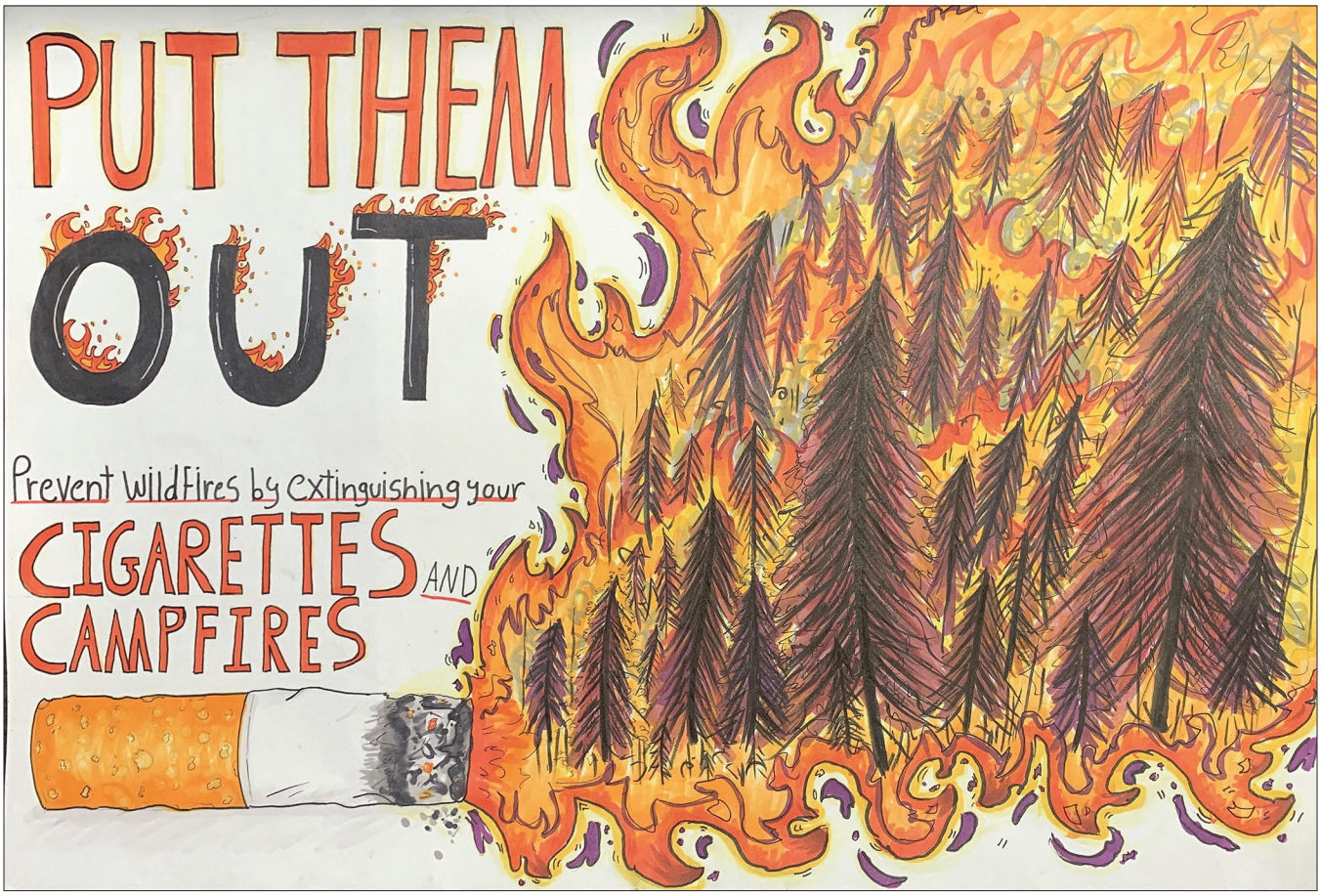
The Massachusetts Fire Problem

2019 Annual Report
Massachusetts Fire Incident Reporting System



Charles D. Baker, Governor
Karyn E. Polito, Lieutenant Governor
Thomas A. Turco, III , Secretary of Public Safety
Peter J. Ostroskey, State Fire Marshal

Department of Fire Services
Division of Fire Safety • Fire Data and Public Education Unit

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ABOUT THE COVERS

The original drawings shown on the front and back covers are the 2020 1st and 2nd place winning entries of the 38th annual statewide Arson Watch Reward Program Poster Contest, sponsored by the Massachusetts Property Insurance Underwriting Association (MPIUA), on behalf of all property and casualty insurance companies of Massachusetts. The poster theme is "Fire Prevention – Everyone/Everyday".

A countywide contest was held for all students in grades 6-8. Eight (8) out of 14 counties participated with approximately 429 posters submitted. Posters were judged, and 1st and 2nd place county winners were chosen at MPIUA by an impartial panel of judges. All 1st place county winners were entered into the Massachusetts statewide contest. The three state winners were announced in May, and were presented with their awards.

The front cover shows a drawing submitted by Emily Quinn, a student at the Plymouth South Middle School, Plymouth, Massachusetts. Emily's poster was chosen as the 1st place winner in the Plymouth County poster contest and was also automatically entered into the statewide contest, along with seven other county winners, where it was chosen as the 1st place state winner.

The back cover shows a drawing submitted by Katie Martini, a student at the Beckwith Middle School, Rehoboth, Massachusetts. Katie's poster was chosen as the 1st place winner in the Bristol County poster contest and was also automatically entered into the statewide contest, where it as chosen as the 2nd place state winner.

MPIUA has generously sponsored the printing of the 2019 Annual Report of the Massachusetts Fire Incident Reporting System (MFIRS), as well as, the use of the 1st and 2nd place posters for the covers, for the last 37 years.

Massachusetts Fire Incident Reporting System

2019 Annual Report

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This report is also available in an electronic format through the Fire Data section of the Department of Fires Services website:

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Fireman's Prayer

When I am called to duty, God
Wherever Flames may rage
Give me the strength to save some life
Whatever Be its age
Help me embrace a little child
Before it is too late
Or save an older person from
The horror of that fate
Enable me to be alert and
Hear the weakest shout
And quickly and efficiently
To put the fire out
I want to fill my calling and
To give the best in me
To guard my every neighbor
And protect their property
And if according to your will
I have to lose my life
Please bless with your protecting hand
My children and my wife

-Unknown

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Executive Summary

Our Mission: *The mission of the Department of Fire Services, through coordinated training, education, prevention, investigation, and emergency response, to provide the citizens of Massachusetts with the ability to create safer communities; to assist and support the fire service community in the protection of life and property; to promote and enhance firefighter safety; and to provide a fire service leadership presence in the Executive Office of Public Safety and Security in order to direct policy and legislation on all fire related matters.*

November 2020

This is the *2019 Annual Report of the Massachusetts Fire Incident Reporting System* (MFIRS), which summarizes the Massachusetts fire experience for 2019. It is based on the 25,176 individual fire reports submitted by members of 366 fire departments and fire districts. It is this effort that makes it possible to look at the total fire experience, to identify our fire problems and to develop strategies to address these issues. One of the goals of the Division of Fire Safety is to provide the fire service and the public with accurate and complete information about the fire experience in Massachusetts.

16,148 Structure Fires, 2,355 Vehicle Fires, 6,673 Outside & Other Fires in 2019
There were 25,176 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2019. The 16,148 structure fires, 2,355 motor vehicle fires, and 6,673 outside and other fires caused 42 civilian deaths, two fire service deaths, 248 civilian injuries, 506 fire service injuries, and an estimated dollar loss of $248.8 million in property damages.

Civilian Fire Deaths Down 5% From 2018
Forty-two (42) civilians died in 35 Massachusetts fires in 2019. Civilian deaths decreased by three, or 5%, from the 45 fire deaths in 2018. Twenty-eight (28) men, 12 women, and two children died in Massachusetts' fires. Of the 42 civilian deaths in fires in 2019, 34 occurred in residential structures. Half (50%), of civilians died at night, at home, while they were sleeping and did not have working smoke alarms or residential sprinklers. Four (4) deaths occurred in four motor vehicle fires. Two (2) people were killed in two outside fires in 2019. In 2019 there were 1.65 civilian deaths for every 1,000 fires.

Smoking Was Leading Cause of Fatal Fires in 2019
Smoking was the leading cause of fatal fires and civilian fire deaths in 2019. These fires caused seven, or 21%, of the residential civilian fire deaths. The second leading cause of residential civilian fire deaths was electrical problems, causing four deaths, or 12%, and cooking and arson were tied for third, each with three, or 9% of residential fire deaths.

2 Child Fire Deaths
Of the 42 civilian deaths in fires in 2019, two, or 5%, were children. Both siblings, aged seven, died in the same residential fire with their father.

All Fires Down in 2019
The total number of reported fires decreased by 3% from 26,038 in 2018 to 25,176 in 2019. Structure fires decreased by 2% from 2018 to 2019. From 2018 to 2019, motor vehicle fires decreased by 6%. Outside, brush, and other fires decreased by 5% during the same time period.

Although the law states that only fires where a loss is sustained must be reported, many fire departments are wisely reporting all of the fire incidents they respond to, giving a more accurate picture of the fire problem in Massachusetts. Many departments are also reporting the non-fire calls to which they respond. Emergency medical and rescue calls represent 60% of the 972,465 total responses that were reported to MFIRS in 2019. The total number of calls reported to MFIRS increased by 3,946, or less than 1% in 2019.

Cooking Was the Leading Cause of Residential Building Fires & Injuries
Seventy-three percent (73%) of all residential building fires were caused by unattended and other unsafe cooking practices in 2019. Seventy-five percent (75%) of residential fires originated in the kitchen. Cooking also caused the most fire-related civilian injuries. Cooking fires caused 56, or 23% of all 2019 civilian fire injuries and three, or 9%, of residential fire deaths in 2019.

Alarms Operated in 63% of Residential Fires
Smoke or heat alarms operated in 8,429, or 63%, of the residential building fires in 2019. There were no working alarms in 3% of these incidents. Based on information reported, smoke alarm performance was undetermined in 3,693 incidents, or 27%, of Massachusetts' 2019 residential building fires.

Alarms Operated in 52% of Building Fires that Caused Injuries
Alarms operated in 52% of the building fires that caused injuries. When an occupant is alerted to the presence of fire, they may try to extinguish it, which could result in an injury. Or, the injury may have occurred as a result of escaping after the situation worsened. When alerted to the presence of a fire, occupants should vacate the building and notify the fire department as soon as possible, letting the professionals with the proper training and gear extinguish the fire.

Arson Up Slightly
Five hundred and seventy-one (571) Massachusetts fires were considered arson in 2019. The 144 structure arsons, 64 motor vehicle arsons, and 363 outside and other arsons caused five civilian deaths, 11 civilian injuries, 12 fire service injuries, and an estimated dollar loss of $6.5 million. This is a 2% increase in arson from the 559 reported in 2018.

Structure arsons increased by 5%, motor vehicle arsons decreased by 18% from 2018 to 2019. Overall motor vehicle arsons have fallen by 99% since 1987. Outside and other arsons increased by 6%.

Firefighters Injured at 1 of Every 3 Vacant Building Fires
One of the most dangerous types of fires for firefighters in 2019 were vacant building fires. Vacant building fires accounted for 75, or 15%, of all firefighter injuries in 2019. These 75 injuries also represent 17% of the number of firefighter injuries at all structure fires. On average there was one firefighter injury for every three vacant building arsons.

Conclusion
The lack of working smoke alarms or sprinkler systems are contributing factors to these tragedies. It is important to remember that properly maintained alarms provide an early warning of a fire, and residential sprinklers provide early suppression, giving occupants the time to safely escape. It is important to make and practice an escape plan.

We would like to thank the Massachusetts Property Insurance Underwriting Association for printing this report and for their support throughout the year. We also wish to thank Governor Charles D. Baker and Public Safety and Security Secretary Thomas A. Turco III for their commitment and support to the Massachusetts fire service through the Department of Fire Services.

We also wish to recognize the efforts of the staff of the Fire Data and Public Education Unit, Cynthia Ouellette, coordinator; Derryl Dion, research analyst and Julie Bergeron, office support specialist, within the Division of Fire Safety who manage the Massachusetts Fire Incident Reporting System and prepared this report.

Peter J. Ostroskey
State Fire Marshal

Massachusetts Fire Departments

Today's firefighters do far more than fight fires. Many are emergency medical technicians or paramedics. All firefighters must be trained to offer first aid if they arrive first at an emergency. They are the first ones called to deal with hazardous materials incidents ranging from the suspected presence of carbon monoxide to a leaking propane truck. They may be called to rescue a child that fell through ice or that locked himself in the bathroom. They get people out of stuck elevators and wrecked cars. They test and maintain their equipment, ranging from self-contained breathing apparatus to hydrants to hoses and trucks. They know the basics of construction, electricity and chemistry. Some undertake the calling of fire prevention and become inspectors or public fire educators. They report their fire incidents through the Massachusetts Fire Incident Reporting System so we can spot trends, problems and successes.

When most people think of the fire department, they think of fire trucks, sirens and flames. Actually, the priority of a fire department is to prevent fires. If prevention fails, then the alarm comes in and the trucks roll.

Fire Department Enforces M.G.L. Chapter 148 and 527 CMR
Fire departments are legally required to enforce the provisions of 527 Code of Massachusetts Regulations (CMR). This contains regulation sections on fireworks, dry cleaning, oil burners, gas stations, liquid propane, plastics, transportation of flammable liquids, above ground storage tanks, electrical systems, explosives, storage of flammable substances, marine fueling, model rockets, lumber yards, bulk plants, tentage, salamanders, flammable decorations and curtains, cannon or mortar firing, fire extinguishers, smoke alarms, obstructions and hazards, combustible fibers, rubbish handling, crop ripening, pesticide storage, welding and storage, carbon monoxide, and unvented appliances. Fire departments must also enforce the laws contained in Massachusetts General Law Chapter 148.

Inspectors must know the regulations they are enforcing and they must know how to apply the regulations to situations in the community. They must communicate information about weaknesses in plans they review, educate people on violations and perform follow-up inspections. Just as firefighters are sent to the Massachusetts Firefighting Academy to learn the principles of suppression, fire prevention personnel must go to classes to learn the ins and outs of the regulations. These functions also produce a corresponding amount of documentation that is critical to be maintained.

Firefighters Teach the Community Fire and Burn Prevention
Firefighters go out in the community to teach children, seniors and interested community groups how to protect themselves from fire and burns. The statistics in this report are critical to these educators in developing injury prevention programs. As we review our reported calls it may lead to a better-rounded prevention program.

The S.A.F.E. Program

The Student Awareness of Fire Education or S.A.F.E. Program was implemented in fiscal year 1996. The Legislature appropriated $1,078,666 to fund public fire education grants. These grants provide local fire departments with funding to educate children about the dangers associated with fire, particularly fires caused by smoking. Any city or town, whose fire department is committed to working with school systems, public health or other community agencies to develop a well-conceived and coordinated fire safety education program message, is invited to apply for these grants. In fiscal year 2019, 241 fire departments shared the $1,033,821 in S.A.F.E. funding.

Freetown- Raleigh Lewis

On Wednesday, November 19, 2019, at approximately 12:05 p.m., 4-year-old Raleigh Lewis was at home with his mother, getting ready for school. Raleigh's mother was cooking him lunch and she stepped away from the kitchen to go to the other room. A short while later, Raleigh noticed smoke coming from the kitchen and calmly told his mother. The smoke alarms activated, Raleigh asked his mother to call 9-1-1 and then exiting the home to the meeting place in the front yard. Chief Gary Silvia and Lieutenant Neal Lafleur of the Freetown Fire Department are proud of Raleigh for being conscientious and calm and for using the fire safety lessons he recently learned in School.

The Senior S.A.F.E. Program

With the success of the S.A.F.E. Program, the Senior SAFE Program was implemented in fiscal year 2015. The Legislature approved and $600,000 was funded through the Fire Standard Compliant Cigarette (CFSC) Program to provide public fire education grants to improve the fire and life safety of older adults throughout the Commonwealth. The primary mission of this program is to educate older adults on how to address the unique fire and life safety risks of their age group. The Senior SAFE Program is designed to create a partnership between older adults and fire departments through established providers of senior support services such as councils on aging, senior centers, visiting nurse associations, or other similar agencies. In fiscal year 2019, 242 fire departments shared the $600,000 in Senior SAFE funding.

FF Anthony Poente, Dartmouth Fire Districts – 2019 PFALSE Educator of the Year

For 20 years, FF Anthony Poente has been providing creative, engaging fire safety education to children and the elderly in three municipalities with a combined population of about 130,000. Anthony is a career New Bedford firefighter where he is active in fire safety education and he is also the lead fire safety educator in two Dartmouth fire districts. FF Poente has a special ability to reach all age groups through spirited communication and active participation. His lectures are always colorful, educational,

and fun. When Anthony teaches fire and life safety education, he takes other firefighters with him to assist. Anthony's skill and enthusiasm helps them understand the importance of the fire and life safety educator in a department's mission. The greatest challenges faced by Anthony is the fact that he completes his fire safety education work for three separate and distinct municipalities – a large city and two suburban fire districts. School age children and the elderly within the city may face different day to day challenges not realized by the residents of their neighboring suburban fire districts. To off-set these challenges Anthony possesses the unique ability to tailor his programming and target those critical fire safety messages to the group he is addressing. Anthony's work with people of all ages has made, and will continue to make, communities on the south coast safer from fire and other perils.

167 MA Departments Receive $9.4 Million in Federal Grants

One hundred sixty-seven (167) local Massachusetts fire departments received $19.3 million in federal grants during fiscal year 2020.

The Federal Assistance to Firefighters Grant program, 167 Massachusetts fire departments received $19.3 million. One hundred fifty-five (155) departments received $14 million for fire operations and firefighter safety. Twelve (12) department received $5.2 for the purchase of firefighting vehicles. The Newton Fire Department received a combined grant of $164,863 for Operations and Safety and vehicle acquisition.

In addition, the Massachusetts Firefighting Academy at the Department of Fire Services received a grant of $400,000 for Operations and Safety. The MA Development Finance Agency received $30,184 for Operations and Safety, and the Boston Public Health Commission also received $192,817 for Operations and Safety. The North Adams Ambulance Service received $43,636 for Vehicle Acquisition.

Eleven (11) fire departments were awarded $8.4 million in Federal SAFER grants that allow for the hiring of more firefighters. Five fire departments received $317,921 for Fire Prevention and Safety grants. The National Fire Protection Association (NFPA) based in Quincy, Massachusetts received a grant $1.4 million for Fire Prevention and Safety. The Fire Protection Research Foundation in Quincy also received a Fire Prevention and Safety grant for $1.3 million.

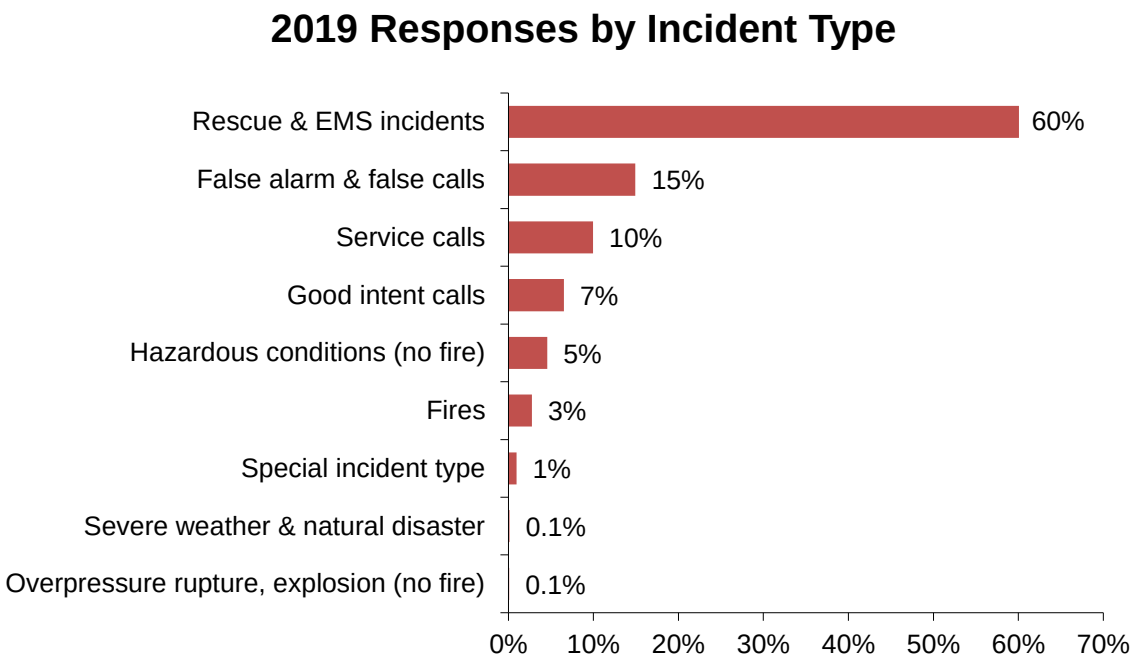
97% of Massachusetts Fire Departments Participated in MFIRS

By law, fire departments are required to report any fire or explosion resulting in a human casualty or dollar loss to the Office of the State Fire Marshal. This is done through the Massachusetts Fire Incident Reporting System (MFIRS). Three hundred and forty-seven (347), or 94.8%, of Massachusetts' fire departments reported at least one incident to MFIRS during 2019. Eight (8), or 2.2%, certified that they had no fires that met the criteria. As an added incentive to comply with the law, a community had to be participating in MFIRS to be eligible for the federal FIRE Act, SAFER grants and state S.A.F.E. funding.

Non-Fire Incidents

Fire Departments Do More than Just Fight Fires
Massachusetts fire departments do much more than just fight fires. Over the past couple of decades, they have branched out and taken on the added responsibilities for EMS responses, multiple types of specialized rescues, hazardous materials incidents, responding during and after natural disasters, as well as the typical service calls, good intent calls, false alarms and the special types of incidents that do not fit neatly into any of the other categories. These numbers have risen as more fire departments automate their reporting and have voluntarily reported all of their incidents to MFIRS.

60% of All Massachusetts Calls Were EMS Incidents
In 2019, 345 fire departments in Massachusetts reported 972,465 responses to MFIRS. Of these responses, 945,649 non-fire calls were voluntarily reported. This is 3,946 more incidents, or a less than 1% increase, from the 968,519 incidents reported in 2018.



Of these 945,649 non-fire incidents, there were 584,336 (60%) reported rescue and emergency medical services (EMS) calls; 145,283 (15%) reported false alarms or false calls; 96,699 (10%) reported service calls such as lock-outs, water or smoke problems, unauthorized burning or public service assistance; 63,390 (7%) reported good intent calls; 44,258 (5%) reported hazardous condition calls with no fire; 9,412 (1%) reported special incident type calls such as citizen complaints; 1,340 (0.1%) reported severe weather and natural disaster incidents; and 931 (0.1%) reported overpressure, rupture, explosion or overheat calls with no fire.

Twenty-six thousand eight hundred and sixteen (26,816), or 3%, of the total responses submitted by Massachusetts fire departments were fires.

Most Large Cities Voluntarily Reported All of Their Incidents
Boston, the largest city in the Commonwealth, reported 83,047 non-fire incidents in 2019. The City of Worcester, the second largest city in Massachusetts, reported the second largest number non-fire incidents in 2019 with 31,931 incidents. The next five cities in terms of the number of non-fire calls reported were: Brockton with 25,855; Springfield with 16,062 calls; Cambridge with 15,349 calls; Lowell with 15,093; and New Bedford with 14,627 reported incidents in 2019.

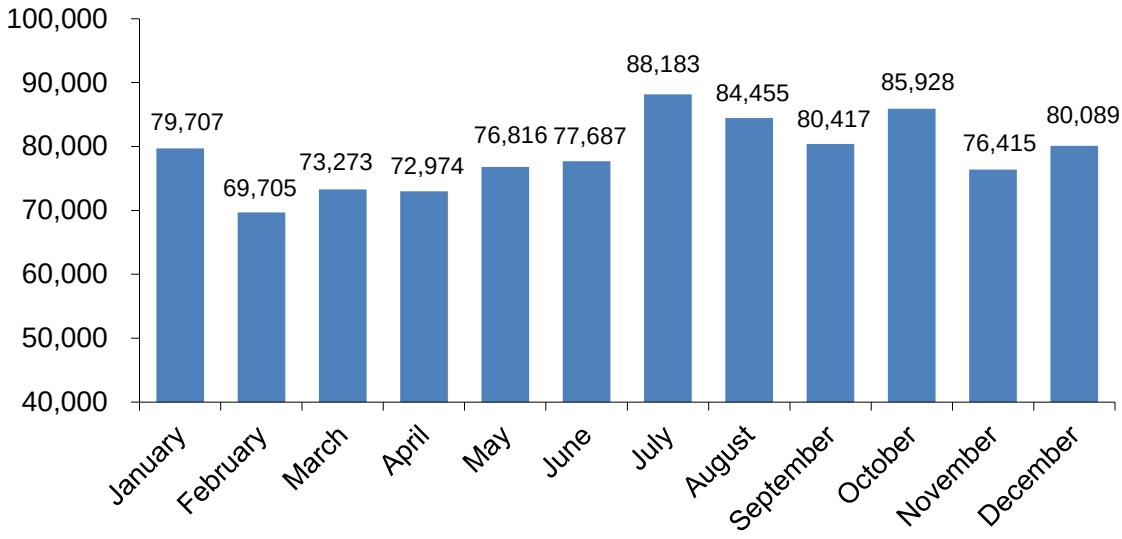
60% of All Fire Department Responses Were EMS Calls
Sixty percent (60%) of all reported 2019 fire department responses in the Commonwealth were emergency medical service calls. The top four types of all calls were all EMS type incidents. Thirty-seven percent (37%) of all reported incidents were EMS calls excluding vehicle accidents with injury. Twelve percent (12%) were calls where firefighters assisted the EMS crews. Three percent (3%) were emergency medical service, other. Three percent (3%) of all reported incidents in 2019 were motor vehicle accidents with injuries. The fifth most reported call type in 2019 was alarm system sounded, no fire - unintentional, accounting for 3% of all reported incidents.

Middlesex & Essex Counties Reported 1/3 of All Non-Fire Incidents
Middlesex and Essex Counties reported a combined 33% of all non-fire incidents to MFIRS in 2019. Middlesex County reported 22% of these types of incidents and Essex County reported 11%. Norfolk County submitted the third most non-fire calls, totaling 11% of all the 2019 non-fire incidents. Nantucket County reported 0.3% non-fire incidents and Dukes County reported 0.2% of all non-fire incidents reported to MFIRS in 2019.

For a complete breakdown of non-fire incidents by incident type and county, refer to the Appendix.

Non-Fire Incidents by Month
July was the month with the most reported non-fire incidents in 2019 (9%), followed by October (9%), and August (9%). February was the month with the least reported non-fire incidents (7%). Statistically these incidents are spread evenly from month to month. Four (4) months each accounted for 9%, seven months each accounted for 8% of the incidents, and one month accounted for 7%. The average number of monthly reported non-fire incidents in 2019 was 78,804 calls.

Non-Fire Responses by Month



Aid Given & Received
In 2019, Massachusetts fire departments reported that they received mutual or automatic aid at 12,061, or 1%, of all calls. They also reported that they gave mutual, automatic or other aid to another fire department 20,895 times, or 2% of all calls.

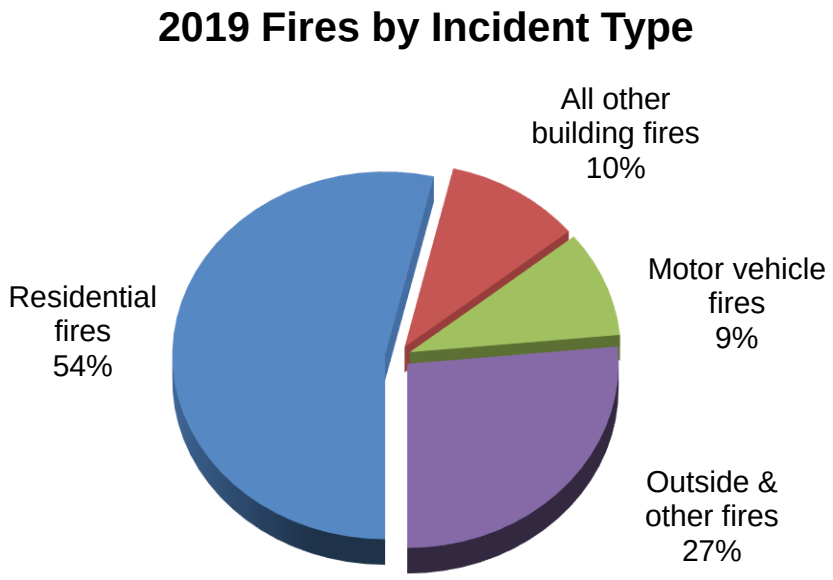
Middlesex County Fire Departments Received the Most Aid
Middlesex County fire departments reported receiving the most aid, accounting for 2,087 incidents, or 17%, of all aid received calls in 2019. These 17% of aid received calls represent 1% of their total calls. Norfolk County accounted for 15% of all aid received calls, but these calls only accounted for 2% of their total calls. Worcester County accounted for 15% of all aid received calls, but these calls only accounted for 2% of Norfolk County's total calls.

Middlesex County Gave the Most Aid
Middlesex County fire departments reported giving the most aid, accounting for 4,063 incidents, or 19%, of all aid given calls in 2019. These 4,063 calls represent 2% of all of Middlesex County's reported calls in 2019. Norfolk County accounted for 16% of all aid given calls in 2019, but these calls only accounted for 3% of their total calls. Worcester County accounted for 15% of all aid given calls, but these calls only accounted for 3% of their total calls. Barnstable County accounted for 9% of all aid given calls, but these calls only accounted for 3% of their total calls.

Fires by Incident Type

16,148 Structure Fires, 2,355 Vehicle Fires, 6,673 Outside & Other Fires in 2019
There were 25,176 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2019. The 16,148 structure fires, 2,355 motor vehicle fires, and 6,673 outside and other fires caused 42 civilian deaths, two fire service deaths, 248 civilian injuries, 506 fire service injuries, and an estimated dollar loss of $248.9 million in property damages.

The following graph depicts the percentage of the major types of fires as part of the whole Massachusetts fire problem. In 2019, 64% of all reported fires were structure fires. The majority of fires were in people's homes. Fifty-four percent (54%) of all fires in the Commonwealth and 84% of all structure fires occurred in someone's home; only 10% of all fires, and 16% of all structure fires occurred in a type of building other than a residence. Nine percent (9%) were reported motor vehicle fires, while 27% were classified as outside and other fires.



16,148 Structure Fires, 36 Civilian Deaths & 2 Firefighter Deaths
Massachusetts fire departments reported 16,148 structure fires to the Massachusetts Fire Incident Reporting System (MFIRS) in 2019. These fires killed 36 civilians, two firefighters and caused 192 civilian injuries, 446 fire service injuries, and an estimated $220.8 million in property damage. Structure fires accounted for 64% of the total incidents and 86% of the civilian deaths in 2018. Structure fires dropped 2% from the

previous year. There were 144 structure arsons in 2018. Structure fires in the Massachusetts Fire Incident Reporting System include any fires that occur inside or on a structure.

2,355 Motor Vehicle Fires Account for 9% of Reported Fires

The 2,355 motor vehicle fires caused four civilian deaths, 34 civilian injuries, 35 fire service injuries, and an estimated $24.3 million in property damage. These incidents accounted for 9% of the reported 25,176 fires in 2019. Motor vehicle fires accounted for 4% of civilian fire deaths. Motor vehicle fires decreased by 6% from 2018. There were 64 motor vehicle arsons in 2019. According to MFIRS, a motor vehicle fire is defined as one involving a car, truck, boat, airplane, construction equipment or other mobile property that does not occur inside a structure.

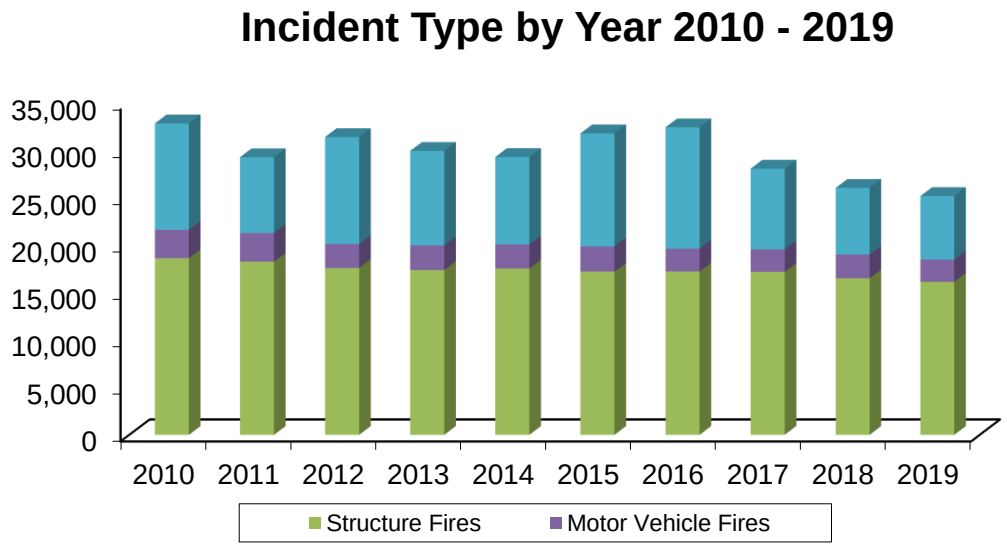
6,673 Brush, Trash, and Other Outside Fires

The 6,673 outside and other fires caused two civilian deaths, 22 civilian injuries, 25 fire service injuries, and an estimated dollar loss of $3.7 million. The 2,974 trees, grass and brush fires, 2,219 outside rubbish fires, 757 special outside fires, 31 cultivated vegetation or crop fires, and 692 other fires accounted for 27% of the total fire incidents in 2019, and 5% of the civilian fire deaths. These fires were down 5% from the 7,004 outside and other fire incidents reported in 2018. There were 363 outside and other arsons in 2019. Fire departments are required to report any fire or explosion resulting in a dollar loss or human casualty to MFIRS. Fires that do not result in a loss may be reported. Many fire departments, particularly those that submit data electronically, voluntarily report these fires. These figures should be considered an underestimate of the "no loss" fire incidents to which fire departments actually responded.

The following table indicates the total number of fires and the subsequent breakdown into structure fires, motor vehicle fires and outside and other fires for the years 2010 through 2019. The total number of fire incidents in 2019 decreased by 3% from the 26,038 incidents reported in 2018. Overall, fires have been on a slightly decreasing trend since 2008.

Year	Total Fires	Structure Fires	Vehicle Fires	Other Fires
2019	25,176	16,148	2,355	6,673
2018	26,038	16,523	2,511	7,004
2017	28,059	17,197	2,385	8,477
2016	32,408	17,241	2,399	12,768
2015	31,768	17,226	2,652	11,890
2014	29,273	17,549	2,528	9,196
2013	29,921	17,393	2,597	9,931
2012	31,362	17,618	2,511	11,233
2011	29,263	18,274	3,016	7,973
2010	32,823	18,656	2,978	11,189

The following graph depicts the same numbers in a different manner. It shows what portion of the fire problem each incident type represents. Since 2001[1], the number of structure fires steadily increased peaking in 2010, and since have been declining. During the past 10 years motor vehicle fires have steadily declined. However, the trend for outside and other fires seems to be developing a 'wave' pattern where the number of these types of fires rises or 'crests' every two to three years mostly due to the dry and hot weather patterns in the spring and summer that allow for an increased vulnerability of vegetation to brush fires. However 2019 was the second lowest reported number of brush fires since 1988 when MFIRS started to keep records[2].



Structure Fires

16,148 Structure Fires Account for 64% of Reported Fires, 86% of Fire Deaths

The 16,148 structure fires caused 36 civilian deaths, two fire service deaths, 192 civilian injuries, 446 fire service injuries, and an estimated dollar loss of $220.8 million. The average structure fire caused $13,675 in property damage. Structure fires accounted for 64% of reported fires and 86% of the civilian fire deaths in 2019.

According to the MFIRS definition, any fire occurring inside or on a structure is considered a structure fire. This includes chimney fires, cooking fires, indoor waste basket fires, fires on a back porch, exterior trim fires, and vehicle fires that occur inside a garage that

[1] 2001 was the first year of MFIRS v5.0.

[2] This is not a false positive as 2019 had the most incidents ever reported to MFIRS – 972,694 total incidents reported.

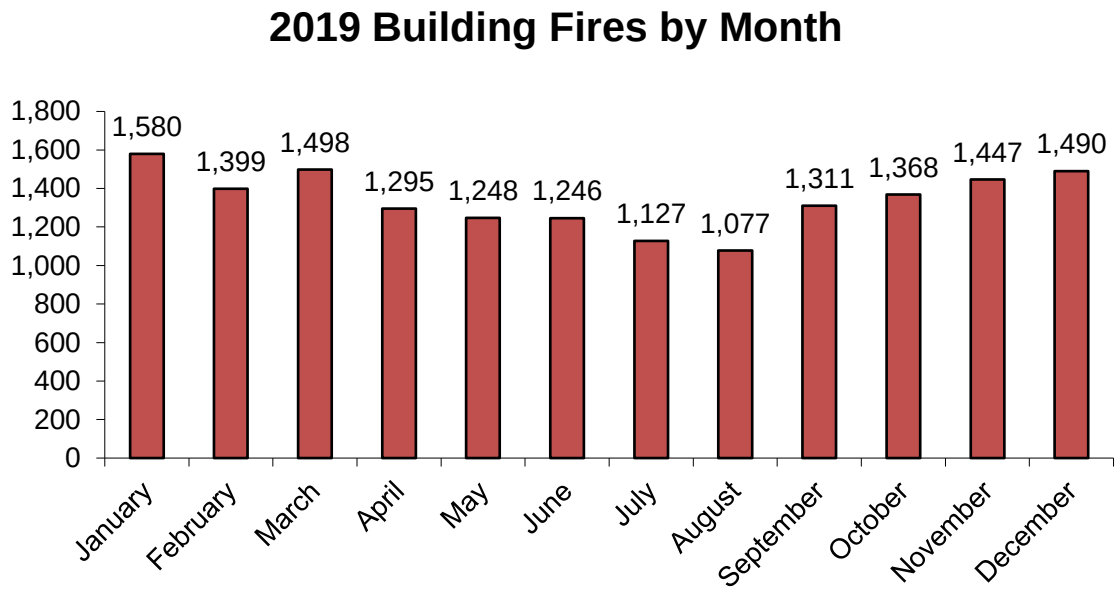
extend beyond the vehicle. The number of structure fires decreased by 375, or 2%, from the 16,523 reported in 2018.

Building Fires

Most, but not all structure fires occur in buildings. It is important to distinguish between the two because many structures that are not buildings, like bridges, tunnels, and towers, do not have the same fire prevention and alarm devices that many buildings are required to have, and their inclusion in this discussion could skew the figures.

There were 16,086 building fires of different types in Massachusetts in 2019. These 16,086 building fires accounted for 99.6% of all structure fires in Massachusetts.

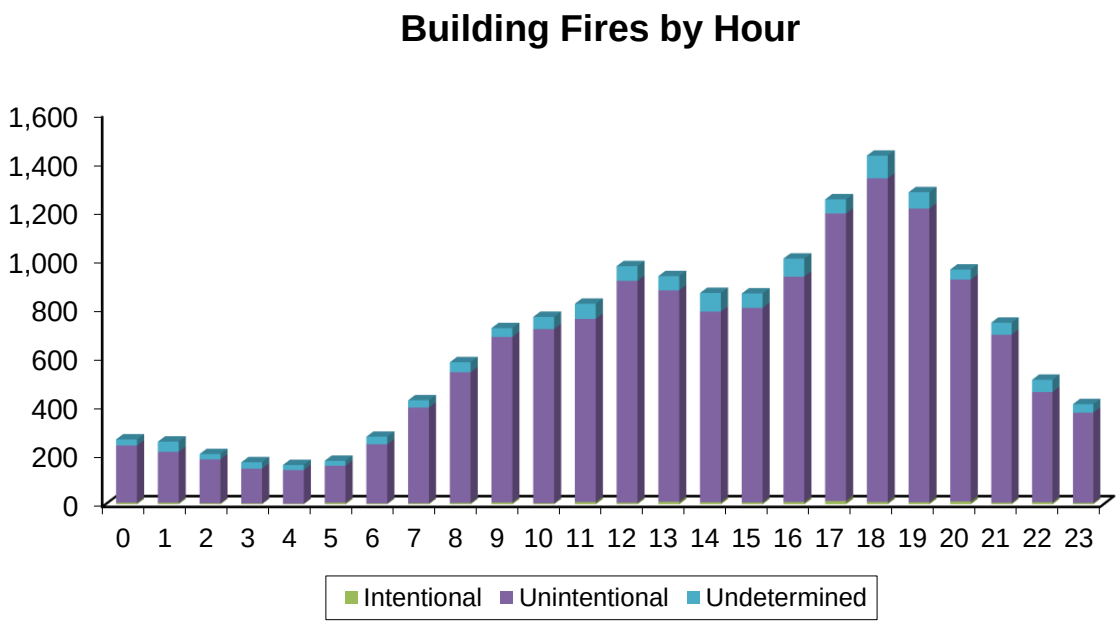
Building Fires Most Common in Colder Months
Heating equipment is the second leading cause of building fires. It is not surprising that January was the peak month for these incidents in 2019. March ranked second and December had the third largest number of building fires. The warmer months had significantly fewer building fires. The fewest fires occurred in August, and July had the second lowest frequency of these incidents; June had the third lowest number of building fires in 2019.



Building Fires Most Common Around Dinner Time
Cooking is the leading cause of building fires. Predictably, building fires occurred most often around dinnertime. Intentionally set building fires were most common between 4:00 p.m. and 8:00 p.m. Unintentional building fires reached their lowest point between 3:00

a.m. and 5:00 a.m. and increased fairly steadily to a peak between 5:00 p.m. and 7:00 p.m.

This graph shows fire frequency by time of day on the 24-hour clock for building arsons, unintentional building fires and building fires of undetermined origin. A fire is considered arson when the ignition factor is incendiary or suspicious. Midnight to 1:00 a.m. is represented by 0, 1:00 a.m. to 2:00 a.m. is represented by 1, etc.



84% of Building Fires Occurred in Residential Occupancies

Eighty-four percent (84%) of the state's 16,086 building fires, 34 of the 35 civilian building fire deaths and both firefighter deaths occurred in residential occupancies. The following table shows the number of building fires, civilian deaths, civilian injuries, fire service injuries, estimated dollar loss and the percentage of total building fires for each occupancy group. Institutional properties are those used for purposes such as medical or other treatment of persons suffering from physical or mental illness, disease, or infirmity; for the care of infants, convalescents, or aged persons; and for penal or corrective purposes. Industrial facilities, utilities, defense facilities, laboratories, agricultural and mining facilities are considered basic industries. Special properties include buildings such as outbuildings, bus stop shelters and toll booths.

Cambridge Building Fire Has Most Injuries

- On January 14, 2019, at 5:41 a.m., the Cambridge Fire Department was called to undetermined fire in an apartment building that was under construction. Thirty-seven (37) firefighters were injured at this fire. Alarms were present and operated. The building did not have sprinklers. Damages from this fire were estimated to be $1.2 million.

- On April 17, 2019, at 10:35 a.m., the Haverhill Fire Department was called to a chemical fire in a chemical processing plant. Twenty-five (25) firefighters were injured at this fire. Most of them were for exposure to chemicals. Alarms were present and alerted the occupants. An automated extinguishing system was present, but it was not reported how it operated. Damages from this fire were estimated at $40,000.

BUILDING FIRES BY OCCUPANCY TYPE

Occupancy	# of Fires	% of Total	Injuries FF	Injuries Civ	Deaths FF	Deaths Civ	Dollar Loss	Avg. Dollar Loss
Public assembly	700	4%	11	4	0	0	$10,277,997	$14,683
Educational	276	2%	11	2	0	0	2,699,464	9,781
Institutional	447	3%	1	6	0	0	335,173	750
Residential	**13,514**	**84%**	**356**	**164**	**2**	**34**	**158,074,492**	**11,697**
1- & 2-Family homes	*4,481*	*28%*	*180*	*82*	*1*	*21*	*93,224,660*	*20,804*
Apartments	*6,591*	*41%*	*167*	*78*	*1*	*12*	*62,082,418*	*9,419*
All other residential	*2,442*	*15%*	*9*	*4*	*0*	*1*	*2,767,414*	*1,133*
Mercantile, business	671	4%	25	2	0	1	12,498,931	19,840
Basic industry	48	0.3%	2	6	0	0	870,500	15,545
Manufact., processing	84	1%	25	3	0	0	26,200,414	249,528
Storage properties	201	1%	11	3	0	0	7,446,125	33,693
Special properties	134	1%	3	1	0	0	528,406	5,232
Unclassified	36	0.1%	0	0	0	0	1,131,900	31,442
Total	**16,086**	**100%**	**445**	**191**	**2**	**35**	**$220,063,402**	**$13,680**

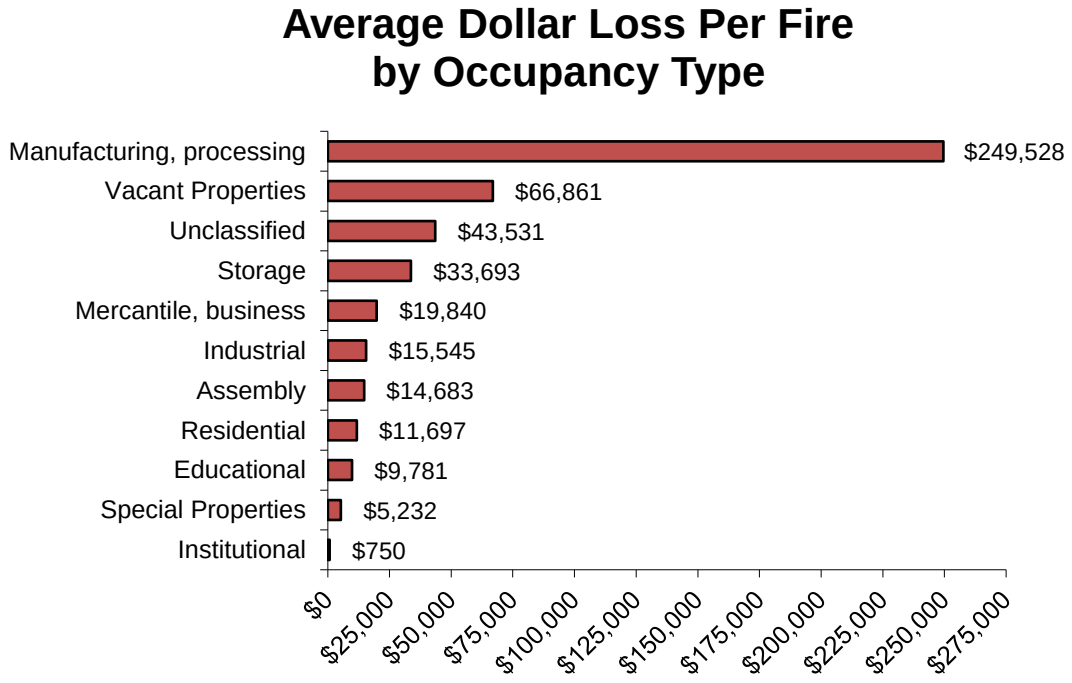
Occupancy Group Definitions

- **Public assembly**: This category includes amusement and recreation places such as bowling alleys, skating rinks, ballrooms, gymnasiums, arenas, stadiums, playgrounds, churches, funeral parlors, clubs, libraries, museums, courtrooms, restaurants, taverns, passenger terminals, theatres and studios.
- **Educational**: This category includes classrooms from nursery school through college, and trade and business schools. Dormitories are considered residential.
- **Institutional**: This category includes institutions that care for the aged, the young, the sick or injured, the physically restrained, the physically inconvenienced and the mentally handicapped.
- **Residential**: This occupancy group includes one- and two-family homes, apartments, rooming, boarding or lodging houses, dormitories, hotels, motels and home hotels, and residential board and care facilities. Seasonal homes are included here.
- **Mercantile, business**: Retail establishments, service stations, laundries, offices, banks, medical offices and post offices are included in this category.
- **Basic industry**: This category includes nucleonics, energy production plants, laboratories, communications facilities, defense facilities, document facilities, utility and energy distribution systems, agriculture, forests, hunting and fishing, mining, and manufacturing of mineral products such as glass, clay or cement.

