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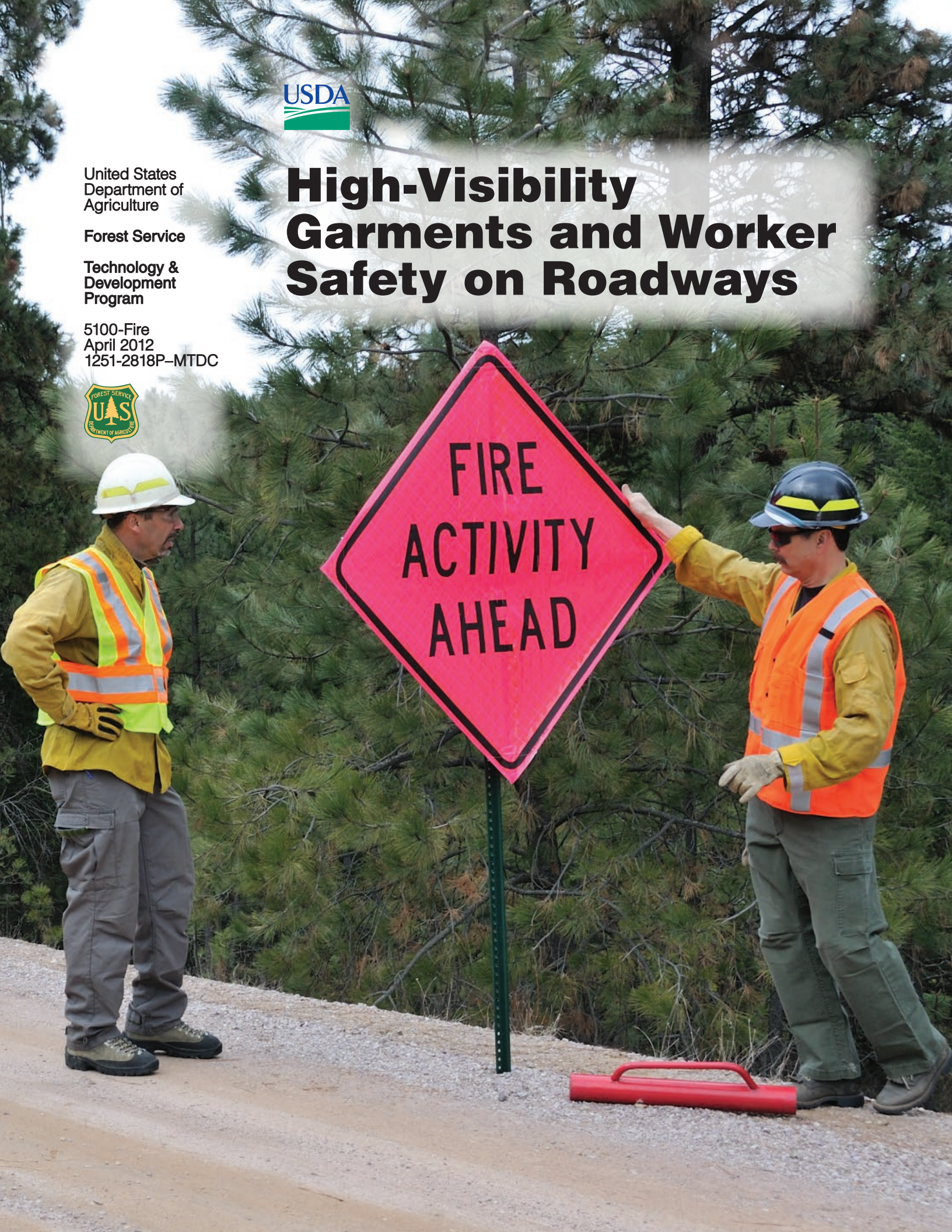

High-Visibility Garments and Worker Safety on Roadways

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Introduction

Forest Service employees in all program areas routinely work on public roadways while performing their duties. This results in a potentially dangerous work environment not only for the employee but also for the traveling public. Establishing a temporary traffic control (TTC) zone helps mitigate some of the danger, but national statistics indicate that TTC zones still can be deadly. A TTC zone may have many distractions that compete for a driver's attention. These distractions include signs, reduced speeds, flaggers, road closures, and ongoing work activities.

