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THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

Data Bulletin

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Transportation Injuries in the Construction Industry

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OVERVIEW

Transportation incidents, which accounted for over a third of all occupational fatalities in 2023, are one of the most common causes of workplace injuries among construction workers. Transportation hazards occur on and off public roadways with *vehicles* and equipment operating on or near construction sites. Highway work zones are especially hazardous for construction workers with an estimated 101 thousand (K) crashes resulting in 39K worker injuries in 2023.

This Data Bulletin examines transportation injuries, including injuries due to transportation incidents (referenced as transportation injuries throughout), involving a vehicle as *primary source*, and fatal motor vehicle crashes in *construction work zones*. Injury statistics come from the U.S. Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII) and Census of Fatal Occupational Injuries and Illnesses (CFOI). Nonfatal data are provided biennially for injuries among private wage-and-salary workers resulting in *days away from work*, while fatal data contain annual injury statistics for all construction workers. Nonfatal and fatal transportation injuries were examined by detailed *event/exposure type*, primary source, and *major subsector*. Fatal injuries were also analyzed by state. Crash data was collected from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS), including *time of day* and *pedestrian* involvement. Data to calculate rates were obtained from the U.S. BLS Current Population Survey (CPS). Nonfatal injury rates were calculated per 10,000 *full-time equivalents* (FTEs) and fatal injury rates were calculated per 100,000 FTEs using CPS data. Nonfatal injury rates by major subsector were calculated per 10,000 workers using CES data.

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THIS ISSUE

This issue examines transportation injuries, including injuries due to transportation incidents, injuries involving a vehicle as a primary source, and fatal motor vehicle crashes in construction work zones.

KEY FINDINGS

From 2011-2012 to 2021-2022, the number of nonfatal transportation injuries among private wage-and-salary construction workers increased 14.8%, but the rate decreased by 16.3%.

Chart 1

From 2021-2022 Specialty Trade Contractors (NAICS 238) had the highest number of nonfatal transportation injuries (4.9K), while Heavy and Civil Engineering (NAICS 237) had the highest injury rate (6.5 per 10,000 workers).

Chart 4

The number (-3.8%) and rate (-30.0%) of fatal transportation injuries among construction workers declined from 2012 to 2023.

Chart 5

In 2023, Texas had the highest number of fatal transportation injuries in construction (31), while West Virginia had the highest rate (9.0 per 100,000 FTEs).

Chart 9

From 2012 to 2023, there was a 31.1% increase in fatal construction work zone crashes.

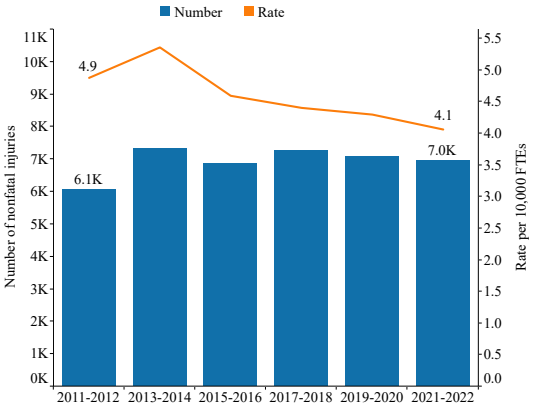
Chart 10

NEXT DATA BULLETIN

Small Establishments in Construction

The number and rate of transportation injuries among construction workers were examined from 2011-2012 to 2021-2022 (Chart 1). Over this period, nonfatal transportation injuries increased 14.8% (6.1 thousand (K) to 7.0K), while the rate of these injuries decreased 16.3% (4.9 to 4.1 injuries per 10,000 FTEs). In comparison, nonfatal injuries overall among construction workers decreased both in number (-2.9%) and in rate (-29.5%).

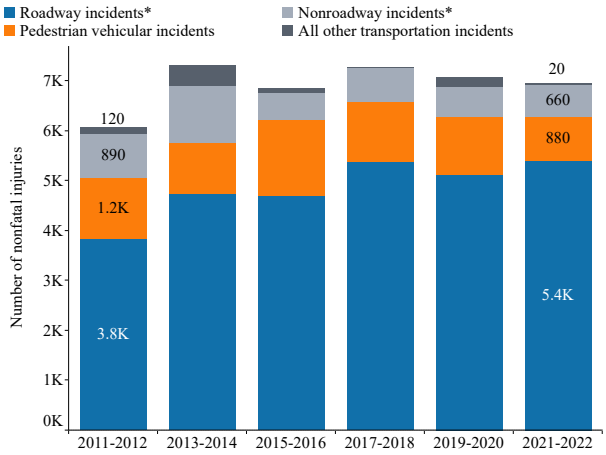
1. Number and rate of nonfatal transportation injuries in construction (Private wage-and-salary; 2011-2022)



