NFPA RESEARCH

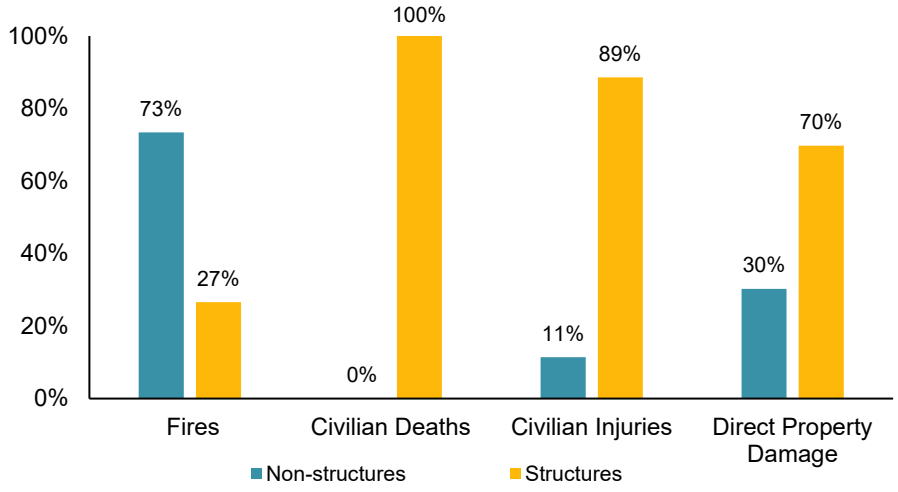
Playing with Fire: Non-Structure Fires

Richard Campbell
May 2021

Overview: Fires Caused by Playing with Fire

Municipal fire departments responded to an estimated annual average of 30,460 fires caused by playing with fire in 2014–2018. These fires resulted in an estimated 50 deaths, 510 injuries, and $205 million in direct property damage each year. The vast majority of these fires were incidents that did not involve structures, including outside or unclassified fires, outside trash or rubbish fires, and vehicle fires. Structure fires accounted for the largest shares of the losses, including all of the deaths, nearly three-quarters of the fires caused by playing with fire were non-structure fires, as shown in Figure 1. Additional information is available in Table 1 in the accompanying tables document.

Figure 1. Fires Caused by Playing with Fire by Incident Type: 2014–2018 Annual Averages



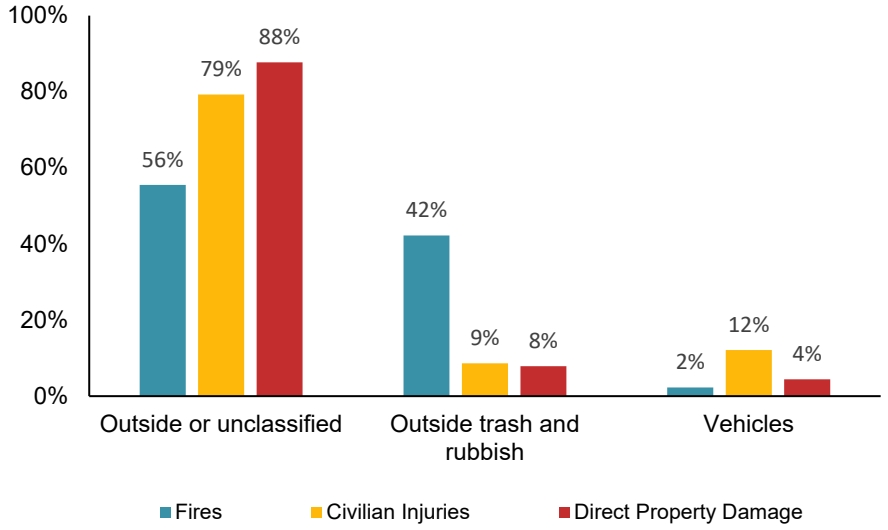
Non-Structure Fires Caused by Playing with Fire: 2014–2018

This report examines **non-structure fires** caused by playing with fire. Structure fires caused by fire play are examined in a separate report.

