

Characteristics of Commercial Motor Vehicle Crashes Reported in the New Hampshire State Police Commercial Crash Dataset for Years 2015 through 2017

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From 2003-2014 there were **22,000** work-related motor vehicle **deaths** in the United States.

INTRODUCTION

The risk of work-related commercial motor vehicle crashes (CMVC) or exposure to road traffic hazards affects millions of workers in the United States. In fact, CMVC are the leading cause of work-related deaths in the U.S.ⁱ Of 47,718 work-related fatalities reported by the Bureau of Labor Statistics between 2003 and 2011, 17,037 (36%) were associated with motor vehicles.ⁱⁱ The toll for this 9-year period included:

- 11,305 deaths in single- or multiple-vehicle crashes on public roadways
- 2,709 deaths in crashes that occurred off the highway or on industrial premises
- 3,023 pedestrian worker deaths as a result of being struck by a motor vehicle

Crash-related fatalities and serious injuries have a devastating impact on workers, their families, and the economic health and productivity of American

businesses. For crash related injuries in 2011 requiring more than 6 days away from work, workers' compensation costs alone were estimated to be \$2.4 billion.ⁱⁱⁱ This figure underestimates the true economic burden of work-related motor vehicle crashes as it does not account for societal costs. Work vehicles also have an impact on the safety of the motoring public. For example, although motor vehicle crashes are the leading cause of fatality for truck drivers, these events result in far more fatalities of other road users.

While there are many reasons behind a CMVC (weather, driver inexperience, excessive speed, fatigue), there is growing concern over the effects of distracted driving on workers who spend their workdays on the road. One study has shown that drivers at work are more likely to be in a hurry, be tired, use a cell phone or are otherwise distracted while driving.^{iv}

This study explores the New Hampshire (NH) State Police crash dataset of commercial vehicle crashes to better understand the contributing factors and actions/events that increase risk of motor vehicle crashes and resulting injuries.

METHODS

Data Source

The NH State Police commercial crash dataset for years 2015 through 2017. A commercial vehicle, according to the U.S. Department of Transportation's (USDOT) Federal Motor Carrier Safety Administration (FMCSA), is a motor vehicle or combination of motor vehicles used in commerce to transport passengers or property,

in New Hampshire.

Analysis was focused on vehicles weighing 10,001 lbs through 26,000 lbs and vehicles weighing over 26,000 lbs.

Only information necessary to do this study was included in the analysis. Motor vehicle crashes are reported to state and local police, who file a report to the State. Variables from the reports used in our analysis included county where crash occurred, driver age, time of day and day of week the crash occurred, vehicle weight (indicated by the government vehicle weight rating or GVWR), road surface (weather related), and cause. The number of fatalities was too small to report. Any personal identifiers were excluded from the data analyzed. All results were aggregated. Output of charts and graphs were created in Microsoft Excel.

RESULTS

Commercial Motor Vehicle Crash Characteristics

Most CMVC occurred in the south-east area of New Hampshire, during the day Monday through Friday among middle-aged drivers in vehicles weighing more than 26,000 pounds and on dry roads with no adverse weather conditions. More specifically, most CMVC occurred between 6am-6pm (84.9%, see Figure 1) and Monday through Friday (89.2%, see Figure 2). The greatest percentages of crashes were between 9am-12pm and 12pm-3pm (22.3% and 25.1%, respectively) and Monday and Tuesday (18.8% and 19.7%, respectively). The majority of CMVC also occurred with drivers between ages 26-65 (88.5%, see Figure 3) and in vehicles weighing more than 26,000 pounds (68.1%, see Figure 4). The greatest percentages of crashes were among drivers ages 36-45 and 46-55 (20.2% and 29.5%, respectively). For road and weather conditions, 62.8% of CMVC occurred on dry roads (see Figure 5) and 71.9% of CMVC occurred with no adverse weather conditions (See Figure 6). Secondly, 36.7% of crashes occurred on icy or wet roads and 26.4% of crashes occurred when it was snowing, sleeting, hailing, or raining.

Cause of Commercial Motor Vehicle Crashes

The most prevalent cause of CMVC varied by road and weather conditions. Overall, the top three causes of CMVC were driver inattention/distraction, unsafe speeds, and failure to yield (19.1%, 13.4%, and 11.4%, respectively, see Figure 7). Driver inattention/distraction can include talking or texting on the phone, eating and drinking, talking to people in the vehicle,

fiddling with the stereo, entertainment or navigations system – anything that takes attention away from the task of safe driving. Driver inattention/distraction only remained the most prevalent cause on dry roads with no adverse weather (15.2% and 16.1%, respectively, see Figures 8 and 9). On roads with ice, slush, or snow, or when it was snowing, sleeting, or hailing, the most prevalence crash cause was unsafe speed (8.6% and 6.7%, respectively see Figures 8 and 9)

Injuries Resulting from Commercial Motor Vehicle Crashes

The percentage of CMVC resulting in injury varied with age but not greatly by vehicle weight, road condition, or weather condition. The greatest percentages of CMVC resulting in injuries were found among drivers less than 26 years of age or drivers ages 76-85 (43.2% and 46.2%, respectively, see Figure 10). For drivers ages 26-75, the percentages of crashes resulting in injuries ranged from 26.7% to 37.1%. The percentages of crashes resulting in injuries for vehicles weighing 10,001-26,000 pounds and greater than 26,000 pounds were 31.8% and 32.0%, respectively (see Figure 11). For road conditions, the percentages of crashes resulting in injuries ranges from 28.6%-37.9% on roads that were dry; had icy, slush, or snow; or were wet (see Figure 12). The percentage of injuries for roads with other conditions was not reported due to small sample size (n=6). For weather conditions, the percentages of crashes resulting in injuries with no adverse weather conditions; snow, sleet, or hail; or rain were 32.1%, 29.0%, and 35.2%, respectively (see Figure 13). The percentages of injuries for fog or other weather conditions was not reported due to small sample sizes (n=12 and n=12, respectively).