Source: *BLS, 2011-2022 Survey of Occupational Injuries and Illnesses and IPUMS, 2011-2022 Current Population Survey.*

Nonfatal transportation injuries among construction workers were then broken down by event/exposure type from 2011 to 2022 (Chart 2). *Roadway incidents involving motorized land vehicles* accounted for 70.2% (29.2K) of injuries during this period, while were the second most common type of injury at 16.9% (7.0K). From 2011-2012 to 2021-2022, the number of roadway incidents involving motorized land vehicles increased 40.3% (3.8K to 5.4K), while *pedestrian vehicular* incidents decreased -27.3% (1.2K to 880).

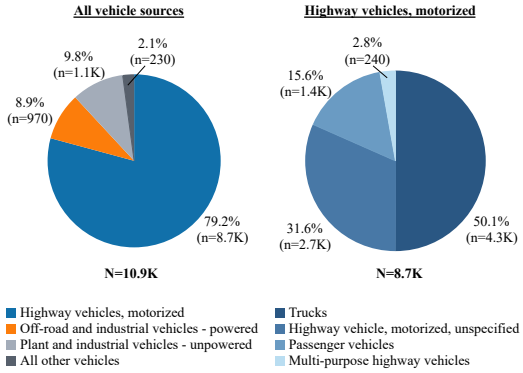
2. Number of nonfatal transportation injuries in construction, by event/exposure (Private wage-and-salary; 2011-2022)



Source: *BLS, 2011-2022 Survey of Occupational Injuries and Illnesses.*
**Involving motorized land vehicles.*

Next, all nonfatal injuries with a vehicle as a primary source from 2021 through 2022 were examined by detailed primary source (Chart 3). These include any on-the-job injury that involved a vehicle. *Highway vehicles*, *motorized* accounted for 79.2% (8.7K) of injuries involving vehicles. Of the highway vehicles involved in injuries, the majority (50.1%) were trucks, followed by unspecified highway vehicles, motorized (31.6%) and passenger vehicles (15.6%).

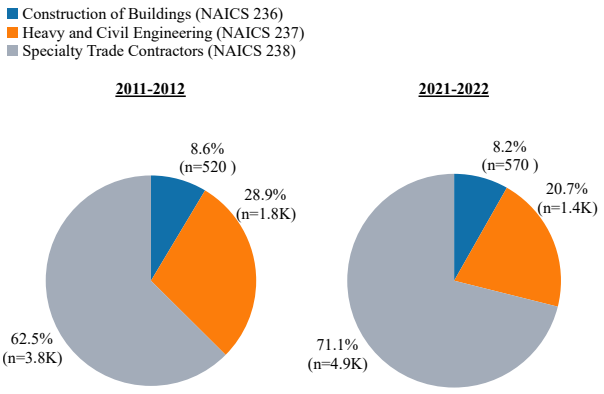
3. Nonfatal injuries in construction, by vehicles source (Private wage-and-salary; 2021-2022)



Source: *BLS, 2021-2022 Survey of Occupational Injuries and Illnesses.*

Nonfatal transportation injuries were also analyzed by major subsector (Chart 4). Specialty Trade Contractors (NAICS 238), where a majority of construction workers are employed, had the largest increase in the number of nonfatal transportation injuries among construction workers from 2011-2012 to 2021-2022 (28.9%, 3.8K to 4.9K). Specialty Trade Contractors accounted for 64.2% of nonfatal transportation injuries over this period. Construction of Buildings (NAICS 236) had an increase of 9.6% (520 to 570) in nonfatal worker injuries, while Heavy and Civil Engineering (NAICS 237) firms had a reduction of -17.7% (1.8K to 1.4K). Heavy and Civil Engineering had the highest rate of nonfatal injuries, with 6.5 nonfatal transportation incidents per 10,000 workers, compared to 5.1 per 10,000 workers among Specialty Trade Contractors and 1.7 per 10,000 workers among Construction of Buildings (data not shown).

