

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

REPORT#: 20KY010

REPORT DATE: 8/17/20

INCIDENT HIGHLIGHTS



DATE:

January 22, 2020



TIME:

6:00 PM



VICTIM:

Age: 52

Sex: Male

Occupation: Commercial Driver



INDUSTRY/NAICS CODE:

484110



EMPLOYER:

Interstate Commercial Carrier



SAFETY & TRAINING:

CDL Training Program



SCENE:

Interstate Highway



LOCATION:

Kentucky

EVENT TYPE:

Vehicle Collision



Semi-Truck Driver Dies in Single Vehicle Collision After Truck Overturns

SUMMARY

On Wednesday, January 22, 2020, a 52-year-old male commercial truck driver (victim) was traveling on a Kentucky interstate en route to an out-of-state destination. The semi-truck veered to the left, off of the roadway. The driver overcorrected as he approached an overpass, struck a guardrail and overturned coming to final rest on the surface street below.

[READ THE FULL REPORT>](#) (p.5)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Possible distracted driving
- Possible fatigue
- Possible driver inattention

[LEARN MORE>](#) (p.6)

RECOMMENDATIONS

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

- Commercial carriers should implement lane departure warning technology in fleet trucks.
- The Federal Highway Department should consider installing concrete barriers in areas which lead to overpasses.
- Commercial carriers should install forward and driver facing cameras in fleet trucks.
- Companies who require employees to drive should implement a distracted driving policy and associated training.

[LEARN MORE>](#) (p.7)

<http://www.mc.uky.edu.kiprc/FACE/index.html>



KENTUCKY

State **FACE** Program

Fatality Assessment & Control Evaluation

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839



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 NIOSH-funded 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.

Email: Kyfaceprogram@uky.edu

Twitter: <http://twitter.com/KYFACEProgram>

Facebook: <https://www.facebook.com/Kyfaceprogram/>

Website: <http://www.mc.uky.edu/kiprc/face/index.html>



Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

INTRODUCTION

On Wednesday, January 22, 2020, a commercial truck driver was traveling north, in the left lane, on a four-lane Kentucky interstate en route to an out-of-state destination. At approximately 6:00 PM, the vehicle began exiting the highway to the left and onto the shoulder. Collision investigators say the driver attempted to steer the vehicle back onto the roadway, but overcorrected and struck a W-beam guardrail located on the left shoulder of the roadway. After striking the guardrail, the vehicle overturned as it traveled across an overpass section of the highway and came to final rest on the surface street below. The victim succumbed to the injuries sustained in the crash and was pronounced dead at the scene. On May 21, 2020, the Kentucky Labor Cabinet informed the Kentucky Fatality Assessment and Control Evaluation Program of the incident. On June 5, 2020, the Kentucky FACE investigator conducted a site visit at which time photographs of the scene were taken.

EMPLOYERS

The employer is a family-owned, interstate commercial carrier which has been in operation for nearly 60 years. According to their website, the company has multiple locations throughout the United States and primarily transports bulk liquid products. The company fleet consist of 50 drivers and 58 company-owned, commercial vehicles.

WRITTEN SAFETY PROGRAMS and TRAINING

The company's safety program was not provided to the Kentucky FACE Program. However, a company representative stated all their drivers hold a commercial driver license and must successfully complete an in-depth field training program. According to the company, annual refresher training is also provided.

WORKER INFORMATION

The victim was a married 52-year-old white male with five children. The decedent held an associate's degree and had worked for the company for 20 years. The victim held a class-A, commercial drivers license.

INCIDENT SCENE

The incident initially began in the northbound lane of a major, four-lane interstate highway with a posted speed limit of 65 miles per hour. North- and south-bound travel lanes are separated by a cable barrier and a grassy median that ends 100-feet prior to an overpass. As the cable barrier ends, a standard W-beam guardrail begins and continues for approximately 70-feet until it meets the concrete bridge rail of the overpass. At the location initial contact was made with the W-beam guardrail, the median measures approximately 30 feet across. The left shoulder of the highway narrows as it approaches the bridge. At the initial point of contact with the guardrail, the shoulder measures approximately 36 inches from the yellow line located on the left side of the highway to the guardrail. A two-lane highway sits beneath the interstate overpass and runs east and west.

Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839



Photo 1. Google image of the location where the collision occurred.
"Kentucky Interstate," by Google, Digital Image.



Photo 2. Google image of the location where the collision occurred.
"Kentucky Interstate," by Google, Digital Image.

Kentucky Injury Prevention and Research Center
 Bona fide agent for Kentucky Department for Public Health
 333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

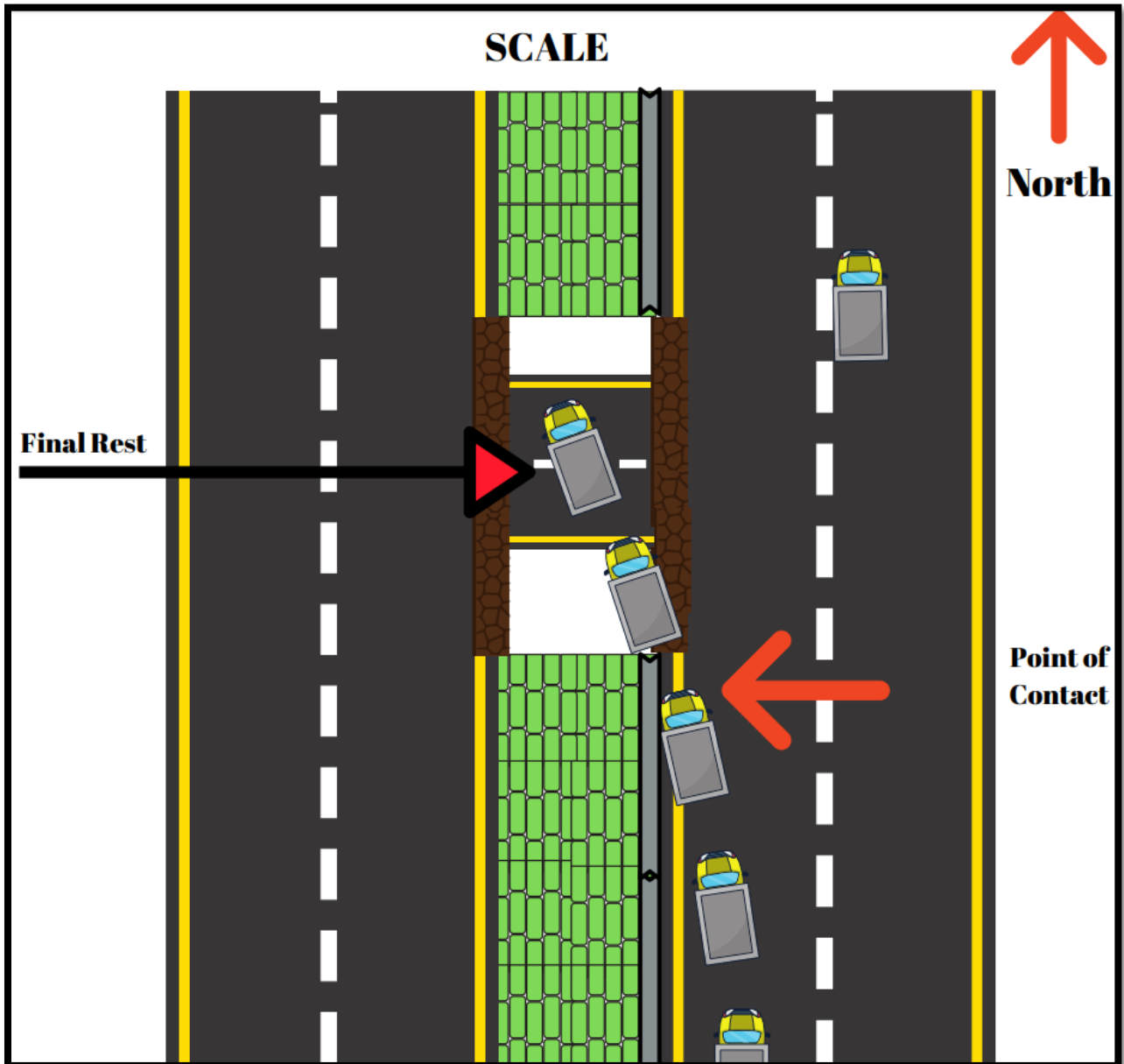


Diagram 1. Diagram depicting the path the semi-truck traveled as it left the roadway, struck the guardrail and came to final rest on the surface street below. Diagram was created by and is property of KY FACE.

WEATHER

The temperature was approximately 42°F at the time of the incident. The humidity was 37% with a southeast wind at 8 mph. There was no precipitation. Weather was not determined to be a factor in the accident.



Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

INVESTIGATION

According to investigators, no witnesses who may have observed the crash came forward, so many facts with this case are unknown.

At approximately 11:00 AM CST on Wednesday, January 22, 2020, a commercial driver (victim) departed his out-of-state place of business and was traveling north through Kentucky to the company's corporate office located in another state. The driver was given the directive to deliver the 2007 Kenworth 4600, single unit truck he was driving to the corporate office and return with an alternate truck. No cargo was being transported; this was an inner company equipment move. Shortly after departing, the victim's wife stated he contacted her briefly to discuss his day. According to the spouse, all appeared to be well with the victim's behavior.

Approximately six hours into the trip, as the driver traveled at or near 65 mph, in the north-bound left lane, his vehicle began exiting the highway to the left for reasons unknown. The truck traveled across the yellow fog line onto the left shoulder of the highway. Investigators say the driver attempted to steer the truck back onto the travel portion of the highway, but overcorrected. Yaw marks present on the surface of the roadway support the overcorrection and suggest that a rapid weight transfer occurred and forced the vehicle into the W-beam guardrail situated on the left shoulder. After impacting the guardrail face, the truck began to rollover on the driver's side as it was traveling toward the overpass. The truck left the roadway, struck a tree situated in the median, plummeted to the surface street below, and came to final rest on the driver's side. Police and emergency personnel were on scene eight minutes after the collision occurred, but the victim had succumbed to his injuries and was pronounced