

Prevention at Work

Work Zone-Related Deaths, Oklahoma, 1998-2008

Background

Each year in the United States, approximately 100 highway and street construction industry workers die and 20,000 are injured on the job. From January 1998 to December 2008, 41 people were killed in fatal work zone-related incidents in Oklahoma. All deaths occurred among males. The age of workers killed ranged from 18 to 70, with a median age of 41. The largest number of fatal injuries occurred in 2003 and 2007. Injuries were most common in the months of September and October. The smallest number of fatal injuries occurred in February and August. Almost all fatal injuries occurred between 6:00 AM and 6:00 PM, with the most occurring from 3:00-4:00 PM. One-fourth of fatal injuries occurred on Tuesdays, and one-fifth on Thursdays. The least common days for injury were Saturday and Sunday. The largest number of fatal injuries occurred in Tulsa County.

Injured by Privately-owned Vehicle

- A 46-year-old male highway construction security worker was sitting in the passenger seat of his pickup parked off the roadway on the shoulder, well within the protected section of a construction zone. The truck was rear-ended by another vehicle that swerved to miss an animal in the roadway. Warning lights and barricades instructed drivers to veer to the left and follow a temporary lane. The worker was not wearing a seat belt and the truck did not have airbags, but his vehicle was not in motion at the time of the incident.
- A 23-year-old road worker was using a shovel to get asphalt-patching materials out of a company vehicle to fill potholes when he was struck by a car that swerved onto the shoulder. Both the road worker and the company vehicle were off the roadway and on the shoulder when hit.
- A 44-year-old male highway construction worker was struck by a vehicle whose driver fell asleep at the wheel. The worker may have been wearing a jacket over his orange safety vest.
- A 23-year-old male road worker was working on a manhole clean out crew when a car drove through the work zone and struck a trailer that then struck the worker.
- A 57-year-old male and 35-year-old male were struck by a motor vehicle traveling approximately 80 miles per hour. They were standing next to a paving machine parked in the median of the road and were surrounded by traffic cones. The oncoming driver looked down to adjust his radio and veered into the median.
- A 21-year-old male road construction worker was working in a roadway construction zone just after midnight when a drunk driver passed behind a barrier, drove through a sign, and struck a parked pickup before hitting the construction worker and two co-workers.
- A 22-year-old male was working in a roadside ditch on a highway when the driver of a vehicle lost control and went into the ditch and struck the worker.
- An 18-year-old male and a 29-year-old male were part of a fencing crew constructing a center median cable safety system on a major highway. A vehicle on the highway was pulling a two-axle trailer when the left rear tire broke off and rolled into the median, hitting and killing the two workers.
- A 59-year-old male flagman saw a semi-truck approaching that looked like it was going to hit him and the arrow truck next to him. The flagman jumped into the adjacent lane to avoid being hit, but the semi-truck swerved into the same lane. As the flagman tried to get back to the original lane, the semi-truck also swerved back and hit him.
- A 36-year-old male highway maintenance worker entered the roadway to pick up a piece of debris and was hit by an oncoming motor vehicle. No flagman was on the scene and the driver of the vehicle said oncoming traffic prevented him from swerving to avoid hitting the worker.
- A 36-year-old male road worker was marking utility lines in the right lane of a highway when he was struck by a vehicle. There were no skid marks from the vehicle, no road warning signs present, and the worker was not wearing any safety clothing.

Prevention at Work

Work Zone-related Deaths, Oklahoma, 1998-2008

- A 54-year-old male flagman stepped onto the highway to slow traffic. A vehicle on the highway hit the flagman's parked pickup and was hit by another vehicle on the highway, causing the first vehicle to lose control and hit the flagman.

