

## MIFACE INVESTIGATION: #02MI106

### SUBJECT: Highway Worker Killed by Passenger Vehicle While Setting Up Highway Work Zone Warning Signal

#### Summary

On Friday, August 9, 2002, a 26-year-old technical sales representative employed by a highway traffic management firm was struck and killed by a passenger vehicle while setting up a highway work zone warning device. The victim and her partner were working on the shoulder of a six-lane interstate highway. The shoulder was 11 feet wide where they were working. A guardrail was placed at its edge to prevent cars from driving over the drop off onto the embankment. The workers were therefore constrained from moving farther away from the moving traffic. Several areas of signage identifying the work zone were in place before the work zone including one approximately one-quarter of a mile before the area where they were working. An electronic message board, message side facing traffic, was mounted on the back of a trailer. The victim, on the hitch side of the electronic message board, had plugged her laptop computer into the board to check the calibration of the "Do Not Pass" message. She was positioned with her back to oncoming traffic. The company vehicle in which she and her co-worker had driven to the site was parked a slight distance beyond her. A car swerved off the road onto the shoulder striking the sign, trailer, and workers. The victim was crushed between the message board trailer and the company vehicle. Her co-worker was propelled 50 feet from the point of impact down the embankment and received serious injuries to his legs, pelvis, hands and face. He was hospitalized in critical condition. He is continuing to recover from his injuries.

#### RECOMMENDATIONS

- Employers/highway construction contractors should develop and implement an accident prevention plan prior to beginning a construction project that addresses specific worksite hazards and how to minimize or eliminate them.
- A truck-mounted attenuator should be placed in the proper position to protect traffic control installers working on road shoulders from high-speed traffic when they are setting up signals.
- Employers/highway construction contractors should use traffic control variable message boards that can be programmed in advance or programmed from a remote location, so they can be put into position with minimum time spent in close proximity to high-speed traffic flow.
- All entities concerned with work zone worker safety including the Department of Transportation, Traffic Enforcement, and the Michigan Occupational Safety and Health Administration (MIOSHA) should continue their efforts to remind drivers of their responsibility to proceed through highway work zones attentively and according to the posted signs.

Keywords: Work Zone, Other

## INTRODUCTION

On Friday, August 9, 2002, a 26-year-old technical sales representative employed by a highway traffic management firm was struck and killed by a passenger vehicle while setting up a highway work zone warning device. On August 12, 2002, MIFACE investigators were informed by the MIOSHA personnel who had received a report on their 24 hour-a-day hotline that a work-related fatal injury had occurred on August 9, 2002. On October 7, 2002, the MIFACE researcher conducted a telephone interview with a representative of the company that employed the fatally injured worker. During the course of writing the report, newspaper articles, MIOSHA Newsletter articles, the MIOSHA file and citation, police reports, and the medical examiner's report were obtained.

The company for whom the victim worked had been in business for 22 years. It employs approximately 150 people. Its business is highway traffic management and product and systems technology. A road building and maintenance contractor had contracted with the company to set up electronic traffic control devices in preparation for road construction.

The victim was a civil engineer employed by the company for two years as a technical sales representative. She normally worked in an office at its headquarters but had requested a field assignment to enhance her experience. She and her co-worker had been setting up electronic traffic control signs for five days when the incident occurred.

The company convened a general meeting yearly where safety issues might be discussed. Occasional meetings were held during the year dealing specifically with safety. Department heads were responsible for safety. The company did have a safety committee consisting of four salaried and two hourly employees. In general, the company relied on the road building contractor to provide safety information. Most of the safety training consisted of on-the-job training provided by more experienced workers.

The incident occurred at approximately 6:00 p.m. The weather was clear. It was daylight, and the victim and her co-worker were completing the last assignment for their day. There was no apparent reason for the vehicle to leave the highway. According to newspaper accounts of the vehicle operator's trial for causing the death of a road construction worker, her attorney argued that his client had swerved onto the shoulder to avoid hitting a truck that had braked suddenly in front of her. The jury did not convict the vehicle operator on the charges brought against her.

The MIOSHA investigation resulted in one serious violation being issued to the company for failing to have an accident prevention program. Review of the company's traffic control plan required by the Michigan Department of Transportation (MDOT) indicated that the placement of the advance warning signs used to alert motorists of the upcoming work zone were adequate and appropriately positioned. Several areas of signage identifying the work zone were in place before the work zone including one approximately one-quarter of a mile before the area where they were working.

## INVESTIGATION

On Friday, August 9, 2002, a 26-year-old technical sales representative employed by a highway traffic management firm and her partner were activating electronic boards for flashing highway work zone traffic control signals with a laptop computer. The 3.2 miles of highway construction work was scheduled to start on Monday, August 19, 2002. The dynamic lane merge system signs advised motorists to merge from three lanes to two lanes as they entered the work zone. She and her partner had been working on the project for about a week.

On the day of the incident, they had activated several electronic highway work zone warning signals and were preparing to wrap up the work for the day around 6:00 p.m. They were working on the shoulder of a six-lane interstate highway with a speed limit of 70 miles per hour – 3 eastbound lanes and 3 westbound lanes. The area in which they were working was located at the top of a slight rise in the road on the westbound side of the highway. The shoulder was 11 feet wide where they were working. A metal guardrail was placed at its edge to prevent cars from driving over the drop off onto the embankment. The workers were therefore constrained from moving farther away from the moving traffic. Signage identifying a reduced speed zone ahead had been placed at several intervals before the work zone as well as at the beginning of the rise. The beginning of the rise was approximately one-quarter of a mile before the area where they were working.