In the five-year period from 2014–2018, playing with fire was the cause of an estimated 22,350 non-structure fires each year. These fires resulted in an estimated 60 civilian injuries and $62 million in direct property damage each year.

Nearly three in five of the non-structure fires and even greater shares of the losses involved outside or unclassified fires, as shown in Figure 2. Outside trash or rubbish fires accounted for just over two in five fires, but those fires resulted in much smaller shares of the injuries and direct property damage. Vehicle fires caused by playing with fire accounted for just 2 percent of the non-structure fires, but they caused 12 percent of the injuries.

Figure 2. Non-Structure Fires Caused by Playing with Fire by Incident Type: 2014–2018 Annual Averages



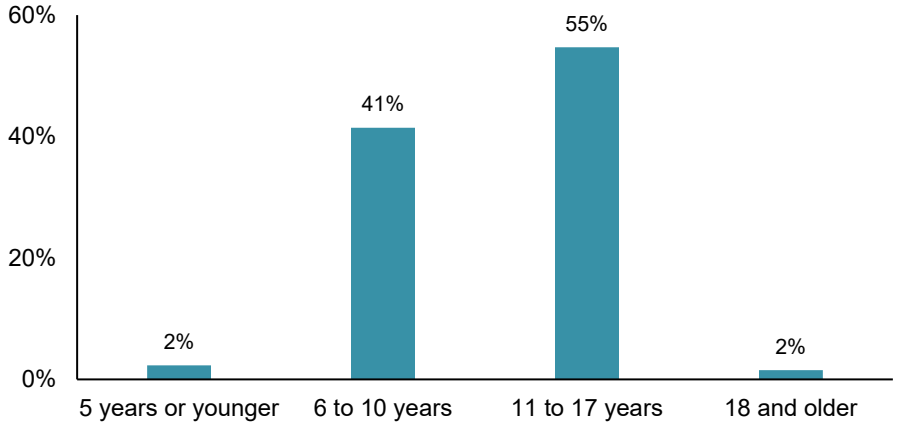
I. Outside or Unclassified Fires Caused by Playing with Fire

Outside or unclassified fires caused by playing with fire resulted in an estimated 50 civilian injuries and $54 million in direct property damage each year in the five-year period from 2014–2018.

Age and Sex of Fire Setters

Males were the fire setters in nine out of ten of the outside or unclassified fires caused by playing with fire. Over half (55 percent) of the fire setters were 11 to 17 years old, as shown in Figure 3. Just 2 percent of the fire setters were 5 years old or younger. The age distribution of fire setters in outside and unclassified fires differs substantially from home structure fires caused by playing with fire, where 36 percent of fires were set by children 5 years old or younger and one-fifth were aged 11 to 17 years. The older ages of fire setters in fires outside the home is likely to reflect the greater independence of older children and opportunities to spend more time outside the home.

Figure 3. Outside and Unclassified Fires Caused by Playing with Fire by Age of Fire Setter: 2014–2018 Annual Averages

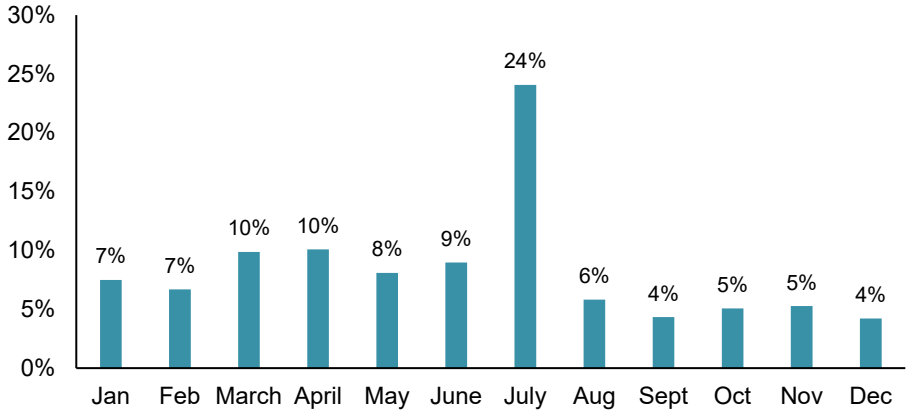


Outside and Unclassified Fires Caused by Playing with Fire by Month

One-quarter (24 percent) of the outside and unclassified fires caused by playing with fire occurred in July, which coincides with school vacation for most fire setters. However, the other summer months of August and September experienced far fewer fires caused by fire play, so the magnitude of the July peak merits further exploration.

