

Technical Provisions for AFADs:

Section I. Automated Flagger Assistance Devices - General

Support:

Automated Flagger Assistance Devices (AFADs) enable the flagger to be positioned out of the lane of traffic and are used to control road users through temporary traffic control zones. These devices are designed to be remotely operated either by a single flagger at a central location or by separate flaggers near each device's location.

The provisions for the design and use of AFADs described in this Interim Approval are based on experimentation with an AFAD that uses a remotely controlled STOP/SLOW sign on either a trailer or a movable cart system.

AFADs might be appropriate under certain conditions for daytime work activities where they are set up and then removed each day or for some nighttime work activities. Typical applications include TTC activities such as, but not limited to:

- A. Bridge maintenance;
- B. Haul road crossings; and
- C. Pavement patching.

Guidance:

AFADs should only be used when determined to be appropriate based on an engineering study.

AFADs should not be used for long-term stationary work (see Section 6G.02).

Standard:

AFADs shall only be used in situations where there is only one lane of approaching traffic in the direction to be controlled.

Guidance:

The maximum distance between two AFADs controlling opposing directions of traffic should be 450 m (1,500 ft), unless a longer distance is justified by an engineering study. AFADs should not be used where traffic volumes are greater than 1,500 ADT unless justified by an engineering study.

Portable temporary traffic control signals (see Sections 4D.20 and 6F.80 and Chapter 4G) should be considered for use if traffic control is required in situations where AFADs are not permitted or are not recommended.

Standard:

When used at night, the location of the AFAD shall be illuminated in accordance with the provisions of Section 6G.20.

If used on the National Highway System, AFADs shall meet the crashworthy performance criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 350, “Recommended Procedures for the Safety Performance Evaluation of Highway Features” (see Section 6F.01).

Guidance:

If used on highways that are not on the National Highway System, AFADs should meet the NCHRP Report 350 crashworthy performance criteria.

If used, AFADs should be located in advance of lane closure tapers and downstream from the point where approaching traffic is to stop in response to the device.

Standard:

If used, AFADs shall be placed so that all of the signs and other items controlling traffic movement are readily visible to the driver of the initial approaching vehicle with advance warning signs alerting other approaching traffic to be prepared to stop.

If used, an AFAD shall be operated only by a qualified flagger (see Section 6E.01) who has been trained on the operation of the AFAD. The flagger operating the AFAD shall not leave the AFAD unattended at any time while it is in operation.

If an AFAD is used to control traffic that is entering a one-lane, two-way TTC zone, then a separate AFAD shall also be used to control traffic that is entering the one-lane, two-way TTC zone from the other direction. Using an AFAD to control traffic in one direction while a flagger manually controls traffic in the other direction with a hand-signaling device shall not be permitted.

Except as noted in the Option below, two AFADs that are controlling opposing directions of traffic shall be operated by two separate flaggers.

Option:

A single flagger may simultaneously operate two AFADs that are controlling opposing directions of traffic if all four of the following conditions are present:

- A. The flagger has an unobstructed view of both AFADs;
- B. The flagger has an unobstructed view of approaching traffic in both directions;
- C. The AFADs are less than 240 m (800 ft) apart; and
- D. The highway has an ADT of less than 1,500.

Guidance:

When an AFAD is used, the advance warning signing should include a ROAD WORK AHEAD (W20-1) sign, a ONE LANE ROAD (W20-4) sign, and a BE PREPARED TO STOP (W3-4) sign.

When an AFAD is not in use, it should be removed from its normal operating position and stored in a manner that reduces its probability of being impacted by run-off-the-road vehicles.

Standard:

When the AFAD is not in use, the signs associated with the AFAD, both at the AFAD location and in advance, shall be removed or covered.

Guidance:

A State or local agency that elects to use AFADs should adopt a policy governing AFAD applications that, as a minimum, complies with the requirements of this Interim Approval and the MUTCD. The policy should also consider more detailed and/or more restrictive requirements for AFAD use, such as the following:

- A. Fail safe procedures;
- B. Additional signing and pavement markings;
- C. Application consistency;
- D. Volume criteria; and
- E. Maximum distance between AFADs.

Section II. STOP/SLOW Automated Flagger Assistance Devices

Standard:

A STOP/SLOW Automated Flagger Assistance Device AFAD shall include a STOP/SLOW sign that alternately displays the STOP face and the SLOW face of a STOP/SLOW paddle without the need for a flagger in the immediate vicinity of the AFAD or on the roadway.

