

**Posting Title: Automated Flagger Assistance Device**  
**TCP #: 000-0043**  
**Closing Date: December 10, 2021**

Comment ID	Organization	Comment	Response
68	North America Traffic Inc	Signal backplates should be considered for use on signal faces where sun glare, bright sky, and/or complex or confusing backgrounds indicate a need for enhanced signal face target value.	Regulation 185/22 - The signal on an automated flagger assistance device shall be mounted on a black backboard that has an orange retro-reflective border that is at least 2.5 centimetres in width.
		The use of 24" x 34" backplates which fit 12" LED lamps, enhances the contrast between the traffic signal indications and their surroundings for both day and night conditions, which is also helpful to older drivers.	Regulation 185/22 - <b>Signal Mount 8 (a)</b> The signal on an automated flagger assistance device shall be mounted on a black backboard that is not less than 85 centimetres in height and not less than 50 centimetres in width.
		The inside of signal visors (hoods), the entire surface, and the front surface of backplates shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background.	Regulation 185/22 - <b>Signal Mount 8 (b)</b> The signal on an automated flagger assistance device shall be mounted on a black backboard that has an orange retro-reflective border that is at least 2.5 centimetres in width.
		Signal Lamp Housing:	-
		Two section, consisting of Red and Yellow signal lamps	Regulation 185/22 - <b>Design of device 7 (2)</b> The signal on an automated flagger assistance device must contain no lens other than one red lens and one amber lens.
		ITE certified polycarbonate housing	Specifications to be determined by Road Authority.
		Aluminum back plate (back board)	Specifications to be determined by Road Authority.
		Ball cap visors, extending over each LED lamp by 10 inches (25.4 cm)	Specifications to be determined by Road Authority.
		The control gate arm should have the following requirements:	-
		Descends to the down position, blocking the approaching lane of traffic when the red indication is displayed:	Regulation 185/22 - <b>Operation and maintenance of device 10 (1)</b> The gate arm of an automated flagger assistance device shall be horizontal when a red lens is illuminated.
		8 feet (2.43 meters) in total length	Regulation 185/22 - <b>Gate Arm 9. (1) 1.</b> The gate arm must be at least two metres long and at least 10 centimetres wide.
		5 inch (12.7 cm) vertical aspect (including foam gasket)	Regulation 185/22 - <b>Gate Arm 9. (1) 1.</b> The gate arm must be at least two metres long and at least 10 centimetres wide.
		Made from 6061 grade aluminum	Specifications to be determined by Road Authority.
		Breakaway mechanism allowing the arm to swing out of the way upon vehicular impact	Specifications to be determined by Road Authority.
		Foam gasket on underside of gate arm to prevent vehicle damage	Specifications to be determined by Road Authority.
		Alternating 16 inch (40.64 cm) sections of red and white retro-reflective tape with vertical aspect of 2.5 inches (6.35 cm)	Regulation 185/22 - <b>Gate Arm 9. (1) 2.</b> The gate arm must be covered on both sides with alternating vertical contrasting stripes. At least one set of stripes must be made of retro-reflective sheeting. <b>NOTE:</b> July 1, 2027 - the gate arm must be covered on both sides with alternating vertical stripes of orange and black. The orange stripes must be made of retro-reflective sheeting.
		18 inch x 18 inch orange flag on the roadside end of gate arm	OTM Book 7 Pg. 181 - A 60 cm square fluorescent orange flag may be attached at, or near, the end of the gate arm to make the gate more conspicuous.
		Maintenance-free electric actuator lift system rated for 100,000 revolutions (one revolution = one complete up/down cycle)	Specifications to be determined by Road Authority.
		The 'Stop Here On Red' sign (RB-78) shall comply with the following specifications:	OTM Book 7 pg. 181 - The Rb-78 Stop here on red signal sign indicating the location where the driver approaching an AFAD device is to bring their vehicle to a stop shall be erected in front of an AFAD. RB-78 as per Book 5.
		24 inches x 36 inches (60.96 cm x 91.44 cm)	OTM Book 5 Rb-78 600 mm x 900 mm
		3M high intensity prismatic grade	OTM Book 5 Rb-78 Minimum sheeting requirements Type III or IV.
		Black lettering with white background	OTM Book 5 Rb-78 Black lettering with white background.
		Fabricated with rust-free aluminum sheeting	Specifications to be determined by Road Authority.