These fires were less common from October through December, as shown in Figure 4.

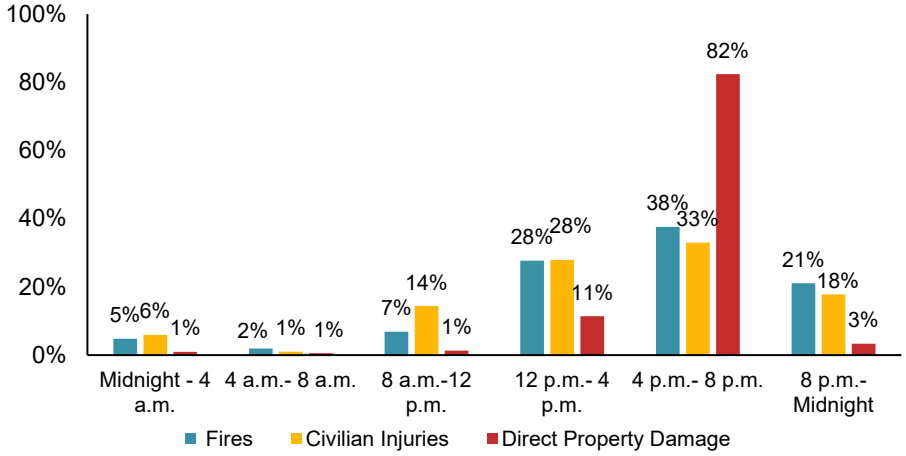
Figure 4. Outside and Unclassified Fires Caused by Playing with Fire by Month: 2014–2018 Annual Averages



Outside and Unclassified Fires Caused by Playing with Fire by Time of Day

Approximately two in five of these fires occurred in the eight-hour period from 4 p.m. to 8 p.m., and they accounted for the greatest share of direct property damage, as shown in Figure 5. Half of the remaining fires occurred in the hours from 12 p.m. to 4 p.m. (28 percent) or 8 p.m. to midnight (21 percent). Only a small share of the fires occurred in the overnight hours from midnight to 8 a.m.

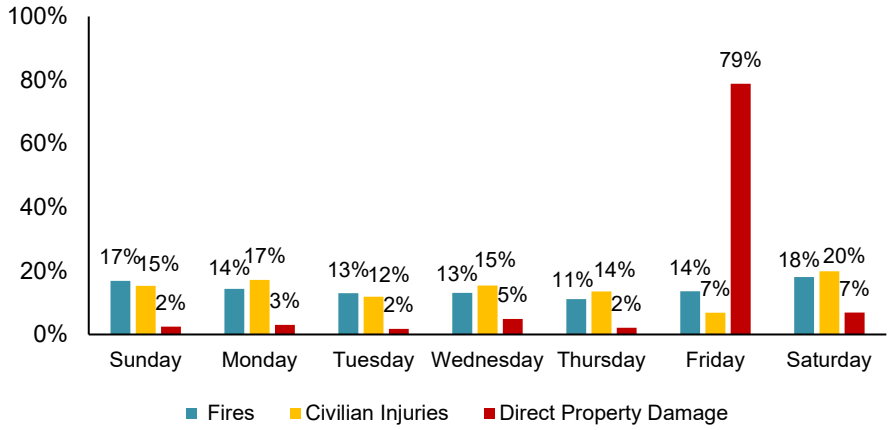
Figure 5. Outside and Unclassified Fires Caused by Playing with Fire by Time of Day: 2014–2018 Annual Averages



Outside and Unclassified Fires Caused by Playing with Fire by Day of Week

Slightly more than one-third of the outdoor and unclassified fires started by playing with fire occurred on the weekend (18 percent on Saturday and 17 percent on Sunday), with little variation among the remaining days of the week. See Figure 6.