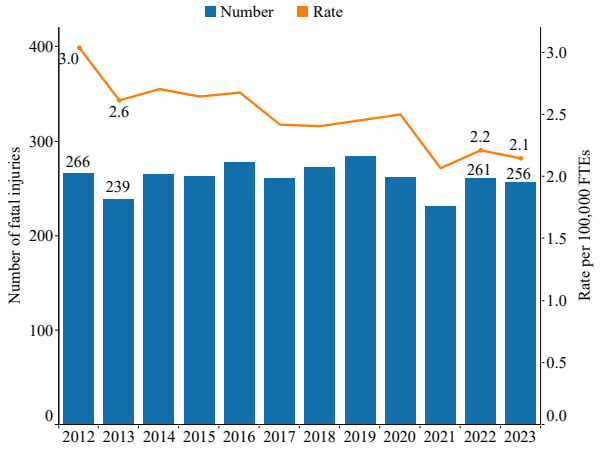
4. Number of nonfatal transportation injuries, by major construction subsector (Private wage-and-salary; 2011-2012 versus 2021-2022)



Source: *BLS, 2011-2012 and 2021-2022 Survey of Occupational Injuries and Illnesses.*

Next, fatal transportation injuries were examined. From 2012 to 2023, the number of incidents decreased -3.8 % (266 to 256; Chart 5), while the rate decreased -30.0% (3.0 to 2.1 per 100,000 FTEs). In comparison, fatal injuries overall among construction workers increased 24.9% during this period, while the rate decreased 5.2%.

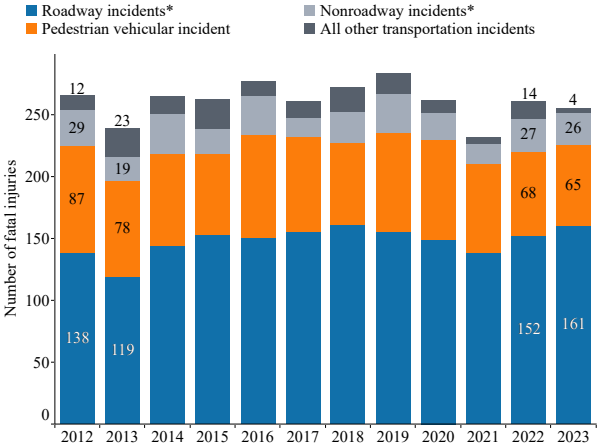
5. Number and rate of fatal transportation injuries in construction (2012-2023)



Source: *BLS, 2012-2023 Census of Fatal Occupational Injuries and IPUMS, 2012-2023 Current Population Survey.*

By event/exposure type, roadway incidents involving motorized land vehicles increased 16.7% (138 to 161; Chart 6) from 2012 to 2023, with an annual average of 148 fatal incdents. Pedestrian vehicular incidents were the second-most common fatal transportation injury event/exposure, with an annual average of 75 fatal incidents per year, although the number decreased about a quarter since 2012 (-25.3%, 87 to 65). *Nonroadway incidents* also fell -10.3% (29 to 26).

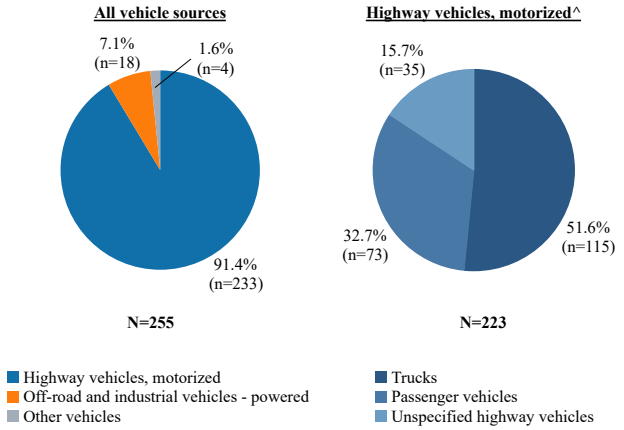
6. Number of fatal transportation injuries in construction, by event/exposure (2012-2023)



Source: *BLS, 2012-2023 Census of Fatal Occupational Injuries.*
**Involving motorized land vehicles.*

Next, the detailed primary source of fatal injuries involving a vehicle were examined. In 2023, 91.4% of fatal vehicular injuries involved motorized highway vehicles (n=233; Chart 7). Of these fatalities with detailed source information, over half involved trucks (51.6%, n=115), while nearly a third involved a passenger vehicle (32.7%, n=73). *Off-road and industrial vehicles* accounted for 7.1% (n=18) of vehicular fatalities.

