

REPORT#: 15MI110

REPORT DATE: 1/16/19

INCIDENT HIGHLIGHTS



DATE:

Fall, 2015



TIME:

10:00 p.m.



VICTIM:

Construction laborer



INDUSTRY/NAICS CODE:

Construction/23



EMPLOYER:

Highway/Street/Bridge
Construction



SAFETY & TRAINING:

General Safety Training



SCENE:

Right lane of 3-lane
expressway



LOCATION:

Michigan



EVENT TYPE:

Struck By/Motor Vehicle

Construction Laborer Working in Highway Work Zone Struck by Van

SUMMARY

In fall 2015 a Hispanic male construction laborer in his 40s died when he was struck by a van traveling in the closed right lane of a highway work zone. The decedent and coworker, wearing high visibility vests, were on break from sealing pavement cracks and were standing behind/near their parked “kettle truck”. The work operation was performed at night. The incident area was lit by overhead streetlamp lighting and the lighting on the kettle truck. The driver disregarded the barricades at a nearby ramp and entered the work zone [READ THE FULL REPORT](#)> (p.3)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Vehicle driver may have disregarded traffic barricade, entered construction work lane, did not merge into travel lane.
- Vehicle driver was impaired due to illegal and prescription drugs.
- Tar components covering kettle truck making it difficult to see in low light conditions.
- MDOT contract terms prohibiting trailing attenuator, speed reduction.

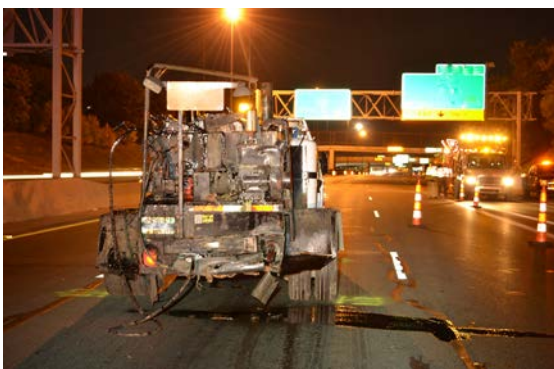
[LEARN MORE](#)> (p.9)

RECOMMENDATIONS

MIFACE investigators concluded that, to help prevent similar occurrences, employers should:

- Employers should ensure equipment and workers are visible when working at night. This could include, but not be limited to, additional lighting and clean high visibility vests/clothing.
- Use an audible warning alarm system to alert workers of a work zone intrusion or other emergency..... [LEARN MORE](#)> (p.9)

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State **FACE** Program

Fatality Assessment & Control Evaluation

Michigan State University

Department of Medicine • Occupational and Environmental Medicine

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Michigan Fatality Assessment and Control Evaluation (FACE) Program

MIFACE (Michigan Fatality Assessment and Control Evaluation), Michigan State University (MSU) Occupational & Environmental Medicine, 909 Fee Road, 117 West Fee Hall, East Lansing, Michigan 48824-1315; <http://www.oem.msu.edu>.

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SUMMARY

In fall 2015, a Hispanic male construction laborer in his 40s died when he was struck by a van traveling in the closed right lane of a highway work zone. The decedent and coworker, wearing high visibility vests, were on break from sealing pavement cracks and were standing behind/near their parked “kettle truck”. The 2-mile long work zone started with signage, then orange/white barrels forming a taper and an arrow board on the right shoulder closing the far right lane of the expressway. Tall orange/white cones were placed on the division lines dividing the center and right lane. Per contract with the MDOT, no reduction in speed was required from the posted 55 mph and no mobile attenuator was used. The work operation was performed at night. The incident area was lit by overhead streetlamp lighting and the lighting on the kettle truck. Two highway entrance ramps in the work zone had been closed; ramp #1 was approximately one mile away and ramp #2 was near the area where the decedent was working. The van driver lived very near ramp #2. It appears that the van driver may have disregarded the barricades at ramp #2. The responding police indicated that the kettle truck was covered in tar and was difficult to see, and due to limited streetlamp lighting, the van driver may not have been able to see the truck. The rear of the kettle truck did have overhead spot lights on, for the work operation. The van driver was traveling, at a minimum, 60mph and did not apply his brakes before striking the both of the workers and the kettle truck. A witness reported to police that the van was driving in the closed work zone lane in an area past ramp #2.