The AFAD's STOP/SLOW sign shall have an octagonal shape and be mounted with the bottom of the sign a minimum of 2.1 m (7 ft) above the pavement on an appropriate support. The size of the STOP/SLOW sign shall be at least 600 x 600 mm (24 x 24 in) with letters at least 200 mm (8 in) high. The background of the STOP face shall be red with white letters and border. The background of the SLOW face shall be diamond shaped and orange with black letters and border. Both faces of the STOP/SLOW sign shall be retroreflectorized.

The AFAD's STOP/SLOW sign shall have a means to positively lock, engage, or otherwise maintain the sign assembly in a stable condition when set in the STOP or SLOW position.

The AFAD's STOP/SLOW sign shall be fabricated of rigid material.

The AFAD's STOP/SLOW sign shall be supplemented with active conspicuity devices by incorporating either:

- A. White or red flashing lights within the STOP face and white or yellow flashing lights within the SLOW face meeting the provisions contained in Section 6E.03; or**
- B. A Stop Beacon (see Section 4K.05) mounted no more than 600 mm (24 in) above the STOP face and a Warning Beacon (see Section 4K.03) mounted no more than 600 mm (24 in) above, below, or to the side of the SLOW face. The Stop Beacon shall not be flashed or illuminated when the SLOW face is displayed, and the Warning Beacon shall not be flashed or illuminated when the STOP face is displayed. Except for the mounting locations, the beacons shall conform to the provisions of Chapter 4K.**

Option:

Type B warning light(s) (see Section 6F.78) may be used in lieu of the Warning Beacon during the display of the SLOW face of the AFAD's STOP/SLOW sign.

Standard:

If Type B warning lights are used in lieu of a Warning Beacon, they shall flash continuously when the SLOW face is displayed and shall not be flashed or illuminated when the STOP face is displayed.

Option:

The faces of the AFAD's STOP/SLOW sign may include louvers to improve the stability of the device in windy or other adverse environmental conditions.

Standard:

If louvers are used, the louvers shall be designed such that the aspect of the sign face to approaching traffic is a full sign face at a distance of 15 m (50 ft) or greater.

Guidance:

The STOP/SLOW AFAD should include a gate arm that descends to a down position across the approach lane of traffic when the STOP face is displayed and then ascends to an upright position when the SLOW face is displayed.

Option:

In lieu of a stationary STOP/SLOW sign with a separate gate arm, the STOP/SLOW sign may be attached to a mast arm that physically blocks the approach lane of traffic when the STOP face is displayed and then moves to a position that does not block the approach lane when the SLOW face is displayed.

Standard:

If used, the gate arm or mast arm shall be covered with alternating red and white retroreflective stripes at 150 mm (6 in) intervals measured horizontally. When the arm is in the downward position blocking the approach lane:

- A. The minimum vertical aspect of the arm and sheeting shall be 75 mm (3 in).**
- B. The stripes shall slope downward at an angle of 45 degrees from the upper right to the lower left on the side of the arm facing stopped traffic, and from the upper left to the lower right on the side of the arm facing moving traffic in the oncoming direction.**
- C. The end of the arm shall reach at least to the center of the lane being controlled.**

A WAIT ON STOP (R1-7) sign (see Figure A) shall be displayed to road users approaching the AFAD.

Option:

A GO ON SLOW (R1-8) sign (see Figure A) may also be displayed to road users approaching the AFAD.

Standard:

The GO ON SLOW sign, if used, and the WAIT ON STOP sign shall be positioned on the same support structure as the AFAD or immediately adjacent to the AFAD such that they are in the same direct line of view of approaching traffic as the sign faces of the AFAD. Both signs shall have black legends and borders on white backgrounds. Each of these signs shall be rectangular in shape and each shall be at least 600 x 750 mm (24 x 30 in) in size with letters at least 150 mm (6 in) high.

To stop road users, the AFAD shall display the STOP face and the red or white lights within the STOP face shall flash or the Stop Beacon shall flash. To permit stopped road users to proceed, the AFAD shall display the SLOW face and the yellow or white lights within the SLOW face shall flash or the Warning Beacon or the Type B warning lights shall flash.

If STOP/SLOW AFADs are used to control traffic in a one-lane, two-way TTC zone, safeguards shall be incorporated to prevent the flagger(s) from simultaneously displaying the SLOW face at each end of the TTC zone. Additionally, the flagger shall not display the

AFAD's SLOW face until all oncoming vehicles have cleared the one-lane portion of the TTC zone.

Attachment: Figure A