Figures

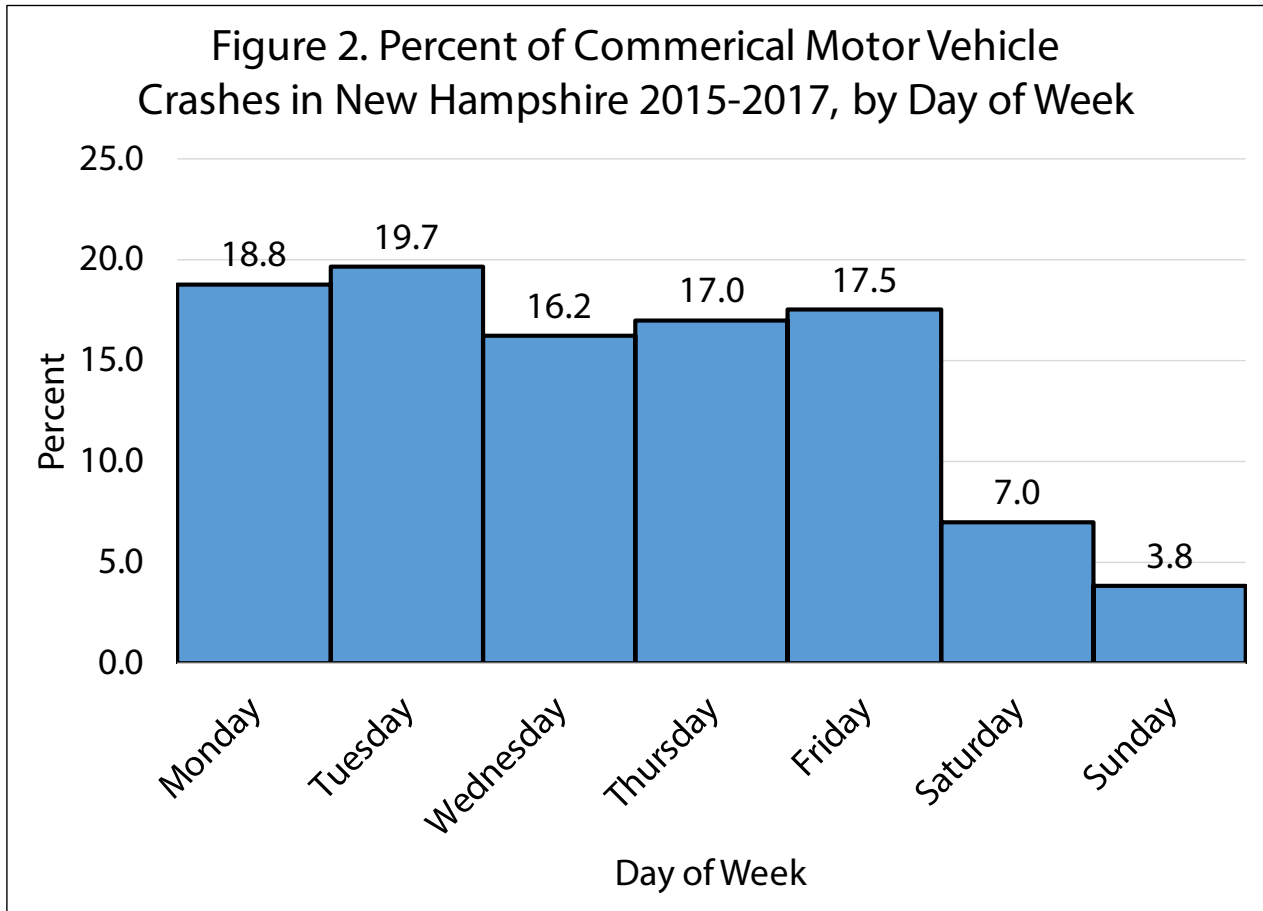
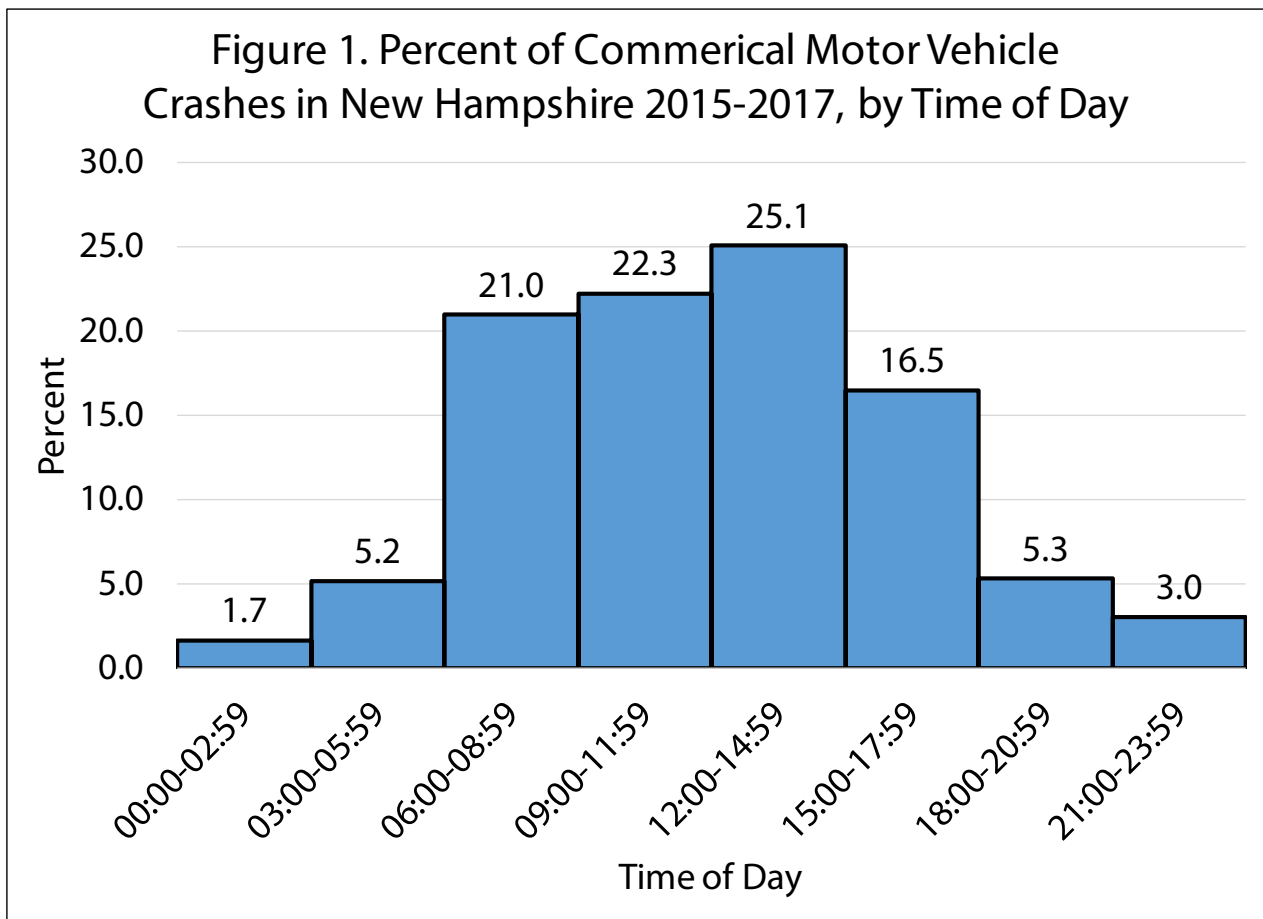