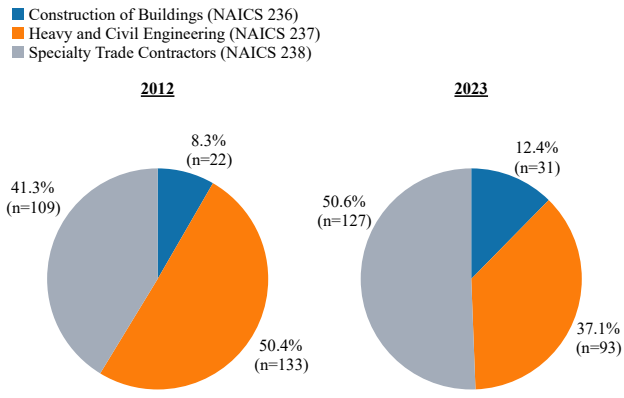
7. Fatal injuries in construction, by vehicle source* (2023)



Source: *BLS, 2023 Census of Fatal Occupational Injuries.*
**Due to rounding may not sum to 100%.*
^Excludes injuries without detailed source information.

By major subsector, fatal transportation injuries increased 16.5% from 2012 to 2023 among workers at Specialty Trades Contractors (109 to 127; Chart 8), a subsector that also accounted for more than half (50.6%) of all fatal transportation injuries in 2023. This finding is consistent with the trend for all fatal construction injuries: Specialty Trade Contractors accounted for the greatest share of fatal injuries among major subsectors in 2023. Although Heavy and Civil Engineering began the period with the largest share of fatalities, its number decreased substantially. (-30.1%, 133 to 93). Construction of Buildings firms had the largest increase in the number of fatalities among workers (40.9%, 22 to 31).

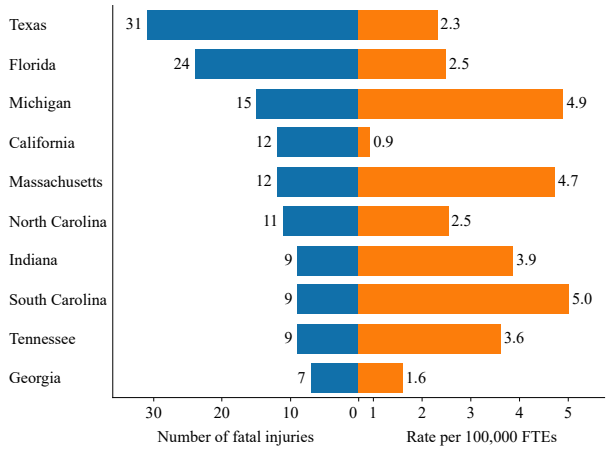
8. Number of fatal transportation injuries, by major construction subsector (2012 versus 2023)



Source: *BLS, 2012 and 2023 Census of Fatal Occupational Injuries.*

Transportation fatalities among construction workers in 2023 were then examined by state (Due to data suppression, many states did not have data available.) Of those with data, the states with the highest number of fatalities were Texas (31; Chart 9), Florida (24), Michigan (15), California (12), and Massachusetts (12). West Virginia had the highest fatality rate among states (9.0 per 100,000 FTEs; data not shown), followed by South Carolina (5.0 per 100,000 FTEs), Michigan (4.9 per 100,000 FTEs), and Massachusetts (4.7 per 100,000 FTEs).

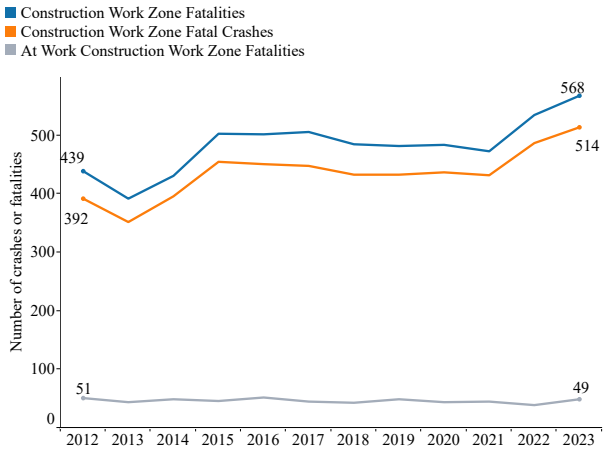
9. States* with the most fatal transportation injuries in construction (2023)



Source: *BLS, 2023 Census of Fatal Occupational Injuries.*
**Due to disclosure policies, data is unavailable/suppressed in some states.*

From 2012 to 2023, the number of fatal construction work zone crashes increased 31.1% (392 to 514), and the number of associated construction work zone fatalities rose 29.4% (439 to 568; Chart 10). During the same period, there was a -3.9% decrease in *at work* construction work zone fatalities (e.g., person was at work; 51 to 49).