INTRODUCTION

MIFACE personnel contacted the chief executive officer of the firm who agreed to be interviewed by MIFACE personnel. MIFACE reviewed the MIOSHA compliance officer file, death certificate, medical examiner and police reports during the writing of this report. Pictures used in the report are courtesy of the responding police department, pictures taken by the MIOSHA compliance officer at the time of the MIOSHA compliance inspection and MIFACE at the time of the site visit.

EMPLOYER

The employer had been in business approximately 30 years. The firm fills cracks and roadway seams on highways and was contracted by the state of Michigan to seal cracks in both directions of approximately six miles, of three lanes of an east-west highway. The firm hired seasonal workers to supplement regular workforce. At the time of the incident, approximately 100 individuals, both seasonal and non-seasonal worked for the firm. The firm was not unionized. The firm is a member of an association dedicated to road preservation.

WRITTEN SAFETY PROGRAMS and TRAINING

The firm had a written health and safety plan. Although the firm had both Spanish-speaking and English-speaking workers, the written plan was in English. The firm used a trade association to assist in writing their program. The firm’s vice president is responsible for the health and safety program’s administration. Safety responsibilities were delegated to site foreman/supervisors with on-the-job safety experience. The program included a written disciplinary procedure for health and safety policy violations. The firm followed the contract requirements; it did not have specific written safety rules or procedures for sealing cracks on expressways with a closed lane at night.

Safety meetings were scheduled on the 1st day of each project. For reasons unknown, the decedent was not present for the meeting regarding the 6-mile long project. Safety training is conducted in English; no training is conducted in Spanish. The firm maintains health and safety training records.

The firm did not have a health and safety committee.

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WORKER INFORMATION

The decedent was employed full-time as a general laborer performing crack-sealing activities on roadways; he was not a temporary worker. His primary language was Spanish. The decedent had worked for the firm for 8 years and was paid on an hourly basis for his 8-hour workday. He primarily worked on the roadways that were closed for “night” work. Although his exact time of arrival at the worksite was unknown, the MIFACE interviewee indicated that the fatal incident occurred within one hour of his arrival. He was wearing a high visibility vest.

MIFACE was not able to gather any information regarding his coworker at the kettle truck or information regarding the workers in the lead truck.

INCIDENT SCENE

The incident occurred on the third day of crack sealing the 6-mile stretch of road. The 2-mile long work zone was the far right lane of a 3-lane expressway; the center and left lanes were open to public vehicle travel with a 55 mph speed limit. Two Michigan Department of Transportation (MDOT) traffic signage plans were followed: M0080a-Typical Advance Signing Treatment For Intermediate And Short Term Stationary Work Zone Operations Where All Traffic Control Devices Are Removed At The End Of Each Work Day On A Divided Roadway and MD-23a - One-Lane Closure On An Undivided Multi-Lane Roadway, No Speed Reduction. Supervisors were responsible for setting up traffic control devices.

The beginning of the 2-mile stretch of expressway having crack sealing performed was west of the incident scene. The work zone started with signage, then orange/white barrels forming a taper and an arrow board on the right shoulder and then the 36-inch tall channelizing devices (orange/white cones) were placed on the division lines dividing the center and right lane. The work occurred at night, and although street lights were present, responding police described the area as having “low lighting”.

In the direction in which the work crew was working, there were four expressway entrance ramps within the 2-mile long work zone (See Figure 1). The responding police accident investigator stated to the MIOSHA compliance officer that both ramps #1 and #2 had barricades erected; the accident investigator had to drive around the barricades at ramp #2. Sight lines to the entrance ramp #2 were unobstructed (Photo 1). After entering the expressway, the roadway curved (Photo 2).



Photo 1. Visual sight lines to entrance ramp #2. Arrow shows ramp #2 entrance



Photo 2. View of entrance ramp #2 from overpass. Note roadway curvature.

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The crew consisted of lead truck (“over truck”) with 4 workers. The “over truck” was located approximately 65 feet east of the second crew (decedent and his coworker) with a kettle truck. The “over truck” workers used high pressure air to clean out roadway cracks and seams to prepare the cracks/seams for sealing. The decedent and his coworker followed with the kettle truck and used a pressurized wand to inject a molten asphalt based material into the now open and clean seams/cracks. At the time of the incident, the over truck was working just east of the foot of the entrance ramp #3e (See Figure 1)

WEATHER

The responding police consulted the National Weather Service data at 2253 hours taken at a nearby airport. Roads and weather conditions were: 64 degrees, Winds SW at 9mph, Skies clear, Visibility 10 miles. Roads were dry.

