

U.S. VEHICLE FIRE TRENDS AND PATTERNS

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Abstract

In 2003-2007, U.S. fire departments responded to an average of 287,000 vehicle fires per year. These fires caused an average of 480 civilian deaths, 1,525 civilian injuries, and \$1.3 billion in direct property damage annually. Cars, trucks and other highway vehicles (meaning a vehicle designed for highway use, not that the fire occurred on a highway) accounted for 93% of the vehicle fires and 92% of the vehicle fire deaths. Data from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual fire department experience survey are used to provide details about the types of vehicles involved in fire and the circumstances of highway vehicle fires.

Mechanical or electrical failures caused roughly three-quarters of the highway vehicle fires, but only 11% of the deaths. Collisions and overturns were factors contributing to the ignition in only 3% of the fires, but fires resulting from these incidents caused 58% of these vehicle fire deaths. Older teens and young adults are the age groups at highest risk of highway vehicle fire death and injuries. One-third (35%) of non-fatal highway vehicle fires injuries occurred when civilians attempted to fight the fire themselves.

Keywords: fire statistics, vehicle, highway, car fires, truck, bus, motorcycle.

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For more information about the National Fire Protection Association, visit www.nfpa.org or call 617-770-3000. To learn more about the One-Stop Data Shop go to www.nfpa.org/osds or call 617-984-7443.

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Executive Summary

In 2003-2007, U.S. fire departments responded to an average of 287,000 vehicle fires per year. These fires caused an average of 480 civilian deaths, 1,525 civilian injuries, and \$1.3 billion in direct property damage annually.

Details about the causes and circumstances of vehicle fires are provided by Version 5.0 of the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0). National estimates of these factors are derived from NFIRS 5.0 and NFPA's annual fire department experience survey. The statistics in the following paragraphs are annual averages for fires reported in 2003-2007.

Highway vehicles account for the vast majority of vehicle fires and associated losses.

Ninety-three percent of reported vehicle fires and 92% of vehicle fire deaths involved highway-type vehicles such as cars, trucks, buses, recreational vehicles, and motorcycles. The term "highway vehicle fires" is used to describe the type of vehicle, *not* the location of the fire. During 2003-2007, the 267,600 highway vehicles reported per year caused an average of 441 civilian deaths, 1,326 civilian fire injuries, and \$1.0 billion in direct property damage. On average, 31 highway vehicle fires were reported per hour. These fires killed one person a day. Overall, highway vehicles fires were involved in 17% of reported U.S. fires, 12% of U.S. fire deaths, 8% of U.S. civilian fire injuries, and 9% of the direct property damage from reported fires.

According to the U.S. Federal Highway Administration data, roughly 2,980 billion miles were driven, on average, per year on U.S. roads during this period. Roughly 90 highway vehicle fires and 0.15 highway vehicle fire deaths were reported per billion miles driven.

Some form of mechanical failure or malfunction, such as leaks or breaks, backfires, or worn-out parts, contributed to 49% of the highway vehicle fires and 11% of the associated deaths. Electrical failures or malfunctions contributed to 23% of the highway vehicle fires but less than 1% of the associated deaths. Although collisions or overturns were factors in only 3% of the fires, 58% of the deaths resulted from these incidents. Older vehicles were more likely to have a fire caused by mechanical or electrical failures.

Eight percent of the highway vehicle fires were intentionally set. More than half (54%) of these intentional fires originated in the operator or passenger area

Almost two-thirds (64%) of the highway vehicle fires began in the engine, running gear, or wheel area. Thirty-five percent of the associated civilian fire deaths, 46% of the civilian fire injuries, and 53% of the direct property damage resulted from fires that originated in this type of area. Only 2% of the highway vehicle fires started in the fuel tank or fuel line area but these fires caused 18% of the associated deaths.

Although only 14% of the U.S. population was between 15 and 24 in 2003-2007, 25% of the people killed in highway vehicle fires during these years were in this age group, giving them a risk of vehicle fire death nearly twice that of the general population. This group also had the highest risk of vehicle fire injury. Seventy-eight percent of the people who died from highway vehicle fires and 79% of those who were non-fatally injured were male.

One-third (35%) of non-fatal highway vehicle fires injuries occurred when civilians attempted to fight the fire themselves.

NFPA survey shows that vehicle fires hit a new low in 2008.

NFPA's annual fire department survey, based on fire department reports about the number of responses they made, provides estimates of how many fires were reported. The survey does not collect details about causes and circumstances. Because it is designed as a statistical sample, however, projections can be made about totals of broad types of fires and associated losses.

During 2008, U.S. fire departments responded to an estimated 236,000 fires involving vehicles of all types, including highway and other non-road vehicles such as water vessels, aircraft, construction, yard, and agricultural vehicles. These fires caused an estimated 365 civilian deaths, 1,065 civilian injuries, and \$1.5 billion in direct property damage. Vehicle fires, as well as civilian deaths and injuries caused directly by these fires, were at their lowest point in 2008 since NFPA began tracking vehicle fires and losses with its current methods.