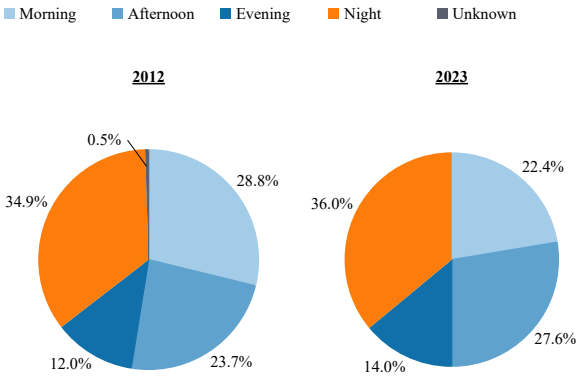
10. Fatal crashes and fatalities in construction work zones (2012-2023)



Source: *NHTSA, 2012-2023 Fatality Analysis Reporting System.*

From 2012 to 2023, the percentage of crashes that occurred in the morning decreased from 28.8% to 22.4% (Chart 11). Meanwhile, the percentage of crashes occurring in the afternoon (23.7% to 27.6%), evening (12.0% to 14.0%), and night (34.9% to 36.0%) increased over those years. Nighttime construction environments are complex for both motorists and workers due to decreased visibility.

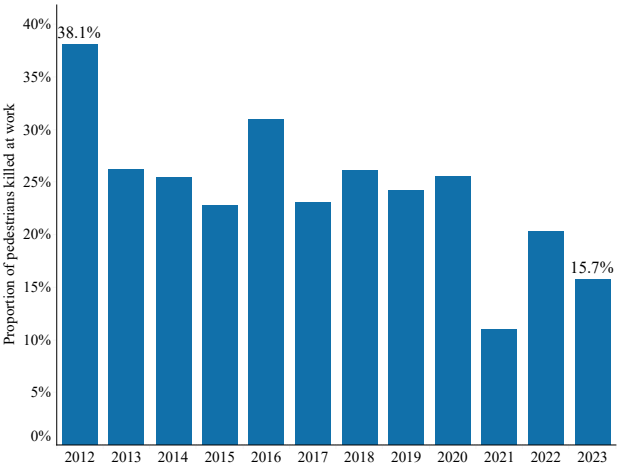
11. Fatal crashes in construction work zones, by time of day (2012 versus 2023)



Source: *NHTSA, 2012 and 2023 Fatality Analysis Reporting System.*

From 2011 to 2023, the proportion of pedestrian fatalities in work zones occurring at work decreased 58.8% (38.1% to 15.7%; Chart 12). This proportion hit a low in 2021 at 11.0%, while increasing in 2022 (20.3%) and declining in 2023 (-15.7%). This proportion hit a low in 2021 at 11.0% of pedestrians killed fatal crashes in construction work zones being at work, while this percentage increased in 2022 (20.3%) and declined in 2023 (-15.7%).

12. Proportion of pedestrians killed at work in construction work zones (2012-2023)



Source: *NHTSA, 2012-2023 Fatality Analysis Reporting System.*

Roadway incidents involving motorized vehicles remain a major hazard in the construction industry, resulting in 5.4K nonfatal injuries during 2021-2022 and 161 fatalities in 2023. The number of nonfatal transportation injuries among construction workers has risen over the past dozen years, while the rate of these injuries and the number/rate of fatal injuries decreased. By major subsectors, Construction of Buildings experienced an increase in transportation injuries, and Heavy and Civil Engineering experienced a decrease. Meanwhile, Specialty Trade Contractors had the most transportation injuries, with an average of 121 fatalities each year. The number of fatal construction work zone crashes and fatalities increased from 2012 to 2023, with the largest percentage occurring at night.

CPWR provides resources and training tools to help employers and workers prevent struck-by injuries, including those caused by work zone vehicles and nighttime roadwork. Our Planning Program to Prevent Struck-by Incidents includes questions and supporting resources to guide pre-job and pre-task planning related to all types of struck-by incidents potentially present on a jobsite. CPWR is also a primary organizing partner in the annual National Stand Down to Prevent Struck-by Incidents, which occurs every April in conjunction with National Work Zone Awareness Week. OSHA and NIOSH also provide resources that address transportation hazards in the construction industry and the National Work Zone Safety Information Clearinghouse is reliable a source of work zone statistics and resources.