- **Manufacturing, processing**: Manufacturing that is not listed under Basic Industry is listed here.
- **Storage property**: This category includes warehouses, barns, garages and tool sheds.
- **Special property**: This category includes, dumps, sanitary landfills, recycling collection points, outbuildings, bus stop shelters, phone booths, bridges, roads, railroad properties, outdoor properties, water areas, aircraft areas and equipment operating areas outbuildings.

Manufacturing Facilities Have Highest Average Dollar Loss per Fire

Manufacturing or processing facilities had the highest dollar loss per fire for any property type in 2019. In 2019, the average dollar loss for a building fire at a manufacturing facility property was $249,528. This is a 520% increase over the 2018 average dollar loss per fire at $40,255 per fire[3]. Vacant properties[4] had the second highest dollar loss per fire for any property type. In 2019, the average dollar loss for a vacant property fire was $66,861. Usually vacant properties have the highest dollar loss per fire of any property type.



[3] In 2019, $25.1 million, or 11% of all structure fire dollar loss was from 2 fires in Manufacturing or processing.

[4] Vacant property is not an occupancy type. Any property use can be a vacant property if certain conditions are met. It is included here with the other property use categories to illustrate how dangerous and destructive fires in these types of buildings can be.

2019 Massachusetts Building Fires by Property Use

MFIRS Code	Property Use	# of Building Fires
	Assembly	**700**
100	Assembly, other	42
110	Fixed use recreation places, other	4
111	Bowling alley	2
113	Electronic amusement center	2
114	Ice rink: indoor, outdoor	2
116	Swimming facility: indoor or outdoor	3
120	Variable use amusement, recreation places	4
121	Ballroom, gymnasium	4
122	Convention center, exhibition hall	1
123	Stadium, arena	3
124	Playground	6
129	Amusement center: indoor/outdoor	2
130	Places of worship, funeral parlors	6
131	Church, mosque, synagogue, temple, chapel	73
134	Funeral parlor	1
140	Clubs, other	11
141	Athletic/health club	16
142	Clubhouse	8
143	Yacht Club	2
144	Casino, gambling clubs	1
150	Public or government, other	15
151	Library	3
152	Museum	4
155	Courthouse	4
160	Eating, drinking places	40
161	Restaurant or cafeteria	400
162	Bar or nightclub	10
170	Passenger terminal, other	1
171	Airport passenger terminal	2
173	Bus station	3
174	Rapid transit station	20
180	Studio/theater, other	1
181	Live performance theater	1
182	Auditorium or concert hall	2
183	Movie theater	1

MFIRS Code	Property Use	# of Building Fires
	Educational	**276**
200	Educational, other	40
210	Schools, non-adult	25
211	Preschool	13
213	Elementary school, including kindergarten	58
215	High school/junior high school/middle school	55
241	Adult education center, college classroom	64
254	Day care, in commercial property	21
	Institutional	**447**
300	Health care, detention, & correction, other	20
311	24-hour care Nursing homes, 4 or more persons	123
321	Mental retardation/development disability facility	76
322	Alcohol or substance abuse recovery center	58
323	Asylum, mental institution	8
331	Hospital - medical or psychiatric	96
340	Clinics, Doctors offices, hemodialysis centers	7
341	Clinic, clinic-type infirmary	8
342	Doctor, dentist or oral surgeon's office	12
343	Hemodialysis unit	2
361	Jail, prison (not juvenile)	17
363	Reformatory, juvenile detention center	10
365	Police station	10
	Residential	**13,514**
400	Residential, other	913
419	1 or 2 family dwelling	4,481
429	Multifamily dwellings	6,591
439	Boarding/rooming house, residential hotels	541
449	Hotel/motel, commercial	190
459	Residential board and care	204
460	Dormitory type residence, other	474
462	Sorority house, fraternity house	26
464	Barracks, dormitory	94
	Mercantile, Business	**630**
500	Mercantile, business, other	124
511	Convenience store	25
519	Food and beverage sales, grocery store	141
529	Textile, wearing apparel sales	4
539	Household goods, sales, repairs	11
549	Specialty shop	22
557	Personal service, including barber & beauty shops	16
559	Recreational, hobby, home repair sales, pet store	3

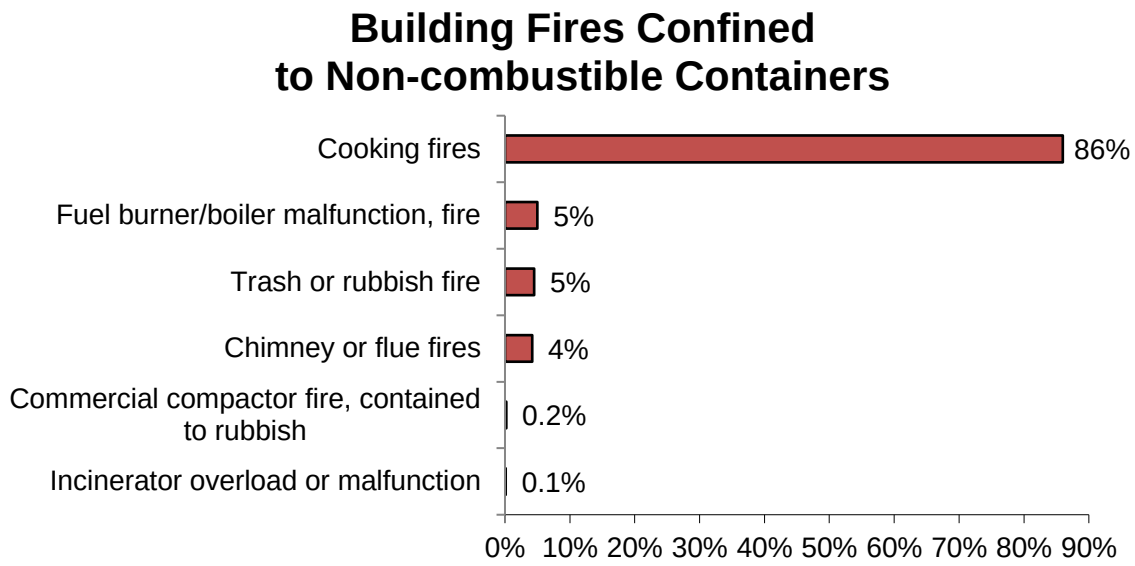
MFIRS Code	Property Use	# of Building Fires
564	Laundry, dry cleaning	50
569	Professional supplies, services	6
571	Service station, gas station	21
579	Motor vehicle or boat sales, services, repair	28
580	General retail, other	22
581	Department or discount store	9
592	Bank	15
593	Office: veterinary or research	4
599	Business office	129
	Industrial, Utility, Defense, Agriculture, Mining	**56**
600	Utility, defense, agriculture, mining, other	6
610	Energy production plant, other	2
614	Steam or heat generating plant	3
615	Electric generating plant	3
629	Laboratory or science laboratory	20
631	Defense, military installation	1
635	Computer center	1
639	Communications center	2
640	Utility or Distribution system, other	3
642	Electrical distribution	2
645	Flammable liquid distribution, pipeline, flammable	1
647	Water utility	1
648	Sanitation utility	7
655	Crops or orchard	1
659	Livestock production	2
669	Forest, timberland, woodland	1
	Manufacturing, Processing	**105**
700	Manufacturing, processing	105
	Storage	**221**
800	Storage, other	15
807	Outside material storage area	5
808	Outbuilding or shed	84
819	Livestock, poultry storage	11
880	Vehicle storage, other	11
881	Parking garage, (detached residential garage)	32
882	Parking garage, general vehicle	18
888	Fire station	5
891	Warehouse	35
899	Residential or self storage units	5

MFIRS Code	Property Use	# of Building Fires
	Outside or Special Property	**101**
900	Outside or special property, other	15
919	Dump, sanitary landfill	4
921	Bridge, trestle	1
922	Tunnel	1
926	Outbuilding, protective shelter	5
931	Open land or field	12
936	Vacant lot	2
937	Beach	1
938	Graded and cared-for plots of land	2
940	Water area, other	1
946	Lake, river, stream	1
951	Railroad right of way	1
952	Railroad yard	1
960	Street, other	17
962	Residential street, road or residential driveway	15
963	Street or road in commercial area	6
965	Vehicle parking area	14
981	Construction site	2
	Unclassified	**36**
NNN	None	9
UUU	Undetermined	1
000	Property Use, other	26
	Total Building Fires	**16,086**

80% of Building Fires Are Confined to Non-Combustible Containers

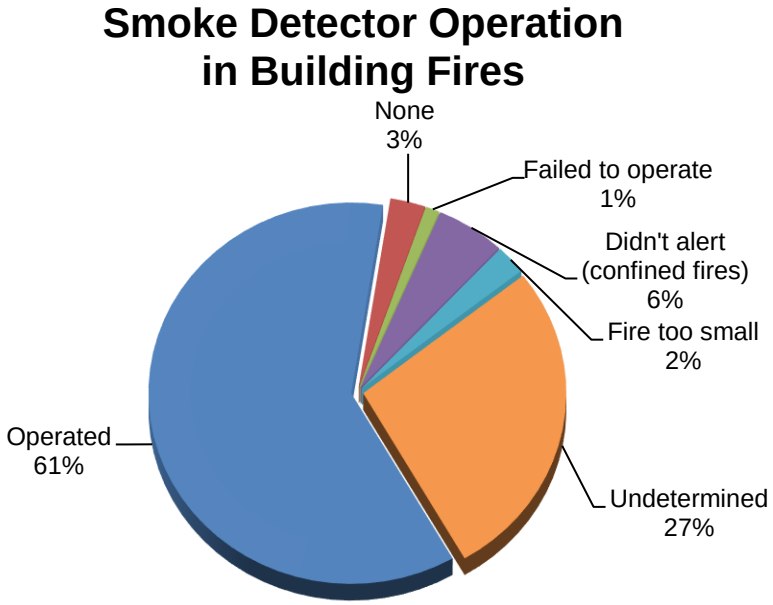
Twelve thousand eight hundred and nine (12,809), or 80%, of all building fires were reported as confined to non-combustible containers in 2019. Confined building fires decreased by 178 incidents, or 1%, from the 12,987 reported in 2018.

Incident Type	# of Incidents	% All Building Fires	% Confined to Non-combustible containers
Cooking fires	11,015	68%	86%
Chimney or flue fires	537	3%	4%
Incinerator overload or malfunction	15	0.1%	0.1%
Fuel burner/boiler malfunction, fire	640	4%	5%
Commercial compactor fire, contained to rubbish	25	0.2%	0.2%
Trash or rubbish fire	577	4%	5%
Total	12,809	80%	100%



Detectors Operated in 61% of Building Fires

Smoke or heat detectors operated in 9,787, or 61%, of the building fires in 2019. In 6% of these fires[5], the detectors did not alert the occupants. Detectors were present but did not operate in 1% of these incidents. In 3% of these fires, no detectors were present at all. The fire was too small to trigger the detector in 2% of the fires. Smoke detector performance was undetermined in 4,383 incidents, or 27%, of the building fires in 2019.



[5] These represent confined fires where it was reported that the detector did not alert the occupants.

The following table shows detector performance by occupancy type for building fires.

DETECTOR PERFORMANCE

	Operated	Failed to Operate	Didn't Alert (Conf.)	Fire Too Small	None	Unknown	Total
Public assembly	427	4	42	29	16	182	700
Educational	176	5	23	10	5	57	276
Institutional	327	2	16	13	4	85	447
Residential	8,429	162	720	298	212	3,693	13,514
Mercantile, business	310	6	35	29	41	209	630
Basic industry	30	1	2	2	8	13	56
Manufacturing	39	1	7	11	18	29	105
Storage properties	30	0	6	6	128	51	221
Special properties	4	0	28	0	16	53	101
Unclassified	15	0	4	0	4	11	36
Total	**9,787**	**181**	**885**	**398**	**452**	**4,383**	**16,086**

$20 Million Fire in Boston is Largest Loss Building Fire

- On March 16, 2019, at 3:05 p.m., the Boston Fire Department was called to a fire of undetermined cause at 1141 Bennington St., a manufacturing plant for the New England Casket Company. No one was injured at this fire. It was undetermined if alarms were present. Sprinklers were present but the fire was not in the area protected by the system. Damages from this fire were estimated to be $20 million.

North Andover Has 2nd Largest Loss Building Fire in 2019

- On August 20, 2019, at 6:32 p.m., the North Andover Fire Department was dispatched to a fire of undetermined cause in a recycling center at Thomson Brothers Industries. No one was injured at this fire. Alarms were present but failed to operate. The building did have dry pipe sprinklers but they failed to operate also. Damages from this fire were estimated to be $5.1 million.

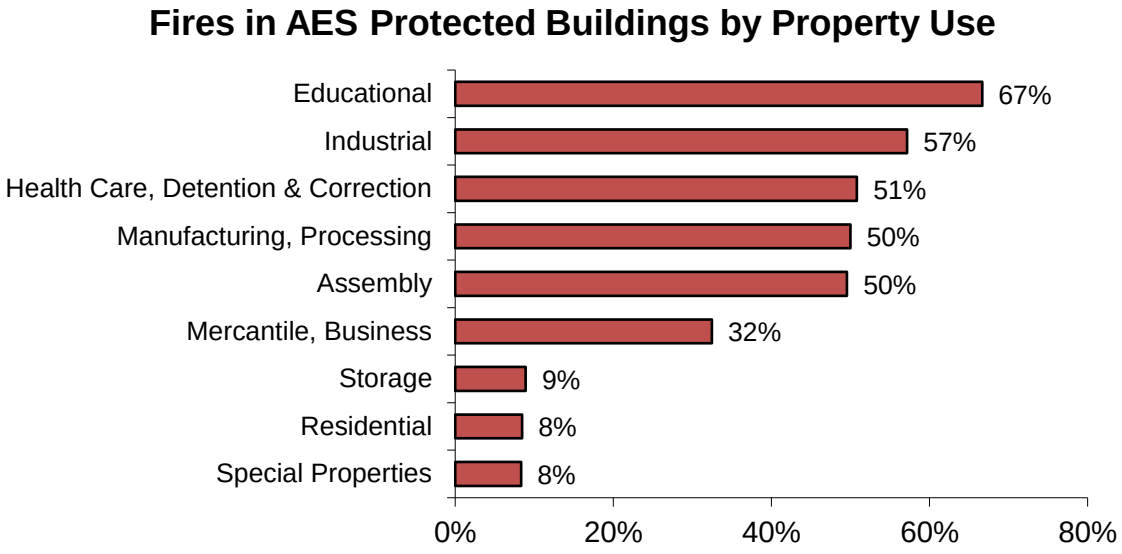
Overall, there were 34 large loss building fires reported to MFIRS in 2019 with a total combined dollar loss of $74.6 million, representing 34% of all the estimated dollar loss of Massachusetts' building fires in 2019.

16% of Unconfined Fires Occurred in Buildings with AES

Overall, 630, or 16%, of the 3,688 unconfined building fires in 2019 occurred in buildings that had automatic extinguishing systems (AES), regardless of whether the fire was large enough to activate the system. In MFIRS, an AES can be a wet or dry sprinkler system, a dry chemical system, a foam system, a halogen-type system, a CO^2 system, or some other fire suppression system.

The following chart lists the percentage of unconfined fires in buildings that were at least partially protected by an AES for that specific property use. Educational properties and

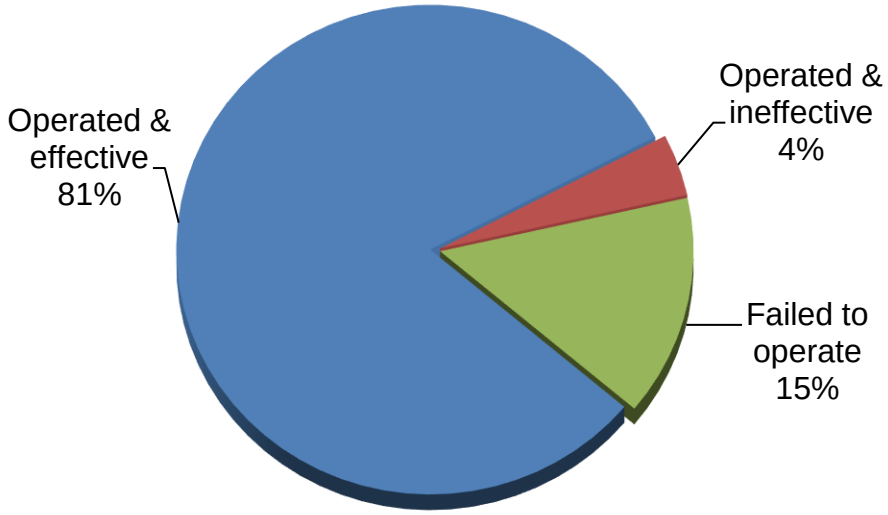
institutional properties were most likely to have an AES. Sixty-seven percent (67%) of the fires in educational properties and 57% of the fires in institutional facilities occurred in an AES protected structure. Eight percent (8%) of residential fires and another 8% of fires in special properties occurred in buildings with an automatic extinguishing system.



AES Work in 81% of Building Fires When Installed & Maintained

One hundred and seventy-one (171) building fires were in buildings protected by an automatic extinguishing system, which had a reported fire large enough for the AES to activate in Massachusetts in 2019. Of these 171 fires, the systems were effective in 139, or 81%, and ineffective in seven, or 4%, of these incidents. AES were present but failed to operate in 25, or 15%, of these 171 building fires. Some of the reasons for the automatic extinguishing system failures were reported to be: the fire was started in an area not protected by the system or the system was shut off.

AES Status in AES Protected Buildings



The table below shows AES performance by occupancy group for those incidents where AES presence and performance were reported.

AUTOMATIC EXTINGUISHING SYSTEM PERFORMANCE

	Operated	Did Not Operate	Fire Too Small	None	Unknown	Total
Assembly	24	7	24	13	3	71
Educational	6	2	23	5	1	37
Institutional	1	2	28	18	0	49
Residential	79	5	127	86	2	299
Mercantile, business	13	4	46	26	0	89
Basic industry	6	0	9	3	3	21
Manufacturing	11	4	17	11	0	43
Storage properties	5	1	9	4	0	19
Special properties	1	0	0	0	0	1
Unclassified	0	0	0	1	0	1
Total	**146**	**25**	**283**	**167**	**9**	**630**

High Rise Buildings Must be Fully Equipped with Sprinklers

Evacuating a high-rise building while fighting a raging fire is a logistical nightmare for firefighters. Automatic sprinklers make these buildings much safer for residents, office workers, visitors and firefighters. Under the provision of MGL Chapter 148, Section 26A 1/2, all existing buildings of more than 70 feet in height above the mean grade had to be retrofitted by a fully protected adequate system of automatic sprinklers by March 30,

1998. This took effect in 1988. All new high rises are required to have automatic sprinklers.

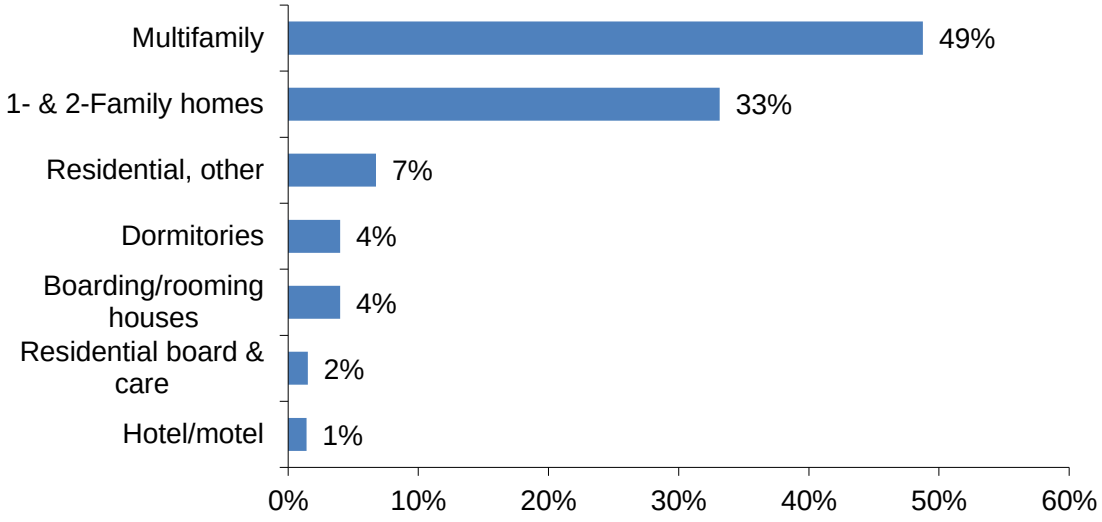
Written Permit Required from Fire Department before Disconnecting Sprinklers
Under the provisions of MGL Chapter 148, Section 27A, it is illegal to "…shut off, disconnect, obstruct, remove or destroy…any part of any sprinkler system, water main, hydrant, or other device used for fire protection…without first procuring a written permit from the head of the fire department." The head of the fire department is authorized to issue conditions necessary to provide protection from fire and the preservation of public safety. In the event of an emergency, the system may be shut down as long as the fire department head is immediately notified of the action and when the system is back in service. Violators may be punished by imprisonment for not more than one year and/or a fine of not more than $1,000.

Residential Building Fires

84% of Building Fires Occurred in Residential Occupancies
Massachusetts fire departments reported that 13,514, or 84%, of the 16,086 building fires occurred in residential occupancies. These fires caused 34 civilian deaths, two fire service deaths, 164 civilian injuries, 356 fire service injuries and an estimated dollar loss of $188.1 million. The average dollar loss per fire was $11,697. The total number of reported residential building fires decreased by 388, or less than 3%, from the 13,902 reported in 2018.

Almost 1/2 of All Residential Fires Occurred in Apartments
Almost half, or 49%, of all residential building fires in 2019 occurred in multifamily apartment buildings. Thirty-three percent (33%) of these fires happened in one- or two-family homes. Dormitories accounted for 4% of residential fires in Massachusetts. Another 4% occurred in rooming houses. Residential board and care facilities accounted for 2%, and hotels or motels accounted for 1% of the residential building fires in 2019. Seven percent (7%) of residential building fires occurred in unclassified residences.

Residential Structure Fire by Occupancy Type



The following table shows the statistics for fires, firefighter and civilian casualties and the estimated dollar loss by residential occupancy.

RESIDENTIAL BUILDING FIRES

Occupancy	# of Fires	% of Total	Injuries FF	Injuries Civ	Deaths FF	Deaths Civ	Dollar Loss
1- & 2-Family homes	4,481	33%	180	82	1	21	$93,224,660
Multifamily	6,591	49%	167	78	1	12	62,082,418
Rooming houses	541	4%	0	0	0	1	402,226
Hotels & motels	190	1%	0	0	0	0	369,385
Residential board & care	204	2%	0	0	0	0	82,004
Dormitories	594	4%	1	1	0	0	83,944
Unclassified	913	7%	8	3	0	0	1,829,855
Total	**13,514**	**100%**	**356**	**164**	**2**	**34**	**$158,074,492**

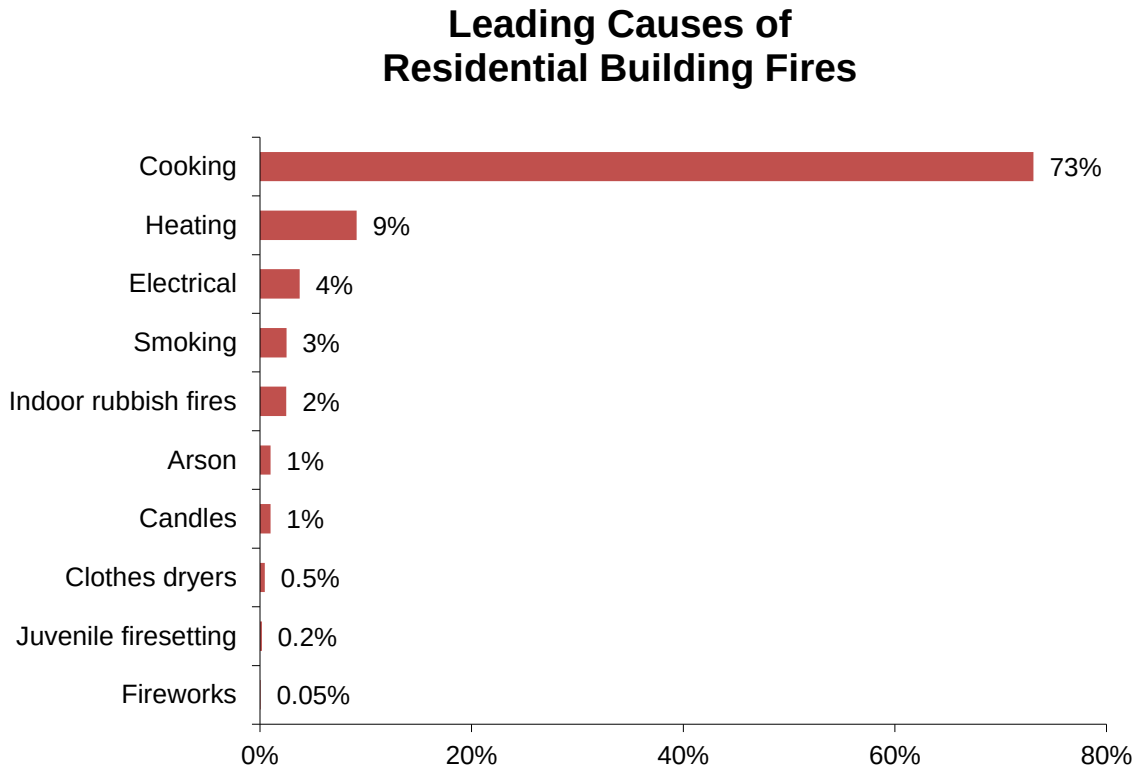
Residential Occupancy Sub-Group Definitions

- **1- & 2-Family**: This category includes one- or two-family homes, detached, manufactured homes, mobile homes and duplexes.
- **Multifamily dwellings**: This category includes apartments, condominiums, townhouses, rowhouses and tenements.
- **Boarding, rooming houses**: This category includes residential hotels and shelters.
- **Hotels, motels**: This occupancy group includes commercial hotels, motels or inns.
- **Residential board and care**: This category includes long-term care and half-way houses. Excluded are nursing facilities (Property Use code = 311).

- **Dormitories**: This category includes dormitory type residences and sorority or fraternity houses. It also includes nurses' quarters, military barracks, monasteries/convents, dormitories, bunk houses and workers' barracks.
- **Residential, other**: Any type of residential occupancy that is not defined above.

Cooking Causes Almost 3/4 of Residential Building Fires

Cooking was the leading cause of residential building fires, accounting for 9,879, or 73%, of the 13,514 incidents. Heating equipment accounted for 1,235, or 9%, of the total fires. Electrical problems caused 507, or 4%, of incidents. The unsafe use and disposal of smoking materials accounted for 339, or 3%, of these incidents. Indoor rubbish fires were the cause of 337, or 2%, of residential building fires. Arson accounted for 107, or 1%, of residential building fires. Seventy-five (75), or 1%, were caused by candles. Clothes dryer fires were the cause for 61, or 0.5%, of these incidents. Juvenile firesetting accounted for 25, or 0.2%, of residential building fires. Fireworks caused seven, accounting for 0.05% of residential fires in Massachusetts in 2019.

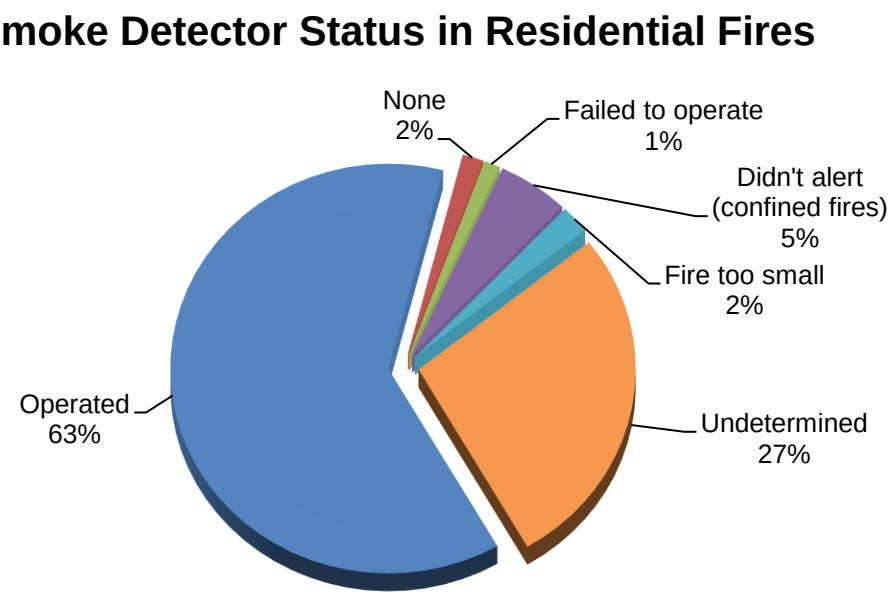


2019 MA Home Fires Confined to Non-Combustible Containers

Incident Type	# of Incidents	% Residential Fires	% Confined to Non-combustible containers	Dollar Loss	Average Dollar Loss
Cooking fires	9,573	71%	87%	$ 689,661	$ 72
Chimney or flue fires	512	4%	5%	$ 196,618	$ 384
Incinerator overload or malfunction	6	0.04%	0.05%	$ 3,500	$ 583
Fuel burner/boiler malfunction, fire	562	4%	5%	$ 238,792	$ 425
Commercial compactor fire, confined to rubbish	7	0.05%	0.1%	$ 0	$ 0
Trash or rubbish fire	321	2%	3%	$ 65,543	$ 204
Total	10,981	81%	100%	$ 1,164,114	$ 109

Alarms Operated in 63% of Fires

Smoke or heat alarms operated in 8,429, or 63%, of the residential building fires in 2019. In 5% of these fires[6], the alarms did not alert the occupants. Alarms were present but did not operate in 1% of these incidents. In 2% of these fires, no alarms were present at all. The fire was too small to trigger the alarm in 2% of the residential fires. Smoke alarm performance was undetermined in 3,693 incidents, or 27%, of Massachusetts' 2019 residential building fires.



All Houses Must Have Alarms

All houses must have smoke alarms according to either the state fire or building codes. Under the provisions of Massachusetts General Law Chapter 148, Section 26E, all

[6] These represent confined fires where it was reported that the alarm did not alert the occupants.

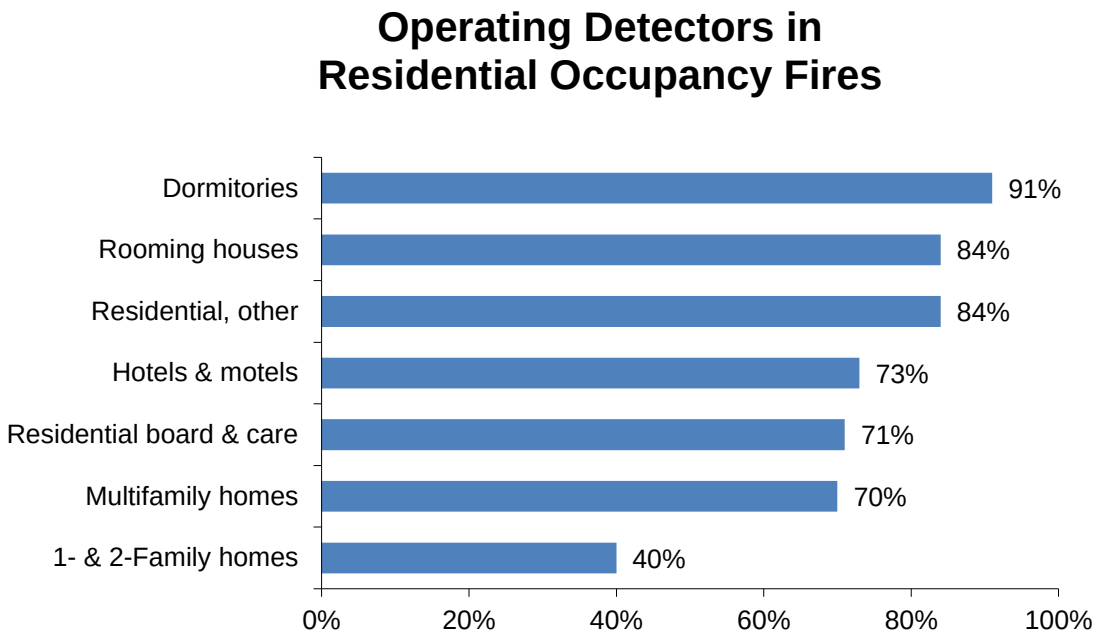
buildings containing one to five dwelling units built prior to 1975 must be equipped with approved smoke alarms. This statute took effect in March 2006. Under M.G.L. Chapter 148 Section 26F, the fire department verifies compliance with the law. The State Building code has required all new homes built since 1975 to have smoke alarms.

New Homes Must Have Alarms in Bedroom Areas
At a minimum, smoke alarms should be installed on every floor of the home and at the bottom of the basement stairwell. The Massachusetts Building Code requires smoke alarms within the bedroom area in all *new* residential occupancies. When a bedroom door is shut, it can help prevent the spread of fire from room to room. Unfortunately, a shut door also makes it harder to hear a smoke alarm sounding in the hallway. People who sleep with their bedroom door closed should install an alarm inside their bedroom. After alarms are installed, they need to be regularly tested and maintained. All it can do is sound the alarm. Everyone needs to develop and practice the escape routes they would use in the event of a fire.

Smoke Alarms That Are 10 Years Old or Older Should Be Replaced
Studies have indicated that like any other appliance in your household, smoke alarms do not last forever. The life span for a typical smoke alarm, whether it is battery-powered or hard-wired, is 10 years. Smoke alarms that are 10 years old should be replaced. The manufacture date is stamped or marked on the back of the alarm. If there is no date, the alarm should be replaced because it is already more than 10 years old. Alarms should be tested monthly and the batteries should be replaced twice a year. Alarms should be kept free of dust and never painted over.

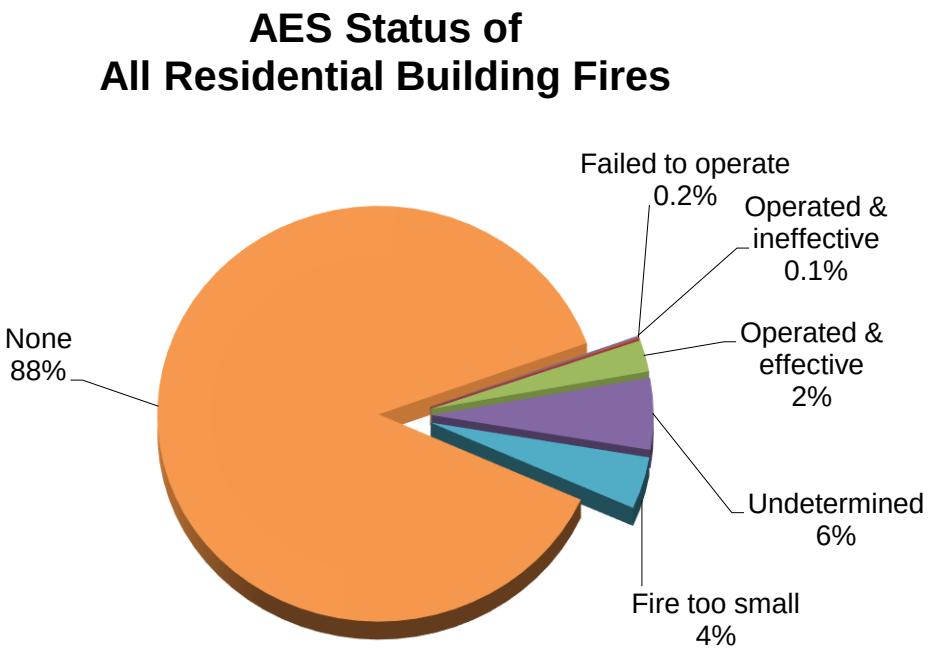
37% of Failed Alarms Had No Batteries or Dead Ones
Of the 161 fires where smoke alarms were present but failed to operate, 47, or 29%, failed because the batteries were either missing or disconnected. Thirteen (13), or 8%, did not operate because of dead batteries. Nineteen (19), or 12%, failed because of a power failure, shutoff or disconnect. Seven (7) alarms, or 4%, failed from a lack of maintenance such as not cleaning dust from the alarm or painting over the alarm. Six (6) units, or 4%, failed because they were defective. Four (4), or 2%, failed from improper installation or placement. For 65 cases, or 40%, the reason the alarm failed was not determined.

1- & 2-Family Homes Had Lowest Percentage of Operating Alarms
One- and two-family homes were the least likely residential occupancies to have operating smoke alarms. Dormitories were the most likely residential occupancy to have operating smoke alarms in 2019. Rooming houses were the second most likely residence to have working smoke alarms. Unclassified residences and hotels or motels and residential board and care facilities were the next most likely residential occupancies to have operating smoke alarms. The following chart shows the percentage of operating smoke alarms in fires in residential occupancies.



AES Present in Only 7% of Residential Building Fires
In 2019, only 3,147 residential fire incident reports completed the automatic extinguishing system field. This was 23% of all residential building fires.

In these fires where system performance was reported, automatic extinguishing systems (AES) were reported present and operated effectively in 77, or 2%, of the 3,147 residential building fires. AES were present and operated ineffectively in two, or 0.1%, of these fires. In five, or 0.2%, of the fires in residential occupancies, the system did not operate. In 127, or 4%, the fire was too small to activate the system. In 2,761, or 88%, of the cases, there were no systems present or installed. AES performance was not classified in 175, or 6%, of the incidents involving residential building fires.



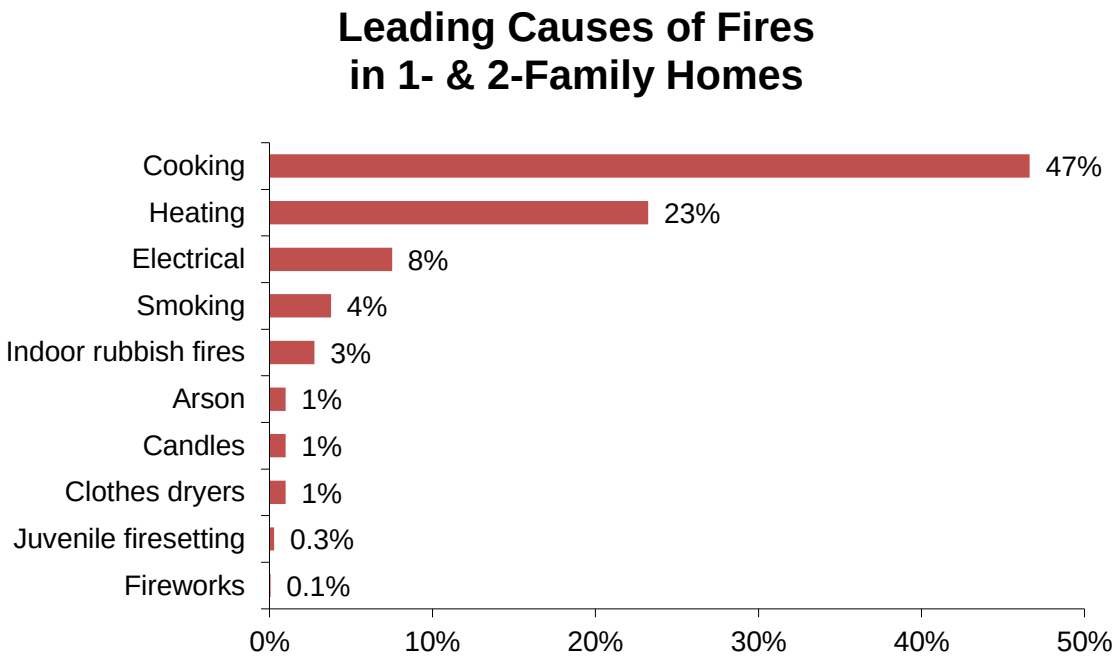
Only You Can Make Your Home Safer for You and Your Family
Efforts to reduce the incidence of fire and fire deaths must be focused on home fire safety to have the greatest impact. Increased maintenance of smoke alarms, installation of residential sprinklers, practicing home escape plans coupled with safer products such as self-extinguishing cigarettes, upholstered furniture that meets the California flammability standard, and flame resistant sleepwear for all ages can help make homes and the families who live in them safer from fire.

Fires in One- and Two-Family Homes

4,481 Fires, 21 Civilian Deaths, 1 Fire Service Death & $93.2 Million in Damage
Four thousand four hundred and eighty-one (4,481) building fires in one- and two-family homes caused 21 civilian deaths, one fire service death, 82 civilian injuries, 180 fire service injuries, and an estimated $93.2 million in property damage. In 2019, 33% of the Commonwealth's 13,514 residential building fires occurred in one- and two-family homes. The average dollar loss from these types of fires was $20,804. Fires in one- and two-family homes were down by 211, or 4%, from 4,692 in 2018.

More fire deaths occurred in one- and two-family homes than all the other residential occupancies combined.

Cooking & Heating Were the Leading Causes of Fires in 1- & 2-Family Homes
Cooking caused 47% of incidents occurring in one- and two-family homes. Heating equipment caused 23% of these fires. Eight percent (8%) of one- and two-family residential building fires were caused by electrical problems. The unsafe and improper use of smoking materials caused 4% and indoor rubbish fires caused 3% of these fires. Arson, clothes dryers, and candles each caused 1% of these fires. Juvenile-set fires and fireworks each accounted for less than 1% of the fires in one- and two-family homes in 2019.

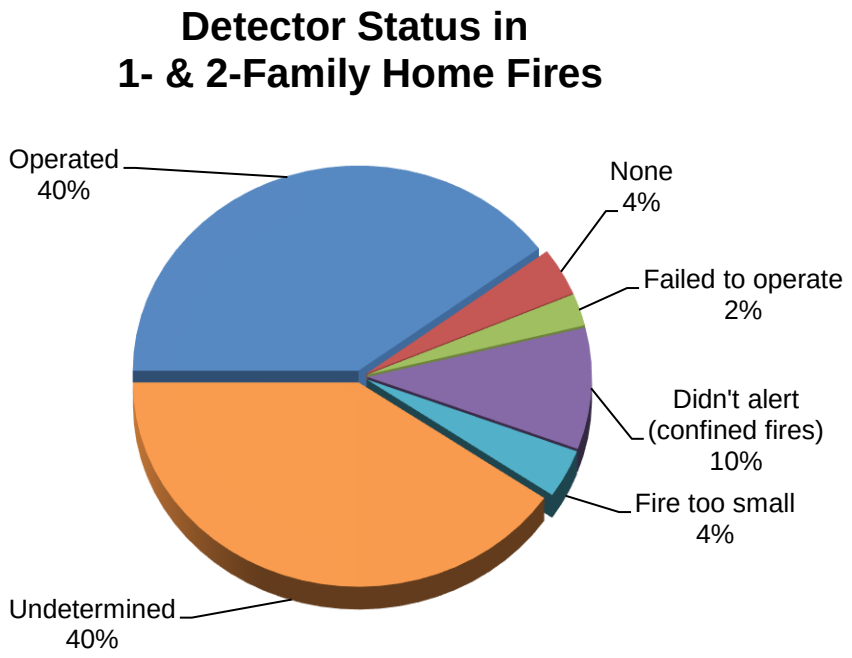


Cooking is the leading cause of fires overall in every residential occupancy.

1- & 2-Family Home Fires Confined to Non-Combustible Containers

Incident Type	# of Incidents	% 1- & 2-Family Home Fires	% Confined to Non-combustible containers	Dollar Loss	Avg. Dollar Loss
Cooking fires	1,941	43%	65%	$ 273,325	$ 141
Chimney or flue fires	487	11%	16%	$ 184,918	$ 380
Incinerator overload or malfunction	3	0.1%	0.1%	$ 0	$ 0
Fuel burner/boiler malfunction, fire	458	10%	15%	$ 196,691	$ 429
Commercial compactor fire, confined	0	0%	0%	$ 0	$ 0
Trash or rubbish fire	114	3%	4%	$ 15,112	$ 133
Total	3,003	67%	100%	$ 670,046	$ 223

Alarms Alerted Occupants in 40% of Fires
Smoke or heat alarms operated and alerted the occupants in 1,785, or 40%, of the one- and two-family home fires in 2019. In 10% of these fires[7], the alarms did not alert the occupants. Alarms were present but did not operate in 2% of these incidents. In 4% of these fires, no alarms were present at all. The fire was too small to trigger the alarm in 4% of these residential fires. Smoke alarm performance was undetermined in 1,813 incidents, or 40%, of Massachusetts' 2019 one- and two-family fires.



38% of Failed Alarms Had No Batteries or Dead Ones
Of the 114 fires where smoke alarms were present but failed to operate, 33, or 29%, failed because the batteries were either missing or disconnected. Ten (10), or 9%, did not operate because of dead batteries. Ten (10), or 9%, failed because of a power failure, shutoff or disconnect. Five (5), or 4%, failed from improper installation or placement. Four (4) alarms, or 4%, failed because they were defective. Three (3) alarms, or 3%, failed from a lack of maintenance. For 49 cases, or 43%, the reason the alarm failed was not determined.

Multifamily Home Fires

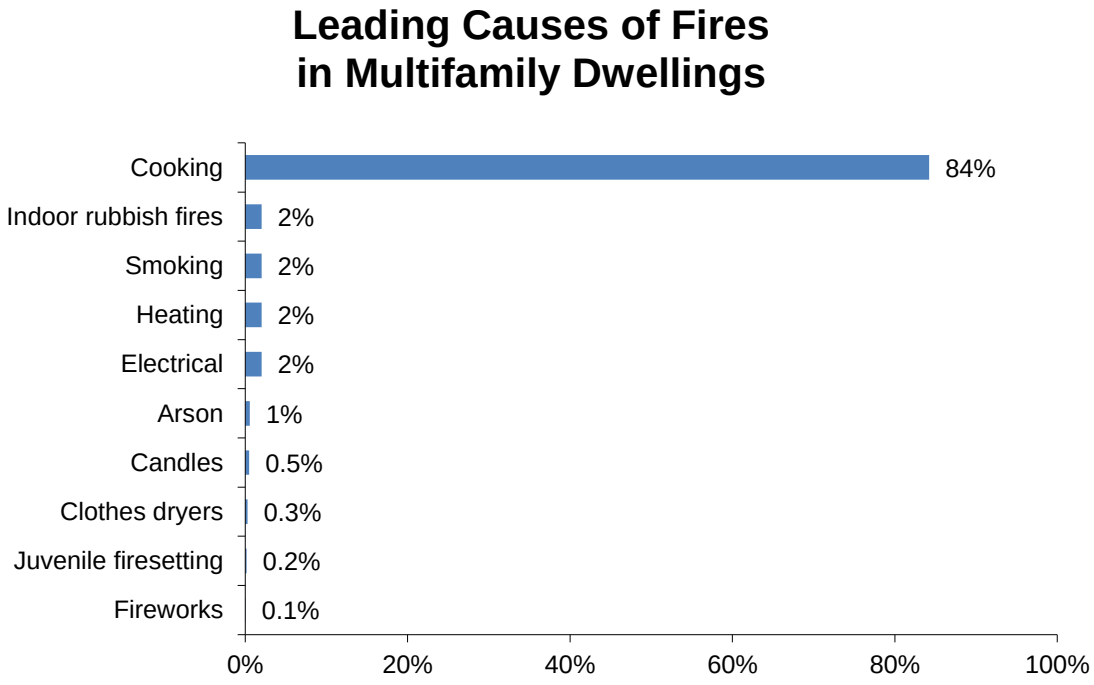
6,591 Fires, 12 Civilian Deaths, 1 Fire Service Death & $62.1 Million in Damage
Six thousand five hundred and ninety-one (6,591), or 49%, of the Commonwealth's 13,514 residential building fires occurred in multifamily dwellings in 2019. These 6,591 fires caused 12 civilian deaths, one firefighter death, 78 civilian injuries, 167 fire service

[7] These represent confined fires where it was reported that the alarm did not alert the occupants.

injuries, and an estimated dollar loss of $62.1 million. The average dollar loss per fire was $9,419. Fires in apartments were down by 278, or 4%, from 6,869 in 2018.