deceased at the scene. Collision investigators were unable to determine a root-cause to explain why the truck initially left the roadway and no witness provided statements on the events that occurred. Based on prior similar investigations, distracted driving or fatigue are the most likely contributing factors. In an interview with a company representative, FACE investigators inquired about the victim's prior performance. The company stated that the victim was a 20-year employee, very knowledgeable, professional, and proficient in his abilities. According to the company representative, the victim had not been involved in any other major collision to his knowledge. The company rep theorized that the victim may have suffered a medical emergency while driving; however, an autopsy was performed and according to the death certificate, no underlying conditions were discovered.

CAUSE OF DEATH

According to the death certificate, the cause of death was multiple blunt force injuries sustained in a motor vehicle collision.

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

- Possible distracted driving
- Possible fatigue
- Possible inattention

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Commercial carriers should implement lane departure warning technology in fleet trucks.

Discussion: Due to the lack of evidence on the scene and no witness statements, a root-cause to explain why the victim's vehicle left the highway was not established. Based on previous similar collisions, the most probable root-cause is distracted driving or fatigue. The vehicle exited the left side of the highway which triggered the chain events that unfolded and ultimately led to the vehicle overturning. Lane departure warning (LDW) technology now exist for commercial vehicles to address contributing human factors that lead to vehicle crashes. According to AAA Foundation for Traffic Safety, LDW systems are passive safety systems. Unlike active safety systems, passive ones simply alert the driver to a potential threat and do not assume control over any aspect of the vehicle. In other words, passive safety systems provide a warning to the driver, but the driver is not required to take any action as a result. These systems assist the driver by providing feedback and alerts regarding potential safety conflicts or unsafe driving behaviors. LDW systems are vision-based, in-vehicle electronic systems that monitor the vehicle's position within a roadway. Based on lane line markings, the LDW system warns a driver if the vehicle deviates or is about to unintentionally deviate outside the lane line. LDW systems are capable of providing direction-specific audible or haptic warnings depending on which way the vehicle is drifting (Camden, Medina-Flintsch, Hickman, Miller, & Hanowski, 2017).

