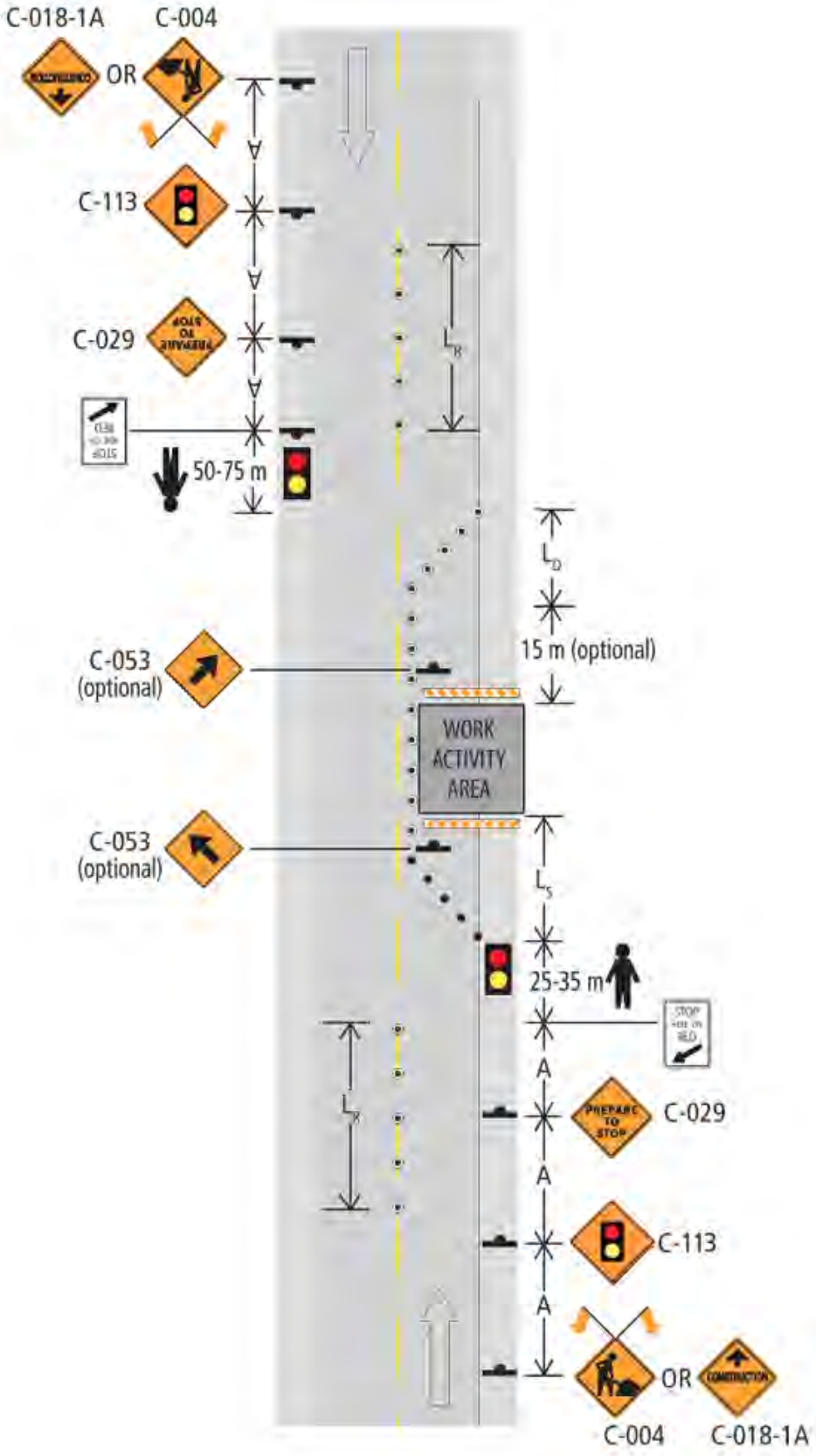
Guidance:

- Where Crew Working – Maximum Speed C-002-2 signs establish a Temporary Speed Zone, the C-002-2 should be placed upstream of the C-004 or C-018-1:
- Thank You Resume Speed C-086-1 signs should be placed across from the Crew Working – Maximum Speed C-002-2 signs in the opposing lanes

Options:

- A Single Lane Traffic C-030-8 sign may be added upstream of the Prepare to Stop C-029 sign for additional advanced warning in single lane alternating traffic applications
- Lane Closure Arrow C-053 signs may be added upstream and downstream of the work activity area to direct traffic into the correct lanes
- Run-in delineation, L_R may be omitted during periods where queues are low, permitting the full release of the queue in each direction
- The 2C-AFAD C-113 sign may be paired with the Flagger Controlled C-113-Ta tab as an enhancement

Figure 7.9: Lane Closure with AFADs – Short and Long Duration



7.9.1 Lane Closure with 3C-AFADs – Short and Long Duration

Purpose:

This layout shows the use of Three Colour Automated Flagger Assistance Devices (3C-AFADs) when they are used to control traffic for a lane closure on a two-lane, two-way roadway.