This residential occupancy category includes apartments, condominiums, townhouses, rowhouses and tenements.

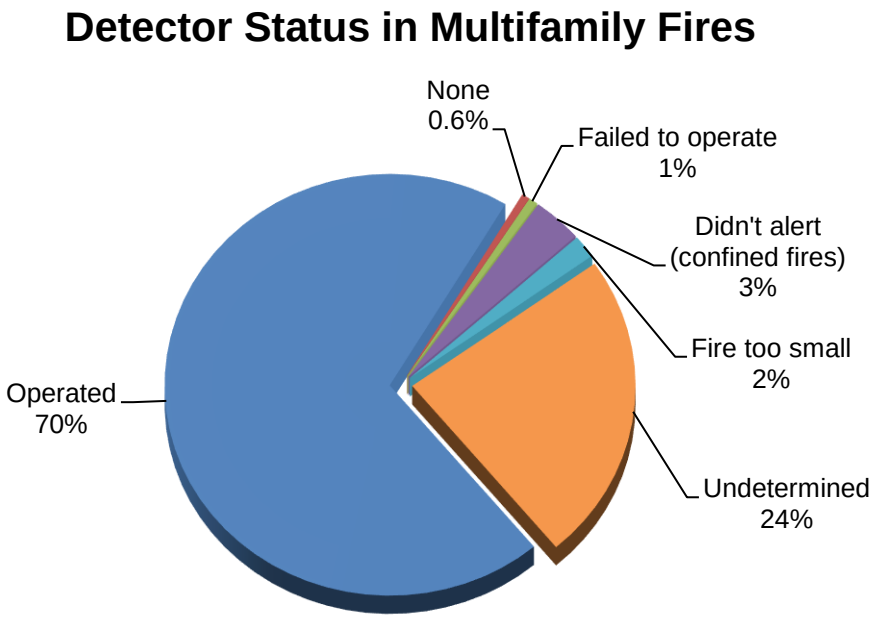
Unsafe Cooking Caused 84% of Apartment Fires
Eighty-four percent (84%) of the fires in apartments were caused by unsafe cooking in 2019. Indoor rubbish fires, smoking, heating equipment, and electrical problems each accounted for 2% of apartment fires. Arsons caused 1% of the fires in these dwellings. Clothes dryers, candles, juvenile-set fires and fireworks each caused less than 1% of the fires in multifamily homes in 2019.



Multifamily Home Fires Confined to Non-Combustible Containers

Incident Type	# of Incidents	% Multifamily Home Fires	% Confined to Non-combustible containers	Dollar Loss	Avg. Dollar Loss
Cooking fires	5,414	82%	95%	$ 350,863	$ 65
Chimney or flue fires	16	0.2%	0.3%	$ 11,700	$ 731
Incinerator overload or malfunction	0	0%	0%	$ 0	$ 0
Fuel burner/boiler malfunction, fire	84	1%	1%	$ 36,101	$ 430
Commercial compactor fire, confined	5	0.1%	0.1%	$ 0	$ 0
Trash or rubbish fire	156	2%	3%	$ 38,252	$ 245
Total	5,675	86%	100%	$ 436,916	$ 77

Alarms Alerted Occupants in 70% of Fires
Smoke or heat alarms operated and alerted the occupants in 4,595, or 70%, of the multifamily fires in 2019. In 3% of these fires[8], the alarms did not alert the occupants. Alarms were present but did not operate in 1% of these incidents. In less than 1% of these fires, no alarms were present at all. The fire was too small to trigger the alarm in 2% of these residential fires. Smoke alarm performance was undetermined in 1,562 incidents, or 24%, of Massachusetts' 2019 multifamily fires.



33% of Failed Alarms Failed from Dead or Missing Batteries
Of the 43 fires where smoke alarms were present but failed to operate, the batteries were either missing or disconnected in 11 alarms, or 26%. Three (3), or 7%, did not operate because of dead batteries. Nine (9), or 21%, failed because of a power failure, shutoff or disconnect. Four (4), or 9%, didn't operate because of a lack of maintenance. Two (2), or 5%, failed because they were defective. For 14 cases, or 33%, the reason the alarm failed was not classified or undetermined.

All Other Residential Fires

2,442 Fires, 1 Civilian Death & $2.8 Million in Damages
There were 2,442 reported fires in all the other residential property types in 2019. These 2,442 fires caused one civilian death, four civilian injuries, nine fire service injuries and an estimated $2.8 million in damages. The average dollar loss per fire was $1,133. These

[8] These represent confined fires where it was reported that the alarm did not alert the occupants.

fires increased by 101, or 4%, from 2,341 reported in 2018. Only 18% of the 13,514 residential building fires in 2019 occurred in rooming houses, hotels or motels, residential board and care facilities and dormitories or barracks.

The following table shows the breakout of the reported number of fires, casualties and dollar loss of these other residential occupancies

All Other Residential Fires by Property Use

Property Use	# of Incidents	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss	% of Residential	Average Dollar Loss
Residential, other	913	8	3	0	0	$1,829,855	7%	$ 2,004
Boarding/rooming houses	541	0	0	0	1	$ 402,226	4%	$ 743
Hotel/motel	190	0	0	0	0	$ 369,385	1%	$ 1,944
Residential board & care	204	1	0	0	0	$ 82,004	2%	$ 402
Dormitories	594	0	1	0	0	$ 83,944	4%	$ 141
All Other Residential	2,442	9	4	0	1	$2,767,414	18%	$ 1,133

Cooking Was the Leading Cause of These Fires
Cooking was the leading cause of these fires. Cooking caused over 87% of fires in all the other residential occupancies.

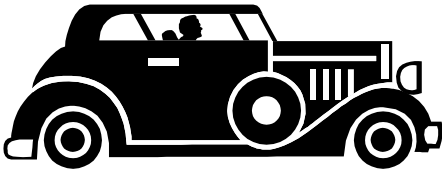
Hotel-Motel Safety
It is important to consider fire safety when selecting accommodations.

- Choose lodging equipped with sprinklers and smoke alarms in each room.
- If you are hearing impaired, you may request a room with an appropriate smoke alarm with a flashing strobe light.
- Think about fire safety when checking into a hotel or motel. Count the number of doors down the hall to the nearest fire exit staircase. Remember to never use the elevator in case of a fire. Travelers should test the smoke alarm in their room.
- It is recommended that you keep the room key, eyeglasses and a flashlight on the night table. If a fire occurs or a fire alarm sounds, take them with you and go out the door. However, before opening the door, test the door with the back of your hand. If the door feels cool, open the door a crack. Be ready to close the door if hot air, flames, or smoke rush through the crack. If this does not occur, yet the hall is hazy with smoke, crawl down the hall counting the doors to the nearest stairway exit. If this exit cannot be reached, turn around and count the doors back to your room. Unlock the door and re-enter.
- If it is unsafe to leave the room during a fire: Fill the tub with cold water; stuff wet towels around the door to keep the smoke out; if possible, open a window and hang a sheet outside to signal for help; cover your face with a wet cloth and stay low if smoke gets in the room; do not jump.
- Try to call out to emergency services on a cell phone or house phone and advise the emergency dispatcher of your exact location within the hotel.

Motor Vehicle Fires

2,356 Motor Vehicle Fires Account for 9% of All Reported Fires

Motor vehicle fires accounted for 9% of total reported fire incidents. The 2,356 motor vehicle fires in 2019 were a decrease of 155, or 6%, from the 2,511 motor vehicle fires reported in 2018. They caused four, or 10%, of the civilian fire deaths, 34 civilian injuries, 35 fire service injuries, and an estimated property damage of $24.4 million.



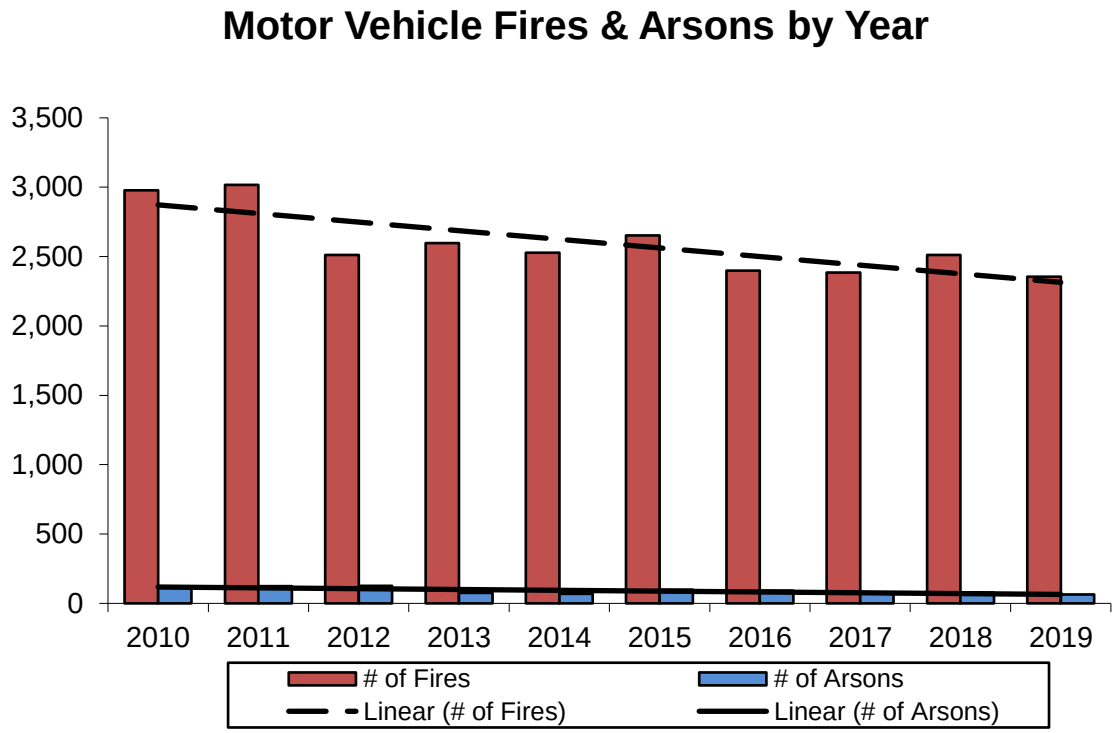
According to MFIRS, a motor vehicle fire is defined as any fire involving a car, truck, boat, airplane, construction equipment or other mobile property (not being used as a permanent structure) that occurs outside of a structure.

The table below shows the number of vehicle fires and vehicle arsons and the percentage of vehicle fires caused by arson for the past decade.

VEHICLE FIRES AND VEHICLE ARSONS BY YEAR

Year	Vehicle Fires	Vehicle Arsons	% Arsons
2019	2,356	64	2.7%
2018	2,511	78	3.1%
2017	2,385	72	3.0%
2016	2,399	92	3.8%
2015	2,652	98	3.7%
2014	2,528	68	2.7%
2013	2,598	75	2.9%
2012	2,512	126	5.0%
2011	3,016	124	4.1%
2010	2,978	116	3.9%

The following graph illustrates the data in the previous table.

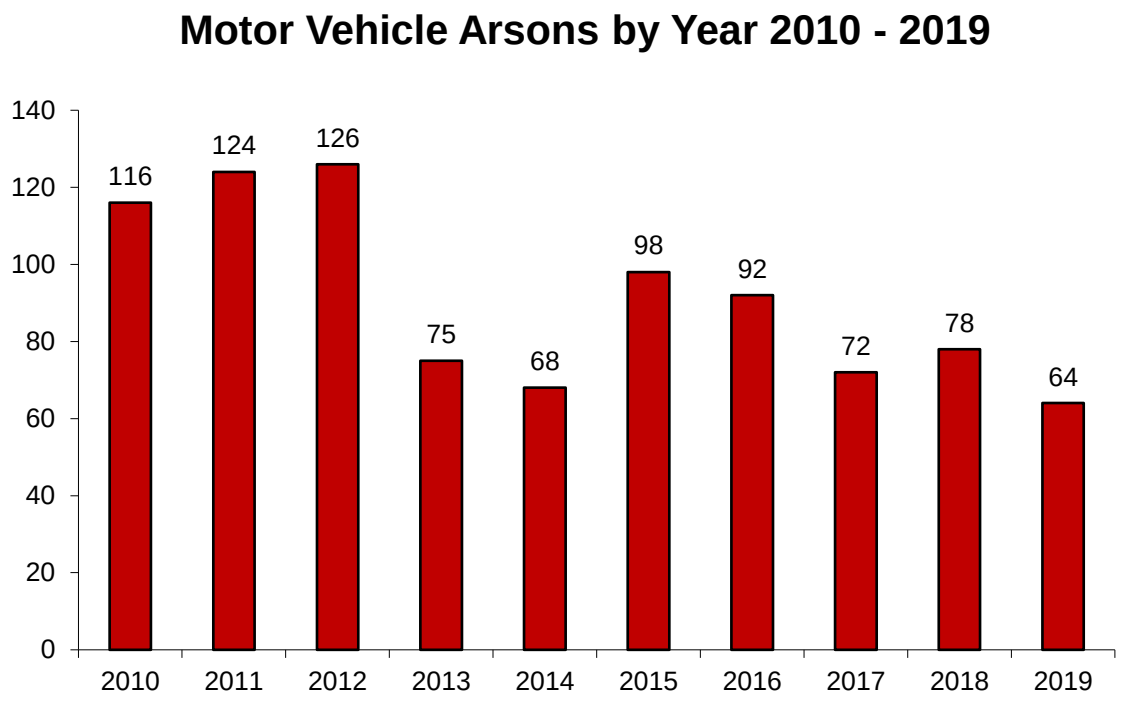


4 Motor Vehicle Fire Deaths
There were four civilian fire deaths in four motor vehicle fires in 2019. Three (3) of the deaths were because of motor vehicle crashes with ensuing fire. The other person died by suicide in their vehicle.

Mechanical Failures Caused Almost 1/4 of Massachusetts Motor Vehicle Fires
Of the 2,356 motor vehicle fires in 2019, 22% were caused by some type of mechanical failure or malfunction; 3% were considered intentionally set; and 41% resulted from other accidental causes. The cause was undetermined or not reported in 35% of the motor vehicle fires.

Motor Vehicle Arsons Decreased
In 2019, there were 64 reported motor vehicle arsons. This is a decrease of 18% from the 78 reported in 2018. These 78 arsons caused one civilian death, two civilian injuries and an estimated dollar loss of $662,411.

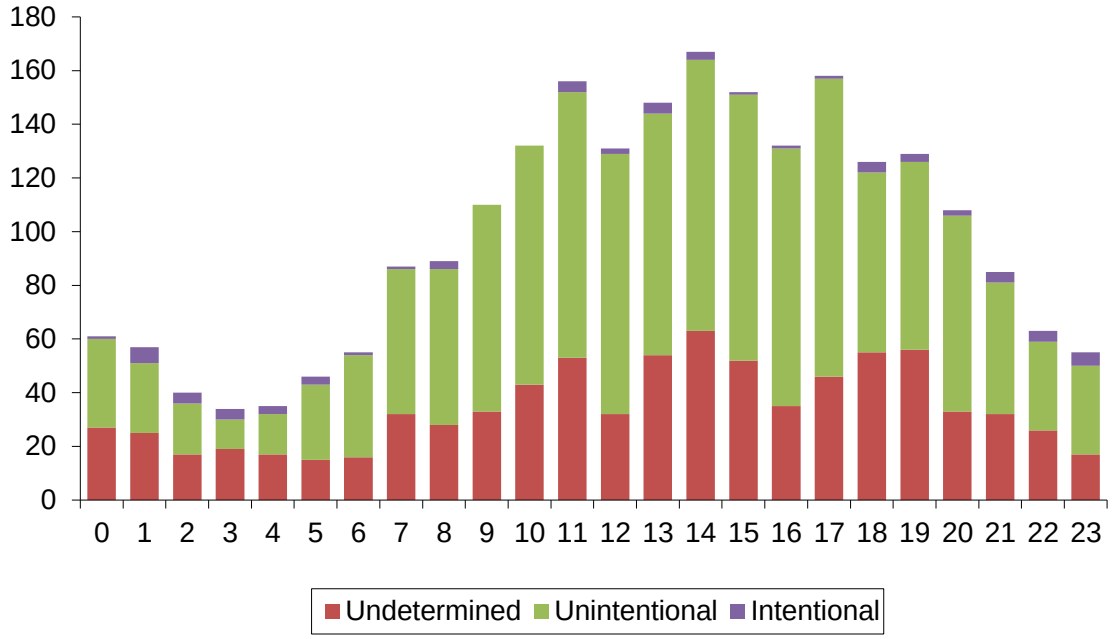
The following graph depicts the drop in motor vehicle arsons from 2010 to 2019.



Unintentional Fires Occur During Day and Early Evening

Motor vehicle fires of different causes occur at different times of the day. As the following graph shows, accidental or unintentional fires are more common during the day and early evening. Incendiary fires are generally set in darkness. The graph below shows fire frequency by time of day on the 24-hour clock for the causes of motor vehicle fires. Midnight to 1:00 a.m. is represented by 0, 1:00 a.m. to 2:00 a.m. is represented by 1, etc.

Causes of Motor Vehicle Fires by Time of Day



Boston Has Largest Loss Motor Vehicle Fire

In 2019 there were three reported motor vehicle fires that had an estimated dollar loss over $1 million. These three fires caused $3.4 million in total estimated damages, or 14% of all motor vehicle fire losses in 2019.

- On January 8, 2019, at 11:18 p.m., the Boston Fire Department responded to boats on fire on the Charles River. No one was injured at this fire. Total estimated damages were $1.1 million.

What Should You Do if You Have a Car Fire?

1. Pull over to the side of the road and stop as soon as possible. For automobiles with an automatic transmission put the vehicle in Park; for cars with a manual transmission, set the parking brake and put it in gear. Fire can disable a car's electrical system in seconds. Power steering and brakes can be harder to use than normal.
2. Turn off the ignition. You want to make sure no more gasoline is pumped to the fire.
3. Get everyone out of the car.
4. Move away and call 911. Do not open the hood or trunk. You risk injury, and give the fire more oxygen.

Unless you're trained, let firefighters handle it. They wear protective clothing and are trained to handle pressurized systems, exploding bumpers, etc. Chemicals in the fire extinguisher can be compacted. To be effective, they must be used correctly. You don't want to practice in a panic situation.

Gasoline Deserves Respect
There were 90 motor vehicle fires at gas and service stations in 2019. There were 120 motor vehicle fires at facilities used for motor vehicle or boat sales, service or repairs. Many of these fires were started by gasoline or gasoline fumes. Gasoline is so much a part of our lives that we don't think about it. However, it is a very dangerous substance and certain measures should be taken to minimize the chances of an incident.

Gas Station Safety

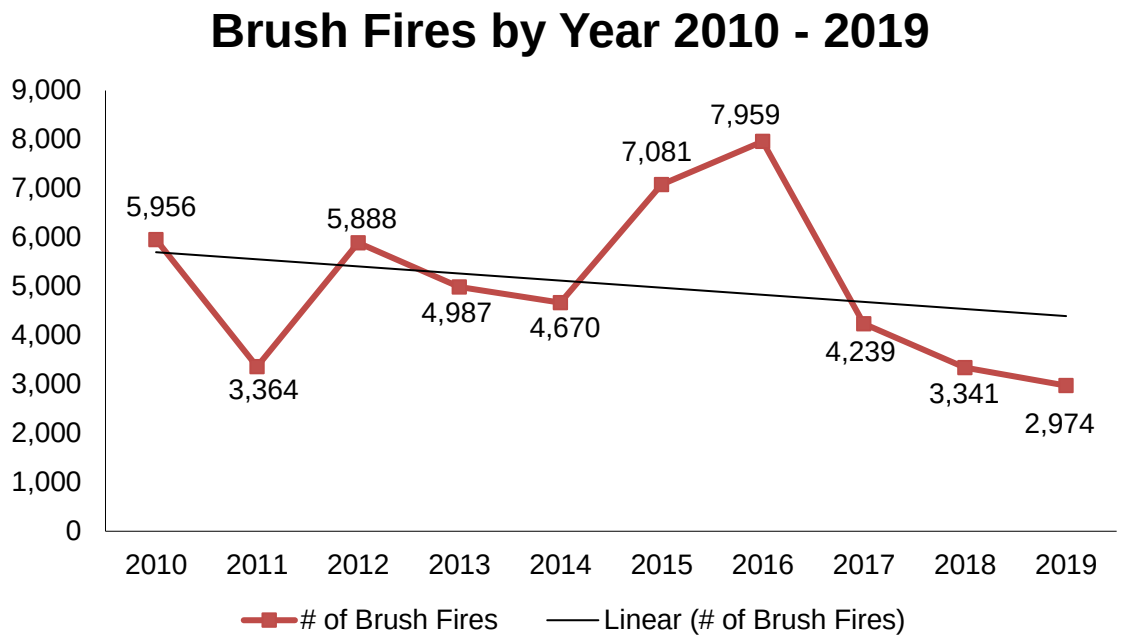
- Turn off your car when you get gas.
- At self-service stations, remember to put the nozzle back and your gas cap on before driving off. Monitor the fueling; do not get back in the vehicle.
- Gasoline vapors burn at a very low temperature. These fumes are heavier than air, and can travel a distance to find a spark. Keep anything that could provide heat to start a fire away from gasoline. A spark or a lit cigarette is enough to ignite the invisible fumes that may linger on clothing.
- If you need to carry or store gasoline, use an approved container.
- When filling an approved container, place it on the ground to prevent static electricity build–up which could ignite the gasoline vapors. Make sure that the nozzle is always in contact with the container when filling.
- Make sure the approved container is in a secured, upright position away from passenger areas, and that the fill and vent openings are tightly closed. At home, always store these containers in safe, secure areas – outside of living areas – away from ignition sources such as pilot lights.

Outside and Other Fires

6,673 Brush, Trash, & Other Outside Fires Down 5%
The 6,673 outside and other fires and explosions caused two civilian deaths, 22 civilian injuries, 25 fire service injuries, and an estimated dollar loss of $3.7 million. The 2,974 trees, grass and brush fires, 2,219 outside trash fires, 757 special outside fires, 31 cultivated vegetation or crop fires, and 692 other fires accounted for 27% of the total fire incidents in 2018. These fires decreased by 5% from the 7,004 incidents reported in 2018.

These types of fires are the most variable categories of fires from year to year. Large increases and decreases are not uncommon and are often dependent on the weather. If it is a dry spring or summer, the number of outside fires usually increases. In 2019, the reported number of brush fires decreased by 367 or 11%, from the 3,341 reported in

2018. It seems that 2019 was another particularly down year for brush fires. It's the second lowest number of reported brush fires since 1986 following 2018 which is now the fifth lowest on record.



Fire departments are required to report any fire or explosion resulting in a dollar loss or human casualty to MFIRS. Fires that do not result in a loss may be reported. Many fire departments, particularly those that submit data electronically, voluntarily report these fires. These figures should be considered an underestimate of the "no-loss" fire incidents to which fire departments actually responded.

The 6,673 reported outside and other fires include:

- 2,974 natural vegetation fires (tree, grass, and brush fires) that caused two civilian injuries, 10 fire service injuries, and an estimated dollar loss of $136,357; this is an 11% decrease from the 3,341 incidents reported in 2018. 2019 is the second lowest number of reported brush fires since 1986. There were a reported 1,008 acres burned in 2019.
- 2,219 trash fires that caused one civilian injury, six fire service injuries and an estimated dollar loss of $167,061; this is an 8% increase from the 2,048 incidents reported in 2018.
- 757 special outside fires (including outside, storage, equipment, mailbox fires and outside gas or vapor explosions) that caused five civilian injuries and an estimated dollar loss of $1 million; this is a 3% decrease from the 783 incidents reported in 2018.
- 31 cultivated vegetation or crop fires that caused one fire service injury; this is a 28% decrease from the 43 incidents reported in 2018.

- 692 other fires that could not be classified further which caused 14 civilian injuries, nine fire service injuries, and an estimated dollar loss of $2.4 million; this is a 12% decrease from the 789 incidents reported in 2018.

363 Brush, Trash & Other Outside Arsons
There were 363 reported brush, trash and other outside arsons in 2018. There were 161 natural vegetation arsons, 91 outside rubbish arsons, 77 special outside arsons, one cultivated vegetation or crop arson, and 33 arsons that could not be classified any further. These 363 arsons caused one civilian death, one fire service injury and $138,941 in estimated damages. This is an increase of 19, or 6%, over the 344 arsons reported in 2018.

1,431 Fires with Cause Still Under Investigation or Undetermined
In 2019, 152 outside and other fires were still listed as 'Cause Under Investigation'. There were 1,279 fires where the *Cause of Ignition* was listed as 'Undetermined'.

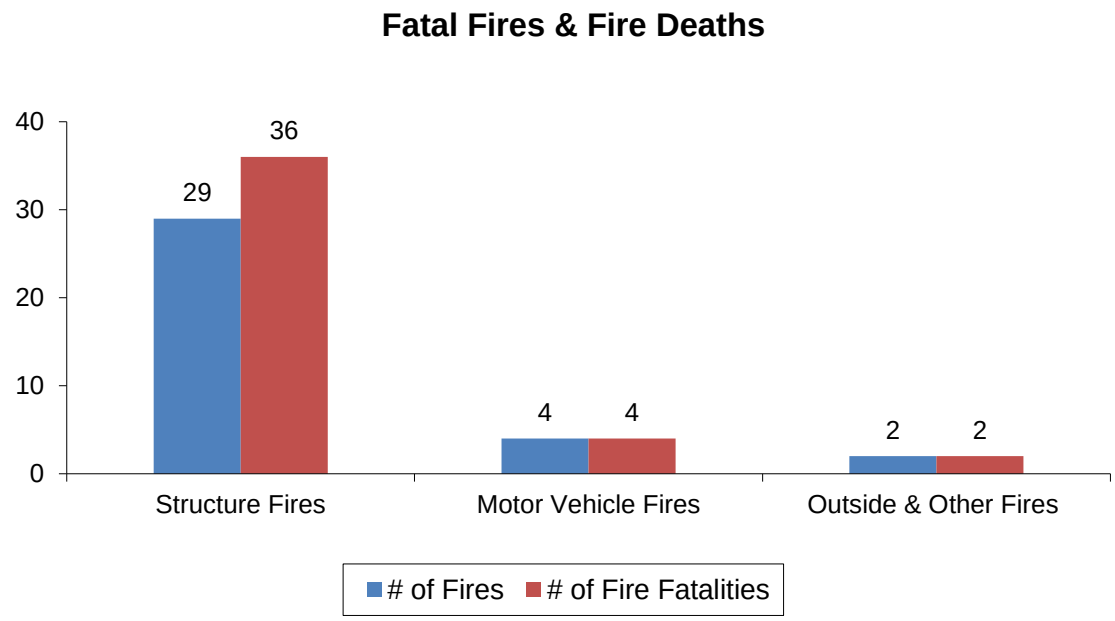
Largest Loss Outside and Other Fire
- On August 29 2019, at 4:14 p.m., the Northfield Fire Department was called to an outside equipment fire at an electric generating plant. No one was injured at this fire. Damages from this fire were estimated to be $190,000.

2019 Massachusetts Fire Deaths

Civilian Fire Deaths

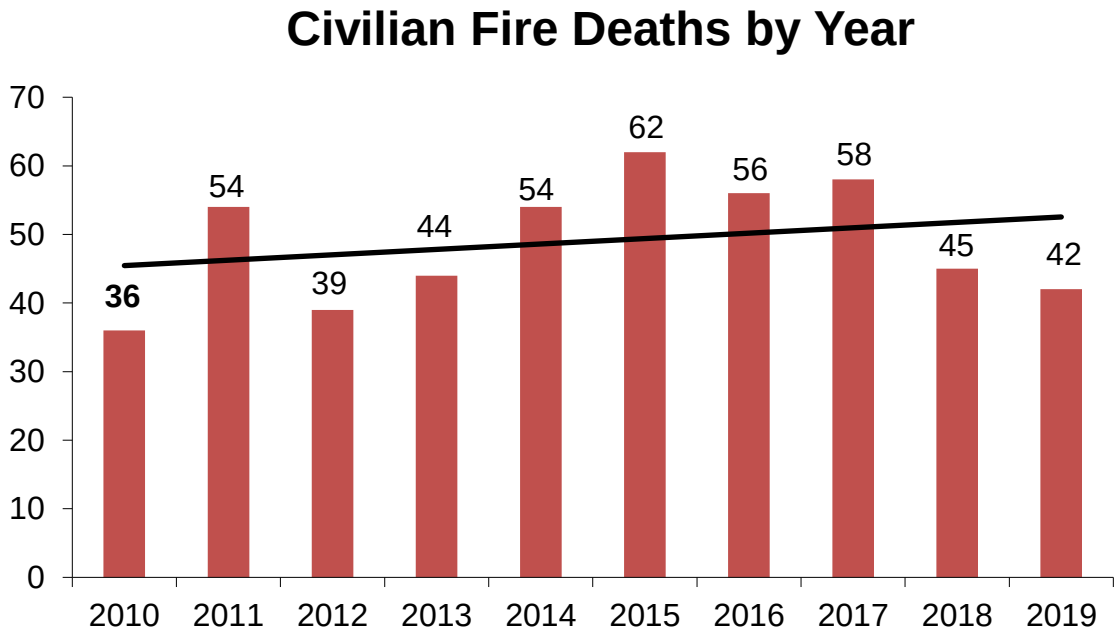
42 Civilians Died in Massachusetts Fires & 1 Died in an Explosion
Forty-two (42) civilians died in 35 Massachusetts fires during 2019. This is three less than the 45 civilian fire deaths recorded in 2018. Thirty-six (36) civilians died in 29 structure fires. Four (4) people died in four motor vehicle fires. Two (2) people died in two outside fires in Massachusetts in 2019. In 2019, there were 6.4 fire deaths per one million population in Massachusetts which is 0.5 less than in 2018.

The following graph shows the number of fatal fires and the number of civilian fire deaths in structure fires, motor vehicle fires and other fires and explosions.



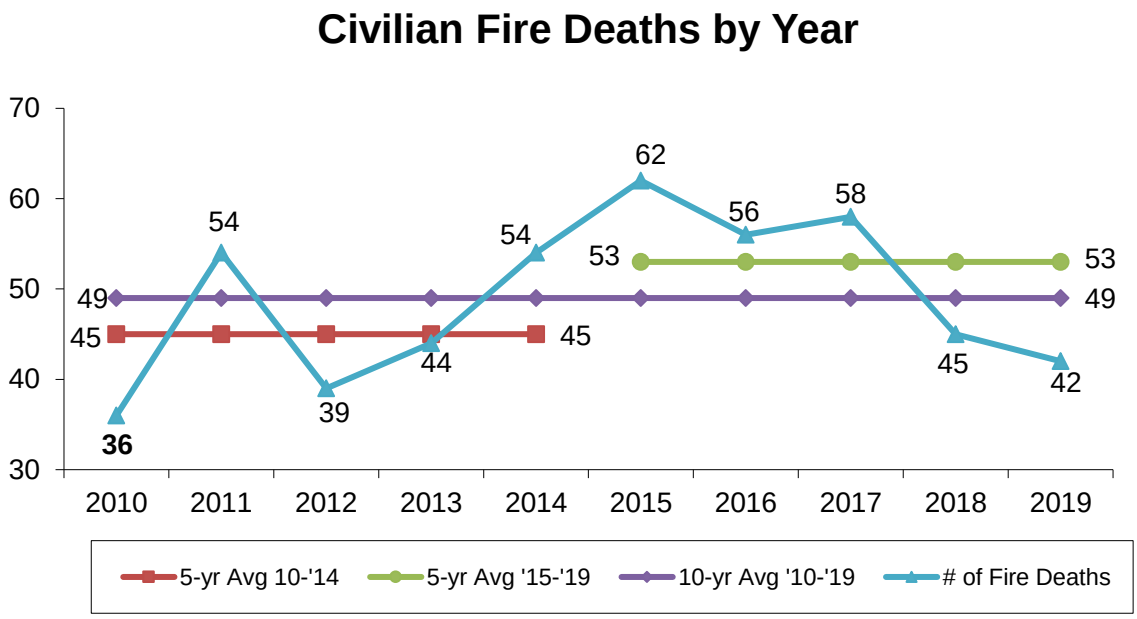
Fire Deaths Down by 3 from 2018

The 42 civilian fire deaths reported in 2019 were a decrease of three, or 5% less, than was reported in 2018. The following chart shows the trend of civilian fire deaths for the past decade on a general incline; but that is helped by having four of the five lowest years of fire deaths on record. However, civilian fire deaths have decreased by 60% from the high of 105 in 1990.



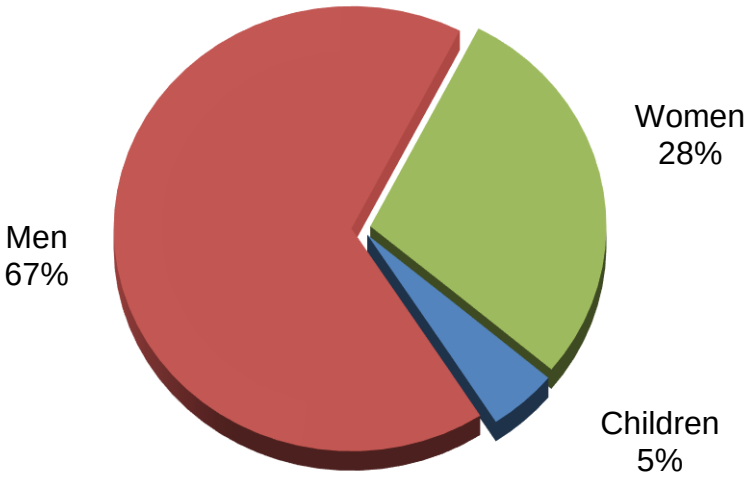
2019 Is Below the 5 & 10 - Year Averages
Because the number of fire deaths fluctuates from year to year and may be influenced by uncontrollable outside factors such as high energy costs for heating, it is helpful to look at averages over five- and 10-year periods. The following graph illustrates the number of fire deaths for the past 10 years in relation to the five-year average for fire deaths for the periods from 2010 through 2014 and from 2015 through 2019. The average number of fire deaths per year from 2010 through 2014 was 45 deaths. The average number of fire deaths per year from 2015 through 2019 was 53 deaths. The graph also depicts the relationship of the number of fire deaths in relation to the 10-year average of 49 deaths for the same time period. Three (3) of the last five years have been above the 10-year and five-year average; but the last two have been below both.

Note that the following chart starts at 30 rather than the traditional zero value. This is so the reader can concentrate on the sometimes subtle changes in the figures. The 42 fire deaths in 2019 are 20% below the five-year average and 13% below the 10-year average.



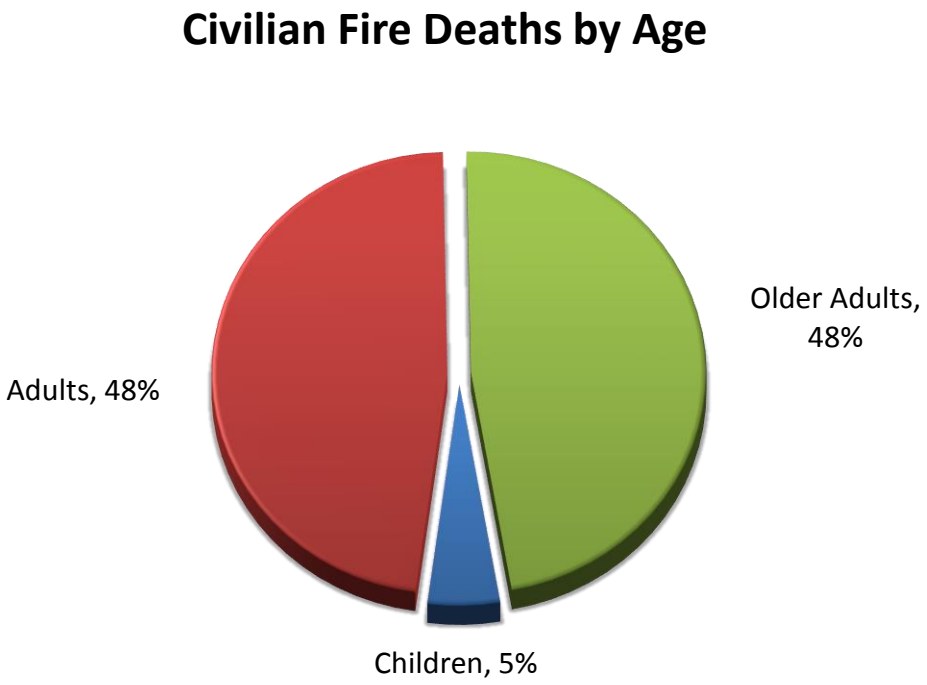
28 Men, 12 Women and 2 Children Under 18 Died from Fires in 2019
Of the 42 fire deaths, 28, or 67%, were men, 12, or 28%, were women and two, or 5%, were children under 18. The following pie chart illustrates the above figures.

Civilian Fire Deaths by Gender



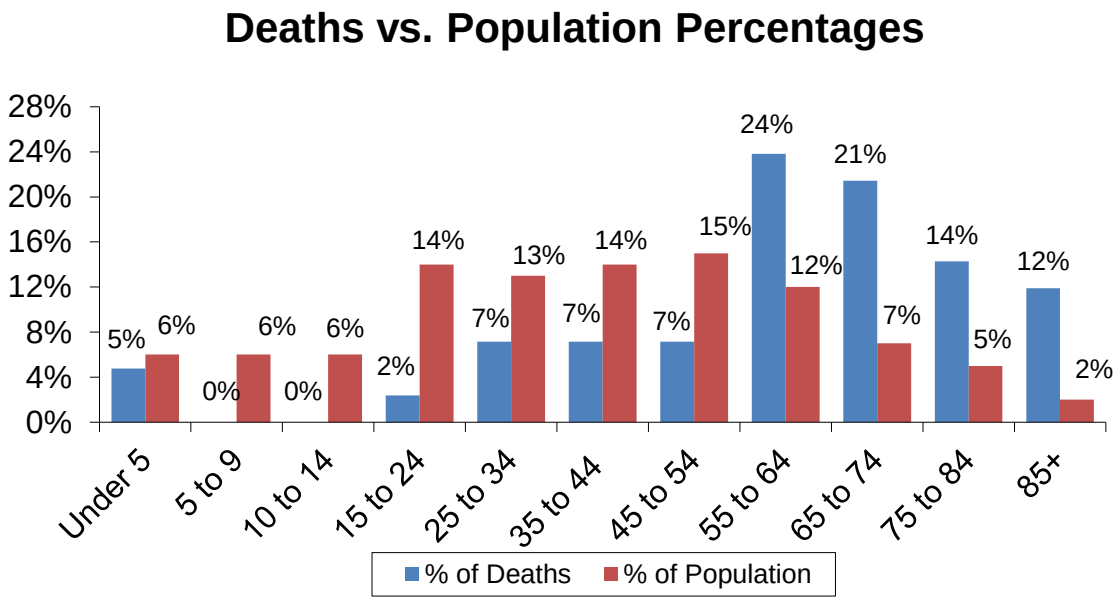
48% of Fire Deaths were Over 65

Twenty (20), or 48%, of the civilian fatal fire victims were over 65 years of age. This included 10 elderly men and 10 elderly women. Two (2), or 5%, of the civilian fatal fire victims were under 18 years old. Twenty (20), or 48%, were adults between 18 and 65 years of age. The following pie chart illustrates the above figures.



Older Adults at Great Risk for Fire Death

Older adults, especially those over the age of 85, had the greatest risk of dying in a fire. Adults over the age 85 account for 2% of the population but 12% of the fire deaths. The risk of fire death for these adults is 6.0. The following graph shows the percentage of fire deaths versus population percentage by age groups in 2019. Other older adults, between the ages of 75 and 84, accounted for 5% of the population but 14% of the fire deaths. Their risk of fire death is at 2.9. Older adults between the ages of 65 and 74 were 3.1 times more likely to die in a fire in Massachusetts. The risk of a fire death for all older adults over the age of 65 was 3.4. The only other age groups that was at a greater risk were adults between the ages of 55 to 64 who were 2.0 times more likely to die in a fire in 2019.

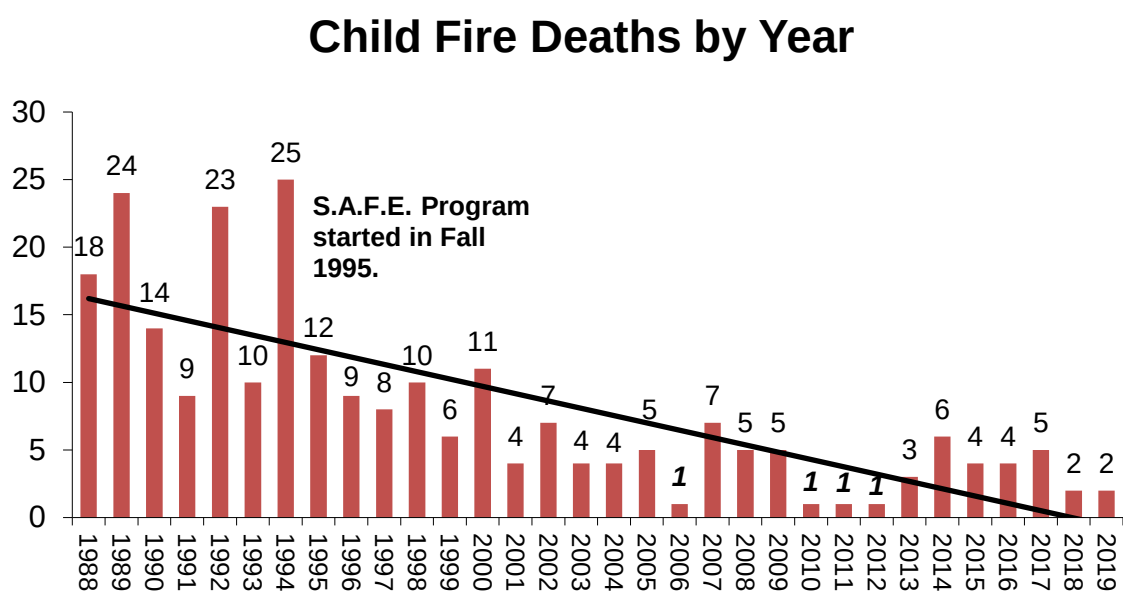


How to Read the Preceding Chart
If an age group represents 10% of the population, we expect it to account for 10% of the fire deaths. If it accounts for a higher percentage of fire deaths than it does for the overall population, that group is at a higher risk of dying in a fire. If the age group accounts for a lower percentage of fire deaths than it does for the overall population, then that group is at a lower risk of dying in a fire.

The percentages of the population in each age group were calculated using data from the 2010 Census from the U.S. Census Bureau.

Children Now at Lower Risk of Dying in Fires in the Commonwealth
Children are not at a disproportionate risk of dying in fires in Massachusetts. The following graph illustrates the number of child (age <18) fire fatalities in Massachusetts from 1988 through 2019. You can see a definite downward trend in the number of fire related deaths to children from a high of 25 in 1994 to a low of one in 2006, 2010, 2011 and 2012. According to United States Fire Administration statistics, children under 10 accounted for an estimated 6.8% of all fire-related deaths nationally in 2017.[9] In 2019, children under 10 accounted for two, or 5%, of the Massachusetts fire-related deaths.

[9] Source: United States Fire Administration's **Fire Risk in 2017, Topical Fire Research Series, Vol. 20 – Issue 3 September 2019.** Most recent national data available.



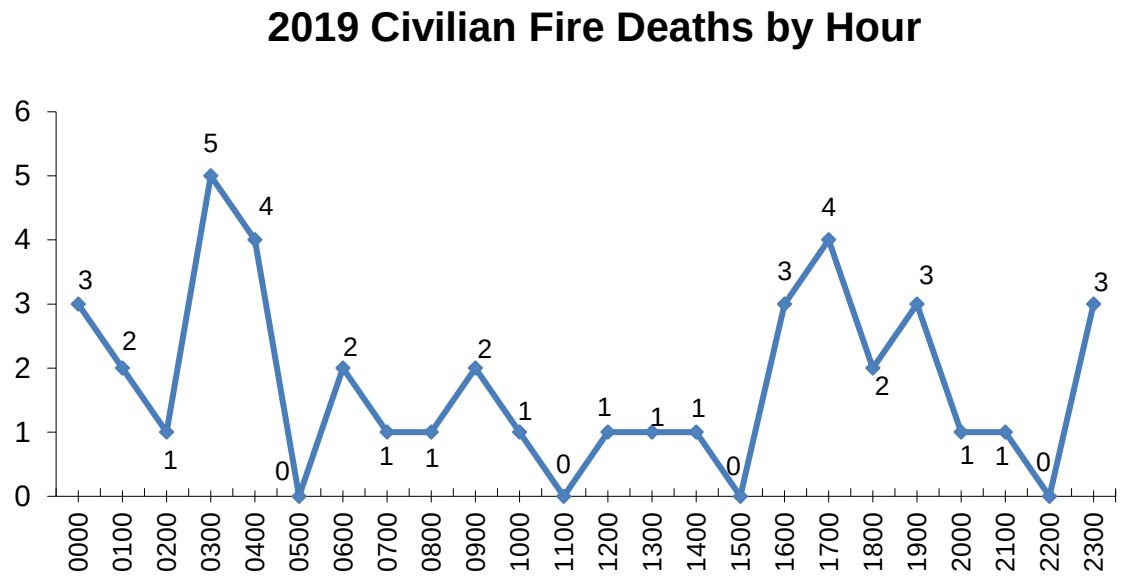
Child Fire Deaths Drop 92% Since the Start of the S.A.F.E. Program
Fire deaths of children under age 18 have fallen by 92% from the 25 child fire deaths in 1994 and since the start of the S.A.F.E. Program in the fall of 1995.

Average Annual Child Deaths Down 77%
Since fire death numbers fluctuate quite a bit from year to year, it is helpful to look both at the trendline in the graph on the previous page, and averages over several years. During the 24 full years where the S.A.F.E. Program has been in effect, from 1996 to 2019, the average number of child fire deaths per year has been 4.8. In the 24 years prior to the S.A.F.E. Program, 1971 to 1994, the average number of child fire deaths per year was 21.8. This 77% drop in the average number of child fire deaths is significant when compared to the 50% drop in the average number of all fire deaths during the same time period.

The one thing that is happening in Massachusetts to improve fire safety for this age group, which is not happening for all other age groups, is consistent, comprehensive, statewide, school-based fire safety education[10].

[10] Based upon the success of the SAFE program, the Senior SAFE program was launched in 2014 to provide funding to local fire departments to improve fire & life safety to older adults through education that addresses the unique fire risks to this age group.

