The

Massachusetts Fire Problem

Massachusetts
Fire Incident
Reporting System

2017
Annual Report

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Governor

Karyn E. Polito
Lieutenant Governor

Thomas A. Turco, III
Secretary of Public Safety

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State Fire Marshal

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

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Massachusetts Fire Incident Reporting System

2017 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.*

December 2017

This is the *2017 Annual Report of the Massachusetts Fire Incident Reporting System* (MFIRS), which summarizes the Massachusetts fire experience for 2017. It is based on the 27,895 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.

17,099 Structure Fires, 2,367 Vehicle Fires, 8,429 Outside & Other Fires in 2017
There were 27,895 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2017. The 17,099 structure fires, 2,367 motor vehicle fires, and 8,429 outside and other fires caused 58 civilian deaths, two fire service deaths, 269 civilian injuries, 434 fire service injuries, and an estimated dollar loss of $390.5 million in property damages.

Civilian Fire Deaths Up 4% From 2016
Fifty-eight (58) civilians died in 45 Massachusetts fires in 2017. Civilian deaths increased by two, or 4%, from the 56 fire deaths in 2016. Thirty-five (35) men, 18 women, and five children died in Massachusetts' fires. Of the 58 civilian deaths in fires in 2017, 49 occurred in residential structures. Over half, 55%, of civilians died at night, at home, while they were sleeping and did not have working smoke alarms or residential sprinklers. Seven (7) deaths occurred in seven motor vehicle fires. No one was killed in an outside fire in 2017. In 2017 there were 2.08 civilian deaths for every 1,000 fires.

Smoking Was Leading Cause of Fatal Fires in 2017
Smoking was the leading cause of fatal fires and civilian fire deaths in 2017. These fires caused 15, or 31%, of the residential civilian fire deaths. The second leading cause of residential civilian fire deaths was electrical problems, causing 10 deaths, or 20%, and heating was third with six, or 12% of residential fire deaths.

5 Child Fire Deaths
For the fifth year in a row more than one person under the age of 18 died in a fire. Of the 58 civilian deaths in fires in 2017, five, or 9%, were children. Three (3) were nine-years old or younger, one was a 12-year old and the other a 15-year old They all died in residential fires.

Time for Residential Sprinklers
It is time for the fire service and its partners to move forward towards enacting legislation and regulation on residential sprinklers in the Commonwealth. Sprinklers have a long history of effectively protecting people's lives and property. We can reduce fire fatalities in the future by requiring them in newly constructed one- and two-family homes.

All Fires Down in 2017
The total number of reported fires decreased by 13% from 32,245 in 2016 to 27,895 in 2017. Structure fires decreased by less than 1% from 2016 to 2017. From 2016 to 2017, motor vehicle fires decreased by 1%. Outside, brush, and other fires decreased by 34% 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 937,310 total responses that were reported to MFIRS in 2017. The total number of calls reported to MFIRS increased by 45,503, or 5% in 2017.

Cooking Was the Leading Cause of Residential Building Fires & Injuries
Almost three-fourths (74%) of all residential building fires were caused by unattended and other unsafe cooking practices in 2017. Seventy-five percent (75%) of residential fires originated in the kitchen. Cooking also caused the most fire-related civilian injuries. Cooking fires caused 78, or 29% of all 2017 civilian fire injuries and two, or 4%, of residential fire deaths in 2017.

Alarms Operated in 63% of Residential Fires
Smoke or heat alarms operated in 8,971, or 63%, of the residential building fires in 2017. There were no working alarms in 3% of these incidents. Based on information reported, smoke alarm performance was undetermined in 3,765 incidents, or 26%, of Massachusetts' 2017 residential building fires.

Alarms Operated in 59% of Building Fires that Caused Injuries
Alarms operated in 59% 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 Down 11%
Six hundred and seventy-one (671) Massachusetts fires were considered arson in 2017. The 187 structure arsons, 68 motor vehicle arsons, and 416 outside and other arsons caused four civilian deaths, five civilian injuries, 13 fire service injuries, and an estimated

dollar loss of $114.3 million. This is an 11% decrease in arson from the 754 reported in 2016.

Structure arsons increased by 18%, and motor vehicle arsons decreased by 24% from 2016 to 2017. Overall motor vehicle arsons have fallen by 99% since 1987. The steady decline of motor vehicle arsons can be explained by the enactment of the Burned Motor Vehicle Reporting Law. It took effect in 1987, and requires owners of burned motor vehicles to complete and sign a report that must also be signed by a fire official from the department in the community where the fire occurred, before they can collect on their fire insurance. Outside and other arsons decreased by 18%.

Firefighters Injured at 1 of Every 6 Vacant Building Fires
One of the most dangerous types of fires for firefighters in 2017 were vacant building fires. Vacant building fires accounted for 41, or 9%, of all firefighter injuries in 2017. These 41 injuries also represent 11% of the number of firefighter injuries at all structure fires. On average there was one firefighter injury for every six vacant building fires.

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 Daniel Bennett 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 2018, 253 fire departments shared the $1,042,421 in S.A.F.E. funding.

Rockland Young Hero – Ariana Medina

On Saturday, April 1, 2017 at 4:00 p.m., a fire related incident occurred at the home of 7-year-old Arianna Medina. A pellet stove malfunctioned in her home causing the smoke alarms to sound and to warn her aunt who lives in the same home as her. Two (2) months prior to this incident Ariana received fire safety education in the first grade, she listened to her S.A.F.E. Educator and with her grandmother's help she checked each of the smoke alarms in her home. Her grandmother found that four of the alarms were not functioning properly and replaced them with new ones. Chief Scott Duffy of the Rockland Fire Department credits Arianna with helping to save her aunt and her home from fire.

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 2018, 241 fire departments shared the $600,000 in Senior SAFE funding.

FF Omar Fromet, Chelsea Fire Department – 2017 PFALSE Educator of the Year

Ten years ago, FF Omar began volunteering in classrooms, teaching fire and life safety to his own children and their classmates. Soon he was invited into other classrooms. When word reached the fire department about his efforts, he was given the position of lead Public Safety Educator and the town began applying for and using Senior SAFE and S.A.F.E. grants to support his work. The S.A.F.E. program in Chelsea has grown from

one classroom to every classroom in the city, from pre-K to high school. Thousands of students have learned about fire and life safety from FF Omar and a growing team of Chelsea firefighter educators. FF Omar's reach is extensive and every so often a young child calls 911 on behalf of an adult, and then reports that it was FF Omar who taught them when and how to make the call. He has built a strong partnership between the Chelsea school system and the fire department. The respect and trust between these agencies is a testament to his strength and devotion to fire and life safety programs and to the people of Chelsea. FF Omar has also established great relationships with facilities for the elderly and many other city organizations. His leadership has helped the S.A.F.E. and Senior SAFE programs to grow quickly and effectively as he teaches other firefighters all that he knows about connecting with the community. FF Omar's 10 year journey as a fire and life safety educator began with his own family and has extended to his professional family - the entire city of Chelsea. He has made this diverse community measurably safer with his dedication and passion for fire and life safety education.

84 MA Departments Receive $26.2 Million in Federal Grants

Eighty-four (84) local Massachusetts fire departments received $37.3 million in federal grants during fiscal year 2017.

In the sixteenth year of the Federal Assistance to Firefighters Grant program, 84 Massachusetts fire departments received $16.6 million. Seventy-seven (77) departments received $10.5 million for fire operations and firefighter safety. Eight (8) departments received $5 million for the purchase of firefighting vehicles.

Twenty-two (22) fire departments were awarded $17.5 million in Federal SAFER grants that allow for the hiring and recruitment of more firefighters, and four fire departments were awarded $276,137 for fire prevention programs. In addition, the Massachusetts Firefighting Academy at the Department of Fire Services also received a grant of $434,783 for equipment. Georgetown Fire Department as the lead agency, received a regional grant for $629,254 for personal protective equipment and Boston as the lead agency received a regional grant for training for $172,427.

The National Fire Protection Association (NFPA) based in Quincy, Massachusetts received a $1.5 million grant for Research and Prevention. Northeastern University in Massachusetts also received a Research grant for $1.5 million.

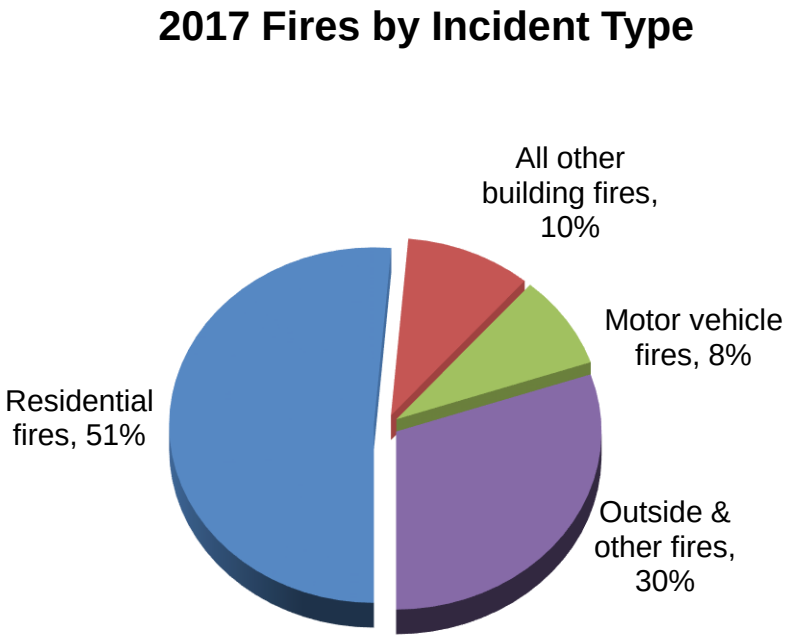
98% of Massachusetts Fire Departments Participated in MFIRS

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-nine (349), or 95.4%, of Massachusetts' fire departments reported at least one incident to MFIRS during 2017. Ten (10), or 2.9%, 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.

Fires by Incident Type

17,099 Structure Fires, 2,367 Vehicle Fires, 8,429 Outside & Other Fires in 2017
There were 27,895 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2017. The 17,099 structure fires, 2,367 motor vehicle fires, and 8,429 outside and other fires caused 58 civilian deaths, two fire service deaths, 269 civilian injuries, 434 fire service injuries, and an estimated dollar loss of $390.5 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 2017, 61% of all reported fires were structure fires. The majority of fires were in people's homes. Fifty-one percent (51%) 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. Eight percent (8%) were reported motor vehicle fires, while 30% were classified as outside and other fires.



17,099 Structure Fires, 47 Civilian Deaths & 258 Civilian Injuries
Massachusetts fire departments reported 17,099 structure fires to the Massachusetts Fire Incident Reporting System (MFIRS) in 2017. These fires killed 51 civilians, two firefighters and caused 210 civilian injuries, 382 fire service injuries, and an estimated $364.7 million in property damage. Structure fires accounted for 61% of the total incidents and 88% of the civilian deaths in 2017. Structure fires dropped less than 1%

from the previous year. There were 187 structure arsons in 2017. Structure fires in the Massachusetts Fire Incident Reporting System include any fires that occur inside or on a structure.

2,367 Motor Vehicle Fires Account for 7% of Reported Fires

The 2,367 motor vehicle fires caused seven civilian deaths, 19 civilian injuries, 19 fire service injuries, and an estimated $31.2 million in property damage. These incidents accounted for 8% of the reported 27,895 fires in 2017. Motor vehicle fires accounted for 12% of civilian fire deaths. Motor vehicle fires decreased by 1% from 2016. There were 88 motor vehicle arsons in 2017. 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.

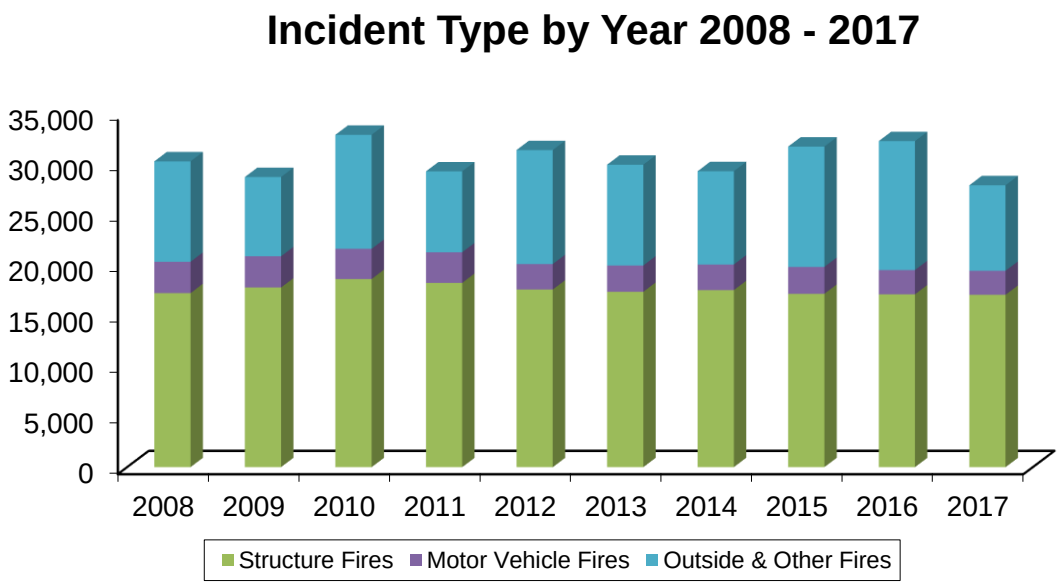
8,429 Brush, Trash, and Other Outside Fires

The 8,429 outside and other fires caused 40 civilian injuries, 33 fire service injuries, and an estimated dollar loss of $4.6 million. The 4,206 trees, grass and brush fires, 2,382 outside rubbish fires, 813 special outside fires, 66 cultivated vegetation or crop fires, and 962 other fires accounted for 30% of the total fire incidents in 2017, and none of the civilian fire deaths. These fires were down 34% from the 12,706 outside and other fire incidents reported in 2016. There were 416 outside and other arsons in 2017. 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 2008 through 2017. The total number of fire incidents in 2017 decreased by 13% from the 32,245 incidents reported in 2016. Overall, fires have been on a slightly decreasing trend since 2008.

Year	Total Fires	Structure Fires	Vehicle Fires	Other Fires
2017	27,895	17,099	2,367	8,429
2016	32,245	17,146	2,393	12,706
2015	31,709	17,202	2,649	11,858
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
2009	28,707	17,819	3,081	7,807
2008	30,254	17,269	3,085	9,900

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.



Structure Fires

17,099 Structure Fires Account for 61% of Reported Fires, 88% of Fire Deaths

The 17,099 structure fires caused 51 civilian deaths, two fire service deaths, 210 civilian injuries, 382 fire service injuries, and an estimated dollar loss of $364.7 million. The average structure fire caused $21,331 in property damage. Structure fires accounted for 61% of reported fires and 88% of the civilian fire deaths in 2017.

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 extend beyond the vehicle. The number of structure fires decreased by 47, or less than 1%, from the 17,146 reported in 2016.

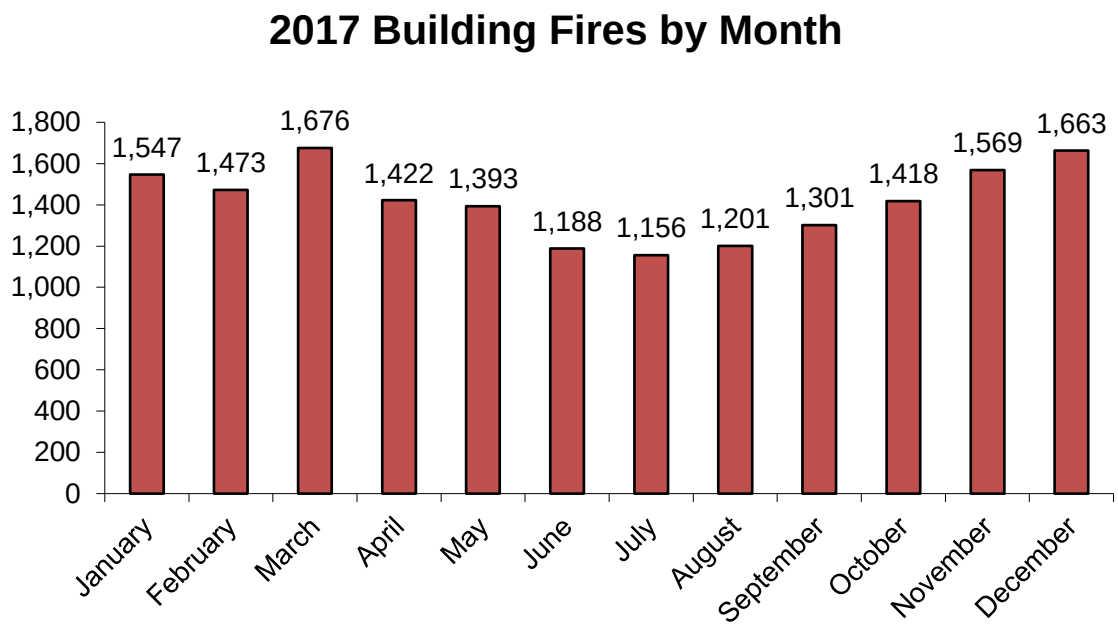
[1] 2001 was the first year of MFIRS v5.0.

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 17,006 building fires of different types in Massachusetts in 2017. These 17,006 building fires accounted for 99.5% of all structure fires in Massachusetts.

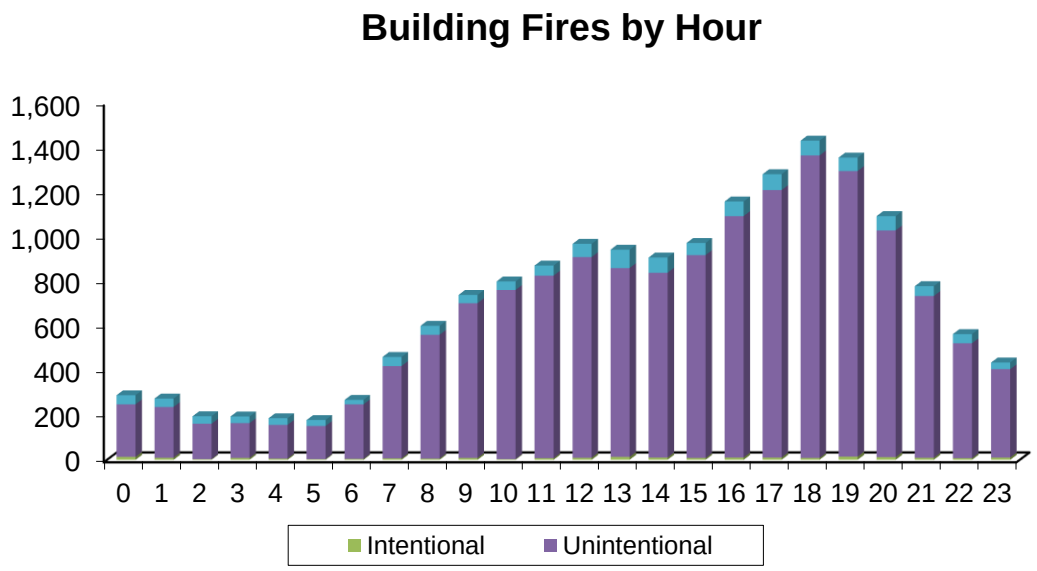
Building Fires Most Common in Colder Months
Heating equipment is the second leading cause of building fires. It is not surprising that December was the peak month for these incidents in 2017. March ranked second and November had the third largest number of building fires. The warmer months had significantly fewer building fires. The fewest fires occurred in July, and June had the second lowest frequency of these incidents; August had the third lowest number of building fires in 2017.



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 2:00 p.m. and 9:00 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 17,006 building fires, 49 of the 51 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.

Quincy & Chelsea Building Fires Have Most Injuries

- On February 11, 2017, at 1:24 a.m., the Quincy Fire Department was called to a fatal smoking fire in a three-family home. The fire was started by someone smoking while using home oxygen. The victims, a 19-year old man and a 67-year old woman were overcome while trying to escape. Thirteen (13) firefighters were injured at this fire. It was undetermined if alarms were present. The home did not have sprinklers. Damages from this fire were estimated to be $375,000.

- On May 19, 2017, at 4:38 p.m., the Chelsea Fire Department was called to an electrical fire in a three-unit apartment building. The fire was started by an air conditioner in a third floor bedroom. Ten (10) firefighters were injured at this fire. Alarms were present and alerted the occupants. Sprinklers were not present. Damages from this fire were estimated to be $375,000.