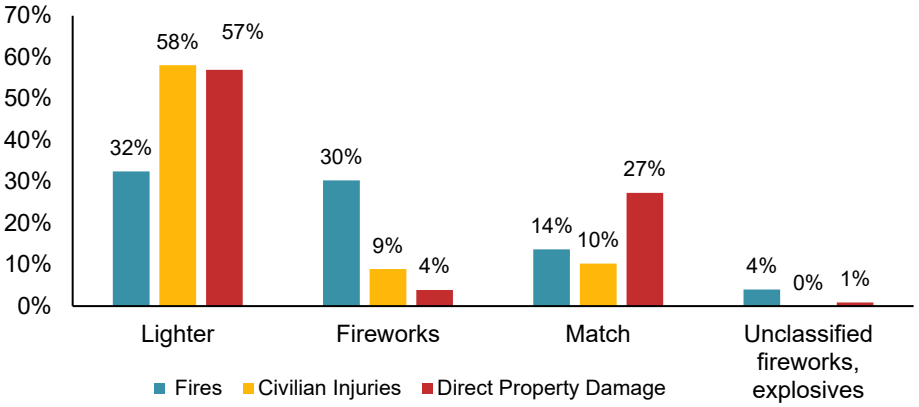
Figure 6. Outside and Unclassified Fires Caused by Playing with Fire by Day of Week: 2014–2018 Annual Averages



Outside and Unclassified Fires Caused by Playing with Fire by Heat Source

Most of the outdoor and unclassified fires caused by playing with fire were ignited by lighters, matches, or some type of fireworks or explosives, as indicated in Figure 7. The fires that were ignited by lighters were responsible for disproportionately large shares of the injuries and direct property damage. Fires ignited by matches also caused a substantial share of direct property damage.

Figure 7. Outside and Unclassified Fires Caused by Playing with Fire by Heat Source: 2014–2018 Annual Averages



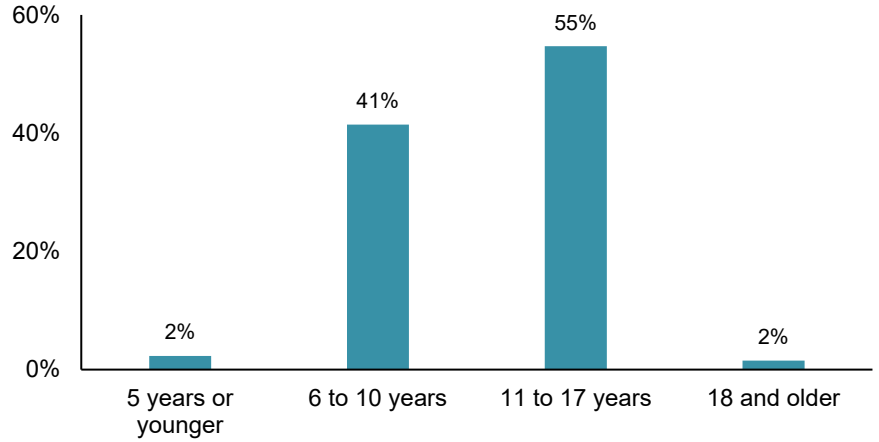
II. Outside Trash or Rubbish Fires Caused by Playing with Fire

There were an estimated 9,440 outside trash or rubbish fires each year in the five-year period from 2014–2018 that were caused by playing with fire. These fires resulted in an estimated five civilian injuries and direct property damage of $5 million each year. There were no reported fatalities.

Age and Sex of Fire Setters

Most fire setters (88 percent) of outside trash or rubbish fires caused by playing with fire were males. As shown in Figure 8, the age distribution of fire setters was similar to that of outside and unclassified fires. Most fire setters were 11 to 17 years old (55 percent) or 6 to 10 years old (41 percent).