1/2 of People Died in Fires at Night
Twenty-one (21), or 50%, of the fire victims died in fires that occurred between 10:00 p.m. and 7:00 a.m. Smoke alarms are the key to notifying occupants to danger whether they are asleep or awake, but they cannot guarantee escape. Almost half (47%) of the people who died during 'daytime' fires were intimately involved in ignition, and 53% of them were older adults who may have had limited mobility. The following graph shows the fire death frequency by time of day on the 24-hour clock. Midnight to 1:00 a.m. is represented by 0000; 1:01 a.m. to 2:00 a.m. is represented by 0100, etc.



Structure Fire Deaths

In 2019, there were 36 structure fire deaths in 29 fatal fires. All but two of the structure fire deaths occurred in residential occupancies. In 2019, two non-residential structure fires killed two civilians.

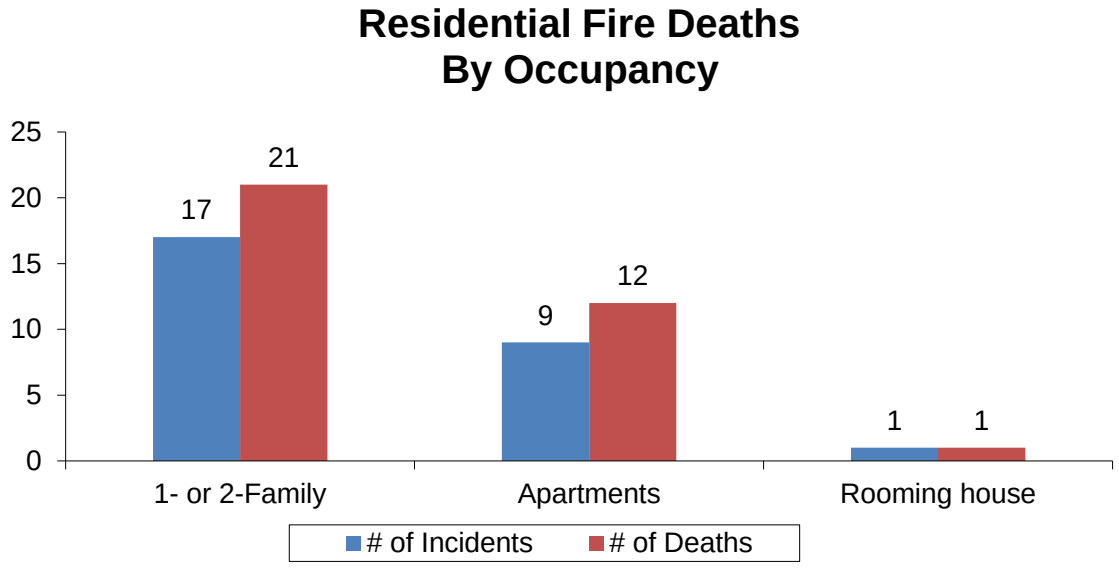
- On March 18, 2019, at 12:57 a.m., the Ashland Fire Department responded to a fatal fire in a shed of undetermined causes. The victim was a 52-year old man. Damages from this fire were not estimated.

- On September 25, 2019, at 12:35 p.m., the Mansfield Fire Department responded to a fatal fire at a gas station. The victim, a 64-year old man, was using a welding torch on a barrel that still contained some ignitable liquids. Heat from the torch ignited the vapors causing an explosion and ensuing fire. The victim was transported to a hospital where he succumbed to his injuries. No one was injured at this fire. The building did not have smoke alarms, nor did it have any fire suppression system. Damages from this fire were estimated to be $500,000.

Residential Building Fire Deaths

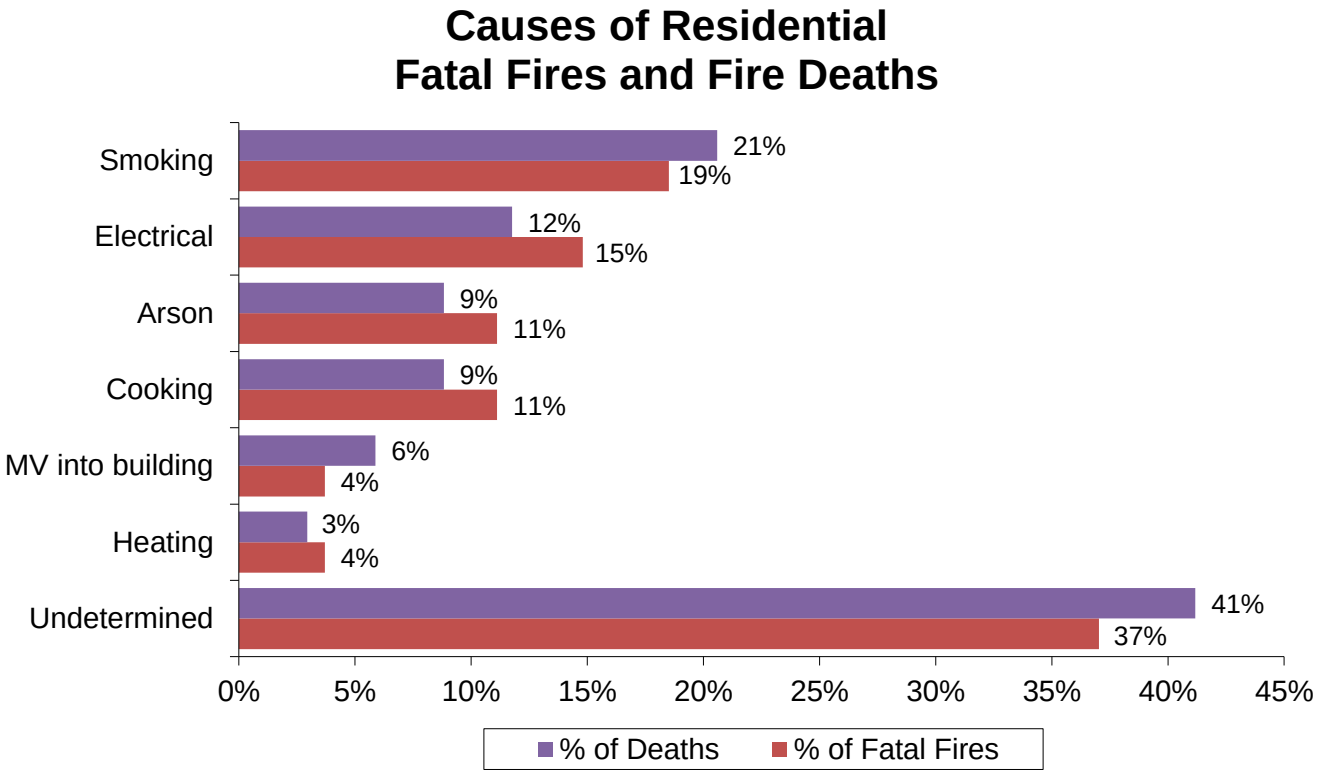
Most Fire Deaths Occur in the Home
The majority of fire deaths occur in residential occupancies. We focus our analysis on these deaths because it is where prevention can yield the greatest results or have the most impact.

In 2019, there were 34 fire deaths in 27 fatal residential building fires. This represents 94% of the structure fire deaths and 81% of all fire deaths. Twenty-one (21) fire deaths occurred in 17 one- and two-family dwellings; 12 fire deaths occurred in nine apartment fires; and one fire death occurred in a rooming house. Typically more fatal fires and associated deaths occur in one- and two-family homes than occur in apartment fires or other residential occupancies.



Smoking Fires Are Leading Cause of Fire Deaths
In 2019, improper disposal of smoking materials was the leading cause of residential fire deaths and fatal residential fires. These fires accounted for seven, or 21%, of residential fire deaths. Electrical problems were the second leading cause of fire deaths, accounting for four, or 12%, of residential fire deaths. Arsons and cooking fires each caused three, or 9%. A motor vehicle into a building severing the gas line caused two, or 6%, of these deaths. Heating equipment, caused one, or 3%, of these fire deaths. Fourteen (14), or 41%, of these deaths occurred in fires where no cause could be determined or multiple causes could not be ruled out.

The following graph illustrates the number of residential building fire deaths and the number of fatal residential building fires by cause. The classifications are ranked by the percentage of fire deaths that they caused.



5 Fatal Smoking Fires Cause 7 Deaths in Homes
In 2019, the improper use and disposal of smoking materials caused seven, or 21%, of residential building fire deaths and five, or 19%, of fatal residential building fires.

4 Elderly Fire Deaths Caused by Smoking
In 2019, four of the older adult fire deaths were caused by the improper disposal of smoking materials while at home. In 2018, nine older adults were killed in smoking fires. Since 2004 older adult fire deaths have increasingly been caused by improper disposal of smoking materials.

You will note some common threads as you read the following summaries of the fatal fires caused by smoking materials, such as people falling asleep in the living room on upholstered furniture, or in bed while smoking, and with no working smoke alarms in the building.

- On January 3, 2019, at 4:30 a.m., the Northampton Fire Department was called to a fatal smoking fire in a single-family home. A cigarette ignited furniture in the living room. The victim, a 69-year old man, was discovered by firefighters in the kitchen.

No one else was injured at this fire. Neither alarms nor sprinklers were present in the home. Damages were estimated to be $140,000.

- On January 17, 2019, at 1:34 a.m., the Boston Fire Department was called to a fatal smoking fire in a two-family home. The fire was started by careless disposal of smoking materials in the living room. The victim, a 61-year old man fell asleep while smoking. No one else was injured at this fire. It was undetermined if alarms were present. There were no sprinklers. Damages from this fire were estimated to be $1 million.

- On April 27, 2019, at 4:00 a.m., the Newton Fire Department was called to a fatal smoking fire in a single-family home. The fire was started by a cigarette being thrown away in the trash just outside the basement. The victims were a 92-year old woman and her 63-year old son. The mother was transported to a local hospital where she succumbed to her injuries. No one else was injured at this fire. Alarms were not present. There were no sprinklers. Damages from this fire were estimated to be $700,000.

- On August 3, 2019, at 1:05 p.m., the Plymouth Fire Department was called to a fatal smoking fire in a single-family home. The fire was started by undetermined smoking materials in a bedroom. The victim was a 58-year old man who was in the area of origin of the fire. No one else was injured at this fire. Smoke alarms were present but the failed to operate because of missing batteries. There were no sprinklers. Damages from this fire were estimated to be $12,500.

- On December 9, 2019, at 7:40 p.m., the Great Barrington Fire Department was called to a fatal smoking fire in an eight-unit apartment building. The fire was caused by undetermined smoking materials igniting the bedding in a bedroom. The victims, a 67-year old woman and her 68-year old husband, were in the area of origin of the fire. No one else was injured at this fire. Alarms were present but did not operate because of a power shutoff or disconnect. Sprinklers were not present. Damages from this fire were estimated to be $75,000.

Smoking on Oxygen

Using home oxygen increases the risk of fires and burns. When more oxygen is in the air, fires will burn hotter and faster. In 2019, no one died in a fire when someone in the home was using oxygen while smoking. In the previous 10 year prior to 2019 however, 18 people died in fires started from smoking while using home oxygen.

4 Fatal Electrical Fires Cause 4 Deaths

Four (4) people died in four residential electrical fires in 2019. Electrical fires accounted for 12% of residential fire deaths and 15% of fatal residential fires.

- On April 6, 2019, at 4:33 a.m., the Fall River Fire Department was called to a fatal electrical fire in a two-family home. The fire was started by arcing in the ceiling and floor assembly. The victim was an 88-year old physically disabled man. One (1)

firefighter was injured at this fire. Alarms were present but failed to operate because of a lack of cleaning. There were no sprinklers. Damages from this fire were estimated to be $30,000.

- On May 3, 2019, at 4:58 p.m., the Chelsea Fire Department was called to a fatal electrical fire in a two-family home. The fire was caused by arcing in the ceiling of the enclosed porch. The victim was a 37-year old man. Four (4) firefighters were injured at this fire. Alarms were present but it was undetermined if they operated. There were no sprinklers in the home. Damages were estimated to be $325,000. The fire spread to a neighboring building and caused another $150,000 in estimated damages.

- On August 19, 2019, at 6:22 a.m., the Boston Fire Department was called to a fatal electrical fire in a three-unit apartment building. The fire started by a short circuit in a surge protector in a bedroom. The victim was a 58-year old man in the area of origin. No one else was injured at this fire. It was undetermined if alarms were present. There were no sprinklers. The fire caused an estimated $440,000 worth of damage.

- On October 8, 2019, at 3:35 a.m., the Brockton Fire Department was called to a fatal electrical fire in a rooming house. The fire was caused by arcing in the ceiling and floor assembly between the basement and first floor. The victim, a 56-year old man, was in the area of origin. No one else was injured at this fire. Alarms were present and the alerted the occupants. Sprinklers were not present in the home. Damages were estimated to be $100,000.

3 Fatal Arson Fires Caused 3 Deaths

Three (3) fatal arson fires, or 11% of fatal residential building fires, caused three, or 9%, of the residential building fire deaths in 2019. Two (2) of the three fires were self-immolations.

- On March 13, 2019, at 7:48 a.m., the Sheffield Fire Department was called to a fatal arson, murder/suicide, in a single-family home. The victim, a 41-year old man, had killed the rest of his family and then set fire to their home. One (1) firefighter was injured at this fire. Alarms were present but it was undetermined why they failed to operate. The building was not sprinklered. Damages from this fire were not estimated.

- On September 22, 2019, at 5:40 p.m., the Fitchburg Fire Department was called to a fatal arson fire in a 24-unit multi-family building. The victim, a 59-year old man, was being evicted from his unit. During a standoff an incendiary device he had built ignited starting the fire. Two (2) civilians and four firefighters were also injured at this fire. Alarms were present and alerted the occupants. The building was not sprinklered. Damages from this fire were estimated to be $1.4 million.

- On September 25, 2019, at 5:51 p.m., the Brimfield Fire Department was called to a fatal arson fire in a single-family home. The victim, a 56-year old man, poured gasoline on the floor and ignited it, resulting in death by suicide. No one else was

injured at this fire. Alarms were present and operated. The home was not sprinklered. Damages from this fire were estimated to be $67,000.

3 Killed in 3 Cooking Fires
Three (3) people died in three fatal residential cooking fire in 2019. Cooking fires accounted for 9% of residential fire deaths and 11% of fatal fires in residential buildings.

- On March 9, 2019, at 6:19 a.m., the Springfield Fire Department was called to a fatal cooking fire in a 349-unit apartment building. The fire was caused by an electrical stove igniting nearby linen. The victim was a 71-year old woman whose clothes caught fire. She was transported to a hospital where she succumbed to her injuries months later. No one else was injured at this fire. Alarms were present and alerted the occupants of the building. The sprinklers extinguished the fire prior to the fire department's arrival. Damages from this fire were estimated to be $102,000.

- On July 9, 2019, at 8:36 p.m., the Marion Fire Department was called to a fatal cooking fire in a single-family home. The victim was an 83-year old woman who came too close to her stove and her clothing ignited. She extinguished the fire herself, but was badly burned. She was transported to a Rhode Island hospital where she later succumbed to her injuries. No one else was injured at this fire. Alarms were present but failed to operate for unknown reasons. The building was not sprinklered. Damages from this fire were estimated to be $160.

- On December 3, 2019, at 1:04 a.m., the Springfield Fire Department was called to a fatal cooking fire in a single-family home. The fire was started by a gas stove in the kitchen. The victim was an 85-year old physically disabled man who was unable to attempt an escape. It is believed the use of home oxygen helped the fire to spread more quickly. One (1) firefighter was injured at this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from this fire were estimated to be $105,000.

Motor Vehicle into a Home Caused 2 Deaths
A motor vehicle crash into a building severing the gas line caused one fire, or 4% of fatal residential building fires, and two, or 6%, of the residential building fire deaths in 2019.

- On January 1, 2019, at 9:40 a.m., the Fall River Fire Department was dispatched to a fire in a 36-unit apartment building. A car crashed into the building severing the natural gas line and igniting the escaping gas. The victims, a 75-year old woman and a 72-year old woman were trapped by the fire and unable to act. Two (2) other occupants and seven firefighters were injured at this fire. Alarms were present and alerted the occupants. The building did not have any sprinklers. Damages from this fire were estimated to be $5 million.

1 Fatal Heating Fires Caused 1 Death
One (1) fatal heating fires, or 4% of fatal residential building fires, caused one or 3%, of the residential building fire deaths in 2019.

- On October 22, 2019, at 4:49 p.m., the New Bedford Fire Department responded to a fatal heating fire in a three-unit apartment building. The fire was started when the 85-year old female victim placed a towel on the gas stove used for heating in the living room. She was overcome while trying to escape. She was transported to a hospital where she succumbed to her injuries. No one else was injured at this fire. Alarms were not present and the building did not have any sprinklers. Damages from this fire were estimated to be $100,000.

10 Fatal Fires of Undetermined Cause

Ten (10) fatal residential building fires that took the lives of 14 Massachusetts residents in 2019 remain undetermined. These represent 37% of the fatal residential fires, and 41% of the residential fire deaths in 2019. The cause of over one-third of all residential fire deaths could not be definitely determined after investigation. According to the National Fire Protection Association (NFPA) standard 921, Chapter 16.2.4, whenever the cause of a fire cannot be proven, the proper classification is "undetermined." NFPA 921, Chapter 16.2.5 advises that, "Undetermined is also acceptable when multiple fire causes or ignition factors cannot be eliminated, leaving the investigator with most probable causes."

- On January 21, 2019, at 6:59 p.m., the Billerica Fire Department was dispatched to a fire in a single-family home of undetermined cause. The victim was a 78-year old man. No one else was injured at this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from this fire were estimated to be $350,000.

- On February 2, 2019, at 3:09 a.m., the Worcester Fire Department was called to a fatal fire in a single-family of undetermined cause. The fire started on a mattress in the bedroom. The victim, a 63-year old man, was overcome while escaping. One (1) firefighter was injured at this fire. Alarms were not present and the building was not sprinklered. Damages from the blaze were estimated to be $159,000.

- On February 9, 2019, at 6:07 p.m., the Fairhaven Fire Department was called to a fatal fire in a 42-unit apartment building of undetermined cause. The fire originated in the first floor kitchen. The victim was a 66-year old man who was in the area of origin. He was transported to a local hospital where he succumbed to his injuries. No one else was injured at this fire. Alarms were present and operated. The building was not sprinklered. Damages from the blaze were estimated to be 40,000.

- On March 11, 2019, at 12:19 a.m., the Wellfleet Fire Department was dispatched to a fire in a single-family home of undetermined cause. The victims were a 77-year old woman and her 77-year old husband. One firefighter was also injured at this fire. It was undetermined if smoke alarms were present. It was also undetermined if the building was sprinklered. Damages from this fire were estimated to be $586,000.

- On March 16, 2019, at 3:38 a.m., the Pittsfield Fire Department was dispatched to a fire in a single-family manufactured home (trailer) of undetermined cause. The victims were a 25-year old man and two seven-year old boys. They were overcome while trying to escape. Two (2) other family members and one firefighter were also injured at this fire. Alarms were present but it was undetermined if they operated. The building was not sprinklered. Damages from this fire were estimated to be $100,000.

- On July 30, 2019, at 8:36 a.m., the Pepperell Fire Department was called to a fatal fire in a six-unit apartment building of undetermined cause. The victim was a 70-year old physically disabled woman who was unable to act. One (1) firefighter was also injured at this fire. Alarms were present but it was undetermined if they operated. The building was not sprinklered. Damages from the blaze were estimated to be $600,000.

- On September 1, 2019, at 11:45 p.m., the Everett Fire Department was dispatched to a fire in a three-unit apartment building of undetermined cause. The victims were a 63-year old woman and a 65-year old woman. One (1) firefighter was also injured at this fire. Alarms were present alerted and the occupants. The building was not sprinklered. Damages from this fire were estimated to be $810,900.

- On November 21, 2019, at 2:31 p.m., the Provincetown Fire Department was called to a fatal fire in a single-family home of undetermined cause. The victim was a 73-year old man. No one else was injured at this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from the blaze were estimated to be $455,000.

- On November 22, 2019, at 10:08 p.m., the Springfield Fire Department was called to a fatal fire in a vacant single-family home of undetermined cause. The most likely cause was the victim who was squatting started a fire in the fireplace to keep warm. The victim was 50-year old man who had previously lived in the home. Two (2) firefighters were also injured at this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from the fire were estimated to be $95,000.

- On December 28, 2019, at 5:04 p.m., the New Bedford Fire Department was called to a fatal fire in a two-family home of undetermined cause. The fire started in the second floor kitchen. The victim was an 88-year old physically disabled man. One (1) firefighter was also injured at this fire. Alarms were present but it was undetermined if they operated. The building was not sprinklered. Damages from the blaze were estimated to be $150,000.

Bedroom or Living Room is the Area of Origin for 38% of Fire Victims

Given that most fatal fires occur at night, and that many people fall asleep in their living rooms, it is not surprising that 38% of the victims were killed in fires that started in bedrooms or living rooms; eight, or 24%, succumbed to fires that originated in the living room, and five victims, or 15%, died in fires that began in the bedroom. Five (5) victims, or 15%, died when the area of origin was the kitchen. The ceiling and floor assembly was

the area of origin of the fire for four, or 12%, of the residential fire deaths in 2019. The heating room or area and an exterior wall surface were each the area of origin for two, or 6%; and an unclassified area of origin was the area of origin for one, or 3%, of the residential fire deaths in 2019. Seven (7) victims, or 21%, died in a fire where the area or origin was undetermined or not classified.

21% of Deaths Involved Smoking Materials as a Heat Source
Of the 34 residential building fire deaths, 21% involved smoking materials; 12% from undetermined smoking materials and 9% from cigarettes. Another 21% were classified as heat from operating equipment; 12% from radiated or conducted heat from operating equipment, and 9% from arcing. Heat from other open flame or smoking materials caused 12%; and heat or spark from friction caused 6%. An incendiary device and a lighter were each the heat source for 3% of residential fire deaths. The *Heat Source* was undetermined or unclassified in 12 deaths, or 34%, of the residential building fire deaths in 2019.

Bedding Was the Leading Item 1st Ignited
Of the 34 residential building fire deaths, bedding was the item first ignited in 9% of residential fire deaths; 6% was bedding and 3% was a mattress or pillow. A structural member or framing, an unclassified structural component, flammable gas from a pipe and rubbish were each the item first ignited in 6% of these deaths. Wearing apparel on a person, a floor cover such as a rug, carpet or mat, an uncontained flammable liquid, and an upholstered sofa or chair were each the item first ignited in 3% of these deaths. The item first ignited was undetermined or unclassified in 17, or 50%, of the residential building fire deaths in 2019.

Alarm Operation Undetermined for 44% of Residential Fire Victims
Of the 34 people who died in residential building fires in 2019, the smoke alarm performance was reported for 19 of the victims. Victims were not alerted by smoke alarms in eight fires that killed 10 people, or 30% of the victims. No alarms were present at all in four fires that were responsible for five, or 15%, of the deaths. In another four fires and five deaths, or 15%, there were alarms present but they failed to operate.

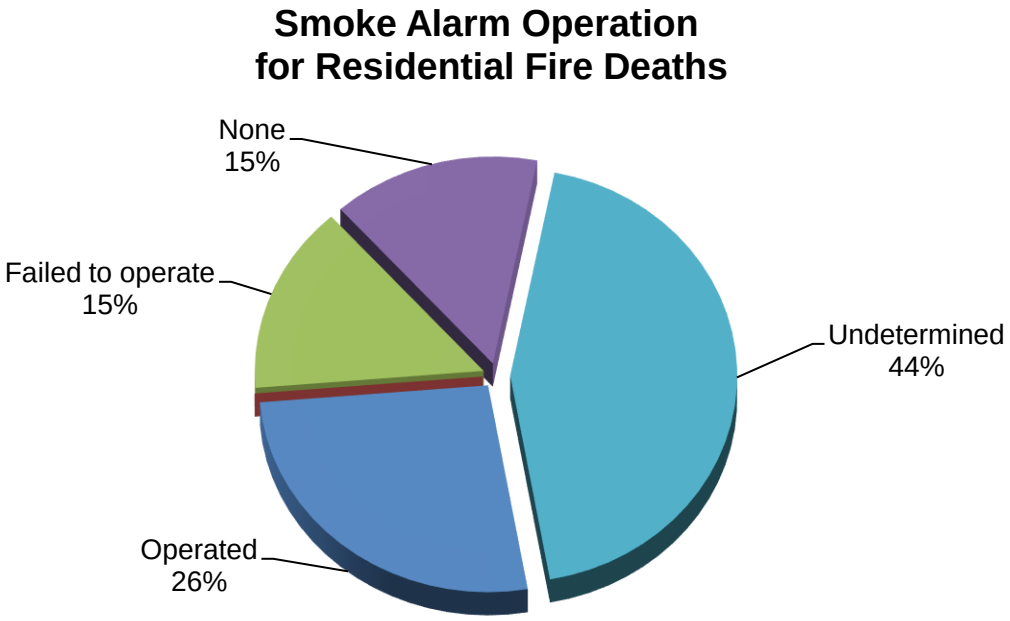
Nine (9) people died in seven separate residential fires with alarms that did operate, accounting for 26% of fatal fire victims. It is important to remember that alarms provide an early warning of a fire. They do not guarantee an escape if exits are blocked or an individual's clothing ignites. A fire that appears small when discovered can quickly grow beyond an individual's ability to control or escape it.

No one was reported to have died in a fire where the fire was too small to activate the alarm.

In 2019, all nine fatal residential fire victims whose smoke alarms operated were in the area of origin. Eight (8) of these victims were intimately involved with ignition; two died when a car crashed into their home severing the gas line, one died in a cooking fire, another person died in an electrical fire; an arsonist died in a fire he stared, and three others died in fires where the cause was undetermined.

In 2019 there were three victims that were not in the area of origin but were involved in the ignition of the fires. While smoke alarms cannot by themselves save a person who is directly involved in the ignition, they can alert other occupants to the danger and give them precious time to escape to safety.

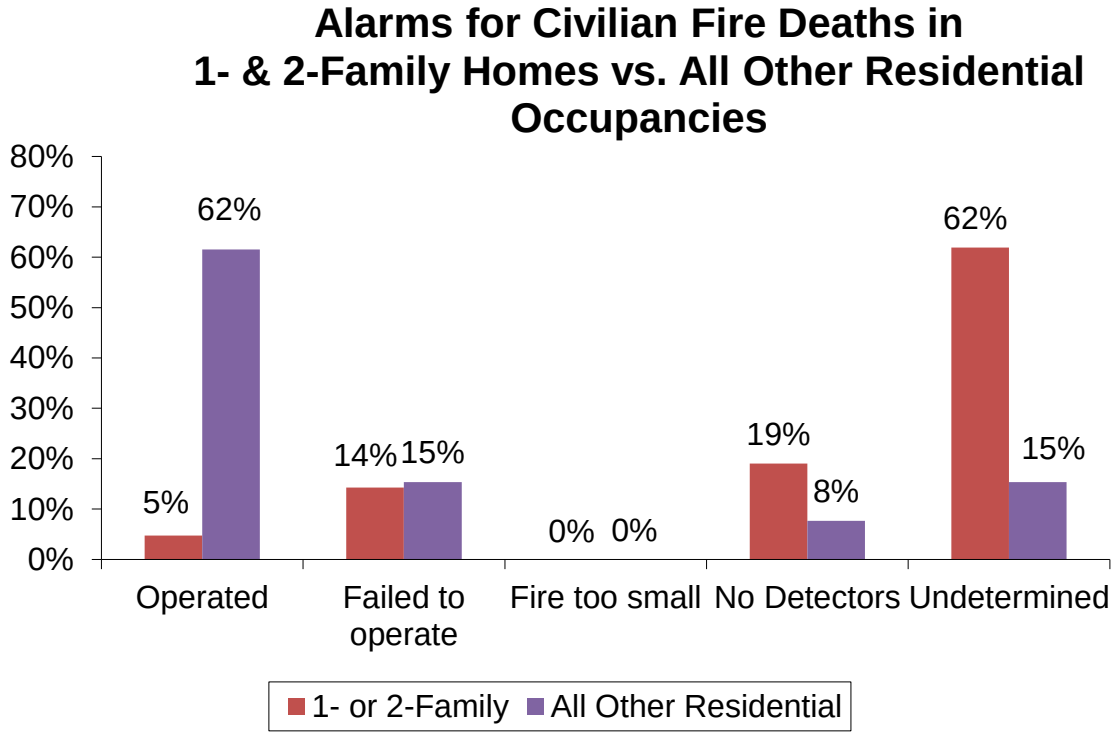
Alarm performance was undetermined in 12 residential building fires that killed 15 people, accounting for 44% of the residential building fire deaths in 2019. In five of these fires and seven deaths the alarms were present but it was undetermined if they operated. The pie chart shows the smoke alarm status as a percentage of the civilian residential building fire deaths in 2019.



No Working Smoke Alarms in 1/3 of Fire Deaths in 1 & 2-Family Homes
In 2019, you were more likely to die in a fire in a one- and two-family home than in any other residence and one without a working smoke alarm. There were 1.6 times more fire deaths in one- and two-family homes than all other residential occupancies combined. Twenty-one (21) people died in 17 one- and two-family dwelling fires in 2019. Seven (7), or 33%, of the fire deaths in one- and two-family homes occurred in fires with no alarms at all or with alarms that failed to operate. Of these deaths, three occurred in a home where smoke alarms failed to work while the other four deaths were in homes where there were no smoke alarms present. One (1) death, or 5%, occurred in homes where the smoke alarms operated. There were no reported deaths when the fire was too small to activate the alarm. Thirteen (13) deaths, or 62%, occurred in nine fires where smoke alarm performance was undetermined.

Other Residential Occupancies More Likely to be Protected by Smoke Alarms
Twelve (12) people died in nine apartment fires, and one person died in a rooming house fire in 2019. The alarm performance was known for 11 of the victims. Eight (8) people died in six fires where smoke alarms were present and working. Two (2) people were killed in a fire where the alarm failed to operate, and another person died in a fire where there were no alarms. No one died when the fire was too small to activate the alarm. Two (2) people died in two fires where alarm operation was undetermined.

The following graph illustrates the alarm status and the percentage of deaths between 1- and 2-family homes and all other residential occupancies.



5 Alarms Failed
Of the five residential fire deaths where smoke alarms were present but failed to operate, two failed from a power failure, shutoff or disconnect; one failed to operate because of missing batteries, one failed from a lack of maintenance, and it was undetermined why the other alarm failed.

37% of Older Adults Died in Fires with No Working Alarms
Seven (7), or 37%, of the 19 senior residential fire deaths had no working smoke alarms. Five (8) senior deaths, or 26%, occurred where there were operating alarms. No senior died in a fire where the fire was too small to activate the alarm. Seven (7) seniors, or 37%, died in fires where the alarm presence or operation could not be determined. Because of their age, older adults may have mobility and hearing impairments making

escape from a fire more difficult. Earlier warning and/or residential sprinklers may have allowed them to escape or survive the fire until firefighters arrived.

Physically Disabled Led Human Factors Contributing to Injury[11]
Of the 34 fatal residential building fire victims, 10 had a *Human Factor Contributing to Injury* reported in MFIRS. Eighteen percent (18%) were bedridden or had another physical handicap; 6% of the victims were asleep; and 3% were possible mentally disabled. Twenty-four (24), or 71%, of the 34 civilian fire deaths reported *None* or did not report a human factor contributing to injury.

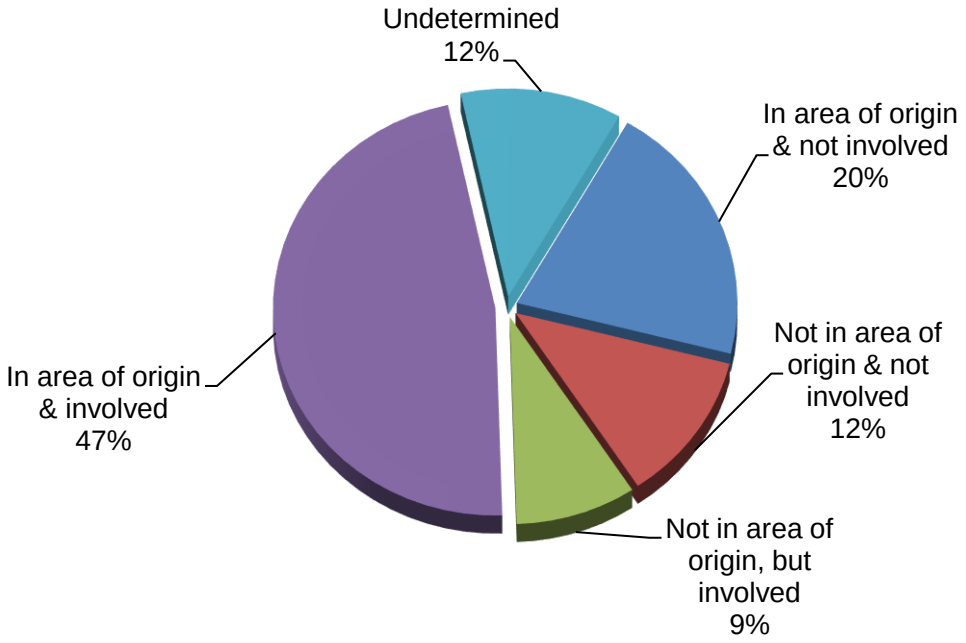
21% of Victims Were Escaping When They Were Overcome
Seven (7), or 21%, of the 34 fatal fire victims were trying to escape when they incurred their fatal injuries. Four (4) victims, or 12%, were unable to act. Three (3) victims, or 9%, were sleeping. Two (2) victims, or 6%, were acting irrationally when they were injured and another person, or 3%, was killed returning to the vicinity of the fire before it was under control. Activity at time of death was undetermined or not reported for 17, or 50%, victims of fatal residential fires in 2019. Working smoke alarms combined with a home escape plan are essential to escape a fire.

79% of the Victims Suffered Burns, Smoke Inhalation or Both
Burns or smoke inhalation was the primary apparent symptom for 27, or 79%, of the victims; 19, or 56%, suffered burns and smoke inhalation; seven, or 21%, suffered from smoke inhalation only, and one, or 3%, just had thermal burns. Two (2) people, or 6%, died from cardiac arrest. There were five deaths, or 15%, where the primary apparent symptom was not classified, undetermined or not reported.

56% of All Fatalities Were Somehow Involved in Ignition
Nineteen (19), or 56%, of the residential fatal fire victims were somehow involved with the start of the fire that eventually killed them. Sixteen (16), or 47%, of these victims were in the area of origin and intimately involved with the ignition of the fire that killed them, and three, or 9%, of these victims were not in the area of origin but were somehow involved in starting these fires; such as a person who is smoking and exits the room, leaving the cigarette behind unattended, or a person who forgets that they started cooking on the stove. Seven (7), or 20%, were in the area of origin but not involved in the fire's ignition. Three (3), or 9%, of the victims were not in the area of origin and not involved with the ignition of the fire that claimed their lives. The *Location at Time of Incident* was unknown for four, or 12%, of the residential fatal fire victims.

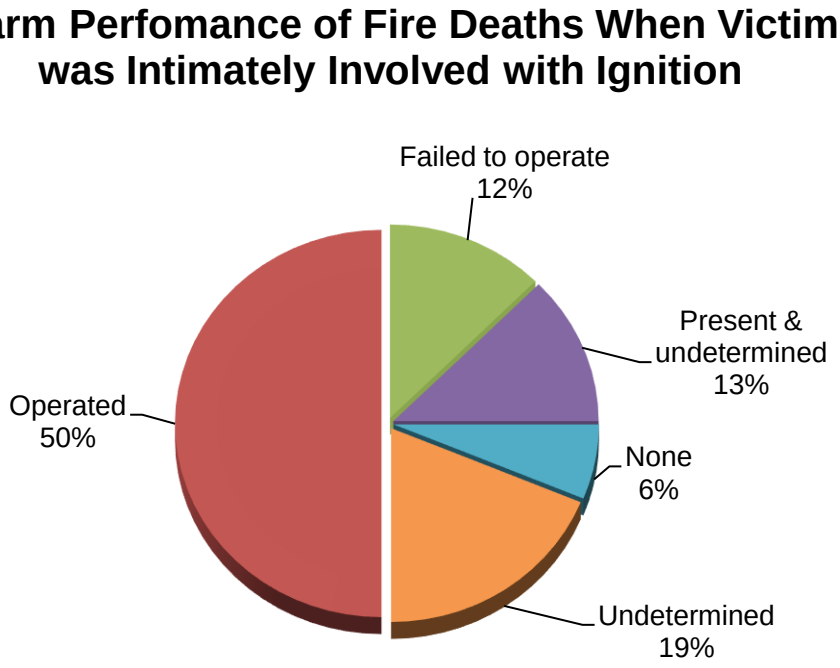
[11] Some fields in version 5 allow for multiple entries. Therefore the number of entries may be greater than the actual number of incidents being analyzed.

Civilian Fatalities
Location at Time of Incident



1/2 of Alarms Operated When the Victim Was Intimately Involved in Ignition
There were 16 victims that were reportedly in the area of origin and were involved with the ignition of the fire that killed them. It is most probable that no amount of early warning would have saved any of these victims. This is where fire prevention and education become key components in saving lives. Eight (8), or 50%, of these victims actually had a working smoke alarm in their home at the time of the fire. In two of these deaths, or 13%, there were alarms present in the home but they failed to operate. One (1) fire death, or 6%, did not have any smoke alarms. Alarms were present but it was undetermined if they operated in two of the deaths, or 13%. There were no reported deaths where the fire was too small to activate the alarm. It was undetermined in three, or 19%, of these deaths if there were any alarms.

In the case of the eight victims where the alarms operated and they were involved with the ignition, two died in a fire caused by a car crash into their home severing the gas line, one was a cooking fire, one was an electrical fire, another was an arson, and the other three fire causes were undetermined. Five (5) of these victims were older adults.



Fatal Motor Vehicle Fires

In 2019, four motor vehicle fires killed four civilians. Motor vehicle fire deaths are determined subsequent to the autopsy of the victim. When smoke is found in the lungs of the victim, it is an indication the victim survived the impact of the collision and was killed by the fire and not the crash. Three (3) of these fires and the accompanying death involved a motor vehicle crash. One (1) of these fires involved death by suicide.

3 Motor Vehicle Crashes Kill 3 Occupant
Three (3) motor vehicle fires and the subsequent deaths were caused by three motor vehicle crashes. These incidents accounted for 9% of the fatal fires and 7% of the fire fatalities in the Commonwealth in 2019.

- On August 3, 2019, at 2:07 a.m., the Plymouth Fire Department was called to a fatal motor vehicle crash with ensuing fire. The victim, a 22-year old man, was trapped in the vehicle and died in the fire. No one else was injured at this fire. Damages from this fire were estimated to be $5,200.

- On November 13, 2019, at 5:16 p.m., the Fairhaven Fire Department was called to a fatal motor vehicle crash with ensuing fire. The victim, a 31-year old man, was trapped in the vehicle and died in the fire. No one else was injured at this fire. Damages from this fire were estimated to be $3,200.

- On December 5, 2019, at 11:42 p.m., the Sturbridge Fire Department was called to a fatal motor vehicle fire. The car was stuck in a wooded area and heat from the exhaust caused the surrounding vegetation to ignite. The victim, a 76-year old man, was trapped in the vehicle and died in the fire. No one else was injured at this fire. Damages from this fire were not estimated.

1 Suicide Kills 1 Occupant
One (1) motor vehicle fire was a death by suicide. This incident accounted for 3% of the fatal fires and 2% of the fire fatalities in the Commonwealth in 2019.

- On December 1, 2019, at 7:04 a.m., the Arlington Fire Department was dispatched to a motor vehicle fire in an open lot. It is believed that the driver, a 54-year old man and only occupant of the vehicle set the car on fire. When the car burst into flames he died by suicide. No one else was injured in this fire. Damages from this fire were estimated to be $15,000.

Other Fatal Fires

In 2019, two outside fire incidents killed two civilians. These incidents accounted for 6% of the fatal fires and 5% of the fire fatalities in Massachusetts in 2019. One (1) of these incidents was a suicide by self-immolation, and the other of these incidents was undetermined.

1 Unknown Victim Found Burned by Fire
- On May 18, 2019, at 4:53 p.m., the Boston Fire Department was called to a fatal fire in Franklin Park. The identity of the victim is unknown as is the cause of the fire that killed him. The victim is the only thing that burned.

1 Outside Fire Kills 1 Massachusetts Resident
- On June 21, 2019, at 10:50 a.m., the Medford Police Department was called to a fatal outside fire at the Middlesex Fells Reservation. The victim was the only thing burning. The victim, a 35-year old woman, committed suicide by self-immolation.[12]

[12] The Medford Fire Department did not respond to this call because the police determined that the condition of the victim was obvious death and the fire was extinguished. The MFIRS report was compiled from data from the MSP FIU investigation.

Multiple Fire Deaths

For statistical purposes, a fire is considered a multiple death fire if it kills three or more people. In 2019, there was one multiple death fire in Massachusetts. It was the fire in Pittsfield on March 16, 2019 that killed two siblings and their father.

Explosion Deaths

Marlborough Suicide by Explosion

- On October 29, 2019 at 9:08 a.m., a 20-year old Marlborough resident died by suicide when he ignited a homemade IED. He created the IED using components from M-class fireworks.

Civilian Fire Deaths - Conclusion

42 Civilians Died in Massachusetts Fires

In 2019, there were 35 fatal fires in Massachusetts with 42 accompanying fatalities. This is a decrease of three, or 5%, from the 45 civilian fire deaths reported in 2018. Of these 42 deaths, 34 occurred in residential fires.

Majority of Fire Deaths Occur in Residential Occupancies

We focus our analysis on residential fire deaths because it is where prevention can have the most impact. Thirty-four (34) of the 36 fatal structure fire victims died in residential building fires. Twenty-one (21) of these deaths occurred in one- or two-family homes, accounting for half of all fire deaths.

Smoking Fires Are Leading Cause of Fire Deaths

In 2019, smoking fires were the leading cause of residential fire deaths and fatal residential fires. These fires accounted for seven, or 21%, of residential fire deaths. Electrical fires were the second leading cause of fire deaths, accounting for four, or 12%, of residential fire deaths. Arsons and cooking each caused three, or 9% of residential fire deaths.

2 Children Died in a Fire

Two (2) children under the age of 18 died in one fire in Massachusetts in 2019. Two (2) seven-year old brothers died in an undetermined fire at home in a trailer.

48% of All Fire Deaths are Older Adults

Twenty (20) older adults died in fires, accounting for nearly half, 48%, of all fire deaths in Massachusetts in 2019. Historically, the lack of working smoke alarms is a significant factor in senior fire deaths. In 2019, five of the 19 senior residential fire deaths had working smoke alarms; three of the deaths occurred in a fire with no alarms at all; four

occurred in fires where the alarms did not operate; and in the other seven deaths it was undetermined if alarms were present or operational.

Older Adults at Significant Risk for Fire Death
Older adults, especially those over the ages of 65 had a significant risk of dying in a fire. The risk of fire death for adults over the age of 85 is 6.0 and those adults between the ages of 75 and 84 is 2.9. Older adults between the ages of 65 and 74 were 3.1 times more likely to become a fire-related fatality.

1/2 of People Died in Fires When They Would be Sleeping
Over half of the people who died in fires died while they slept. Twenty-one (21), or half, of the fire victims died in fires that occurred between 10:00 p.m. and 7:00 a.m.

Just Over 1/4 of Fatalities Had Working Smoke Alarms
Twenty-six percent (26%) of the residential fire victims had a working smoke alarm. Many of these victims could have possibly survived if they had residential sprinklers to help them. Thirty-eight percent (38%) of the victims died in fires that began in either the bedroom or living room. Bedding was the leading item first ignited. Also, when Primary Apparent Symptom was reported, 79% of the victims suffered burns, smoke inhalation or both.

68% of Fatalities Were in the Area of Origin
Twenty-three (23), or 68%, of all the civilians that died in residential fires were reported to be in the area of fire origin. Sixteen (16) victims were intimately involved in the ignition of the fire that killed them. It is most probable that no amount of early warning would have saved any of these victims. This is where fire prevention and education become key components in saving lives.

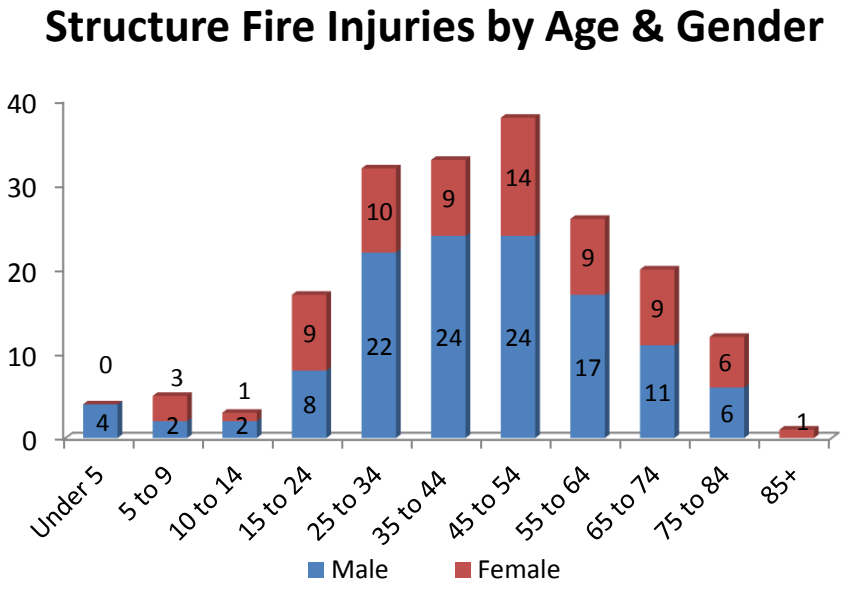
4 Suicides – Continues Tragic Trend
In past years there were a tragic number of people who used fire to take their own lives. In 2019, there were four confirmed suicides and one possible suicide. All four were by self-immolation, two at home, one in a car and one outside. In 2018 there was one confirmed and one possible self-immolation. In the past 10 years there have been 40 civilian fire deaths by suicide. In the past five years there have been 11 civilian fire deaths by suicide.

Civilian Injuries

248 Civilians Injured in Fires in 2019 – Mostly at Home
Massachusetts' fires injured 248 civilians in 2019. One hundred and ninety-two (192), or 77%, of civilian injuries occurred in structure fires. One hundred and sixty-four (164) injuries occurred in residential building fires, accounting for 66% of all injuries and 85% of all structure fire injuries. Thirty-four (34), or 14%, occurred in motor vehicle fires. Twenty-two (22), or 9%, of civilian injuries occurred in outside and other fires. Special outside fires accounted for five, or 2%, of all civilian injuries, and brush fires accounted for two, or 1%, of civilian fire injuries. Outside rubbish fires accounted for one, or less than 1% of all civilian fire injuries. Fourteen (14), or 6%, of civilian injuries were caused by unclassified fires.