INVESTIGATION

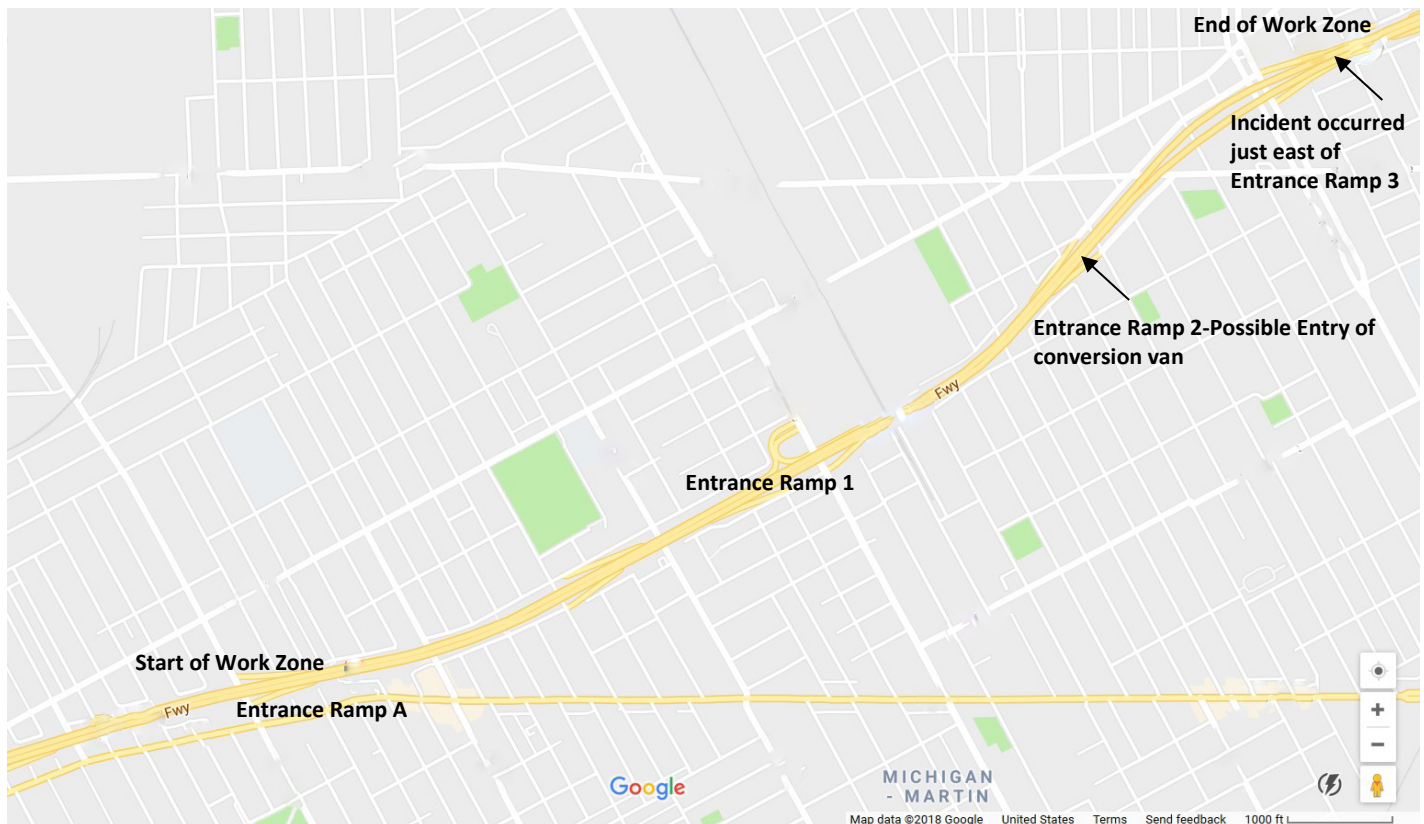


Figure 1. Google Map view, with identifying street names removed, of the incident site

The incident occurred on the third day of work. It is unknown *when* the barricades were erected closing entrance ramps #1 and #2 to the eastbound freeway. The decedent’s coworker indicated to the MIOSHA compliance officer investigating the incident that the ramps #1 and #2 had been closed for several weeks. With the entrance ramps barricaded/closed, the

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taper and cones placed to establish the work zone, the crew began the job of cleaning and sealing the cracks/seams in the pavement.

