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Police Officer Dies After Being Backed Over by a Dump Truck - Massachusetts

Case: 01-MA-039-01
Release Date: July 30, 2003

SUMMARY

On November 2, 2001, a 66-year-old male municipal police officer (the victim) was fatally injured while working a traffic detail (controlling traffic) at a highway construction site (work zone). The victim was on site to direct traffic around the work zone and to direct construction equipment entering and exiting the work area. The dump truck involved in the incident was loaded with asphalt and located inside the construction site. The task to be performed was to finish paving a small section of a turnout that was located inside the construction site immediately north of an intersection. The dump truck driver was asked by the general contractor to back to the unfinished section of the turnout approximately 1,000 feet away. The victim was standing at the edge of the construction work zone in the closed northbound right-hand travel lane. He was facing oncoming traffic and had his back to the backing dump truck when he was struck and backed over by the truck. Two witnesses, a mother and her child, stopped to report the incident. Calls were placed for emergency assistance and the victim was pronounced dead at the scene. The Massachusetts FACE Program concluded that to prevent similar occurrences in the future, employers should:

- **develop, implement, and enforce an internal traffic control plan (ITCP) specific to each construction site to reduce backing of construction vehicles**
- **ensure backing protocols are in place and that designated individuals are assigned as signalers to direct backing construction vehicles on construction sites**
- **ensure that communication exists among equipment operators and workers on foot**

In addition, **local and state government agencies** should:

- **consider offering work zone safety training for all municipal officers who perform traffic details**

In addition, **manufacturers of heavy construction equipment, such as dump trucks,** should:

- **explore the possibility of incorporating collision avoidance technology on their equipment to assist the operator while backing.**

INTRODUCTION

On November 2, 2001, the Massachusetts FACE Program was alerted by local media that, on the same day, a 66-year-old male police officer was fatally injured when he was crushed beneath a dump truck at a highway construction site. An investigation was immediately initiated, and on November 9, 2001, the Massachusetts FACE Program Director traveled to the municipal police department that employed the victim and to the incident site. During the course of the investigation the death certificate and the OSHA catastrophe/fatality report were reviewed. In addition, the victim's employer and the investigating trooper were interviewed.

The employer was a suburban municipal police department for a municipality consisting of approximately 8,000 residents. The department employed approximately 36 people, eight of them, including the victim, were part-time officers. In addition to the victim, three other town police officers from the department were assigned to highway traffic details at the construction site during the time of the incident.

The victim, a graduate of a local police academy, had been employed part-time with the department for approximately 16 years. Additionally, he had been employed part-time with a local county sheriff's department as a deputy for approximately 35 years. Municipal police officers, unlike Massachusetts State Police troopers, typically do not receive specific training on work zone safety.

INVESTIGATION

The incident site was a public highway reconstruction project. The project, which consisted of redesigning and rebuilding an intersection of two major routes, had been in progress for approximately two years at the time of the incident and was near completion. Typically, two officers had been performing traffic details at the highway construction site (work zone) for nine hours a day (6:30 a.m. – 3:30 p.m.) for the past two years.

The larger, more traveled state highway ran north and south at the intersection. This highway consisted of four lanes, two lanes traveling north and two lanes traveling south with a divider. On the day of the incident and during the investigation, there were temporary, single dashed white line road markings dividing the travel lanes. The smaller less traveled state highway, which ran east and west, consisted of two travel lanes, one in each direction. The pavement markings for this highway consisted of solid double yellow center lines and white fog lines. The intersection where the two routes crossed contained traffic lights and a turnout located to the east of the right-hand northbound lane of the four lane divided highway. Approximately 1,000 feet north of the intersection, on the same highway as the turnout, was the entrance/exit for a racetrack parking lot. The racetrack parking lot was in use by raceway clientele at the time of the incident and throughout the project. The incident occurred south of this parking lot entrance/exit in the northbound right-hand lane of the four lane divided highway. (Figure #1)

The construction project was near completion, with only the asphalt overlay remaining. On the day of the incident, the victim had arrived at the work zone at approximately 6:30 a.m. to perform a traffic detail wearing a blue jacket and a traffic vest. The work zone setup had routinely changed throughout the project depending on tasks scheduled for that day. Prior to the incident, the right-hand northbound lane of the four lane divided highway had been closed to motorists from the intersection past the entranceway to the racetrack with the use of orange traffic drums.