LDW technology may have alerted the driver proactively and allowed him the opportunity to steer the vehicle back into the proper lane of travel before having to take evasive action. Many commercial truck manufactures now offer LDW along with other collision mitigation technology as optional equipment from the factory. Companies can also retrofit their fleet trucks with LDW, as many manufactures offer LDW technology that can be installed on any vehicle. LDW technology can be extremely effective, according to an article published by Fleet Owner, companies who have implemented LDW have experienced up to a 75% reduction in lane departure collisions ("LDW Statistics," 2011).

Recommendation #2: The Federal Highway Department should consider installing concrete barriers in areas which lead to overpasses.

Discussion: At the location this collision occurred, the north and southbound travel lanes are separated by a cable barrier and a grassy median that ends 100-feet prior to an overpass. As the cable barrier ends, a standard W-beam guardrail begins and continues for approximately 70-feet until it meets the concrete bridge rail of the overpass. The victim's vehicle struck the W-beam guardrail, rolled over the guardrail and plummeted to the surface street below. Research by the New Jersey Turnpike Authority (NJTA), shows concrete barriers can be an extremely effective countermeasure in preventing large truck rollovers. NJTA has developed a 42" concrete barrier which they state will effectively prevent heavy trucks from rolling over. Crash testing with this barrier shows that when a heavy truck strikes this barrier, it rolls toward the barrier until the underside of the truck bed comes to rest on the top of the barrier, stopping the roll motion. The vehicle then slides along the top of the barrier until it is redirected upright. For this to occur, the concrete barrier must have a minimum height of 815 mm (32 in). To contain and redirect an "18-wheeler" or tractor-trailer in a crash test, a concrete barrier must have a minimum height of 1070 mm (42 in). In collisions with trucks, the primary load path is vertical because the load is transferred from the underside of the truck bed or trailer to the top of the concrete barrier. A concrete barrier is essentially a short, stocky column that can easily resist these vertical loads (McDevitt, 2000).

Barriers leading to overpasses are particularly important as busy surface streets generally sit below. Fortunately, the victim's vehicle did not contact any vehicles or pedestrians on the street below even though the probability of doing so

Kentucky Injury Prevention and Research Center
 Bona fide agent for Kentucky Department for Public Health
 333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

was high. The force of impact in this rollover collision was greatly increased due it coming to its final rest on the surface street below, rather than on the highway in which the victim was traveling. The Federal Highway Administration should consider installing concrete barriers in areas which lead to overpasses to help prevent rollover crashes from occurring, reduce the severity with collision do occur and to protect others traveling on streets situated below overpasses.

