



INCIDENT HIGHLIGHTS



DATE: May 18, 2023



TIME: 7:15 a.m.



VICTIM: 46-year-old

46-year-old non-Hispanic general laborer/ commercial driver



INDUSTRY/NAICS CODE: Heavy & Civil Engineering Construction /237990



EMPLOYER: Highway construction



SAFETY & TRAINING: Formal safety program



SCENE: Interstate highway



EVENT TYPE: Motor vehicle collision



REPORT#: 23KY063

REPORT DATE: August 22, 2024

General Laborer Killed on Kentucky Interstate in Multi-Vehicle Collision

On May 18, 2023, a 46-year-old general laborer (victim) was operating a commercial vehicle on a Kentucky interstate en route to a highway construction project. While en route, the driver was involved in a multi-vehicle collision. The victim succumbed to his injuries at the scene of the incident.

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CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Mechanical issues limiting a semi-truck's ability to travel at safe speeds,
- Need for hazard recognition,
- Need for driver training program.

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RECOMMENDATIONS

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

- Not allow commercial motor vehicles unable to travel at the state mandated minimum speeds to be operated on roadways;
- Implement an initial and refresher road-testing and skills evaluation program for all new drivers to verify their ability to safely operate a commercial motor vehicle;
- Provide defensive driver training to employees who operate commercial motor vehicles;
- Equip commercial motor vehicles with collision mitigation technology.

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Kentucky FACE Program





Fatality Assessment and Control Evaluation (FACE) Program

This case report was developed to draw the attention of employers and employees to a serious safety hazard and is based on preliminary data only. This publication does not represent final determinations regarding the nature of the incident, cause of the injury, or fault of employer, employee, or any party involved.

This case report was developed by the Kentucky Fatality Assessment and Control Evaluation (FACE) Program. Kentucky FACE is a NIOSHfunded occupational fatality surveillance program with the goal of preventing fatal work injuries by studying the worker, the work environment, and the role of management, engineering, and behavioral changes in preventing future injuries. The FACE program is located in the Kentucky Injury Prevention and Research Center (KIPRC). KIPRC is a bona fide agent for the Kentucky Department for Public Health.

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INTRODUCTION

On May 18, 2023, a 46-year-old general highway construction laborer (victim) was driving on a Kentucky interstate en route to a highway construction project. Approximately 1 hour and 15 minutes after his departure, the victim's vehicle struck a slow-moving commercial truck and semi-trailer traveling in the same direction as the victim. As a result, the victim sustained fatal injuries; he succumbed to those injuries at the scene of the collision. On May 19, 2023, the Kentucky Labor Cabinet informed the Kentucky Fatality Assessment and Control Evaluation Program (FACE) of the incident. On June 26, 2023, the Kentucky FACE investigator conducted a site visit to gather photographs of the incident site.

EMPLOYERS

The employer is a family-owned and -operated highway engineering and construction company. They specialize in the installation and repair of bridges, highway construction sign rental, rumble strip installation, milling, and traffic control services. The company was founded in 1978 and consists of 70 employees. According to the Federal Motor Carriers Safety Administration (FMCSA), they operate more than 50 commercial motor vehicles, travel over 300,000 miles annually, and transport company-owned assets.¹ The company works exclusively on state and federal government contracted jobs across multiple states in the south and midwestern regions of the United States.

WRITTEN SAFETY PROGRAMS and TRAINING

According to a company representative, the company provides highway construction safety training and traffic safety training to all new employees. Additionally, the company hosts weekly safety briefings and regularly distributes safety updates to employees. Currently, no driver training program is in place. However, employees who operate commercial motor vehicles are required to have previous commercial driving experience. According to the company website, the company has a 100% drug-free workplace policy and had previously experienced no on -the-job, lost-time injuries since 2011.

WORKER INFORMATION

The victim was a 46-year-old non-Hispanic single male. He was a high school graduate and had attended a local university. The victim had worked for the company since November of 2022. Prior to becoming an employee at the involved company, the victim owned an excavating business and worked in the auto body repair industry. According to the company, the victim had held a valid class-B commercial driver's license for more than 15 years.