At approximately 3:00 p.m., the dump truck involved in the incident arrived at the construction site. The dump truck had traveled northbound on the four lane divided highway, passed the turnout and pulled into the work zone. The operator parked the truck north of the racetrack parking lot entrance/exit in the closed right-hand northbound lane and unpinned the dump gate. A section of the racetrack parking lot entrance/exit still needed to be paved. The dump truck had been loaded with asphalt to pave the remaining section of the turnout located just north of the intersection, approximately 1,000 feet south of where the truck was parked. It was reported that the general contractor asked the dump truck operator to re-pin the rear dump gate and start backing toward the turnout.

The victim and one other police officer were assigned to the racetrack entranceway. The victim started to walk towards the turnout along the west side of the closed right-hand northbound lane of the four lane divided highway. The other officer had noticed a car attempting to exit the racetrack parking lot and walked over to the car, passing in front of the dump truck, to direct the motorist. The dump truck started backing down the right-hand northbound lane of the four lane divided highway. This was the same lane the victim was in with his back to the dump truck, facing oncoming traffic (Figure #2). The dump truck, backing towards the turnout with an operating backup alarm, struck the victim causing him to fall to the ground. The truck operator backed over the victim and then noticed the victim through the windshield lying on the ground in front of the truck. A passing motorist and her young child had witnessed the incident and pulled over to report the incident. A call was placed for emergency medical services (EMS) which had responded to the scene within minutes. The medical examiners office was also contacted and the victim was pronounced dead at the incident site.

CAUSE OF DEATH

The medical examiner listed the cause of death as crushing injuries of head and torso.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should develop, implement, and enforce an internal traffic control plan (ITCP) specific to each construction site to reduce backing of construction vehicles.

Discussion: An internal traffic control plan (ITCP) is a tool that a project manager can use to coordinate the flow of construction vehicles, equipment, and workers on foot moving in close proximity to each other within the work zone.[1]

To reduce the hazard associated with backing construction vehicles and equipment, an ITCP can be developed to minimize the backing of all construction vehicles and equipment on site. This can be accomplished by taking into consideration the tasks to be performed and how the vehicles can safely navigate through the construction site to complete these tasks while backing as little as possible. The ITCP should also address workers on foot by creating walkways for these workers that are clear of backing construction vehicles and equipment.[1] In addition, some areas within a construction work zone might have to be defined as areas that are prohibited for workers on foot.

In this incident, the dump truck was going to back approximately 1,000 feet to the turnout. A majority of this backing could have been eliminated if the truck turned around in the racetrack entranceway and drove to the turn or if the truck entered the work zone at the turnout.

Discussion: In this case, if backing protocols had been established and there was a person assigned as a backing signaler, the dump truck would not have been able to start backing until the signaler was sure it was safe to start. Backing protocols should be developed and implemented for each highway/street construction project. These protocols should include, but not be limited to, an assigned backing signaler[2], and policies that backing will not begin without an understandable signal from the signaler that it is safe to start backing. In addition, the established protocols should state that operators of construction vehicles and equipment must come to a complete stop if contact with signaler is lost and not resume backing until contact is re-established. All equipment operators and truck drivers, upon entering the construction site, should be notified of who the signalers are and the established backing protocol.

As an additional precaution, the signaler could be equipped with an air horn that would only be used when a hazard exists from a backing vehicle. The air horn might get the attention of the backing vehicle operator, the operator of another piece of equipment or a worker on foot, reducing the hazard of a backing vehicle.

Recommendation #3: Employers should ensure that communication exists among equipment operators and workers on foot.

Discussion: Communication among workers on a construction site regarding current work plans and any potential changes to scheduled tasks is critical especially between equipment operators and workers on foot. This can be accomplished by personal one-on-one communication or with two-way radios. Communication used in combination with an internal traffic control plan (ITCP) and a site specific backing protocol (as discussed in recommendations 1 and 2) could reduce the chance of workers on foot being struck by backing vehicles.