ACCESS THE CHARTS & MORE

View the charts in PowerPoint and the data underlying the charts in Excel. Downloading will start when you click on each link. These files can also be found under the Data Bulletin at: https://www.cpwr.com/research/data-center/data-reports/.

DEFINITIONS

- ***At Work*** *– Indicates if the person was at work at the time of the crash. More information can be found in the Fatality Analysis Reporting System Analytical User's Manual.*
- ***Construction Work Zone*** *– Area of the road in which road repair work (e.g., long-term stationary construction like building a bridge or adding lanes) is being conducted. A full definition can be found in the FARS CRSS Coding and Validation Manual.*
- ***Days away from work (DAFW)*** *– Nonfatal injury cases resulting in at least one day away from work beyond the day of injury or illness onset.*
- ***Event/exposure*** *– The manner in which the injury or illness was produced or inflicted, such as a roadway collision, off-road vehicle incident, etc. Full definitions can be found in the Occupational Injury and Illness Classification Manual (OIICS).*
  - ***Pedestrian vehicular incident*** *– Injuries involving pedestrians and other non-occupants of vehicles who are struck by vehicles or other mobile equipment, regardless of location. For more information, please see the OIIC Manual.*
  - ***Roadway incident involving motorized land vehicle*** *– Includes injuries to vehicle occupants occurring on public roads, streets, are highways normally used for travel, as well as the shoulder and surrounding areas. For more information, please see the OIIC Manual.*
  - ***Transportation incident*** *– Injuries with event/exposure code reported as OIICS 2, which includes events involving "transportation vehicles, animals used for transportation purposes and powered industrial vehicles or powered mobile industrial equipment … and the injury or illness was due to a collision or other type of traffic incident" (see OIICS Manual).*
- ***Full-time equivalent worker (FTE)*** *– Determined by the hours worked per employee on a full-time basis, defined as working 2,000 hours (40 hours x 50 weeks) per year.*
- ***Major subsector*** *– 3-digit NAICS codes within construction.*
- ***Nonroadway incident*** *– Includes injuries to vehicle occupants that occur entirely off a public roadway. For more information, please see the OIICS Manual.*
- ***Pedestrian*** *– As defined in NHTSA FARS, all individuals not on a personal conveyance (e.g., a non-transport device used for personal mobility assistance or recreation).*
- ***Primary source*** *– The objects, substances, equipment, and other factors that were responsible for the injury or illness incurred by the worker. For example, a worker who was climbing up a ladder when they slipped and fell would have a reported primary source of, "Ladders." For more details, see OIIC Manual.*
  - ***Vehicles*** *– The primary source responsible for the injury incurred by the worker was a vehicle. Detailed vehicle primary sources defined below:*
    - ***Highway vehicles motorized*** *– Vehicles operated on public roadways.*
    - ***Off-road and industrial vehicles powered*** *– Off-road vehicles primarily used in non-roadway areas.*
    - ***Plant and industrial vehicles-nonpowered*** *– Nonpowered vehicles used for transportation of payloads, such as nonpowered hand trucks.*
- ***Time of day*** *– When the crash was reported to occur.*
  - ***Morning*** *– 5 a.m. to 11:59 a.m.*
  - ***Afternoon*** *– 12 p.m. to 4:59 p.m.*
  - ***Evening*** *– 5 p.m. to 8:59 p.m.*
  - ***Night*** *– 9 p.m. to 4:59 a.m.*

DATA SOURCES

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Besides cpwr.com, visit CPWR's other online resources to help reduce construction safety and health hazards:

- Construction Solutions
  https://www.cpwrconstructionsolutions.org/
- COVID-19 Construction Clearinghouse
  https://covid.elcosh.org/index.php
- Electronic Library of Construction Occupational Safety and Health
  https://www.elcosh.org/index.php
- eLCOSH Nano
  https://nano.elcosh.org/
- Exposure Control Database
  https://ecd.cpwrconstructionsolutions.org/
- Nano Safety Data Sheet Improvement Tool
  https://nanosds.elcosh.org/
- Safety Climate–Safety Management Information System (SC-SMIS)
  www.scsmis.com
- Stop Construction Falls
  https://stopconstructionfalls.com/
- Work Safely with Silica
  https://www.silica-safe.org/

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