Roadside workers are required by law under Title 23 of the Code of Federal Regulations (CFR), Part 655, to wear high-visibility safety apparel when work activities expose them to moving vehicles. There are exceptions to this regulation for firefighters and law enforcement personnel. This report is intended to help all Forest Service employees understand high-visibility safety apparel requirements and how to use other mitigations for roadside hazards.

Part I—Regulations and Standards

Federal regulations requiring high-visibility safety apparel are enacted to prevent injuries and fatalities. The latest regulation requires this safety apparel for workers exposed to public traffic, work vehicles, and construction equipment while working along roads open to public travel. This includes all Federal, State, county, city, and National Forest System Roads (NFSRs). Additional information is provided in the current edition of the Manual on Uniform Traffic Control Devices (MUTCD), U.S. Department of Transportation, Federal Highway Administration (FHWA). The MUTCD is published by the FHWA under 23 CFR, Part 655, Subpart F.

Section 6D.03 of the MUTCD provides direction concerning worker safety and requires:

- All workers (including emergency responders) within the right-of-way to wear high-visibility safety apparel that meets the Performance Class 2 or 3 requirements of the American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) 107-2004 "American National Standard for High-Visibility Safety Apparel and Headwear."
- A person designated by the employer to be responsible for worker safety. This person shall make the selection of the appropriate class of garment.

Section 6D.03 also provides options to this general requirement that will be explained later in this report.

ANSI/ISEA 107-2004 Compliance

The high-visibility safety apparel requirement for most routine Forest Service work activities is met with a garment that complies with ANSI/ISEA 107-2004, Performance Class 2 or 3 (figure 1).

Work supervisors need to help develop a general job hazard analysis (JHA) to determine the appropriate class of garment for specific work activities. Go with the higher level of protection if there is any doubt as to the appropriate class. Table 1 provides some guidelines for selecting a garment of the appropriate class.

Figure 1—The most obvious difference between a Class 2 (left) and a Class 3 garment (right) is that a sleeveless garment cannot be considered Performance Class 3.

Table 1—Suggested criteria for determining the appropriate ANSI/ISEA 107-2004 performance class.

Class 2 Garments

The garment should:

- Provide increased visibility during inclement weather conditions
- Create contrast against complex backgrounds
- Increase visibility for operators of vehicles traveling faster than 25 miles per hour
- Enhance worker visibility when work activities are near vehicle traffic

Class 3 Garments

The garment should:

- Protect workers exposed to high vehicle speeds and/or reduced sight distances
- Help mitigate risk when workers and vehicle operators have high task loads that clearly place the workers in danger
- Allow workers the most visibility through the full range of body motions to ensure identification as people

These guidelines are intended as an assessment tool only. Work activities and site specific conditions must be considered as part of the JHA/risk assessment process. Garment color should be selected to provide the greatest contrast between the worker and the work environment (figure 2).

Figure 2—Some vest colors provide better contrast to surroundings than others.

Be cautious when purchasing high-visibility safety apparel. Garments advertised as ANSI/ISEA 107-2004 "style" or "design" may not conform to the standard. Garments must contain a label clearly stating compliance with ANSI/ISEA 107-2004 (figure 3). Additionally, the label must include a pictogram showing performance class and photometric performance level (figure 4).

Safety apparel that complies with the ANSI/ISEA 107-2004 standard is available from safety equipment stores and the General Services Administration (GSA) Advantage! Web site at <https://www.gsaadvantage.gov/main/start_page.do>. Search for "ANSI/ISEA 107-2004 vests."

High-visibility safety apparel should be replaced if it becomes faded, torn, dirty, soiled, worn or defaced, or if it is not visible during the day or night at 1,000 feet. The typical useful service life of high-visibility safety apparel depends on the type of work an individual performs while wearing it.

Figure 3—ANSI/ISEA 107-2004 compliance must be stated on the garment label.