		AFADs shall not be used as a substitute for or a replacement for a continuously operating temporary traffic control signal. They should not be used in an automatic mode.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work.
		These devices are designed to be remotely operated either by a single flagger at one end of the TTC zone or at a central location, or by separate flaggers near each device's location. Traffic Control Person operating AFADs should have clear line of site.	Regulation 185/22 - <b>Operation and Maintenance of device 10. (6)</b> An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
		Operation using a Wireless Hand Held Remote from up to 800ft:	OTM Book 7 pg. 178 - Operation by remote control allowing the TCP to stand off to the highway and out of danger from passing vehicles or construction
		Fits in the users hand, or clips onto a belt buckle	Specifications to be determined by Road Authority.
		Solid state, with 3 simple buttons	Specifications to be determined by Road Authority.
		Syncs with the controller in under 3 seconds	Specifications to be determined by Road Authority.
		Commands from the remote to the controller are instantaneous	Specifications to be determined by Road Authority.
Reliance on a digital feed as the means of controlling traffic is risky and subject to external interferences	Specifications to be determined by Road Authority.		
Should have on-board Battery Charger	Specifications to be determined by Road Authority.		
15 Amp charger with multi-stage charging	Specifications to be determined by Road Authority.		
400 Watt power output	Specifications to be determined by Road Authority.		
External, corrosion proof plug for connection to a 120 VAC In-line surge protection	Specifications to be determined by Road Authority.		
Should have internal conflict monitoring which continually checks for data corruption, communication failures, conflicting signals, and monitoring of the power system source	OTM Book 7 pg. 179 - The AFAD should have a conflict monitoring capability that prevents illumination of all red and amber lenses at the same time.		
Multiple external devices required to operate an AFAD system are not practical. If one of these items gets lost, stolen, or broken, the entire system is non-operational	-		

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69	-	A location and down arm coverage should be considered when the regulation is developed. It is not uncommon to see that the AFADs are located so far off the roadway that the down arm is not effective in relaying the message to stop.	OTM Book 7 pg. 181 - The AFAD should be positioned in a location where the end of the arm reaches at least the center of the lane being controlled.
70	-	The use of an AFAD should not reduce the amount of traffic control persons (TCPs) required for single lane closure, regardless of length.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement to a TCP to control two way traffic on a two lane highways which have been reduced to one lane.
71, 74	Site 2020	Request is to allow one operator to manage two AFADs on road construction projects. This current regulation for a specific distance did not contemplate that there would be technology that could provide the operator with superior information than another TCP using wireless communication to help direct traffic.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10. (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
		one operator manage traffic (two AFADs) because it eliminates human error in communication when sending traffic west and east bound, entering and exiting work zones	OTM Book 7 pg. 180 - If two AFADs are being used, the two devices can be connected. One TCP can control both AFADs to eliminate the possibility of conflicting commands being given to the devices. Both TCPs must still be close enough to their respective AFAD that they can see/recognize a malfunction and use a TC-22 STOP/SLOW paddle to control traffic if required.
		CHANGE REQUEST 1 - 5.3.1 Automated Flagger Assistance Devices (Remote Control Device) Book 7 (previously reviewed by steering committee and vetoed, maybe book 7 says something about two AFADs connected....etc.) Currently - On longer work areas (from 50 to 500 m), two TCPs must be used, in communication with each other, one at each end, and controlling the AFADs at that end. Suggested change - On longer work areas (50m to 2km), one TCPs must be used, must maintain a continuous and unobstructed visual of all operational AFADs and traffic, in communication with each other and controlling the AFADs from a safe location.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work.
		CHANGE REQUEST 2 - 3.2.2.1 Automated Flagger Assistance Devices (AFADs) Book 7 (previously reviewed by steering committee and vetoed) Currently - Operation by radio remote control from a distance of up to 300m, which allows a TCP to stand off the roadway and out of danger from passing vehicles or construction vehicles that are backing up in the work zone. Suggested change - Operation by radio remote control, from a distance of up to 300m, which allows a TCP to stand off the roadway and out of danger from passing vehicles or construction vehicles that are backing up in the work zone.	OTM Book 7 pg. 178 - Safety benefits include operation by remote control allowing the TCP to stand off the highway and out of danger from passing vehicles or construction vehicles.