Figure 3. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Age

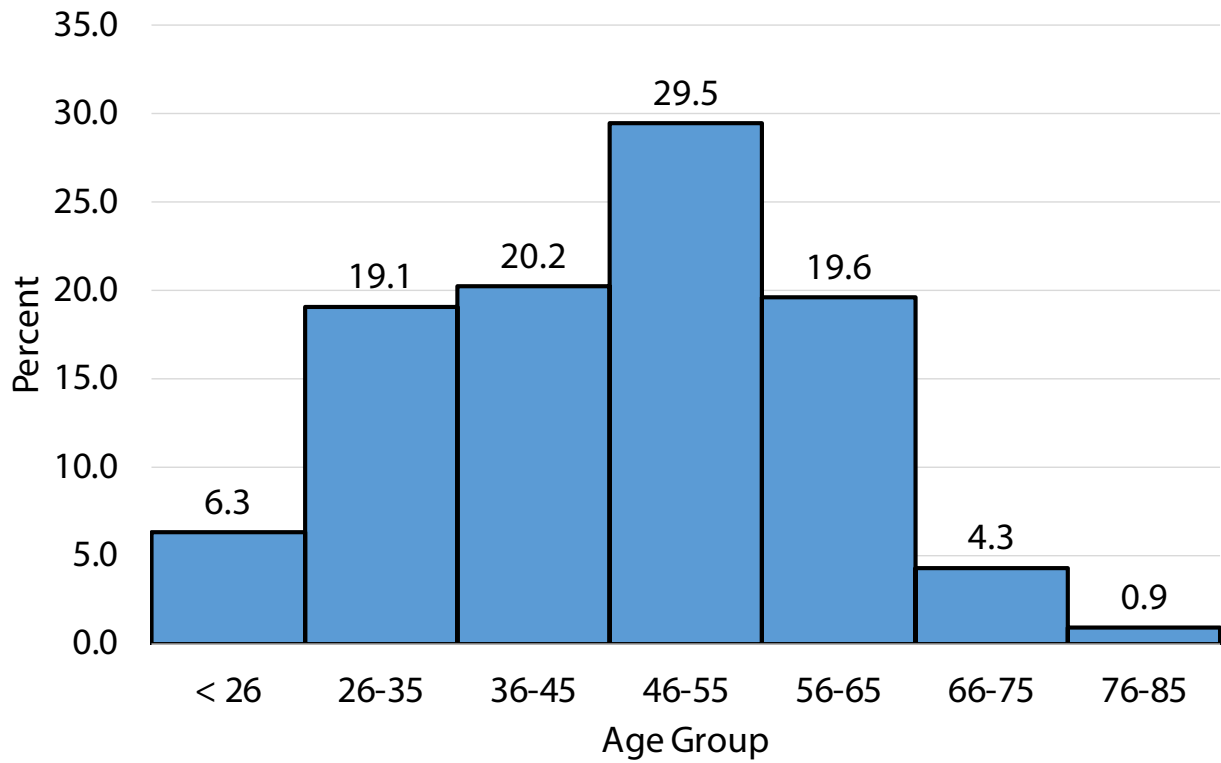


Figure 4. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Weight

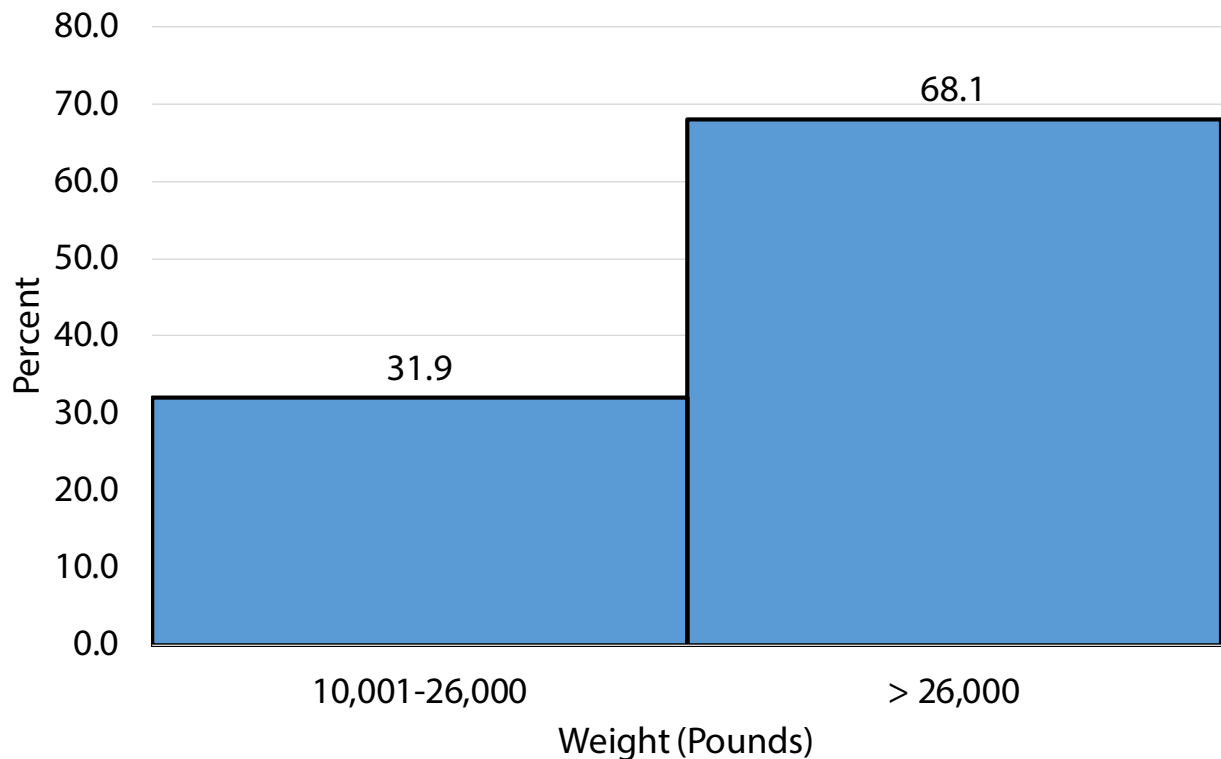


Figure 5. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Road Condition