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	732	4%	12	4	0	0	$5,186,951	$7,086
Educational	263	2%	4	1	0	0	2,855,897	10,859
Institutional	472	3%	2	1	0	1	278,068	589
Residential	**14,325**	**84%**	**340**	**193**	**2**	**49**	**177,190,014**	**22,927**
1- & 2-Family homes	*4,714*	*28%*	*179*	*96*	*2*	*29*	*96,143,330*	*20,395*
Apartments	*7,288*	*43%*	*155*	*184*	*0*	*20*	*226,621,081*	*31,095*
All other residential	*2,323*	*13%*	*6*	*13*	*0*	*0*	*5,661,417*	*2,437*
Mercantile, business	664	4%	13	3	0	0	14,770,218	21,468
Basic industry	57	0.4%	1	2	0	1	783,070	11,516
Manufact., processing	108	0.5%	1	0	0	0	2,119,182	27,169
Storage properties	225	1%	8	4	0	0	7,690,781	40,478
Special properties	157	1%	1	2	0	0	186,635	1,085
Unclassified	18	0.03%	0	0	0	0	102,520	5,696
Total	**17,006**	**100%**	**382**	**210**	**2**	**51**	**$362,399,150**	**$21,310**

Occupancy Group Definitions

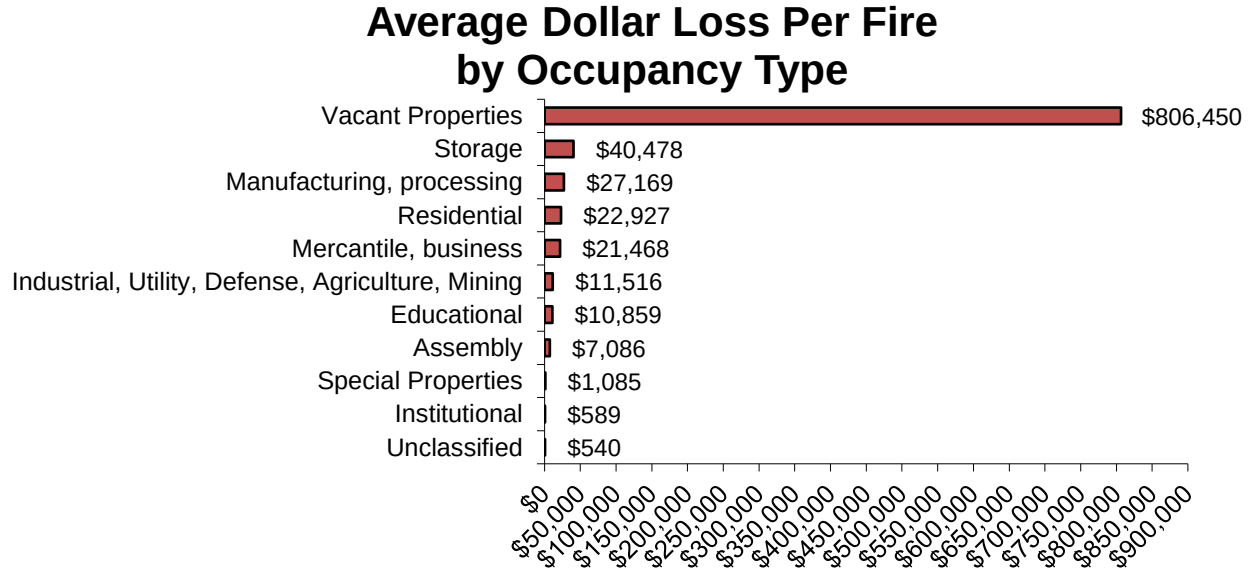
- **Public assembly**: This category includes amusement and recreation places such as bowling alleys, skating rinks, ballrooms, gymnasiums, arenas, stadiums, playgrounds, churches, funeral parlors, clubs, libraries, museums, courtrooms, restaurants, taverns, passenger terminals, theatres and studios.
- **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.

Vacant Properties Have Highest Average Dollar Loss Per Fire

Vacant properties[2] had the highest dollar loss per fire of any property type. In 2017, the average dollar loss for a building fire at a vacant property was $806,450[3]. This is a 696% increase over the 2016 average dollar loss per storage property fire at $101,307 per fire. Storage properties had the second highest dollar loss per fire for any property type. In 2017, the average dollar loss for a storage facility fire was $40,478.



[2] 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.

[3] $170 million, or 54% of all structure fire dollar loss was from 3 fires in buildings under construction in Waltham, Boston and Weymouth

2017 Massachusetts Building Fires by Property Use

MFIRS Code	Property Use	# of Building Fires
	Assembly	**732**
100	Assembly, other	34
110	Fixed use recreation places, other	7
111	Bowling alley	1
113	Electronic amusement center	2
114	Ice rink: indoor, outdoor	1
116	Swimming facility: indoor or outdoor	1
120	Variable use amusement, recreation places	4
121	Ballroom, gymnasium	1
122	Convention center, exhibition hall	1
123	Stadium, arena	1
124	Playground	9
129	Amusement center: indoor/outdoor	2
130	Places of worship, funeral parlors	6
131	Church, mosque, synagogue, temple, chapel	89
134	Funeral parlor	1
140	Clubs, other	14
141	Athletic/health club	14
142	Clubhouse	31
150	Public or government, other	20
151	Library	8
152	Museum	8
154	Memorial structure, including monuments & statues	2
155	Courthouse	2
160	Eating, drinking places	51
161	Restaurant or cafeteria	358
162	Bar or nightclub	22
170	Passenger terminal, other	1
171	Airport passenger terminal	1
173	Bus station	2
174	Rapid transit station	26
180	Studio/theater, other	1
181	Live performance theater	3
182	Auditorium or concert hall	4
183	Movie theater	2
185	Radio, television studio	2
	Educational	**263**
200	Educational, other	39
210	Schools, non-adult	9
211	Preschool	18

MFIRS Code	Property Use	# of Building Fires
213	Elementary school, including kindergarten	49
215	High school/junior high school/middle school	67
241	Adult education center, college classroom	57
254	Day care, in commercial property	22
255	Day care, in residence, licensed	2
	Institutional	**472**
300	Health care, detention, & correction, other	33
311	24-hour care Nursing homes, 4 or more persons	124
321	Mental retardation/development disability facility	58
322	Alcohol or substance abuse recovery center	71
323	Asylum, mental institution	16
331	Hospital - medical or psychiatric	91
332	Hospices	2
340	Clinics, Doctors offices, hemodialysis centers	13
341	Clinic, clinic-type infirmary	12
342	Doctor, dentist or oral surgeon's office	17
343	Hemodialysis unit	1
361	Jail, prison (not juvenile)	10
363	Reformatory, juvenile detention center	11
365	Police station	13
	Residential	**14,325**
400	Residential, other	827
419	1 or 2 family dwelling	4,714
429	Multifamily dwellings	7,288
439	Boarding/rooming house, residential hotels	474
449	Hotel/motel, commercial	161
459	Residential board and care	205
460	Dormitory type residence, other	493
462	Sorority house, fraternity house	23
464	Barracks, dormitory	140
	Mercantile, Business	**688**
500	Mercantile, business, other	112
511	Convenience store	16
519	Food and beverage sales, grocery store	169
529	Textile, wearing apparel sales	3
539	Household goods, sales, repairs	9
549	Specialty shop	20
557	Personal service, including barber & beauty shops	20
559	Recreational, hobby, home repair sales, pet store	1
564	Laundry, dry cleaning	34

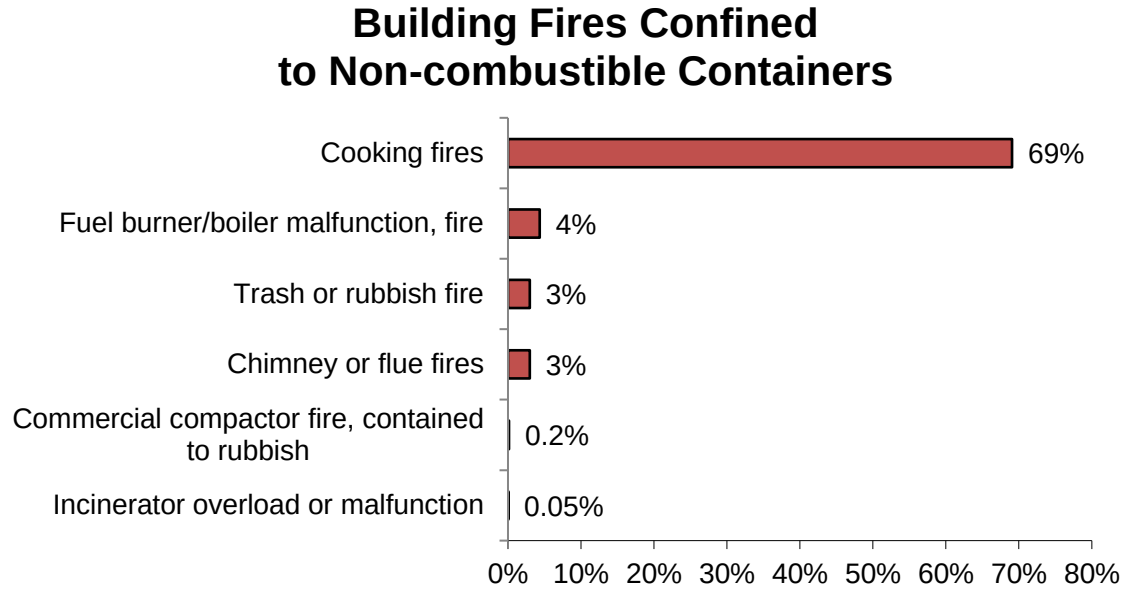
MFIRS Code	Property Use	# of Building Fires
569	Professional supplies, services	15
571	Service station, gas station	24
579	Motor vehicle or boat sales, services, repair	36
580	General retail, other	21
581	Department or discount store	4
592	Bank	30
593	Office: veterinary or research	7
596	Post office or mailing firms	4
599	Business office	163
	Industrial, Utility, Defense, Agriculture, Mining	**68**
600	Utility, defense, agriculture, mining, other	5
610	Energy production plant, other	2
614	Steam or heat generating plant	2
615	Electric generating plant	1
629	Laboratory or science laboratory	21
631	Defense, military installation	4
635	Computer center	1
639	Communications center	1
640	Utility or Distribution system, other	2
642	Electrical distribution	7
647	Water utility	5
648	Sanitation utility	10
655	Crops or orchard	2
659	Livestock production	3
679	Mine or quarry	2
700	**Manufacturing, processing**	**78**
	Storage	**190**
800	Storage, other	17
807	Outside material storage area	8
808	Outbuilding or shed	60
819	Livestock, poultry storage	7
839	Refrigerated storage	3
880	Vehicle storage, other	10
881	Parking garage, (detached residential garage)	28
882	Parking garage, general vehicle	14
888	Fire station	5
891	Warehouse	36
898	Dock, marina, pier, wharf	1
899	Residential or self storage units	1

MFIRS Code	Property Use	# of Building Fires
	Outside or special property	**172**
900	Outside or special property, other	32
919	Dump, sanitary landfill	1
922	Tunnel	1
926	Outbuilding, protective shelter	13
931	Open land or field	18
935	Campsite with utilities	2
936	Vacant lot	4
937	Beach	2
938	Graded and cared-for plots of land	6
941	Open ocean, sea or tidal waters	1
951	Railroad right of way	3
960	Street, other	22
961	Highway or divided highway	4
962	Residential street, road or residential driveway	28
963	Street or road in commercial area	10
965	Vehicle parking area	19
981	Construction site	3
984	Industrial plant yard - area	3
	Other	**18**
000	Property Use, other	13
	Total Building Fires	**17,006**

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

Thirteen thousand five hundred and sixty-three (13,563), or 80%, of all building fires were reported as confined to non-combustible containers in 2017. Confined building fires increased by 324 incidents, or 2%, from the 13,239 reported in 2016.

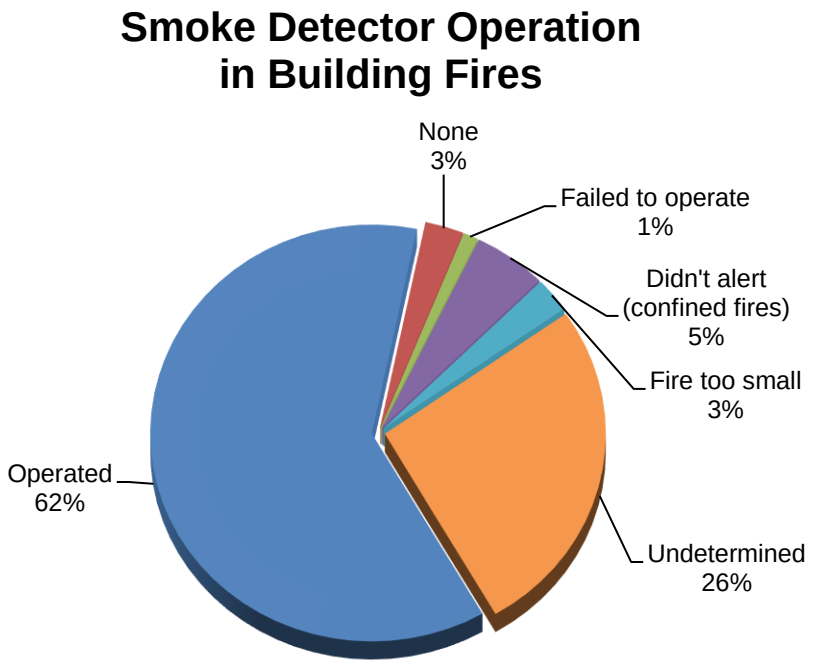
Incident Type	# of Incidents	% All Building Fires	% Confined to Non-combustible containers
Cooking fires	11,745	69%	87%
Chimney or flue fires	486	3%	4%
Incinerator overload or malfunction	8	0.05%	0.1%
Fuel burner/boiler malfunction, fire	742	4%	5%
Commercial compactor fire, contained to rubbish	26	0.2%	0.2%
Trash or rubbish fire	556	3%	4%
Total	13,563	80%	100%



Detectors Operated in 62% of Building Fires

Smoke or heat detectors operated in 10,441, or 62%, of the building fires in 2017. In 5% of these fires[4], 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 3% of the fires. Smoke detector performance was undetermined in 4,475 incidents, or 26%, of the building fires in 2017.

[4] 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	443	5	73	24	13	174	732
Educational	174	1	19	12	4	53	263
Institutional	347	1	18	13	1	92	472
Residential	8,971	169	782	357	281	3,765	14,325
Mercantile, business	396	7	35	26	34	190	688
Basic industry	31	1	2	3	14	17	68
Manufacturing	34	0	4	9	8	23	78
Storage properties	17	3	6	7	105	52	190
Special properties	15	0	34	1	16	106	172
Unclassified	13	0	0	1	1	3	18
Total	**10,441**	**187**	**973**	**453**	**477**	**4,475**	**17,006**

$110 Million Fire in Waltham is Largest Loss Building Fire

- On July 23, 2017, at 3:47 a.m., the Waltham Fire Department was called to an intentionally set fire at the 265-unit apartment building under construction at 20 Cooper St. The fire started on the second floor. Four (4) firefighters were injured at this fire. Alarms were present but did not operate because there was no power. The building did have sprinklers but they were shut off. Damages from this fire were estimated to be $110 million.

Boston Has 2nd Largest Loss Building Fire in 2017

- On June 28, 2017, at 2:32 p.m., the Boston Fire Department was called to a fire at 1971 Dorchester Ave., an 83-unit apartment building that was under construction. Heat from a generator on the sixth floor ignited a nearby structural member. No one was injured at this fire. Alarms were present but they were shut off. Sprinklers were also present but the system was also shut off. Damages from this fire were estimated to be $45 million.

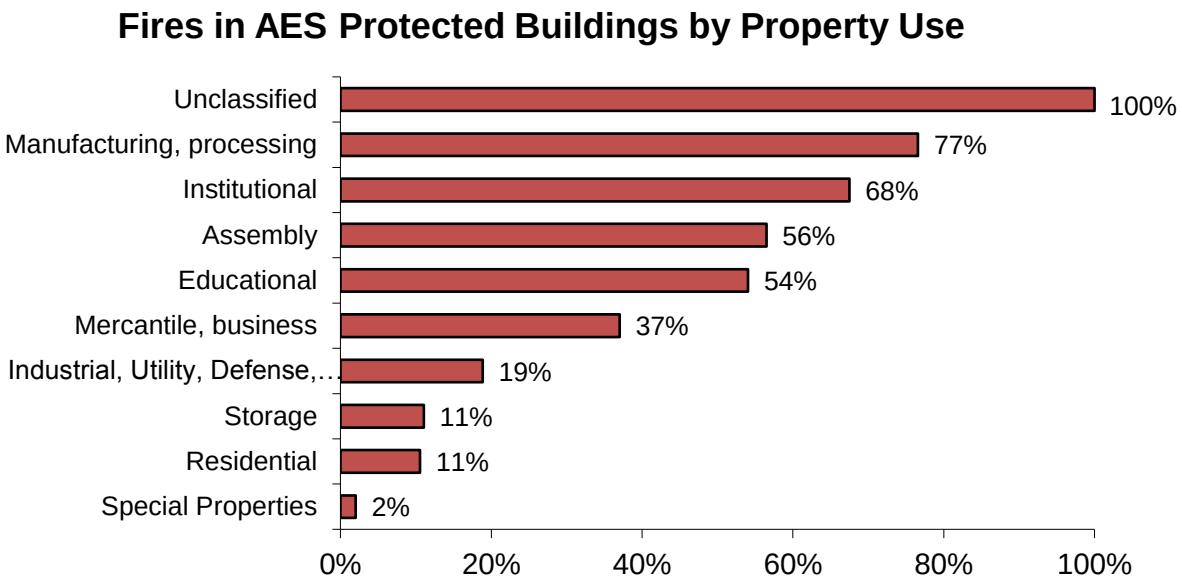
Overall, there were 17 large loss building fires reported to MFIRS in 2017 with a total combined dollar loss of $197 million, representing 54% of all the estimated dollar loss of Massachusetts' building fires in 2017.

14% of Unconfined Fires Occurred in Buildings with AES

Overall, 563, or 14%, of the 3,848 unconfined building fires in 2017 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.

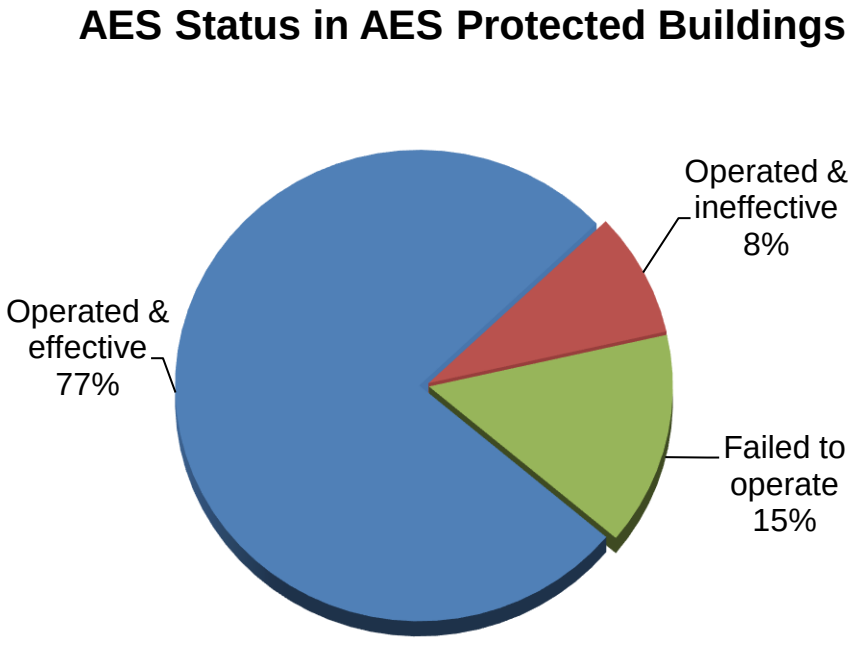
The following chart lists the percentage of unconfined fires in buildings that were at least partially protected by an AES for that specific property use. Manufacturing and processing facilities and institutional properties were most likely to have an AES. Seventy-seven percent (77%) of the fires in manufacturing or processing facilities and 68% of the fires in health care, detention and correctional facilities occurred in an AES protected structure[5]. Eleven percent (11%) of residential fires and 11% of fires in storage facilities occurred in buildings with an automatic extinguishing system.

[5] Both, or 100%, of the Unclassified property fires occurred in building with either a full or partial AES present.



AES Work in 85% of Building Fires When Installed & Maintained

AES were present and operated in 140, or 77%, of the 164 building fires in buildings protected by an automatic extinguishing system, which had a reported fire large enough for the AES to activate in Massachusetts in 2017. Of these 164 fires, the systems were effective in 126, or 77%, and ineffective in 14, or 8%, of these incidents. AES were present but failed to operate in 24, or 15%, of these 164 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; the system was shut off; a lack of maintenance to the system; and manual intervention.



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	14	8	32	18	2	74
Educational	2	0	11	5	2	20
Institutional	4	1	12	10	0	27
Residential	78	7	119	85	6	295
Mercantile, business	18	5	27	28	2	80
Basic industry	1	1	5	2	1	10
Manufacturing	17	0	16	3	0	36
Storage properties	6	2	6	4	0	18
Special properties	0	0	0	1	0	1
Unclassified	0	0	1	1	0	2
Total	**140**	**24**	**229**	**157**	**13**	**563**

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.

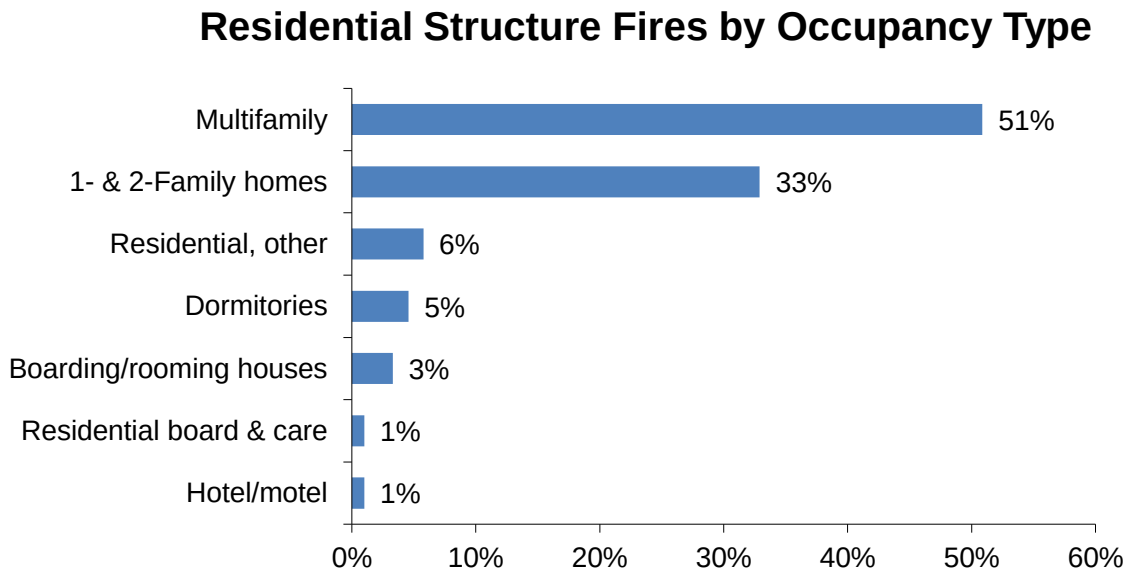
Written Permit Required from Fire Department before Disconnecting Sprinklers

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 14,325, or 84%, of the 17,006 building fires occurred in residential occupancies. These fires caused 49 civilian deaths, two fire service deaths, 193 civilian injuries, 340 fire service injuries and an estimated dollar loss of $328.4 million. The average dollar loss per fire was $22,927. The total number of reported residential building fires increased by 13, or less than 1%, from the 14,312 reported in 2016.