		CHANGE REQUEST 3 - 3.2.2.1 Automated Flagger Assistance Devices (AFADs) Book 7 (previously reviewed by steering committee and vetoed) Currently - AFADs are only to be used as a supplement for TCPs to control two-way traffic on two-lane highways which have been reduced to one lane. One remotely controlled device is placed at each end of a lane closure that displays a red or amber lens, generally in conjunction with a control arm. At least one TCP must be dedicated to controlling. Suggested change - AFADs are only to be used as a supplement for TCPs to control two-way traffic on two-lane highways which have been reduced to one lane. One remotely controlled device is placed at each end of a lane closure and side streets within the closure that displays a red or amber lens, generally in conjunction with a control arm. At least one TCP must be dedicated to controlling.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work and Regulation 185/22 Operation and Maintenance of device 10. (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
72	Angel Auto Flagger Team	An Auto Flagger should have the ability to set up/disassemble away from the construction or danger zone and then driven into place for the safety of the flagger personnel and work zone.	Specifications to be determined by Road Authority.
		An Auto Flagger should have quick deployment for usage; this reduces the risk when an unaware motorist enters a construction zone.	Specifications to be determined by Road Authority.
		An Auto Flagger should be very visible and leave no room for misinterpretation for motorists regarding the action required of them.	Regulation 185/22 - <b>Placement</b> 11. (1) An automated flagger assistance device shall be placed on a highway such that the signal of the device is to the right of, facing and clearly visible to approaching traffic.
		It should have an extension arm that includes a stop sign that activates a red traffic light for oncoming traffic in the affected lane and a slow sign that is visible on the backside of arm. When the flagger arm is extended with stop sign, the light will be red and visible from a distance. When traffic is to proceed with caution, the arm is vertical; the yellow light would be activated and visible. This allows the flagging personnel the ability to stop/direct traffic without physically standing in the traffic lane.	Regulation 185/22 - <b>Gate Arm</b> 9 (2) Figure 4 is an illustration of an automated flagger assistance device that meets the requirements set out in this section and sections 7 and 8. <b>Design of Device</b> 7 (2) 2 the lenses in the set must be arranged vertically in the following order, commencing at the bottom: amber and red.
		An Auto Flagger should have a wireless remote that controls the arm and lights. This remote allows the flagging personnel the ability to operate from a safe distance, out of danger and/or from inside the vehicle.	OTM Book 7 pg. 178 - Operation by remote control allowing the TCP to stand off to the highway and out of danger from passing vehicles or construction vehicle.
		An Auto Flagger should provide a safe place for the flagger personnel during adverse weather conditions, along with a place to avoid confrontations with the traveling public.	OTM Book 7 pg. 178 - Operation by remote control allowing the TCP to stand off to the highway and out of danger from passing vehicles or construction vehicle.
		An Auto Flagger should have the ability to be driven while set up, keeping the construction zone tight. Motorists have the tendency to speed if the work zone is not within visible range.	Specifications to be determined by Road Authority.
		An Auto Flagger should be lightweight and able to assemble/disassemble safely and easily within minutes.	Specifications to be determined by Road Authority.

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73	Arges Training & Consulting	We suggest that the nomenclature of this device should be changed. It should not be described as an automated device, which terminology could suggest that the devices could be left to function essentially as traffic control signals without the need for TCP control. This already happens far too often, despite the guidelines of OTM Book 7. It is an electro-mechanical device, although such terminology would be rather unwieldy. Perhaps a term such as "Auxiliary Flagger Assistance Device" or something like it could be used.	Noted.
		The proposed wording in the HTA regulation stipulates the colour of the AFAD lenses, but not the size. We suggest that this should be specified as a minimum of 200 mm, for both the red and the amber lenses.	Regulation 185/22 - <b>Design of Device</b> 7. (2) 3. Each lens in the set must be at least 30 centimetres in diameter.
		We believe that there should be a backboard, for more focused visibility, and that the colour should be orange, with high-intensity sheeting. (High-reflectivity micro-prismatic sheeting could be too bright, possibly overpowering or competing with the colour indications of the lenses.) Assuming two 200 mm lenses, we suggest that the size of the backboard should be 500 mm wide by 775 mm high, which would be consistent with Figure 11 in OTM Book 7 for Portable Lane Control Signals.. A narrow black border should be inset 75 mm from the edge of the backboard, again consistent with Figure 11. We suggest that the bottom of the backboard should be a minimum of 3.00 m above the ground, again, consistent with the position shown in Figure 11.	Regulation 185/22 - <b>Signal Mount</b> 8. The signal on an automated flagger assistance device shall be mounted on a black backboard that, (a) is not less than 85 centimetres in height and not less than 50 centimetres in width; (b) has an orange retro-reflective border that is at least 2.5 centimetres in width.