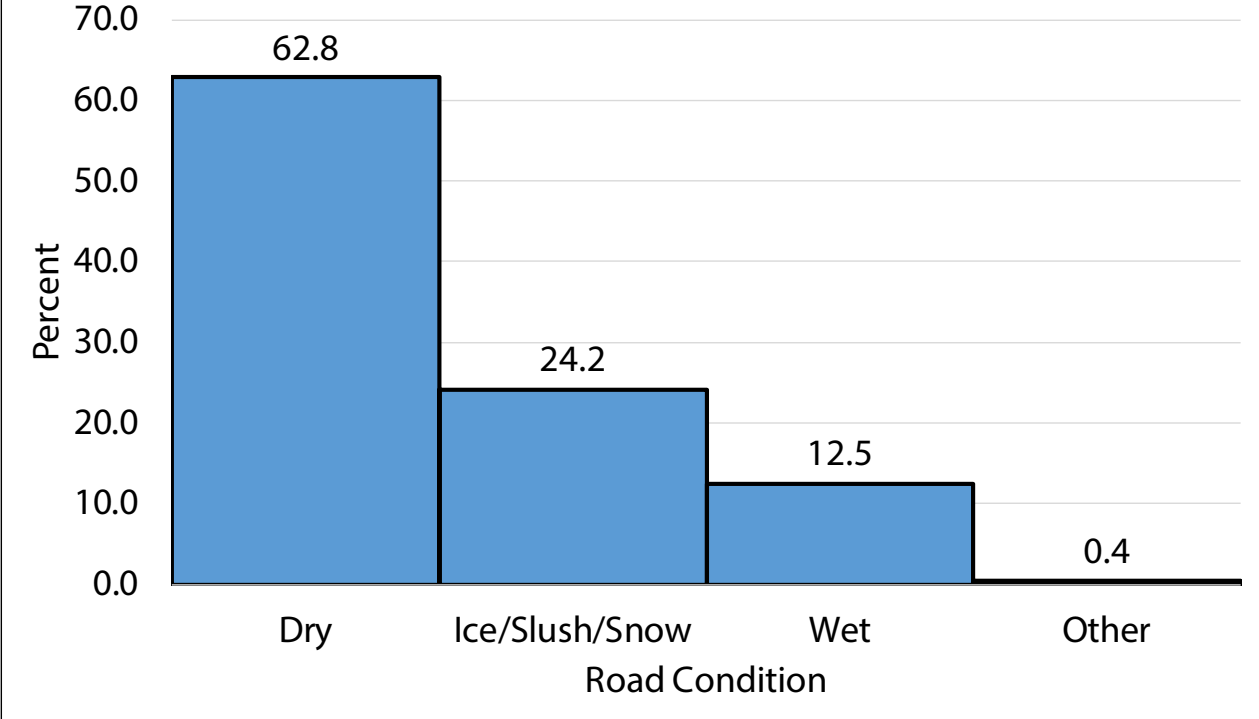


Figure 6. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Weather Condition

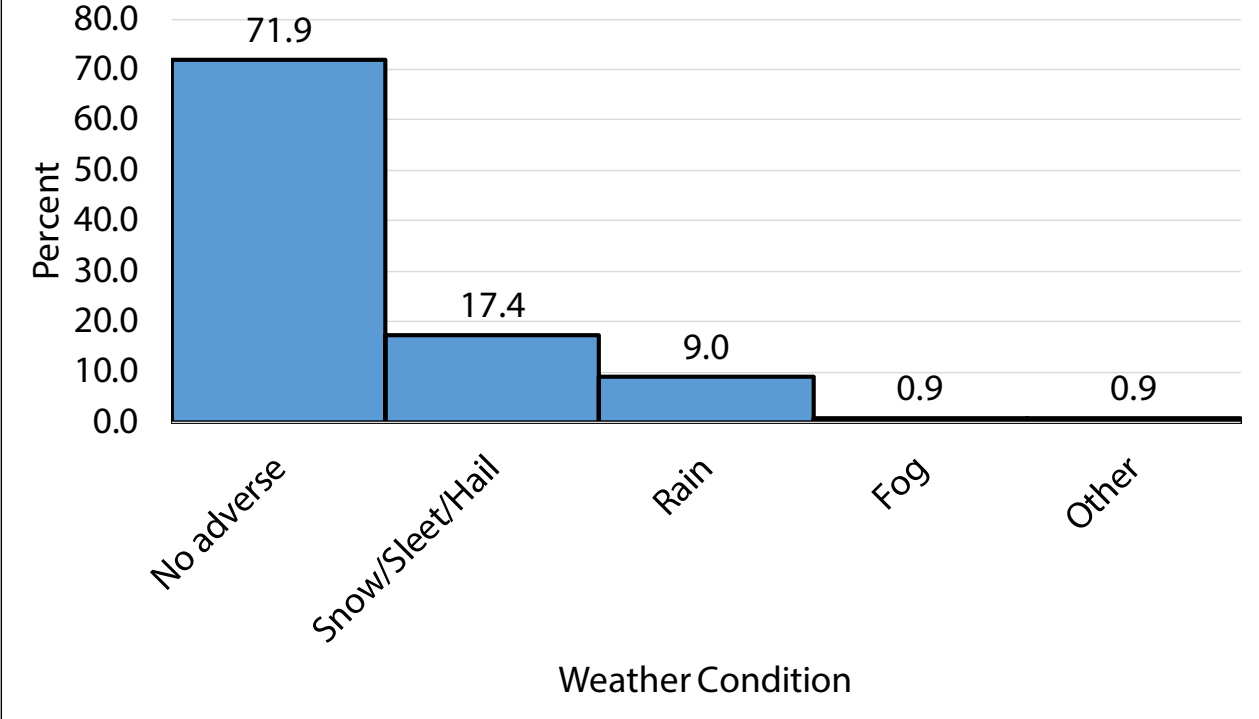


Figure 7. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Crash Cause

