

Report to the Legislature on the Use of Automated Flagger Assistance

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Report to the Legislature on the use of Automated Flagger Assistance Device by WSDOT per ESSB 5352 Section 218(3)

Introduction

The automated flagger assistance device (AFAD) is considered to be a safety enhancement for work areas by physically removing the human flagger from the roadway. Most flagger injuries and deaths are related to the flaggers' high level of exposure to errant vehicles, and in many cases an AFAD would eliminate or greatly reduce this exposure.

AFADs are intended to be operated and controlled by a human flagger since they effectively become an extension of the flagger's arm by use of a remote control instead of a flagging paddle. AFAD decision making is done by a human because preset control programs are not allowed. The human flagger is stationed in a relatively safe location off the roadway (behind a guardrail, barrier, or in the back of a ditch, or back slope) but close enough to the AFAD to observe traffic and confirm AFAD operation.

Because the AFAD device must be operated by a certified flagger there is little opportunity to employ it as a cost saving device. However, there are limited conditions where a single flagger would be able to physically operate two AFADs simultaneously, saving the cost of an additional flagger.

Figure 1: example of AFAD



Background Information

AFADs first entered the market in the mid 1990s on a limited basis in the Midwestern US and Canada. In 2002, WSDOT Headquarters Traffic Operations, in cooperation with the Traffic Safety Commission Target Zero program, purchased two red/yellow lens type AFAD devices for the purpose of using technology in an effort to improve worker safety. The devices were given to the Olympic Region Work Zone crew to supplement their flagging operations, and have been in continual use since that time. Currently, the Olympic Region crew uses the devices in approximately 60-70 percent of their flagging operations, but because the units are near the end of their service life the region doesn't use them for every operation.

Olympic Region's AFADs were formally evaluated and approved by the WSDOT New Products Committee in 2004. The evaluation found these types of AFADs to be effective in providing the necessary guidance to drivers as they approached the work area. The combination of the red/yellow lights similar to a traffic signal and the cross arm similar to a railroad crossing gives drivers unmistakable direction as to the required action they are being asked to make.

Crews remarked that while the device was easy to set up and operate it did require some advance planning to ensure that proper vehicles were available to haul units to and from the job site. The location where the device is to be parked must have enough shoulder and lane width available to safely deploy the unit.

WSDOT developed a specification for the AFAD, allowing the use of the device on WSDOT projects. As per the Manual on Uniform Traffic Control Devices (MUTCD) requirements for experimental devices, WSDOT requested and was granted FHWA Interim Approval in July 2005 for AFAD use on roadways under WSDOT jurisdiction. AFAD devices have since been included in the 2009 MUTCD.

To date the device has been included in six WSDOT contracts statewide with favorable results from contract personnel, WSDOT inspectors and the traveling public. The AFAD is especially preferred for flagging operations at night to help improve worker safety when worker visibility is compromised. The use of the device is ideally suited to two-lane roadways where alternating one-way traffic operations are necessary to safely perform work such as paving operations, guard rail installation or bridge work. An AFAD is recommended for consideration on any operation that typically requires the assistance of a flagger to control traffic movements (aside from intersections). AFADs are scheduled to be used in at least two projects during the 2010 construction season.

In addition to WSDOT contracts, several local agencies and utility companies have begun using AFADs to supplement flagging operations: Lewis County PUD owns AFAD devices and uses them regularly in their flagging operations. The Port of Seattle and City of SeaTac have reportedly used the device in the past. The City of Vancouver used AFADs.

WSDOT Southwest Region maintenance crews have used the devices on occasions during the flood cleanup on SR 6 and on US 12.

Costs

AFAD units are available for both purchase and rental. In WSDOT contracts, a unit bid item is included so the bidding contractor can include a bid price in his package. Approximate rental costs are \$3,500 per unit per month. Purchase price is approximately \$12,000 to \$15,000 per unit depending on the manufacturer.

Operational Requirements for AFADs:

In order to ensure the safest practicable operation AFADs, WSDOT follows the requirements found in the Manual on Uniform Traffic Control Devices, (MUTCD). The MUTCD is the national standard for the use on any type of traffic control device placed on highways, roads and streets. The requirements for AFAD use are straight forward:

- AFADs are to be used only where there is one lane of approaching traffic to be controlled;
- When used at night the AFAD location shall be illuminated;
- Maximum distance between two AFADs controlling opposing directions of traffic is 800 feet;
- An AFAD device must be indicated on an approved traffic control plan and operated by a certified flagger.

Two versions of the AFAD have been approved for use nationally, the red/yellow lens with a cross arm gate and the stop/slow paddle version that provides an optional cross arm gate. To date, WSDOT has only field tested the red/yellow lens version.

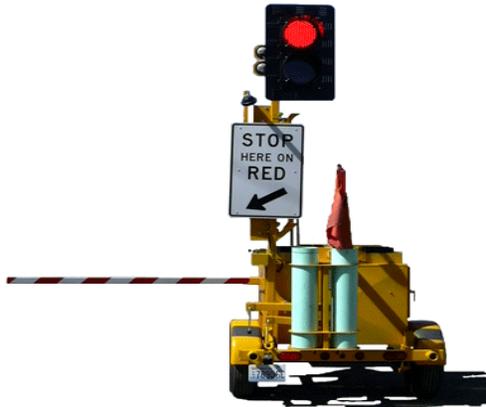


Figure 2:
Red/Yellow Lens AFAD

The stop/slow paddle version of the AFAD is currently limited to the Midwest and east coast and not available on the west coast. WSDOT's determination for approval and use of the of the stop/slow paddle version AFAD is based on national data research and anecdotal responses from other states on the performance. The red/yellow lens version is based on WSDOT new product evaluation.



Figure 3:
Stop/Slow AFAD

Based on its evaluation, WSDOT preferred the red/yellow lens AFAD with cross arm due to the visibility of the signal display and the added safety feature that the cross arm offers in providing drivers with clear expectations.

Public Perception

Response by the public to WSDOT's use of AFADs has been very positive; there have been few occasions of driver confusion reported. By far the consensus has been that the combination of red/yellow lights and the cross arm has been easily understood and well accepted by the public as a safer operation for the flagger.

Figure 4: Comparison photo of human flagger versus AFAD operation SR 6



Project photo examples

Figure 5: SR 162



Figure 6: SR 20



Figure 7: US 97



Figure 8: SR 109



Night operations and inclement weather examples

Figure 9: US 2



Figure 10: Local roadway off US 2



Summary

WSDOT recognizes the safety benefits of AFADs and will continue to include AFADs on projects where appropriate for the operation and location. In addition, WSDOT maintenance crews have expressed an increased interest in AFADs and regions are looking at funding options to acquire devices. A few local agencies are also interested in using AFADs.