Over 1/2 of All Residential Fires Occurred in Apartments
Over half, or 51%, of all residential building fires in 2017 occurred in multifamily apartment buildings. Thirty-three percent (33%) of these fires happened in one- or two-family homes. Dormitories accounted for 5% of residential fires in Massachusetts. Three percent (3%) occurred in rooming houses; and residential board and care facilities and hotels or motels each accounted for 1% of the residential building fires in 2017. Six percent (6%) of residential building fires occurred in unclassified residences.



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

RESIDENTIAL BUILDING FIRES

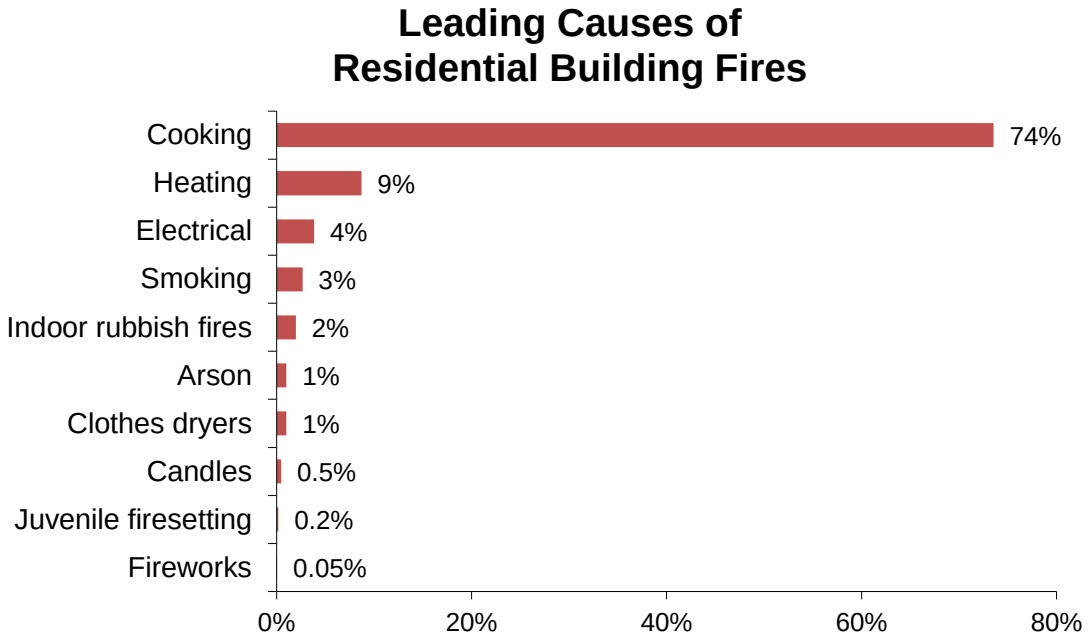
Occupancy	# of Fires	% of Total	Injuries FF	Injuries Civ	Deaths FF	Deaths Civ	Dollar Loss
1- & 2-Family homes	4,714	33%	179	96	2	29	$96,143,330
Multifamily	7,288	51%	155	84	0	19	226,621,081
Rooming houses	474	3%	2	10	0	0	1,228,824
Hotels & motels	161	1%	1	1	0	0	1,034,725
Residential board & care	205	1%	0	0	0	0	22,662
Dormitories	656	5%	1	1	0	0	738,735
Unclassified	827	6%	2	1	0	0	2,636,471
Total	**14,325**	**100%**	**340**	**193**	**2**	**48**	**$328,425,828**

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

The leading causes of residential building fires in 2017 were cooking, heating, electrical problems, indoor rubbish fires, smoking, arson, candles, clothes dryer fires, juvenile firesetting, Christmas tree fires, and fireworks. Cooking was the leading cause of residential building fires, accounting for 10,533, or 74%, of the 14,325 incidents. Heating equipment accounted for 1,248, or 9%, of the total fires. Electrical problems caused 550, or 4%, of incidents. The unsafe use and disposal of smoking materials accounted for 381, or 3%, of these incidents. Indoor rubbish fires were the cause of 282, or 2%, of residential building fires. Arson accounted for 121, or 1%, of residential building fires. Clothes dryer fires were the cause for 93, or 1%, of these incidents. Seventy-one (71), or 0.5%, were caused by candles. Juvenile firesetting accounted for 26, or less 0.2%, of residential building fires. Fireworks caused seven, accounting for 0.05% of these fires in Massachusetts in 2017.



2017 MA Home Fires Confined to Non-Combustible Containers

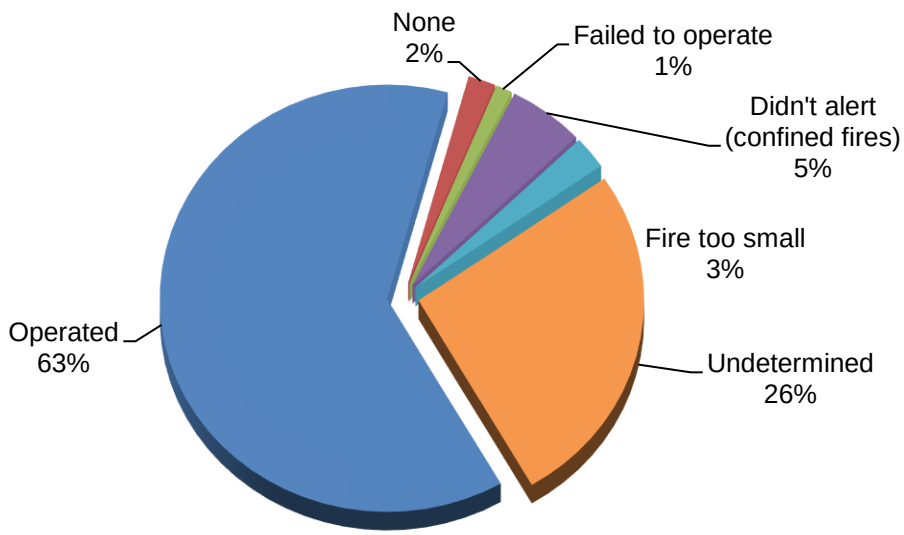
Incident Type	# of Incidents	% Residential Fires	% Confined to Non-combustible containers	Dollar Loss	Average Dollar Loss
Cooking fires	10,175	71%	88%	$ 835,809	$ 82
Chimney or flue fires	464	3%	4%	$ 175,094	$ 377
Incinerator overload or malfunction	3	0.02%	0.03%	$ 1,000	$ 333
Fuel burner/boiler malfunction, fire	643	4%	6%	$ 233,297	$ 363
Commercial compactor fire, confined to rubbish	12	0.1%	0.1%	$ 35,000	$ 2,917
Trash or rubbish fire	269	2%	2%	$ 47,872	$ 178
Total	11,566	81%	100%	$ 1,328,072	$ 115

Alarms Operated in 63% of Fires

Smoke or heat alarms operated in 8,971, or 63%, of the residential building fires in 2017. 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 3% of the residential fires. Smoke alarm performance was undetermined in 3,765 incidents, or 26%, of Massachusetts' 2017 residential building fires.

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

Smoke Detector Status in Residential 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 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.

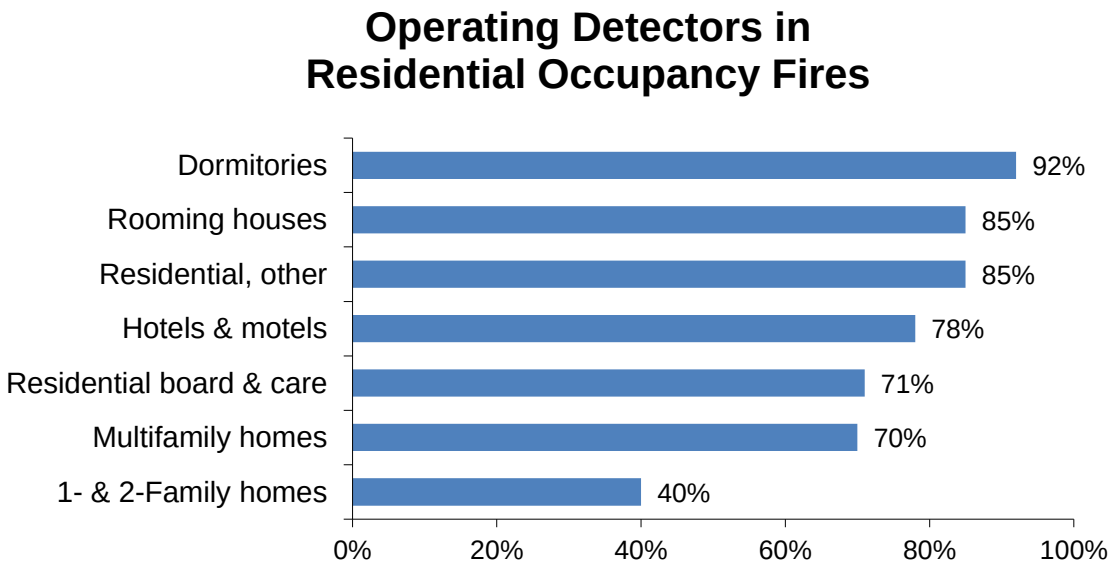
New Homes Must Have Alarms in Bedroom Areas
At a minimum, smoke alarms should be installed on every floor of the home and at the bottom of the basement stairwell. The Massachusetts Building Code requires smoke alarms within the bedroom area in all *new* residential occupancies. When a bedroom door is 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.

1/3 of Failed Alarms Had No Batteries or Dead Ones
Of the 169 fires where smoke alarms were present but failed to operate, 42, or 25%, failed because the batteries were either missing or disconnected. Thirteen (13), or 8%, did not operate because of dead batteries. Nineteen (19), or 11%, failed because of a power failure, shutoff or disconnect. Eight (8) alarms, or 5%, 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. Five (5), or 3%, failed from improper installation or placement. For 76 cases, or 45%, the reason the alarm failed was not determined.

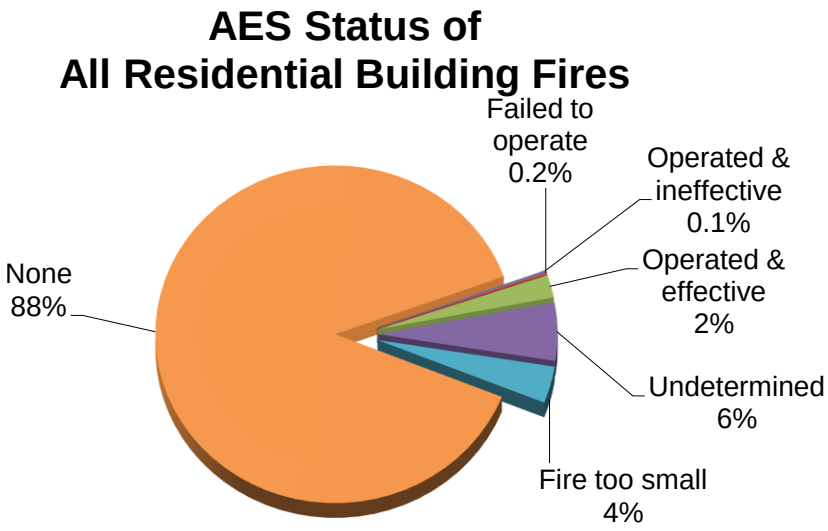
1- & 2-Family Homes Had Lowest Percentage of Operating Alarms
One- and two-family homes were the least likely residential occupancies to have operating smoke alarms. Dormitories were the most likely residential occupancy to have operating smoke alarms in 2017. Rooming houses were the second most likely 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 6% of Residential Building Fires
In 2017, only 3,387 residential fire incident reports completed the automatic extinguishing system field. This was 24% of all residential building fires.

In these fires where system performance was reported, automatic extinguishing systems (AES) were reported present and operated effectively in 73, or 2%, of the 3,387 residential building fires. AES were present and operated ineffectively in five, or 0.1%,

of these fires. In seven, or 0.2%, of the fires in residential occupancies, the system did not operate. In 119, or 4%, the fire was too small to activate the system. In 2,994, or 88%, of the cases, there were no systems present or installed. AES performance was not classified in 189, 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

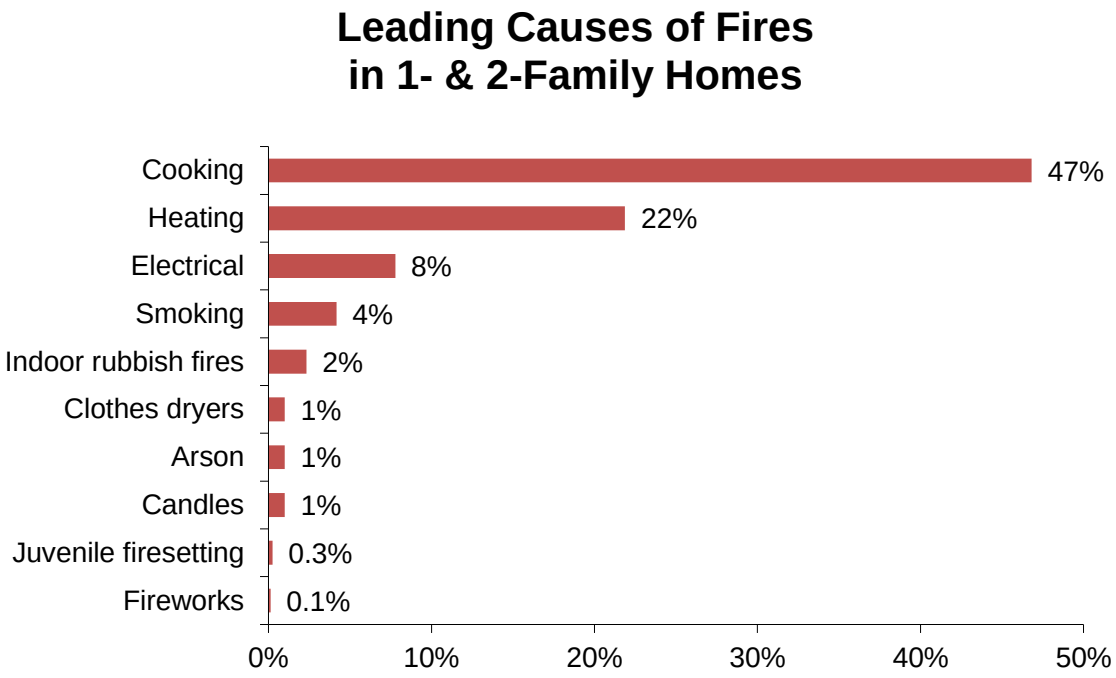
4,714 Fires, 29 Civilian Deaths, 2 FF Deaths & $96.1 Million in Damage
Four thousand seven hundred and fourteen (4,714) building fires in one- and two-family homes caused 29 civilian deaths, two fire service deaths, 96 civilian injuries, 179 fire service injuries, and an estimated $96.1 million in property damage. In 2017, 33% of the Commonwealth's 14,325 residential building fires occurred in one- and two-family homes. The average dollar loss from these types of fires was $20,395. Fires in one- and two-family homes were down by 122, or 3%, from 4,836 in 2016.

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 22% 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 2% of these fires. Clothes dryers, arson 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 2017.

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

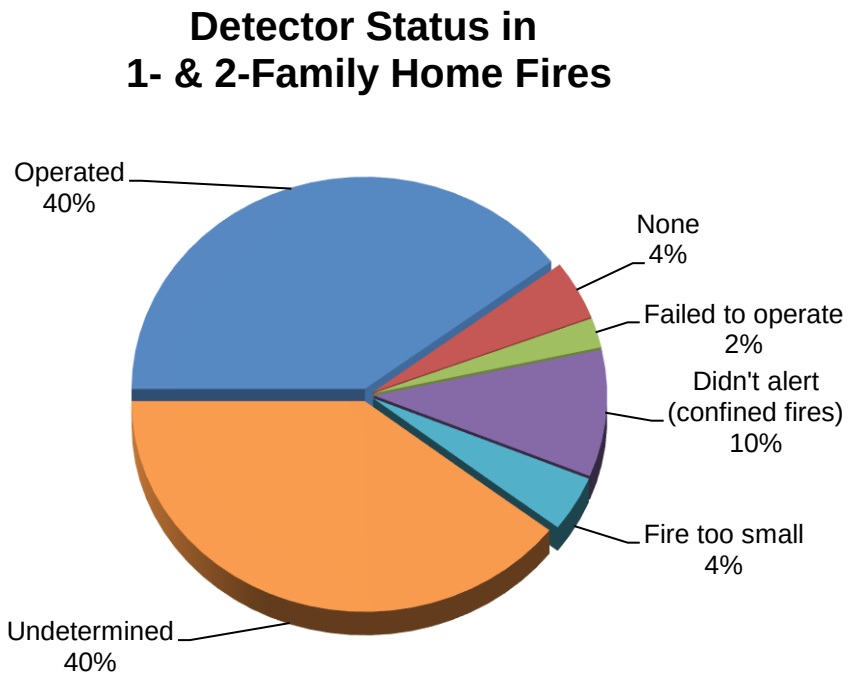


1- & 2-Family Home Fires Confined to Non-Combustible Containers

Incident Type	# of Incidents	% 1- & 2-Family Home Fires	% Confined to Non-combustible containers	Dollar Loss	Avg. Dollar Loss
Cooking fires	2,035	43%	66%	$ 264,879	$ 130
Chimney or flue fires	433	9%	14%	$ 171,594	$ 396
Incinerator overload or malfunction	2	0.04%	0.1%	$ 1,000	$ 500
Fuel burner/boiler malfunction, fire	506	11%	16%	$ 190,846	$ 377
Commercial compactor fire, confined	0	0%	0%	$	$
Trash or rubbish fire	101	2%	3%	$ 21,232	$ 210
Total	3,077	65%	100%	$ 649,551	$ 211

Alarms Alerted Occupants in 40% of Fires

Smoke or heat alarms operated and alerted the occupants in 1,874, or 40%, of the one- and two-family home fires in 2017. 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 1,864 incidents, or 40%, of Massachusetts' 2017 one- and two-family fires.



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

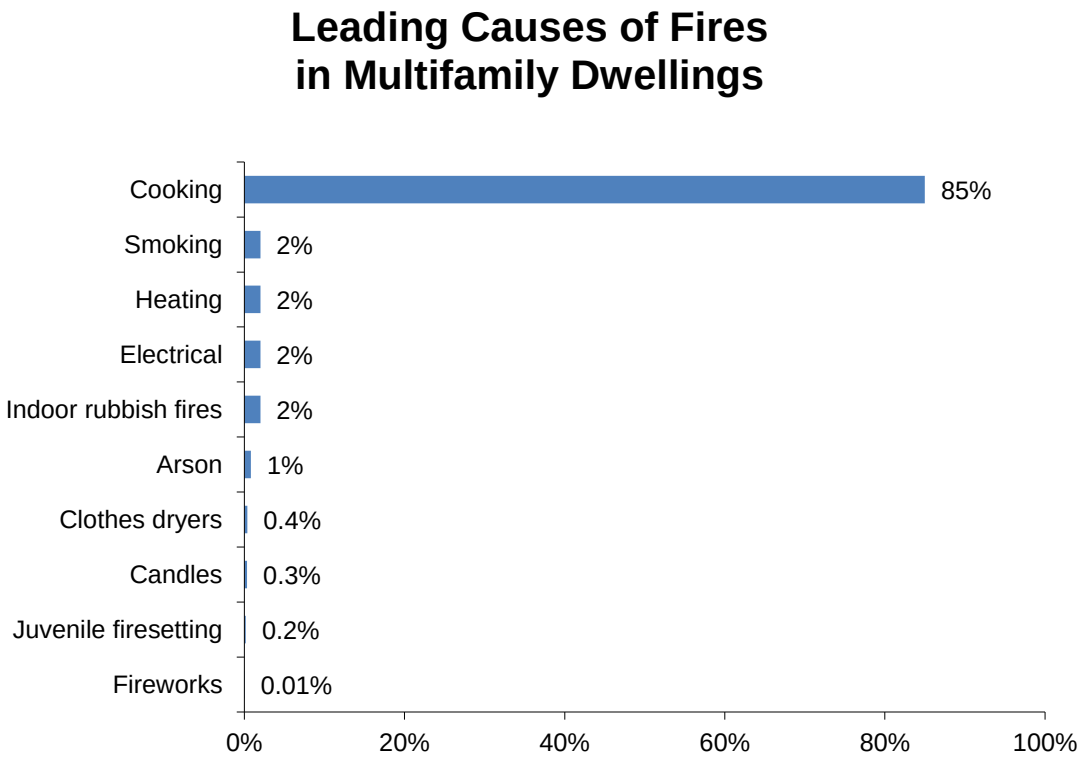
40% of Failed Alarms Had No Batteries or Dead Ones
Of the 107 fires where smoke alarms were present but failed to operate, 32, or 30%, failed because the batteries were either missing or disconnected. Eleven (11), or 10%, did not operate because of dead batteries. Seven (7), or 7%, failed because of a power failure, shutoff or disconnect. Six (6) alarms, or 6%, failed from a lack of maintenance. Four (4) alarms, or 4%, failed because they were defective. Four (4), or 4%, failed from improper installation or placement. For 43 cases, or 40%, the reason the alarm failed was not determined.