		We suggest that the gate arm colours should be black and orange, consistent with the usual construction and maintenance colour. The orange sheeting should be high-reflectivity micro-prismatic sheeting for maximum visibility. We support the use of a flag at the end of the gate arm for enhanced visibility.	Regulation 185/22 - <b>Gate Arm</b> 9. (1) 2. The gate arm must be covered on both sides with alternating vertical contrasting stripes. At least one set of stripes must be made of retro-reflective sheeting. <b>NOTE:</b> July 1, 2027 - the gate arm must be covered on both sides with alternating vertical stripes of orange and black. The orange stripes must be made of retro-reflective sheeting.
		The revised sections 146.1 (2) to (6) of the HTA are appropriate: Same - automated flagger assistance device OTM Book 7 (2014) text concerning AFADs (pp 101-102).	- -
75	The Regional Municipality of York	The proposal includes the requirement for an automated flagger assistance device to have one red signal light and one flashing amber signal light and one control arm. Suggest the following additional requirements: Back-up power supply for long duration and 24/7 operation	-
		Reflective tape permitted around the signal backboard in the event of a power outage	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work.
		Supplementary signal head permitted above lane	Regulation 185/22 - <b>Signal Mount</b> 8 (b) The signal on an automated flagger assistance device shall be mounted on a black backboard that has an orange retro-reflective border that is at least 2.5 centimetres in width.
		There should be direction on the type of lights that should be used. Some lights are difficult to see during the daytime, some lights have considerably more range, some are much easier to see at nighttime, etc.	Regulation 185/22 - <b>Placement</b> 11. (1) An automated flagger assistance device shall be placed on a highway such that the signal of the device is to the right of, facing and clearly visible to approaching traffic. Specifications to be determined by Road Authority.
		It is proposed that the minimum sign requirements for use in conjunction with the placement of an automated flagger assistance device shall include a DO NOT PASS sign, a warning sign indicating signals ahead, and a sign indicating the location at which a driver approaching an automated flagger assistance device is to stop their vehicle.	Regulation 185/22 - <b>Signs</b> 12 1. The following signs shall be erected in front of each automated flagger assistance device: i. A DO NOT PASS sign, as prescribed in Regulation 615 of the Revised Regulations of Ontario, 1990 made under the Act. ii. A sign with an orange background indicating that an automated flagger assistance device is ahead. iii. A sign indicating the location at which a driver approaching an automated flagger assistance device is to bring their vehicle to a stop.
		The proposed regulations may also include requirements related to automated flagger assistance device operator safety, such as a minimum and maximum distance at which the operator shall be positioned away from the automated flagger assistance device.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10. (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
		It is strongly recommended that the proposed regulations address such requirements. A large number of flaggers have been killed in recent years and while the use of an automated device would in theory mitigate this (i.e.: distracted driver strikes the sign instead of the person), the flagger may remain at risk if standing near or beside the automated device.	-

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77	Pioneer Construction	Request is to allow one operator to manage two AFADs on road construction projects. This current regulation for a specific distance did not contemplate that there would be technology that could provide the operator with superior information than another TCP using wireless communication to help direct traffic.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10. (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
		one operator manage traffic (two AFADs) because it eliminates human error in communication when sending traffic west and east bound, entering and exiting work zones	OTM Book 7 pg. 180 - If two AFADs are being used, the two devices can be connected. One TCP can control both AFADs to eliminate the possibility of conflicting commands being given to the devices. Both TCPs must still be close enough to their respective AFAD that they can see/recognize a malfunction and use a TC-22 STOP/SLOW paddle to control traffic if required.
		CHANGE REQUEST 1 - 5.3.1 Automated Flagger Assistance Devices (Remote Control Device) Book 7 (previously reviewed by steering committee and vetoed, maybe book 7 says something about two AFADs connected....etc.) Currently - On longer work areas (from 50 to 500 m), two TCPs must be used, in communication with each other, one at each end, and controlling the AFADs at that end. Suggested change - On longer work areas (50m to 2km), one TCPs must be used, must maintain a continuous and unobstructed visual of all operational AFADs and traffic, in communication with each other and controlling the AFADs from a safe location.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work.