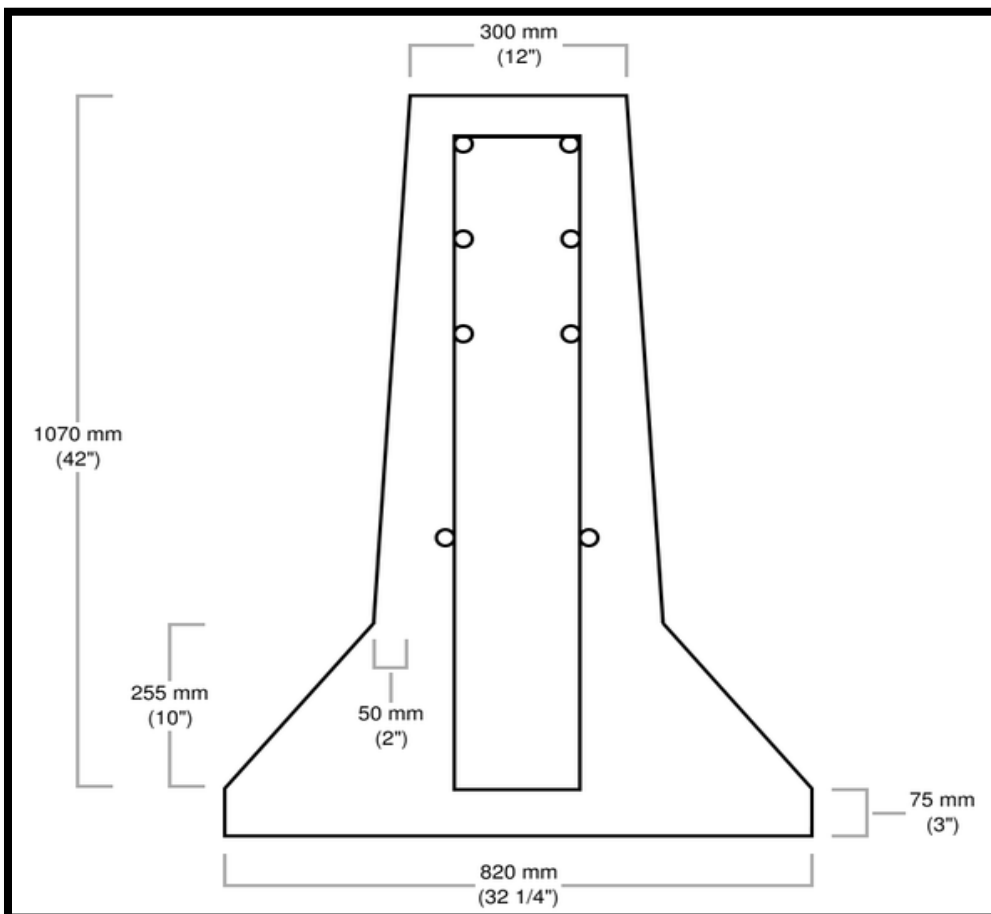


Diagram 2. Diagram showing measurements and design of a concrete Jersey Barrier. Retrieved from https://upload.wikimedia.org/wikipedia/commons/0/0d/Jersey_barrier_2.png

Recommendation #3: Commercial Carriers should implement forward and driver facing cameras in fleet trucks.

Discussion: Collision investigators were unable to conclude why the victim's vehicle initially left the travel portion of the highway. When a collision investigation occurs, investigators must utilize the evidence present at the crash scene to form a conclusion and establish collision causation. If substantial evidence does not exist, investigators often seek statements from individuals who witnessed the collision. Due to the lack of both evidence and witnesses, much is left unknown as to what the root-cause was. Having an in-cab video solution can offer critical insight as to the causation of crashes. Having a camera inside the truck when a crash occurs may not prevent the collision, but can offer valuable information that can be analyzed and used to implement preventive measures and driver focused training in place to address future occurrences. In-cab video cameras can provide footage that may instrumental to the investigation of that crash and can observe the behavior of other motorists, equipment malfunctions, or unsafe driver behaviors such as distracted driving or fatigue.

Many in-cab cameras systems operate based on customizable trigger events. Common types of trigger events include hard-braking, hard-acceleration and hard-cornering. If the camera detects one of these events, it will automatically capture, notify, and provide the video to the company. The company can then review the event to determine if a risky-driver behavior is occurring. If so, the behavior can be addressed proactively prior to a collision occurring. These types of camera systems often identify distracted driving and driving while fatigue as both behaviors are typically associated with a trigger event. For example, a driver who is texting while driving or falling asleep at the wheel is likely to cross into another lane of travel, notice the error and quickly maneuver back into the proper lane. The quick maneuver may trigger a hard-cornering event and notify the company. This allow the company to intervene and coach the driver accordingly.