In 2008, an estimated 207,000 highway vehicle fires caused 350 civilian fire deaths, 850 civilian fire injuries, and \$1.2 billion in direct property damage. From 1980 to 2008, these fires fell a cumulative 55%, and have been hitting new lows every year since 2002. Civilian deaths from highway vehicle fires fell 4% from 365 in 2007 to 350 in 2008, two consecutive years of record lows. Civilian injuries in highway vehicle fires fell 43% from 1,500 in 2007 to 850 in 2008. From 1980 to 2008, these injuries fell a cumulative 70%. Direct property damage, adjusted for inflation, rose 4%.

AAA and NFPA offer the following safety tips for highway vehicle fire safety:

- Have your vehicles inspected at least annually by a trained, professional technician.
- Watch for fluid leaks under vehicles, cracked or blistered hoses, or wiring that is loose, has exposed metal or has cracked insulation. Have any of these conditions inspected and repaired as soon as possible.
- Be alert to changes in the way your vehicle sounds when running, or to a visible plume of exhaust coming from the tailpipe. A louder than usual exhaust tone, smoke coming from the tailpipe or a backfiring exhaust could mean problems or damage to the high-temperature exhaust and emission control system on the vehicle. Have vehicles inspected and repaired as soon as possible if exhaust or emission control problems are suspected.
- Avoid smoking. If you must smoke, use your vehicle ashtray.
- Drive according to posted speed limits and other traffic rules. Remain alert to changing road conditions at all times.

If a fire occurs:

- **Stop** – If possible, pull to the side of the road and turn off the ignition. Pulling to the side makes it possible for everyone to get out of the vehicle safely. Turn off the ignition to shut off the electric current and stop the flow of gasoline. Put the vehicle in park or set the emergency brake; you

don't want the vehicle to move after you leave it. Keep the hood closed because more oxygen can make the fire larger.

- **Get Out** – Make sure everyone gets out of the vehicle. Then move at least 100 feet away. Keep traffic in mind and keep everyone together. There is not only danger from the fire, but also from other vehicles moving in the area.
- **Call for Help** – Call 9-1-1 or the emergency number for your local fire department. Firefighters are specially trained to combat vehicle fires. Never return to the vehicle to attempt to fight the fire yourself. Vehicle fires can be tricky, even for firefighters.

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Vehicle Fires in the U.S. in 2003-2007

U.S. fire departments responded to an average of 287,000 vehicle fires per year in 2003-2007. These fires caused an average of 480 civilian deaths, 1,525 civilian injuries, and \$1.3 billion in direct property damage.

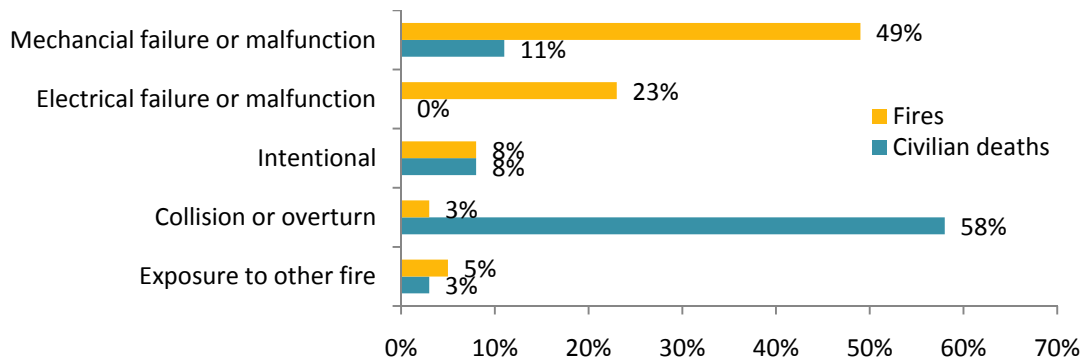
- Highway vehicles¹ accounted for 267,600 (93%) of the reported vehicle fires and 441 (92%) of the associated deaths.
- Aircraft fires accounted for less than 1% of the vehicle fires, but 6% of the associated deaths.
 - The majority of aircraft fire deaths (4% of all vehicle fire deaths) resulted from fires in personal, business, or utility aircraft.
 - Aircraft fires were the only type of vehicle fires with more civilian deaths than civilian injuries.

Highway Vehicle Fires

Overall, highway vehicle fires were involved in 17% of reported U.S. fires, 12% of U.S. fire deaths, 8% of U.S. civilian fire injuries, and 9% of the direct property damage from reported fires.

- On average, 31 highway vehicle fires were reported per hour. These fires killed one person a day.

2003-2007 Highway Vehicle Fires and Deaths by Fire Causal Factors



- Mechanical or electrical failures or malfunctions were factors in roughly three-quarters of the highway vehicle fires.
- Collisions and overturns were factors in only 3% of highway vehicle fires, but these incidents accounted for 58% of the associated deaths.

¹ Highway vehicles include cars, trucks, recreational vehicles, motorcycles, and other vehicles intended for road use. "Highway vehicle fire" describes the type of vehicle. It does not mean the fire occurred on a highway.