		CHANGE REQUEST 2 - 3.2.2.1 Automated Flagger Assistance Devices (AFADs) Book 7 (previously reviewed by steering committee and vetoed) Currently - Operation by radio remote control from a distance of up to 300m, which allows a TCP to stand off the roadway and out of danger from passing vehicles or construction vehicles that are backing up in the work zone. Suggested change - Operation by radio remote control, from a distance of up to 300m, which allows a TCP to stand off the roadway and out of danger from passing vehicles or construction vehicles that are backing up in the work zone.	OTM Book 7 pg. 178 - Safety benefits include operation by remote control allowing the TCP to stand off the highway and out of danger from passing vehicles or construction vehicles.
		CHANGE REQUEST 3 - 3.2.2.1 Automated Flagger Assistance Devices (AFADs) Book 7 (previously reviewed by steering committee and vetoed) Currently - AFADs are only to be used as a supplement for TCPs to control two-way traffic on two-lane highways which have been reduced to one lane. One remotely controlled device is placed at each end of a lane closure that displays a red or amber lens, generally in conjunction with a control arm. At least one TCP must be dedicated to controlling. Suggested change - AFADs are only to be used as a supplement for TCPs to control two-way traffic on two-lane highways which have been reduced to one lane. One remotely controlled device is placed at each end of a lane closure and side streets within the closure that displays a red or amber lens, generally in conjunction with a control arm. At least one TCP must be dedicated to controlling.	OTM Book 7 pg. 178 - The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work and Regulation 185/22 Operation and Maintenance of device 10. (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions.
78		AFADs are traffic devices that are well defined in the MUTCD (Manual on Uniform Traffic Control Devices). We recommend using the same or similar wording for better alignment with the typical product offering.	Noted.
79- 82	Signalisation Ver-Mac	Technical Recommendations Gate height = reg, remaining = bk 7 We are recommending technical addition and suggestion to improve the TCP safety and clarify some elements currently in MTO Book 7. See the included 2 documents	Regulation 185/22 - <b>Gate Arm 9</b> (1) The gate arm of an automated flagger assistance device shall meet the following criteria: 1. The gate arm must be at least two metres long and at least 10 centimetres wide. 2. The gate arm must be covered on both sides with alternating vertical contrasting stripes. At least one set of stripes must be made of retro-reflective sheeting. 3. When lowered, the bottom edge of the gate arm must be not less than 110 centimetres but not more than 140 centimetres above the level of the roadway.
		British Columbia MOTI (Minister of Transportation and Infrastructure) has a section related to AFAD Placement and Operating options. This section defines when 1 versus 2 TCP(s) are required to operate the AFAD.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10 (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions
		The Ministry of Transportation of Quebec passed a law making AFADs mandatory for all flagging operations with speed limits over 70 KPH. As of July 2021, the CNESST in Quebec has reported no injuries or fatalities to flaggers in work zones where AFADs have been deployed since the mandate was implemented in October of 2020.	The AFAD is intended to be used as a supplement for a TCP to control two way traffic on two lane highways which have been reduced to one lane during ID, VSD, or SD work. OTM Book 7 Pg. 181 - Refer to the two decision matrices in Section 4.4.6, Table 4.10 and Table 4.11, to determine if the use of an AFAD is appropriate for the temporary condition.
84	Ontario Road Builders' Association	Allow one operator to manage two AFADs on road construction projects. Most AFAD technology assumes a TCP will independently control two or more AFADs. This technology provides the operator with superior information compared to that of another TCP using wireless communication to help direct traffic.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10 (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions
		Allow one operator to be used on longer work areas (50m-2km) as long as there is continuous and unobstructed visuals of all operational AFADs and traffic.	Regulation 185/22 - <b>Operation and Maintenance of device</b> 10 (6) An AFAD shall not be operated unless a TCP is positioned close enough to the device to enable the TCP to immediately display a traffic control stop/slow paddle to approaching traffic if the device malfunctions
		Allow radio remotes to be used for operation of AFADs over a distance of 300 m.	OTM Book 7 pg. 178 - Safety benefits include operation by remote control allowing the TCP to stand off the highway and out of danger from passing vehicles or construction vehicles