In this case, the dump truck operator drove past the turnout, the area to be paved, and continued approximately 1,000 feet to the racetrack parking lot entrance/exit location. If the dump truck operator knew that the next paving task was the turnout, the truck operator could have entered the work zone at the turnout eliminating the need to back.

Recommendation #4: Local and state government agencies should consider offering work zone safety training for all municipal officers who perform traffic details.

Discussion: The Massachusetts State Police train their troopers in work zone safety during there academy training. This existing training course, based on the Manual on Uniform Traffic Control Devices (MUTCD), Part 6, which governs work zone designs, could be used as an outline to develop training for local city and town officers.[3] Training municipal officers in work zone safety, including work zone setup and design would provide officers knowledge to better protect, not only themselves, but also construction workers, pedestrians, and motorists. The possibility of extending training to include other hazards common on construction sites, such as backing vehicles and equipment, should also be considered.

Recommendation #5: Manufacturers of heavy construction equipment, such as dump trucks, should explore the possibility of incorporating collision avoidance technology on their equipment to assist the operator while backing.

Video cameras and fiber optic systems would be mounted at the rear of the equipment, or at a blind spot, and a monitor would be placed inside the operator's area giving the operator an unobstructed view of the area around the rear of the vehicle. The RFID system has each worker on foot wearing a small RFID tag and a tag reader mounted in the equipment. When a tag is sensed within the tag reader's sensing range, the equipment operator receives a warning.

REFERENCES

1. NIOSH 2001. Building Safer Highway Work Zones: Measures to Prevent Worker Injuries from Vehicles and Equipment, Department of Health and Human Services, Center for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2001-128.
2. Code of Federal Regulations, 29 CFR 1926.601 (b)(4) Safety and Health Regulations for Construction, Motor vehicles, Government Printing Office.
3. Manual on Uniform Traffic Control Devices (MUTCD), 1988 Edition, Revision 3, September 3, 1993, Revision No. 4, issued January 4, 1995 and Errata No. 1, issued April 11, 1995, (15M-11-96), Part VI. Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility, and Incident Management Operations, U.S. Department of Transportation Federal Highway Administration, printed by American Traffic Safety Services.
4. NIOSH 1998. Program for mining research, navigation and warning aides for mobile equipment, U.S. Department of Health and Human Services, Public Health Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 98-114.
5. NIOSH website: https://www.cdc.gov/niosh/mining/works/coversheet296.html. NIOSH 2000. Test results of collision warning systems for surface mining dump trucks. U.S. Department of Health and Human Services, Public Health Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) RI 9652. (Link updated 3/20/2013)

ILLUSTRATIONS

Figure 1. Incident location.

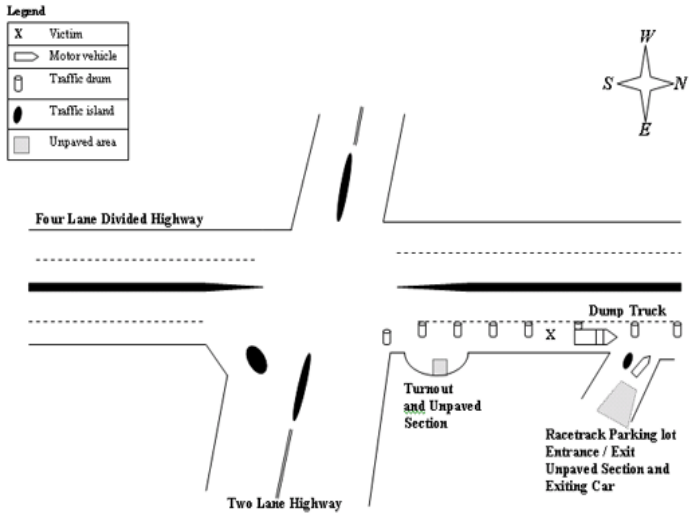

Figure 2 – Diagram of the incident site.
*** Not drawn to scale**

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