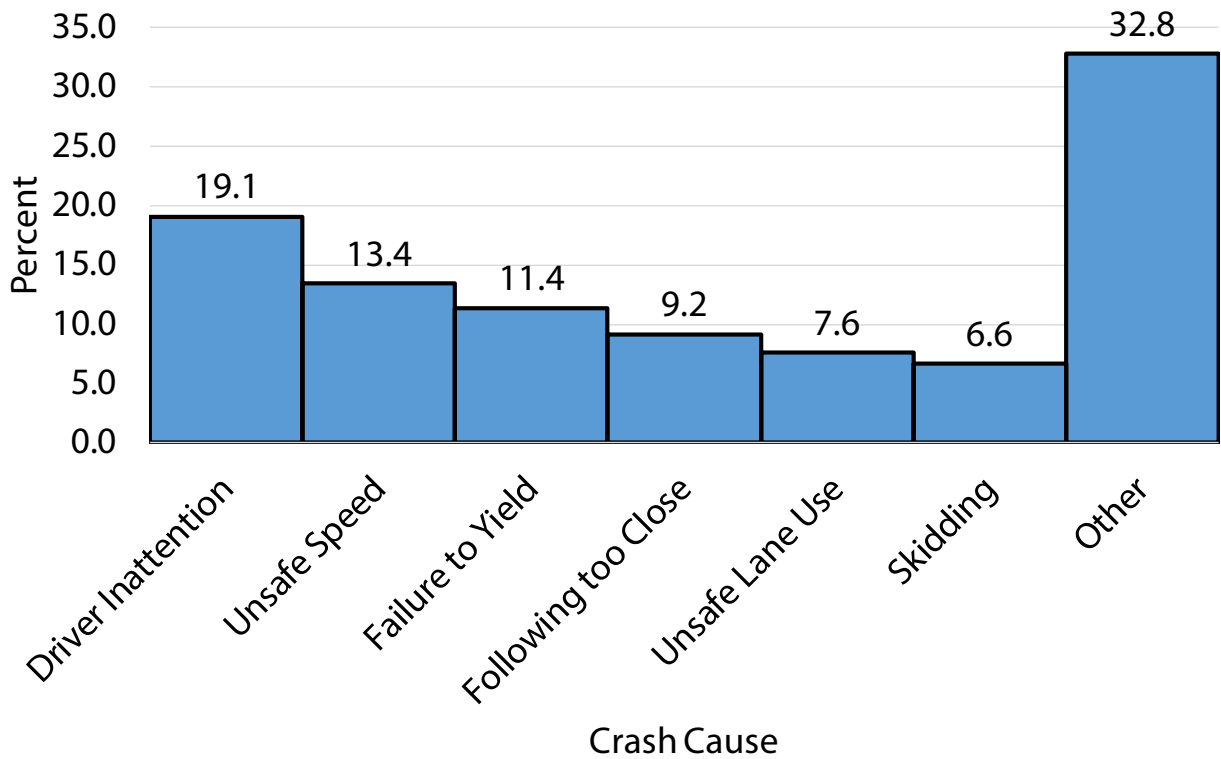


Figure 8. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Road Condition and Crash Cause

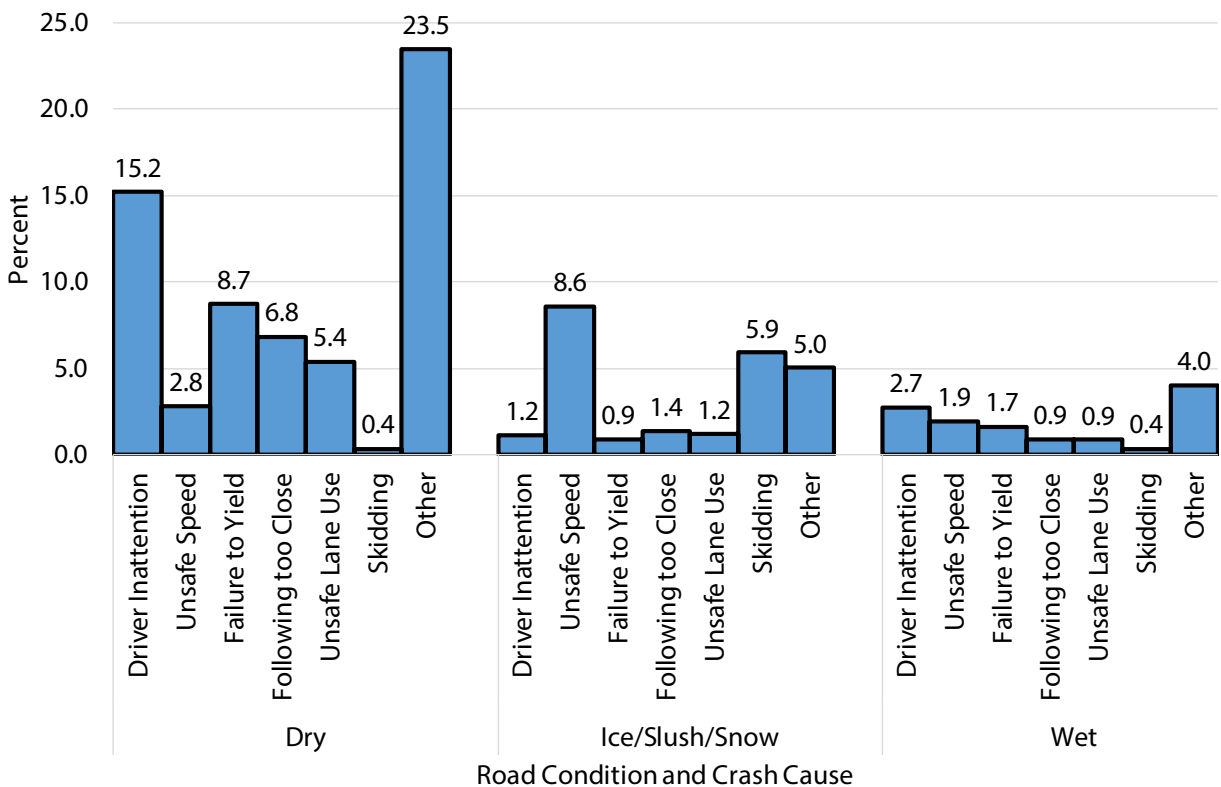


Figure 9. Percent of Commerical Motor Vehicle Crashes in New Hampshire 2015-2017, by Weather Condition and Crash Cause