The driver of the conversion van striking the decedents/kettle truck lived near entrance ramp #2. It is hypothesized that entrance ramp #2 is the ramp the driver of the conversion van used to enter the freeway. After the incident, a family member of the conversion van driver ran down entrance ramp #2 in an attempt to investigate the crash.

The kettle truck was stopped in the right lane just east of ramp #3 near the end of the work zone. The kettle truck had lights on it, but according to the investigating police agency “did not appear to have enough lighting to illuminate the roadway”. The responding police indicated that the kettle truck was covered in tar making it difficult for the conversion van driver to see the truck in the low light.

The decedent and his coworker were wearing Class 3 high visibility vests; scene pictures show the vests had substantial amounts of sealing material on them. The workers were on break and waiting for the “over truck” crew to move ahead. The decedent’s coworker was positioned at the rear of the truck on the driver’s side checking the temperature of the crack sealing material. He saw the decedent walking toward him from the right shoulder of the roadway (Photo 3).

A witness reported to the investigating police agency that they saw a van driving in the right lane that did not move to the center lane after entering the highway construction zone. Police estimated the van was travelling at approximately 60 mph. The expressway curved and that the decedent and his coworker were on the “inside” of the curve, out of the visual sightline of the van driver after he drove down the entrance ramp and when he was traveling in the closed lane.

His coworker noticed the van coming toward them and warned the decedent. Both workers were unable to get out of the way. The conversion van struck the passenger side rear of the kettle truck and both workers. The police did not see any evidence that the van driver applied the vehicle brakes before striking the workers/truck.

As a result of the impact, the kettle truck was moved forward approximately 140 feet to the east from where it was parked and into the center lane. The van moved to the east from the impact point remaining in the right lane and came to rest approximately 30 feet from the impact point.



Photo 3. Overview of Incident site. View of expressway just east of entrance ramp #3.

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After the impact, the decedent's coworker landed between the center and right lanes, approximately 4 feet behind the driver's side rear of the van with a broken left leg and related cuts/lacerations (Photo 4). The coworker was transported to a local hospital by emergency responders and survived.



Photo 4. Close up of gore area of entrance ramp #3 where incident took place

The decedent landed in the right hand lane approximately half the distance between the van and the kettle truck. Both the decedent and the van driver died on scene as a result of the crash.

The contract between the company and the Michigan Department of Transportation stated specifically that an attenuator could not be used unless it was for lane marking operations.



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MIOSHA Citations

MIOSHA Construction Safety and Health division issued the following Regulatory Notice and Health and Safety Recommendation to the employer at the conclusion of its fatality investigation:

Regulatory Notice: RECORDING AND REPORTING OF OCCUPATIONAL INJURIES AND ILLNESSES, ADM PART 11, RULE 408.22139(1):

Within 8 hours after the death of any employee from a work-related incident or the inpatient hospitalization of 3 or more employees as a result of a work-related incident, you must orally report the fatality/multiple hospitalization by telephone or in person to the Michigan Department of Consumer and Industry Services, Bureau of Safety and Regulation, State Secondary Complex, 7150 Harris Drive, Lansing, Michigan, Phone 1-800-858-0397.

The death of an employee, working at a construction site, was reported to MIOSHA approximately 14 hours after the incident. Crack sealing was being done on *expressway* at *street*, in *city*, Michigan. (*MIFACE removed the expressway, street and city identifiers*)

Safety and Health Recommendation: As a means to protect the employers most valuable tool, it's employees, while working on/in/next to public and/or private roadways (and their like) the corporate policy should be reviewed and appropriate action taken. Such action should include, but not be limited to:

1. Ensuring that daily records are maintained (including photographs of final installation) detailing what Temporary Traffic Controls have been placed. These records should include a daily checklist indicating what controls are installed, where they are located (GPS coordinates may be used), what condition they are in and who inspected them.
2. Obtaining permission (from the entity having control over the roadway) permitting the employer to install speed reduction to "45 mph" signage where the speed limit is greater than 45 mph.
3. Obtaining permission for use of a mobile attenuator, or device serving the same purpose as an attenuator for employee protection.
4. Where possible physical barriers (k-rails Jersey barriers) be installed to separate the work zone from the traveled way.
5. If it is noted that traffic is not observing the lawful signage, the employer will notify the appropriate law enforcement entity for assistance, as soon as possible, but no later than the end of the next work shift. Such notification would be verbal and given in a written form to the highest ranking official contacted.
6. Said actions, listed herein should then be included in the daily records (Item #1) and maintained on file for a period of 1 year past the completion of the contract.
7. All items listed above should be included in employee training (field staff and management). Said training should be given in a manner/language that permits it to be fully understood.