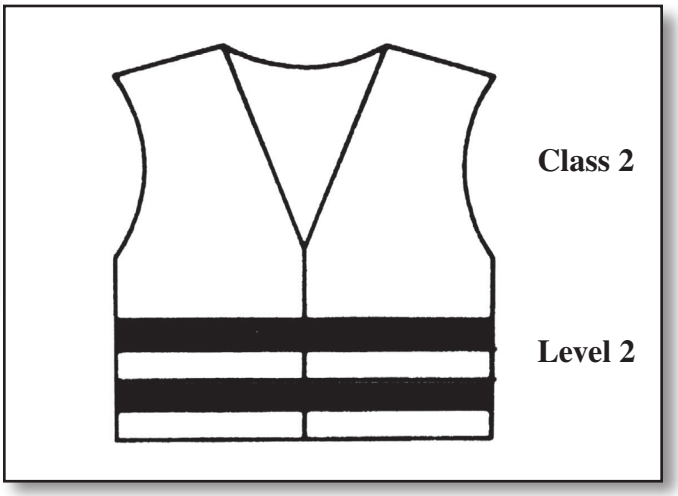

Figure 4—The required pictogram on the vest label shows where the performance class (2 or 3) and the photometric performance level (1 or 2) are located.

According to the American Traffic Safety Services Association (ATSSA), apparel worn on a daily basis has a service life expectancy of about 6 months. Apparel that is not worn on a daily basis may have a useful service life of up to 3 years. More service life information is available in "High-Visibility Safety Apparel In Highway Work Zones."

When high-visibility safety apparel is not in use, it should be stored in a cool, dry location out of direct sunlight. Large resealable plastic bags are good for storing high-visibility apparel in vehicles. Follow the proper cleaning instructions found on the garment label.

Additional Agency Direction

In addition to the MUTCD requirements, the Forest Service Health and Safety Code Handbook (FSH 6709.11) identifies when a specified activity requires high-visibility vests as personal protective equipment (PPE). All work projects and activities should have an associated JHA that identifies PPE needs. Some work activities always require that high-visibility vests be provided for employees. For example, FSH 6709.11, Chapter 27.13b lists PPE required for surveying, which includes a high-visibility vest when on public roadways and during hunting season. It is recommended that every Forest Service vehicle carry at least two vests that comply with the ANSI/ISEA 107-2004 Standard.

Options for Firefighters

The 2009 MUTCD, Section 6D.03, (paragraph 05) provides the option for emergency and incident responders and law enforcement personnel within the temporary traffic control (TTC) zone to wear high-visibility safety apparel that meets the ANSI/ISEA 207-2006 "American National Standard for High-Visibility Public Safety Vests" performance requirements. This is used in lieu of ANSI/ISEA 107-2004 apparel. This option was included because this type of vest better meets the special needs of these employees. The ANSI/ISEA 207-2006 public safety vests can have a shorter body length than the ANSI/ISEA 107-2004 vests (figure 5). This feature allows easier access to equipment worn on a belt, such as a radio or fire shelter (figure 6).

Section 6D.03 (paragraph 08) of the MUTCD provides another option. Firefighters or other emergency responders working within the right-of-way and engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials may wear firefighter clothing or retroreflective turnout gear. This gear is specified and regulated by other organizations, such as the National Fire Protection Association (NFPA). Clarification from FHWA verifies that this option applies to all firefighters performing firefighting duties. The high-visibility safety apparel requirements remain for firefighters working within rights-of-way who are not exposed to flame, fire, heat and/or hazardous materials. Additional clarification and guidance for firefighters is found in Part II of this report.

Figure 5—The ANSI/ISEA 207-2006 vest (left) has a shorter body length than the ANSI/ISEA 107-2004 vest (right).

Figure 6—The ANSI/ISEA 207-2006 vest allows the wearer easier access to equipment worn on a waist belt.

Options for Law Enforcement Personnel

Requirements for law enforcement personnel are included in the MUTCD, Section 6D.03 (paragraph 05), which allows an ANSI/ISEA 207-2006 public safety vest to be worn when working within the TTC zone. As with firefighters, when law enforcement personnel are required to wear high-visibility safety apparel, their needs are better met with the shorter ANSI/ISEA 207-2006 vest.