Multifamily Home Fires

7,288 Fires, 19 Civilian Deaths & $226.6 Million in Damage
Seven thousand two hundred and eighty-eight (7,288), or 51%, of the Commonwealth's 14,325 residential building fires occurred in multifamily dwellings in 2017. These 7,288 fires caused 19 civilian deaths, 84 civilian injuries, 155 fire service injuries, and an estimated dollar loss of $226.6 million. The average dollar loss per fire was $31,095. Fires in apartments were up by 25, or less than 1%, from 7,263 in 2016.

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

Unsafe Cooking Caused Over 85% of Apartment Fires
Eighty-five percent (85%) of the fires in apartments were caused by unsafe cooking in 2017. Smoking, heating, electrical problems and indoor rubbish fires each accounted for 2% of apartment fires. Arsons caused 1% of the fires in these dwellings. Clothes dryers,



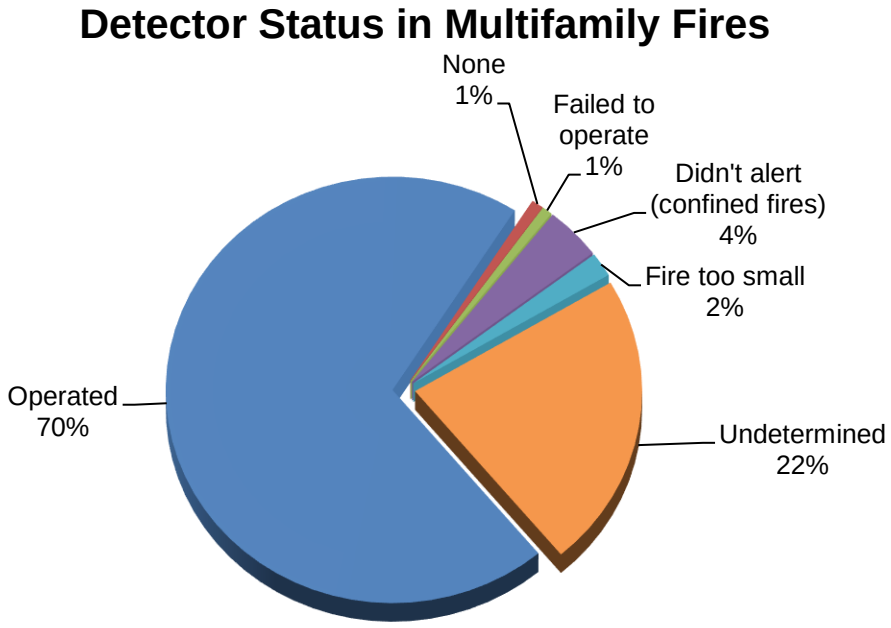
candles, juvenile-set fires and fireworks each caused less than 1% of the fires in multifamily homes in 2017.

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	6,026	83%	96%	$ 462,136	$ 77
Chimney or flue fires	18	0.2%	0.3%	$ 3,500	$ 194
Incinerator overload or malfunction	1	0.01%	0.02%	$ 0	$ 0
Fuel burner/boiler malfunction, fire	118	2%	2%	$ 40,350	$ 342
Commercial compactor fire, confined	7	0.1%	0.1%	$ 35,000	$ 5,000
Trash or rubbish fire	139	2%	2%	$ 17,305	$ 124
Total	6,309	87%	100%	$ 558,291	$ 88

Alarms Alerted Occupants in 70% of Fires

Smoke or heat alarms operated and alerted the occupants in 5,114, or 70%, of the multifamily fires in 2017. In 4% of these fires[8], the alarms did not alert the occupants. Alarms were present but did not operate in 1% of these incidents. In 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 1,631 incidents, or 22%, of Massachusetts' 2017 multifamily fires.



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

20% of Failed Alarms Failed Due to Power Shut-offs
Of the 54 fires where smoke alarms were present but failed to operate, 11, or 20%, failed because of a power failure, shutoff or disconnect. The batteries were either missing or disconnected in nine alarms, or 17%. Two (2), or 4%, did not operate because of dead batteries. Two (2), or 4%, failed because they were defective. Two (2), or 4%, didn't operate because of a lack of maintenance. Another one, or 2%, failed from improper installation or placement. For 27 cases, or 50%, the reason the alarm failed was not classified or determined.

All Other Residential Fires

2,323 Fires, 13 Civilian Injuries, 6 Fire Service Injuries & $5.7 Million in Damages
There were 2,323 reported fires in all the other residential property types in 2017. These 2,323 fires caused 13 civilian injuries, six fire service injuries and an estimated $5.7 million in damages. The average dollar loss per fire was $2,437. These fires increased by 227, or 2%, from 2,213 reported in 2016. Only 16% of the 14,173 residential building fires in 2017 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	827	2	1	0	0	$2,636,471	6%	$ 3,188
Boarding/rooming houses	474	2	10	0	0	$1,228,824	3%	$ 2,592
Hotel/motel	161	1	1	0	0	$1,034,725	1%	$ 6,427
Residential board & care	205	0	0	0	0	$ 22,662	1%	$ 111
Dormitories	656	1	1	0	0	$ 738,735	5%	$ 1,126
All Other Residential	2,323	6	13	0	0	$5,661,417	16%	$ 2,437

Cooking Was the Leading Cause of These Fires
Cooking was the leading cause of these fires. Cooking caused over 90% of fires in all the other residential occupancies except hotels and motels where it caused 83% of the fires.

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

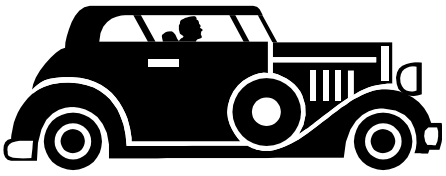
- Choose lodging equipped with sprinklers and smoke alarms in each room.
- If you are hearing impaired, you may request a room with an appropriate smoke alarm with a flashing strobe light.

- 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

2,367 Motor Vehicle Fires Account for 8% of All Reported Fires

Motor vehicle fires accounted for 8% of total reported fire incidents. The 2,367 motor vehicle fires in 2017 were a decrease of 26, or 1%, from the 2,393 motor vehicle fires reported in 2016. They caused seven, or 12%, of the civilian fire deaths, 19 civilian injuries, 19 fire service injuries, and an estimated property damage of $21.2 million.



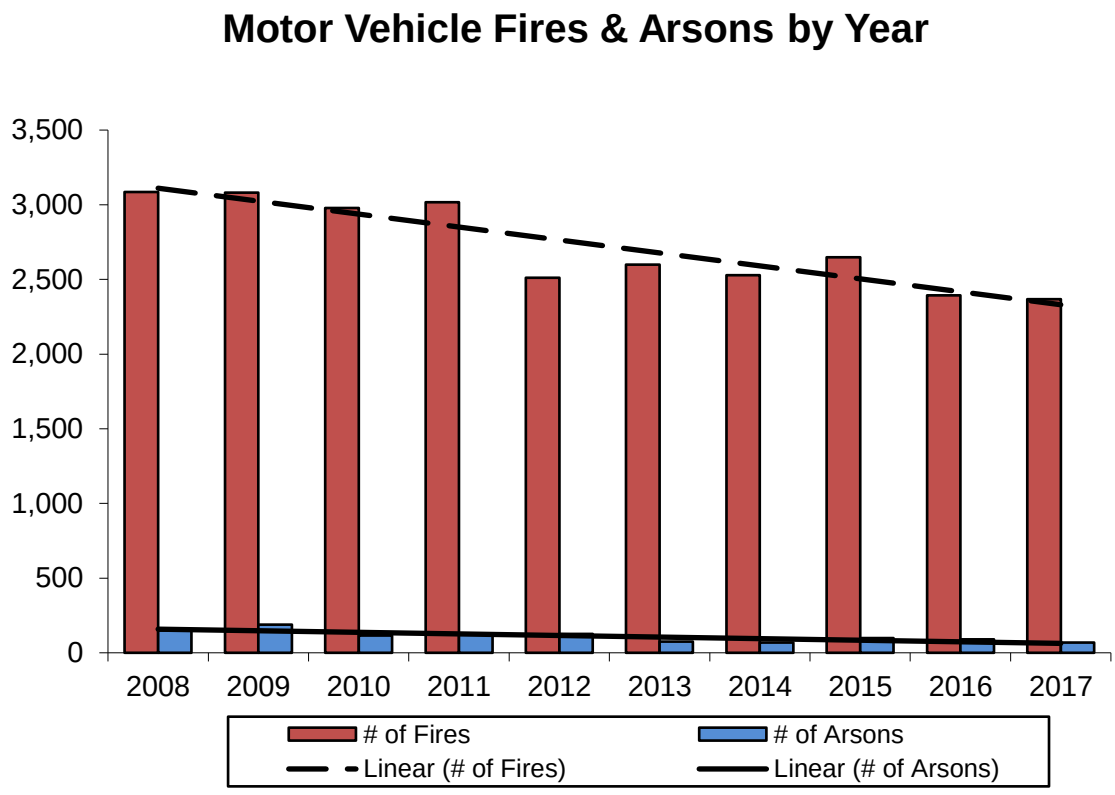
According to MFIRS, a motor vehicle fire is defined as any fire involving a car, truck, boat, airplane, construction equipment or other mobile property (not being used as a permanent structure) that occurs outside of a structure.

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
2017	2,367	68	2.9%
2016	2,393	91	3.8%
2015	2,644	98	3.7%
2014	2,528	68	2.7%
2013	2,597	75	2.9%
2012	2,512	126	5.0%
2011	3,016	124	4.1%
2010	2,978	116	3.9%
2009	3,081	189	6.1%
2008	3,085	151	4.9%

The following graph illustrates the data in the previous table.



7 Motor Vehicle Fire Deaths

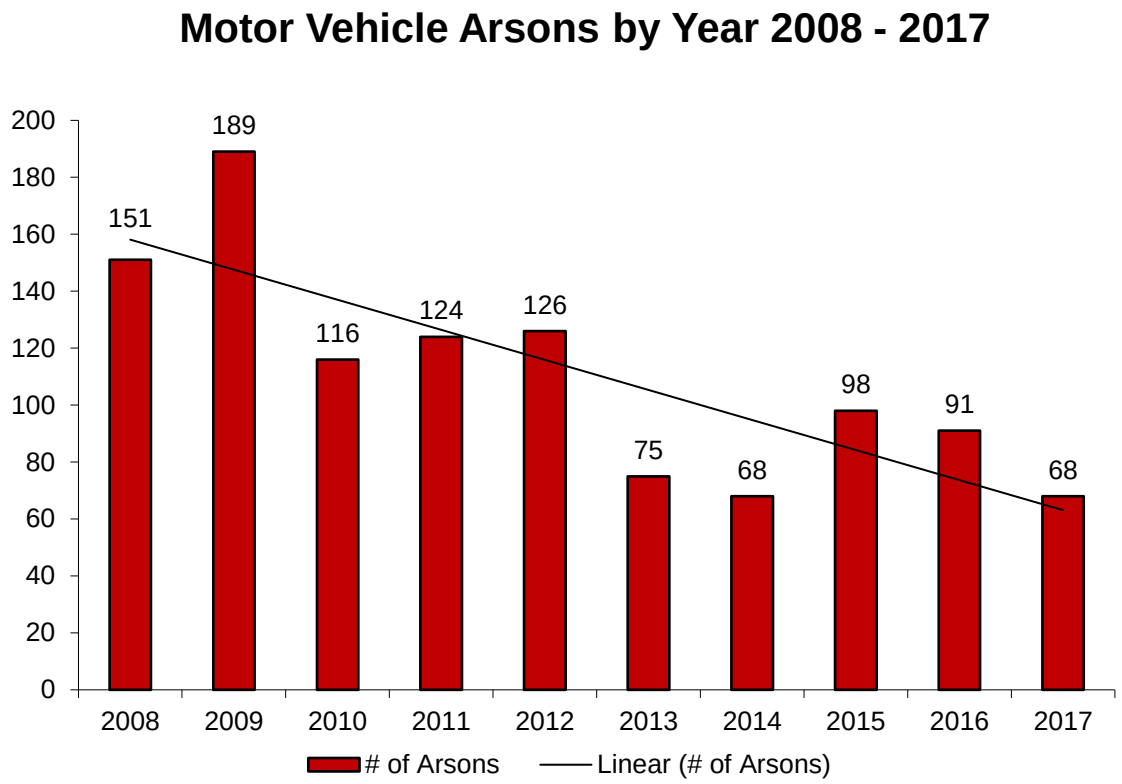
There were seven civilian fire deaths in five motor vehicle fires in 2017. There were four deaths in four motor vehicle crashes with ensuing fire. One (1) person died when his car

started a brush fire that consumed the vehicle and two other people died car fires where the cause of ignition was undetermined.

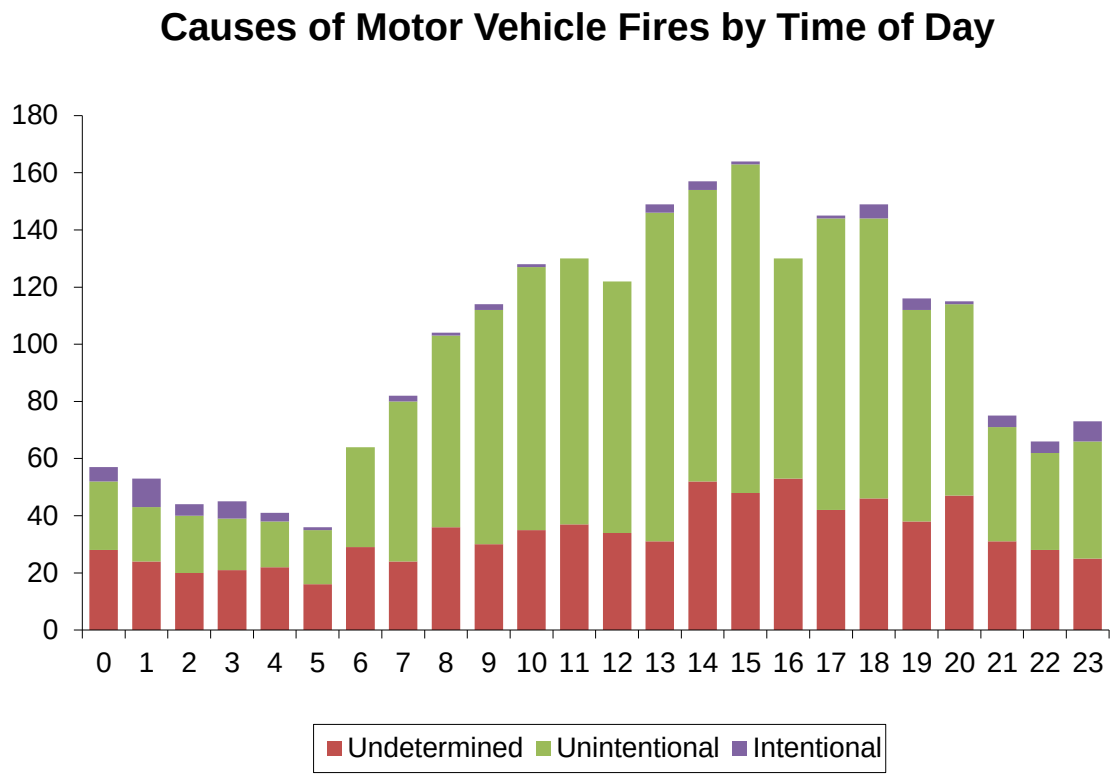
Mechanical Failures Caused Almost 1/4 of Massachusetts Motor Vehicle Fires
Of the 2,367 motor vehicle fires in 2017, 24% were caused by some type of mechanical failure or malfunction; 3% were considered intentionally set; and 39% resulted from other accidental causes. The cause was undetermined or not reported in 34% of the motor vehicle fires.

Motor Vehicle Arsons Decreased by 25%
In 2017, there were 68 reported motor vehicle arsons. This is a decrease of 25% from the 91 reported in 2016. These 68 arsons caused an estimated dollar loss of $6,547,629.

The following graph depicts the drop in motor vehicle arsons from 2008 to 2017.



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.



Wellesley Has Largest Loss Motor Vehicle Fire

In 2017 there were two reported motor vehicle fires that had an estimated dollar loss over $1 million. These large loss motor vehicles fire accounted for 14% of the total dollar loss of all motor vehicle fires.

- On August 27, 2017, at 12:13 a.m., the Wellesley Fire Department responded to an excavator fire or Interstate 95 South. The fire started in the rear engine compartment and hydraulic area. No one was injured at this fire. Total estimated damages were $1.5 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 45 motor vehicle fires at gas and service stations in 2017. There were 34 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

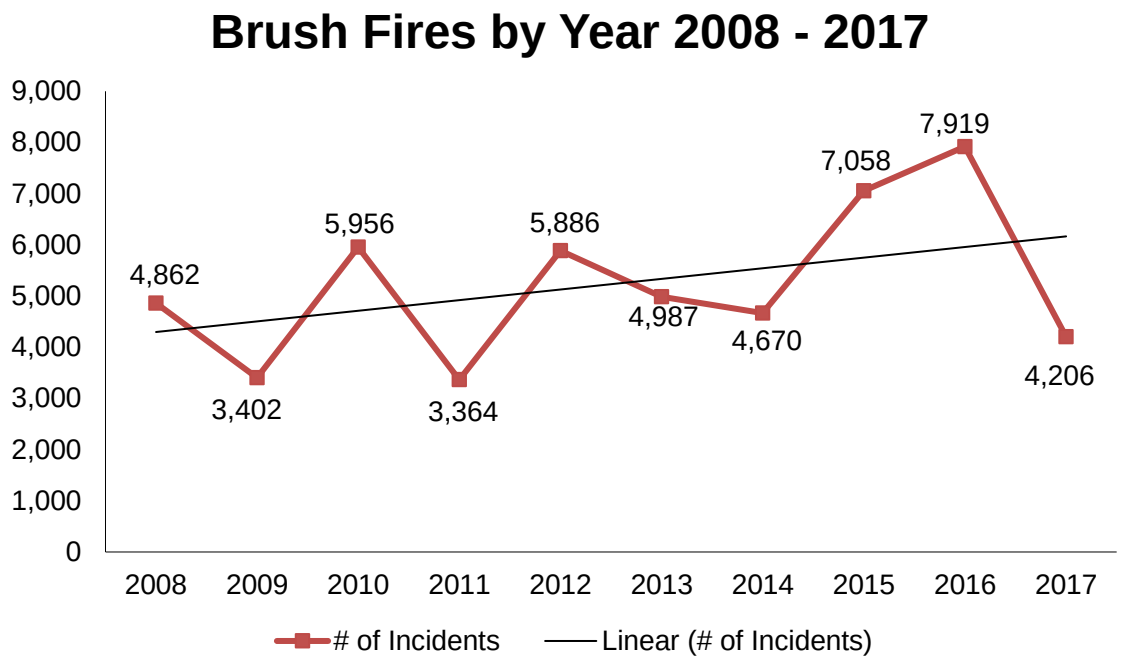
- Turn off your car when you get gas.
- At self-service stations, remember to put the nozzle back and your gas cap on before driving off. Monitor the fueling; do not get back in the vehicle.
- Gasoline vapors burn at a very low temperature. These fumes are heavier than air, and can travel a distance 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

8,429 Brush, Trash, & Other Outside Fires Down 34%

The 8,429 outside and other fires and explosions caused 40 civilian injuries, 33 fire service injuries, and an estimated dollar loss of $4.6 million. The 4,206 trees, grass and brush fires, 2,382 outside trash fires, 813 special outside fires, 66 cultivated vegetation or crop fires, and 962 other fires accounted for 30% of the total fire incidents in 2017. These fires decreased by 34% from the 12,706 incidents reported in 2016.

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 2017, the reported number of brush fires decreased by 3,713 or 47%, from the 7,919 reported in 2016. It seems that 2017 was a particularly wet year.



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 8,429 reported outside and other fires include:

- 4,206 natural vegetation fires (tree, grass, and brush fires) that caused six civilian injuries, 14 fire service injuries, and an estimated dollar loss of $215,156; this is a 47% decrease from the 7,919 incidents reported in 2016. There were a reported 873 acres burned in 2017.
- 2,382 trash fires that caused one civilian injury, seven fire service injuries and an estimated dollar loss of $161,426; this is an 18% decrease from the 2,889 incidents reported in 2016.
- 813 special outside fires (including outside, storage, equipment, mailbox fires and outside gas or vapor explosions) that caused 14 civilian injuries, two fire service injuries and an estimated dollar loss of $1 million; this is a 15% decrease from the 962 incidents reported in 2016.

- 66 cultivated vegetation or crop fires that caused an estimated dollar loss of $4,610; this is a 16% decrease from the 79 incidents reported in 2016.
- 962 other fires that could not be classified further which caused 19 civilian injuries, 10 fire service injuries, and an estimated dollar loss of $3.2 million; this is a 12% increase from the 857 incidents reported in 2016.

416 Brush, Trash & Other Outside Arsons
There were 416 reported brush, trash and other outside arsons in 2017. There were 176 natural vegetation arsons, 73 outside rubbish arsons, 86 special outside arsons, nine cultivated vegetation or crop arson, and 72 arsons that could not be classified any further. These 416 arsons caused three civilian injuries, one fire service injury and $17,374 in estimated damages.