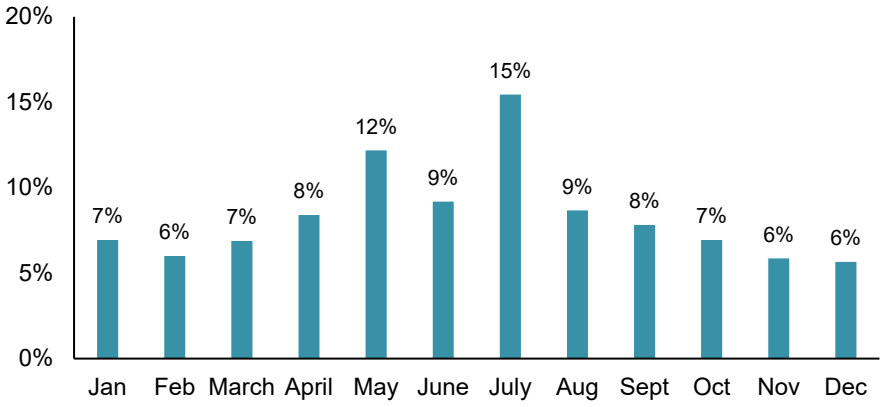
Figure 8. Outside Trash or Rubbish Fires Caused by Playing with Fire by Age of Fire Setter: 2014–2018 Annual Averages



Outside and Trash or Rubbish Fires Caused by Playing with Fire by Month

As with outside and unclassified fires, July was the peak month for outside trash or rubbish fires started by playing with fire, accounting for 15 percent of the annual total. Other than the month of May, which accounted for 12 percent of the fires, outside and trash and rubbish fires in all the remaining months ranged from 6 to 9 percent of the annual total, as shown in Figure 9.

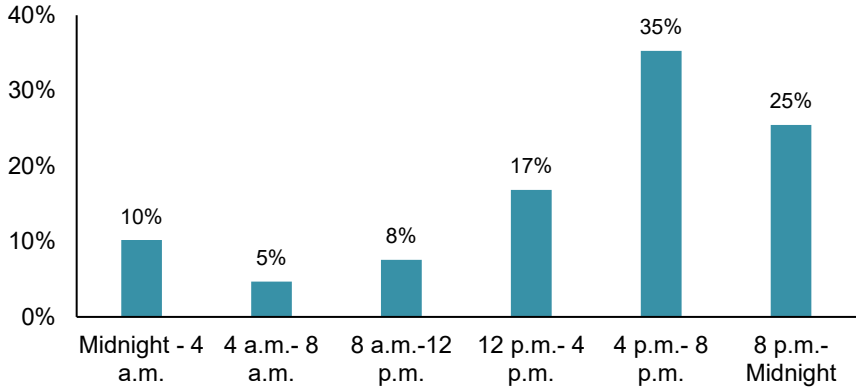
Figure 9. Outside Trash or Rubbish Fires Caused by Playing with Fire by Month: 2014–2018 Annual Averages



Outside Trash or Rubbish Fires Caused by Playing with Fire by Time of Day

Outside trash or rubbish fires caused by playing with fire most often occurred between 4 p.m. and midnight, as indicated in Figure 10. As expected, fires caused by fire play were least likely to occur between 4 a.m. and 8 a.m.

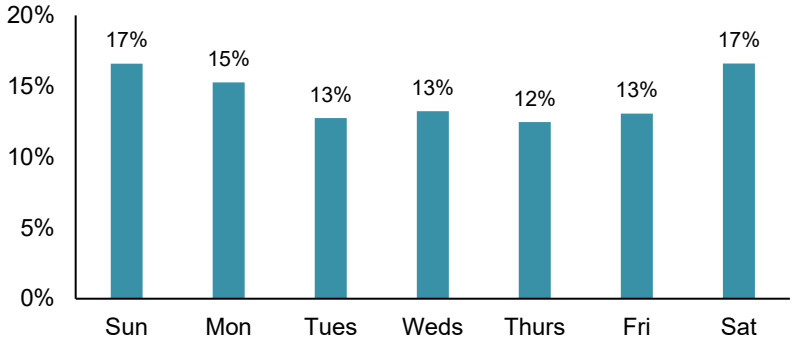
Figure 10. Outside Trash or Rubbish Fires Caused by Playing with Fire by Time of Day, 2014–2018 Annual Averages



Outside Trash or Rubbish Fires Caused by Playing with Fire by Day of the Week

Outside trash or rubbish fires caused by playing with fire were somewhat more likely to occur on weekends, accounting for approximately one-third of the fires. There was little variation in the distribution of these fires during the remaining days of the week.