Standard:

- When used at night, the 3C-AFAD station shall be illuminated with overhead lighting
- A black-on-white Stop Here on Red Signal R-280-R sign shall be installed on the right side of the approach at the point where drivers are expected to stop
- When 3C-AFADs are used, the construction speed limit shall be ≤ 70 km/h

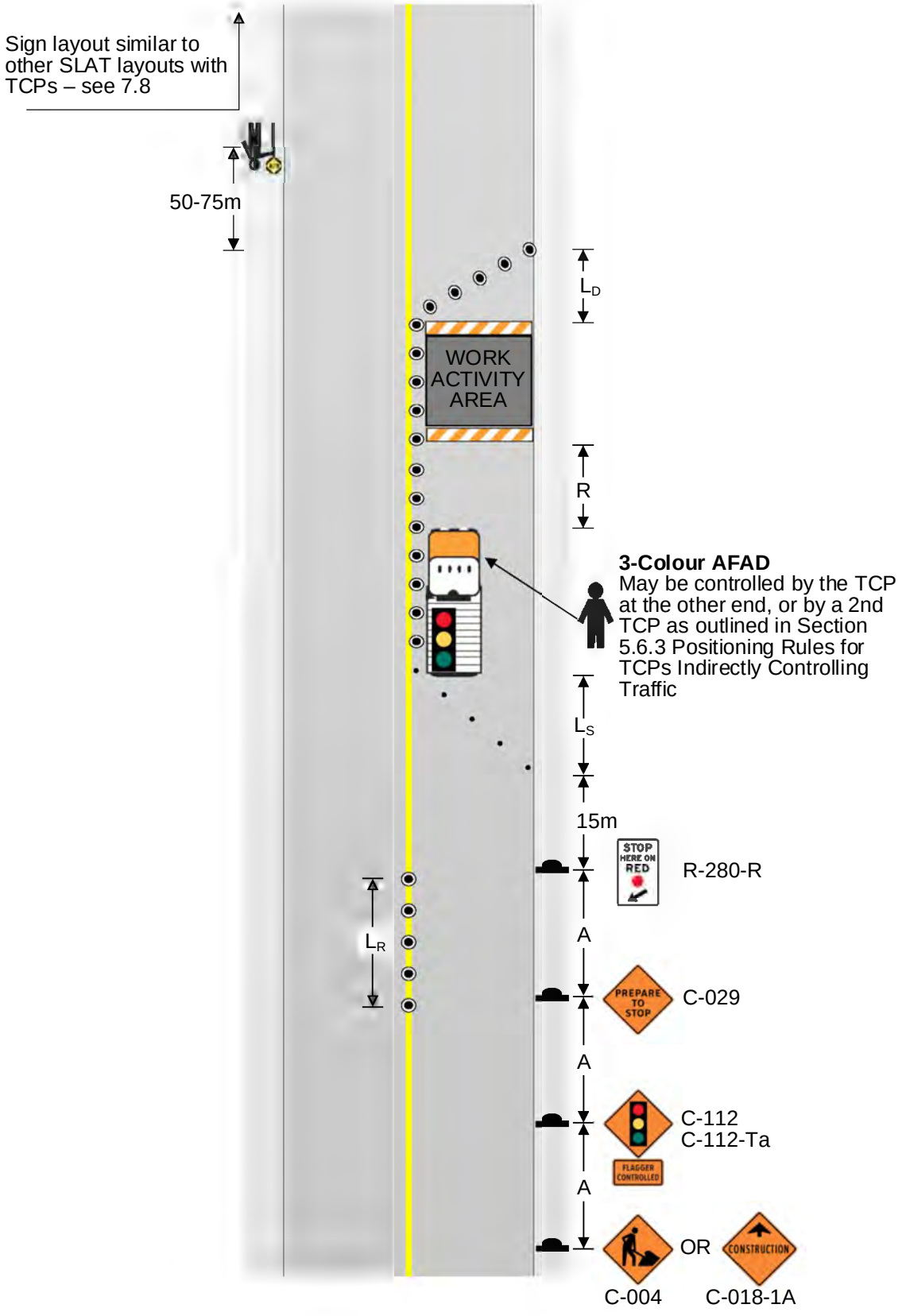
Guidance:

- Where Crew Working – Maximum Speed C-002-2 signs establish a Temporary Speed Zone, the C-002-2 should be placed upstream of the C-004 or C-018-1:
- Thank You Resume Speed C-086-1 signs should be placed across from the Crew Working – Maximum Speed C-002-2 signs in the opposing lanes

Options:

- A Single Lane Traffic C-030-8 sign may be added upstream of the Prepare to Stop C-029 sign for additional advanced warning in single lane alternating traffic applications
- Lane Closure Arrow C-053 signs may be added upstream and downstream of the work activity area to direct traffic into the correct lanes
- Run-in delineation, LR may be omitted during periods where queues are low, permitting the full release of the queue in each direction
- A temporary stop bar may be installed at the point where drivers are expected to stop. See Section: 5.6.5 Temporary Stop Bars for further details

Figure 7.9.1: Lane Closure with 3C-AFADs – Short and Long Duration



8.15 Three Colour AFAD (3C-AFAD) within a Lane Closure – Short and Long Duration

Purpose:

This layout shows the typical setup for a travel lane closure on a multilane undivided highway where a Three Colour Automated Flagger Assistance Devices (3C-AFAD) is used to control traffic (e.g. equipment access and egress) in the open lane. This layout may also apply to multilane divided highways.

The 3C-AFAD should be positioned within the lane closure. Figure 8.15 shows a right lane closure, but this setup may also be applied for a left lane closure with the appropriate changes to traffic control devices for left lane closures.

Standard:

- A Lane Closed Ahead C-130-R or C-130-L sign with a C-130-T distance tab and a second Lane Closed Ahead C-130-R or C-130-L sign are required
- A barricade is required on the approach side of the work activity area for long-duration work
- When used at night, the 3C-AFAD station shall be illuminated with overhead lighting
- A black-on-white Stop Here on Red R-280-R sign shall be installed on the right side of the approach at the point where drivers are expected to stop
- When 3C-AFADs are used, the construction speed limit shall be ≤ 70 km/h
- On multilane divided highways, all signs prior to the merge taper (C-004 or C-018-1A, C-112 with C-130-T, C-130-R with C-130-T and C-130-R) where there is still more than one travel lane, shall also be installed on the median

Guidance:

- Where shoulders are wide and may be mistaken for travel lanes, shoulder tapers should be considered and installed in accordance with Table A – Taper Lengths
- Where Crew Working – Maximum Speed C-002-2 signs establish a Temporary Speed Zone, the C-002-2 should be placed upstream of the C-004 or C-018-1:
- Thank You Resume Speed C-086-1 signs should be placed across from the Crew Working – Maximum Speed C-002-2 signs in the opposing lanes
- The 3C-AFAD should be positioned at a minimum distance of the Roll-Ahead Buffer Distance (R) from the work activity area, but may be field fitted based on local site conditions for maximum visibility

Options:

- In urban environments, if the regular posted speed limit is ≤ 60 km/h:
- The upstream Lane Closed with distance tab C-130-R or C-130-L sign with C-130-T and Traffic Signal Ahead with distance tab C-112 and C-130-T may be omitted. The Crew Working Ahead C-004 sign or Construction Ahead C-018-1A