1,957 Fires with Cause Still Under Investigation or Undetermined
In 2017, 184 outside and other fires were still listed as 'Cause Under Investigation'. There were 1,773 fires where the *Cause of Ignition* was listed as 'Undetermined'.

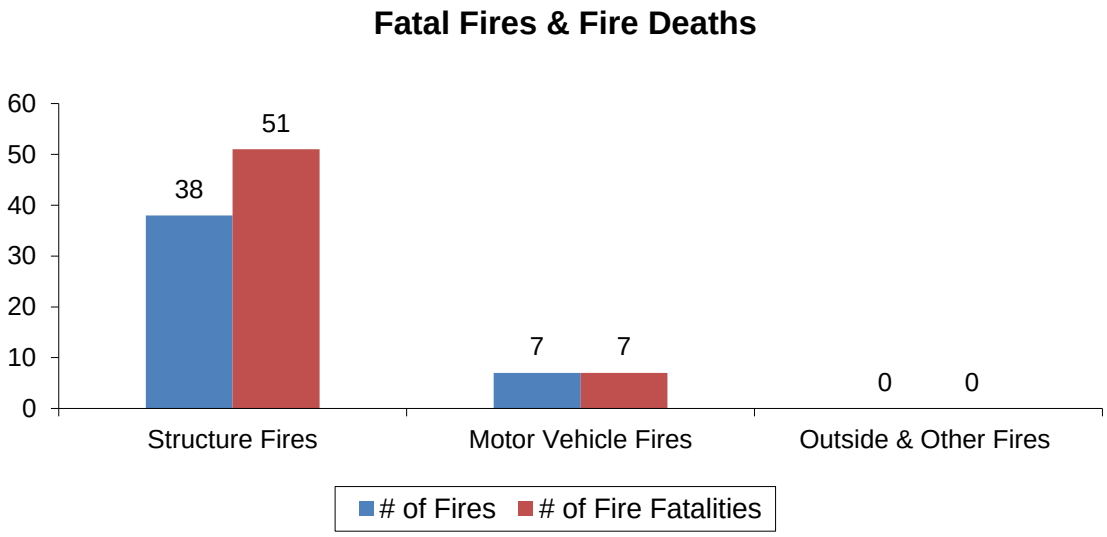
Largest Loss Outside and Other Fire
- On June 20 2017, at 5:53 p.m., the Chicopee Fire Department was called to a conveyor on fire in the industrial yard at the Ted Ondrick Company. One (1) civilian was injured at this fire. Damages from this fire were estimated to be $500,000.

2017 Massachusetts Fire Deaths

Civilian Fire Deaths

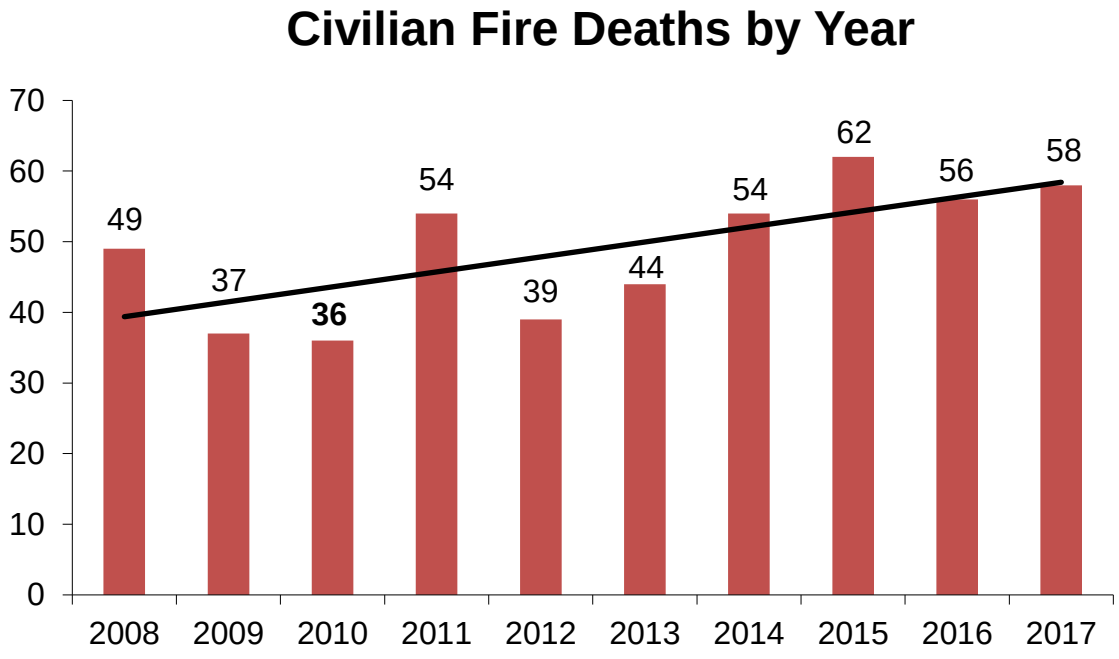
58 Civilians Died in Massachusetts Fires
Fifty-eight (58) civilians died in 44 Massachusetts fires during 2017. This is two more than the 56 civilian fire deaths recorded in 2016. Fifty-one (51) civilians died in 38 structure fires. Seven (7) people died in seven motor vehicle fires. No one died in an outside fire in Massachusetts in 2017. In 2017, there were 8.9 fire deaths per one million population in Massachusetts which is 0.1 more than in 2016.

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 Up by 2 over 2016

The 58 civilian fire deaths reported in 2017 were two, or 4% more, than was reported in 2016. The following chart shows the trend of civilian fire deaths for the past decade on a general incline; but that is helped by having the five lowest years of fire deaths on record. However, civilian fire deaths have decreased by 45% from the high of 105 in 1990.

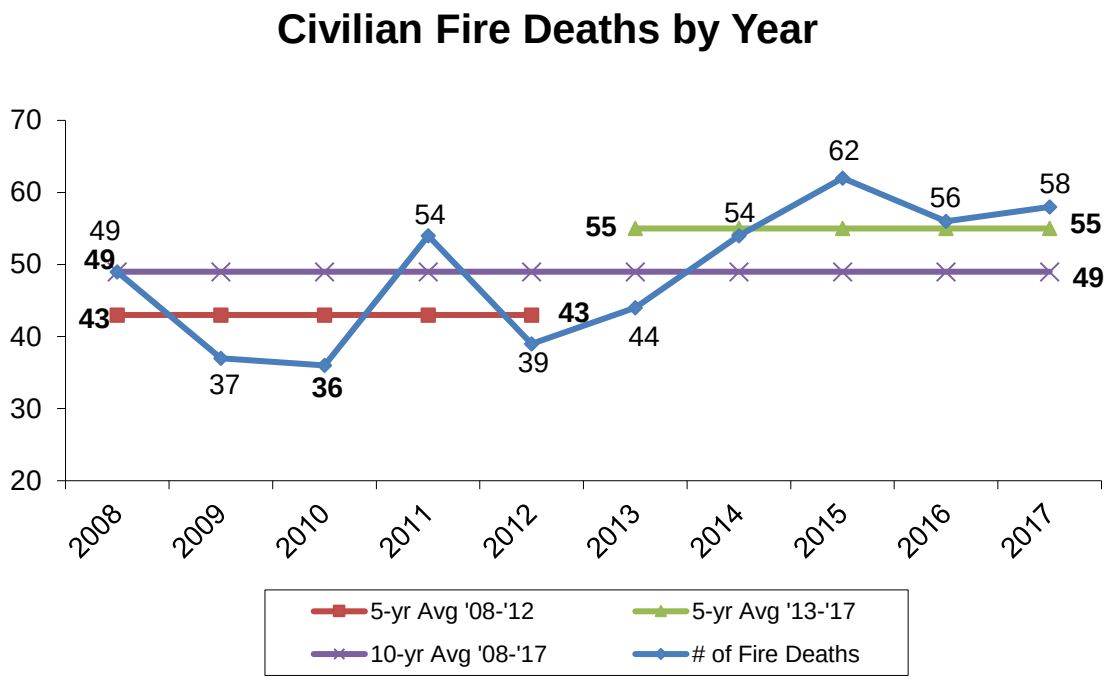


2017 Is Above the 5 & 10 - Year Averages

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 2008 through 2012 and from 2013 through 2017. The average number of fire deaths per year from 2008 through 2012 was 43 deaths. The average number of fire deaths per year from 2013 through 2017 was 55 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.

Note that the following chart starts at 20 rather than the traditional zero value. This is so the reader can concentrate on the sometimes subtle changes in the figures. The 58 fire deaths in 2017 are 6% above the five-year average and 19% above the 10-year average.



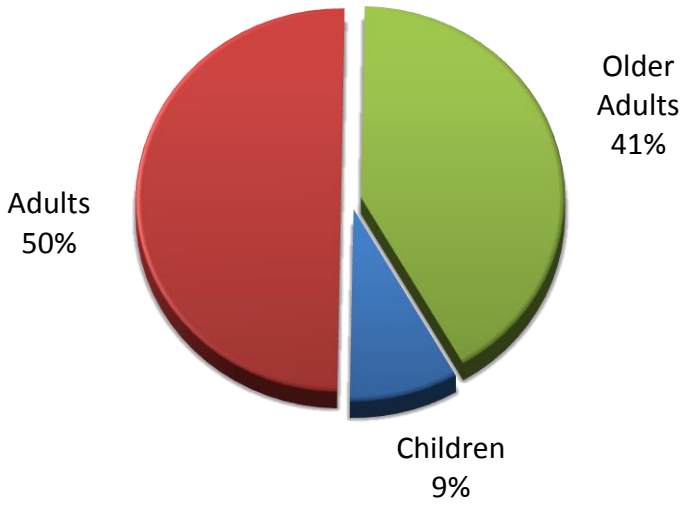
35 Men, 18 Women and 5 Children Under 18 Died from Fires in 2017
Of the 58 fire deaths, 35, or 60%, were men, 18, or 31%, were women and five, or 9%, were children under 18. The following pie chart illustrates the above figures.

Civilian Fire Deaths by Gender

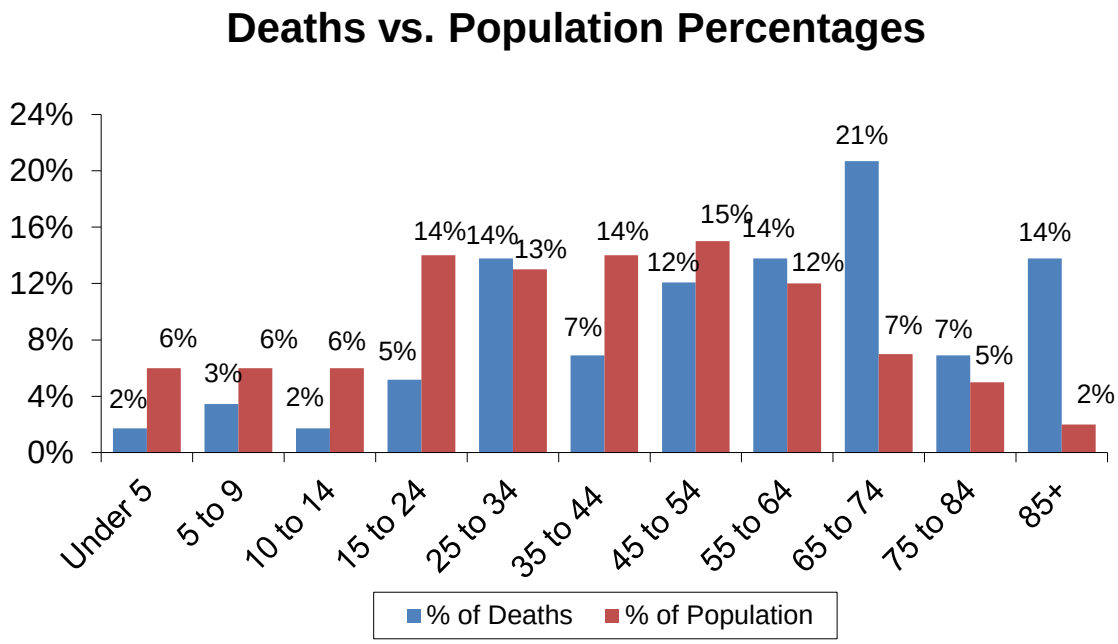
42% of Fire Deaths were Over 65

Twenty-four (24), or 41%, of the civilian fatal fire victims were over 65 years of age. This included 14 elderly men and 10 elderly women. Five (5), or 9%, of the civilian fatal fire victims were under 18 years old. Twenty-nine (29), or 50%, were adults between 18 and 65 years of age. The following pie chart illustrates the above figures.

Civilian Fire Deaths by Age



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 14% of the fire deaths. The risk of fire death for these adults is 6.9. The following graph shows the percentage of fire deaths versus population percentage by age groups in 2017. Other older adults, between the ages of 75 and 84, accounted for 5% of the population but 7% of the fire deaths. Their risk of fire death is at 1.4. Older adults between the ages of 65 and 74 were three 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 3.0. The only other age groups that was at a greater risk were adults between the ages of 25 and 34, and 55 to 64 who were each 1.1 times more likely to die in a fire in 2017.

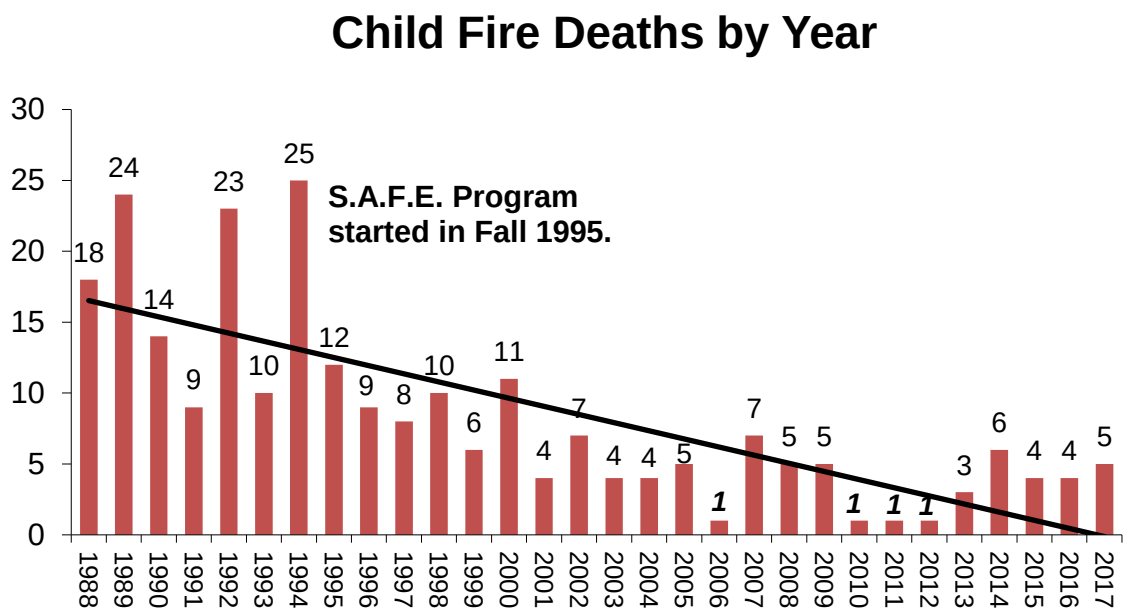


How to Read the Preceding Chart
If an age group represents 10% of the population, we expect it to account for 10% of the fire deaths. If it accounts for a higher percentage of fire deaths than it does for the overall population, that group is at a higher risk of dying in a fire. If the age group accounts 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
Contrary to national trends, children are no longer 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 2017. 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 7% of all fire-related deaths nationally in 2016.[9] In 2017, children under 10 accounted for five, or 9%, of the Massachusetts fire-related deaths.



Child Fire Deaths Drop 40% Since the Start of the S.A.F.E. Program
Fire deaths of children under age 18 have fallen by 40% since the start of the S.A.F.E. Program in the fall of 1995.

Average Annual Child Deaths Down 74%
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 22 full years where the S.A.F.E. Program has been in effect, from 1996 to 2017, the average number of child fire deaths per year has been 5.3. In the 21 years prior to the S.A.F.E. Program, 1973 to 1994, the average number of child fire deaths per year was 20.6. This 74% drop in the average number of child fire deaths is significant when compared to the 48% 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].

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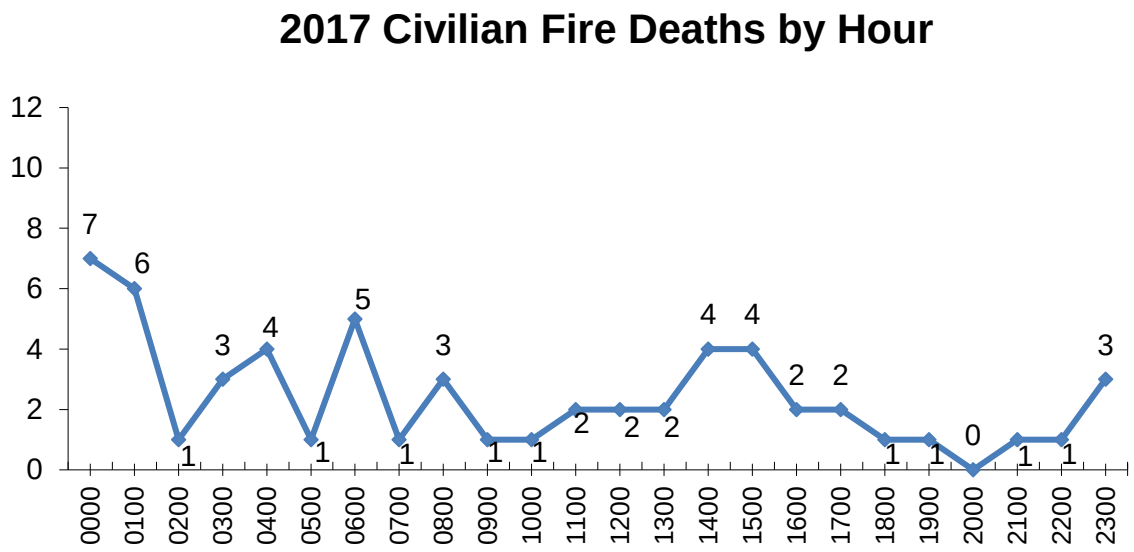
[9] Source: United States Fire Administration's **Fire Risk in 2016, Topical Fire Research Series, Vol. 18 – Issue 6 September 2018.** Most recent national data available.

[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.

57% of People Died in Fires at Night
Over half of the people died in fires that occurred at night, when people are usually asleep. Thirty-two (32), or 56%, 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. The vast majority (75%) of the people who died during 'daytime' fires were intimately involved in ignition, and almost half 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 2017, there were 51 structure fire deaths in 38 fatal fires. All but two of the structure fire deaths occurred in residential occupancies. In 2017, two non-residential structure fires killed two civilians.

- On September 21, 2017, at 9:29 p.m., the North Reading Fire Department responded to a fatal fire on and around a high voltage power line tower. The victim was a 30-year old man whose body ignited as he came into contact with the high voltage wires while he was still in contact with the steel tower. First arriving firefighters discovered the victim's body at the base of the tower. No one else was injured at this fire. It was determined that it was death by suicide. Damages from this fire were not estimated.

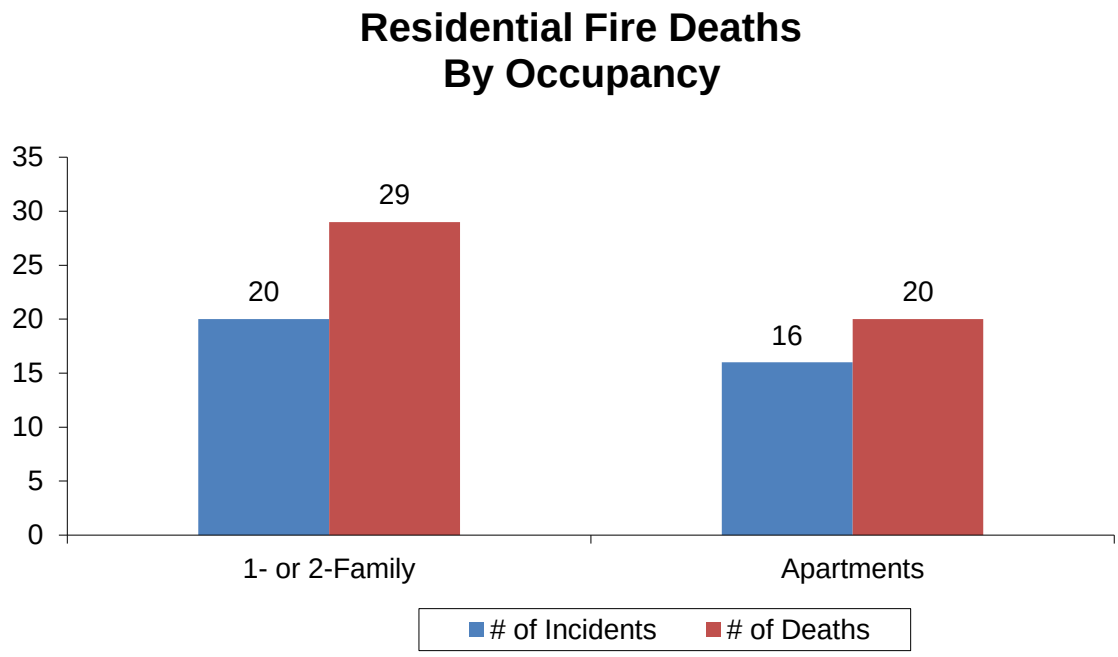
- On November 30, 2017, at 11:59 a.m., the North Adams Fire Department responded to a fatal fire at a dentist office. The victim, a 56-year old man, was at the office to pick up his mother. He had recently filled his car with gasoline, spilling some on his clothes in the process. While he was in the office he tried to get rid of the gasoline smell by igniting the fumes with a lighter. He ignited his clothing. He was transported

to a hospital where he succumbed to his injuries. No one else was injured at this fire. The fire was too small to activate the alarms. The building did not have any sprinklers. The only thing burned was the victim so monetary damages were not estimated.