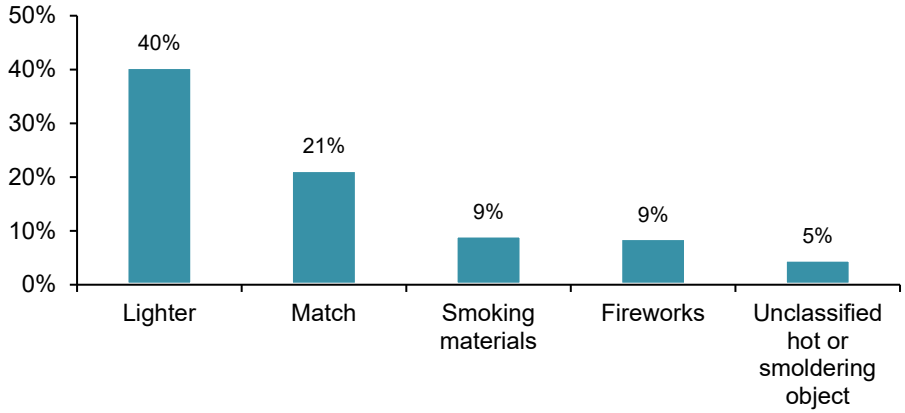
Figure 11. Outside Trash or Rubbish Fires Caused by Playing with Fire by Day of Week: 2014–2018 Annual Averages



Outside Trash or Rubbish Fires Caused by Playing with Fire by Heat Source

Outside trash or rubbish fires caused by playing with fire were most often ignited by lighters or matches, which together served as the heat source in three of five of the fires. Smoking materials and fireworks each accounted for almost one in ten fires, as shown in Figure 12.

Figure 12. Outside Trash or Rubbish Fires Caused by Playing with Fire by Heat Source: 2014–2018 Annual Averages



III. Vehicle Fires Caused by Playing with Fire

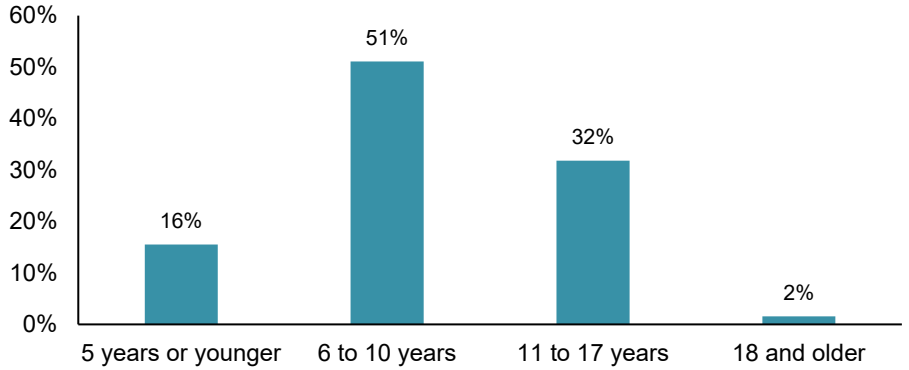
Playing with fire was the cause of an estimated 510 vehicle fires per year in the five-year period from 2014 through 2018. These fires resulted in an estimated 10 civilian injuries and $3 million in direct property damage each year. No fatalities were reported as a result of these fires.

Age and Sex of Fire Setters

As with other fire incidents caused by playing with fire, males were the fire setters in the vast majority (88 percent) of the vehicle fires involving fire play.

