

# Focus on Worker Safety Vests

## One factor taken from “Innovative Traffic Control Devices for Improving Safety at Rural Short-Term Maintenance Work Zones”

*by Michael D. Fontaine, Texas Transportation Institute, Texas A&M University System*

Much of the maintenance work performed on low-volume rural roads is completed in a single day. The short duration of these work zones can create a number of safety challenges. First, it is often difficult to coordinate work zone speed enforcement for these sites with local law enforcement agencies. Many rural enforcement agencies have limited resources, and it can be difficult to schedule enforcement activities when the location of work zones change daily. Most rural roads have a posted regulatory speed limit, but regulatory speeds are usually not reduced for short-term work zone activities. Traffic control is often limited to devices that can be easily installed and removed by a work crew due to the short duration of maintenance activities.

TxDOT and the Federal Highway Administration (FHWA) sponsored a Texas Transportation Institute (TTI) research project to determine if innovative traffic control devices could improve safety at short-term rural maintenance work zones. This project examined several innovative countermeasures to determine if they would produce a positive safety benefit at short-term rural work zones.

Five different traffic control devices were selected for further evaluation: speed display trailers, radar drones, portable rumble strips, alternative worker vests, and fluorescent orange roll-up signs.

In this excerpt, we highlight the portion on alternative worker vests.

### Alternative Worker Vests

At the time of this study, TxDOT workers wore fluorescent orange mesh vests. There was some concern that the color of these vests may cause workers to be camouflaged by work zone traffic control devices. Fluorescent yellow-green worker vests offered the potential to better distinguish workers from surrounding traffic control than the standard TxDOT orange vest. This evaluation examined five different worker garments in order to determine if the conspicuousness of workers could be improved. The garments were evaluated based on both their visual performance and the wearer’s comfort level.

### Field Evaluation

The worker vests were evaluated at six field sites. The solid fabric worker vests were used during this testing since they provided the maximum amount of fluorescent fabric and retroreflective material. Workers were asked to wear the vest for an afternoon, and then comment on their perceptions of its comfort and visibility. Worker comments on the vests were positive. They felt that the vests were more visible than the orange vests. They also felt that the garments were comfortable, and that the solid fabric vest was not noticeably warmer than the standard TxDOT mesh vest.

A downstream driver survey was also conducted at two sites in order to determine if drivers noticed the new worker vest more than the normal TxDOT worker vest. Approximately four percent of drivers noticed that the workers were wearing yellow vests rather than orange vests.

### *Photometric Testing*

The field luminance of the five worker garments was measured to assess how bright each garment appears to the eye. The fluorescent yellow green solid vest had the largest field luminance of all garments tested.

The luminance contrast ratio was also determined for each worker garment, measuring whether the vest "stood out" from the surrounding background including sky, asphalt, concrete, foliage, white and yellow trucks and equipment. The fluorescent yellow-green solid vest produced the highest contrast ratios for six of the eight backgrounds evaluated, while the fluorescent yellow-green solid jacket performed the best for the remaining two alternatives. However, the jacket is probably not a feasible alternative for workers to wear during the Texas summer. If a mesh vest is needed to accommodate workers during summer heat, the proposed TxDOT fluorescent yellow-green mesh vest appears to be the best alternative.

Cutline: The vests (left to right)

TxDOT orange mesh vest,

Proposed TxDOT yellow-green mesh vest,

Mesh yellow-green vest,

Solid fabric yellow-green vest, and

Yellow-green jacket with sleeves.

It should be noted that American National Standards Institute (ANSI) standard ANSI/ISEA 107-1999 was released after this evaluation was performed (2). The proposed TxDOT yellow-green vest did not meet the requirements for background material for small and medium vests.



The full article by Michael D. Fontaine, Texas Transportation Institute, describes the results of the evaluation of all the devices. Read it here:

<https://ops.fhwa.dot.gov/wz/workshops/accessible/fontaine.htm>

# # #