INCIDENT SCENE

The incident occurred in the southbound lanes of a major six-lane interstate with a posted speed limit of 70 miles per hour. North- and south-bound travel lanes are divided by a standard concrete barrier. The shoulder of the highway measures approximately 7 feet on either side of the highway. A grassy upward slope meets the edge of the shoulder and leads to a ditch and earth embankment on the southbound lanes where the incident occurred (photos 1–3).







Photo 1. Photo of the incident scene where the crash occurred. Red arrow depicts location of crash. Photo property of Kentucky FACE.







Photo 2. Photo of the incident scene where the crash occurred. Red X depicts location of crash. Photo property of Kentucky FACE.



Photo 3. Google earth image of interstate highway showing the location where the crash occurred.





WEATHER

The weather on the day of the incident was approximately 49 degrees Fahrenheit, 62% humidity, 8 mph average northeast wind speed. The weather is not believed to have been a factor in this incident.²

INVESTIGATION

On May 18, 2023, a 46-year-old general laborer (victim) arrived at the Kentucky-based business at approximately 5:45 a.m. to gather supplies in preparation for the day's task, an interstate highway rumble strip installation project. May 18, the day the incident occurred, would be the first day of a projected multiday project. To install rumble strips, a specialized piece of equipment, a "Rumble Hog," is required. The Rumble Hog (photo 4) is affixed permanently to a nonarticulating commercial motor vehicle, in this instance a 2021 Mack G42F9 with a gross vehicle weight rating (GVWR) of 50,000 lbs (photos 5 & 6). Like many employees at the involved company, the victim had dual responsibilities : He served as both a general laborer and a commercial driver. Although the victim did not operate the Rumble Hog itself, he was tasked with driving the truck to the job site on the morning the incident occurred. According to the involved company, the victim departed the business at approximately 6:00 a.m., which, according to a company representative, was his typical start time. The projected distance from the involved company's place of business to the job site was approximately 150 miles.

Just after daylight, at 7:15 a.m., 1 hour and 15 minutes into the trip, the victim was involved in a fatal motor vehicle collision. According to the involved company, three total vehicles were involved, all of which were traveling south in the right lane of a major six-lane Kentucky interstate. Witnesses at the scene state the victim was initially following a passenger vehicle, and the passenger vehicle was following the involved semi-truck and trailer (diagram 1).

The involved semi-truck and trailer was traveling at approximately 15 mph due to mechanical issues. The passenger vehicle approached the semi-truck and trailer rapidly, due to the semi's low speed of travel, and made an evasive maneuver to the right shoulder to avoid striking the semi-truck and trailer (diagram 2).

Also approaching the semi-truck and trailer rapidly, the victim was unable to stop and struck the semi-truck and trailer in the rear bumper at an estimated speed of 70 mph (diagram 3). Witnesses contacted emergency services, who arrived 7 minutes after the collision occurred. The local coroner pronounced the victim deceased at the scene of the incident; the victim was wearing a seatbelt.

Interviews conducted with the driver of the involved semi-truck and trailer determined that the mechanical issues with the semi-truck had begun the day prior, on May 17, 2023. The police report states that the driver indicated the truck was repeatedly losing power. The driver notified his company of the mechanical issues, and the company advised the driver to continue to a repair facility to have the truck diagnosed. The driver, close to his destination, stop ped at the facility to obtain his cargo, two 24,000-lb forklifts and two 17,000-lbs forklifts, prior to driving to the repair facility. After the semi-truck and trailer were loaded, the driver departed that facility for the repair shop. After departing, the power issues worsened. The driver reported that the truck would not exceed 15 mph. The company was updated on the condition of the truck and advised the driver to continue to the repair facility. Upon arriving at the repair facility, it was discovered that all mechanics had departed for the day and would not return until the following day, on May 18. Having no place to park, the driver departed the facility to seek parking for the night. The driver later parked on the interstate entrance ramp and rested for the night. At approximately 6:00 a.m. on May 18, the repair facility contacted the driver to bring the truck back for diagnosis and repair. The driver departed for the repair facility. The truck continued to struggle,





not able to exceed 15 mph. Approximately 1 hour and 15 minutes later, while traveling to the repair facility, the semi-truck and trailer was struck in the rear bumper by the victim.