Children in the youngest age groups were more likely to be the fire setters in vehicle fires than in outside fires. Just over half of the vehicle fires (51 percent) were started by children 6 to 10 years old, while two in five outdoor fires were started by children in this age group. Children 5 years old or younger started 16 percent of the vehicle fires, compared to just 2 percent of fire setters in outdoor fires. It may be that vehicles were at the home, while outside fires may have taken place away from the home, where older children may have engaged in fire play.

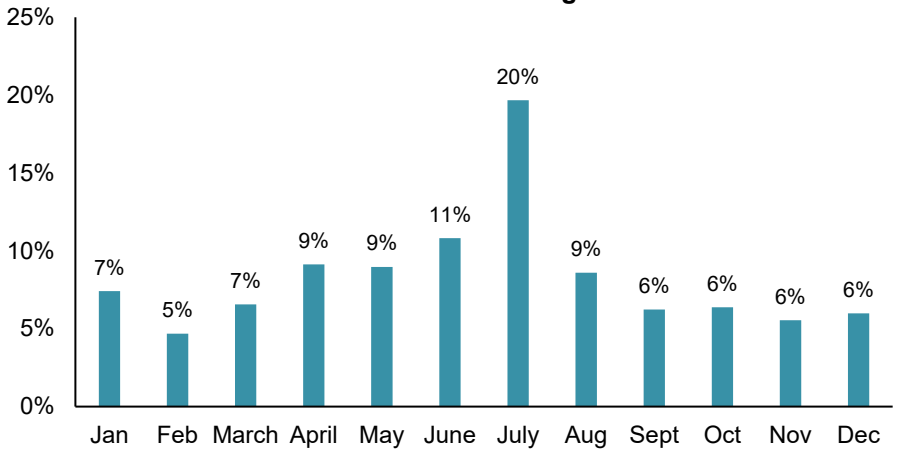
Figure 13. Vehicle Fires Caused by Playing with Fire by Age of Fire Setter: 2014–2018 Annual Averages



Vehicle Fires Caused by Playing with Fire by Month

The peak months for vehicle fires caused by playing with fire were July, with one-fifth of the fires, and June, which accounted for just over one in ten fires. Vehicle fires caused by fire play were generally lower in the colder weather months, as indicated in Figure 14.

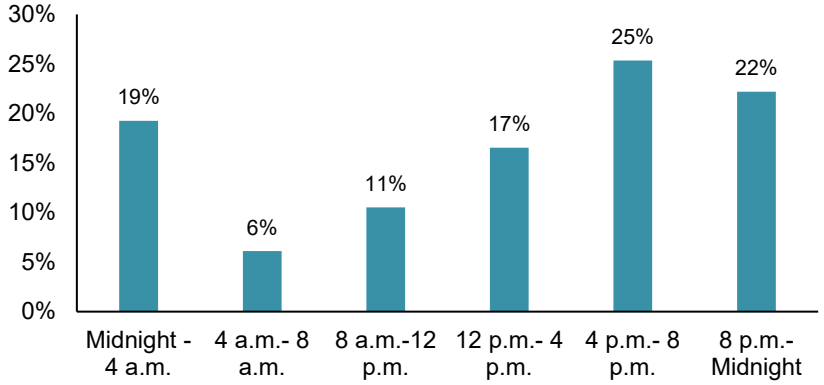
Figure 14. Vehicle Fires Caused by Playing with Fire by Month: 2014–2018 Annual Averages



Vehicle Fires Caused by Playing with Fire by Time of Day

The peak time period for vehicle fires caused by playing with fire was the four-hour period from 4 p.m. to 8 p.m., followed by the period from 8 p.m. to midnight. Only a small share of the fires occurred between 4 a.m. and 8 a.m., as shown in Figure 15.