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 2017, there were 49 fire deaths in 36 fatal residential building fires. This represents 98% of the structure fire deaths and 86% of all fire deaths. Twenty-nine (29) fire deaths occurred in 20 one- and two-family dwellings; and 20 fire deaths occurred in 16 apartment fires. Typically more fatal fires and associated deaths occur in one- and two-family homes than occur in apartment fires or other residential occupancies.

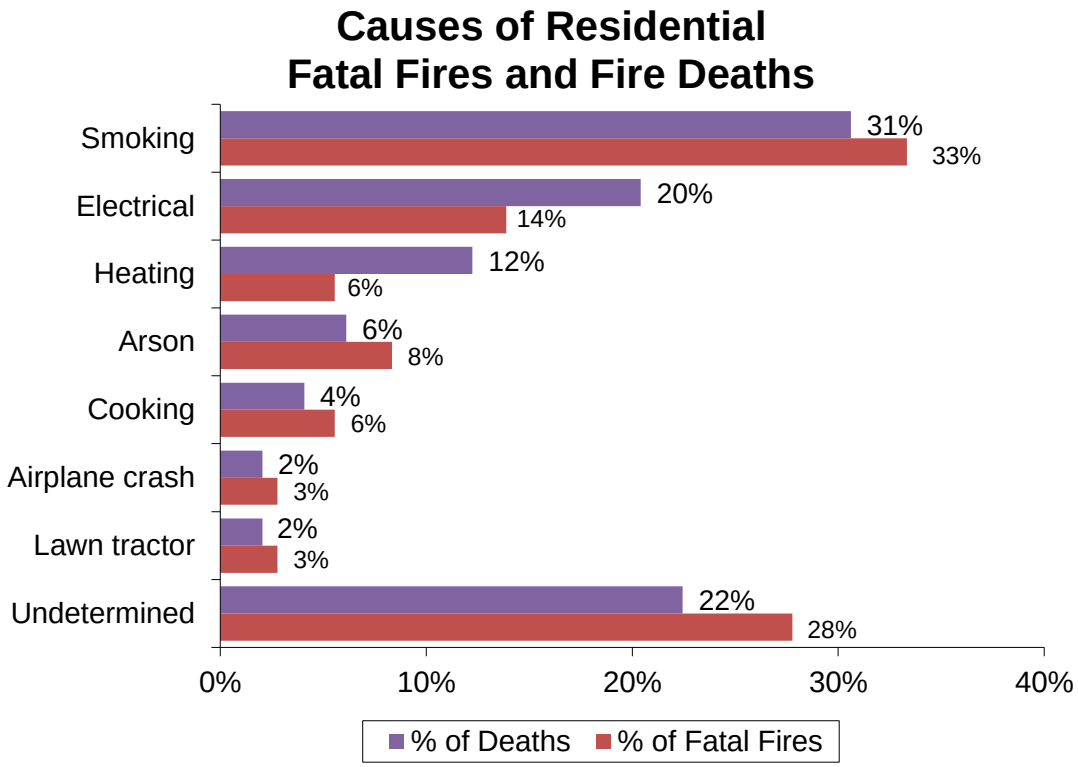


Smoking Fires Are Leading Cause of Fire Deaths
In 2017, careless disposal of smoking materials was the leading cause of residential fire deaths and fatal residential fires. These fires accounted for 15, or 31%, of residential fire deaths. Electrical problems were the second leading cause of fire deaths, accounting for 10, or 20%, of residential fire deaths. Heating equipment caused six deaths, or 12% and arson[11] accounted for three, or 6%. Cooking was the cause of two, or 4% of residential

[11] Two of the three arson fire deaths were self-immolations.

fire deaths. An airplane crash into an apartment building and a lawn tractor each caused one, or 2%, of these fire deaths. Eleven (11), or 22%, 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.



12 Fatal Smoking Fires Cause 15 Deaths in Homes
In 2017, the improper use and disposal of smoking materials caused 15, or 31%, of residential building fire deaths and 12, or 33%, of fatal residential building fires.

9 Elderly Fire Deaths Caused by Smoking
In 2017, nine of the older adult fire deaths were caused by the improper disposal of smoking materials while at home. In 2016 six older adults were killed in smoking fires. Since 2004 older adult fire deaths have increasingly been caused by careless 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 February 14, 2017, at 11:32 p.m., the Malden Fire Department was called to a fatal smoking fire in a four-unit apartment building. The victims, an 81-year old woman and her 86-year old husband were overcome by the heat and smoke. The husband fell asleep while smoking in the living room. The cigarette ignited the furniture. Both victims were asleep at the time of the fire. The wife was transported to a local hospital where she succumbed to her injuries. No one else was injured at this fire. There were no alarms present. Sprinklers were not present. Damages were estimated to be $100,000.

- On March 8, 2017, at 4:02 p.m., the Mansfield Fire Department was called to a fatal smoking fire in a 12-unit apartment building. The fire was started by undetermined smoking materials in the bedroom. The victim, a 62-year old woman fell asleep while smoking. One (1) firefighter was injured at this fire. Alarms were present and alerted the occupants of the building. There were no sprinklers. Damages from this fire were estimated to be $150,000.

- On March 17, 2017, at 3:48 p.m., the Bourne Fire Department was called to a fatal smoking fire in a single-family home. The fire was started by undetermined smoking materials on upholstered furniture in the living room. The victim was a 65-year old woman. One (1) firefighter was injured at this fire. It was undetermined if alarms were present. There were no sprinklers. Damages from this fire were estimated to be $941,041.

- On March 30, 2017, at 12:04 p.m., the Falmouth Fire Department was called to a fatal smoking fire in a single-family home. The fire was started by a cigarette igniting the bedding in the bedroom. The victim was a 43-year old woman who was possibly impaired by drugs. A second occupant tried to drag the victim out of the house but was overcome before he could move her very far. He suffered from smoke inhalation. Smoke alarms were present and operated. There were no sprinklers. Damages from this fire were estimated to be $3,000.

- On April 20, 2017, at 3:51 a.m., the Marlborough Fire Department was called to a fatal smoking fire in a two-family home. The fire was caused by smoking materials in the living room. The victim, a 59-year old physically disabled woman, was in the area of origin and involved with the start of the fire. No one else was injured at this fire. Alarms were present and operated. There were no sprinklers. Damages from this fire were estimated to be $130,000.

- On September 4, 2017, at 11:34 p.m., the Wakefield Fire Department was called to a fatal smoking fire in a six-unit apartment building. The fire was started by a cigarette igniting a mattress in the bedroom. The victim, a 71-year old woman, was in the area of origin and asleep at the time of the fire. No one else was injured at this fire. Alarms were present and operated. The building was not sprinklered. Damages from this fire were estimated to be $150,000.

- On November 22, 2017, at 1:02 a.m., the Boston Fire Department was called to a fatal smoking fire in an eight-unit apartment building. The fire was started by undetermined smoking materials igniting the victim's bedding while he was asleep. The victims, a 33-year old man, died when he jumped in an escape attempt; and a 59-year old man was overcome while he attempted to escape. Three (3) other civilians 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 $1.5 million.

- On December 5, 2017, at 1:25 p.m., the Springfield Fire Department was called to a fatal smoking fire in a single-family home. The fire was started when smoking materials ignited a couch in the basement. The victim was a 69-year old man possibly impaired by alcohol who was in the area of origin and involved in ignition. One (1) firefighter was injured at this fire. It was undetermined if alarms were present. It was undetermined if the home had any sprinklers. Damages from this fire were estimated to be $25,000.

- On Christmas Eve, December 24, 2017, at 2:34 p.m., the Abington Fire Department was called to a fatal smoking fire in a 65-unit apartment building. The fire was started by a cigarette lighter igniting a piece of upholstered furniture in a third-floor bedroom. The victim, who was intimately involved with the start of the fire, was a 71-year old man who was asleep. There were no other injuries at this fire. Alarms were present but did not operate because the batteries were missing. The home did not have sprinklers. Damages from this fire were estimated to be $28,000.

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 2017, four people died in three fires when someone in the home was using oxygen while smoking.

- On February 4, 2017, at 4:26 a.m., the Haverhill Fire Department was called to a fatal smoking fire in a two-unit home. The fire was started by the victim smoking while using home oxygen. The victim, a 68-year-year old man, was possibly impaired by alcohol. Three (3) firefighters were injured at this fire. It was undetermined if alarms were present. It was also undetermined if the home had sprinklers. Damages from this fire were estimated to be $2,000.

- On February 11, 2017, at 1:24 a.m., the Quincy Fire Department was called to a fatal smoking fire in a three-family home. The fire was started by someone smoking while using home oxygen. The victims, a 19-year old man and a 67-year old woman were overcome while trying to escape. Thirteen (13) firefighters were injured at this fire. It was undetermined if alarms were present. The home did not have sprinklers. Damages from this fire were estimated to be $375,000.

- On November 10, 2017, at 5:19 p.m., the West Springfield Fire Department was called to a fatal smoking fire in an 80-unit apartment building. The fire was started by

the victim smoking while using home oxygen. The victim, a 71-year old man, sustained significant burns. EMS crews transported him to a local hospital where he later succumbed to his injuries. There were no other injuries at this fire. Alarms were present but did not operate because the fire was too small. The building did not have sprinklers. Damages from this fire were not estimated.

5 Fatal Electrical Fires Cause 10 Deaths

Ten (10) people died in five residential electrical fires in 2017. Electrical fires accounted for 20% of residential fire deaths and 14% of fatal residential fires.

- On January 1, 2017, at 8:53 a.m., the Holyoke Fire Department was called to a fatal electrical fire in a 24-unit apartment building. The fire was started by arcing in a third-floor living room. The victims were a 48-year old woman, a 55-year old man and a 34-year old man. The 48-year old woman was killed when she jumped in an attempt to escape. The other two victims were trapped and overcome by the fire. Two (2) firefighters were injured at this fire. Alarms were present and operated. There were no sprinklers. Damages from this fire were not estimated.

- On February 10, 2017, at 4:33 a.m., the Fall River Fire Department was called to a fatal electrical fire in a single-family home. A space heater plugged into an extension cord arced and started the fire. The victim, a 50-year old woman, evacuated the building but re-entered the building with a fire extinguisher to try and extinguish the fire. She was overcome after she re-entered the building. No one else was injured at this fire. Alarms were present and alerted the occupants. There were no sprinklers in the home. Damages were estimated to be $15,000.

- On March 6, 2017, at 12:29 a.m., the Milton Fire Department was called to a fatal electrical fire in a single-family home. The fire started in a bedroom. The victims, an 87-year old man and a 91-year old man were both asleep at the time of the fire. Two (2) firefighters were also injured at this fire. Alarms were present and alerted the occupants. There were no sprinklers. The fire caused an estimated $530,000 worth of damage.

- On July 4, 2017, at 6:22 a.m., the Ludlow Fire Department was called to a fatal electrical fire in a single-family home. The fire was caused by an air conditioner in the living room. The victims, an 82-year old man, his 78-year old wife and their 50-year old son were sleeping at the time of the fire and overcome while trying to escape. No one else was injured at this fire. There were no alarms present. Sprinklers were not present in the home. Damages were estimated to be $100,000.

- On July 23, 2017, at 3:21 a.m., the Fall River Fire Department was called to a fatal electrical fire in a three-unit apartment building. The fire was started by arcing in an extension cord in a second-floor living room. The victim, a 74-year old woman was overcome while she attempted to escape. One (1) firefighter was also injured at this fire. Alarms were present but did not operate. There were no sprinklers. Damages from this fire were estimated $30,000.

2 Fatal Heating Fires Caused 6 Deaths
Two (2) fatal heating fires, or 6% of fatal residential building fires, caused six or 12%, of the residential building fire deaths in 2017.

- On March 4, 2017, at 12:45 a.m., the Warwick Fire Department responded to a fatal heating fire at a single-family home. The fire started when combustibles were left too close to the woodstove. The five victims, a 42-year old woman, her seven-year old son, nine-year old daughter, 12-year old son and 15-year old son were all sleeping at the time of the fire. Her 43-year old husband and 10-year old daughter were able to escape with moderate injuries. No one else was injured at this fire. Alarms were present but failed due to a power failure. The home did not have any sprinklers. Damages from this fire were estimated to be $155,000.

- On December 14, 2017, at 7:47 p.m., the Oxford Fire Department responded to a fatal heating fire at a single-family home. The fire was started by a woodstove in the first floor living room. The victim was a 93-year old woman. Two (2) firefighters were injured at this fire. It was undetermined if there were alarms and the building did not have any sprinklers. Damages from this fire were estimated to be $215,000.

3 Fatal Arson Fires Caused 3 Deaths
Three (3) fatal arson fires, or 8% of fatal residential building fires, caused three, or 6%, of the residential building fire deaths in 2017. Two (2) of the three fires were self-immolations.

- On January 29, 2017, at 4:40 a.m., the Lynn Fire Department was called to a fatal self-immolation fire in a 19-unit apartment building. The victim, a 41-year old man, set fire to the living room sectional and forced his estranged wife out of the apartment. No one else was injured at this fire. Alarms were present but it was undetermined if they operated. The victim was intimately involved with the ignition of the fire. The building was not sprinklered. Damages from this fire were estimated to be $500,000.

- On October 16, 2017, at 11:35 a.m., the Leominster Fire Department was called to a fatal arson fire in a vacant and unsecured two-family home. The victim, a 33-year old man who was possibly impaired by drugs, barricaded himself inside the home when police came to serve a warrant. He set fire to the home. No one else was injured at this fire. Alarms were not present and the home was not sprinklered. Damages from this fire were estimated to be $300,000.

- On November 28, 2017, at 12:39 p.m., the Fitchburg Fire Department was called to a fatal self-immolation fire in a six-unit apartment building. The victim, a 58-year old man, started the fire because he was being evicted. 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 $11,500.

2 Killed in 2 Cooking Fires
Two (2) people died in two fatal residential cooking fires in 2017. Cooking fires accounted for 4% of residential fire deaths and 6% of fatal fires in residential buildings.

- On September 25, 2017, at 10:25 a.m., the Beverly Fire Department was called to a fatal cooking fire in a single-family home. The fire was started by a burner on the stove being left on with combustibles too close to the stove. There was much debris throughout the home leading to a hoarding situation. The victim was an 85-year old woman. She was overcome by the smoke. No one else was 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 $350,000.

- On September 27, 2017, at 3:50 p.m., the Melrose Fire Department was called to a fatal cooking fire in a two-family home. The victim, a 101-year old woman was cooking when a stove top fire flared up and her clothing ignited as she tried to extinguish the fire. No one else was injured at this fire. Alarms were present but did not operate because of missing batteries. The building was not sprinklered. Damages from this fire were estimated to be $150,000.

Airplane Crash Caused 1 Deaths
A crash of a single engine 'experimental' airplane into an apartment building caused one fire, or 3% of fatal residential building fires, and one, or 2%, of the residential building fire deaths in 2017.

- On February 28, 2017, at 1:06 p.m., the Methuen Fire Department was dispatched to an airplane crash into a seven-unit apartment building. The victim, a 73-year old man was working flying his single-engine 'experimental' plane when it crashed into the building starting the fire. The pilot was trapped and killed inside the plane. No one else was injured at this fire Alarms were present and alerted the occupants of the building. The building's sprinklers did work to suppress the fire until firefighters arrived and totally extinguished it. Damages from this fire were estimated to be $250,000.

Lawn Tractor Fire Caused 1 Deaths
A lawn tractor started one fire, or 3% of fatal residential building fires, and caused one, or 2%, of the residential building fire deaths in 2017.

- On April 24, 2017, at 9:05 a.m., the East Bridgewater Fire Department was dispatched to a fatal fire in a single-family home. The victim, an 86-year old man was working on his lawn tractor when it caught fire and spread to his clothes and the deck. No one else was injured at this fire. Alarms were present and operated. The building did not have any sprinklers Damages from this fire were estimated to be $242,400.

10 Fatal Fires of Undetermined Cause
Ten (10) fatal residential building fires that took the lives of 11 Massachusetts residents in 2017 remain undetermined. These represent 28% of the fatal residential fires, and 22%

of the residential fire deaths in 2017. 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 23, 2017, at 3:55 a.m., the Belmont Fire Department was dispatched to a fire in a two-family home of undetermined cause. The victim, a 20-year old man, was overcome as he tried to escape. Two (2) firefighters were also injured at this fire. Alarms were present but did not operate. The building was not sprinklered. Damages from this fire were estimated to be $450,000.

- On February 17, 2017, at 6:26 a.m., the Lowell Fire Department was called to a fatal fire in a three-unit apartment building of undetermined cause. The fire started in a first floor kitchen. The victim, a three-year old boy, was sleeping at the time of the fire. His 27-year old father was injured attempting to rescue him. It was undetermined if alarms were present and the building was not sprinklered. Damages from the blaze were estimated to be $290,000.

- On March 18, 2017, at 1:36 a.m., the Winthrop Fire Department was called to a fatal fire in a single-family home of undetermined cause. The fire originated in the second floor bedroom. The victim was a 72-year old man who was sleeping 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 not present, and the building was not sprinklered. Damages from the blaze were estimated to be 150,000.

- On March 28, 2017, at 4:03 p.m., the Brockton Fire Department was dispatched to a fire in a 12-unit apartment building of undetermined cause. The fire started in a third floor kitchen. The victim, an 82-year old physically disabled man was unable to act. No one else was injured at this fire. Smoke alarms were present and alerted the occupants. The building was not sprinklered. Damages from this fire were estimated to be $250,000.

- On June 17, 2017, at 2:58 p.m., the Westfield Fire Department was dispatched to a fire in a single-family home of undetermined cause. Firefighters had a difficult time fighting this fire and locating the victims because of hoarding conditions. The victims were a 92-year old woman and a 54-year old woman. There were no other injuries associated with this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from this fire were estimated to be $70,000.

- On September 4, 2017, at 1:24 a.m., the Lawrence Fire Department was called to a fatal fire in a three-unit apartment building of undetermined cause. The victim, 37-year old man, was in the general area of origin of the fire and was overcome by the smoke as he tried to escape. He was transported to a local hospital and died months

later from his injuries. Two (2) firefighters were also injured at this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from the blaze were estimated to be $150,000. The fire spread to a neighboring building and caused another $10,000 in damages.

- On October 2, 2017, at 7:21 a.m., the Grafton Fire Department was dispatched to a fire in a 5-unit apartment building of undetermined cause. The victim was a 69-year old man. He was transported to a local hospital and succumbed to his injuries. Someone in the home used oxygen. There were no other injuries associated with this fire. Alarms were present and alerted the occupants of the building. The building was not sprinklered. Damages from this fire were estimated to be $240,000.

- On November 11, 2017, at 5:06 a.m., the Holyoke Fire Department was called to a fatal fire in a single-family home of undetermined cause. The victim was a 30-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 not estimated.

- On November 19, 2017, at 10:56 p.m., the Braintree Fire Department was called to a fatal fire in a single-family home of undetermined cause. The victim was 46-year old man. No one else was injured at this fire. Alarms were not present. The building was not sprinklered. Damages from the fire were estimated to be $450,000.

- On November 20, 2017, at 3:23 p.m., the Springfield Fire Department was called to a fatal fire in an eight-unit apartment building of undetermined cause. The fire started in the attic. The victim, a 32-year old woman, is believed to have been in the area of origin. One (1) firefighter 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 $60,000.

Bedroom or Living Room is the Area of Origin for Over 1/2 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 57% were killed in fires that started in bedrooms or living rooms; 15 victims, or 31%, died in fires that began in the bedroom, and 13, or 28%, succumbed to fires that originated in the living room. Eleven (11) victims, or 23%, died when the area of origin was the kitchen. Bar areas were the area of origin of the fire for two, or 4%, of the residential fire deaths in 2017. An unclassified function room, a basement, a ceiling and floor assembly, an attic, and a courtyard, patio or terrace were each the area of origin of the fire for one, or 2%, of the residential fire deaths in 2017. Three (3) victims, or 6%, died in fires where the area or origin was undetermined or not classified.

33% of Deaths Involved Smoking Materials as a Heat Source
Of the 49 residential building fire deaths, 33% involved smoking materials; 16% from cigarettes, 12% from undetermined smoking materials, 2% from lighters, and 2% from non-classified open flame or smoking materials. Thirty-seven percent (37%) were

classified as heat from operating equipment; 14% from arcing, 10% from radiated or conducted heat from operating equipment, 8% from non-classified heat from operating equipment, and 4% from sparks, embers or flames from operating equipment. Unclassified hot or smoldering object and heat from direct flame were each the heat source in 2% of these deaths. The *Heat Source* was undetermined or unclassified in 13 deaths, or 27%, of the residential building fire deaths in 2017.

Upholstered Sofa or Chair Was the Leading Item 1st Ignited

Of the 49 residential building fire deaths, upholstered sofas or chairs were the item first ignited in 12% of these deaths. Bedding was the item first ignited in 10% of residential fire deaths. A mattress or pillow was the item first ignited in 6%. Electrical wire or cable insulation and unclassified furniture or utensils were each involved in 4%. Exterior sidewall covering, unclassified soft goods or wearing apparel, wearing apparel not on a person, a person living or dead, cooking materials, and a book were each the item first ignited in 2% of these fire deaths. Multiple items was also the item first ignited in 2% of these deaths. The item first ignited was undetermined or unclassified in 24, or 49%, of the residential building fire deaths in 2017.