Structure Fire Injuries

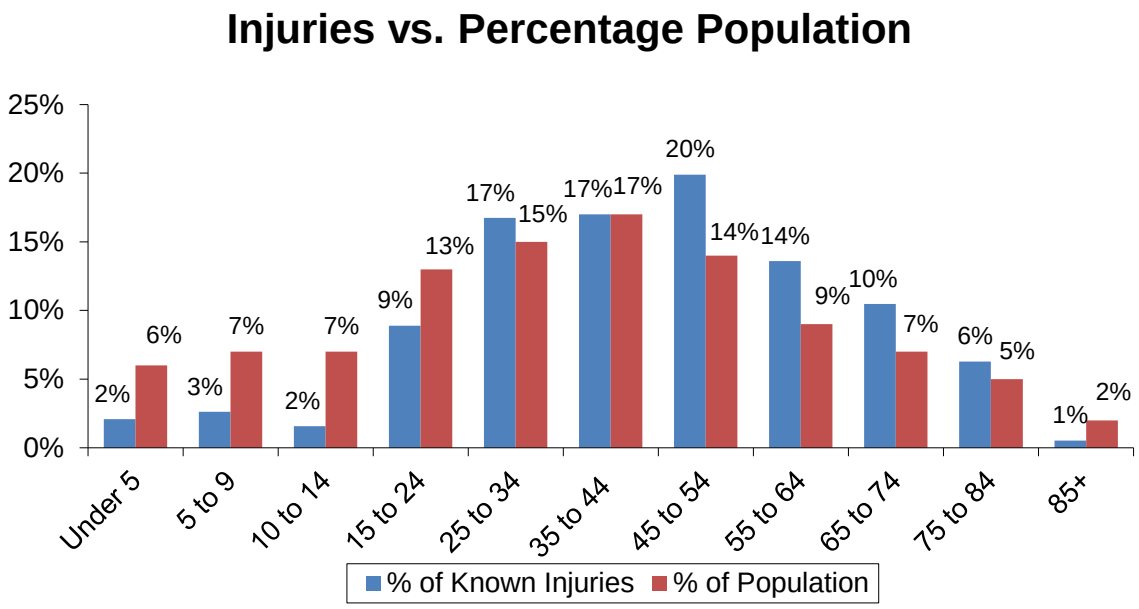
Of the 191 civilian injuries resulting from structure fires where gender was reported, 120, or 63%, were men and 71, or 37%, were women. Overall, 16 children under 18 years of age, 142 adults aged 18 to 64 years old, and 33 older adults over the age of 65, were injured in structure fires in 2019. The following chart illustrates the structure fire injuries by age and gender in 2019.



Adults 45 to 54 at Highest Risk for Fire Injury
Adults between the ages of 45 and 54 represent 14% of the population and yet they accounted for 20% of the injuries in 2019. In this age grouping, 50% of the fire-related

injuries were incurred while trying to control the fire, and 11% were injured trying to escape. People in these age groups are most at risk being injured in a fire because they are more likely to try and control the fire. Adults between the ages of 55 and 64 represent 9% of the Massachusetts population, yet they accounted for 14% of the injuries at structure fires in 2019. Adults between the ages of 25 and 34 and older adults between the ages of 65 and 74 and 75 to 84 were also at slightly higher risk for a fire injury.

The following graph shows the percentage of injuries by age group and the percent of the population that age group represents in Massachusetts. When the percentage of injuries is greater than the percentage of population, that group is at a greater risk for being injured in a fire.



82% of Injuries Were Directly Related to Exposure to Fire Products
Of the 176 civilian injuries in structure fires where the *Cause of Injury* was known, 82% were directly linked to exposure to fire products. The *Cause of Injury* was not reported or Undetermined in 18 civilian fire injuries. These were excluded from the percentage calculations

Cause of Injury	# of Injuries	% Known Injuries
Other	11	6%
Exposed to fire products	145	82%
Exposed to hazmat or toxic fumes	8	5%
Jumped in escape attempt	0	0%
Fell, slipped or tripped	2	1%
Caught or trapped	1	1%
Structural collapse	0	0%
Struck by or contact w/object	2	1%
Overexertion	4	2%
Multiple causes	3	2%
Total Known	212	100%

80% of Injuries Were Due to Smoke Inhalation or Burns or Both

Of the 173 civilian injuries in structure fires where the *Primary Apparent Symptom* was known, 80% were caused by smoke inhalation, burns or both. The nature of injury was undetermined or not reported in 18 civilian fire injuries. These were excluded from the percentage calculations.

Primary Apparent Symptom	# of Injuries	% Known Injuries
Smoke inhalation	71	41%
Burns only, thermal	43	25%
Burns & smoke inhalation	24	14%
Breathing difficulty, shortness of breath	12	7%
Cut or laceration	4	2%
Other	4	2%
Emotional/psychological stress	3	2%
Alcohol impairment	2	1%
Pain, only	2	1%
Shock	2	1%
Burn, electric	1	1%
Burn, scald	1	1%
Cardiac symptoms	1	1%
Contusion, bruise	1	1%
Electric shock	1	1%
Unconscious	1	1%
Total Known	**173**	**100%**

44% Injured While Trying to Control the Fire

Of the 158 victims for whom A*ctivity at Time of Injury* was known, 44% were attempting to control the fire. There were 33 injuries where the activity at time of injury was unknown; these were excluded from the percentage calculations.

Activity When Injured	# of Injuries	% Known
Fire control	69	44%
Escaping	34	22%
Other	22	14%
Return to vicinity of fire before control	11	7%
Sleeping	10	6%
Rescue attempt	5	3%
Unable to act	4	3%
Irrational Act	3	2%
Return to vicinity of fire after control	0	0%
Total known	158	100%

The key to preventing these injuries is to make and practice a home escape plan, remember to get out and stay out, and leave firefighting to the professionals. They have the training, equipment and protective clothing to do the job.

Almost 1/2 of Victims Were Asleep Just Before the Injury
Of the 42 victims for which the *Human Factor Contributing to the Injury* was known, 40% were asleep. Fire sprinklers can provide the extra time to escape to safety for people who are impaired, have a disability, are very young or are very old.

The table on the next page is a cross tabulation which allows us to know what the person was doing when injured and what was either their physical or mental state shortly before becoming a victim.

CIVILIAN INJURIES BY ACTIVITY AND PRIOR CONDITION

Human Factors Contributing to Injury

Activity At Injury	Asleep	Uncon-scious	Possibly Impaired: Alcohol	Possibly Impaired: Drugs	Mentally Disabled	Physically Disabled	Physically Restrained	Unsuper-vised
Escaping	5	0	1	0	1	0	0	0
Rescue attempt	0	0	0	0	0	0	0	0
Fire control	2	0	0	2	0	0	0	0
Return before fire control	0	0	1	0	0	0	0	1
Return after fire control	0	0	0	0	0	0	0	0
Sleeping	7	0	0	0	0	0	0	0
Unable to act	0	1	1	0	0	1	0	0
Irrational act	0	0	0	0	0	0	0	1
Other	0	0	0	0	1	0	0	0
Unknown	3	0	2	0	0	1	0	0
Total	17	1	5	2	2	2	0	2

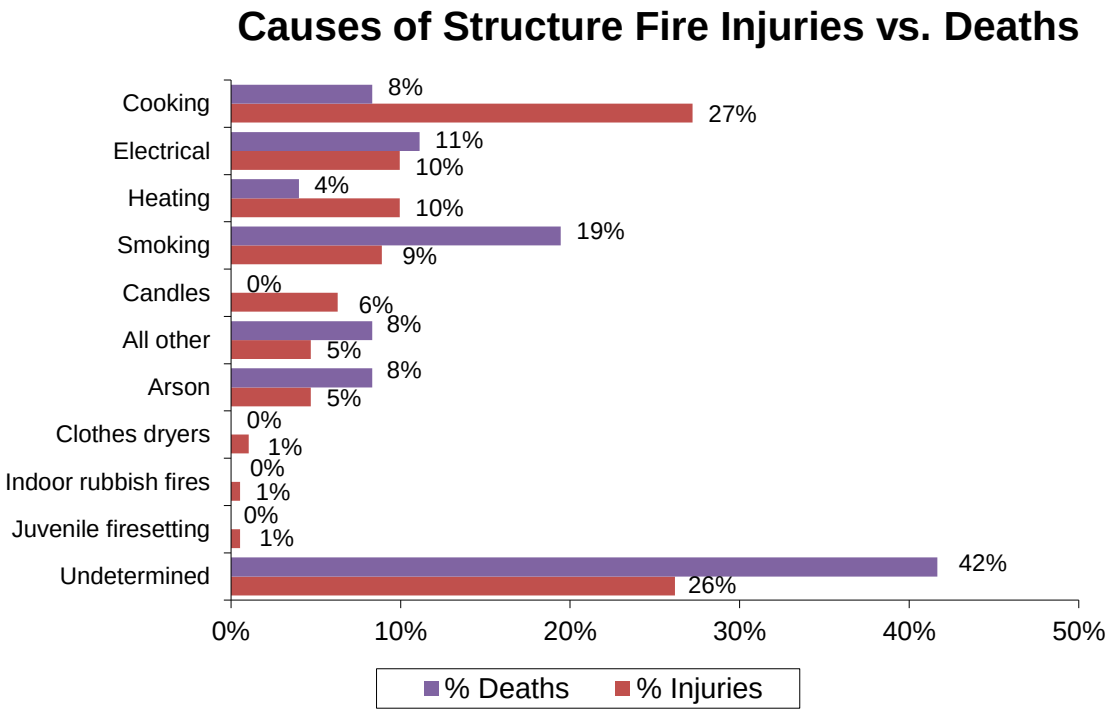
Most Injured People Usually Asleep When Fire Started & Then Slept Through Fire
Historically when both of the fields, *Activity When Injured* and *Human Factors Contributing to Injury*, were completed, the majority of civilian fire injuries occurred

when people were asleep at the time of injury and were still asleep at the time of the fire. The other leading cause is when someone was asleep, awoke and attempted to escape.

48% of All Victims Were Involved With the Ignition of the Fire
Forty-five percent (45%) of all victims were involved with the ignition of the fire that injured them. The *Location at Time of Incident* was undetermined or not reported in 36 civilian fire injuries. These were excluded from the percentage calculations.

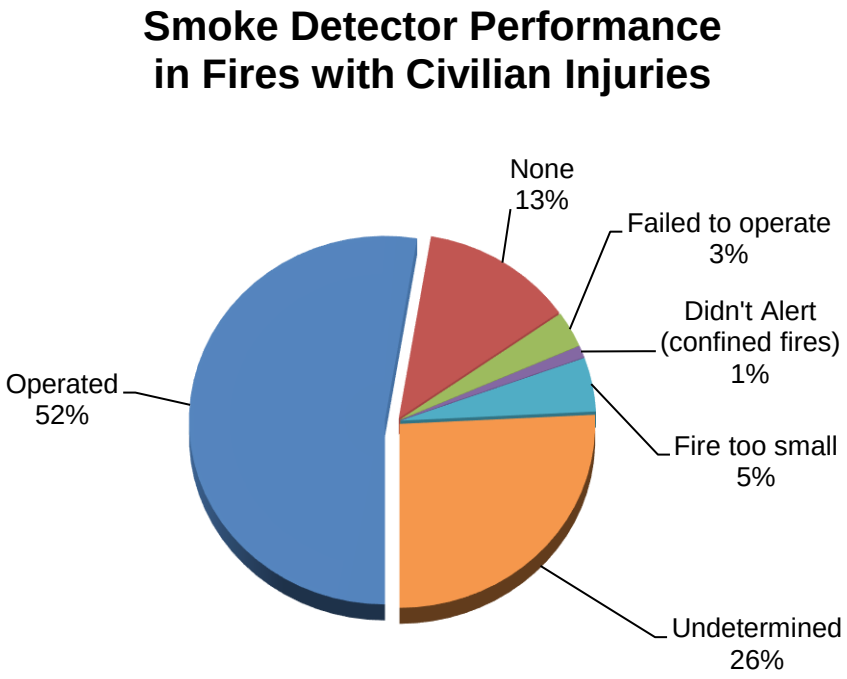
Location at Time of Incident	# of Injuries	% Known Injuries
In area of origin & not involved	41	26%
Not in area of origin & not involved	33	21%
Not in area of origin & involved	12	8%
In area of origin & involved	69	45%
Total Known	155	100%

Cooking Fires Were the Leading Cause of Injuries in Structure Fires
The leading cause of fire-related injuries is rarely a leading cause of fire-related deaths. Cooking fires caused over one quarter, or 27% of civilian fire injuries and only 8% of civilian fire deaths.



Alarms Operated in 52% of Civilian Injuries
Of the 190 injuries where alarm status was reported, 52% occurred where smoke alarms were present and operated. Smoke alarm performance was undetermined in 49 injuries, or 26% of all injuries. The presence of operating smoke alarms generally gives the victims

the time needed to escape the byproducts of the fire: heat, flame and smoke, or alerts them to the fire and they are injured trying to extinguish it.



Motor Vehicle Fire Injuries

There were 34 motor vehicle fire injuries in 2019, accounting for 14% of all civilian fire injuries. Twenty-seven (27) of these injuries were to men and seven were to women. Ninety-seven percent (97%) of the injuries were caused by exposure to fire products, when the cause was known.

Cause of Injury	# of Injuries	% Known Injuries
Exposed to fire products	29	97%
Other	2	7%
Struck by or contact w/object	1	3%
Total	32	100%

When the *Primary Apparent Symptom* was reported, 48% of these were reported as smoke inhalation.

Primary Apparent Symptom	# of Injuries	% Known Injuries
Smoke inhalation	15	48%
Burns only, thermal	8	26%
Burns & smoke inhalation	6	19%
Cut or laceration	1	3%
Pain only	1	3%
Total	32	100%

Where the *Activity at Time of Injury* was known, 37% were trying to return to the vicinity of the fire before it was under control. There were four injury where the activity at time of injury was unknown; these injuries were excluded from the percentage calculations.

Activity at Time of Injury	# of Injuries	% Known
Return to vicinity of fire before fire under control	11	37%
Escaping	7	31%
Fire control	6	23%
Other	3	10%
Irrational act	3	10%
Total	30	100%

The causes of motor vehicle fires that injured civilians in 2019 included fuel spills, collisions, arson, and mechanical malfunctions. See the Motor Vehicle Fire section for safety tips in the event of a car fire.

Outside and Other Fire Injuries

Twenty-two (22), or 9%, of civilian fire injuries occurred in outside and other fire incidents in 2019. Five (5), or 23%, of civilian injuries were caused by special outside fires.

Incident Type	# of Injuries	% of Outside & Other Fire Injuries	% Total Injuries
Fire - Other	14	64%	6%
Brush Fire	2	9%	1%
Outside rubbish fire	1	5%	0.4%
Special outside fire	5	23%	2%
Total	22	100%	9%

Sixty-four percent (64%) of the civilian victims were men and 36% were women.

Burns and smoke inhalation accounted for 39% of the injuries to this group, when the *Primary Apparent Symptom* was known. There were five injuries where the primary apparent symptom was unknown; these were excluded from the percentage calculations.

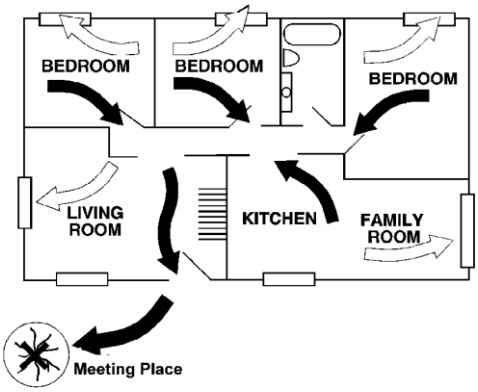
Primary Apparent Symptom	# of Injuries	% Known
Burns and smoke inhalation	7	41%
Burns only: thermal	5	29%
Smoke inhalation	2	12%
Burns, scald	1	6%
Cut or laceration	1	6%
Strain or sprain	1	6%
Total	17	100%

The victims were intimately involved with the ignition in 79% of these injuries where *Location at Ignition* was known. There were eight injuries where the activity at time of injury was unknown; these were excluded from the percentage calculations.

Location at Ignition	# of Injuries	% Known Injuries
In area of origin & not involved	2	14%
Not in area of origin & not involved	1	7%
Not in area of origin & involved	0	0%
In area of origin & involved	11	79%
Total	14	100%

Safety Practices Are the Best Prevention Methods

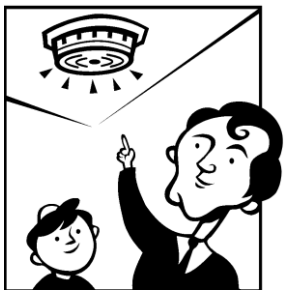
In a typical nighttime fire, there is a window of 1-3 minutes in the average home after the smoke alarm sounds for the family to get out safely. In a few minutes, heat and toxic gases make escape impossible. To survive a fire, one must install and maintain smoke alarms, and when possible install sprinklers. Make and practice an escape plan. These types of basic fire safety practices are ignored by too many Massachusetts residents and result in fires, injuries, and deaths.



Home Escape Plan

- Practice your home escape plan with the whole family at least twice a year.
- Hold a nighttime drill to test if your children will react properly to a smoke alarm activation. Adjust your escape plan accordingly.
- Plan two ways out of each room. The easy way out is probably a door and the second way out might be a window.
- If you plan for a child or a senior to exit a window, make sure they can open it easily.
- If you can't get out, close your door and go to the window and signal for help.

- Teach children to never hide under beds or in closets.
- If you must go through smoke, crawl low. The coolest, cleanest air will be about 18 inches off the ground.
- Have a meeting place outside where everyone will meet. Be able to tell the fire department if everyone is out safely.
- Get out and stay out; don't go back into a burning building for anything.
- Telephone the fire department from a neighbor's house or use the fire alarm emergency box or a cell phone at a safe distance from the building.



Smoke Alarms

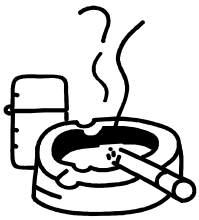
- Install smoke alarms on every level and outside each sleeping area.
- Test smoke alarms monthly.
- Replace the batteries twice a year if you don't have 10-year sealed lithium batteries in your alarms.
- Never disable your alarm.
- Replace alarms every 10 years.

Cooking Safety

- Put a lid on a grease fire to smother it, then turn off the heat.
- Wear short or tight fitting sleeves when cooking. Loose sleeves easily catch fire.
- Never throw water on a grease fire. Water will only spread the fire around.
- Never move a burning pan. You can too easily ignite your clothes or spill the fire onto someone or something else.
- Stand by your pan! Never leave cooking unattended.

Safe Smoking

- Quit!
- Never smoke in bed.
- Use large ashtrays with center rests so cigarettes fall into the ashtray, not on the floor.
- Never throw cigarettes into mulch or flower pots.
- Restrict smoking to outdoors.
- Do not smoke in homes or buildings where medical oxygen is used. Oxygen soaks into clothes, rugs, furniture, hair and bedding, creating an oxygen enriched environment, which make fires start more easily and burn more rapidly, even when the oxygen is "turned off."



Dryer Safety

- Clean the filter screen after each load.
- Stay home while the dryer is in use.
- Clean vents to outside.
- Vacuum the motor area periodically.
- Clean dryer vents regularly.

2019 Firefighter Deaths

2 Fire-Related Firefighter Deaths in 2019
In 2019, there were two fire-related fire service fatalities in the Commonwealth of Massachusetts. In the past five years there have been five fire-related fire service deaths for an average of one fire-related fire service death per year.

Worcester Lieutenant Jason Menard

Marion Firefighter Thomas Nye

Marion 2/26/19 - FF Thomas Nye, Age 72
On Tuesday, February 26, at 12:47 p.m., the Marion Fire Department was called to a chimney fire in a single-family home at 894 Point Rd. FF Thomas Nye responded to the fire and helped extinguish it. He collapsed at his home early the next morning on 2/27/19 after suffering an apparent cardiac incident. He was transported to Tobey Hospital where he was pronounced deceased, he was 72-year old. No one else was injured at this fire. Alarms were present and operated; and the home did not have sprinklers. Damages from this fire were estimated to be $15,000.

Worcester 11/13/19 - LT Jason Menard, Age 39
On November 13, 2019, at 1:00 a.m., the Worcester Fire Department was called to a fire at 7 Stockholm St., a traditional “three-decker” apartment building. Lt. Jason Menard was inside the building with his crew when conditions deteriorated rapidly, He pushed one of his crew out a window and another down the stairs saving their lives. He was unable to extricate himself from the worsening conditions. He was extricated from the home and transported to a local hospital where he succumbed to his injuries, he was 39 years old. Four (4) other firefighters and two civilians were also injured at this fire. Alarms were present and operated. The building did not have sprinklers. Damages from this fire were estimated to be $550,145.

Fire Service Injuries

506 Firefighters Injured in 2019
In 2019, 506 firefighters were injured while fighting the 25,176 reported fires in Massachusetts. On average, one firefighter was injured at one of every 50 fires in 2019. Four hundred and forty-six (446) firefighters were injured at structure fires. Thirty-five (35) firefighters were injured at motor vehicle fires. Twenty-five (25) firefighters were injured at outside and other fires. This is an increase of 65, or 15%, from the 441 fire-related fire service injuries reported in 2018.

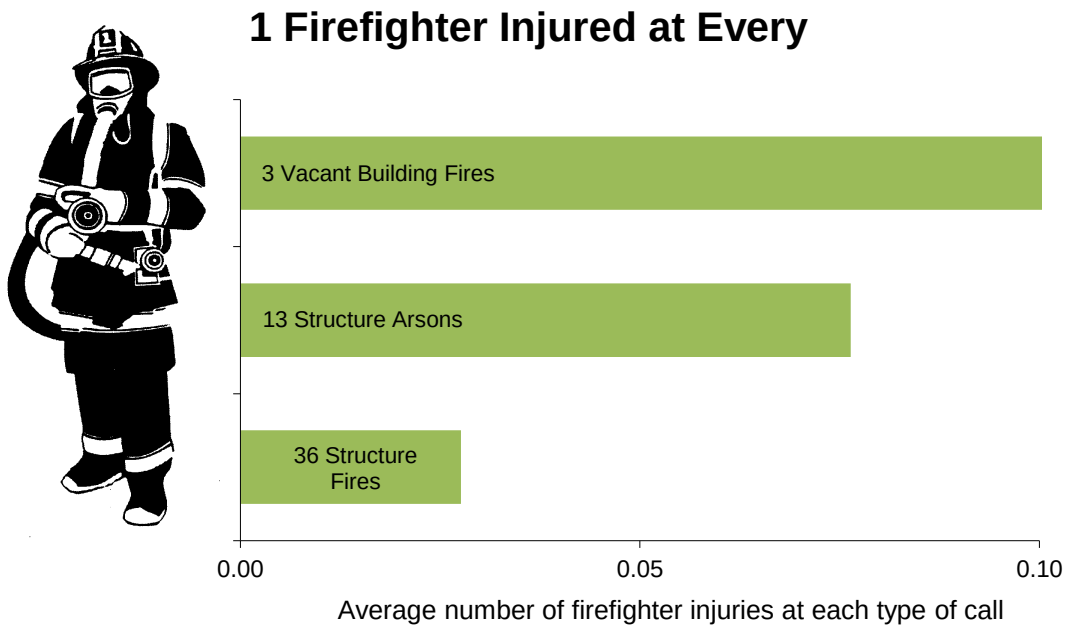
88% of Firefighter Injuries Occurred at Structure Fires
Firefighters were injured more frequently at structure fires than any other fire incident type. Eighty-eight percent (88%) of firefighter injuries occurred at structure fires, while structure fires only accounted for 70% of all fires.

Electrical Fires Caused the Most Injuries at Structure Fires
The largest number of firefighter injuries took place at structure fires caused by electrical problems. Eighty-nine (89), or 20%, of structure fire firefighter injuries occurred at electrical fires. Even though cooking fires are the leading cause of structure fires and civilian fire injuries, fires caused by cooking accounted for 23, or 5%, of fire service injuries at structure fires. Smoking fires, candles and heating equipment fires each accounted for 19, 18 and 17 respectively, or 4%, of structure fire firefighter injuries.

Firefighters Injured at 1 of Every 3 Vacant Building Fires
One of the most dangerous types of fires for firefighters in 2019 were vacant building fires. Vacant building fires accounted for 75, or 15%, of all firefighter injuries. These 75 injuries also represent 17% of the number of firefighter injuries incurred fighting structure fires in 2019.

On average there was one firefighter injury for every three vacant building fires. There was one firefighter injury for every 13 structure arsons; and one firefighter injury for every 36 structure fires[13].
The following graph illustrates this.

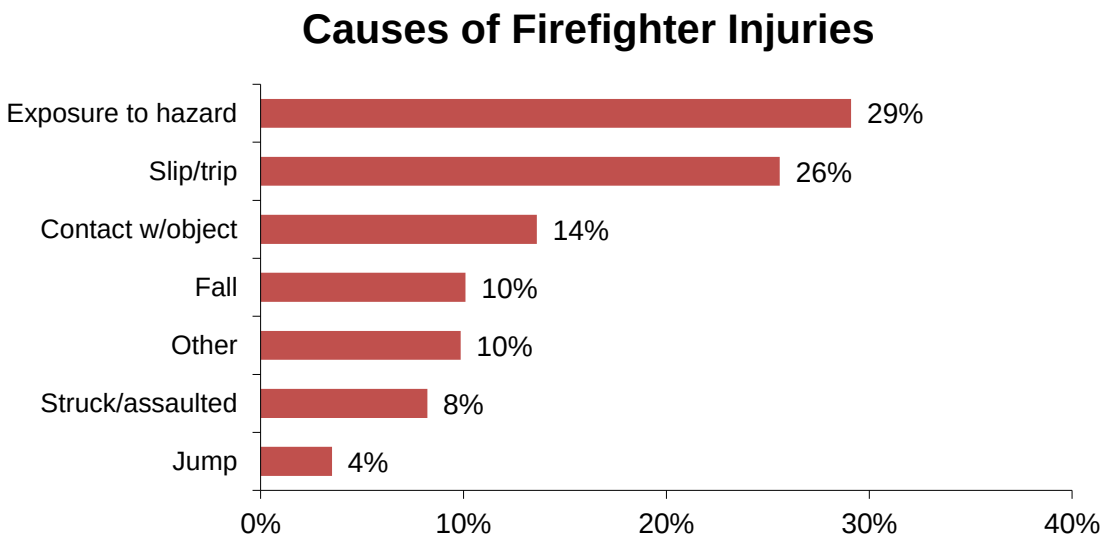
[13] On average there were 0.33 firefighter injuries at every vacant building fire; there were only 0.08 reported firefighter injuries per structure arson in 2019; and there were 0.03 reported firefighter injuries per structure fire in the Commonwealth in 2019.



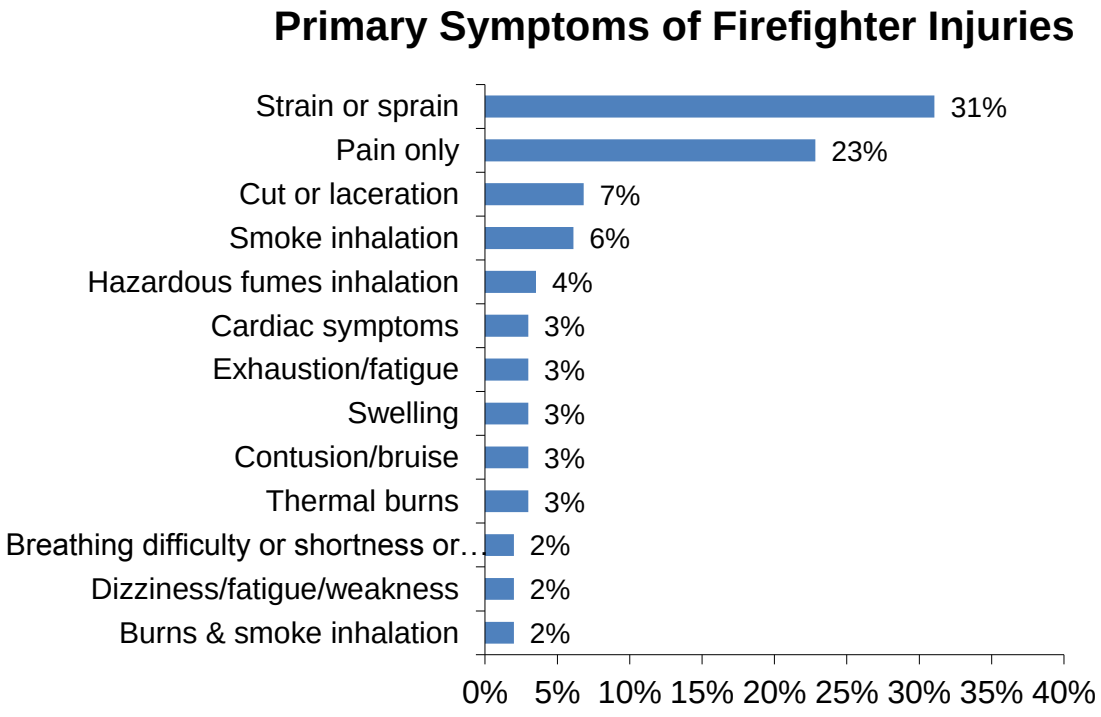
Almost 3/4 of Firefighter Injuries Minor
Seventy-four percent (74%) of reported firefighter injuries were minor.

Severity	# of FF Injuries	% of FF Injuries
Report only, including exposure	262	52%
First aid only	60	12%
Treated by physician, not a lost time injury	52	10%
Lost time injury, moderate severity	125	25%
Lost time injury, severe	7	1%
Lost time injury, life threatening	0	0.2%
Total Known	506	100%
Minor	374	74%

29% of Injuries from Overexertion or Strain
Twenty-nine percent (29%) of all reported firefighter injuries were from overexertion or strains.



31% Experienced Sprains or Strains & 23% of Firefighters Reported Pain
The leading *Primary Symptoms* for firefighter injuries were strains or sprains, pain and cuts or lacerations.

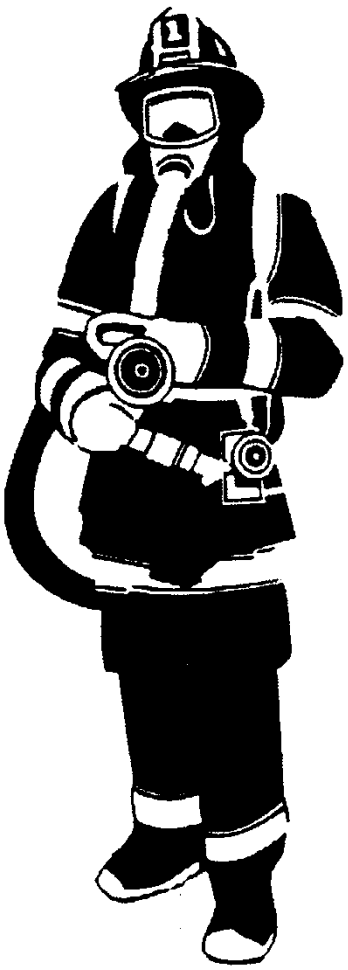


Firefighters Face Other Risks in Addition to Fires
The Massachusetts Fire Incident Reporting System (MFIRS) generally only collects information about injuries at fires. Firefighters face many other dangerous situations in addition to those found at fires. Many are also injured while controlling hazardous materials incidents, performing rescues and extrications, performing emergency medical services, investigations, inspections and other activities.

20% of All Firefighter Injuries Were To the Trunk Part of the Body
Firefighting is a very strenuous and potentially dangerous job. It requires a person to lift heavy loads and put large amounts of stress on their body. Eighty-one (80), or 20%, of all firefighter injuries were to the trunk part of the body that includes the lower back. The chart below shows the distribution of firefighter injuries by body part. The percentages given are the ratio of the number of reported primary apparent symptoms for each given body part grouping.

Leading Firefighter Injuries by Part of Body

Eyes (12)	
Avulsion	11%
Abrasion	11%
Trunk (81)	
Pain only	44%
Strain or sprain	42%
Internal (42)	
Smoke inhalation	38%
Breathing difficulty	10%
Hazardous fumes	10%
Cardiac symptoms	11%
Hand, Fingers (57)	
Cut, laceration	40%
Strain or sprain	12%
Swelling	11%
Legs (12)	
Strain or sprain	50%
Pain only	42%



Ears & Face (7)	
Cut, laceration	43%
Thermal burns	43%
Abrasion	14%
Back & Spine (47)	
Strain or sprain	57%
Pain only	40%
Arms (16)	
Strain or sprain	38%
Contusion, bruise	25%
Pain only	19%
Wrists (4)	
Strain or sprain	50%
Pain only	50%
Knees (43)	
Strain or sprain	53%
Pain only	33%
Feet & Toes (7)	
Strain or sprain	29%

Undetermined Fire in Cambridge Injures 37 FF's – Most Fire Service Injuries

- On January 14, 2019, the Cambridge Fire Department was called to fire in afire of undetermined cause in an apartment building under construction. Thirty-seven (37) firefighters were injured at this fire. Alarms were present and they alerted the occupants. The building did not have sprinklers. Damages from this fire were estimated to be $1.2 million.

Haverhill Chemical Fire Injures 25 Firefighters –2nd Most Fire Service Injuries

- On April 17, 2019, at 10:35 a.m., the Haverhill Fire Department was called to a chemical fire at Thermal Fisher Scientific. Twenty-five (25) firefighters were injured at this fire. Most of them were for exposure to the chemicals. Alarms were present and alerted the occupants. An automated extinguishing system was present but its effectiveness was reported as 'Other'. Damages from this fire were estimated at $40,000.

Arson Fires

571 Arsons - 144 Structures, 64 Vehicles, 363 Other Arsons

Five hundred and seventy-one (571), or 2%, of the 25,176 fire incidents reported to the Massachusetts Fire Incident Reporting System were considered to be intentionally-set, or for the purpose of analysis, arson[14]. The 144 structure arsons, 64 motor vehicle arsons, and 363 outside and other arsons caused five civilian deaths, accounting for 12% of civilian fire deaths, 11 civilian injuries and 12 fire service injuries. The estimated dollar loss from arson was $6.5 million. The average dollar loss per arson fire was $11,349. Total arsons were up by 2% from the 559 arsons in 2018.

748 Fires with Cause Still Under Investigation

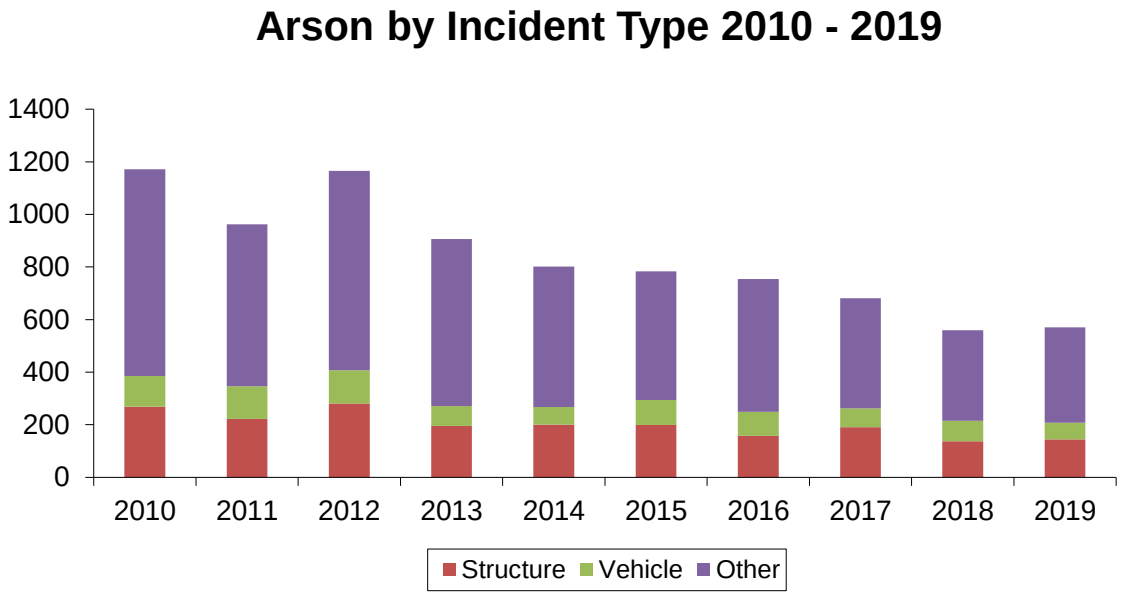
In 2019, 748 Massachusetts fires were still listed as 'Cause Under Investigation'. There were 2,637 fires where the *Cause of Ignition* was listed as 'Undetermined'. It is important that fire departments update their fire incident reports when either a cause is determined or its cause is deemed to be undetermined after investigation.

The following table and chart shows the total number of reported arsons for the past 10 years. The total is then broken down into the total number of reported structure, vehicle and all other types of arsons along with that subtotal's percentage of the total number of arsons. It also illustrates that in recent years all arsons, including structure and outside and other arsons are at all-time lows.

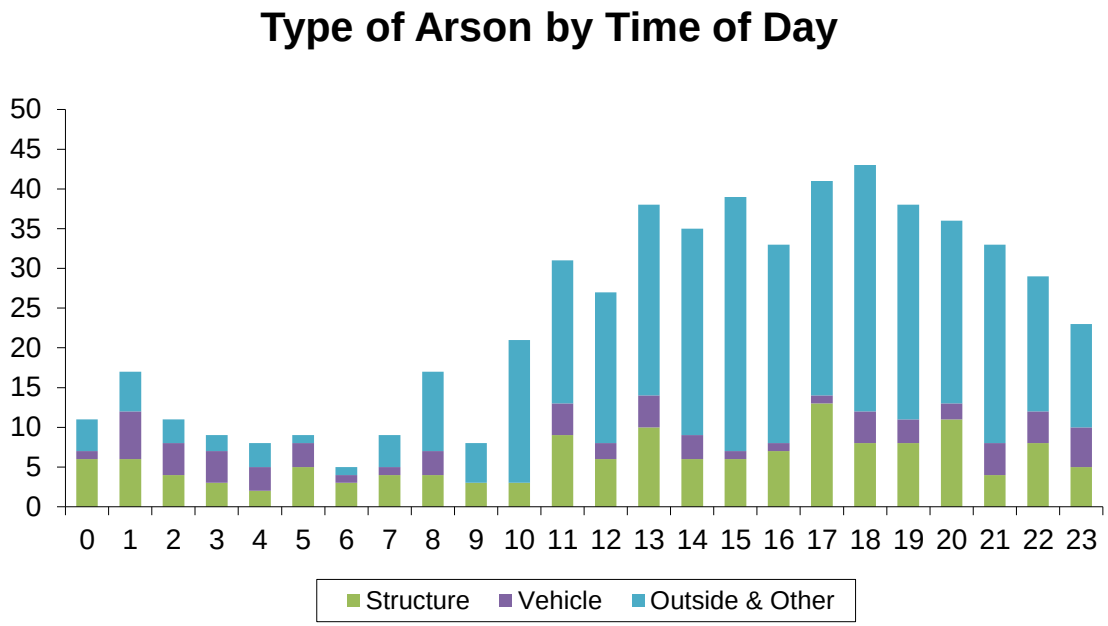
[14] In MFIRS v5 a fire is considered an arson if the Cause of Ignition = 1 (Intentional) and the Age of Person (Fire Module) is greater than 17 or if the field is blank; or if the Wildland Module is used, the Wildland Fire Cause = 7 (Incendiary) and the Age of the Person (Wildland Module) is greater than 17 or if the field is left blank.

ARSONS BY YEAR

Year	Total Arsons	Structure Arsons	% All Arsons	Vehicle Arsons	%All Arsons	Other Arsons	% All Arsons
2019	571	144	25%	64	11%	363	64%
2018	559	137	24%	78	14%	344	62%
2017	681	191	28%	72	11%	418	61%
2016	754	158	21%	91	12%	505	67%
2015	803	208	25%	98	12%	497	62%
2014	810	203	25%	68	8%	539	67%
2013	907	196	22%	75	8%	636	70%
2012	1,169	284	24%	126	11%	759	65%
2011	976	224	23%	124	10%	628	67%
2010	1,189	269	23%	116	10%	804	66%



The following chart illustrates the types of arsons by the time of day they occur. Midnight to 1:00 a.m. is represented by 0, 1:00 a.m. to 2:00 a.m. is represented by 1, etc. Arson is most likely to occur between the hours of 3:00 p.m. to 10:00 p.m. The peak times for structure arsons were between 1:00 p.m. and 8:00 p.m. Motor vehicle arsons were most likely to occur between 9:00 p.m. and 3:00 a.m. Outside and other arsons peaked from 3:00 p.m. to 10:00 p.m.



Structure Arson

144 Arsons, 3 Civilian Deaths & $5.7 Million in Damages
In 2019, there were 144 reported structure arsons. They caused three civilian deaths, nine civilian injuries, 11 fire service injuries and an estimated dollar loss of $5.7 million. These 144 incidents accounted for 1% of the 16,148 structure fires in 2019, and were down 5% from the 137 reported structure arsons in 2018.

There were three civilian deaths in structure arsons in 2019. One (1) of these deaths was part of a murder/suicide where the father killed his family and was the only one to die in the fire; in another case, the victim set multiple fires inside his home, because he was being evicted and the other was a death by suicide. The nine civilian injuries accounted for 4% of the overall civilian injuries and 5% of all civilian injuries at structure fires. The 11 fire service injuries accounted for 2% of the total fire service injuries and 2% of the injuries firefighters sustained at all structure fires in 2019. The estimated dollar loss for structure arsons was $5,679,148, accounting for 2% of the overall dollar loss and 3% of the estimated dollar loss in all reported structure fires. The average loss per structure arson was $39,439.

In 2019, 408 Massachusetts structure fires were still listed as 'Cause Under Investigation'. There were 729 structure fires where the *Cause of Ignition* was listed as 'Undetermined'.

Structure Arsons Slightly Up
Structure arsons increased by seven, or 5%, from the 137 reported in 2018.

Structure Arson Down 46% Since 2010
Structure arsons have been on a downward trend since 1991 when 1,974 structure arsons were reported to MFIRS. Structure arsons have decreased by 46% since 269 were reported in 2010. The above chart shows the trend of structure arsons in the past decade.

Building Arsons
In 2019 there were 141 building arsons. These accounted for 98% of all the structure arsons in Massachusetts. These building arsons caused three civilian deaths, nine civilian injuries and 11 fire service injuries and $5.7 million in estimated dollar loss.

70% of Building Arsons Occurred in Residences
Ninety-eight (98), or 70%, of the 141 building arsons occurred in residential occupancies. Educational facilities and mercantile and business properties each accounted for 9% of these arsons and public assembly facilities accounted for 4%. The following table shows the number of structure arsons, civilian deaths, civilian injuries, fire service injuries, dollar loss and the percentage of the total structure arsons for each occupancy type.

BUILDING ARSON BY OCCUPANCY TYPE

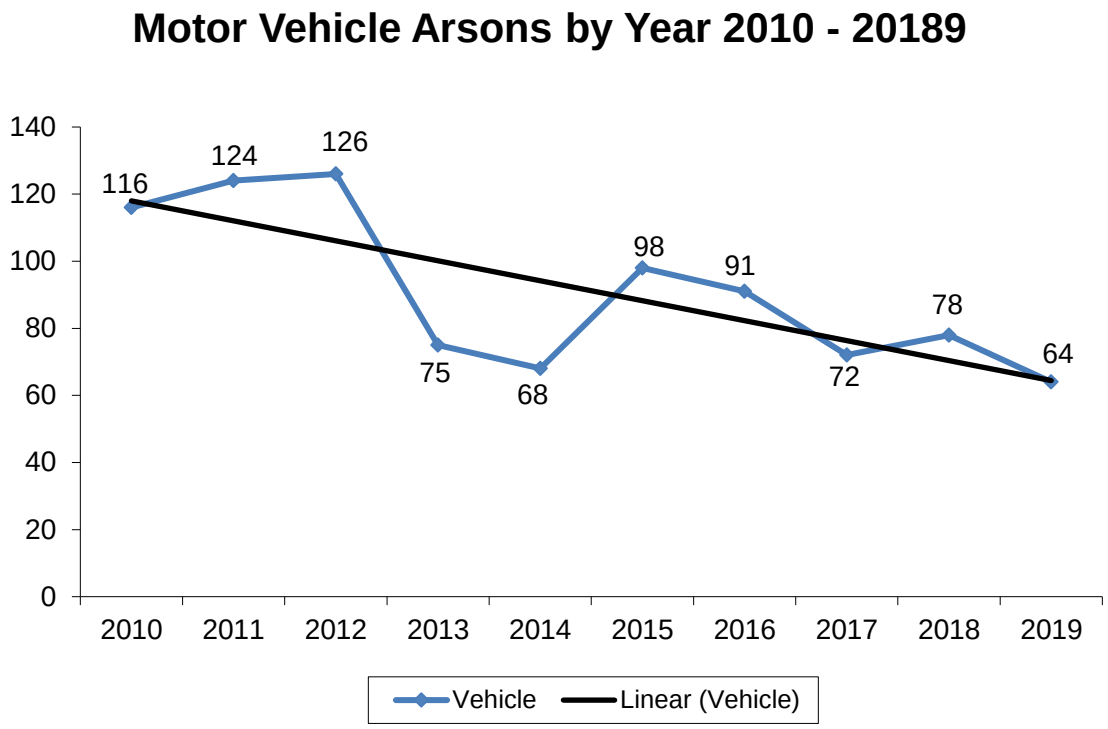
Occupancy	Building Arsons	Percent of Total	Injuries FF	Injuries Civ	Deaths FF	Deaths Civ	Dollar Loss
Assembly	6	1%	0	0	0	0	$130,000
Educational	13	4%	0	0	0	0	26,550
Institutional	2	9%	0	0	0	0	1,120
Residential	**98**	**70%**	**10**	**9**	**0**	**3**	**5,069,713**
1- & 2-Family	*51*	*36%*	*3*	*4*	*0*	*2*	*1,679,408*
Multifamily	*38*	*27%*	*7*	*5*	*0*	*1*	*3,383,305*
All Other Residential	*9*	*6%*	*0*	*0*	*0*	*0*	*7,000*
Mercantile, business	12	9%	1	0	0	0	417,150
Basic Industry	0	0%	0	0	0	0	0
Manufacturing	1	1%	0	0	0	0	1,010
Storage	4	3%	0	1	0	0	5,500
Special Properties	4	3%	0	0	0	0	28,505
Unclassified	2	1%	0	0	0	0	100
Total	**141**	**100%**	**11**	**9**	**0**	**3**	**$5,677,548**

Motor Vehicle Arson

64 Arsons – 1 Civilian Death & $662,411 in Damages
Sixty-four (64), or 3%, of the 2,355 vehicle fires were considered intentionally-set in 2019. There was one civilian death, and two civilian injuries. The death was a death by suicide. Motor vehicle arsons also caused an estimated dollar loss of $662,411, accounting for less than 1% of the overall fire dollar loss and 3% of the dollar loss associated with all the 2019 motor vehicle fires in a motor vehicle arson in 2019. The average loss per vehicle arson was $10,350. Passenger cars and vans accounted for 83% of the 64 motor vehicle arsons.

In 2019, 188 Massachusetts motor vehicle fires were still listed as 'Cause Under Investigation'. There were 629 motor vehicle fires where the *Cause of Ignition* was listed as 'Undetermined'.

Motor Vehicle Arsons Down
Motor vehicle arsons decreased in 2019. These 64 arsons are a decrease of 14, or 18%, from the 78 reported in 2018. This goes back to the overall downward trend since 2009.