CAUSE OF DEATH

The death certificate listed the cause of death as multiple injuries. Post-mortem toxicology indicated the presence of hydrocodone in his blood, negative for alcohol and other drugs.

Post-mortem laboratory results of the driver striking the decedent found alprazolam, codeine, methadone, hydrocodone, hydromorphone, morphine, oxycodone and oxymorphone in his bloodstream.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. The following unrecognized hazards were identified as key contributing factors in this incident:

- The vehicle driver may have disregarded traffic barricade, entered construction work lane, did not merge into travel lane.
- The driver of the vehicle striking the decedent was impaired due to illegal and prescription drugs.
- The tar components covering kettle truck making it difficult to see in low light conditions.
- The high visibility vests were in poor condition, covered with tar components
- The MDOT contract terms prohibiting trailing attenuator, speed reduction.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should ensure equipment and workers are visible when working at night. This could include, but not be limited to, additional lighting and clean high visibility vests/clothing.

Discussion: The Michigan Motor Vehicle Code Section 698.5(f) permits a vehicle engaged in authorized highway repair or maintenance to be equipped with flashing, rotating, or oscillating amber lights. The Code requires that the flashing, rotating, or oscillating amber lights not be activated except when the warning produced by the lights is required for public safety. MIFACE recommends that employers mount lighting compliant with the Motor Vehicle Code on construction vehicles operated in active roadways during construction activities. If the kettle truck had lighting mounted on it, the oncoming driver may have seen the vehicle and the crash avoided.

The decedent's high visibility vest was covered with the crack sealing product, minimizing the vest's capacity to make the workers visible to motorists. Over time and especially with outdoor work, high visibility clothing can get dirty or stained. Dirty retro-reflective vest materials will no longer be ANSI compliant with the same high visibility class safety class rating because of the lower visibility provided.

Keeping high visibility vests/apparel clean is a must. Many high-visibility vests can be washed in the laundry; the label will have instructions regarding how to launder and the permitted number of launderings. The employer should ensure that vests are maintained and instruct workers to check their vests for suitability and replace them if the vest is faded, torn, still dirty/soiled after laundering, worn, or defaced, or if the vest is not visible at 1,000 feet day or night. The cost of a high visibility vest is much less than a single visit to an emergency room.

Recommendation #2: Use an audible warning alarm system to alert workers of a work zone intrusion or other emergency.

Discussion: According to the National Research Council, Strategic Highway Research Program, many highway/road work zone incidents, injuries and deaths occur when vehicles fail to recognize and follow work zone traffic control mechanisms including, as in this incident, roadway barricades. Vehicles intruding into a work zone kill and injure many workers because workers had little warning to alert them of a vehicle entering their workspace. Audible warning alarm systems may alert workers of a work zone intrusion or other emergency. There are many types of these devices including automatic work zone intrusion alarms; the alarms can be strategically placed along the work zone. The [National Work Zone Safety Information Clearinghouse](#) has examples of these types of warning devices.

The intruding vehicle was traveling approximately 60mph. If an adequate warning system had been in place, the system may have alerted the workers in time to take evasive action as the vehicle traveled down the ramp and into the closed lane.

Recommendation #3: Michigan Department of Transportation should require the use of traffic trucks with impact attenuators for construction work zones on interstate highways with high speed and/or high volume.

Discussion: Traffic trucks with impact attenuators are designed to protect highway construction workers from impacts from vehicles that violate the work zone. These vehicles are positioned between the oncoming traffic and the workers and work vehicles, and they can absorb the impact of vehicles that intrude into the work zone. The Michigan Department of Transportation contract prohibited the use of an attenuator truck during roadway crack sealing activities. If a truck with an impact attenuator had been utilized to protect the workers conducting the crack sealing activity, the truck attenuator would have absorbed the impact of the oncoming vehicle and reduced the likelihood of the death and injury that occurred.

Recommendation #4: Employers performing highway maintenance work should consider using additional traffic control devices and warning signs to supplement the minimum signs recommended by the Michigan Manual on Uniform Traffic Control Devices (MMUTCD).