Photo 4. Stock photo of a Rumble Hog. Photo retrieved from and property of www.thehog.com.







Photo 5. Google image depicting make and model of the truck driven by the victim that was involved in the collision.



Photo 6. Google image depicting make and model of the truck driven by the victim that was involved in the collision.





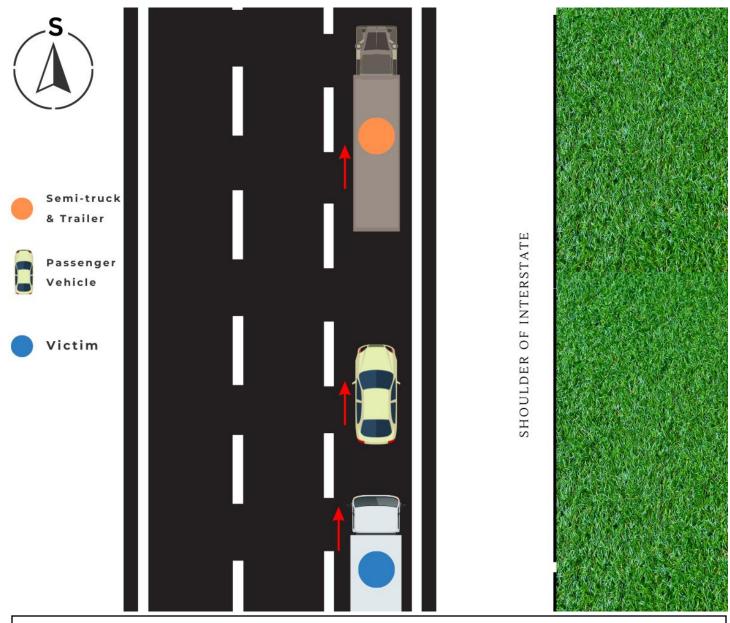


Diagram 1. Diagram depicting original arrangement of the three involved vehicles prior to the occurrence of the vehicle collision. Diagram property of Kentucky FACE.





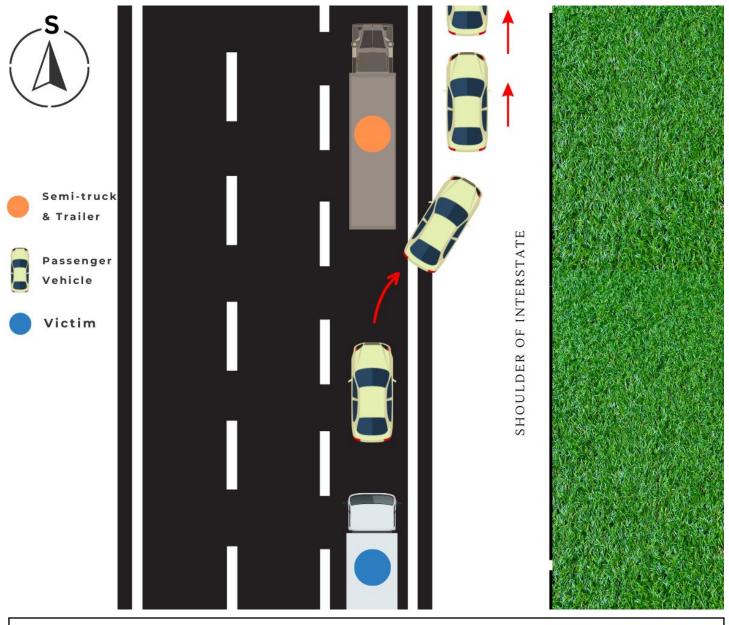


Diagram 2. Diagram depicting the evasive maneuver executed by the driver of the involved passenger vehicle to avoid striking the semi-truck and trailer. Diagram property of Kentucky FACE.