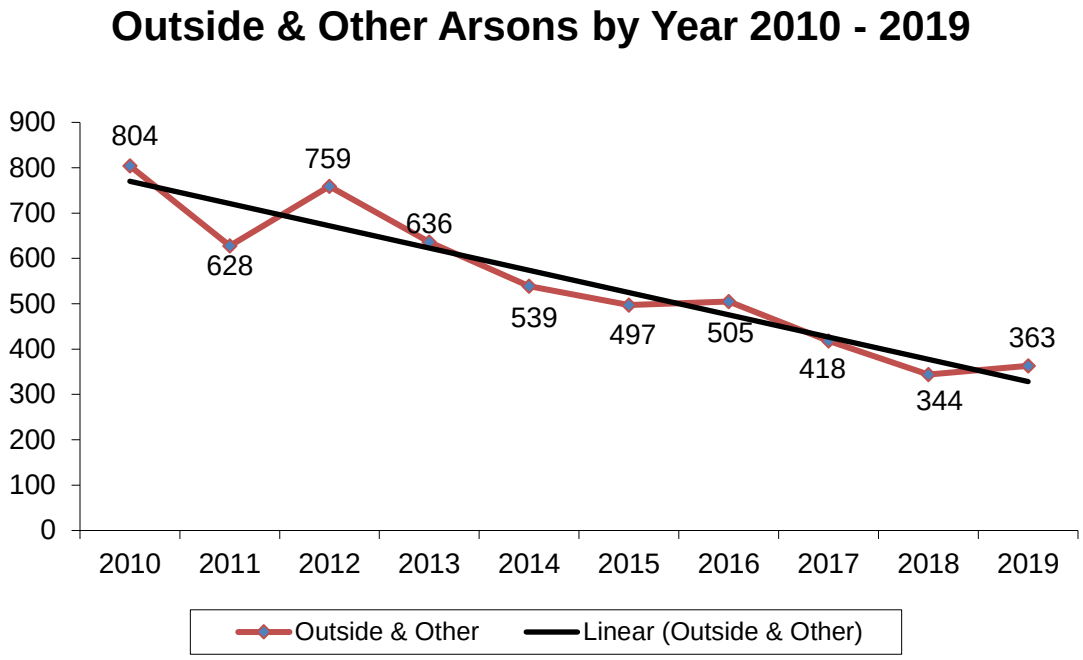


Outside and Other Arson

363 Arsons – 1 Civilian Death & 1 Fire Service Injury
Three hundred and sixty-three (363), or 5%, of the total outside and other fires were considered intentionally-set in 2019. These arsons caused one civilian death that was a suicide. They also caused one fire service injury. The estimated dollar loss for these arsons was $138,941. The average loss per outside and other arson was $383.

In 2019, 152 outside and other fires were still listed as 'Cause Under Investigation'. There were also 1,279 outside and other fires where the *Cause of Ignition* was listed as 'Undetermined'. This is a 7% decrease from the previous year when 1,279 outside and other fires were undetermined.

Outside & Other Arsons Up
Outside and other arsons increased by 19, or 19%, from the 344 reported in 2018. Brush arsons increased by three, or 2%; outside rubbish arsons increased by 21, or 30%; special outside arsons increased by 12, or 18%; cultivated vegetation or crop arsons decreased by one, or 50%; and unclassified arsons decreased by 16, or 33%, from those reported in 2018.



Fitchburg Had Largest Loss Arson in 2019

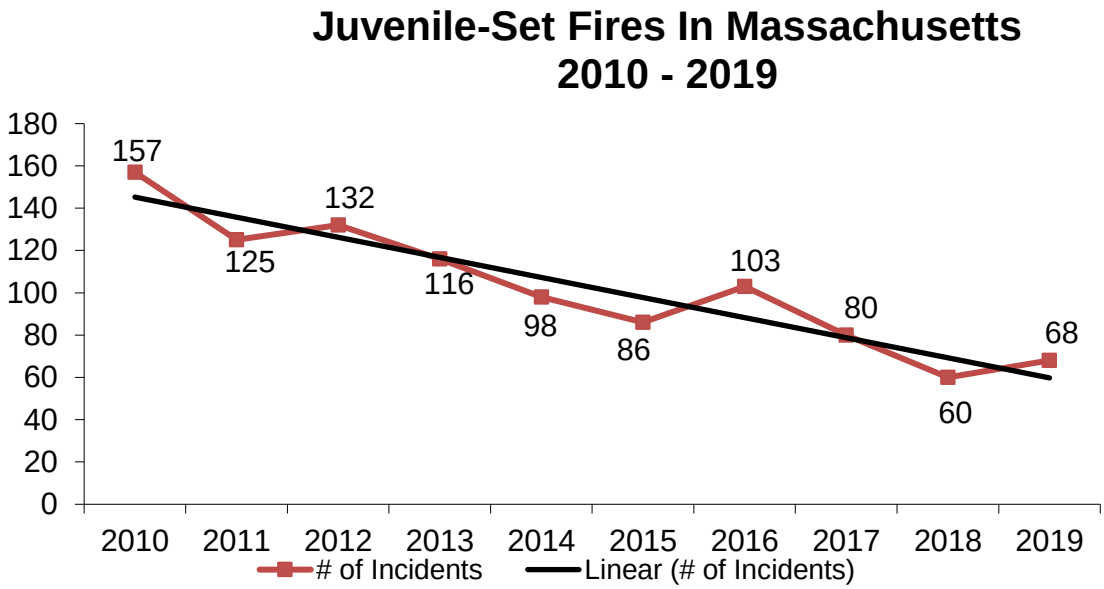
There were two reported arsons where the dollar loss was greater than $1 million in 2019. These two arsons caused a combined $2.4 million, or 37% of the total estimated damages of all arsons in 2019. There were 10 other arsons with a dollar loss between $100,000 and $999,999, totaling $2.7 million, or 42% of the total estimated dollar loss from arson.

- On September 22, 2019, at 5:40 p.m., the Fitchburg Fire Department was called to a fatal arson fire in a 24-unit multifamily building. The victim, a 59-year old man was being evicted from his unit. During a standoff an incendiary device he had built ignited starting the fire. Two (2) civilians and four firefighters were also injured at this fire. Alarms were present and alerted the occupants. The building was not sprinklered. Damages from this fire were estimated to be $1.4 million.

Juvenile-set Fires

Children Playing With Fire Caused 68 Fires & 1 Civilian Injury

In 2019, children playing[15] with matches, lighters and other heat sources caused 68 reported fires, one civilian injury and an estimated dollar loss of $637,549. The average dollar loss per fire was $9,376. These fires increased by eight, or 13%, from 60 incidents in 2018.



36 Structure Fires, 1 MV Fire & 31 Outside & Other Fires

The 68 fires set by children and youth included: 36 structure fires, one motor vehicle fire, 15 brush, tree or grass fires, four outside rubbish fire, three special outside fires, and nine fires that could not be classified further.

69% of All Juvenile-set Building Fires Occur in Apartments or 1- &2-Families

Sixty-nine percent (69%) of the 36 building fires caused by juveniles occurred in multi-family homes or one- and two-family homes; 36% occurred in one or two-family homes and 33% occurred in apartments. Eleven percent (11%) occurred in high schools, junior high schools or middle schools, and 8% happened in elementary schools. Three percent (3%) each occurred in a department or discount store, stores selling food or beverages or an electronic amusement center (arcade).

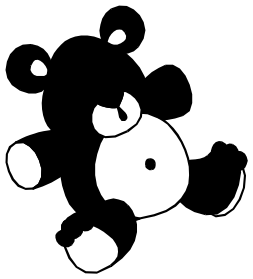
[15] The U.S. Fire Administration (USFA) determines the codes for the National Fire Incident Reporting System (NFIRS) & uses the code children playing to describe juvenile-set fires. We fully realize this term is inadequate to describe all child and youth-set fires & try to limit use of the phrase to describe the codes used to report these fires.

Twenty-two percent (22%) of the juvenile-set building fires started in bedrooms; 17% in bathrooms; and 11% in living rooms.

54% of Fires Set by Juveniles Using Smoking Materials

Fifty-four percent (54%), of juvenile-set fires were started by smoking materials[16]. Forty-one percent (41%) of the fires were started using lighters and 12% were started with matches. Heat from other open flame or smoking materials caused 14%. Candles started 9% and fireworks 7%. Unclassified hot or smoldering objects and unclassified heat sources each caused 5%. Unclassified explosives or fireworks, heat from a direct flame and a spark, ember or flame from operating equipment each started 2% of juvenile-set fires in 2019. This demonstrates a need for education to both parents and children on the dangers of matches and lighters, the use of illegal fireworks, and safe candle use.

Heat Source	# of Incidents	% Known
Lighter	24	41%
Heat from other open flame or smoking materials	8	14%
Match	7	12%
Candle	5	9%
Fireworks	4	7%
Hot or smoldering object, other	3	5%
Other	3	5%
Explosives, fireworks, other	1	2%
Flame/torch used for lighting	1	2%
Heat from direct flame	1	2%
Spark, ember, flame from operating equipment	1	2%



Juvenile-set Fire in Worcester Is Largest Loss

In 2019 there were three juvenile-set fires that caused over a $100,000 in estimated damages. These fires caused 65%, of the total dollar loss for all juvenile-set fires.

- On March 18, 2019, at 3:49 p.m., the Worcester Fire Department was called to a fire in a six-unit apartment building caused by a youth playing with a lighter in a bedroom. No one was injured at this fire. Alarms were present and alerted the occupants. The building was not sprinklered. Total damages were estimated to be $192,159.

Parents and Caregivers Must Protect Children from Themselves

Parents and caregivers must take steps to protect children from the dangers of fire.

- Make sure that all matches and lighters are stored out of children's reach.
- If you need a lighter, buy one that is child resistant. Since 1994, all disposable butane lighters and most novelty lighters are required to be able to resist the efforts of 85% of children under five who try to operate them in a specified test. Some are easier to

[16] Smoking materials includes cigarettes, pipes, cigars, cigarette lighters, matches, and heat from unspecified smoking materials.

use than others. If one brand is cumbersome, switch to another. *Do not disable the child-resistant feature.*

- Supervise young children at all times. Teach children the safe uses of fire, including birthday candles and barbecuing. When a child is old enough, let him or her light the candles while you watch. It is only safe for children to use fire when adults are present.
- If your child seems overly curious about fire or has set a fire, call your local fire department and ask if they have a juvenile firesetting intervention program. Don't assume the child will 'grow out of it.' Juvenile firesetting is dangerous and must be addressed by trained professionals.

- Parents who smoke should keep their lighters on their person at all times, not on the table or in a purse.
- Fireworks are illegal in Massachusetts. Adults should leave the fireworks to the professionals in order to protect everyone's children.

Tip of the Iceberg
These fires should be considered just the tip of the iceberg. Juvenile firesetting intervention programs have found that only one in 10 juvenile-set fires is actually reported to the fire department.

Cooking Fires

Cooking Caused 11,502 Fires, 3 Civilian Deaths & 56 Civilian Injuries
Unattended cooking, other unsafe cooking practices and defective cooking equipment caused 11,502 fires, three civilian deaths, 56 civilian injuries, 23 firefighter injuries and an estimated dollar loss of $9 million. The average dollar loss per fire was $780. Cooking fires accounted for 46% of the total 25,176 fires that occurred in 2019.

Ninety-nine percent (99%) of the fires caused by cooking occurred in structures. The 11,502 fires included: 11,360 structure fires, 55 special outside fires, three brush fires, one outside rubbish fire and 83 fires that could not be classified further.

Confined Cooking Fires Account for 44% of Total Fires
The majority of cooking fires, 11,015, were confined to a non-combustible container. These fires represent 44% of the total fires that occurred and is the largest single cause of fires in Massachusetts. Confined cooking fires decreased by 1% from the 11,167 reported in 2018.

80% of Cooking Fires in Buildings Were Unintentional
In 1,458, or 82%, of the 1,832 cooking fires in buildings where the *Cause of Ignition* was reported, it was reported as unintentional. The 9,670, or 84%, of all cooking fires were

fires contained to non-combustible containers that did not require having a cause reported.[17]

Cause of Ignition	# of Incidents	% of Total	% Completed
Confined fire, no fire module completed	9,670	84%	
Other	0	0.0%	0%
Intentional	13	0.1%	1%
Unintentional	1,458	13%	80%
Failure of equipment or heat source	83	1%	5%
Act of Nature	2	0.02%	0.1%
Under investigation	19	0.2%	1%
Undetermined	257	2%	14%
Total	11,502	100%	
Total completed	1,832		

Unattended Cooking Starts 12% – Stand by Your Pan!

Human error was responsible for the majority of cooking fires. Twelve percent (12%) of cooking fires, where 'Factors Contributing to Ignition' was completed, were caused by unattended cooking. Eighty-four percent (84%) of cooking fires were confined fires where this data is not collected. This data has led to our "Stand By Your Pan" cooking safety campaign.

Factor Contributing to Ignition	# of Cooking Fires	% Known
Confined fire, no fire module completed	9,670	
Equipment unattended	209	12%
Misuse of material or product, other	85	5%
Failure to clean	75	4%
Too close to combustibles	61	4%
Abandoned materials	46	3%
Accidentally turned on, not turned off	42	3%
Other	25	1%
Operational deficiency, other	22	1%
Mechanical failure, malfunction, other	20	1%
Equipment not operated properly	20	1%
Electrical failure, malfunction, other	12	1%
Improper container or storage	10	1%

[17] A fire contained to a non-combustible container has a special incident type code. If one of these codes is used then only a Basic Form is completed and the Cause of Ignition field on the Fire Module does not have to be populated. A fire department may still elect to complete the Fire & Structure Fire Modules and all associated fields if it wishes.

Cooking Was the Leading Cause of Injury in Fires in 2019

Cooking was the leading cause of injury in all types of fires in 2019. This is not surprising considering that almost three-quarter, or 73%, of residential fires start in the kitchen. Of the 56 cooking fire injuries, 62% of victims were male and 38% were female. People aged 25 to 54 accounted for 57% of the people injured in cooking fires.

Age	% of Known Injuries	% of Population	Difference
Under 5	2%	6%	-4%
5 to 9	2%	7%	-5%
10 to 14	0%	7%	-7%
15 to 24	11%	13%	-2%
25 to 34	16%	15%	1%
35 to 44	20%	17%	3%
45 to 54	21%	14%	7%
55 to 64	11%	9%	2%
65 to 74	7%	7%	0%
75 to 84	9%	5%	4%
85+	2%	2%	0%

84% of Victims in Room or Area of Fire Origin

Of the 51 cooking fire injuries where location at ignition is known, 84% of the victims were injured in the room or area of fire origin.

Location at Time of Incident	# of Cooking Fire Injuries	% Known
Total Known	49	
Not reported	1	
In area of origin and not involved	15	29%
Not in area of origin and not involved	7	14%
Not in area of origin but involved	1	2%
In area of origin and involved	28	55%
Undetermined	4	
Total	56	
Total Known	51	

61% of Cooking Injuries Occurred When Trying to Control Fire

Of the 46 cooking fire injuries for which activity at time of injury was known, 61% of victims were attempting to control the fire; of the 28 victims injured while attempting to control the fire, 17, or 61%, were male. This data has led to our “Put A Lid On It” cooking safety campaign.

Activity When Injured	# of Cooking Fire Injuries	% Known
Not reported	1	
Other	9	20%
Escaping	5	11%
Rescue Attempt	1	2%
Fire Control	28	61%
Return to vicinity of fire before control	2	4%
Return to vicinity of fire after control	0	0%
Sleeping	1	2%
Unable to act	0	0%
Irrational act	0	0%
Undetermined	9	
Total	56	
Total Known	46	

63% of All Cooking Injuries Were Burns

Stovetop fires tend to produce a lot of heat in a small area and when people choose to attempt to extinguish them, they run a great risk of being burned. Of the 54 cooking fire injuries where the nature of injury was known, 48% suffered thermal burns; 11% suffered from burns and smoke inhalation; 2% suffered a scald burn; and another 2% suffered an electrical burn.

Primary Apparent Symptom	# of Cooking Fire Injuries	% Known
Not reported	2	
Smoke Inhalation	12	22%
Breathing difficulty/shortness of breath	5	9%
Burns & smoke inhalation	6	11%
Burns only; thermal	26	48%
Scald	1	2%
Burn, electric	1	2%
Cut or laceration	2	4%
Shock	1	2%
Total	56	
Total Known	54	

3 Civilian Fire Deaths in 2019

While cooking is the leading cause of residential building fires, it usually isn't a leading cause of civilian fire deaths. There were three civilian fire deaths attributed to cooking fires in 2019, accounting for 9% of residential fire deaths and 7% of all civilian fire deaths.

The importance of responding correctly to a clothing ignition – Stop, Drop, Cover and Roll – cannot be overemphasized. Older adults, who often are more afraid of falling than of fire, are historically the age group with the highest risk of being injured in a cooking fire. They must be persuaded that they can indeed safely lower themselves to the ground and roll to smother the flames.

- **Stand by your pan!** Never leave cooking, boiling, broiling, or frying unattended.
- **Put a lid** on a grease fire to smother it, and then turn off the heat.
- Never move a burning pan. You can too easily ignite your clothes or spill the fire onto someone or something else.
- Wear short or tight fitting sleeves when cooking. Loose sleeves can easily catch fire.
- Stop, Drop, Cover and Roll if clothing ignites, no matter how young or old.
- Never throw water on a grease fire. Water will only spread the fire around.

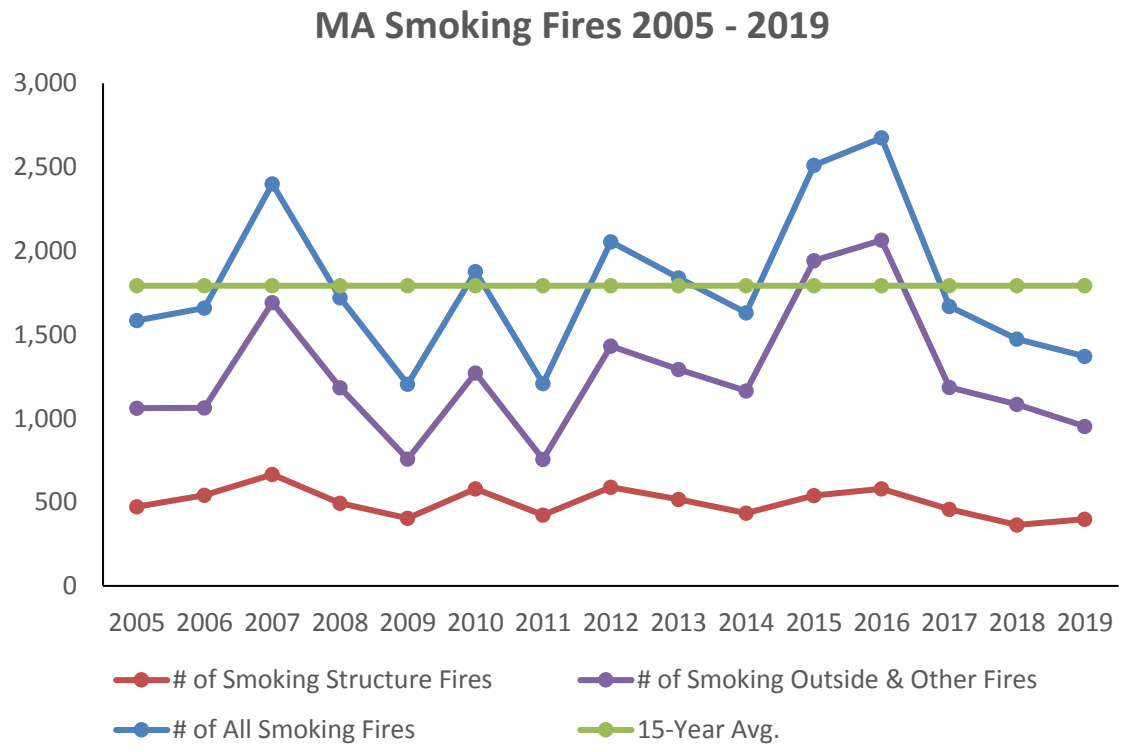
Fires Caused by Smoking

Smoking Caused 5% of Fires and 17% of Deaths
During 2019, 1,377, or 5%, of the 25,176 reported fire incidents were caused by the improper use or disposal of smoking materials. These 1,377 fires caused seven, or 17%, of the 42 civilian deaths and seven, or 19%, of the 36 structure fire deaths; 23 civilian injuries, 20 fire service injuries, and an estimated dollar loss of $12.7 million. The average dollar loss per fire was $9,189. The number of smoking fires decreased by 97, or 7%, from 1,474 in 2018.

399 Structure Fires – Up 10% From 2018
The 1,377 fires caused by smoking included 399 structure fires, up 35 from 364, or 10%, in 2018.

Incident Type	# of Smoking Fires	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss
Fire, other	59	0	2	0	0	$ 156,850
Structure fires	397	19	18	0	7	$ 12,342,215
Mobile property used as a structure fires	2	0	0	0	0	$ 5,500
MV fires	218	0	2	0	0	$ 59,300
Brush fires	681	1	0	0	0	$ 41,568
Outside rubbish fires	110	0	0	0	0	$ 4,955
Special outside fires	105	0	1	0	0	$ 43,250
Cultivated vegetation or crop fires	5	0	0	0	0	$ 75
Total	1,377	20	23	0	7	$ 12,653,713

Over the last 15-years, smoking fires have been showing a slightly upward trend. However, 2019, like 2018 and 2017, goes against that trend. The majority of these were outside fires. The lowest number of recorded smoking fires since 1986 was 1,204 in 2009 and is far below the 15-year average of 1,792 smoking fires. In 2017, there was a sudden downward spike in the number of smoking-related fires, predominantly outdoor brush fires caused by smoking materials and 2019 continued this trend. In years with upward spikes, the weather conditions were dry and made it easier for brush type fires to get started as we can see in the dramatic increases statewide in brush fires in 2007, 2012, 2015 and 2016. 2019 had the third lowest number of reported smoking fires since 1986.



87% of All Smoking Building Fires Occurred in Residences

Three hundred and thirty-nine (339), or 87% of the 391 smoking-related building fires occurred in residential occupancies. The occupancies with the next highest percentages of smoking-related building fires in Massachusetts in 2019 were mercantile and business properties and public assembly facilities at 3%.

There are statutes that prohibit smoking in public places. These laws have forced smokers outside where they may not be as careful disposing their cigarettes or cigars.

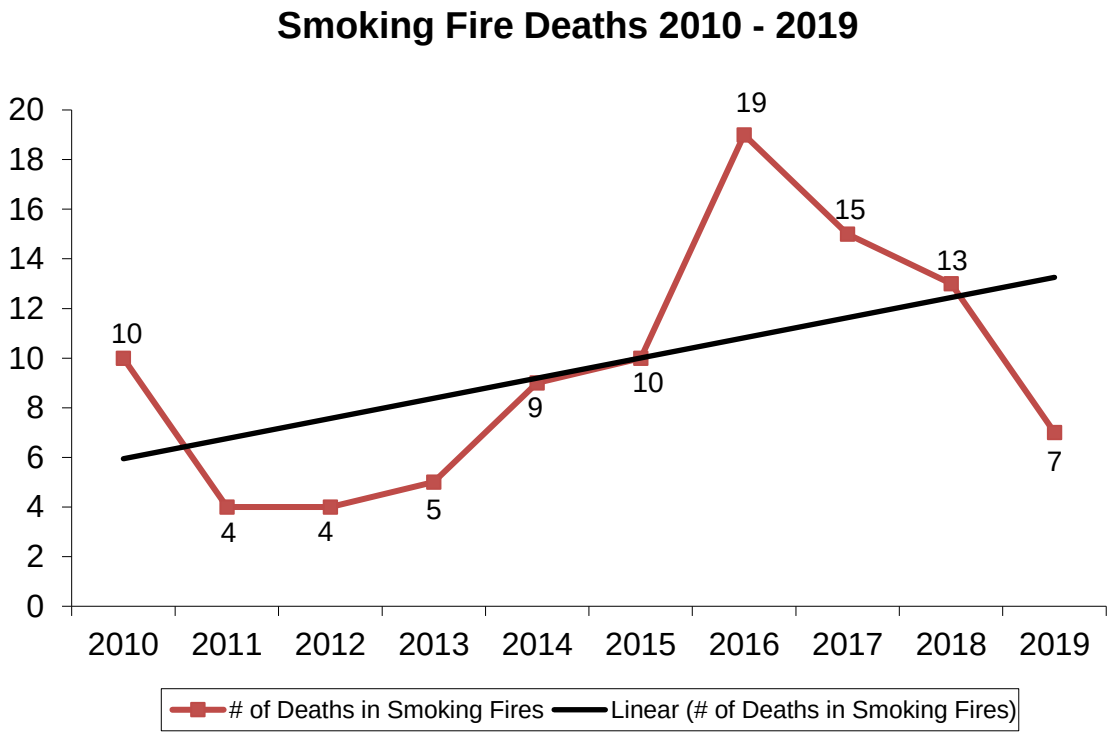
Property Use	# of Smoking Fires	% of Smoking Fires	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss
Assembly	13	3%	0	0	0	0	$ 20,750
Educational	0	0%	0	0	0	0	$ 0
Institutional	7	2%	1	0	0	0	$ 5,701
Residential	339	87%	18	17	0	7	$ 12,096,754
Mercantile, business	13	3%	0	0	0	0	$ 157,025
Basic Industry	0	0%	0	0	0	0	$ 0
Manufacturing, processing	0	0%	0	0	0	0	$ 0
Storage properties	2	3%	0	0	0	0	$ 59,460
Special properties	7	2%	0	0	0	0	$ 1,000
Total Known	391	100%	19	17	0	7	$ 12,340,690

Smoking Leading Cause of Fire Deaths - Elders at Risk

The 399 smoking-related structure fires caused all seven of the smoking-related fire deaths, 18 civilian injuries, 19 fire service injuries, an estimated dollar loss of $12.3 million and an average dollar loss of $30,947. Smoking fires accounted for 17% of the fatal structure fires and 19% of structure fire deaths in 2019. The unsafe and improper use of smoking materials caused 21% of residential structure fire deaths and 19% of fatal residential structure fires. Four (4), or 21%, of the 19 home fire deaths to people over 65 were caused by smoking.

2019 Smoking Fire Deaths

In 2019, seven people died in smoking-related fires of all types. These seven deaths are below the 10-year average of 10 smoking-related fire deaths per year since 2007. After a high-water mark of 19 deaths in 2007 (and again in 2016), smoking-related fire deaths dropped significantly. In 2011 and 2012 there were four smoking-related fire deaths, the lowest number on record. Overall, smoking fire deaths are once again on an upward trend in Massachusetts during the past 10 years, but on a downward trend the past four years.

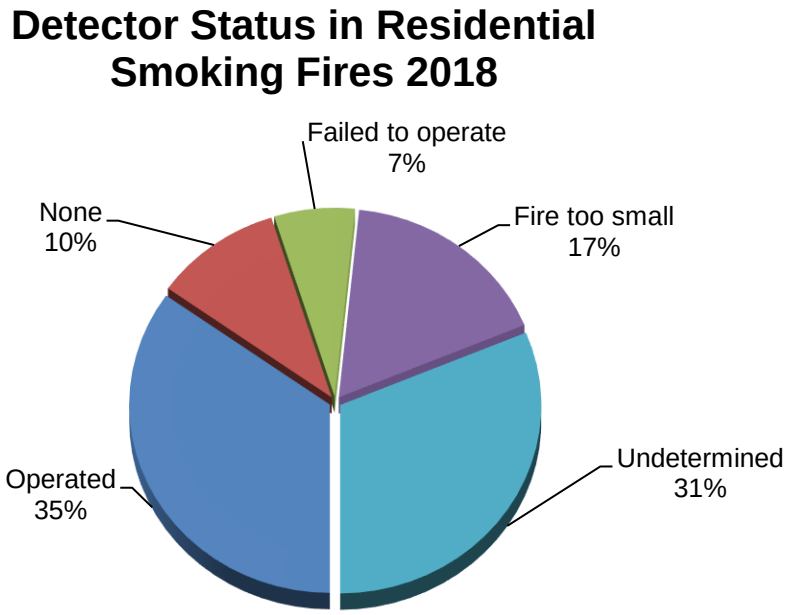


No Working Alarms in 80% Fatal Smoking Fires
None of the seven smoking fatal fires occurred in a structure where smoke alarms were present and operated. Two (2) occurred in fires where the alarm failed to operate; and two occurred where there were no alarms. It was undetermined in one fire if there were any alarms. Two (2), or 29%, of these victims were intimately involved with the ignition; and another two were in the area of origin but not involved with starting the fire. The smoke alarms helped prevent these fires from claiming any additional lives.

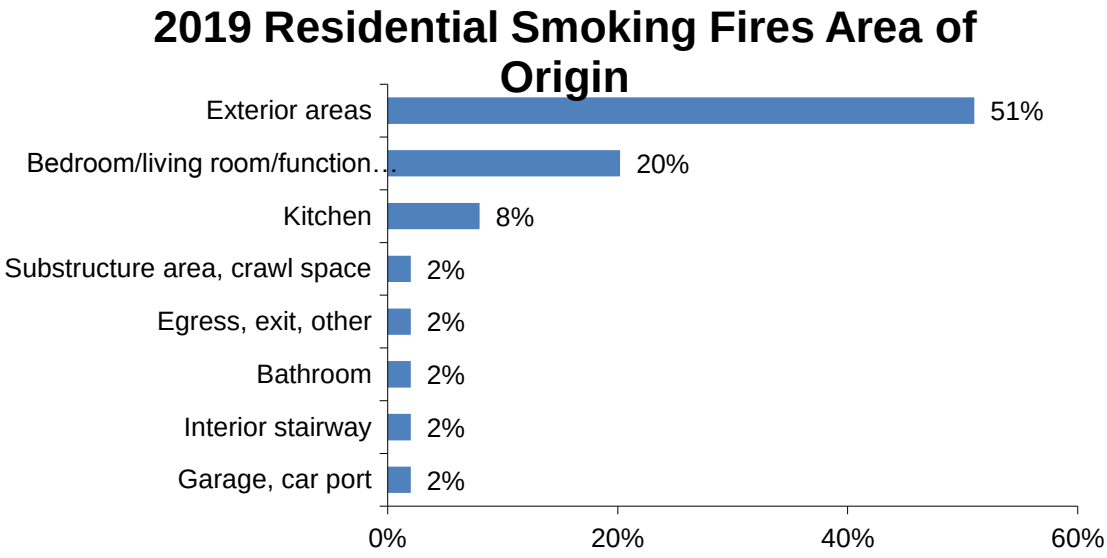
For a listing of all the smoking-related fire deaths in 2019, please refer to the *2019 Massachusetts Fire Deaths* section of this report.

Smoking on Oxygen
There were no fire deaths in 2019 that involved the use of oxygen while smoking.

35% of Building Smoking Fires had Operating Alarms
Of the 391 smoking-related building fires, 339, or 87%, occurred in residences. Smoke alarms operated in 35% of the smoking-related residential structure fires.



Over 1/2 of Smoking Fires in the Home Start in the Exterior
Continuing the trend, 174, or 51% of all residential smoking fires started outside the home, not inside. Historically the bedroom and living room were where most smoking fires start. As more people smoke outside the home in areas like balconies, exterior stairways or enclosed porches, we see more smoking fires beginning in these locations. It is possible since more smoking fire are starting on building exteriors, that fires are getting a foothold on the building before smoke alarms inside can alert the occupants.



Fire Standard Compliant Cigarettes
In January 2007, the Fire Standard Compliant (FSC) Cigarette legislation or 'fire safe cigarette' law, making it mandatory for cigarette manufacturers to start selling only the fire standard compliant type of cigarettes in Massachusetts, took effect. There is no federal standard for self-extinguishing cigarettes despite over 20 years of proposed legislation. On January 1, 2013, every state had implemented their own state law banning the sale of ordinary cigarettes.

Fire safe cigarettes meet an established cigarette fire safety performance standard based on ASTM E2187, Standard Test Method for Measuring the Ignition Strength of Cigarettes. It requires that no more than 25% of 40 cigarettes tested burn their full length when placed on 10 layers of standard filter paper. These cigarettes are designed to be less likely to ignite upholstered furniture and mattresses, historically the item first ignited in most fatal smoking fires.

Smoking Fires Ignite Exterior Sidewall Covering & Rubbish
The most common item first ignited by smoking fires in the home was rubbish, trash or waste accounting for 13% of residential smoking fires. The second leading cause was exterior sidewall coverings accounting for 12% of these smoking fires. Exterior trim, structural member or framing, and unclassified organic materials and light vegetation each accounted for 6% of these fires. Fire standard compliant cigarettes cannot prevent every cigarette from causing a fire, and not every smoking fire is caused by a cigarette.

Item 1st Ignited	# of Incidents	%
Rubbish, trash, waste	45	13%
Exterior sidewall covering	41	12%
Undetermined	34	10%
Exterior trim, appurtenances	20	6%
Structural member, framing	20	6%
Structural component, finish, other	18	5%
Box, carton, bag	16	5%
Upholstered sofa, chair	15	4%
Light vegetation	13	4%
Other	12	4%
Bedding	11	3%
Multiple items	11	3%
Cooking materials	10	3%
Magazine, newspaper	8	2%
Mattress, pillow	7	2%
Organic materials, other	7	2%

Furniture Should Meet CA Flammability Standard
Another safety aspect to think about is purchasing only upholstered furniture that meets the California flammability standard, because many smoking-related fires start by igniting upholstery.

Smokers Should Always Use Non-Flammable Ashtrays or Containers
Until they can quit, smokers should use deep ashtrays, store ashes in metal containers and never smoke in bed. Families should consider banning smoking inside the house for health and fire safety reasons. Children of smokers often have easy access to matches and lighters. Adults must keep these tools out of the reach of small children. If smokers are going to smoke on an exterior balcony, deck or porch, they should also be using an appropriate metal or other non-combustible container to collect the ashes and properly extinguish their smoking materials. In 2019, 9% of these fires ignited organic materials or light vegetation, mostly potted plants on balconies or porches or mulch used for landscaping.

Think of Flame Retardant Sleepwear for Adults
State and federal regulations require most children's sleepwear to be flame-retardant. However, no such requirements apply to adult clothing. Physically disabled and elderly people may not be able to easily 'Stop, Drop, Cover and Roll' if their clothing ignites.

Everyone Needs a Working Smoke Alarm at Home
While everyone needs at least one working smoke alarm on every level of their home, this is even more important for smokers and their families because of the high risk of fire death. Placing an alarm inside every bedroom increases the probability that if a fire occurs, residents will wake up in time to escape. A cigarette accidentally left on a sofa places the smoker and everyone else in the building at risk. A smoke alarm's warning may enable a smoker to live long enough to quit.

Never Smoke Where Oxygen is in Use
Smoking should never be permitted in a home where oxygen is in use. The oxygen-enriched environment increases the speed at which the fire will burn once it starts. "Most materials will ignite at considerably lower temperatures in oxygen-enriched environments than in air, and once ignited, combustion rates are greater in oxygen-enriched environments."[18]

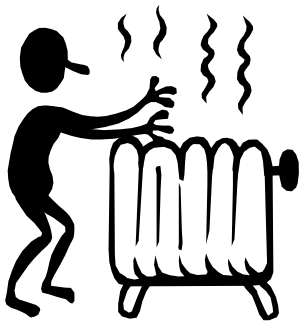
Oxygen can saturate clothing, rugs, upholstery, and facial hair thus increasing the fire danger even when the home oxygen system is "turned off".

Illegal to Throw Cigarettes Out Car Window
The improper disposal of smoking materials has been a major problem for the fire service for years. Massachusetts General Law Chapter 148 Section 54 states, "Whoever drops or throws from any vehicle while the same is upon a public or private way running along or near forest land or open fields, or, except as permitted by law, drops, throws, deposits or otherwise places in or upon forest land, any lighted cigarette, cigar, match, live ashes or other flaming or glowing substance, or any substance or thing which in and of itself is likely to cause a fire, shall be punished by a fine of not more than one hundred dollars or by imprisonment for not more than thirty days."

[18] *Fire Protection Handbook*, 19th edition, 2003, National Fire Protection Association, pg. 8-134, Quincy, MA.

Mulch Regulation Implemented in 2012
Since more people are being forced to smoke in outside areas of their homes and other buildings, cigarettes are finding their way into adjacent landscaped areas; most of which are filled with mulch, a combustible material. On September 1, 2012, a new regulation on mulch safety took effect in the Commonwealth that prohibits the new application of mulch within 18 inches around combustible exteriors of buildings (such as wood or vinyl but not brick or concrete). Residential buildings with less than six units are exempted from this regulation, but all homeowners may also wish to adopt this safety practice. It is also important to note that FSC cigarettes were not designed to prevent igniting mulch-type materials.

Heating Equipment Fires



1,381 Fires, 1 Civilian Death& 1 FF Death
Massachusetts fire departments reported that some form of heating equipment was involved in 1,381, or 9%, of the 16,086 building fires in 2019. These heating equipment fires caused one civilian death, one firefighter death, 19 civilian injuries, 17 fire service injuries, and an estimated dollar loss of $5.5 million. The average loss per fire was $3,955. This is an 8% decrease from the 1,507 fires reported in 2018.

85% of All Heating Fires Were Confined Fires
In 2019, 85% of heating fires were confined to the container of origin. Six hundred and forty (640), or 46%, of all heating related building fires in Massachusetts were coded as 'fuel burner/boiler malfunction, fire contained'. Five hundred and thirty-seven (537), or 39%, were determined to be chimney or flue fires, confined to the chimney or flue.

The number of contained heating fires fell in 2019. Confined heating equipment fires decreased by 103 incidents, or 8%, from the 1,280 reported in 2018.

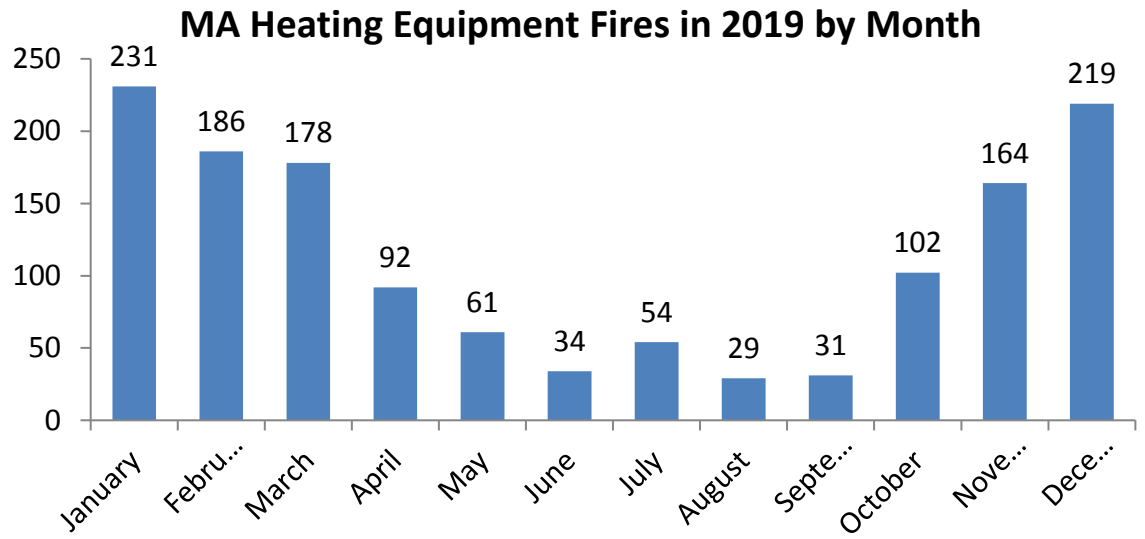
Types of Heating Equipment
Only one type of equipment per fire incident may be reported to MFIRS. Consequently, the totals for specific types of equipment should, in many cases, be considered underestimates. For example, sparks from a wood stove may ignite a fire in the chimney. The recorded equipment involved might be either the chimney or the wood stove, but not both. When a fire results from an extension cord overloaded by the demands of a portable heater, the extension cord might be recorded instead of the heater.

The following table shows the number of fires caused by each of the leading types of heating equipment, the percentage of heating equipment fires for each type of equipment, the number of civilian and fire service deaths and injuries, and the estimated dollar loss for each type of heating equipment.

HEATING EQUIPMENT FIRES

Heating Equipment Involved	# of Heating Fires	% of Heating Fires	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss
Central heating units	656	48%	10	1	0	0	$ 731,892
Confined	*640*	*46%*	*8*	*1*	*0*	*0*	*$ 303,842*
Furnace, central heating unit	*8*	*1%*	*2*	*0*	*0*	*0*	*$ 390,000*
Boiler (power, process, heating)	*8*	*0.6%*	*0*	*0*	*0*	*0*	*$ 38,050*
Chimney, flue	552	40%	1	2	1	0	$ 956,018
Confined	*537*	*39%*	*1*	*2*	*0*	*0*	*$ 233,518*
Fireplace, chimney, other	*4*	*0.3%*	*0*	*0*	*0*	*0*	*$ 266,000*
Chimney connector, vent connection	*1*	*0.1%*	*0*	*0*	*0*	*0*	*$ 300,000*
Chimney, brick, stone, masonry	*4*	*0%*	*0*	*0*	*1*	*0*	*$ 45,000*
Chimney, metal, incl. stovepipe	*6*	*0%*	*0*	*0*	*0*	*0*	*$ 111,500*
Space heaters	30	2%	3	4	0	0	$ 730,500
Portable space heaters	*22*	*2%*	*3*	*0*	*0*	*0*	*$ 649,400*
Fireplace	7	1%	0	0	0	0	$ 215,000
Fireplace, masonry	*4*	*0%*	*0*	*0*	*0*	*0*	*$ 187,000*
Fireplace insert/stove	*0*	*0.0%*	*0*	*0*	*0*	*0*	*$ 0*
Fireplace factory built	*3*	*0%*	*0*	*0*	*0*	*0*	*$ 28,000*
Water heater	6	0%	0	0	0	0	$ 152,800
Heating, vent. & air cond,. other	31	2%	1	5	0	0	$ 355,675
All other reported equipment	7	1%	0	0	0	0	$ 33,060
Total	**1,381**	**100%**	**17**	**19**	**1**	**1**	**$ 5,461,210**

Most Heating Fires Occur During Colder Months
Sixty-six percent (66%) of all heating equipment fires occurred during the months of January through April, and December.



Furnaces Should Be Cleaned and Checked Annually

- Homeowners should have furnaces cleaned and checked annually to ensure that they are working well.
- Combustible materials such as trash or supplies should never be stored near heating equipment.
- Keep a 3-foot clear space around the furnace.
- Only licensed trades people may install oil, gas, or electric heating units.
- Regulations about oil burners may be found in 527 CMR 1.11.

Have Chimneys Cleaned Annually to Remove Creosote

Creosote is a black, tar-like by-product of fire. It can accumulate in a chimney and cause a fire. Chimneys should be cleaned at the start of each heating season and checked monthly for soot build-up. They should also be checked for loose mortar. Keep the temperature in the recommended range when using wood or coal stoves. Use chimney guards to prevent animals from nesting in your chimney. Have the chimney inspected by a professional after a fire before using your chimney again.

Install Wood Stoves According to Building Code Standards

A homeowner must obtain a building permit prior to installing a wood, pellet or coal stove and the installation must be inspected upon completion. In general, the stove should be at least three feet away from walls, ceilings and furnishings. If the flue does not draw properly, deadly levels of carbon monoxide may accumulate in the home.

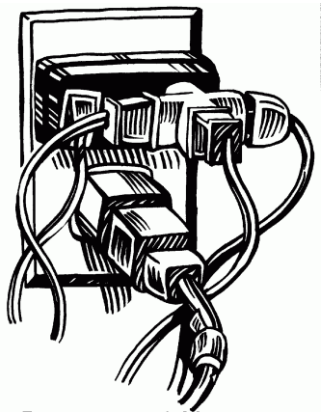
- Keep the temperature within the manufacturer's suggested range. Wood and coal stoves should be operated at moderate heat. If the fire is too low, creosote may accumulate in the chimney and eventually cause a fire. If the fire is too hot, nearby combustibles or creosote in the chimney could ignite.
- Only burn fuels intended for use in these stoves. Other items may cause overheating and the release of toxic gases. Never use gasoline or flammable liquids to stoke the fire — doing so could cause a flash fire or explosion.
- Install and regularly test smoke and carbon monoxide alarms.
- Have your chimney cleaned and inspected for creosote build-up before each heating season, and check it at least once a month during the season.
- Place ashes in a covered metal container until they are completely cool. Store them outdoors, away from the house, porch or other outside buildings. Hot ashes may stay "live" for 24 hours or longer.

Space Heater Safety

- When buying a heater, look for one that has been tested and labeled by a nationally recognized testing company.
- Keep the heater 3 feet away from drapes, furniture or other things that can burn. Place it on a level surface away from areas where a person or a pet might bump it and knock it over.
- If you must use an extension cord, make sure it is a heavy-duty cord marked with a power rating as least as high as that on the label of the heater itself and plug it directly into a wall outlet.

- Never leave a space heater unattended or running while you sleep.
- Keep electric heaters away from water. Never use them near a sink or in the bathroom.
- Do not use space heaters to thaw pipes. They were not designed for this task. Space heaters must be kept at least three feet away from any combustibles including walls and wall coverings.

Electrical Fires



667 Electrical Fires Caused 4 Civilian Deaths
Local fire departments reported that there were 667 structure fires caused by electrical problems in Massachusetts in 2019. These fires caused four civilian deaths, 19 civilian injuries, 89 fire service injuries and an estimated dollar loss of $32.5 million, accounting for 13% of the total dollar loss to fire in 2019. The average loss per fire was $48,786.

Electrical Fires Were the 2nd Leading Cause of Fire Deaths
Electrical fires were the second leading cause of structure fire deaths in 2019. Four (4) fatal electrical fires, or 12%, of fatal structure fires caused four, or 12%, of structure fire deaths in 2019. Electrical fires have been either the leading or second leading cause of structure fire deaths in the past six years.

The criteria to qualify for an electrical equipment fire includes all fires caused by electrical problems or malfunctions. Specifically, it needs to be coded as *Heat Source* – 'Arcing' or - *Factors Contributing to Ignition* – 'Equipment overloaded' or – 'Electrical failure malfunction' or to have *Equipment Involved in Ignition* in the 200 series – 'Electrical distribution, lighting and power transfer equipment'.

Unspecified Electrical Failure Responsible for 30% of Electrical Fires[19]
Two hundred and one (201), or 30%, of electrical fires were caused by an unclassified electrical failure or malfunction.

[19] *Factors Contributing to Ignition* is one of the fields in version 5 that allows for multiple codes. Two factors contributing to ignition may be coded. For example, in the case of a malfunctioning electrical heater, we can capture not only the electrical malfunction, but also a contributing factor such as: was the heater too close to combustibles; did the automatic control fail; was it knocked over; was it worn out; or was the equipment overloaded. This field also is not a mandatory field, although fire departments are strongly encouraged to complete it, should it apply to the incident. Because of these factors, the percentages may not add up to 100%.

Factor Contributing to Ignition	# of Incidents	%
Electrical failure, malfunction, other	201	30%
Unspecified short-circuit arc	95	14%
Short circuit arc from defective, worn insulation	37	6%
Mechanical failure, malfunction, other	19	3%
Arc from faulty contact, broken conductor	17	3%
Arc, spark from operating equipment	17	3%
Short circuit arc from mechanical damage	16	2%
Equipment overloaded	15	2%
Too close to combustibles	10	1%
Water-caused short circuit arc	9	1%
Storm	7	1%

Equipment	# of Incidents	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss
Electrical service, wiring, meter box and circuit breaker	192	34	2	0	2	$ 10,885,474
Lamp, lighting	44	3	0	0	0	$ 642,850
Ventilation and air conditioning	43	3	7	0	0	$ 1,334,350
Kitchen & cooking equipment	38	0	1	0	0	$ 884,010
Transformer, generator, battery, charger	34	9	0	0	1	$ 1,915,750
Household appliances (non-cooking)	27	2	0	0	0	$ 2,012,822
Heating equipment	21	1	0	0	0	$ 39,711
Cord, plug	20	2	3	0	0	$ 977,250
Electronic & other electrical equipment	13	9	0	0	0	$ 451,301
Shop tools & industrial equipment	11	0	0	0	0	$ 208,500
Electrical distribution, lighting & power transfer, other	9	1	0	0	0	$ 322,000
Decorative lighting, signs	3	0	0	0	0	$ 461,000
Commercial & medical equipment	1	0	0	0	0	$ 3,500
Garden tools & agricultural equipment	1	0	0	0	0	$ 11,000
Total Known Equipment	457	64	13	0	3	$ 20,149,518
Not reported (Null)	155	19	3	0	1	$ 9,546,253
Unclassified (Other)	5	0	0	0	0	$ 55,150
None	47	4	3	0	0	$ 1,489,497
Undetermined	3	2	0	0	0	$ 1,300,000
Total Unspecified	210	25	6	0	1	$ 12,390,900
Total	**667**	**89**	**19**	**0**	**4**	**$ 32,540,418**

Over 3/4 of Electrical Fires Occurred in Residential Occupancies
Over three-quarters of electrical fires occurred in residential occupancies. Of the 667 electrical fires, 507, or 76%, occurred in residential occupancies.