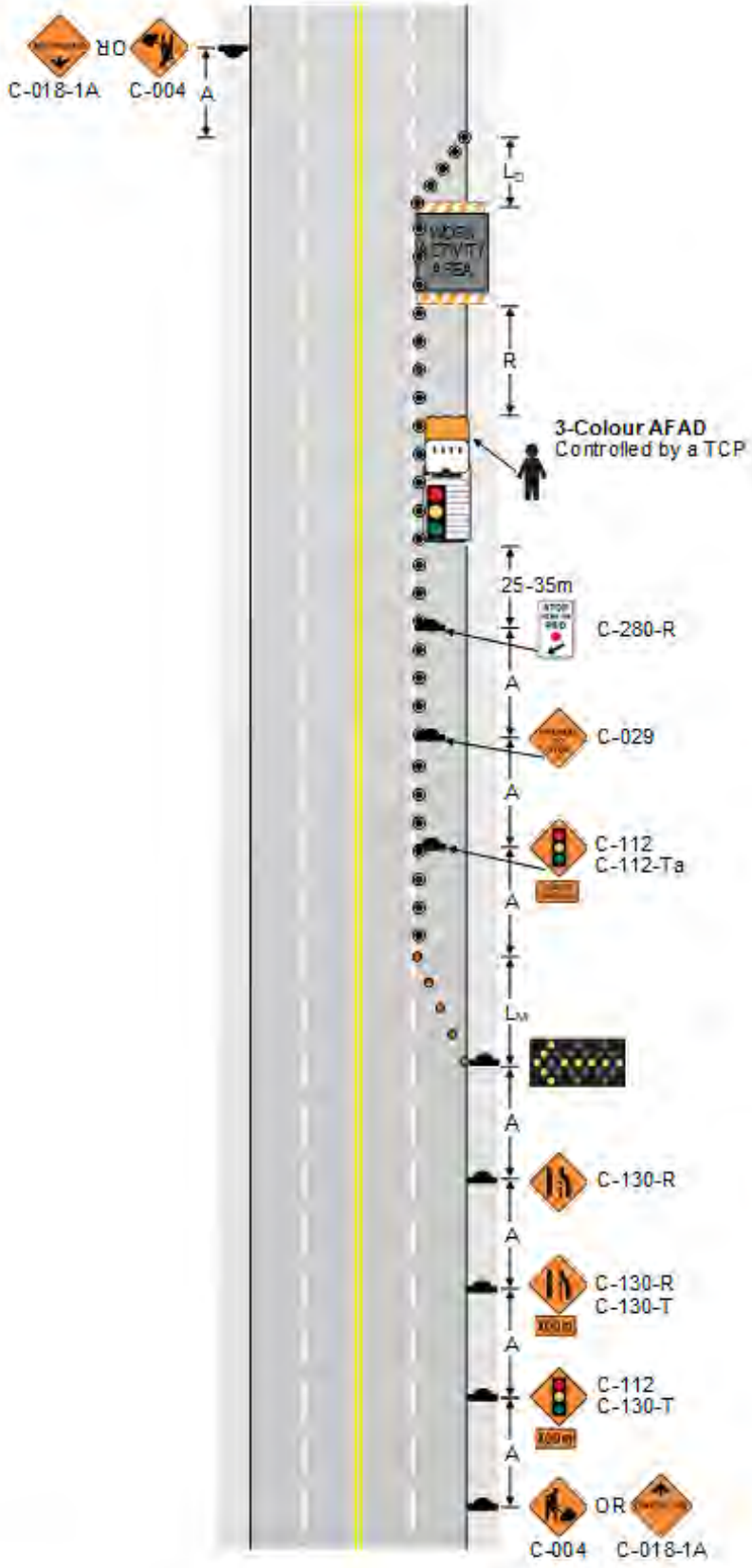
sign should then be moved to where the C-130-R or C-130-L and C-130-T previously was,

- Tubular markers may be used for leading tapers instead of drums
- The flashing arrow board (FAB) may be replaced as shown below.

Speed Limit	Workers or Work Vehicles Present	No Workers or Vehicles Present
≤ 60 km/h	Lane Closure Arrow C-053 sign plus work vehicle with 360° flashing light and 4-way flashers.	Lane Closure Arrow C-053 sign plus barricade and Type A yellow warning light.
≥ 70 km/h	No substitution.	

- Lane Closure Arrow C-053 signs may be added upstream and downstream of the work activity area to direct traffic into the correct lanes

Figure 8.15: Three Colour AFAD (3C-AFAD) within a Lane Closure – Short and Long Duration



Implementation Schedule:

The 2C-AFAD and 3C-AFAD covered in this circular may be deployed immediately once proper training and set-up knowledge has been obtained for the devices.

The operating specifications introduced regarding 2C-AFAD devices in this circular will be fully required after a 3-year period starting September 1, 2026, and be fully implemented as of September 1, 2028.

This timeline will allow recent purchases of 2C-AFADs which lack programable timing control on items such as having a gate down delay to be utilized, until September 1, 2028. New purchases of AFADs after the release of this circular shall be purchased with the functionality as specified for 2C-AFADs.

The BC Ministry of Transportation and Transit (MoTT) reserves the right to call for these updated specifications on contracts by way of Special Provisions, or as called for by a Ministry representative for a particular work project.

The updates provided within this technical circular will be added to an updated manual to the current 2020 TMM, to be released later.

Contact:

Gerald Froese, P. Eng., M.Eng. PTOE
Senior Traffic Engineer
Engineering Services
Jerry.Froese@gov.bc.ca
Phone: 778-974-5272

Michelle Li, P. Eng., PTOE
Senior Traffic Operations Engineer
Engineering Services
Michelle.Li@gov.bc.ca
Phone: 778-572-6430



Ian Pilkington, P. Eng.
Chief Engineer