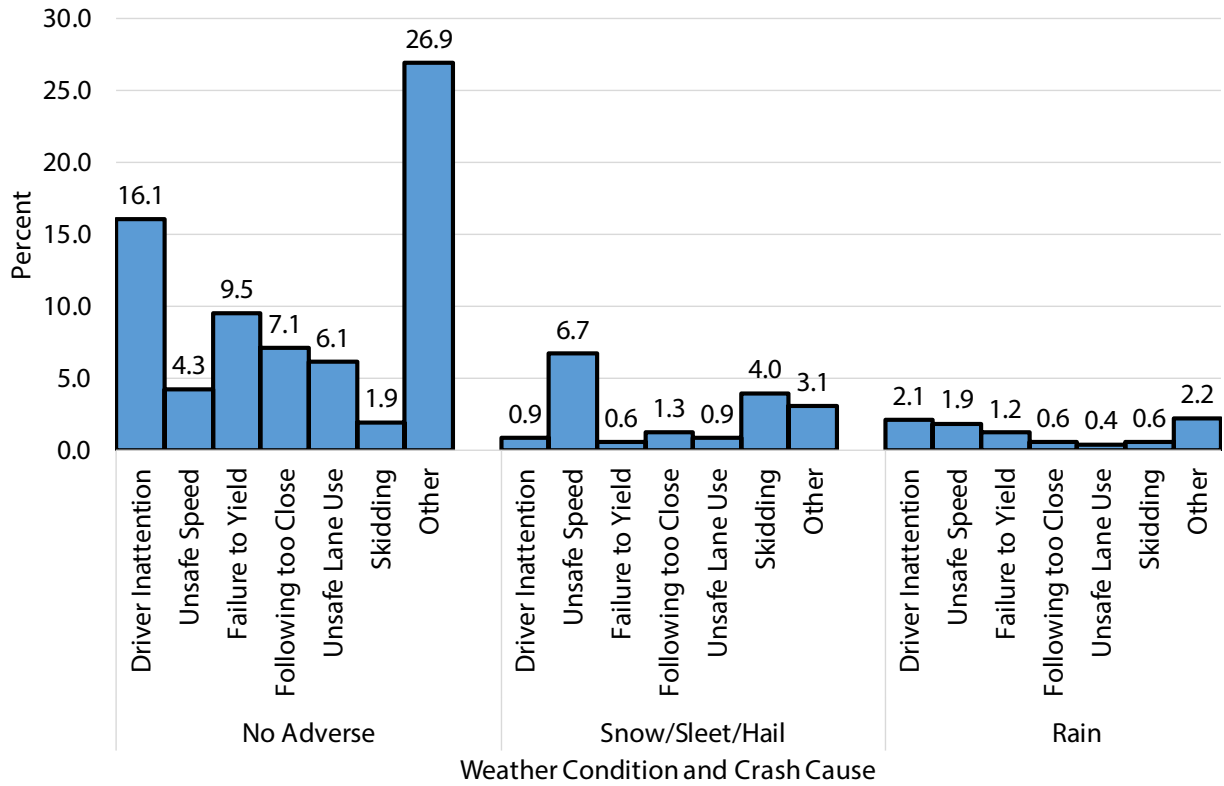


Figure 10. Percent of Commerical Motor Vehicle Crashes Resulting in Injuries in New Hampshire 2015-2017, by Age

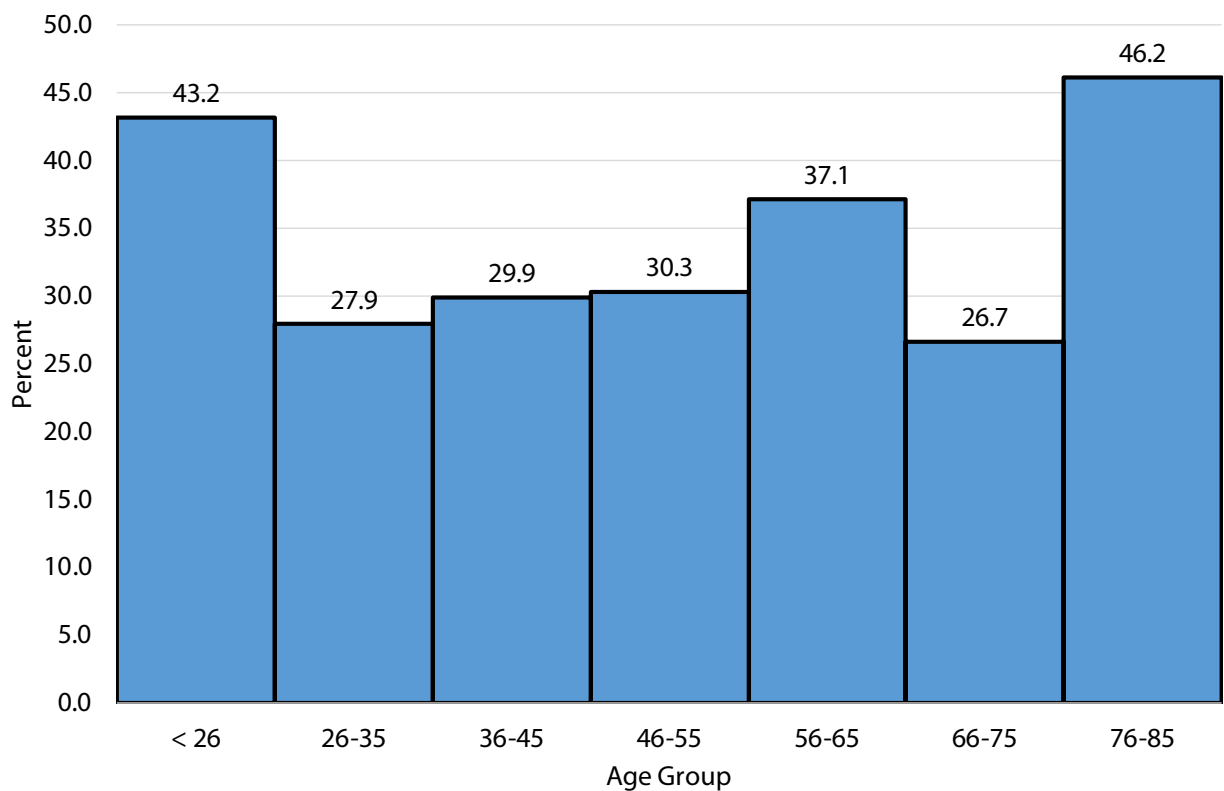


Figure 11. Percent of Commerical Motor Vehicle Crashes Resulting in Injuries in New Hampshire 2015-2017, by Weight