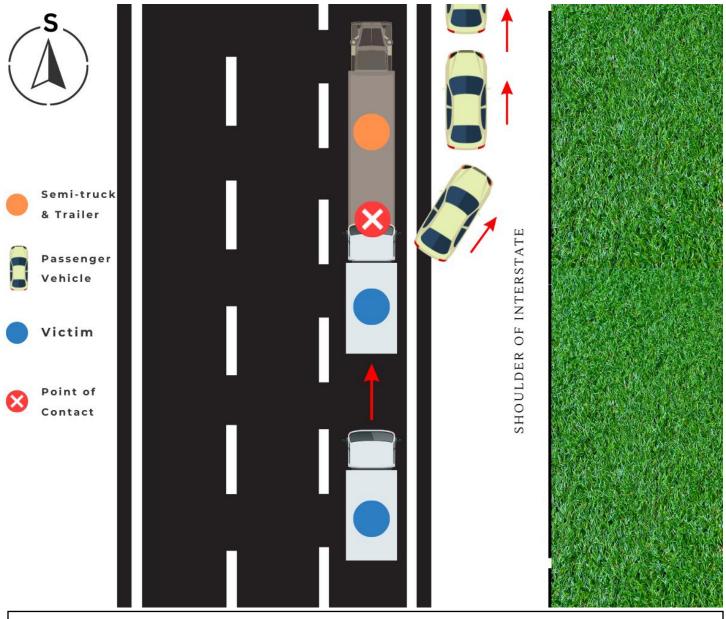


Diagram 3. Diagram depicting the continued path of the victim's vehicle and point of contact with the involved semitruck and trailer. Diagram property of Kentucky FACE.





CAUSE OF DEATH

According to the death certificate, the cause of death was blunt force trauma.

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. Kentucky investigators identified the following unrecognized hazards as key contributing factors in this incident:

- Mechanical issues limiting a semi-truck's ability to travel at safe speeds,
- Lack of hazard recognition,
- No driver training program.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Commercial motor vehicles unable to travel at the state mandated minimum speed should not be operated on roadways.

Discussion: According to investigators, the semi-truck and trailer that the victim struck was traveling at an estimated speed of 15 mph in a 70-mph speed zone due to mechanical issues. The mechanical issues with the truck were known, discovered the day prior to the incident, and limited the truck's ability to travel at the posted speed limit.

Section 396.7 of the FMCSA Regulations states that commercial motor vehicles (CMVs) must not be operated in such a condition as to likely cause an accident or a breakdown of the vehicle.³ Traveling in excess of posted speed limits is most commonly attributed to increased crash risk and severity. However, according to the Virginia Department of Transportation (VDOT), speed variance, in this instance traveling at a significantly slower speed, could be just as risky. Speed variance refers to the difference in speed of travel between two vehicles traveling in the same direction. According to VDOT, research shows that faster travel is not necessarily associated with an increased risk of being involved in a crash. When vehicles travel at the same speed in the same direction, even at high speeds on interstates, they are not passing one another and cannot collide if they maintain the same speed. Conversely, when vehicles are traveling at different rates of speed, the frequency of crashes increases, especially crashes involving more than one vehicle. The key factor is speed variance. The greater the speed variance, or the distribution of speeds, the greater the number of interactions among vehicles. Thus, passing maneuvers and opportunities for collisions increase. Speed variance is associated with an increase in the frequency of crashes.⁴ Kentucky does not establish minimum speed limits on interstates. However, Kentucky Revised Statute (KRS) 189.390 (7) states that a person shall not drive a motor vehicle at a speed that will impede or block the normal and reasonable movement of traffic.⁵ Having known defects that limit a vehicle's ability to travel at the posted speed limit could pose a risk to the driver and other motorists on the highway. To prevent future occurrences, FACE investigators suggest commercial motor vehicles that cannot travel at the statemandated minimum speed should not be operated.





Recommendation #2: Employers should implement an initial and refresher road-testing and skills evaluation program for all new drivers to verify their ability to safely operate a commercial motor vehicle.