Discussion: The MMUTCD sets forth the basic principles and minimum standards governing the design and use of traffic control signs and devices. Employers should consider using additional traffic control devices to supplement the minimum signs and/or devices recommended by MMUTCD. For example, rumble strips provide a vibratory and audible warning in addition to visual stimuli, and speed bumps can physically slow down traffic. Supplemental signs on ramps that have been barricaded may also alert motorists that they are entering an active work zone and to proceed with caution while preparing to exit the closed lane into an active travel lane as soon as possible. An additional option could be the use of a spotter for the work zone; in this case, two spotters, one at each truck to assess public vehicle travel and warn workers of breaches of the work zone. In this instance, a spotter may have seen the headlights rounding the curve of the roadway and may have been able to warn the decedent and his coworker of the oncoming vehicle.

Recommendation #5. The employer should implement all of the MIOSHA Safety and Health Recommendations issued at the conclusion of the MIOSHA fatality investigation.

Discussion: MIOSHA Safety and Health Recommendations, while not regulatory standards, are important guidance based on current best practices and the experience of the MIOSHA compliance officer that employers should comply with. Included in these Recommendations is photo documentation. MIFACE strongly concurs with this MIOSHA recommendation. Video/photographs of work zone traffic control taken at the beginning of each workday and/or shift of work will provide evidence of compliance with the required placement of traffic control measures in the event of an incident. As emergency responders frequently move the traffic control devices, it is important to have this documentation after an incident. Additionally, drivers also strike the traffic control devices and the subsequent movement of the devices could enable other drivers to drive through/around the devices.

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Additionally, MIFACE recommends that the employer include on the checklist the date in which they remove the construction signage, barricades, cones, etc. MIFACE personnel visited the incident site approximately 5 months after the incident and the barricade and several construction barrels were present at entrance ramp #2, and no construction was being performed on the expressway in the area (Photo 5). In MIOSHA compliance officer pictures taken the day after the incident, the construction barrels were not present, but the downed signage was present.

Recommendation #6. Employers should ensure their written health and safety programs and employee training are in a language the workers can understand.

Discussion: Employers are required to instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment using a

language and literacy level that all employees can comprehend. The decedent was born in Mexico and, according to the employer, his first language was Spanish. Having a written health and safety program in both English and Spanish and offering training in both English and Spanish ensures workers would be aware of and minimize potential hazards on the job. Companies that employ workers who do not understand/have a limited understanding of English should identify the languages spoken by their employees and design, implement, and enforce a multi-language safety program. To the extent feasible, the safety program should be developed at a literacy level that corresponds with the literacy level of the company's workforce. Employers may need to consider providing special safety training for workers with low literacy or less common languages to meet their safety responsibilities. The program, in addition to being multi-language, should include a competent interpreter to explain worker rights to protection in the workplace, safe work practices workers are expected to adhere to, specific safety protection for all tasks performed, ways to identify and avoid hazards, and who they should contact when safety and health issues arise.

Recommendation #7. To provide a more accurate document in roadway fatality investigations, investigating agencies should review current procedures to include the use of new and proven technology, such as drones with cameras.

Discussion: The investigating agency took photographs documenting only the conditions in the location of the incident. Photographic evidence was not obtained to show the work zone as a whole, including barricades at expressway ramps providing entrance to the freeway. Investigating agencies should review and if necessary update investigatory procedure to include obtaining photographic documentation of the road conditions leading into the site, such as how or if signage and barricades were installed, lighting, the posted speed limit, other work operations or vehicles in the area and if the vehicles created a hazard, etc.

During the crash scene/crash reconstruction investigation, an unmanned aerial vehicle (drone) provides high-resolution photos processed through computer software to create 3-D models for investigators. Additionally, using a drone can lessen the time the spent by personnel at the scene and the roadway's subsequent closure.

Although the Federal Aviation Administration's (FAA) regulation Part 107-Small Unmanned Aircraft Systems mandate that a drone can be used during daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting, first responders and other entities responding to



Photo 5. Construction materials at entrance ramp #2

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emergency situations can apply for [waivers through the FAA's Special Governmental Interest](#) process to fly the drone at night, and/or fly the drone beyond visual line of sight.

A summary of the FAA's Part 107 rule can be found [here](#).

Recommendation #8. Operators of motor vehicles should not drive while impaired and always adhere to roadway warning signage .