When uniformed law enforcement personnel direct traffic; investigate crashes; or handle lane closures; obstructed roadways, and disasters; high-visibility safety apparel shall be worn, as described in the MUTCD, Section 6D.03 (paragraph 06). Law enforcement personnel engaged in activities other than those identified previously are exempt from the high-visibility safety apparel requirement. Law enforcement personnel often work in potentially adversarial or confrontational roles where high-visibility apparel could be a disadvantage. Additional clarification for law enforcement personnel is found in Part II of this report.

Part II—Mitigations

Whether engaged in everyday work activities or emergency operations, employees working along public roadways risk injury from moving vehicles. At times, wearing a high-visibility vest will be the only necessary mitigation. Other situations may require more extensive temporary traffic control measures, such as signing, traffic cones, barricades, or road closures. This section of the report is designed to help you decide what mitigations are needed and also to help you find more detailed information. The MTDC online safety trainig module "Basic Roadside Safety" is a valuable resource for Forest Service and Bureau of Land Management employees <http://fsweb.mtdc.wo.fs.fed.us/php/library_card.php?p_num=1351%202F01>. The presentation is available in HTML media format. If you are unable to view it, a DVD (1351–2D01–MTDC) can be ordered from MTDC. Please call 406–329–3978 or email wo_mtdc_pubs.

All Forest Service, Including Engineering, Recreation, and Safety

General guidance for mitigating the risks associated with roadside work activities is found in FSH 6709.11. The handbook is a quick reference for determining broad needs related to specific work activities. For example, workers engaged in sign installation or maintenance are required to post warning signs and/or traffic control devices (TCDs) when working in areas exposed to motorized traffic (figure 7). Specific guidelines are found in the MUTCD, Part 6—Temporary Traffic Control and in the "Sign and Poster Guidelines for the Forest Service" (EM–7100–15).

Typical work activities where a high-visibility vest should be worn:

- Changing a flat tire or other roadside emergency
- Trailhead maintenance
- Cone collecting along roadways
- Physical fitness training—running, walking, biking
- Bridge inspection
- Road maintenance
- Sign installation/maintenance
- Surveying
- Heavy equipment operator's helper/signal person
- "Manned" road closures

This list is not all-inclusive. All work activities should have an associated JHA identifying required PPE (figure 8).

Remember: the MUTCD requires workers on public roadways to wear high-visibility safety apparel.

Situations where temporary traffic control is required:

- Sign installation and maintenance
- Road maintenance
- Surveying

Figure 7—Traffic control devices should be used in addition to high-visibility garments when exposed to motorized vehicles.

Figure 8—Employees participating in on-the-job physical fitness activities along a public roadway wear high-visibility apparel.

The extent of temporary traffic control required is task and site specific. At times, a simple warning sign is sufficient. Other situations require more extensive traffic control measures. Consult the "Sign and Poster Guidelines for the Forest Service" (EM–7100–15) and the MUTCD for information on establishing traffic control measures for NFSRs.

Fire and Aviation Management

Although firefighters engaged in fire suppression activities are exempted from the high-visibility garment requirement, they still can be at risk from moving vehicles and equipment. Other means should be considered for mitigating these hazards. Mitigations will vary widely, so incident personnel will be required to make decisions based on the specifics of the situation. This section provides some information on requirements and options firefighters have for mitigating hazards along roadways.

High-Visibility Apparel

When not to wear

As stated in Part I of this report, firefighters working on or in the right-of-way of a public roadway should wear high-visibility safety apparel unless directly exposed to flame, fire, heat, and/or hazardous materials. Firefighters are not required to wear high-visibility garments in these situations because:

- Firefighters could be put at greater risk, particularly if the garment is not made of flame-resistant material.
- The high-visibility garment may hinder access to equipment, such as a radio or fire shelter.

Firefighters must make a judgment based on experience and observations of current and expected fire behavior to determine if they will be directly exposed to flame, fire, or heat. When the hazard exists, agency-approved wildland fire clothing meets regulation requirements.