Commercial carriers should implement forward and driver facing cameras in fleet trucks to gain visibility, understand causation, and prevent future collision based on factual data.

Recommendation #4: Companies who require employees to drive should implement a distracted driving policy and associated training.

Discussion: Although collision investigators did not list distracted driving as a contributing factor, the collision report did specify "vehicle not under proper control" as contributing human factor. Vehicle not under proper control is a broad contributing factor category and is often the result of other contributing factors that are suspected but could not be proved at the time the investigation occurred. Based on the facts that surround this case and the investigation of multiple similar collisions, it is likely that distracted driving was a contributing factor. According to The National Highway Traffic Safety Administration (NHTSA), In 2018 there were 33,654 fatal crashes in the United States involving 51,490 drivers. As a result of those fatal crashes, 36,560 people were killed. There were 2,628 fatal crashes that occurred on U.S. roadways in 2018 that involved distraction (8% of all fatal crashes). These crashes involved 2,688 distracted drivers, since some crashes involved more than one distracted driver. Distraction was reported for 5 percent (2,688 of 51,490) of the drivers involved in fatal crashes. In these distraction-affected crashes, 2,841 fatalities (8% of overall fatalities) occurred (NHTSA, 2020).

According to the Centers for Disease Control and Prevention (CDC), anything that takes your attention away from driving can be a distraction. Sending a text message, talking on a cell phone, using a navigation system, and eating while driving are a few examples of distracted driving. Any of these distractions can endanger the driver and others. Although



Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

distracted driving comes in many forms, texting while driving is one of the most dangerous forms of distracted driving according to the CDC. Texting while driving combines all three types of distraction:

- Visual: taking your eyes off of the road;
- Manual: taking your hands off of the wheel; and
- Cognitive: taking your mind off of driving (CDC, 2019).

Kentucky law prohibits motor vehicle operators from driving while distracted. In addition to requiring employees to follow each state's laws, companies who require employees to travel should consider implementing a policy which prohibits distracted driving. By doing so, the employer sets an expectation and raises awareness surrounding the dangers associated with driving while distracted.

PROGRAM FUNDING

The Kentucky Fatality Assessment & Control Evaluation Program (FACE) is funded by grant 5U6o0H008483-15 from the National Institute for Occupational Safety and Health (NIOSH).

REFERENCES

Google Earth. (n.d.). [Kentucky Interstate Highway]. Retrieved June 3, 2020 from <https://www.google.com/earth/>

Historical Weather Data. Retrieved June 3, 2020 from <https://www.wunderground.com/history/daily/KSDF/date/2020-1-22>

Camden, M. C., Medina-Flintsch, A., Hickman, J. S., Miller, A. M., & Hanowski, R. J. (2017). Leveraging Large-Truck Technology and Engineering to Realize Safety Gains: Lane Departure Warning Systems. Retrieved from https://aaafoundation.org/wp-content/uploads/2017/11/Truck-Safety_Lane-Departure.pdf

McDevitt, C. (2000). Basics of Concrete Barriers. Retrieved from <https://www.fhwa.dot.gov/publications/publicroads/00marapr/concrete.cfm>

Takata SafeTrak, Mobileye join PeopleNet network. (2011). Retrieved from <https://www.fleetowner.com/technology/article/21675388/takata-safetrak-mobileye-join-peoplenet-network>

National Center for Statistics and Analysis. (2020, April). Distracted driving 2018 (Research Note. Report No. DOT HS 812 926). National Highway Traffic Safety Administration. Retrieved from <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812926>

Center of Diseases Control and Evaluation, CDC. Distracted Driving. (2019). Retrieved from https://www.cdc.gov/motorvehiclesafety/distracted_driving/

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.



Kentucky Injury Prevention and Research Center
Bona fide agent for Kentucky Department for Public Health
333 Waller Avenue, Suite 242 • Lexington, KY 40504 • 859-257-5839

ACKNOWLEDGEMENTS

The Kentucky FACE Program would like to thank the involved company, the victim's spouse and emergency services for their assistance with completion of this report.