The victim and her partner were wearing reflective vests and hard hats. The black Ford F-250 company pickup truck in which they had driven to the site was parked on the shoulder of the highway a slight distance in front of the orange trailer upon which the message board was mounted. A strobe light was flashing in the back of their pickup truck.

The victim had walked back to the electronic message board from their truck to check the calibration of the message board on the trailer. She was at the hitch side of the trailer and had plugged her laptop computer into the message board with her back to oncoming traffic. The vertical message board displayed a message that read “Do Not Pass”. The words “When Flashing” below the “Do Not Pass” were not flashing. The electronic message sign was approximately six feet high. The height of the combined trailer and message sign was approximately eight feet.

A car driven by a woman with a 5-year-old child in the front seat and laundry piled high in the back seat swerved off the road onto the shoulder striking the message board trailer, sign and the pickup truck. The collision of the car and trailer caused the trailer to move forward and strike the back of the pickup truck. The victim was crushed between the trailer and the truck. Her co-worker was propelled 50 feet from the point of impact down the embankment and received serious injuries to his legs, pelvis, hands and face. He was hospitalized in critical condition. He is continuing to recover. A Michigan investigation revealed no violations of traffic control requirements.

The driver of the car was prosecuted and tried. The jury did not convict her on the charges brought against her. Newspaper accounts of the trial indicated her attorney argued that she had swerved onto the shoulder to avoid a truck that had braked suddenly in front of her. He also said the area was not clearly marked so his client did not know it was a construction area.

## CAUSE OF DEATH

The cause of death stated on the medical examiner’s report was multiple injuries sustained as a pedestrian at a road construction site, struck by a motor vehicle. The victim’s toxicological results were negative.

## RECOMMENDATIONS/DISCUSSION

- Employers/highway construction contractors should develop and implement an accident prevention plan prior to beginning a construction project that addresses specific worksite hazards and how to minimize or eliminate them.

Highway work zones are hazardous areas in which to work when they are well-marked and well-controlled. Additional significant exposure is encountered when the traffic-control work zones are

being established. Had an accident prevention plan been developed by the company and reviewed with the workers, perhaps the necessity of working during rush hour on Friday on a freeway with a 70-mile per hour speed limit could have been avoided.

- A truck-mounted attenuator should be placed in the proper position to protect traffic control installers working on road shoulders from high-speed traffic when they are setting up signals.

Even though the findings indicated that appropriate procedures were being followed to set up the traffic control warning zone, departments of transportation and road contractors should consider the use of supplemental traffic control devices in addition to the minimum specified by the Michigan Manual of Uniform Traffic Control Devices (MMUTCD). Truck-mounted attenuators can be placed to significantly reduce the consequences of impact if a vehicle penetrates the work space. The attenuator dissipates the energy of a rear-end collision. They are particularly useful in moving and short duration work zones where they can move forward as work progresses to protect workers from being struck from behind by traffic vehicles.

- Use traffic control variable message boards that can be programmed in advance or programmed from a remote location, so they can be put into position with minimum time spent in close proximity to high-speed traffic flow.

Had pre-programmed or remote-programmed variable message boards been used, the exposure time of the workers would have been shortened. The time of day and volume and speed of traffic at the location where they were working, compounded by the fact that they could move no further than 11 feet from the traffic flow, placed them in an extremely hazardous situation. One of the principal ways to control exposure is to reduce the time of the exposure. If they could have preprogrammed the signs or dropped off the message board and continued to another safer location, their exposure time would have been lessened.

- All entities concerned with work zone worker safety including the Department of Transportation, Traffic Enforcement, and the Michigan Occupational Safety and Health Administration (MIOSHA) should continue their efforts to remind drivers of their responsibility to proceed through highway work zones attentively and according to the posted signs.

Michigan enacted a law in 2001 that imposes severe penalties including prison time for persons convicted of killing or injuring a road worker. The law was designed to emphasize the importance of following posted limits and remaining attentive while driving through highway work zones. This law, continued motorist education, strict enforcement of speed laws, and implementation of other alternative speed control measures, such as the increased presence of law enforcement at the beginning of the work zone, should reduce the hazards to workers in highway road construction projects.

## REFERENCES

MIFACE gratefully acknowledges the assistance and expertise of Mr. Timothy Galarnyk, Deputy Director of the Construction Safety Council, [www.buildsafe.org](http://www.buildsafe.org), in the preparation of this report.

“An Excerpt from the Michigan Manual of Uniform Traffic Control Devices”, 1994 Edition, Part 6, Construction and Maintenance, Revised – January 2001.

Accident Prevention Manual for Business & Industry, Engineering and Technology, 11th Edition, National Safety Council, Chicago, 1997.

Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, “Building Safer Highway Work Zones: Measures to Prevent Worker Injuries From Vehicles and Equipment”, April 2001.

MIOSHA standards cited in this report may be found at and downloaded from the MIOSHA, Michigan Department of Labor and Economic Growth website at: [www.michigan.gov/mioshastandards](http://www.michigan.gov/mioshastandards). Also, MIOSHA standards are available for a fee by writing to: Michigan Department of Labor and Economic Growth, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

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