When to wear

All other roadside firefighting activities, such as installing road signs or directing traffic, require high-visibility safety apparel (figure 9). Firefighters may wear a vest that complies with either ANSI/ISEA 107-2004 or ANSI/ISEA 207-2006. Firefighters should avoid wearing a fireline pack over high-visibility apparel. Doing so will decrease the effectiveness of the garment. When circumstances prevent firefighters from wearing high-visibility apparel, traffic control measures such as those outlined in the next three sections should be utilized.

Figure 9—Firefighters need to wear high-visibility apparel when performing fire support activities, such as installing signs.

A variety of ANSI 107- or 207-compliant vests are available for purchase at GSA Advantage! Web site. Choices among vests include solid or mesh fabric, zipper or Velcro front closure, breakaway or non-breakaway, adjustable or non-adjustable, and with or without pockets. A mesh-style vest would be the better choice for firefighters who want to minimize the amount of heat stress caused by wearing an additional garment.

Signing

The "Sign and Poster Guidelines for the Forest Service" (EM–7100–15) provides basic guidance for fire incidents. All incidents and associated management activities that impact roads or require direction of motorized traffic require temporary traffic control. Temporary traffic control for incidents on roads and highways should be set up by initial responders within 15 minutes of their arrival onsite.

Signs warning of fire activity are not required for operations lasting less than 30 minutes if the incident vehicle uses activated, high-intensity rotating, flashing, oscillating, or strobe lights. The signs also may be omitted if the incident vehicle or activity is behind a barrier, more than 24 inches behind a curb, or more than 15 feet from the edge of any roadway. Incidents lasting longer than 30 minutes may require temporary traffic control.

Two Missoula Technology and Development Center (MTDC) publications are available to help incident managers select, procure, and use signs to promote traffic safety: the "Incident Sign Installation Guide" (1251–2820P–MTDC) and the "Incident Sign Ordering Catalog" (1251–2821P–MTDC).

Signing needs vary depending on an incident's location, complexity, and management level. Decisions about when signs are needed and how sign posting will be accomplished should be made at the local level before fire season begins (EM–7100–15). Initial attack vehicles should carry an appropriate number and type of high-visibility garments and a basic set of rollup signs and portable sign stands (figure 10). Local caches should develop an inventory of TCDs to use on initial attack and extended attack incidents. Sign kits designed for Type 1 and Type 2 incidents are available in 2011 from the National Interagency Support Caches (NISC). The National Fire Equipment System (NFES) Incident Road Sign Kits (NFES 1026) are available. Individual signs and mounting hardware are available for purchase through the GSA Advantage! Web site.

Figure 10—Portable warning signs should be carried in initial attack vehicles.

Road Guards and Flaggers

Posting warning signs may not adequately mitigate the hazards in situations where visibility is limited due to smoke or increased traffic flow. Other traffic control measures, such as using electronic sign boards or posting road guards or flaggers, may be necessary. Road guards and flaggers must wear high-visibility garments and should be working in an area away from high heat and flames. Flaggers must be certified in safe traffic control practices and public contact techniques by a State or Federally approved training and certification agency. For further information, refer to the "Incident Sign Installation Guide." Flagger training is available at <http://www.onlineflagger2.com/index1.htm>. The cost per person for flagger training varies from $45 to $65. Flagger training also may be available through a local Department of Transportation or the Local Technical Assistance Program at <http://www.ltap.org>.

Road Closures

There may be times when protecting firefighters and the public requires closing a road. High speeds, roads with low visibility, a lack of room for firefighters to work safely, curious roadway users who are distracted by the fire or fire operations, or a combination of these factors may lead to a road closure. Road closure requirements vary by jurisdiction. If a road must be closed, contact the local law enforcement or highway patrol agency (or the agency with jurisdiction over the road) for further information. As a general rule, Forest Service employees only have the authority to close NFSRs. Refer to the "Incident Sign Installation Guide" for information on establishing an emergency road closure.