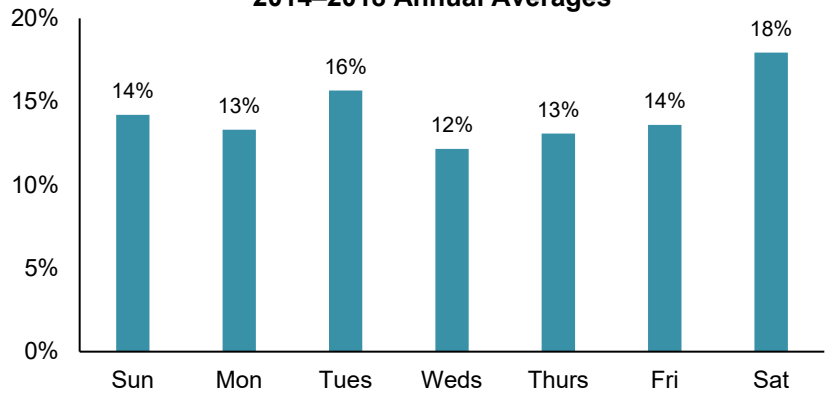
Figure 15. Vehicle Fires Caused by Playing with Fire by Time of Day: 2014–2018 Annual Averages



Vehicle Fires Caused by Playing with Fire by Day of the Week

Nearly one-fifth of the fires (18 percent) occurred on Saturdays, as shown in Figure 16. Fires during the remaining days of the week showed little variation, with Tuesdays recording 16 percent of the fires, but fires caused by fire play otherwise ranging between 12 and 14 percent of the weekly total.

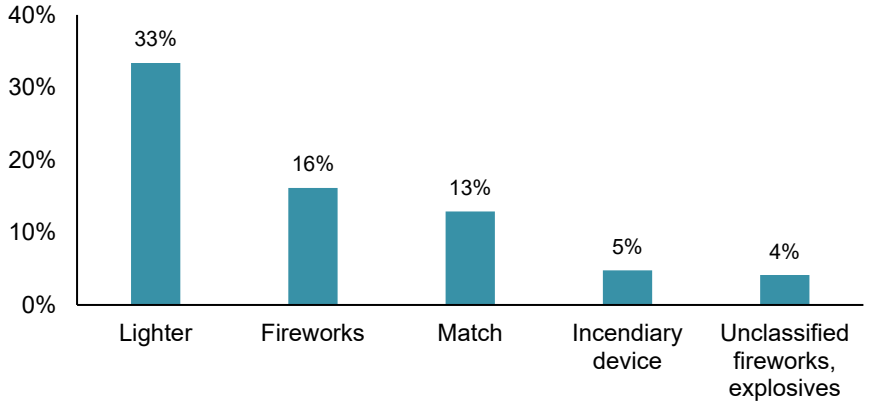
Figure 16. Vehicle Fires Caused by Playing with Fire by Day of Week: 2014–2018 Annual Averages



Vehicle Fires Caused by Playing with Fire by Heat Source

Almost half of the vehicle fires caused by playing with fire were ignited by either a lighter or a match. Fireworks and incendiary devices or explosives were the other leading heat sources for these fires. See Figure 17.

Figure 17. Vehicle Fires Caused by Playing with Fire by Heat Source: 2014–2018 Annual Averages



Safety Tips to Prevent Fires Caused by Playing with Fire

There are a number of fire safety practices that adults can follow in order to reduce the risk of fires caused by playing with fire. These include:

- Store matches and lighters out of the reach of children, preferably in a locked cabinet.
- Never use lighters or matches as a source of amusement for children since they may try to imitate such behavior.
- Only use lighters that are designed with child-resistant features.
- Teach children to tell an adult if they see matches or lighters in a readily accessible location.
- Never leave matches or lighters in a bedroom or any place children may go without permission.
- Get help if you suspect your child is unduly fascinated with fire or engages in fire play. Local fire departments, schools, or community counseling agencies ca facilitate access to train experts.

Additional information is available at *Children and Fire Safety*.

Acknowledgments

The National Fire Protection Association thanks all the fire departments and state fire authorities who participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA fire experience survey. These firefighters are the original sources of the detailed data that makes this analysis possible. Their contributions allow us to estimate the size of the fire problem.

We are also grateful to the US Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

To learn more about research at NFPA visit nfpa.org/research.

E-mail: research@nfpa.org.

NFPA No. USS17NS