Discussion: Under Michigan law, it is illegal to drive while intoxicated, or impaired, by alcohol, illegal drugs, and some prescribed medications. Based on the post-mortem blood analysis, the levels of the illegal and prescription drugs would materially or substantially affect the driver's ability to drive and place the driver in violation of Michigan's Motor Vehicle Code. Vehicle drivers should be aware of the side effects of any drugs taken to ensure their ability to drive is not compromised.

The American Association of State Highway and Transportation Officials, the Federal Highway Administration and the American Traffic and Safety Services Association have joined to promote work zone safety. In 2000, federal agencies, state DOTs and transportation groups joined the National Work Zone Awareness Week (NWZAW) campaign. The NWZAW campaign each April strives to raise awareness to eliminate fatalities on the nations (and Michigan) roads and to promote safer driving practices. Michigan Department of Transportation is part of this nationwide effort to raise awareness and further improve roadway safety for all workers, drivers and their passengers.

ADDITIONAL RESOURCES

- Michigan Department of Transportation. Website has links to the Michigan Manual Uniform Traffic Control Devices – Temporary Traffic Control (MMUTCD) and MDOT Maintenance Work Zone Traffic Control Guidelines 2007. https://www.michigan.gov/mdot/0,4616,7-151-9625_54944---,00.html
- Michigan Motor Vehicle Code, Act 300 of 1949, Section 698.5(f). [http://www.legislature.mi.gov/\(S\(ud2inlwzxfws0k4nvgdtd4i\)\)/mileg.aspx?page=GetObject&objectname=mcl-257-698](http://www.legislature.mi.gov/(S(ud2inlwzxfws0k4nvgdtd4i))/mileg.aspx?page=GetObject&objectname=mcl-257-698)
- National Work Zone Safety Information Clearinghouse. <https://www.workzonesafety.org/>
- CPWR has a section on its Construction Solutions website that covers struck-by incidents in work zones. <http://www.cpwrconstructionsolutions.org/hazard/1588/work-zone-struck-by-injuries-and-fatalities.html>
- Federal Aviation Administration, [Unmanned Aircraft Systems](#). ([14 CFR part 107](#))
- *Member of Road Striping Crew Struck by Semi*. Nebraska FACE Investigation 99NE021, November 30, 1999 <https://www.cdc.gov/niosh/face/stateface/ne/99ne021.html>
- *Lineman Killed After Being Struck by a Car in Washington State*. Investigation: #00WA04001, Release Date: December 30, 2003. <https://www.cdc.gov/niosh/face/stateface/wa/00wa040.html>
- *A Highway Worker Dies When Struck By a Speeding Vehicle While Picking Up Cones on an Interstate Highway*. California FACE Report #00CA004 <https://www.cdc.gov/niosh/face/stateface/ca/00ca004.html>
- *Flagger Dies after being Struck by a Pickup Truck in a Highway Work Zone*. New York Case Report 04NY012 <https://www.cdc.gov/niosh/face/stateface/ny/04ny012.html>



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- *Construction Flagger Struck and Killed in Two-Lane Highway Work Zone.* Kentucky Case Report: 14KY002, Release Date: May 23, 2014. <https://www.cdc.gov/niosh/face/stateface/ky/14ky002.html>
- *Hispanic Laborer Dies After Footing Collapse - North Carolina.* NIOSH In-house FACE Report 2005-04. <https://www.cdc.gov/niosh/face/In-house/full200504.html>

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Mention of any company or product does not constitute endorsement by the Michigan FACE program or the National Institute for Occupational Safety and Health (NIOSH). In addition, citations to websites external to NIOSH do not constitute NIOSH endorsement of the sponsoring organizations or their programs or products. Furthermore, NIOSH is not responsible for the content of these websites. All web addresses referenced in this document were accessible as of the publication date.

REFERENCES

Weather Underground [2015]. Weather history for nearby weather station. The Weather Channel Interactive, Inc.

MIOSHA standards may be found at and downloaded from the MIOSHA, Michigan Department of Licensing and Regulatory Affairs (LARA) website at: www.michigan.gov/mioshastandards. MIOSHA standards are available for a fee by writing to: Michigan Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

- MIOSHA Administrative Standard, Part 11. Recording and Reporting of Occupational Injuries and Illnesses: https://www.michigan.gov/documents/CIS_WSH_part11ad_37844_7.pdf

ACKNOWLEDGEMENT

The Michigan FACE Program would like to acknowledge the company representative for providing assistance and information for this investigation.