Law Enforcement and Investigations

Due to the nature of their jobs, law enforcement personnel have unique requirements. Section 6D.03 of the MUTCD notes where exceptions are granted to the general rule requiring high-visibility apparel.

High-Visibility Apparel

When not to wear

As stated in Part I of this report, high-visibility safety apparel should be worn any time law enforcement personnel are working on or in the right-of-way of a public roadway. The exception is when personnel are engaged in an adversarial or confrontational role, such as at traffic stops or when pursuing and apprehending suspects. Standard operating procedures in these situations do not require high-visibility apparel because of the additional risk that may be involved.

When to wear

Any other roadside activities, such as directing traffic, investigating crashes, and staffing checkpoints, or handling lane closures, obstructed roadways, and disasters, require high-visibility safety apparel. Law enforcement personnel may wear a vest that complies with either ANSI/ISEA 107-2004 or ANSI/ISEA 207-2006.

Signing, Flagging, and Road Closures

Law enforcement duties often require employees to be responsible for temporary traffic control. Additional guidance concerning these activities is found in the fire and aviation management section of this report.

FAQs

Q. What law requires the use of high-visibility apparel for workers?

A. 23 CFR, Part 655, National Standards for Traffic Control Devices; the Manual on Uniform Traffic Control Devices for Streets and Highways.

Q. Does this law apply to emergency responders, such as law enforcement personnel and firefighters?

A. Yes. These employees have some exemptions based on activities in which they are engaged.

Q. How do I know if my work activities require using high-visibility apparel?

A. Generally, all workers within the right-of-way are required to wear high-visibility apparel. Exemptions are provided for firefighters and law enforcement personnel.

Q. Does the type of high-visibility vest required vary according to the work activity?

A. The high-visibility requirement is met in most cases with a garment that is compliant to ANSI/ISEA 107-2004, Performance Class 2.

Q. How do I know if a high-visibility vest meets a particular class?

A. Vests certified to ANSI/ISEA 107-2004 or ANSI/ISEA 207-2006 must have a label clearly stating compliance with the standard.

Q. When should high-visibility safety apparel be replaced?

A. High-visibility safety apparel should be replaced when it becomes faded, torn, dirty, soiled, worn or defaced, or if it is not visible during day or night at 1,000 feet.

Q. When should firefighters wear high-visibility safety apparel?

A. Firefighters engaged in roadside firefighting activities, such as installing road signs, directing traffic, and tactical/logistical support activities, are required to wear a high-visibility garment.

Q. When should firefighters not wear high-visibility safety apparel?

A. High-visibility safety apparel must be worn any time firefighters work on or in the right-of-way of a public roadway unless they are directly exposed to flame, fire, heat, and/or hazardous materials.

Q. When firefighters are required to wear high-visibility apparel, what type should they wear?

A. Firefighters should wear a vest that complies with either ANSI/ISEA 107-2004 or ANSI/ISEA 207-2006.

Q. What other steps for safe operations should firefighters take if they are not wearing high-visibility apparel?

A. Firefighters should set up temporary traffic control measures to ensure roadside safety. These measures can range from signing and flaggers to temporary road closures.

About the Author

John Smith joined MTDC in 2005 as an equipment specialist. He graduated from the University of Montana with a bachelor's degree in education and taught elementary school in Ovando, MT. He began his Forest Service career in 1974 as a wildland firefighter for the Lolo National Forest's Superior Ranger District. A Missoula smokejumper for more than two decades, Smith applies his experience as assistant loadmaster foreman and master parachute rigger to developing equipment for firefighters.

Library Card

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Keywords: Code of Federal Regulations, CFR, fire fighting, firefighting, General Services Administration, GSA, high-visibility safety apparel, law enforcement, personal protective equipment, PPE, safety at work

Electronic copies of MTDC's documents are available on the Internet at:

http://www.fs.fed.us/eng/pubs

For additional information about high-visibility garments, contact MTDC:

Phone: 406–329–3900

Fax: 406–329–3719

Forest Service and Bureau of Land Management employees can search a more complete collection of MTDC's documents, CDs, DVDs, and videos on their internal computer networks at:

http://fsweb.mtdc.wo.fs.fed.us/search/