Alarm Operation Undetermined for 27% of Residential Fire Victims

Of the 49 people who died in residential building fires in 2017, the smoke alarm performance was reported for 36 of the victims. Victims were not alerted by smoke alarms in ten fires that killed 17 people, or 35% of the victims. No alarms were present at all in five fires that were responsible for eight, or 16%, of the deaths. In another five fires and nine deaths, or 18%, there were alarms present but they failed to operate.

Eighteen (18) people died in 14 separate residential fires with alarms that did operate, accounting for 37% 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.

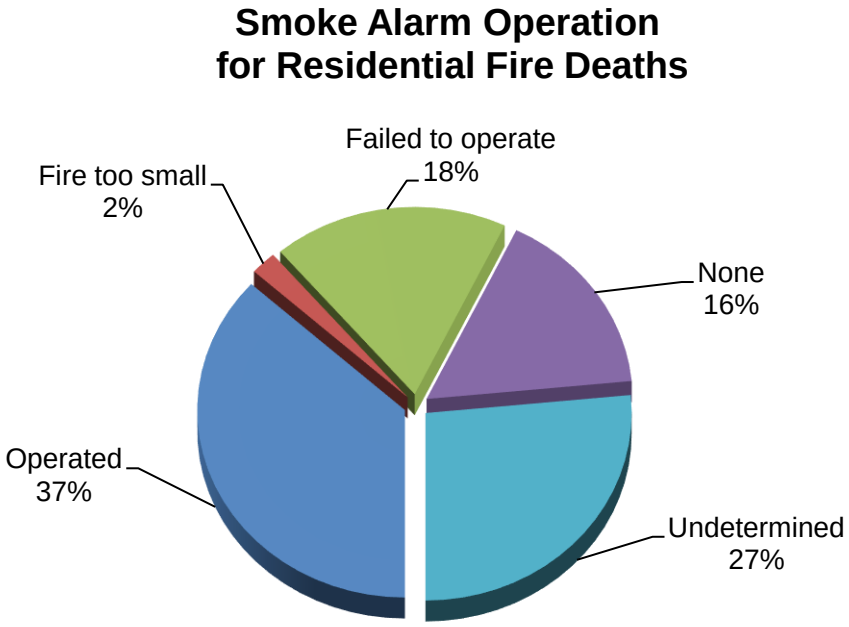
One (1) person, or 2%, died in a fire where the fire was too small to activate the alarm.

In 2017, 11 of the 18 fatal residential fire victims whose smoke alarms operated were in the area of origin. Ten (10) of these victims were intimately involved with ignition; five died in smoking fires, two died in electrical fires, one was the pilot of a plane that crashed into a building, one was working on a lawn tractor and the other was a suicide.

In 2017 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 11 residential building fires that killed 13 people, accounting for 27% of the residential building fire deaths in 2017. In one of these fires and one death the alarms were present but it was undetermined if they operated. The

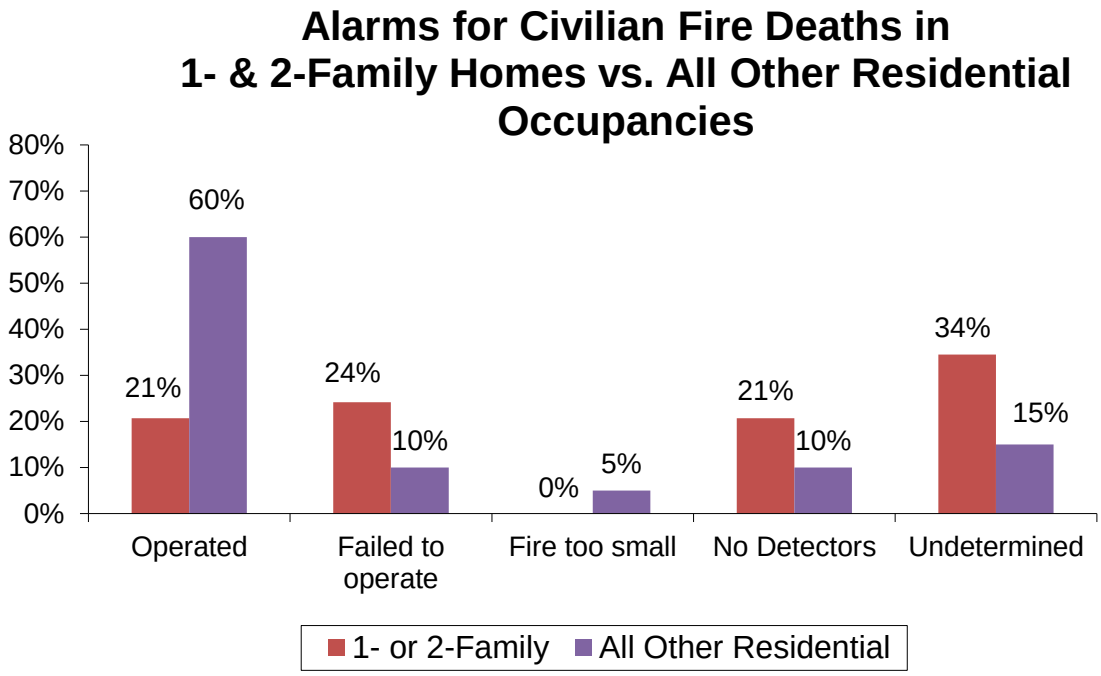
pie chart shows the smoke alarm status as a percentage of the civilian residential building fire deaths in 2017.



No Working Smoke Alarms in 45% of Fire Deaths in 1 & 2-Family Homes
In 2017, 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 53% more fire deaths in one- and two-family homes than all other residential occupancies combined. Twenty-nine (29) people died in 20 one- and two-family dwelling fires in 2017. Thirteen (13), or 45%, 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, seven occurred in a home where smoke alarms failed to work while the other six deaths were in homes where there were no smoke alarms present. Six (6) deaths, or 21%, occurred in homes where the smoke alarms operated. There were no deaths when the fire was too small to activate the alarm. Ten (10) deaths, or 34%, occurred in eight fires where smoke alarm performance was undetermined.

Other Residential Occupancies More Likely to be Protected by Smoke Alarms
Twenty (20) people died in 16 apartment fires in 2017. The alarm performance was known for 17 of the victims. Twelve (12) people died in fires where smoke alarms were present and working. Two (2) people were killed in fires where the alarm failed to operate, and another two people died in apartment fires where there were no alarms. One (1) person died when the fire was too small to activate the alarm. Three (3) people died in three 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.



9 Alarms Failed
Of the nine residential fire deaths where smoke alarms were present but failed to operate, five failed because of a power failure, shutoff or disconnect. Two (2) failed to operate because of missing batteries, and it was undetermined why the other three alarms failed.

36% of Older Adults Died in Fires with No Working Alarms
Eight (8), or 33%, of the 24 senior residential fire deaths had no working smoke alarms. Eight (8) senior deaths, or 33%, occurred where there were operating alarms. One (1) senior, or 4%, died in a fire where the fire was too small to activate the alarm. Seven (7) seniors, or 30%, 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.

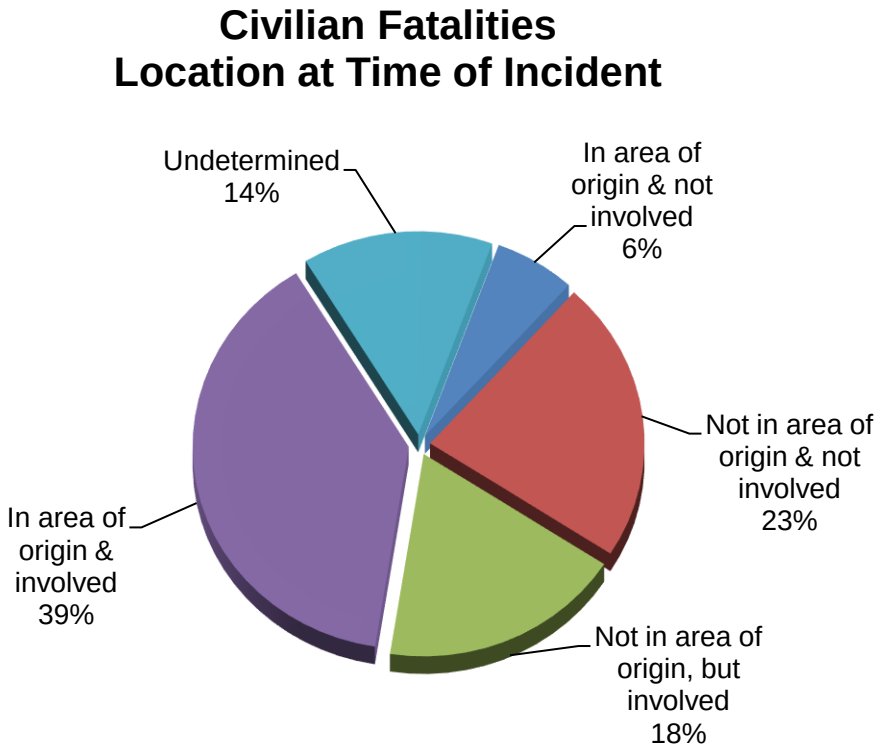
Sleeping Led Human Factors Contributing to Injury[12]
Of the 49 fatal residential building fire victims, 24 had a *Human Factor Contributing to Injury* reported in MFIRS. Thirty-one percent (31%) of the victims were asleep; 8% were possibly impaired by alcohol; 8% were possibly impaired by a drug or chemical; 6% were bedridden or had another physical handicap; 6% were possibly mentally disabled; and 2% were unattended or unsupervised persons. Twenty-five (25), or 51%, of the 49 civilian fire deaths did not report a human factor contributing to injury.

[12] 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.

20% of Victims Were Escaping When They Were Overcome
Ten (10), or 20%, of the 49 fatal fire victims were trying to escape when they incurred their fatal injuries. Nine (9), or 18%, were sleeping when they were fatally injured. Seven (7) victims, or 14%, were unable to act. Two (2) victims, or 4%, were acting irrationally when they were injured; and another two victims, or 4%, returned to the vicinity of the fire before it was under control. One (1) person, or 2%, was killed trying to rescue someone else; and another person, or 2%, was trying to extinguish the fire when they were overcome. Activity at time of death was undetermined or not reported for 17, or 35%, victims of fatal residential fires in 2017. Working smoke alarms combined with a home escape plan are essential to escape a fire.

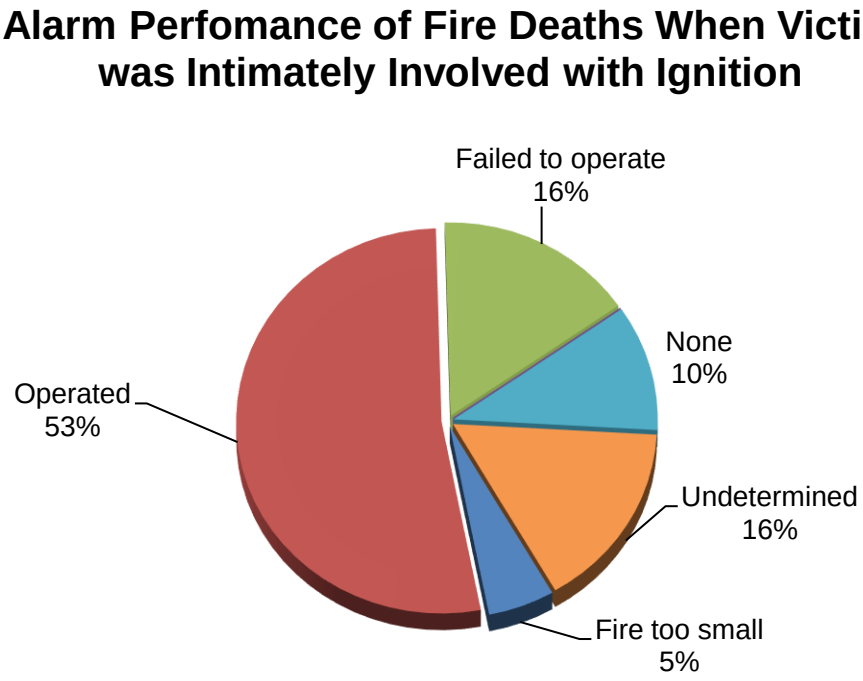
76% of the Victims Suffered Burns, Smoke Inhalation or Both
Burns or smoke inhalation was the primary apparent symptom for 41, or 76%, of the victims; 30, or 61%, suffered burns and smoke inhalation; six, or 12%, suffered from smoke inhalation only, and one, or 2%, just had thermal burns. Respiratory arrest was the reported primary apparent symptom for one, or 2%; and internal trauma was the primary apparent symptom for one, or 2% of these victims. There were 10 deaths, or 21%, where the primary apparent symptom was undetermined or not reported.

Over 1/2 of All Fatalities Were Somehow Involved in Ignition
Twenty-eight (28), or 57%, of the residential fatal fire victims were somehow involved with the start of the fire that eventually killed them. Nineteen (19), or 39%, of these victims were in the area of origin and intimately involved with the ignition of the fire that killed them, and nine, or 18%, 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. Three (3), or 6%, were in the area of origin but not involved in the fire's ignition. Eleven (11), or 23%, 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 seven, or 14%, of the residential fatal fire victims.



1/2 of Alarms Operated When the Victim Was Intimately Involved in Ignition
There were 19 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. Ten (10), or 53%, of these 19 victims actually had a working smoke alarm in their home at the time of the fire. Two (2) fire deaths, or 11%, did not have any smoke alarms. In three of these deaths, or 16%, there were alarms present in the home but they failed to operate. In one, or 5%, of these deaths the fire was too small to activate the alarm. It was undetermined in three, or 16%, of these deaths if there were any alarms.

In the case of the 10 victims where the alarms operated and were involved with the ignition, five were smoking fires, two were electrical fires, one was an irrational act, one was an older adult who crashed his plane into a building, and the other was an older adult working on a lawn mower. Four (4) of these victims were older adults.



Fatal Motor Vehicle Fires

In 2017, seven motor vehicle fires killed seven 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. Four (4) of these fires and the four of the accompanying deaths involved motor vehicle crashes. One (1) of these fires involved a stuck car igniting brush underneath the car with the fire consuming the car. Two (2) of these fire were undetermined. None involved death by suicide.

4 Motor Vehicle Crashes Kill 4 Occupants
Four (4) motor vehicle fires and the subsequent four deaths were caused by motor vehicle crashes. These incidents accounted for 9% of the fatal fires and 7% of the fire fatalities in the Commonwealth in 2017.

- On January 15, 2017, at 2:19 a.m., the Mansfield Fire Department was called to a fatal motor vehicle crash with ensuing fire. The victim, a 32-year old woman, 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 $11,000.

- On April 12, 2017, at 4:14 a.m., the Winchendon Fire Department was called to a fatal motor vehicle crash with ensuing fire between a tractor trailer and an SUV. The driver of the tractor trailer, a 61-year old man was not able to escape. Damages were estimated to be $200,000.

- On August 10, 2017, at 6:43 p.m., the Weymouth Fire Department was called to a fatal motor vehicle crash with ensuing fire. A motorcycle collided with a car and both vehicles ignited. The victim, a 47-year old man and driver of the motorcycle was on fire near both of the vehicles. Damages were estimated to be $5,500 for the motorcycle and $15,000 for the car.

- On October 2, 2017, at 5:44 p.m., the Lee Fire Department was called to a fatal motor vehicle crash with ensuing fire on Interstate 90 (Massachusetts Turnpike). A tractor trailer rear-ended another truck and ignited. The driver of the tractor trailer, a 31-year old man, was trapped inside and could not be freed by good Samaritans. Damages were not estimated.

1 MV Fire Kills 1 Occupant
One (1) motor vehicle fire killed one person in 2017. This incident accounted for 2% of the fatal fires and 2% of the fire fatalities in the Commonwealth in 2017.

- On March 18, 2017, at 2:01 p.m., the Attleboro Fire Department was dispatched to a motor vehicle fire in an open field near a cemetery. It is believed that the driver and only occupant of the vehicle got the car stuck in the field and then the hot components of the car ignited nearby combustibles. The car burst into flames and the victim, a 71-year old man was trapped inside the vehicle and could not be rescued. No one else was injured in this fire. Damages from this fire were not estimated.

2 Undetermined Motor Vehicle Fires Kill 2 Occupants
Two (2) motor vehicle fires and the subsequent two deaths were undetermined. These incidents accounted for 5% of the fatal fires and 4% of the fire fatalities in the Commonwealth in 2017.

- On February 2, 2017, at 6:14 a.m., the Lawrence Fire Department was called to a fatal motor vehicle fire of undetermined cause. Firefighters found a pickup truck on fire behind an auto body shop with a person inside it. It is believed that the victim, a 56-year old man, had been living in the truck and died in the fire. No one else was injured at this fire. Damages from this fire were estimated to be $1,000.

- On April 9, 2017, at 3:48 p.m., the Mansfield Fire Department was called to a fatal motor vehicle fire on Interstate 95 of undetermined cause. The driver of the care, a 45-year old man was not able to escape the car. Damages were estimated to be $2,100.

Other Fatal Fires

In 2017, there were no outside fires that killed any civilians.

Multiple Fire Deaths

For statistical purposes, a fire is considered a multiple death fire if it kills three or more people. In 2017, there was three multiple death fires in Massachusetts. The first was the fire in Holyoke on January 1, 2017 that killed three adults. The second was in Warwick on March 4, 2017 that killed five of seven family members. The third multiple death fire was in Ludlow on July 4, 2017 that killed adult members of the same family.

Civilian Fire Deaths - Conclusion

58 Civilians Died in Massachusetts Fires
In 2017, there were 45 fatal fires in Massachusetts with 58 accompanying fatalities. This is the same number of civilian fire deaths reported in 2016. Of these 58 deaths, 49 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. Forty-eight (48) of the 49 fatal structure fire victims died in residential building fires. Twenty-nine (29) of these deaths occurred in one- or two-family homes, accounting for 50% of all fire deaths.

Smoking Fires Are Leading Cause of Fire Deaths
In 2017, smoking fires were the leading cause of residential fire deaths and fatal residential fires. These fires accounted for 15, or 31%, of residential fire deaths. Electrical fires were the second leading cause of fire deaths, accounting for 10, or 20%, of residential fire deaths. Heating equipment caused six, or 12% of residential fire deaths.

5 Children Died in a Fire
Five (5) children under the age of 18 died in fires in Massachusetts in 2017. A three-year old boy died in residential fire of undetermined cause. Four (4) children, all brothers and a sister, a seven-year old boy, a nine-year old girl, a 12-year old boy and a 15-year old boy, all died in a heating fire in their single-family home.

41% of All Fire Deaths are Older Adults
Twenty-four (24) older adults died in fires, accounting for 41% of all fire deaths in Massachusetts in 2017. Historically, the lack of working smoke alarms is a significant factor in senior fire deaths. In 2017, seven of the 22 senior residential fire deaths had working smoke alarms; five of the deaths occurred in a fire with no alarms at all; three occurred in fires where the alarms did not operate; one happened where the fire was too small to activate the alarm and in the other seven deaths it was undetermined if alarms were present or if they operated.

Older Adults at Significant Risk for Fire Death
Older adults, especially those over the ages of 75 had a significant risk of dying in a fire. The risk of fire death for adults over the age of 85 is 6.9 and those adults between the ages of 75 and 84 is 1.4. Older adults between the ages of 65 and 74 were three times more likely to become a fire-related fatality.

56% of People Died in Fires While They Slept
Over half of the people who died in fires died while they slept. Thirty-two (32), or 56%, of the fire victims died in fires that occurred between 10:00 p.m. and 7:00 a.m.

37% of Fatalities Had Working Smoke Alarms
Thirty-seven percent (37%) 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. Fifty-five percent (55%) of the victims died in fires that began in either the bedroom or living room. Upholstered sofa and chairs were the leading item first ignited. Also, when Primary Apparent Symptom was reported, 76% of the victims suffered burns, smoke inhalation or both.

44% of Fatalities Were in the Area of Origin
Twenty-two (21), or 45%, of all the civilians that died in residential fires were reported to be in the area of fire origin. Nineteen (19) 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.

3 Suicides – Continues Tragic Trend
In past years there were a tragic number of people who used fire to take their own lives. In 2017, there were three confirmed deaths by suicide. All three were by self-immolation, two at home and one on a high voltage steel electrical tower. In 2016 there were three. In the past 10 years there have been 44 civilian fire deaths by suicide. In the past five years there's been 13 civilian fire deaths by suicide.