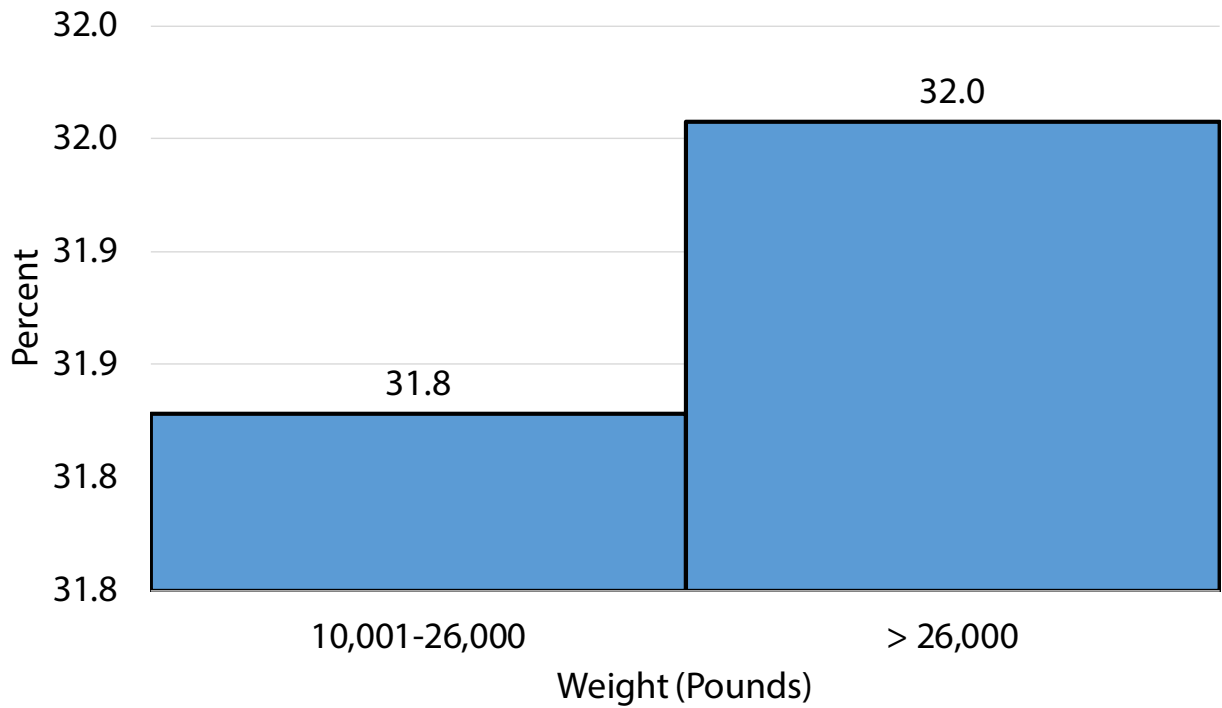


Figure 12. Percent of Commerical Motor Vehicle Crashes Resulting in Injuries in New Hampshire 2015-2017, by Road Condition

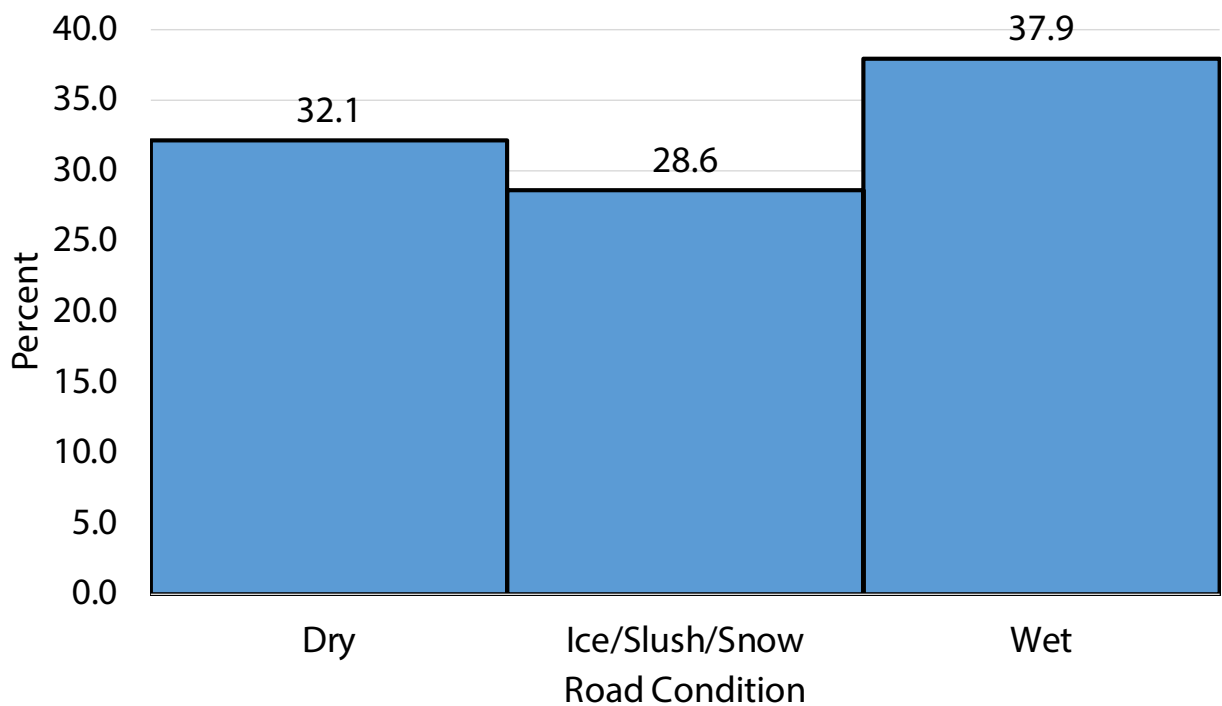
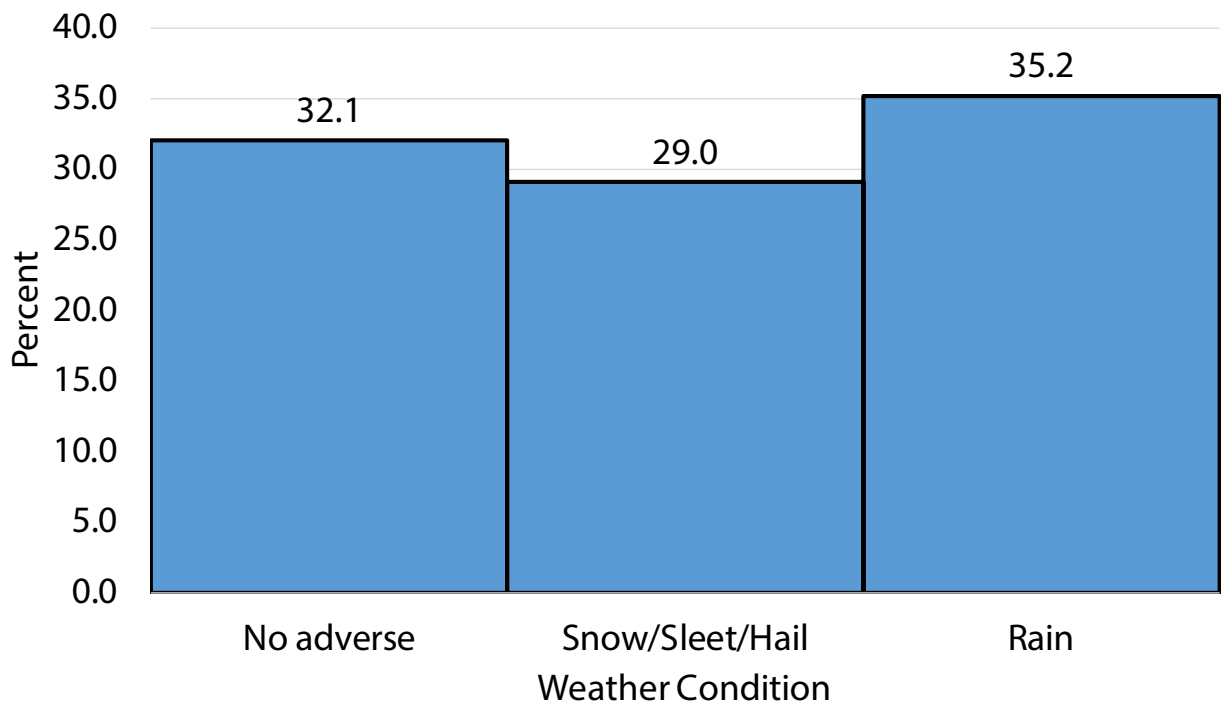


Figure 13. Percent of Commerical Motor Vehicle Crashes Resulting in Injuries in New Hampshire 2015-2017, by Weather Condition



Limitations

The data are based on self-report and limited by recall and observation bias. Reporting may be influenced by what observers remember or find salient and the observation and interaction of people involved in the crash with each other and the individual detailing the crash report.