Discussion: The Federal Motor Carrier Safety Administration exempts some motor carriers from performing road tests, unless the driver will be operating specific types of vehicles that require the driver to pull double, triple, or tank trailers. Part 391.33 (a)(1) of the FMCSA Regulations lists what may be accepted in lieu of a road test:

391.33: Equivalent of road test

(a) In place of, and as equivalent to, the road test required by §391.31, a person who seeks to drive a commercial motor vehicle may present, and a motor carrier may accept

(1) A valid Commercial Driver's License as defined in §383.5 of this subchapter, but not including double/triple trailer or tank vehicle endorsements, which has been issued to him/her to operate specific categories of commercial motor vehicles and which, under the laws of that State, licenses him/her after successful completion of a road test in a commercial motor vehicle of the type the motor carrier intends to assign to him/her.⁶

By federal regulatory standards, the decision to allow the driver to operate the 2021 Mack G42F9 without performing a road test was legal, as he held a valid class-B CDL. However, there may be value in both an initial and regular assessment of driving skills via a road test. According to Road Safety at Work, an advocate for highway safety and provider of driver training programs, "... driving skills are perishable. Lessons learned quickly fade away if not applied. Old habits and complacency 'creep' back in. New technology, different vehicles and changed routes present new challenges to drivers accustomed to doing it 'the old way'. Regularly reassess drivers to confirm they continue to perform as you expect" (Road Safety at Work, 2020).⁷ A skills verification is a great first step in ensuring the competence of the driver, regardless of his or her previous driving history. Skills such as a driver's level of alertness, ability to anticipate the actions of others, correct lane selection, critical thinking and decision making are all skills that can be observed in suitable road tests. If a road test is performed and the new driver lacks these skills, they can be noted and addressed through a formalized driver-training program. Performing a road test may allow a competent skills evaluator to notice potential deficiencies in performance and address them before allowing the driver to operate company equipment on his/her own. As a best practice, commercial carriers should implement an initial and refresher road-testing and skills evaluation program for all new drivers to verify their ability to safely operate a commercial motor vehicle .

For companies wishing to implement a road-testing program, FMCSA provides regulatory guidance on the specifics in section 391.31.





391.31: Road test

(a) Except as provided in subpart G, a person shall not drive a commercial motor vehicle unless he/she has first successfully completed a road test and has been issued a certificate of driver's road test in accordance with this section.

(b) The road test shall be given by the motor carrier, or a person designated by it. However, a driver who is a motor carrier must be given the test by a person other than himself/herself. The test shall be given by a person who is competent to evaluate and determine whether the person who takes the test has demonstrated that he/she is capable of operating the commercial motor vehicle, and associated equipment, that the motor carrier intends to assign him/her.

(c) The road test must be of sufficient duration to enable the person who gives it to evaluate the skill of the person who takes it at handling the commercial motor vehicle, and associated equipment, that the motor carriers intends to assign to him/her. As a minimum, the person who takes the test must be tested, while operating the type of commercial motor vehicle the motor carrier intends to assign him/her, on his/her skill at performing each of the following operations:

- (1) The pre-trip inspection required by §392.7 of this subchapter;
- (2) Coupling and uncoupling of combination units, if the equipment he/she may drive includes combination units;
- (3) Placing the commercial motor vehicle in operation;
- (4) Use of the commercial motor vehicle's controls and emergency equipment;
- (5) Operating the commercial motor vehicle in traffic and while passing other motor vehicles;
- (6) Turning the commercial motor vehicle;
- (7) Braking and slowing the commercial motor vehicle by means other than braking; and
- (8) Backing and parking the commercial motor vehicle.

(d) The motor carrier shall provide a road test form on which the person who gives the test shall rate the performance of the person who takes it at each operation or activity which is a part of the test. After he/she completes the form, the person who gave the test shall sign it.

(e) If the road test is successfully completed, the person who gave it shall complete a certificate of driver's road test in substantially the form prescribed in paragraph (f) of this section.

(f) The form for the certificate of driver's road test.

(g) A copy of the certificate required by paragraph (e) of this section shall be given to the person who was examined. The motor carrier shall retain in the driver qualification file of the person who was examined:





- (1) The original of the signed road test form required by paragraph (d) of this section; and
- (2) The original, or a copy of, the certificate required by paragraph (e) of this section.⁸

Recommendation #3: Employers should provide defensive driver training to employees who operate commercial motor vehicles.