Occupancy	# of Incidents	% Known
Residential	507	76%
Mercantile, business	50	7%
Storage Properties	27	4%
Assembly	25	4%
Educational	15	2%
Institutional	15	2%
Manufacturing, processing	11	2%
Basic Industry	10	1%
Special Properties	7	1%
Total Known	667	100%

12% of Electrical Fires Began in the Kitchen
Eighty-three (83), or 12%, of electrical fires began in the kitchen. The following table shows the leading Areas of Origin of the electrical fires in Massachusetts in 2019.

Area of Origin	# of Incidents	%
Kitchen	83	12%
Bedroom	73	11%
Ceiling & floor assembly	41	6%
Wall assembly, concealed wall space	41	6%
Bathroom	33	5%
Attic	31	5%
Living room	26	4%
Laundry room	25	4%
Substructure area, crawl space	24	4%
Wall surface, exterior	24	4%
Storage area, other	20	3%
Heating room or area	17	3%
Other	15	2%
Function area, other	14	2%
Service or equipment area, other	14	2%

Electrical Wiring Was the Item First Ignited in Over 1/3 of Electrical Fires
Electrical wiring or cable insulation was the item first ignited in 237, or 36%, of electrical fires. This includes fixed wiring, wiring inside electronic items, extension cords and appliance cords. The following table shows the leading Item 1st Ignited of the electrical fires in Massachusetts in 2019.

Item 1st Ignited	# of Incidents	%
Electrical wire, cable insulation	237	36%
Undetermined	77	12%
Structural member, framing	70	10%
Appliance housing or casing	37	6%
Structural component, finish, other	30	4%
Other	25	4%
Thermal, acoustical insulation w/in wall, partition, floor/ceiling	22	3%
Exterior sidewall covering, surface, finish	17	3%
Interior wall covering	16	2%
Interior ceiling covering or finish	16	2%

Large Loss Electrical Fires

There were three large loss ($1 million+) electrical fires in 2019. These three fires caused an estimated $3.8 million in damages, accounting for 12% of the total dollar loss from electrical structure fires in 2019. There were 82 fires with estimated damages between $100,000 and $999,999.

Wellesley Has Largest Loss Electrical Fire

- On September 27, 2019, at 5:23 p.m., the Wellesley Fire Department was called to an electrical fire at a single-family home. The fire was caused by arcing in the wires that caused the curtains to ignite. There were no injuries associated with this fire. Alarms were not present and the home did not have sprinklers. Damages were estimated to be $1.4 million.

Cambridge Has Electrical Fire with Most Fire Service Injuries

- On February 11, 2019, at 7:50 a.m., the Cambridge Fire Department was called to an electrical fire in a four-unit apartment building. The fire was caused by a short circuit in the ceiling and floor assembly. Seventeen (17) firefighters were injured at this fire. Alarms were present but it was undetermined if they operated. Sprinklers were not present. Damages from this fire were estimated at $430,000.

Watch For Warning Signs

People should watch for warning signs of electrical problems. These include:

- Fuses blowing or circuit breakers tripping frequently.
- Unusually warm or faulty outlets or switches.
- A vague smell of something burning.
- A sizzling sound in the wall.

Any of these signs may indicate a potential problem. Contact a licensed electrician if you notice any of these signs, or contact the local fire department. Many departments have technologies such as thermal imaging cameras that can ‘see’ heat inside walls to detect potential problems before they expand and extend to other parts of the building.

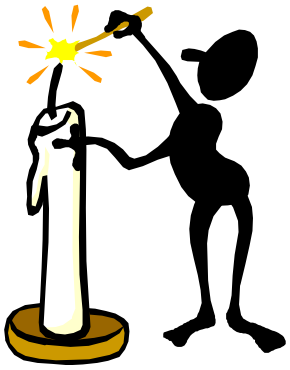
Fuses and circuit breakers are safety devices. They blow or trip when the amount of current cannot safely travel through the wires, which is why frequent blowing or tripping is a warning sign. *Trying to bypass the fuse or circuit breaker protection is an invitation to danger.*

Electrical Systems Pose Unseen Dangers
Just as all systems need maintenance and inspection, so does electrical wiring. As switches, receptacles and connections age, heat is generated and the risk of fires inside walls and at poor connections greatly increases. Because wiring is often hidden behind walls, electrical faults may be hard to detect, except by properly trained electricians.

Have Electrical Systems Examined by a Licensed Electrician Every 10 Years
Have electrical systems examined by a licensed electrician every 10 years. A good electrician will look for electrical faults, check for warm switch plates and receptacles, and analyze the use of electricity to see if additional capacity is needed. It is important to help our homes keep up with the electrical demands of our changing lifestyles, changes in society and new technologies.

Candle Fires

92 Candle Fires Caused 5 Civilian Injuries
In 2019, candles caused 92 fires of all types. These fires caused 13 civilian injuries, 19 fire service injuries and an estimated dollar loss of $3.6 million in damages. There was a 7% decrease from the 99 fires of all types started by candles in Massachusetts in 2018.



85% of Candle Fires are Structure Fires
Of the 92 candles fires in 2019, 78, or 85%, were classified as structure fires. None were reported as motor vehicle fires. Fourteen (14), or 15%, were outside or other fires; one, or 1%, was a special outside fire; and 13, or 14%, were unclassified fires.

Candle Fires Happen Most During the Holidays
Between 2010 and 2019, the days of the year on which most candle fires occurred were:

1. December 25 (Christmas) = 15 candle fires.
2. December 24 (Christmas Eve) and December 22 = 10 candle fires
3. December 31 (New Year's Eve) and February 9 = 9 candle fires.

Brookline Has Largest Loss Candle Fire

- On July 8, 2019, at 6:52 a.m., the Brookline Fire Department was called to a candle fire in a single-family home. The fire was started by a candle in the kitchen. One (1) civilian and one firefighter were injured at this fire. Alarms were present and alerted

the occupants; and the building was not sprinklered. Damages from the blaze were estimated to be $575,000.

96% of Candle Fires Occurred in Homes

Of the 78 candle fires that occurred in buildings, all but three, or 96% were residential fires. These 75 residential fires caused 12 civilian injuries, 18 fire service injuries and an estimated dollar loss of $3.6 million. Two (2) candle fires, or less than 1%, occurred in mercantile or business properties, and one, or less than 1% happened in a public assembly property.

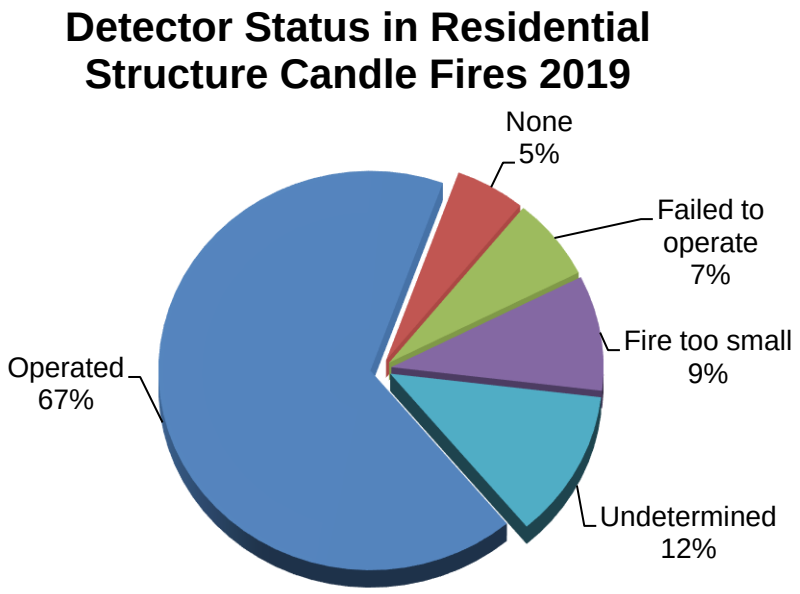
Almost 1/3 of Candle Fires in Homes Occurred in the Bedroom

Of the 75 candle fires in residential structures, 32% occurred in the bedroom and 20% occurred in the living room. The following table is a list of the leading *Area of Origin* for residential candle fires.

Area of Origin	# of Residential Candle Fires	% of Residential Candle Fires
Bedroom	24	32%
Living room	15	20%
Kitchen	8	11%
Bathroom	6	8%
Bar area, cafeteria	6	8%
Exterior balcony, unenclosed porch	3	4%

Smoke Alarms Operated in 2/3 of Candle Fires in Homes

Of the 75 candle fires in homes, smoke alarms operated in 64% of these fires.



If you are going to be burning candles with an open flame in your home make sure that your smoke alarms are working properly. Consider switching to flameless candles, especially if children or pets are around.

Candle Safety Tips

- Burn candles in the center of a 1-foot **Circle of Safety,** free of anything that can burn.
- Stay in the same room with burning candles; do not leave unattended.
- Burn candles on a non-combustible surface such as a ceramic saucer or plate.
- Be sure to snuff out candles before falling asleep, going out, or leaving the room.
- Teach everyone in the family the rules of safe candle use.
- Keep candles out of reach of small children and pets.

More information on candle fire safety can be found on our webpage at http://www.mass.gov/dfs.

Fireworks Incidents

57 Incidents Involving Fireworks Caused $564,250 in Damages
There were 57 fire and explosion incidents reported that involved fireworks in 2019. This is a 31% decrease of fire and explosion incidents from the 83 reported in 2018. Incidents involving fireworks caused one fire service injury and an estimated $564,250 in property damages. The average dollar loss per fireworks incident was $15,277.

Thirty-five percent (35%) of the fireworks incidents were brush fires.

A fireworks explosion without fire is coded as an Incident Type 243 – Fireworks explosion (no fires). In 2019, 20 such incidents were reported.

54% of Fireworks Fires Occurred the Week of July 4th
Twenty (20), or 54%, of the 37 fireworks-caused fires in 2019 took place during the week of the 4th of July. Eight (8) occurred on July 4th.

Largest Loss Fireworks Fire –Boston Fire

- On July 5, 2019, at 1:36 a.m., the Boston Fire Department was called to fire in a three-unit apartment building. The fire was started by fireworks on the exterior balconies. No one was injured at this fire. Alarms were present and alerted the occupants. The building did not have sprinklers. Damages from this fire were estimated to be 500,000. The fire spread to another building and a nearby car causing another $250,000 in estimated damages.

Refer to M–BIRS Annual Report for More Information about Fireworks Injuries
For more information about the causes of burn injuries, please refer to the *Massachusetts Burn Injury Reporting System — 2017 Annual Report.* According to Massachusetts General Law (MGL) Chapter 112, Section 12A, the treatment of all burn injuries extending over 5% or more of a person's body surface area must be reported immediately to the State Fire Marshal. All burn reports received by the Division Fire Safety are reviewed for possible suspicious circumstances. Gasoline burns, burns on the hands and arms or other unusual scenarios are referred for further investigation.

There were four fireworks-related burn injuries reported to M-BIRS in 2019. Since we started collecting burn injury reports in M-BIRS in 1984, the average number of fireworks-related burns per year is nine. The highest number of reported fireworks-related burns occurred in 1989, with 45 reported burn injuries.

Grill Fires

86 Incidents Involving Grills in 2019 Caused 5 Civilian Injuries
In 2019, there were 86 fire and explosion incidents reported to the Massachusetts Fire Incident Reporting System (MFIRS) involving open fired grills. These incidents caused five civilian injuries, one fire service injury and an estimated dollar loss of $1.5 million. This is a 5% increase from the 82 grill fires in 2018.

Eighty-one percent (81%) of these incidents occurred in the months of May to September when people are most likely to use their outdoor grills.

Gas Grill Fires
Of the 86 grill incidents, 76, or 88%, of the grills were gas grills. Solid fuels such as charcoal briquettes powered eight grills, or 9% of these fires. One (1), or 1%, was

powered by a liquid fuel. The 76 gas grill incidents caused all five civilian injuries, the single fire service injury and $1.5 million, or 94% of the total damages.

Canton Had Largest Loss Grill Fire
Canton had the largest loss grill fire at $1.15 million, or 82% of the total damages caused by grill fires in 2019.

- On September 11, 2019, at 11:21 p.m., the Canton Fire Department was called to a fire in a single-family home. The fire was started by a gas grill on the rear deck of the house. No one was injured at this fire. Alarms were present and alerted the occupants. The building was not sprinklered. Damages from the blaze were estimated to be $1.15 million.

Refer to MBIRS Annual Report for More Information about Grill Injuries
For more information about the causes of burn injuries, please refer to the *Massachusetts Burn Injury Reporting System — 2019 Annual Report.* According to Massachusetts General Law (MGL) Chapter 112, Section 12A, the treatment of all burn injuries extending over 5% or more of a person's body surface area must be reported immediately to the State Fire Marshal. Eleven (11) civilians were reported to M-BIRS in 2019 with burn injuries from a grill. The youngest person with a burn injury from a grill was a four-year old girl and the oldest was a 58-year old man. Five (5) of these injuries occurred in July and August.

Grill Safety
Follow these safety tips when using a grill:

- Use all barbecue grills away from the house in the backyard.
- Supervise children whenever any grill is in use.
- Never use gasoline on any grill!

Gas Grill Safety

- Keep all LP-gas outside, 10 feet away from building openings such as doors, windows, and dryer. Gas grill containers must be kept at least five feet away from possible ignition sources such as air conditioners, compressors, cars, and pilot lights.
- LP-gas grills with external tanks are not permitted inside or on balconies above the first floor of any building where people live. LP-gas is heavier than air and sinks. A leaky grill could pose a hazard to people below.
- Make sure all connections are tight and secure.

Charcoal Grill Safety

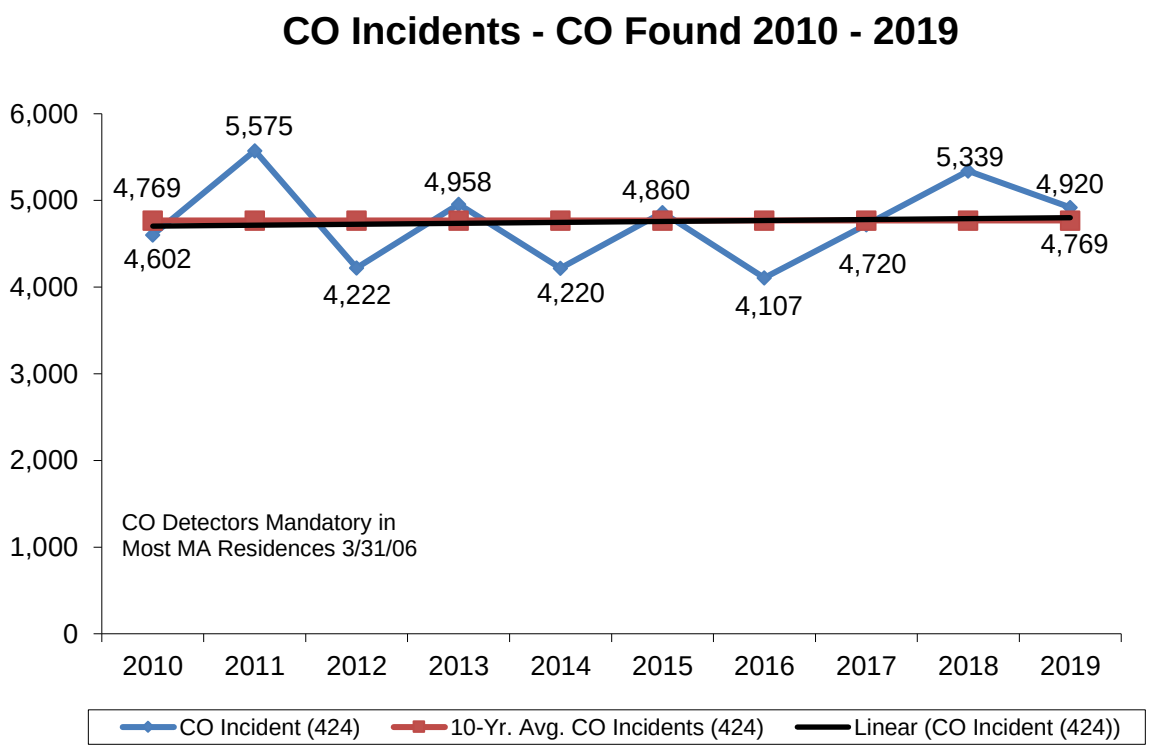
- Use only charcoal lighter fluid to start charcoal grills.
- Once the coals have been lighted, never add more lighter fluid to the fire — flames may travel up the stream of lighter fluid resulting in serious burns.
- Only use charcoal grills outside.

Carbon Monoxide Incidents

In 2019, 317 fire departments voluntarily reported 18,046 carbon monoxide (CO) incidents: hazards[20], carbon monoxide alarm activation due to malfunction[21], and carbon monoxide alarm activation – no CO[22]. A CO hazard is an identifiable carbon monoxide emergency whether or not a CO alarm activated, the presence of CO was confirmed, and some corrective action was indicated. Fire departments responded to 4,920 confirmed CO hazard incidents.

5% Increase from 2018

In 2019, the number of reported carbon monoxide incidents increased by 1,925 calls, or 5%, from the 17,121 calls reported in 2018. The highest number of CO calls of all types was 19,770 that was reported in 2013. This confirms the need to have these life-saving devices in people's homes as a way to avert potential lethal calls. The chart below illustrates the number of calls where carbon monoxide was discovered by responding fire service personnel and the increasing trend in the number of these calls since 2016. Overall, since 2010, CO calls have been on an even trend. Some years there are spikes because of significant weather events that happen like the *Smowmageddon* snow storms in February of 2015.



[20] Carbon monoxide hazards = Incident Type – 424.
[21] Carbon monoxide detector activation due to a malfunction = Incident Type – 736.
[22] Carbon monoxide detector activation, no CO = Incident Type – 746.

91% of All CO Incidents Occur in Residences
Ninety-one percent (91%) of all carbon monoxide calls occurred in residential occupancies. Businesses, public assembly and institutional facilities were the next leading property use categories for CO calls, each accounting for 2% of the incidents.

Property Use	# of CO Calls	% of CO Calls
Assembly	447	2%
Educational	186	1%
Institutional	284	2%
Residential	16,381	91%
Mercantile & business	428	2%
Basic Industry	9	0.1%
Manufacturing & processing	51	0.3%
Storage	115	0.6%
Special Properties	73	0.4%
Total Known	17,974	100%

Almost 1/2 of All CO Calls Occur During the Winter
Forty-nine percent (49%) of all the CO calls that occurred in 2019 happened during the colder months of November through February. Most CO calls occurred between the hours of 5:00 p.m. and 9:00 p.m.

These seem to be the times when most people are awake and doing things around the house or coming home from work or school. This would also be the time that people would turn the heat up. Heating equipment is a leading cause of carbon monoxide incidents.

According to the U.S. Consumer Product Safety Commission (CPSC), an acceptable level of CO is a 15 PPM average over a time span of eight hours or a 22 PPM average for an hour. If you have 1,000 PPM for over thirty minutes, it puts you at a high level of danger in the form of a collapse into a coma or permanent brain damage.

Power Outages = Low Batteries
Whenever there is a prolonged power outage, you should change the battery in plug-in CO alarms. When the power goes out the backup battery powers the unit for a couple of days. Many people misinterpret the low battery warning ‘beep’ as an active detection of CO and call the fire department tying up emergency resources that may be needed elsewhere. After three of the latest major disasters to hit Massachusetts, the 2011 Halloween snowstorm, the 2013 February blizzard and the 2015 “Snowmeggadon” all CO calls increased by 345%, 621% and 123% respectively from the previous year. Specifically, CO Alarm Activation and Malfunction calls increased by 279% in the days following the Halloween snowstorm; by 414% following the blizzard; and by 78% following “Snowmageddon”.

Mapping the Fire Experience

Boston & Worcester Had the Most Reported Fires
Boston reported having the most fires, with 4,468 in 2019. Worcester had the second highest number of reported fires at 1,300. Cambridge (1,008), Quincy (588), Framingham (582), Brockton (533), and Springfield (499) rounded out the top seven communities in the Commonwealth in terms of reported fires.

However if we look at the number of reported fires compared to the total population of the individual community we get a different picture. One would expect that the bigger cities and towns to have more fires because of their populations. When we calculate the rate of reported fires for every 10,000 people in a given municipality, the ranking changes. Usually the top communities in terms of number of reported fires fall towards the bottom of the rankings. Communities with one, two or three reported fires take over the top spots. These communities may have a rate that far exceeds that actual number of fires that they reported. For example towns like New Ashford, Chilmark and Wendell all reported less than 20 fires in 2019 but their small populations cause them to have a high fires per 10,000 population.

For a listing and breakdown of the number of reported fires and arsons by community, please go to the appendix.

The map titled, *2019 Fires per 10,000 Population by Community,* on page 117, displays the rate of reported fires by community for every 10,000 of that community's population. The map's legend indicates which group a municipality belongs. Cities and towns that are blank reported no fires or failed to report at all.

Tolland, with 14 total fires, had the highest rate of 289 reported fires per 10,000 population. Topsfield was the next highest with 104 total fires and 171 fires per 10,000 population; New Ashford had three fires and 149 fires per 10,000 population; Fitchburg had 489 fires and 121 fires per 10,000 population. Rates may exceed total actual reported fires.

Boston & Cambridge Had the Most Reported Structure Fires
Boston reported having the most structure fires, with 3,480 in 2019. Cambridge had the second highest number of reported structure fires at 925. Worcester (878), Framingham (507), and Brookline (454) rounded out the top five communities in the Commonwealth in terms of reported structure fires.

The map titled *2019 Structure Fires per 10,000 Population by Community*, on page 118, displays the rate of reported structure fires by community for every 10,000 of that community's population. Cities and towns that are blank did not report any structure fires or failed to report at all.

Topsfield, with 91 structure fires, had the highest rate of 150 structure fires per 10,000 population. Lincoln was the next highest with 87 structure fires and 137 structure fires per 10,000 population; Fitchburg had 99; Provincetown had 95; and Cambridge had 88 structure fires per 10,000 population.

Boston & Cambridge Had the Most Reported Residential Building Fires
Boston reported having the most residential building fires, with 2,993 in 2019. Cambridge had the second highest number of reported building fires at 753. Worcester (752), Framingham (424), and Brookline (413) rounded out the top five communities in the Commonwealth in terms of reported residential building fires.

The map titled *2019 Residential Building Fires per 10,000 Population by Community*, on page 119, displays the rate of reported building fires by community for every 10,000 of that community's population. Cities and towns that are blank did not report any residential building fires or failed to report at all.

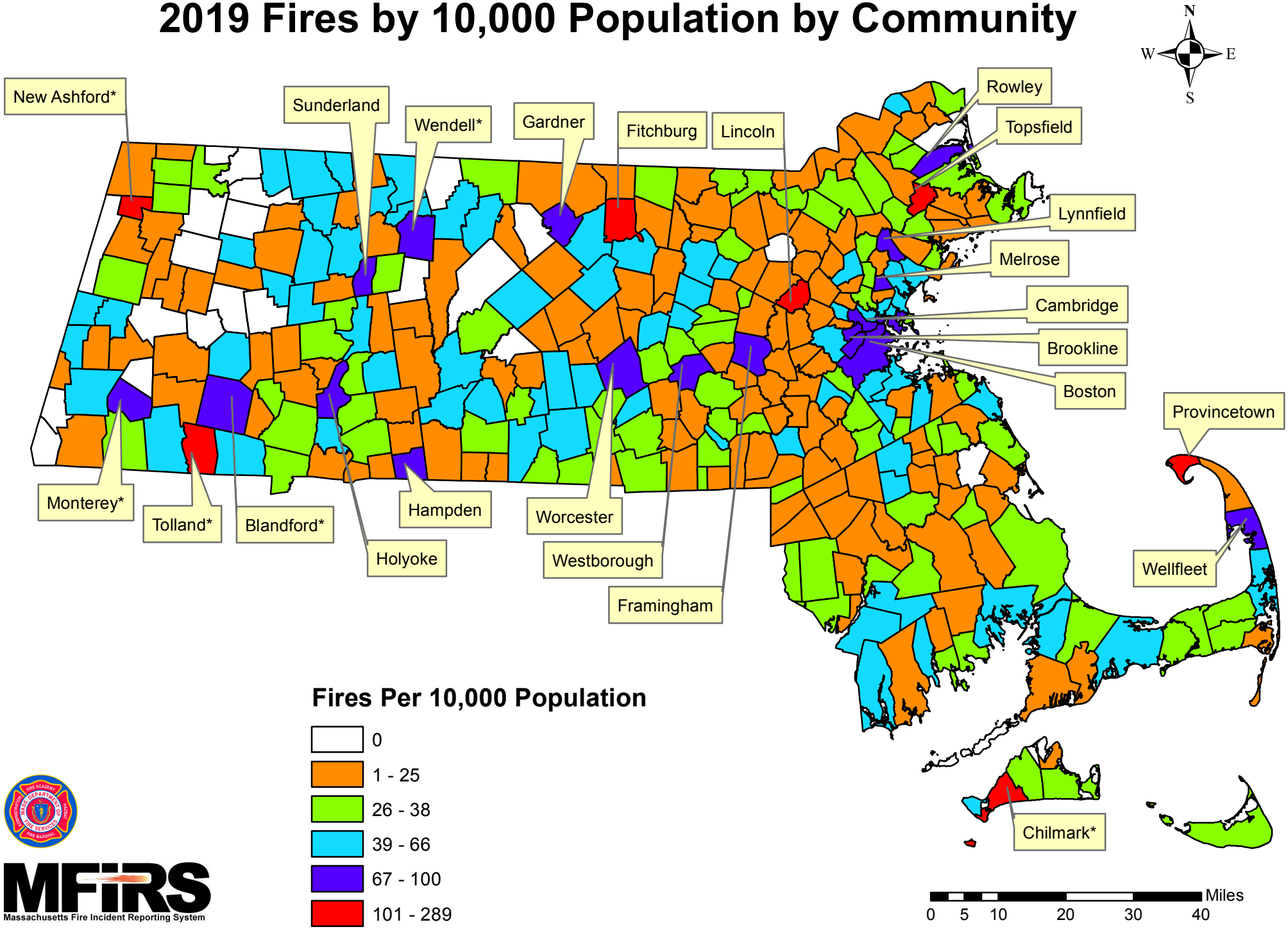
Topsfield, with 81 residential building fires, had the highest rate of 133 residential building fires per 10,000 population. Next highest was Lincoln with 80 residential fires and 126 residential building fires per 10,000 population. Fitchburg had 89, Monterey had 73, Cambridge had 72, and Brookline had 70 residential building fires per 10,000 population.

Boston & Springfield Had the Most Reported Arsons
Boston reported having the most arsons, with 69 in 2019. Springfield had the second highest number of reported arsons at 47. Worcester (32), Barnstable (14), Fall River (12), Randolph (11) and Reading (11) rounded out the top six communities in the Commonwealth in terms of reported arsons.

The map titled *2019 Arsons per 10,000 Population by Community,* on page 120, displays the rate of the total reported arsons by community for every 10,000 of that community's population. Cities and towns that are blank had no reported arsons or they failed to report at all.

Chilmark, with three arsons, had the highest rate of any department reporting more than five arsons, with 35 reported arsons per 10,000 population. Next highest was Lenox with 14 arsons per 10,000 population, East Brookfield had 14, Wendell had 12 and Sandisfield had 11 arsons per 10,000 population.

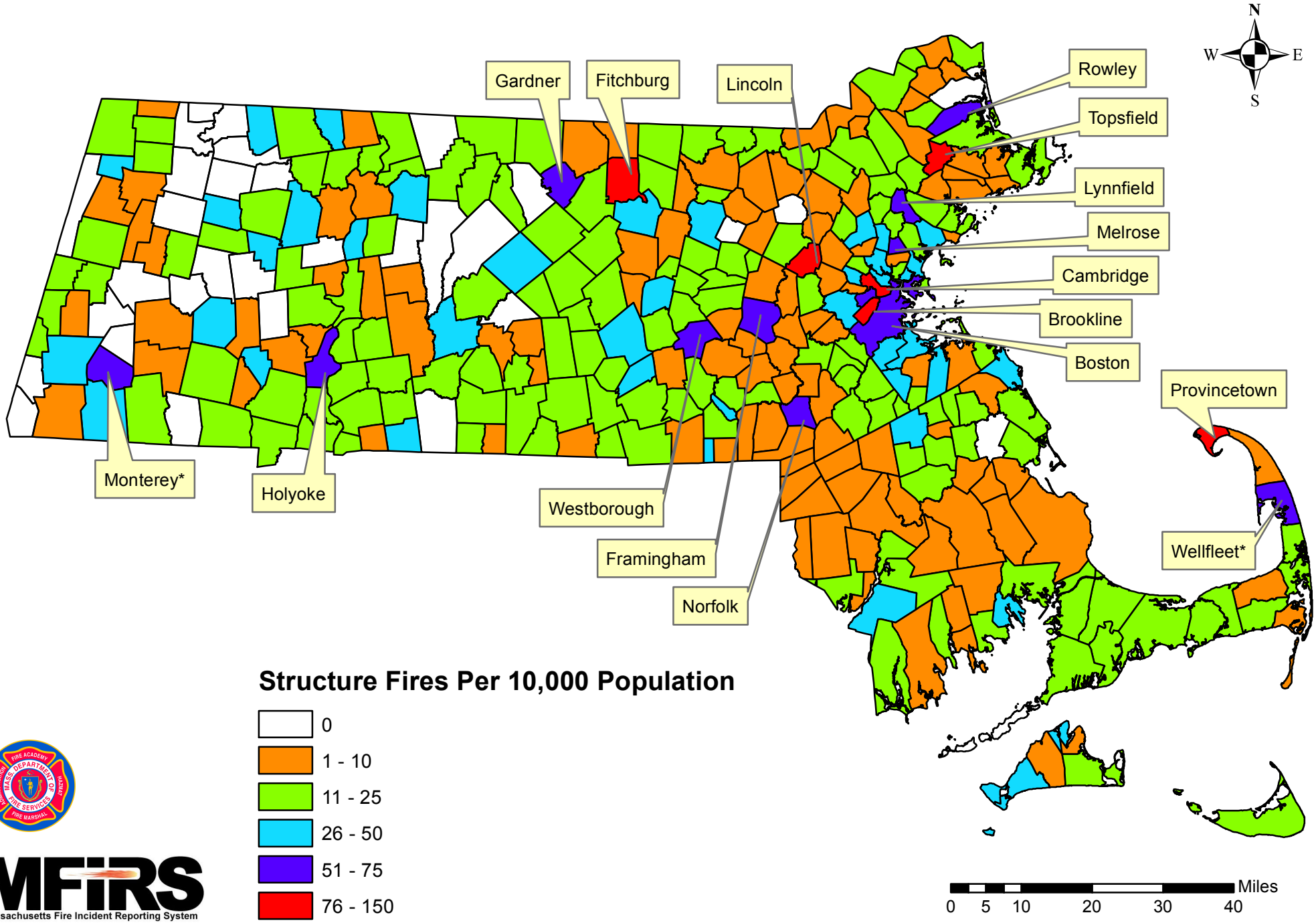
2019 Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 fires or less in 2019.

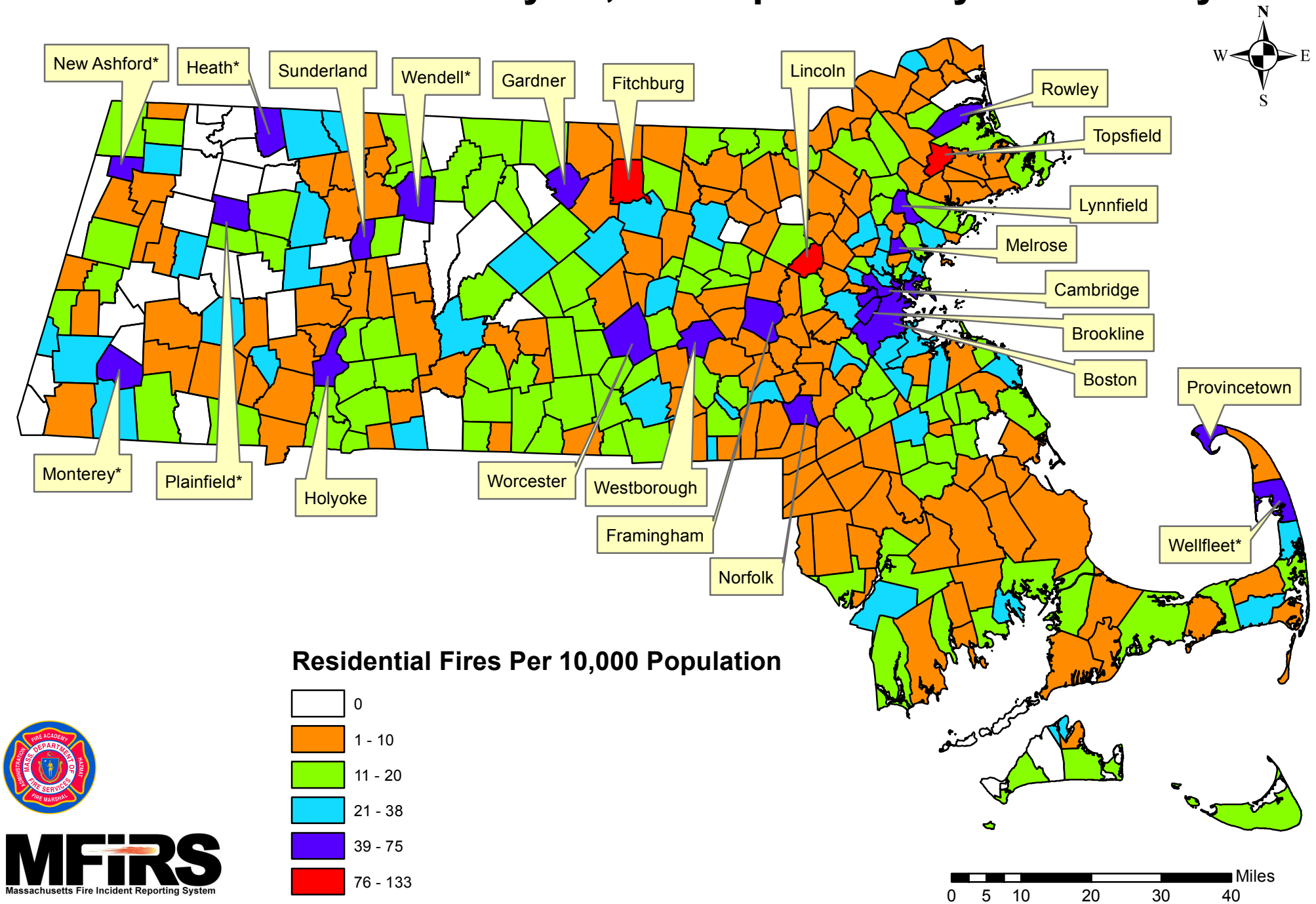
2019 Structure Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 or less structure fires in 2019.

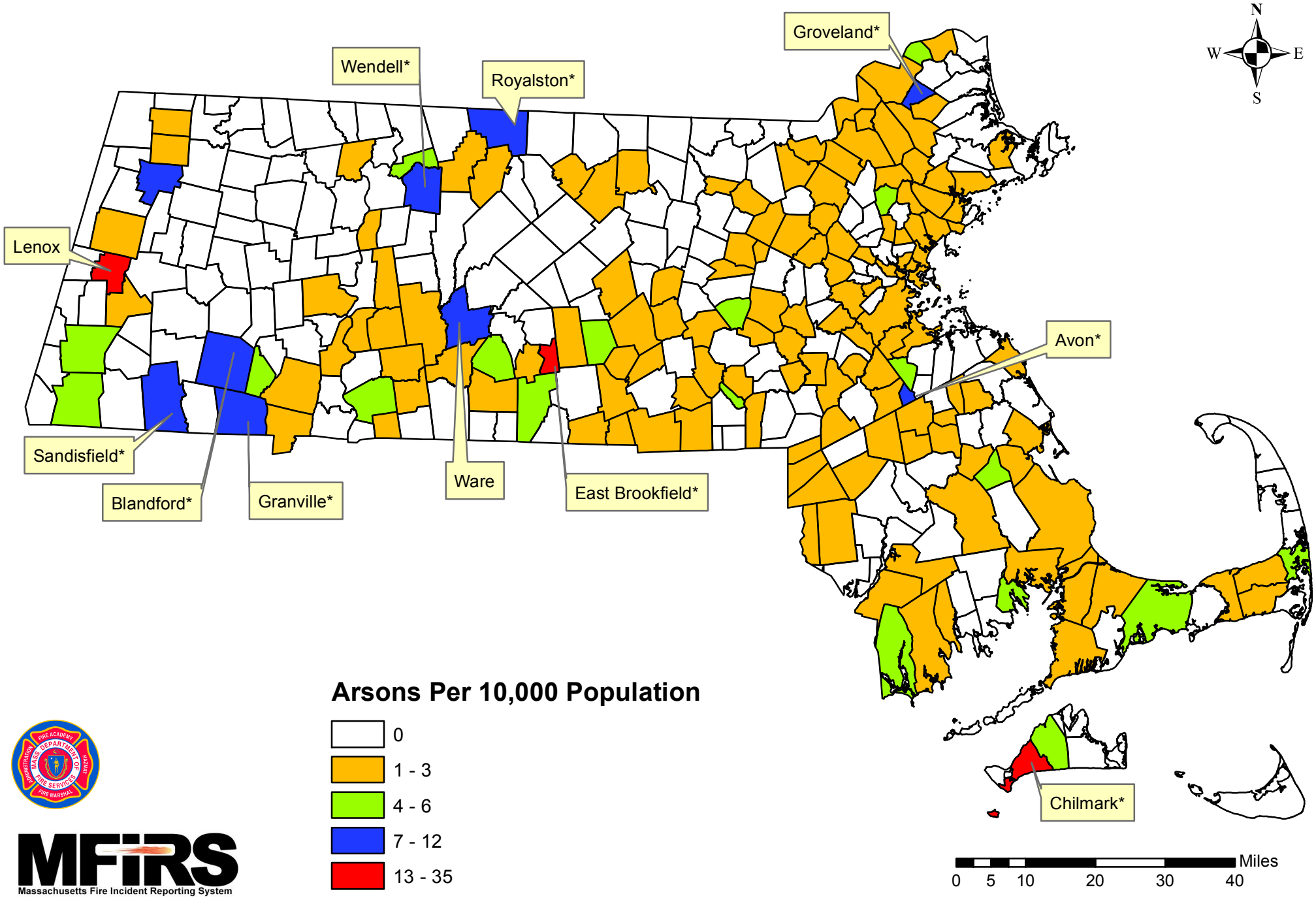
2019 Residential Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 or less residential fires in 2019.

2019 Arsons by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 5 or less arsons in 2019.

Appendix

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Abington	36	17	6	13	0	2	0	1	$432,700
Acton	36	21	5	10	0	0	0	0	$151,100
Acushnet	8	5	0	3	0	0	0	0	$146,500
Adams	27	18	5	4	0	1	0	0	$1,184,328
Agawam	56	30	8	18	0	0	0	1	$740,810
Alford	1	1	0	0	0	0	0	1	$250,000
Amesbury	40	13	7	20	0	0	0	2	$89,050
Amherst	74	37	8	29	0	9	0	1	$2,438,251
Andover	96	61	15	20	0	0	0	0	$4,464,103
Aquinnah	2	1	0	1	0	0	0	0	$5,000
Arlington	103	63	9	31	1	1	0	1	$1,304,066
Ashburnham	12	6	3	3	0	0	0	0	$64,500
Ashby	2	2	0	0	0	0	0	0	$250,000
Ashfield	4	2	0	2	0	0	0	0	$217,166
Ashland	32	14	2	16	1	0	0	1	$5,000
Athol	45	23	0	22	0	0	0	0	$162,000
Attleboro	98	37	20	41	0	0	0	2	$868,813
Auburn	56	24	18	14	0	0	0	0	$0
Avon	24	7	4	13	0	0	0	0	$228,100
Ayer	18	8	2	8	0	0	0	0	$306,900
Barnstable Fire Districts									
Barnstable	*23*	*9*	*4*	*10*	*0*	*0*	*0*	*0*	*$604,501*
Cotuit	*5*	*3*	*0*	*2*	*0*	*0*	*0*	*0*	*$100,000*
C.O.M.M.	*43*	*21*	*6*	*16*	*0*	*0*	*0*	*0*	*$218,600*
Hyannis	*97*	*29*	*11*	*57*	*0*	*3*	*0*	*4*	*$318,250*
West Barnstable	*13*	*2*	*3*	*8*	*0*	*0*	*0*	*0*	*$15,200*
Barre	30	14	1	15	0	2	0	0	$153,850
Becket	3	1	2	0	0	0	0	0	$10,600
Bedford	25	11	6	8	0	5	0	0	$78,852
Belchertown	27	9	8	10	0	0	0	0	$102,000
Bellingham	30	8	8	14	0	0	0	0	$331,100
Belmont	99	75	2	22	0	0	0	0	$239,360
Berkley	19	9	4	6	0	0	0	1	$108,200
Berlin	19	4	5	10	0	0	0	0	$73,100
Bernardston	1	1	0	0	0	0	0	0	$0
Beverly	81	37	8	36	0	0	0		$154,200

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Abington	0	0	0	0	0	0	0	0	$0
Acton	1	0	0	1	0	0	0	0	$2
Acushnet	0	0	0	0	0	0	0	0	$0
Adams	2	2	0	0	0	0	0	0	$419,057
Agawam	0	0	0	0	0	0	0	0	$0
Alford	0	0	0	0	0	0	0	0	$0
Amesbury	1	0	0	1	0	0	0	0	$0
Amherst	1	1	0	0	0	0	0	0	$500
Andover	2	0	0	2	0	0	0	0	$4
Aquinnah	0	0	0	0	0	0	0	0	$0
Arlington	7	0	1	6	1	0	0	0	$15,500
Ashburnham	0	0	0	0	0	0	0	0	$0
Ashby	0	0	0	0	0	0	0	0	$0
Ashfield	0	0	0	0	0	0	0	0	$0
Ashland	1	0	0	1	0	0	0	0	$0
Athol	2	2	0	0	0	0	0	0	$100,000
Attleboro	1	0	1	0	0	0	0	0	$8,500
Auburn	4	3	0	1	0	0	0	0	$0
Avon	3	0	0	3	0	0	0	0	$0
Ayer	1	0	0	1	0	0	0	0	$0
Barnstable Fire Districts									
Barnstable	*7*	*1*	*0*	*6*	*0*	*0*	*0*	*0*	*$570,000*
Cotuit	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
C.O.M.M.	*3*	*1*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Hyannis	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
West Barnstable	*2*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Barre	0	0	0	0	0	0	0	0	$0
Becket	0	0	0	0	0	0	0	0	$0
Bedford	1	0	1	0	0	0	0	0	$14,300
Belchertown	1	0	0	1	0	0	0	0	$0
Bellingham	2	0	0	2	0	0	0	0	$0
Belmont	0	0	0	0	0	0	0	0	$0
Berkley	0	0	0	0	0	0	0	0	$0
Berlin	0	0	0	0	0	0	0	0	$0
Bernardston	0	0	0	0	0	0	0	0	$0
Beverly	10	2	0	8	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Billerica	81	33	15	33	1	1	0	1	$1,224,452
Blackstone	9	5	2	2	0	0	0	0	$15,000
Blandford	10	3	4	3	0	0	0	0	$21,600
Bolton	19	10	7	2	0	0	0	0	$574,760
Boston	4,434	3,477	193	764	3	3	0	1	$51,809,251
Bourne	58	31	6	21	0	0	0	4	$434,401
Boxborough	21	0	7	14	0	0	0	0	$0
Boxford	16	4	4	8	0	0	0	0	$759,117
Boylston	19	12	4	3	0	1	0	0	$49,000
Braintree	69	14	12	43	0	0	0	0	$41,900
Brewster	31	8	3	20	0	0	0	0	$117,250
Bridgewater	87	55	11	21	0	0	0	0	$259,085
Brimfield	10	5	3	2	1	0	0	0	$111,000
Brockton	533	339	53	141	1	7	0	17	$4,642,079
Brookfield	10	5	2	3	0	0	0	0	$0
Brookline	493	454	8	31	0	2	0	8	$2,528,856
Buckland	2	0	1	1	0	0	0	0	$160,000
Burlington	59	28	9	22	0	0	0	0	$491,300
Cambridge	1,008	925	13	70	0	5	0	97	$2,406,100
Canton	66	34	14	18	0	1	0	1	$3,068,700
Carlisle	0	0	0	0	0	0	0	0	$0
Carver	5	4	1	0	0	0	0	0	$74,000
Charlemont	0	0	0	0	0	0	0	0	$0
Charlton	51	24	19	8	0	0	0	0	$510,666
Chatham	12	4	1	7	0	0	0	0	$5,700
Chelmsford	29	14	13	2	0	4	0	1	$635,300
Chelsea	200	138	18	44	1	1	0	20	$1,809,198
Cheshire	5	1	2	2	0	0	0	0	$285,500
Chester	6	4	1	1	0	0	0	0	$30,000
Chesterfield	0	0	0	0	0	0	0	0	$0
Chicopee	168	84	28	56	0	2	0	0	$1,480,334
Chilmark	10	3	0	7	0	0	0	0	$111,000
Clarksburg	1	1	0	0	0	0	0	0	$0
Clinton	32	20	1	11	0	0	0	0	$945,000
Cohasset	28	16	3	9	0	0	0	2	$381,250

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Billerica	2	0	1	1	0	0	0	0	$0
Blackstone	0	0	0	0	0	0	0	0	$0
Blandford	1	0	0	1	0	0	0	0	$0
Bolton	0	0	0	0	0	0	0	0	$0
Boston	69	18	4	47	0	0	0	0	$225,940
Bourne	1	0	0	1	0	0	0	0	$0
Boxborough	0	0	0	0	0	0	0	0	$0
Boxford	1	0	0	1	0	0	0	0	$2
Boylston	1	0	0	1	0	0	0	0	$0
Braintree	0	0	0	0	0	0	0	0	$0
Brewster	2	0	1	1	0	0	0	0	$0
Bridgewater	0	0	0	0	0	0	0	0	$0
Brimfield	1	1	0	0	1	0	0	0	$67,000
Brockton	6	2	1	3	0	0	0	1	$412,000
Brookfield	1	0	0	1	0	0	0	0	$0
Brookline	0	0	0	0	0	0	0	0	$0
Buckland	0	0	0	0	0	0	0	0	$0
Burlington	0	0	0	0	0	0	0	0	$0
Cambridge	0	0	0	0	0	0	0	0	$0
Canton	1	1	0	0	0	0	0	0	$500
Carlisle	0	0	0	0	0	0	0	0	$0
Carver	0	0	0	0	0	0	0	0	$0
Charlemont	0	0	0	0	0	0	0	0	$0
Charlton	0	0	0	0	0	0	0	0	$0
Chatham	0	0	0	0	0	0	0	0	$0
Chelmsford	1	0	0	1	0	0	0	0	$0
Chelsea	4	2	1	1	0	0	0	0	$21,600
Cheshire	0	0	0	0	0	0	0	0	$0
Chester	0	0	0	0	0	0	0	0	$0
Chesterfield	0	0	0	0	0	0	0	0	$0
Chicopee	2	0	2	0	0	0	0	0	$49,000
Chilmark	3	0	0	3	0	0	0	0	$0
Clarksburg	0	0	0	0	0	0	0	0	$0
Clinton	0	0	0	0	0	0	0	0	$0
Cohasset	0	0	0	0	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Colrain	11	4	2	5	0	0	0	1	$11,500
Concord	42	22	2	18	0	1	0	2	$20,000
Conway	8	8	0	0	0	0	0	0	$297,000
Cummington	2	2	0	0	0	0	0	0	$301,000
Dalton	10	4	2	4	0	0	0	1	$12,000
Danvers	67	25	15	27	0	0	0	0	$1,242,860
Dartmouth Fire Districts									
Dartmouth #1	*18*	*6*	*5*	*7*	*0*	*0*	*0*	*0*	*$1,031,291*
Dartmouth #2	*3*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*$0*
Dartmouth #3	*47*	*20*	*9*	*18*	*0*	*0*	*0*	*0*	*$199,150*
Dedham	89	54	13	22	0	2	0	2	$1,032,233
Deerfield Fire Districts									
Deerfield	*4*	*0*	*2*	*2*	*0*	*0*	*0*	*0*	*$115,000*
South Deerfield	*19*	*3*	*0*	*16*	*0*	*0*	*0*	*0*	*$5,025*
Dennis	52	23	3	26	0	0	0	1	$214,815
Devens	15	5	2	8	0	0	0	0	$148,000
Dighton	16	7	6	3	0	0	0	0	$719,000
Douglas	24	9	5	10	0	0	0	0	$886,000
Dover	12	6	1	5	0	0	0	0	$0
Dracut	47	23	9	15	0	5	0	1	$732,600
Dudley	29	10	7	12	0	1	0	0	$373,200
Dunstable	9	7	1	1	0	0	0	1	$68,801
Duxbury	32	18	2	12	0	2	0	0	$113,950
East Bridgewater	29	20	4	5	0	1	0	0	$167,801
East Brookfield	9	2	1	6	0	0	0	0	$6,200
East Longmeadow	26	11	5	10	0	0	0	0	$34,500
Eastham	23	10	1	12	0	0	0	1	$15,500
Easthampton	24	11	5	8	0	0	0	3	$256,500
Easton	34	15	4	15	0	0	0	0	$1,266,700
Edgartown	12	5	2	5	0	0	0	0	$32,000
Egremont	0	0	0	0	0	0	0	0	$0
Erving	8	4	1	3	0	0	0	0	$0
Essex	8	3	1	4	0	0	0	0	$6,040
Everett	166	59	15	92	2	0	0	3	$986,588
Fairhaven	41	12	7	22	2	1	0	0	$193,126