Injured by Vehicle Operating within Work Zone

- A 70-year-old male bulldozer operator and flagman spoke to the driver of a fully loaded three-axle dump truck and told him where to dump his truck's load. The bulldozer operator walked beside the truck, tripped over a rock, fell, and was run over by the dump truck.
- A 54-year-old male road worker was facing away from a heavy truck with a large bucket attached to the rear. The driver of the truck was unaware the worker was behind his vehicle and started backing into him and raising the bucket on the truck. The worker grabbed onto the bucket when he noticed the truck. The driver stopped the bucket abruptly when he saw the worker and this caused him to be thrown from the bucket, fall an unknown number of feet, and strike his head on the concrete.
- A 68-year-old male was driving a dump truck at a construction site and waiting for a load of asphalt to be dumped into the back of the truck. He walked behind the dump truck and was struck and pinned to the rear of the truck by a trackhoe.
- A 63-year-old male road worker was standing between two dirt-packing machines when a dump truck backed into one of the machines, causing it to crush the road worker.
- A 61-year-old male forklift operator was found pinned between a dump truck and a forklift at a roadway work zone. The operator left the forklift for an unknown reason but left it in the slowest gear. The forklift rolled forward and pinned him against the nearby dump truck.
- A 39-year-old male tractor operator was towing an 11-foot sod roller on a new highway construction site when he fell off the tractor and was run over by the sod roller and dragged approximately 30 feet.
- A 59-year-old male county employee was placing road barricades when he stopped to reach under his vehicle for something. The vehicle rolled backwards and the driver's side front tire pinned the employee's chest. The vehicle was on a hill with a 5% grade.

- A 20-year-old male was kneeling setting string line to guide a paving machine putting down a layer of highway asphalt. The worker had his back toward a large tandem dump truck and the driver of the truck did not know the worker was there. The worker did not hear the truck because the work site was noisy (the asphalt layer was about 20 yards away with the engine running) and the truck ran over the worker.
- A 41-year-old male pad-foot drum compactor operator was driving backwards when he hit a large rock or concrete chunk which caused him to fall off the left side of the compactor. As he fell, he got caught on the steps and dragged 30 feet before he came loose and fell under the pad-foot drum. The compactor was equipped with a seat belt, but it was not known if it was in use.

Falls

- A 25-year-old male construction worker fell while working on a bridge approximately 18 feet above the ground. He lost his footing on the scaffolding for the bridge and fell onto the pavement below. He was not wearing any fall protection equipment.
- A 59-year old male worker was changing a light on a highway bridge which crossed a navigation canal when he fell into the water and drowned. He had not been feeling well for several days prior to the incident.
- A 26-year-old male worker was installing metal decking between beams on a bridge under construction and using a safety harness and lanyard for fall protection. He and his co-workers had completed decking one of the bays between the beams except for a small opening that was too small for a full sheet of metal decking. The two workers installing the decking disconnected their lanyards to cut a sheet of decking to fit the small opening, but after they cut it, did not reconnect their lanyards. The worker stepped onto the sheet of decking from which an end had been cut and was trying to force it down where it could be screwed down. The sheet of metal slipped or gave way beneath him and he fell through the opening where the decking was installed.
- A 35-year-old male road worker was repairing a bridge on a highway. Workers were cutting a loose, damaged beam that was hit by a high load when the worker fell from a 10-foot mobile scaffold onto the pavement below.

Work Zone-related Deaths, Oklahoma, 1998-2008

- A 34-year-old male construction worker was riding with two other employees in the back of a foreman's truck or on the tailgate of the truck. The gate either came open or broke off and the worker fell to the pavement and struck his head.

Homicide

- A 41-year-old male flagman was standing by a truck with a coworker when a man with a gun ran up, fired several shots at the flagman, and stole the workers' truck.

Pinned, Struck, or Crushed by Construction Equipment

- A 28-year-old male bridge construction worker was unloading a crane boom. He unlocked the chains but they were caught in a section of the crane. The crane boom started to fall off the bottom boom and the worker fell with it and was pinned and crushed by the boom when it hit the ground.
- A 56-year-old male road worker was crushed by an 8-foot by 24-foot concrete section of sound barrier when it broke loose from a crane. The procedure used during the incident was the same as the last 50 sections moved.
- A 37-year-old male was working at a street construction site. The worker and three other co-workers were attempting to position a concrete drain box in the grade of a trench section. The drain box was approximately 8-feet by 8-feet by 4-feet, weighed 12,000 pounds, and was constructed of concrete and metal rebar. The box was secured with wire cable and hoisted into position by a crane as the four workers attempted to move it into position. The tapered end of the drain box cracked and broke, the weight of the load shifted, and the load flipped, struck the worker, and pinned him against the trench.
- A 56-year-old male concrete saw operator was killed when he was crushed between the rear of the backhoe and the rear boom. The boom swing pins were not installed.
- A 38-year-old male worker was delivering water main pipes that were 20 feet long and weighed about 750 pounds each to a construction site along a roadway. The pipes had shifted on the back of the flat-bed trailer. The worker was unstrapping the pipes despite warnings from co-workers to wait for a forklift. The strap broke and the pipes rolled off the truck and struck the worker in the head.