Discussion: Defensive driver training focuses on the preventive role: what a driver can do to prevent a collision rather than focusing on fault. Regardless of fault, a driver and company can still suffer the negative consequences of a colli sion. Defensive driving is an intentional act — driving in such a manner to think in a preventive mindset, constantly. According to Safemotorist.com, defensive driving is driving in a manner that utilizes safe driving strategies and enables motorists to address identified hazards in a predictable manner. Additionally, the key to any good defensive driving strategy is knowing how to avoid traffic crashes and recognize potential hazards before it is too late. That is why defensive driving courses tend to present information on crash prevention techniques. In a typical defensive driving course, students leam crucial crash prevention techniques that include:

- Scanning the roadway and adapting to surroundings,
- Employing proper following distances,
- Knowing your vehicle's stopping distance,
- Being aware of reaction distance,
- Environment hazards,
- Vehicle emergencies,
- Sharing the road,
- Passing and necessary clear distance,
- Right of way, and
- Speed adjustments and railroad crossings.9

Although the victim's level of awareness just prior to the collision cannot be accurately determined, providing drivers with defensive driver training may increase a driver's abilities and awareness so that drivers can better observe, analyze, and react in such a manner to prevent the collision from occurring.

Recommendation #4: Employers should equip commercial motor vehicles with collision mitigation technology.

Discussion: There are two primary types of collision mitigation technology, Forward Collision Warning (FCW) and Automatic Emergency Braking (AEB).





FCW systems use sensors to monitor the road ahead. These can be cameras or radar. If the system determines a crash is imminent without intervention, it will alert the driver with one or more warnings. This can be a visual alert via a flashing light or an audible signal.¹⁰

AEB systems use multiple sensor technologies that work together to detect a vehicle in a crash-imminent situation. The system automatically applies the brakes if the driver has not done so or, if needed, applies more braking force to supplement the driver's braking.¹¹

The Insurance Institute for Highway Safety (IIHS) conducted a study to determine the effectiveness of both FCW and AEB systems in preventing rear-end crashes in commercial vehicles. The study determined that FCW was associated with a 22% reduction in the rate of police-reported crashes per vehicle miles traveled and a 44% reduction in the rear-end crash rate of large trucks. AEB also proved to be effective, with results showing 12% overall reduction of collisions and 41% reduction in rear-end crashes. IIHS concludes that FCW and AEB are effective countermeasures for crashes in which large trucks rear-end other vehicles. Large truck safety is expected to improve as new trucks are increasingly equipped with these systems. FCW has the advantage that some of these systems can be retrofitted to existing trucks, so benefits can be realized sooner and with less investment.¹²

The National Highway Traffic Safety Administration (NHTSA) and the Federal Motor Carrier Safety Administration have collectively published a joint notice of proposed rulemaking titled "Heavy Vehicle Automatic Emergency Braking; AEM Test Devices."¹³ If adopted, the rule would require heavy vehicles with a gross vehicle weight rating of 10,000 pounds or more to be equipped with an AEB system. The National Transportation Safety Board (NTSB) supports the proposed rule, stating they believe the technology has the potential to prevent more than 19,000 crashes annually.¹⁴

To reduce the potential associated with rear-end crashes, employers should equip commercial motor vehicles with collision mitigation technology.





DISCLAIMER

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INVESTIGATOR INFORMATION

This investigation was conducted by Beau Mosley, Fatality Investigator, Fatality Assessment and Control Evaluation, Kentucky Injury Prevention and Research Center, University of Kentucky, College of Public Health.

ACKNOWLEDGMENT

The Kentucky FACE Program would like to thank the involved company for their assistance with the completion of this report.

PROGRAM FUNDING

The Kentucky Fatality Assessment and Control Evaluation Program (FACE) is funded by the National Institute of Occupational Safety and Health (NIOSH), the Centers for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services (HHS), as part of cooperative agreement 5 U60OH008483 totaling \$1,601,266 with 0% financed with nongovernmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, NIOSH, CDC, HHS, or the U.S. government.