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Colrain	0	0	0	0	0	0	0	0	$0
Concord	4	1	0	3	0	1	0	2	$20,000
Conway	0	0	0	0	0	0	0	0	$0
Cummington	0	0	0	0	0	0	0	0	$0
Dalton	0	0	0	0	0	0	0	0	$0
Danvers	2	1	0	1	0	0	0	0	$15,000
Dartmouth Fire Districts									
Dartmouth #1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Dartmouth #2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Dartmouth #3	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Dedham	3	0	0	3	0	0	0	0	$0
Deerfield Fire Districts									
Deerfield	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
South Deerfield	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Dennis	1	1	0	0	0	0	0	0	$3,000
Devens	1	0	0	1	0	0	0	0	$0
Dighton	0	0	0	0	0	0	0	0	$0
Douglas	1	1	0	0	0	0	0	0	$0
Dover	0	0	0	0	0	0	0	0	$0
Dracut	0	0	0	0	0	0	0	0	$0
Dudley	1	0	0	1	0	0	0	0	$0
Dunstable	0	0	0	0	0	0	0	0	$0
Duxbury	1	1	0	0	0	0	0	0	$0
East Bridgewater	2	1	0	1	0	0	0	0	$300
East Brookfield	3	0	0	3	0	0	0	0	$0
East Longmeadow	2	0	1	1	0	0	0	0	$3,000
Eastham	0	0	0	0	0	0	0	0	$0
Easthampton	0	0	0	0	0	0	0	0	$0
Easton	3	0	1	2	0	0	0	0	$15,000
Edgartown	0	0	0	0	0	0	0	0	$0
Egremont	0	0	0	0	0	0	0	0	$0
Erving	1	0	0	1	0	0	0	0	$0
Essex	1	0	0	1	0	0	0	0	$0
Everett	1	0	0	1	0	0	0	0	$0
Fairhaven	0	0	0	0	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Fall River	408	251	43	114	3	11	0	8	$7,280,042
Falmouth	69	33	7	29	0	4	0	1	$916,760
Fitchburg	489	399	21	69	1	8	0	4	$2,033,142
Florida	2	0	1	1	0	0	0	0	$0
Foxborough	39	13	13	13	0	1	0	0	$335,500
Framingham	582	507	20	55	0	1	0	6	$1,196,295
Franklin	46	20	7	19	0	0	0	3	$0
Freetown	41	18	12	11	0	3	0	1	$692,310
Gardner	153	124	13	16	0	2	0	1	$2,116,821
Georgetown	25	14	6	5	0	0	0	0	$607,500
Gill	6	2	1	3	0	0	0	0	$109,000
Gloucester	84	48	8	28	0	1	0	4	$1,150,596
Goshen	4	3	0	1	0	0	0	0	$224,200
Gosnold	0	0	0	0	0	0	0	0	$0
Grafton	1	1	0	0	0	0	0	0	$60,000
Granby	27	8	7	12	0	0	0	0	$102,200
Granville	9	3	4	2	0	0	0	0	$223,600
Great Barrington	32	22	4	6	2	2	0	0	$233,600
Greenfield	39	22	6	11	0	0	0	0	$170,200
Groton	13	6	3	4	0	1	0	0	$354,313
Groveland	19	5	3	11	0	0	0	0	$170,500
Hadley	25	8	3	14	0	0	0	1	$20,600
Halifax	17	7	1	9	0	0	0	0	$14,350
Hamilton	9	7	0	2	0	0	0	0	$1,200
Hampden	38	18	1	19	0	0	0	0	$77,000
Hancock	0	0	0	0	0	0	0	0	$0
Hanover	51	27	6	18	0	4	0	0	$216,000
Hanson	23	12	0	11	0	0	0	0	$538,200
Hardwick	11	5	2	4	0	0	0	0	$515,100
Harvard	35	19	6	10	0	0	0	0	$233,157
Harwich	46	27	5	14	0	4	0	1	$107,550
Hatfield	12	3	3	6	0	0	0	0	$130,000
Haverhill	129	72	16	41	0	0	0	32	$710,103
Hawley	0	0	0	0	0	0	0	0	$0
Heath	3	3	0	0	0	0	0	0	$3,800
Hingham	45	14	7	24	0	2	0	0	$466,870

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Fall River	12	4	2	6	0	0	0	0	$45,277
Falmouth	2	1	0	1	0	0	0	0	$0
Fitchburg	4	4	0	0	1	2	0	4	$1,424,246
Florida	0	0	0	0	0	0	0	0	$0
Foxborough	5	0	0	5	0	0	0	0	$0
Framingham	2	1	0	1	0	0	0	0	$75
Franklin	0	0	0	0	0	0	0	0	$0
Freetown	1	1	0	0	0	2	0	0	$155,000
Gardner	5	3	0	2	0	1	0	0	$1,000,020
Georgetown	0	0	0	0	0	0	0	0	$0
Gill	0	0	0	0	0	0	0	0	$0
Gloucester	1	1	0	0	0	0	0	0	$0
Goshen	0	0	0	0	0	0	0	0	$0
Gosnold	0	0	0	0	0	0	0	0	$0
Grafton	0	0	0	0	0	0	0	0	$0
Granby	1	0	0	1	0	0	0	0	$0
Granville	1	0	1	0	0	0	0	0	$1,000
Great Barrington	3	2	0	1	0	0	0	0	$5,000
Greenfield	2	0	0	2	0	0	0	0	$0
Groton	0	0	0	0	0	0	0	0	$0
Groveland	5	0	0	5	0	0	0	0	$1,500
Hadley	0	0	0	0	0	0	0	0	$0
Halifax	1	1	0	0	0	0	0	0	$50
Hamilton	0	0	0	0	0	0	0	0	$0
Hampden	0	0	0	0	0	0	0	0	$0
Hancock	0	0	0	0	0	0	0	0	$0
Hanover	1	0	0	1	0	0	0	0	$0
Hanson	0	0	0	0	0	0	0	0	$0
Hardwick	0	0	0	0	0	0	0	0	$0
Harvard	0	0	0	0	0	0	0	0	$0
Harwich	1	0	0	1	0	0	0	0	$0
Hatfield	0	0	0	0	0	0	0	0	$0
Haverhill	1	0	0	1	0	0	0	0	$0
Hawley	0	0	0	0	0	0	0	0	$0
Heath	0	0	0	0	0	0	0	0	$0
Hingham	0	0	0	0	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Hinsdale	1	1	0	0	0	0	0	0	$17,000
Holbrook	38	23	3	12	0	0	0	4	$621,590
Holden	35	19	3	13	0	0	0	0	$283,000
Holland	5	2	1	2	0	0	0	0	$22,000
Holliston	1	1	0	0	0	0	0	0	$0
Holyoke	336	246	32	58	0	2	0	7	$585,200
Hopedale	25	19	1	5	0	0	0	0	$334,510
Hopkinton	40	14	12	14	0	0	0	0	$225,059
Hubbardston	9	7	1	1	0	0	0	0	$76,300
Hudson	50	24	3	23	0	0	0	0	$9,500
Hull	26	12	4	10	0	0	0	0	$1,222,550
Huntington	5	2	2	1	0	0	0	0	$0
Ipswich	36	20	5	11	0	1	0	0	$538,575
Joint Base C. C.	17	0	2	15	0	0	0	0	$0
Kingston	31	8	4	19	0	2	0	0	$50,000
Lakeville	35	7	7	21	0	0	0	1	$57,400
Lancaster	19	8	1	10	0	0	0	0	$3,000
Lanesborough	3	2	1	0	0	0	0	0	$0
Lawrence	147	60	28	59	0	0	0	11	$3,809,350
Lee	1	0	0	1	0	0	0	0	$0
Leicester	47	27	6	14	0	0	0	1	$504,700
Lenox	20	7	2	11	0	0	0	0	$0
Leominster	221	153	14	54	0	1	0	0	$1,121,918
Leverett	5	2	0	3	0	0	0	0	$0
Lexington	36	9	9	18	0	0	0	0	$457,500
Leyden	4	2	1	1	0	0	0	0	$0
Lincoln	95	87	2	6	0	0	0	0	$10,000
Littleton	25	5	13	7	0	0	0	0	$108,600
Logan Airport FD	34	3	11	20	0	0	0	0	$167,100
Longmeadow	26	19	2	5	0	0	0	0	$761,870
Lowell	320	204	18	98	0	0	0	0	$1,211,874
Ludlow	48	30	8	10	0	4	0	1	$95,500
Lunenburg	22	14	1	7	0	0	0	0	$7,250
Lynn	367	248	19	100	0	0	0	5	$769,530
Lynnfield	85	65	6	14	0	0	0	0	$218,500

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Hinsdale	0	0	0	0	0	0	0	0	$0
Holbrook	0	0	0	0	0	0	0	0	$0
Holden	1	0	0	1	0	0	0	0	$0
Holland	0	0	0	0	0	0	0	0	$0
Holliston	0	0	0	0	0	0	0	0	$0
Holyoke	8	2	2	4	0	1	0	0	$5,000
Hopedale	2	0	0	2	0	0	0	0	$0
Hopkinton	0	0	0	0	0	0	0	0	$0
Hubbardston	0	0	0	0	0	0	0	0	$0
Hudson	4	0	0	4	0	0	0	0	$0
Hull	0	0	0	0	0	0	0	0	$0
Huntington	0	0	0	0	0	0	0	0	$0
Ipswich	0	0	0	0	0	0	0	0	$0
Joint Base C. C.	0	0	0	0	0	0	0	0	$0
Kingston	2	1	0	1	0	0	0	0	$0
Lakeville	0	0	0	0	0	0	0	0	$0
Lancaster	0	0	0	0	0	0	0	0	$0
Lanesborough	0	0	0	0	0	0	0	0	$0
Lawrence	8	1	0	7	0	0	0	1	$420,200
Lee	1	0	0	1	0	0	0	0	$0
Leicester	5	0	0	5	0	0	0	0	$0
Lenox	7	2	0	5	0	0	0	0	$0
Leominster	0	0	0	0	0	0	0	0	$0
Leverett	0	0	0	0	0	0	0	0	$0
Lexington	3	1	0	2	0	0	0	0	$2,000
Leyden	0	0	0	0	0	0	0	0	$0
Lincoln	1	0	0	1	0	0	0	0	$0
Littleton	1	1	0	0	0	0	0	0	$0
Logan Airport FD	0	0	0	0	0	0	0	0	$0
Longmeadow	0	0	0	0	0	0	0	0	$0
Lowell	2	1	0	1	0	0	0	0	$1,000
Ludlow	1	0	0	1	0	0	0	0	$0
Lunenburg	0	0	0	0	0	0	0	0	$0
Lynn	9	3	1	5	0	0	0	0	$3,000
Lynnfield	3	0	0	3	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Malden	120	55	5	60	0	0	0	1	$293,000
Manchester	10	4	1	5	0	0	0	0	$1,103,150
Mansfield	48	20	5	23	1	0	0	2	$1,739,250
Marblehead	34	22	0	12	0	0	0	2	$205,910
Marion	26	15	5	6	1	0	1	0	$575,160
Marlborough	104	42	10	52	0	3	0	2	$715,130
Marshfield	73	40	2	31	0	0	0	0	$108,000
Mashpee	24	15	3	6	0	0	0	0	$177,700
Mattapoisett	19	9	5	5	0	0	0	0	$153,000
Maynard	27	19	2	6	0	0	0	0	$0
Medfield	17	6	2	9	0	0	0	0	$203,500
Medford	205	149	15	41	1	0	0	3	$112,000
Medway	37	27	3	7	0	0	0	0	$87,442
Melrose	227	201	4	22	0	1	0	3	$1,113,300
Mendon	21	10	1	10	0	1	0	1	$161,000
Merrimac	27	14	4	9	0	1	0	1	$9,500
Methuen	91	22	25	44	0	0	0	0	$2,379,949
Middleborough	30	12	7	11	0	0	0	0	$169,500
Middlefield	0	0	0	0	0	0	0	0	$0
Middleton	32	9	3	20	0	0	0	0	$33,500
Milford	73	39	15	19	0	4	0	4	$837,000
Millbury	52	36	9	7	0	0	0	0	$370,900
Millis	15	6	0	9	0	0	0	0	$7,500
Millville	10	8	1	1	0	2	0	0	$16,060
Milton	111	87	10	14	0	0	0	2	$1,066,005
Monroe	0	0	0	0	0	0	0	0	$0
Monson	1	0	0	1	0	0	0	0	$0
Montague Fire Districts									
Montague Center	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*$102,000*
Turners Falls	*18*	*6*	*2*	*10*	*0*	*0*	*0*	*1*	*$14,500*
Monterey	7	7	0	0	0	0	0	0	$125,015
Montgomery	3	3	0	0	0	0	0	0	$0
Nahant	4	4	0	0	0	0	0	0	$3,000
Nantucket	31	16	2	13	0	1	0	0	$2,256,104
Natick	63	16	12	35	0	5	0	3	$2,126,524
Needham	50	10	8	32	0	0	0	2	$1,194,800

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Malden	0	0	0	0	0	0	0	0	$0
Manchester	0	0	0	0	0	0	0	0	$0
Mansfield	0	0	0	0	0	0	0	0	$0
Marblehead	0	0	0	0	0	0	0	0	$0
Marion	2	1	0	1	0	0	0	0	$0
Marlborough	0	0	0	0	0	0	0	0	$0
Marshfield	0	0	0	0	0	0	0	0	$0
Mashpee	0	0	0	0	0	0	0	0	$0
Mattapoisett	0	0	0	0	0	0	0	0	$0
Maynard	3	0	0	3	0	0	0	0	$0
Medfield	0	0	0	0	0	0	0	0	$0
Medford	1	0	0	1	1	0	0	0	$0
Medway	0	0	0	0	0	0	0	0	$0
Melrose	1	0	0	1	0	0	0	0	$0
Mendon	0	0	0	0	0	0	0	0	$0
Merrimac	3	0	0	3	0	0	0	0	$0
Methuen	3	0	0	3	0	0	0	0	$0
Middleborough	1	1	0	0	0	0	0	0	$0
Middlefield	0	0	0	0	0	0	0	0	$0
Middleton	1	0	0	1	0	0	0	0	$0
Milford	3	1	1	1	0	1	0	1	$200,000
Millbury	1	1	0	0	0	0	0	0	$500
Millis	1	0	0	1	0	0	0	0	$0
Millville	0	0	0	0	0	0	0	0	$0
Milton	2	0	0	2	0	0	0	0	$0
Monroe	0	0	0	0	0	0	0	0	$0
Monson	0	0	0	0	0	0	0	0	$0
Montague Fire Districts									
Montague Center	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Turners Falls	*5*	*1*	*0*	*4*	*0*	*0*	*0*	*1*	*$0*
Monterey	0	0	0	0	0	0	0	0	$0
Montgomery	0	0	0	0	0	0	0	0	$0
Nahant	0	0	0	0	0	0	0	0	$0
Nantucket	0	0	0	0	0	0	0	0	$0
Natick	1	0	1	0	0	0	0	0	$500
Needham	1	0	0	1	0	0	0	0	$1,000

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
New Ashford	3	1	0	2	0	0	0	0	$0
New Bedford	390	203	50	137	2	7	0	2	$3,869,505
New Braintree	0	0	0	0	0	0	0	0	$0
New Marlborough	5	5	0	0	0	0	0	0	$0
New Salem	2	0	1	1	0	0	0	0	$7,000
Newbury	0	0	0	0	0	0	0	0	$0
Newburyport	17	11	3	3	0	0	0	1	$643,850
Newton	377	312	3	62	2	0	0	3	$7,355,504
Norfolk	74	68	1	5	0	1	0	0	$59,006
North Adams	43	20	8	15	0	1	0	0	$428,800
North Andover	89	49	8	32	0	2	0	0	$5,282,190
North Attleboro	56	22	12	22	0	0	0	0	$475,000
North Brookfield	9	4	3	2	0	0	0	0	$0
North Reading	26	17	2	7	0	0	0	0	$267,502
Northampton	78	34	7	37	1	0	0	1	$539,200
Northborough	38	16	8	14	0	2	0	1	$245,750
Northbridge	35	18	9	8	0	0	0	1	$547,500
Northfield	13	6	2	5	0	0	0	0	$458,000
Norton	29	5	9	15	0	0	0	0	$272,422
Norwell	6	3	1	2	0	0	0	0	$175,500
Norwood	63	30	6	27	0	0	0	0	$81,052
Oak Bluffs	5	3	0	2	0	0	0	0	$1,600
Oakham	3	3	0	0	0	0	0	0	$700
Orange	32	13	6	13	0	2	0	3	$687,606
Orleans	25	14	3	8	0	0	0	0	$237,350
Otis	1	1	0	0	0	0	0	0	$0
Oxford	47	24	6	17	0	3	0	0	$53,050
Palmer Fire Districts									
Bondsville	*7*	*3*	*1*	*3*	*0*	*0*	*0*	*0*	*$1,000*
Palmer	*32*	*8*	*15*	*9*	*0*	*0*	*0*	*0*	*$2,089,851*
Three Rivers	*7*	*6*	*0*	*1*	*0*	*1*	*0*	*0*	*$181,900*
Paxton	9	9	0	0	0	0	0	0	$100,000
Peabody	124	82	13	29	0	1	0	0	$2,057,865
Pelham	1	1	0	0	0	0	0	0	$0
Pembroke	0	0	0	0	0	0	0	0	$0
Pepperell	27	22	1	4	1	0	0	1	$924,150

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
New Ashford	0	0	0	0	0	0	0	0	$0
New Bedford	3	1	2	0	0	0	0	0	$77,400
New Braintree	0	0	0	0	0	0	0	0	$0
New Marlborough	0	0	0	0	0	0	0	0	$0
New Salem	0	0	0	0	0	0	0	0	$0
Newbury	0	0	0	0	0	0	0	0	$0
Newburyport	0	0	0	0	0	0	0	0	$0
Newton	2	2	0	0	0	0	0	0	$21,000
Norfolk	0	0	0	0	0	0	0	0	$0
North Adams	3	1	1	1	0	0	0	0	$6,000
North Andover	2	1	0	1	0	0	0	0	$0
North Attleboro	4	1	0	3	0	0	0	0	$0
North Brookfield	0	0	0	0	0	0	0	0	$0
North Reading	3	0	0	3	0	0	0	0	$0
Northampton	4	0	1	3	0	0	0	0	$4,000
Northborough	0	0	0	0	0	0	0	0	$0
Northbridge	1	0	0	1	0	0	0	0	$0
Northfield	0	0	0	0	0	0	0	0	$0
Norton	3	1	0	2	0	0	0	0	$1,614
Norwell	0	0	0	0	0	0	0	0	$0
Norwood	1	0	1	0	0	0	0	0	$2,000
Oak Bluffs	0	0	0	0	0	0	0	0	$0
Oakham	0	0	0	0	0	0	0	0	$0
Orange	2	0	1	1	0	0	0	0	$3,000
Orleans	3	0	1	2	0	0	0	0	$6,000
Otis	0	0	0	0	0	0	0	0	$0
Oxford	1	1	0	0	0	1	0	0	$0
Palmer Fire Districts									
Palmer	*2*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*$11,000*
Bondsville	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Three Rivers	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Paxton	0	0	0	0	0	0	0	0	$0
Peabody	1	0	0	1	0	0	0	0	$5
Pelham	0	0	0	0	0	0	0	0	$0
Pembroke	0	0	0	0	0	0	0	0	$0
Pepperell	0	0	0	0	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Peru	2	2	0	0	0	0	0	0	$0
Petersham	0	0	0	0	0	0	0	0	$0
Phillipston	4	2	2	0	0	0	0	0	$0
Pittsfield	157	79	3	75	3	7	0	6	$2,274,402
Plainfield	3	3	0	0	0	0	0	0	$1,000
Plainville	22	8	2	12	0	0	0	0	$0
Plymouth	147	51	28	68	2	4	0	2	$981,556
Plympton	10	2	1	7	0	0	0	0	$26,500
Princeton	14	8	1	5	0	0	0	0	$70,000
Provincetown	33	28	2	3	1	0	0	0	$506,000
Quincy	588	414	23	151	0	1	0	28	$2,519,400
Randolph	133	90	10	33	0	2	0	0	$229,399
Raynham	29	9	6	14	0	0	0	1	$93,400
Reading	71	45	6	20	0	0	0	1	$1,166,065
Rehoboth	35	11	12	12	0	0	0	0	$0
Revere	263	191	15	57	0	0	0	3	$4,080,650
Richmond	6	3	1	2	0	0	0	0	$349,000
Rochester	3	3	0	0	0	1	0	1	$0
Rockland	48	23	10	15	0	2	0	0	$284,075
Rockport	0	0	0	0	0	0	0	0	$0
Rowe	0	0	0	0	0	0	0	0	$0
Rowley	50	34	7	9	0	0	0	0	$58,500
Royalston	4	2	0	2	0	0	0	0	$140,000
Russell	2	1	0	1	0	0	0	0	$0
Rutland	17	9	2	6	0	0	0	0	$328,000
Salem	117	54	9	54	0	1	0	0	$767,650
Salisbury	23	9	0	14	0	0	0	0	$0
Sandisfield	5	1	2	2	0	0	0	0	$15,000
Sandwich	54	25	11	18	0	0	0	0	$764,100
Saugus	109	57	13	39	0	1	0	5	$814,210
Savoy	0	0	0	0	0	0	0	0	$0
Scituate	80	46	6	28	0	13	0	0	$159,500
Seekonk	36	10	7	19	0	0	0	0	$830,100
Sharon	35	21	6	8	0	0	0	0	$130,600
Sheffield	1	1	0	0	1	0	0	1	$0

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Peru	0	0	0	0	0	0	0	0	$0
Petersham	0	0	0	0	0	0	0	0	$0
Phillipston	0	0	0	0	0	0	0	0	$0
Pittsfield	10	3	0	7	0	0	0	0	$3,500
Plainfield	0	0	0	0	0	0	0	0	$0
Plainville	1	0	0	1	0	0	0	0	$0
Plymouth	4	2	1	1	0	0	0	0	$94,005
Plympton	1	0	0	1	0	0	0	0	$0
Princeton	0	0	0	0	0	0	0	0	$0
Provincetown	0	0	0	0	0	0	0	0	$0
Quincy	9	2	0	7	0	0	0	0	$0
Randolph	11	2	0	9	0	0	0	0	$0
Raynham	0	0	0	0	0	0	0	0	$0
Reading	11	2	0	9	0	0	0	0	$3,150
Rehoboth	2	0	0	2	0	0	0	0	$0
Revere	1	1	0	0	0	0	0	0	$5,500
Richmond	0	0	0	0	0	0	0	0	$0
Rochester	0	0	0	0	0	0	0	0	$0
Rockland	4	2	1	1	0	0	0	0	$2,000
Rockport	0	0	0	0	0	0	0	0	$0
Rowe	0	0	0	0	0	0	0	0	$0
Rowley	0	0	0	0	0	0	0	0	$0
Royalston	1	0	0	1	0	0	0	0	$0
Russell	1	0	0	1	0	0	0	0	$0
Rutland	0	0	0	0	0	0	0	0	$0
Salem	4	3	0	1	0	0	0	0	$32,000
Salisbury	0	0	0	0	0	0	0	0	$0
Sandisfield	1	0	0	1	0	0	0	0	$0
Sandwich	1	0	1	0	0	0	0	0	$5,000
Saugus	1	0	0	1	0	0	0	0	$50
Savoy	0	0	0	0	0	0	0	0	$0
Scituate	3	0	0	3	0	0	0	0	$0
Seekonk	1	0	1	0	0	0	0	0	$8,500
Sharon	0	0	0	0	0	0	0	0	$0
Sheffield	1	1	0	0	1	0	0	1	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Shelburne Fire Districts									
Shelburne Center	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*$3,000*
Shelburne Falls	*7*	*1*	*0*	*6*	*0*	*0*	*0*	*1*	*$146,840*
Sherborn	7	2	1	4	0	0	0	0	$8,000
Shirley	10	5	1	4	0	0	0	0	$0
Shrewsbury	90	56	12	22	0	0	0	0	$1,154,100
Shutesbury	0	0	0	0	0	0	0	0	$0
Somerset	31	9	10	12	0	1	0	0	$491,550
Somerville	373	308	12	53	0	2	0	24	$631,600
South Hadley Fire Districts									
South Hadley #1	*39*	*24*	*3*	*12*	*0*	*0*	*0*	*0*	*$8,000*
South Hadley #2	*15*	*13*	*1*	*1*	*0*	*0*	*0*	*0*	*$0*
Southampton	10	4	1	5	0	0	0	0	$6,000
Southborough	21	8	6	7	0	0	0	0	$315,000
Southbridge	51	28	12	11	0	0	0	0	$499,603
Southwick	33	12	3	18	0	0	0	0	$0
Spencer	48	25	4	19	0	0	0	0	$104,300
Springfield	499	267	91	141	3	13	0	40	$3,800,138
Sterling	17	7	2	8	0	1	0	0	$398,500
Stockbridge	4	1	0	3	0	0	0	0	$40
Stoneham	80	54	8	18	0	1	0	1	$1,061,000
Stoughton	95	48	15	32	0	0	0	2	$3,582,150
Stow	13	8	1	4	0	0	0	0	$166,150
Sturbridge	47	20	8	19	1	2	0	0	$1,206,600
Sudbury	16	7	2	7	0	0	0	23	$126,000
Sunderland	28	18	2	8	0	0	0	0	$26,250
Sutton	31	19	6	6	0	0	0	0	$78,000
Swampscott	12	6	1	5	0	0	0	1	$451,050
Swansea	56	27	13	16	0	0	0	2	$0
Taunton	4	3	1	0	0	0	0	0	$0
Templeton	0	0	0	0	0	0	0	0	$0
Tewksbury	74	30	11	33	0	1	0	0	$1,688,747
Tisbury	14	10	1	3	0	0	0	0	$673,000
Tolland	0	0	0	0	0	0	0	0	$0
Topsfield	104	91	6	7	0	0	0	0	$95,800
Townsend	26	11	2	13	0	0	0	0	$1,588,800
Truro	3	1	0	2	0	0	0	0	$0

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Shelburne Fire Districts									
Shelburne Center	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Shelburne Falls	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Sherborn	1	0	0	1	0	0	0	0	$0
Shirley	0	0	0	0	0	0	0	0	$0
Shrewsbury	6	0	1	5	0	0	0	0	$21,000
Shutesbury	0	0	0	0	0	0	0	0	$0
Somerset	0	0	0	0	0	0	0	0	$0
Somerville	3	1	1	1	0	0	0	0	$40,000
South Hadley Fire Districts									
South Hadley #1	*4*	*0*	*1*	*3*	*0*	*0*	*0*	*0*	*$0*
South Hadley #2	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Southampton	0	0	0	0	0	0	0	0	$0
Southborough	4	0	1	3	0	0	0	0	$0
Southbridge	0	0	0	0	0	0	0	0	$0
Southwick	1	0	0	1	0	0	0	0	$0
Spencer	1	1	0	0	0	0	0	0	$0
Springfield	47	17	14	16	0	0	0	1	$255,250
Sterling	0	0	0	0	0	0	0	0	$0
Stockbridge	0	0	0	0	0	0	0	0	$0
Stoneham	1	1	0	0	0	0	0	0	$0
Stoughton	1	1	0	0	0	0	0	0	$2,500
Stow	1	1	0	0	0	0	0	0	$0
Sturbridge	4	0	0	4	0	0	0	0	$0
Sudbury	0	0	0	0	0	0	0	0	$0
Sunderland	1	0	0	1	0	0	0	0	$0
Sutton	0	0	0	0	0	0	0	0	$0
Swampscott	1	0	0	1	0	0	0	0	$0
Swansea	0	0	0	0	0	0	0	0	$0
Taunton	0	0	0	0	0	0	0	0	$0
Templeton	0	0	0	0	0	0	0	0	$0
Tewksbury	2	1	0	1	0	0	0	0	$0
Tisbury	0	0	0	0	0	0	0	0	$0
Tolland	0	0	0	0	0	0	0	0	$0
Topsfield	0	0	0	0	0	0	0	0	$0
Townsend	0	0	0	0	0	0	0	0	$0
Truro	0	0	0	0	0	0	0	0	$0

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Tyngsborough	35	17	8	10	0	1	0	0	$170,550
Tyringham	0	0	0	0	0	0	0	0	$0
Upton	14	8	1	5	0	0	0	0	$275,000
Uxbridge	32	11	9	12	0	0	0	1	$90,210
Wakefield	39	25	11	3	0	0	0	0	$0
Wales	4	2	1	1	0	0	0	0	$600
Walpole	46	24	7	15	0	1	0	2	$1,733,300
Waltham	136	58	24	54	0	5	0	6	$1,580,100
Ware	40	26	3	11	0	0	0	0	$0
Wareham Fire Districts									
Onset	*31*	*20*	*1*	*10*	*0*	*1*	*0*	*0*	*$1,000*
Wareham	*68*	*21*	*12*	*35*	*0*	*3*	*0*	*0*	*$398,110*
Warren	29	11	8	10	0	0	0	0	$956,180
Warwick	0	0	0	0	0	0	0	0	$0
Washington	0	0	0	0	0	0	0	0	$0
Watertown	41	14	5	22	0	0	0	1	$968,770
Wayland	16	9	2	5	0	0	0	1	$101,356
Webster	41	25	5	11	0	4	0	1	$205,115
Wellesley	41	23	5	13	0	0	0	0	$2,927,419
Wellfleet	25	15	5	5	2	0	0	2	$1,177,500
Wendell	7	4	0	3	0	0	0	0	$5,000
Wenham	8	4	1	3	0	0	0	0	$750
West Boylston	19	7	6	6	0	0	0	0	$30,150
West Bridgewater	45	10	11	24	0	0	0	1	$62,550
West Brookfield	2	2	0	0	0	0	0	0	$15,000
West Newbury	8	3	3	2	0	0	0	0	$162,000
West Springfield	113	57	23	33	0	5	0	4	$870,670
West Stockbridge	5	2	1	2	0	0	0	0	$20,000
West Tisbury	7	1	1	5	0	0	0	0	$3,000
Westborough	150	114	23	13	0	2	0	1	$613,391
Westfield	110	50	18	42	0	1	0	1	$1,317,590
Westford	43	20	4	19	0	0	0	0	$443,988
Westhampton	4	0	2	2	0	0	0	0	$0
Westminster	31	11	9	11	0	0	0	0	$237,100
Weston	25	14	6	5	0	0	0	0	$800,000
Westport	62	28	8	26	0	0	0	0	$495,401

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Tyngsborough	0	0	0	0	0	0	0	0	$0
Tyringham	0	0	0	0	0	0	0	0	$0
Upton	1	0	0	1	0	0	0	0	$0
Uxbridge	2	0	0	2	0	0	0	0	$0
Wakefield	0	0	0	0	0	0	0	0	$0
Wales	0	0	0	0	0	0	0	0	$0
Walpole	1	0	0	1	0	0	0	0	$0
Waltham	6	2	3	1	0	1	0	0	$38,500
Ware	7	3	0	4	0	0	0	0	$0
Wareham Fire Districts									
Onset	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Wareham	*1*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*$200*
Warren	3	0	0	3	0	0	0	0	$0
Warwick	0	0	0	0	0	0	0	0	$0
Washington	0	0	0	0	0	0	0	0	$0
Watertown	0	0	0	0	0	0	0	0	$0
Wayland	0	0	0	0	0	0	0	0	$0
Webster	1	0	0	1	0	0	0	0	$0
Wellesley	0	0	0	0	0	0	0	0	$0
Wellfleet	0	0	0	0	0	0	0	0	$0
Wendell	1	0	0	1	0	0	0	0	$0
Wenham	0	0	0	0	0	0	0	0	$0
West Boylston	0	0	0	0	0	0	0	0	$0
West Bridgewater	1	0	1	0	0	0	0	0	$14,000
West Brookfield	0	0	0	0	0	0	0	0	$0
West Newbury	0	0	0	0	0	0	0	0	$0
West Springfield	0	0	0	0	0	0	0	0	$0
West Stockbridge	0	0	0	0	0	0	0	0	$0
West Tisbury	1	0	0	1	0	0	0	0	$0
Westborough	1	0	1	0	0	0	0	0	$0
Westfield	3	1	0	2	0	0	0	0	$2,000
Westford	0	0	0	0	0	0	0	0	$0
Westhampton	0	0	0	0	0	0	0	0	$0
Westminster	1	0	0	1	0	0	0	0	$0
Weston	0	0	0	0	0	0	0	0	$0
Westport	9	1	0	8	0	0	0	0	$1,500

2019 Fire Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Westwood	56	34	5	17	0	0	0	0	$114,950
Weymouth	223	156	17	50	0	2	0	3	$791,830
Whately	1	0	1	0	0	0	0	0	$0
Whitman	29	13	3	13	0	2	0	0	$2,057,700
Wilbraham	35	21	1	13	0	0	0	0	$72,285
Williamsburg	10	6	0	4	0	0	0	0	$6,100
Williamstown	14	10	0	4	0	1	0	0	$682,100
Wilmington	40	2	9	29	0	0	0	1	$557,880
Winchendon	23	14	2	7	0	0	0	1	$0
Winchester	20	15	2	3	0	0	0	1	$533,500
Windsor	0	0	0	0	0	0	0	0	$0
Winthrop	55	34	2	19	0	0	0	0	$813,695
Woburn	215	134	25	56	0	1	0	0	$4,343,339
Worcester	1,300	878	74	348	1	11	1	21	$7,537,853
Worthington	0	0	0	0	0	0	0	0	$0
Wrentham	14	3	4	7	0	0	0	0	$115,000
Yarmouth	70	26	6	38	0	0	0	1	$537,401

2019 Arson Experience By Community

Community	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Westwood	0	0	0	0	0	0	0	0	$0
Weymouth	0	0	0	0	0	0	0	0	$0
Whately	0	0	0	0	0	0	0	0	$0
Whitman	3	1	1	1	0	0	0	0	$145,650
Wilbraham	1	1	0	0	0	0	0	0	$0
Williamsburg	0	0	0	0	0	0	0	0	$0
Williamstown	0	0	0	0	0	0	0	0	$0
Wilmington	0	0	0	0	0	0	0	0	$0
Winchendon	0	0	0	0	0	0	0	0	$0
Winchester	0	0	0	0	0	0	0	0	$0
Windsor	0	0	0	0	0	0	0	0	$0
Winthrop	0	0	0	0	0	0	0	0	$0
Woburn	0	0	0	0	0	0	0	0	$0
Worcester	32	7	5	20	0	0	0	0	$448,603
Worthington	0	0	0	0	0	0	0	0	$0
Wrentham	0	0	0	0	0	0	0	0	$0
Yarmouth	0	0	0	0	0	0	0	0	$0

2019 Fires By Incident Type

Incident Type	Total Fires	% of Total	Civilian Deaths	Civilian Inj.	Fire Service Deaths	Fire Service Inj.	Dollar Loss
Structure Fires	16,148	64%	36	192	2	446	$220,818,947
Vehicle Fires	2,355	9%	4	34	0	35	24,306,200
Brush Fires	2,974	12%	0	2	0	10	136,357
Outside Rubbish Fires	2,219	9%	0	1	0	6	167,061
Special Outside Fires	757	3%	2	5	0	0	1,011,837
Cult. Veg. & Crop Fires	31	0.2%	0	0	0	0	1,675
Other Fires	692	3%	0	14	0	9	2,371,197
Total Fires	**25,176**	**100%**	**42**	**248**	**2**	**506**	**$248,813,274**

2019 Arsons* By Incident Type

Incident Type	Total Fires	% of Total	Civilian Deaths	Civilian Inj.	Fire Service Deaths	Fire Service Inj.	Dollar Loss
Structure Arsons	144	25%	3	9	0	11	$5,679,148
Vehicle Arsons	64	11%	1	2	0	0	662,411
Brush Arsons	161	28%	0	0	0	1	3,065
Outside Rubbish Arsons	91	16%	0	0	0	0	7,805
Special Outside Arsons	77	13%	1	0	0	0	126,216
Cult. Veg. & Crop Arsons	1	0.2%	0	0	0	0	0
Other Arsons	33	6%	0	0	0	0	1,855
Total Arsons	**571**	**100%**	**5**	**11**	**0**	**12**	**$6,480,500**

*For statistical purposes in MFIRS v5 a fire is considered an arson if the Cause of Ignition = 1 (Intentional) and the Age of Person (Fire Module) is greater than 17 or if the field is blank; or if the Wildland Module is used, the Wildland Fire Cause = 7 (Incendiary) and the Age of the Person (Wildland Module) is greater than 17 or if the field is left blank.

2019 Fires by County

County	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	723	324	82	317	3	11	0	15	$6,468,578
Berkshire	359	191	34	134	6	12	0	9	5,887,385
Bristol	1,509	727	243	539	8	23	0	19	20,771,760
Dukes	50	23	4	23	0	0	0	0	825,600
Essex	2,068	1,157	238	673	0	8	0	64	28,760,098
Franklin	224	103	28	93	0	2	0	6	2,538,887
Hampden	1,584	885	250	449	4	28	0	54	12,517,448
Hampshire	400	194	53	153	1	9	0	6	4,135,051
Middlesex	5,410	3,778	386	1,246	9	44	0	189	41,464,515
Nantucket	31	16	2	13	0	1	0	0	2,256,104
Norfolk	2,554	1,704	210	640	0	13	0	59	23,412,582
Plymouth	1,565	808	198	559	4	46	1	23	13,407,136
Suffolk	4,986	3,843	239	904	4	4	0	24	58,679,984
Worcester	3,713	2,395	388	930	3	47	1	38	27,688,236
Total	**25,176**	**16,148**	**2,355**	**6,673**	**42**	**252**	**2**	**506**	**248,813,274**

2019 Arsons by County

County	Total Arsons	Structure Arsons	Vehicle Arsons	Other Arsons	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	25	4	3	18	0	0	0	0	$584,000
Berkshire	28	11	1	16	1	0	0	1	433,567
Bristol	40	9	7	24	0	2	0	0	312,791
Dukes	4	0	0	4	0	0	0	0	0
Essex	60	12	1	47	0	0	0	1	471,761
Franklin	13	1	1	11	0	0	0	1	3,000
Hampden	72	23	21	28	1	1	0	1	393,250
Hampshire	18	4	2	12	0	0	0	0	4,500
Middlesex	69	15	8	46	2	2	0	2	156,027
Nantucket	0	0	0	0	0	0	0	0	0
Norfolk	42	6	1	35	0	0	0	0	6,000
Plymouth	33	14	5	14	0	1	0	1	668,205
Suffolk	74	21	5	48	0	0	0	0	253,040
Worcester	93	24	9	60	1	5	0	5	3,194,369
Total	**571**	**144**	**64**	**363**	**5**	**11**	**0**	**2**	**$6,480,500**

2019 Fires, Arsons and Deaths by County and by Population*

County	Population	Total Fires	Fires per 1,000 Pop.	Fire Deaths	Deaths per 1,000 Fires	Deaths per 10,000 Pop.	Total Arsons	Arsons per 1,000 Pop.
Barnstable	215,888	723	3.3	3	4.1	0.14	25	0.1
Berkshire	131,219	359	2.7	6	16.7	0.46	28	0.2
Bristol	548,285	1,509	2.8	8	5.3	0.15	40	0.1
Dukes	16,535	50	3.0	0	0.0	0.00	4	0.2
Essex	743,159	2,068	2.8	0	0.0	0.00	60	0.1
Franklin	71,372	224	3.1	0	0.0	0.00	13	0.2
Hampden	463,490	1,584	3.4	4	2.5	0.09	72	0.2
Hampshire	158,080	400	2.5	1	2.5	0.06	18	0.1
Middlesex	1,503,085	5,410	3.6	9	1.7	0.06	69	0.05
Nantucket	10,172	31	3.0	0	0.0	0.00	0	0.0
Norfolk	670,850	2,554	3.8	0	0.0	0.00	42	0.1
Plymouth	494,919	1,565	3.2	4	2.6	0.08	33	0.1
Suffolk	722,023	4,986	6.9	4	0.8	0.06	74	0.1
Worcester	798,552	3,713	4.6	3	0.8	0.04	93	0.1
Massachusetts	**6,547,629**	**25,176**	**3.8**	**42**	**1.7**	**0.06**	**571**	**0.1**

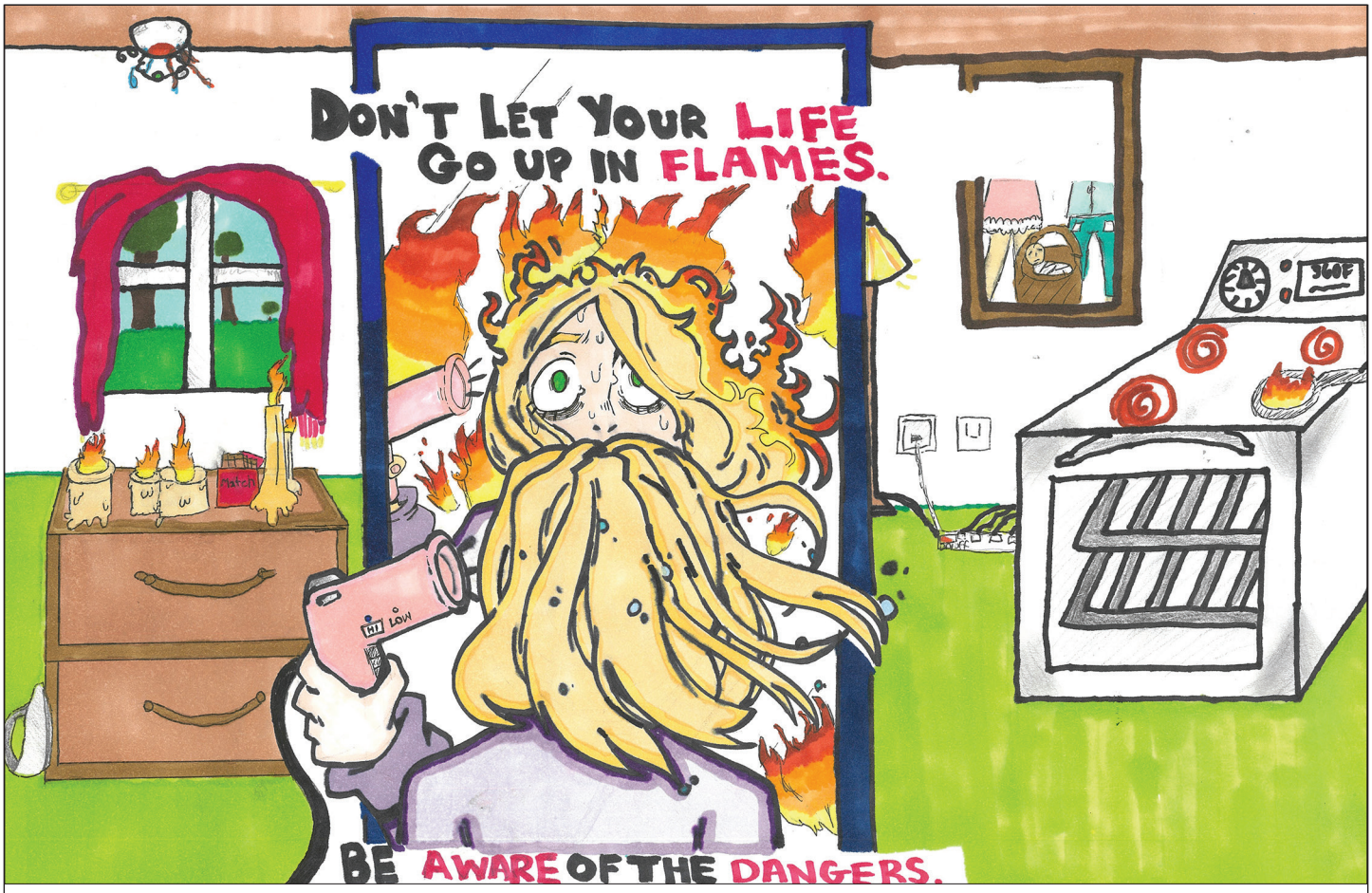
*Population statistics based on 2010 U.S. Census Bureau data.

2019 Non-Fire Responses by County and by Incident Type[1]

County	Total Non-Fire Responses	Overpressure Rupt. & Explos. (No-fire)	Rescue EMS Incidents	Hazardous Conditions (No-fire)	Service Calls	Good Intent Calls	False Alarm Calls	Severe WX2 & Natural Disaster	Special Incident Type
Barnstable	65,244	57	46,773	2,950	4,508	2,919	7,661	108	268
Berkshire	12,554	12	6,862	791	1,658	715	2,395	38	83
Bristol	62,594	54	41,974	2,454	3,861	3,545	10,114	49	543
Dukes	1,933	6	123	137	105	424	1,116	3	19
Essex	107,271	108	60,785	5,979	13,737	7,698	18,406	204	354
Franklin	8,571	15	4,999	734	837	571	1,028	73	314
Hampden	53,056	78	33,785	2,065	4,064	4,455	8,379	77	153
Hampshire	18,909	28	12,851	896	896	1,093	3,005	91	49
Middlesex	207,925	137	124,251	10,330	22,360	12,506	32,843	173	5,325
Nantucket	2,412	3	1,202	80	31	51	1,037	0	8
Norfolk	105,744	132	67,501	5,137	10,177	6,888	14,906	124	879
Plymouth	89,573	67	61,625	4,394	7,959	5,142	9,865	228	293
Suffolk	104,031	64	51,143	4,097	16,865	10,178	20,762	30	892
Worcester	105,636	169	70,424	4,134	9,615	7,201	13,730	142	221
Massachusetts	**945,453**	**930**	**584,298**	**44,178**	**96,673**	**63,386**	**145,247**	**1,340**	**9,401**

[1] These numbers may be higher than reported in the text of this document as they are the most recent figures available.

[2] WX is the abbreviation for Weather.



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