- A 70-year-old male was working with a sign crew on the shoulder of a highway. The worker was operating a tractor-mounted auger when his sleeve was caught by the auger. The worker was thrown around by the auger while his crew members tried to shut off the tractor.
- A 61-year-old male worker was operating a road grader spreading gravel when it became stuck. A 47-foot nylon tow rope with a circumference of 10 inches was attached to the stuck grader and a loop of the tow rope was placed over a ripper tine of the towing grader. As the tow rope tightened, it pulled the ripper tine, causing it to come loose, and propelling it toward the stuck grader. The tine went through the back of the stuck grader and struck the victim in the head.

Injured During Jump-Start or Bypass

- A 62-year-old male worker was driving a rented dirt-compacting machine. The machine had a faulty ignition switch so the worker crawled between the wheel well and tire to bypass the starting mechanism. The vehicle was still in gear when it started and rolled over the worker.

Vehicle Rollovers

- A 43-year-old male truck driver was hauling concrete to a construction site for a county bridge. He was backing up on a dirt road to empty the concrete when a side of the road gave in to the weight of the truck. This caused the truck to roll over and crushed the cab of the truck, pinning the worker in the truck for nearly an hour. The worker was not wearing a seat belt.
- A 66-year-old male front-end loader operator was moving dirt on a graded street when the rear tires hit the curb. The front-end loader rolled onto its top, ejected the worker, and pinned him under the vehicle. The front-end loader was not equipped with seat belts or a roll cage.
- A 26-year-old male worker was driving a water truck for a road construction site when it ran off the right side of the roadway, overcorrected, and lost control. The vehicle flipped two and a half times, ejected the driver and rolled over him. The 34-year-old male passenger of the truck was also killed in the crash. Neither the driver nor passenger was wearing a seat belt.

Prevention at Work

Work Zone-related Deaths, Oklahoma, 1998-2008

Prevention

Preventing work zone-related injuries and deaths requires measures to protect workers from hazards within the work zone and from passing motorists. Within work zones, supervisors and workers should:

- Be alert to potential hazards.
- Wear proper safety equipment, such as reflective vests and hard hats.
- Use fall protection systems when working at heights.
- Wear seat belts available on equipment.
- Maintain and utilize equipment according to manufacturer's recommendations.
- Keep workers on foot separated from equipment as much as possible.
- Use spotters to guide equipment operators.
- Install back-up alarms, back-up cameras, or radar systems on all vehicles.
- Establish temporary traffic control plans for work zone areas.
- Make traffic flow in one direction to reduce back-over incidents.

The Federal Highway Administration also offers the following tips for driving safely in work zones to protect the lives of motorists and roadway construction workers:

- Expect the unexpected.
- Slow down.
- Don't tailgate.
- Keep a safe distance between your vehicle and the construction workers and their equipment.
- Pay attention to the signs.
- Obey road crew flaggers.
- Stay alert and minimize distractions.
- Keep up with the traffic flow.
- Schedule enough time to drive safely and check radio, TV and websites for traffic information.
- Be patient and stay calm.

Work Zone Safety Resources

NIOSH: Highway Work Zone Safety

<http://www.cdc.gov/niosh/topics/highwayworkzones/#feature>

Federal Highway Administration: Safety-Work Zones

<http://safety.fhwa.dot.gov/wz/>

National Work Zone Safety Information Clearinghouse

<http://www.workzonesafety.org>

Prepared by:

Claire Nguyen, MS

Epidemiologist

ClaireN@health.ok.gov



Prevention at Work is a publication of the Injury Prevention Service, Oklahoma State Department of Health. This and other IPS information may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, OK 73117, 405-271-3430 or 1-800-522-0204 (in Oklahoma). IPS publications are also available at <http://ips.health.ok.gov>.