Although the dataset used for this report includes multiple years of data, it only includes crashes occurring in NH and may not be generalizable to other states in New England or across the nation. A substantial majority of crashes occurred during the work week, daylight hours, on dry roads with no adverse weather conditions and a larger data sample is needed to better understand, characterize, and generalize to other crash times and conditions.

Finally, details of the cause type of “driver inattention/distracted” are not defined further in the report for injuries and therefore cannot provide additional information about the event.

CONCLUSIONS

The characteristics of common commercial motor vehicle crashes in the New Hampshire State Police

commercial crash dataset for years 2015 through 2017 vary. However, most crashes occurred in the southeast area of New Hampshire, during the week and daylight hours, during no adverse weather conditions, involving a collision with another moving vehicle, dry road surface, and on a two-way undivided road. The highest percent of crashes occurred in the age group 46-55. The main contributing factor (besides other) of the crashes was driver inattention/ distraction overall; however, the main contributing factor for poor road and weather conditions (ice/slush/snow and snow/sleet/hail) was unsafe speed. Injuries occurred more often in crashes involving vehicles weighing more than 26,000 pounds, and among workers with ages < 26 years and ages over 76 years. Injuries were relatively evenly distributed across road and weather conditions.

Millions of workers in the United States are exposed to hazards of motor vehicle traffic, as vehicle operators, passengers, or pedestrians. For some of these workers, notably drivers of large trucks and buses, federal safety regulations provide a level of protection through rules that govern hours of driving, vehicle inspection, load safety, fitness to drive, and numerous other areas. For many other workers, especially those who operate light vehicles, safety regulations that cover driving for work

are limited. Whatever the regulatory environment, the safety of workers who drive on the job is a responsibility shared by many: employers, workers, policy makers, vehicle manufacturers, and the research community. The efforts of all these stakeholders are critical if we are to make meaningful progress in reducing the burden of work-related crashes.^v

In particular, employers have the opportunity to leverage the employer-employee relationship to complement and enforce government policies that will reduce work-related crashes and injuries. Safe-driving policies implemented in the workplace can promote safer driving for workers and family members away from work. In addition, employers, as purchasers of large fleets of vehicles, can spur improvements in vehicle safety and encourage development of road safety capacity and legislation in the local areas and countries in which they operate, thereby improving road safety for all.^v

PREVENTION

Preventing Worker Injuries and Deaths from Traffic-Related Motor Vehicle Crashes

If you employ motor vehicle operators, take the following steps:

- Set and enforce mandatory seatbelt use policies for both drivers and passengers.
- Conduct driver's license background checks before hiring drivers.
- Establish schedules that allow drivers enough time to obey speed limits and to limit their hours of service according to regulations.
- Train drivers in safe driving practices and the proper use of vehicle safety features.
 - Prohibit texting while driving
 - Establish work procedures and rules that do not make it necessary for workers to text while driving in order to carry out their duties.
 - Incorporate safe communications practices into worker orientation and training.
 - Incorporate training on fatigue management and the dangers of distracted driving into safety programs.
- Establish procedures to ensure proper maintenance of all vehicle systems.

- Make sure that newly purchases vehicles are equipped with appropriate occupant protection and other safety features.
- Address factors that contribute to crashes, such as drowsy and distracted driving, in the company driver safety programs.
- Adopt the U.S. Department of Transportation regulations for commercial motor carriers as part of your motor vehicle safety program.

If driving is part of your job, take the following steps:

- Use seat belts at all times. Let other workers ride with you only when the vehicle has a seat belt for each person.
- Always drive within the speed limit.
- Do not drive if you are fatigued.
- Avoid distracting activities such as eating, drinking, and adjusting radio and other controls while driving.
- Stop the vehicle before using a cell phone.
- Be familiar with the maintenance procedures for all vehicle systems.
- Use detailed maps to determine your route before you leave, or use a GPS.
- Carry an emergency kit containing a flashlight, extra batteries, flares, a blanket, and bottled water.

RESOURCES

New Hampshire State Police

The Department of Safety (NH DOS), as the lead agency for the Motor Carrier Safety Assistance Program in New Hampshire, authorizes NH Division of State Police (NHSP) Troop G to enforce Federal Motor Carrier Safety Regulations and Federal Hazardous Material Regulations.

<https://www.nh.gov/safety/>

NH Motor Transport

<http://www.nhmta.org/safety/>

NIOSH

The National Institute for Occupational Safety and Health is the only federal agency whose mission encompasses the prevention of work-related motor vehicle crashes and resulting injuries for all worker populations, work vehicles, and work settings. NIOSH is part of the Centers for Disease Control and Prevention,

within the Department of Health and Human Services. The NIOSH Center for Motor Vehicle Safety (CMVS) is the focal point for activities within the Institute that address this pressing occupational safety problem.

<https://www.cdc.gov/niosh/motorvehicle/ncmvs/default.html>

OSHA - The Occupational Safety and Health Administration

OSHA requirements for the motor vehicle industry are addressed in specific OSHA standards for Agriculture and Marine Terminals.

<https://www.osha.gov/SLTC/motorvehiclesafety/>

OSHA Consultation – WorkWISE NH at Keene State College, provides free, on-site occupational safety and health consultation services to eligible employers.

<https://www.keene.edu/academics/conted/safety/workwise/>

FMCSA - Federal Motor Carriers Safety Administration

<https://www.fmcsa.dot.gov/>

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Citations

- i. Bureau of Labor Statistics [2004-2017]. TABLE A-2. Fatal occupational injuries resulting from transportation incidents and homicides, all United States, 2003-2016.
- ii. Source: Bureau of Labor Statistics online query system at <http://data.bls.gov/cgi-bin/dsrv?fi>
- iii. Liberty Mutual Research Institute for Safety [2013]. 2013 Liberty Mutual Workplace Safety Index.
- iv. Salminen S, Lähdeniemi E [2002]. Risk factors in work-related traffic. *Transportation Research Part F* 5(1):77-86
- v. NIOSH Center for Motor Vehicle Safety Strategic Plan for Research and Prevention, 2014-2018, at: <https://www.cdc.gov/niosh/docs/2014-122/pdfs/2014-122.pdf?id=10.26616/NIOSH PUB2014122>