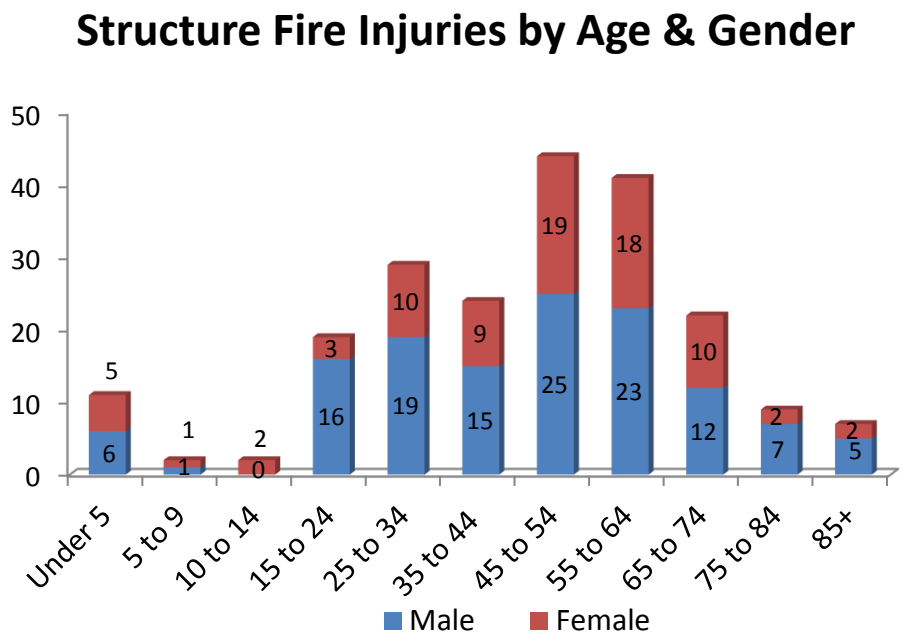
Civilian Injuries

269 Civilians Injured in Fires in 2017 – Mostly at Home
Massachusetts' fires injured 269 civilians in 2017. Two hundred and ten (210), or 78%, of civilian injuries occurred in structure fires. One hundred and ninety-three (193) injuries occurred in residential building fires, accounting for 72% of all injuries and 92% of all structure fire injuries. Nineteen (19), or 7%, occurred in motor vehicle fires.
Forty (40), or 15%, of civilian injuries occurred in outside and other fires. Special outside fires accounted for 14, or 5%, of all civilian injuries, and

brush fires also accounted for six, or 2%, of civilian fire injuries. Outside rubbish fires accounted for one, or less than 1% of all civilian fire injuries. Nineteen (19), or 7%, of civilian injuries were caused by unclassified fires.

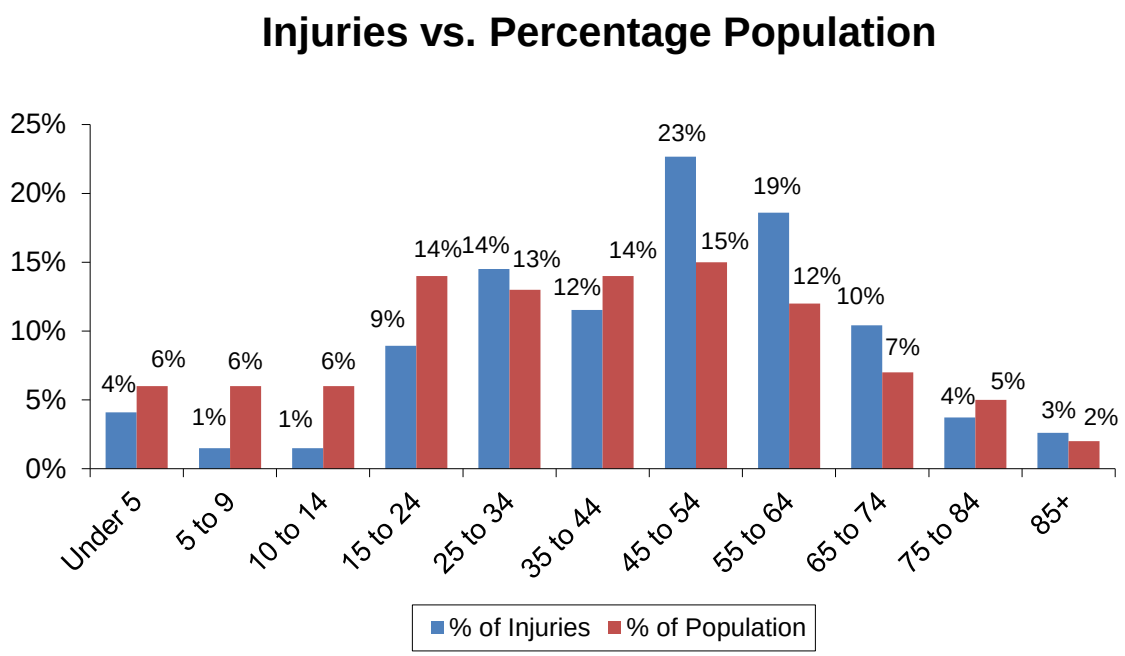
Structure Fire Injuries

Of the 210 civilian injuries resulting from structure fires where gender was reported, 129, or 61%, were men and 81, or 39%, were women. Overall, 19 children under 18 years of age, 153 adults aged 18 to 64 years old, and 38 older adults over the age of 65, were injured in structure fires in 2017. The following chart illustrates the structure fire injuries by age and gender in 2017.



Adults 45 to 64 at High Risk for Fire Injury
Adults between the ages of 45 and 54 represent 15% of the population and yet they accounted for 23% of the injuries in 2017. Adults between the ages of 55 and 64 represent 12% of the Massachusetts population, yet they accounted for 19% of the injuries at structure fires in 2017. 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. In these age groupings, 54% of the fire-related injuries were incurred while trying to control the fire, and 19% were injured trying to escape. Adults 25 to 34 and older adults between the ages of 65 and 74 and over the age of 85 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.



83% of Injuries Were Directly Related to Exposure to Fire Products
Of the 183 civilian injuries in structure fires where the *Cause of Injury* was known, 84% were directly linked to exposure to fire products. The *Cause of Injury* was not reported or Undetermined in 27 civilian fire injuries. These were excluded from the percentage calculations

Cause of Injury	# of Injuries	% Known Injuries
Other	7	4%
Exposed to fire products	153	84%
Exposed to hazmat or toxic fumes	12	7%
Jumped in escape attempt	1	1%
Fell, slipped or tripped	1	1%
Caught or trapped	3	2%
Structural collapse	0	0%
Struck by or contact w/object	2	1%
Overexertion	3	2%
Multiple causes	1	1%
Total Known	183	100%

84% of Injuries Were Due to Smoke Inhalation or Burns or Both
Of the 161 civilian injuries in structure fires where the *Primary Apparent Symptom* was known, 82% were caused by smoke inhalation, burns or both. The nature of injury was undetermined or not reported in 49 civilian fire injuries. These were excluded from the percentage calculations.

Primary Apparent Symptom	# of Injuries	% Known Injuries
Smoke inhalation	56	35%
Burns only, thermal	53	33%
Burns & smoke inhalation	23	14%
Breathing difficulty, shortness of breath	10	6%
Hazardous fumes inhalation	5	3%
Burn, scald	3	2%
Cut or laceration	3	2%
Sickness, other	2	1%
Cardiac symptoms	1	1%
Disorientation	1	1%
Emotional/psychological stress	1	1%
Pain only	1	1%
Shock	1	1%
Strain or sprain	1	1%
Total Known	161	100%

44% Injured While Trying to Control the Fire

Of the 144 victims for whom A*ctivity at Time of Injury* was known, 44% were attempting to control the fire. There were 66 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	64	44%
Escaping	36	25%
Other	16	11%
Sleeping	16	11%
Return to vicinity of fire before control	5	3%
Rescue attempt	4	3%
Unable to act	2	1%
Irrational Act	1	1%
Return to vicinity of fire after control	0	0%
Total known	144	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.

1/2 of Victims Were Asleep Just Before the Injury

Of the 40 victims for which the *Human Factor Contributing to the Injury* was known, 50% 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 following table 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		Mentally Disabled	Physically		Unsuper-vised	None
			Alcohol	Drugs		Disabled	Restrained		
Escaping	6	0	0	0	0	1	0	0	26
Rescue attempt	1	0	0	0	0	0	0	0	2
Fire control	0	1	3	1	2	1	0	0	44
Return before fire control	0	0	0	0	0	0	0	1	3
Return after fire control	0	0	0	0	0	0	0	0	0
Sleeping	8	0	0	0	0	1	0	0	5
Unable to act	0	0	0	0	0	1	0	0	0
Irrational act	0	0	0	0	0	0	0	0	1
Other	0	0	0	1	0	0	0	0	14
Unknown	3	0	0	0	0	1	0	1	22
Total	20	1	3	2	2	5	0	2	117

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.

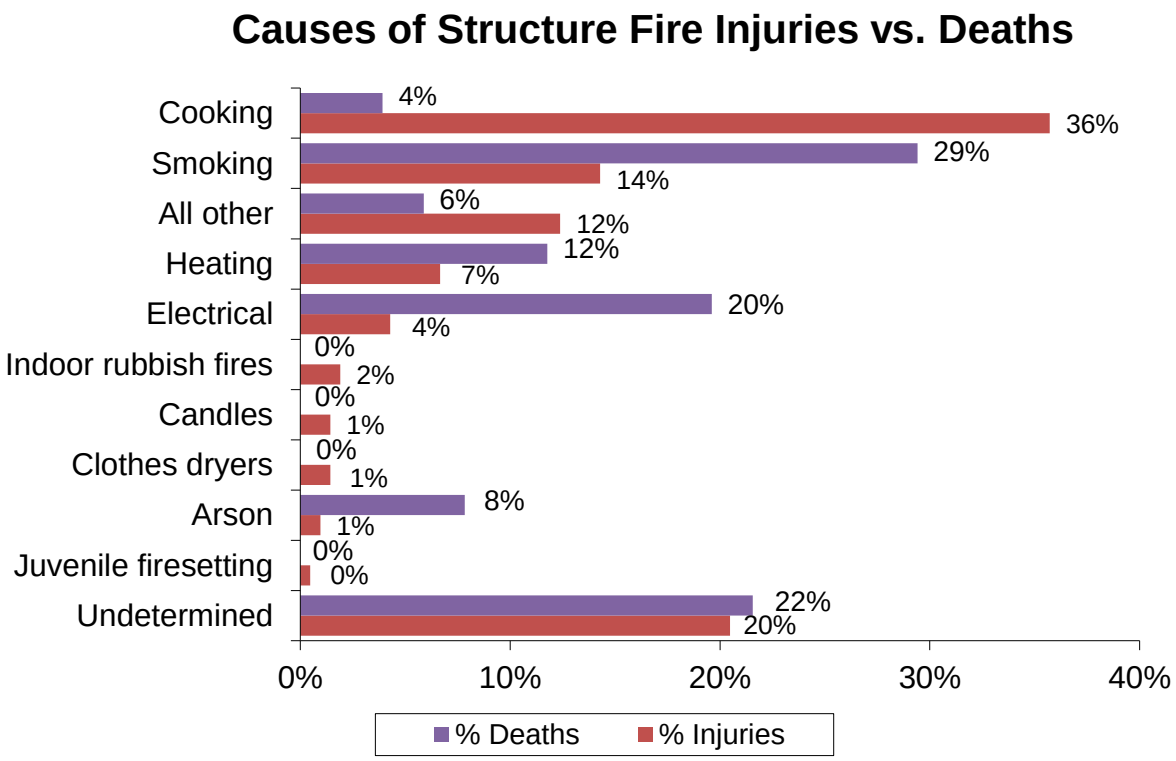
42% of All Victims Were Involved With the Ignition of the Fire

Forty-two percent (42%) 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 59 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	55	36%
Not in area of origin & not involved	32	21%
Not in area of origin & involved	9	6%
In area of origin & involved	55	36%
Total Known	151	100%

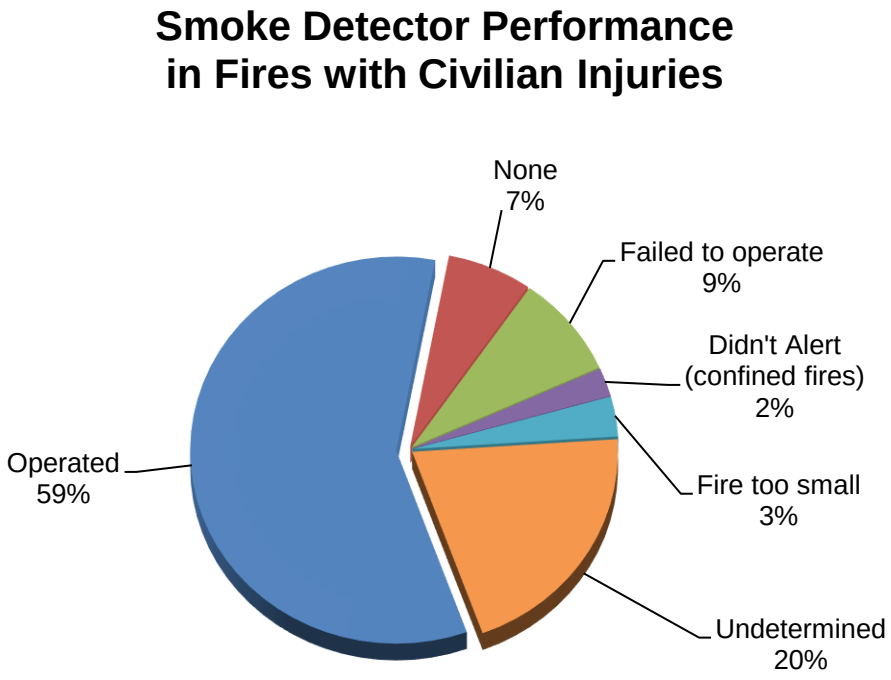
Cooking Fires Were the Leading Cause of Injuries in Structure Fires

The leading cause of fire-related injuries is most often not the leading cause of fire-related deaths. Cooking fires caused one quarter, or 36% of civilian fire injuries and only 4% of civilian fire deaths.



Alarms Operated in 59% of Civilian Injuries

Of the 210 injuries where alarm status was reported, 59% occurred where smoke alarms were present and operated. Smoke alarm performance was undetermined in 43 injuries, or 20% 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 19 motor vehicle fire injuries in 2017, accounting for 7% of all civilian fire injuries. Sixteen (16) of these injuries were to men and three were to women. Ninety-three percent (93%) 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	14	93%
Struck by or contact w/object	1	7%
Total	15	100%

When the *Primary Apparent Symptom* was reported, 60% of these were reported as burns only.

Primary Apparent Symptom	# of Injuries	% Known Injuries
Burns only, thermal	9	60%
Burns & smoke inhalation	2	13%
Cut or laceration	2	13%
Breathing difficulty, shortness of breath	1	7%
Pain only	1	7%
Total	15	100%

Where the *Activity at Time of Injury* was known, 33% were trying to extinguish the fire. There were four injuries 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
Other	4	27%
Escaping	4	27%
Fire control	5	33%
Unable to act	1	7%
Irrational act	1	7%
Total	15	100%

The causes of motor vehicle fires that injured civilians in 2017 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

Forty (40), or 15%, of civilian fire injuries occurred in outside and other fire incidents in 2017. Fourteen (14), or 35%, of civilian injuries were caused by brush fires.

Incident Type	# of Injuries	% of Outside & Other Fire Injuries	% Total Injuries
Fire - Other	19	48%	7%
Brush Fire	6	15%	2%
Outside rubbish fire	1	3%	0.4%
Special outside fire	14	35%	5%
Total	40	100%	15%

Sixty-three percent (63%) of the civilian victims were men and 37% were women.

Burns accounted for 60% of the injuries to this group, when the *Primary Apparent Symptom* was known. There were 10 injuries where the activity at time of injury was unknown; these were excluded from the percentage calculations.

Primary Apparent Symptom	# of Injuries	% Known
Smoke inhalation	4	13%
Breathing difficulty, shortness of breath	3	10%
Burns and smoke inhalation	3	10%
Burns only: thermal	18	60%
Emotional/psychological stress	1	3%
Pain only	1	3%
Total	41	100%

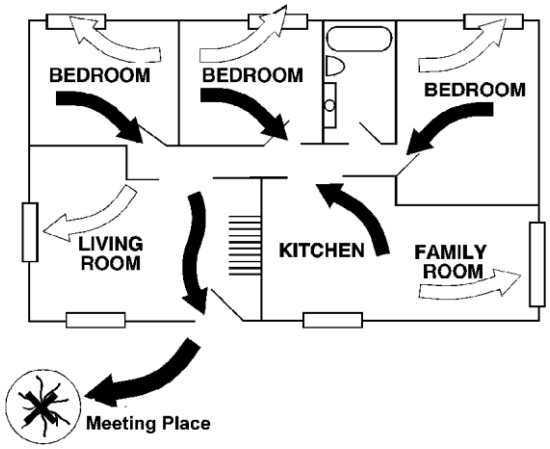
The victims were intimately involved with the ignition in 68% of these injuries where *Location at Ignition* was known. There were 12 injuries where the activity at time of injury was unknown; these were excluded from the percentage calculations.

Location at Ignition	# of Injuries	% Known Injuries
In area of origin & not involved	8	29%
Not in area of origin & not involved	1	4%
Not in area of origin & involved	0	0%
In area of origin & involved	19	68%
Total	28	100%

Safety Practices Are the Best Prevention Methods

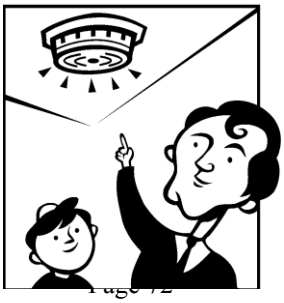
In a typical nighttime fire, there is a window of 1-3 minutes in the average home after the smoke alarm sounds for the family to get out safely. In a few minutes, heat and toxic gases make escape impossible. To survive a fire, one must install and maintain smoke alarms, and when possible install sprinklers. 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.

2017 Firefighter Deaths

2 Fire-Related Firefighter Deaths in 2017

In 2017, there were two fire-related fire service fatalities in two fires in the Commonwealth of Massachusetts. In the past five years there have been four fire-related fire service deaths for an average just under one fire-related fire service death per year.

Watertown FF Joseph A. Toscano

Montgomery Chief Stephen P. Frye

Watertown 3/17/17 - FF Joseph A. Toscano, Age 54
On Friday, March 17, 2017, at 10:16 a.m., the Watertown Fire Department was called to a smoking fire in a single-family home at 29 Merrifield Avenue. FF. Joseph Toscano was inside the building performing suppression duties with the rest of his crew when he suddenly collapsed. His brother firefighters extricated him from the home and immediately began CPR at the scene. He was transported to Mt. Auburn Hospital where he succumbed to his medical issues, he was 54-years old.

Montgomery 12/5/17 - Chief Stephen P. Frye, Age 59
On Tuesday, December 5, 2017, at 11:08 p.m., the Montgomery Fire Department was called to a chimney fire in a single-family home at 1524 Southampton Rd. Chief Stephen Frye was coordinating suppression efforts outside of the building when he suddenly collapsed. His brother firefighters immediately rendered first aid at the scene. He was transported to Baystate Noble Hospital in Westfield where he was pronounced deceased, he was 59-years old.

Fire Service Injuries

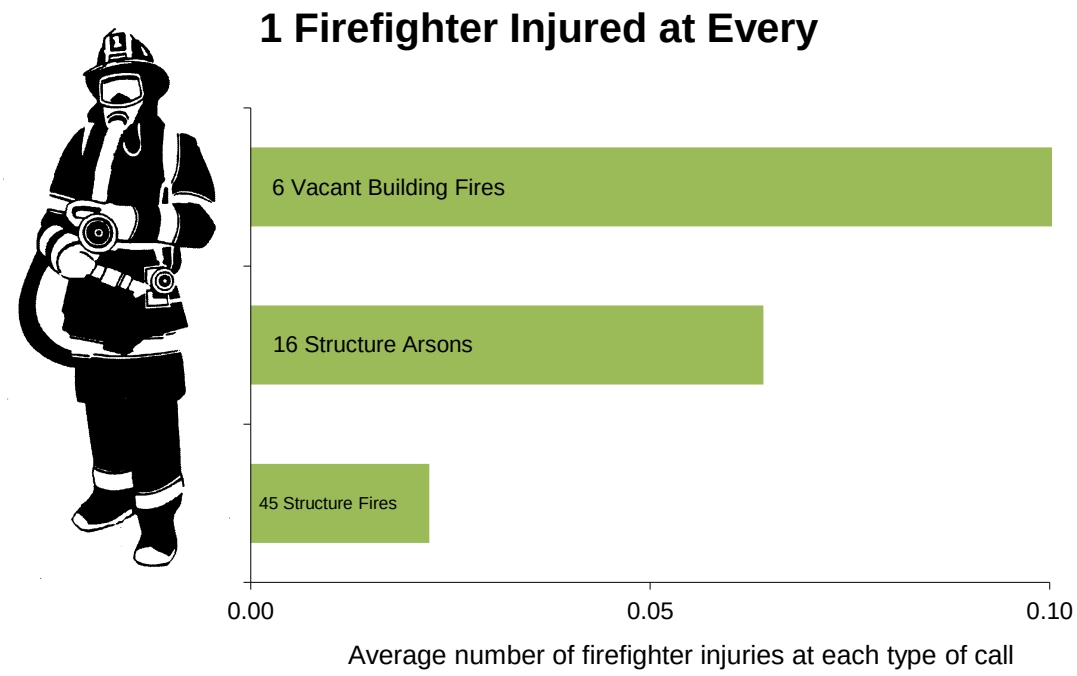
434 Firefighters Injured in 2017
In 2017, 434 firefighters were injured while fighting the 27,895 reported fires in Massachusetts. On average, one firefighter was injured at one of every 64 fires in 2017. Three hundred and eighty-two (382) firefighters were injured at structure fires. Nineteen (19) firefighters were injured at motor vehicle fires. Thirty-three (33) firefighters were injured at outside and other fires. This is a decrease of 56, or 11%, from the 490 fire-related fire service injuries reported in 2015.

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 61% 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. Seventy-one (71), or 19%, 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 25, or 7%, of fire service injuries at structure fires. Smoking fires accounted for 39, or 10%, of structure fire firefighter injuries and heating equipment fires accounted for 27, or 7% of these injuries.

Firefighters Injured at 1 of Every 6 Vacant Building Fires
One of the most dangerous types of fires for firefighters in 2017 were vacant building fires. Vacant building fires accounted for 41, or 9%, of all firefighter injuries. These 41 injuries also represent 11% of the number of firefighter injuries incurred fighting structure fires in 2017. On average there was one firefighter injury for every six vacant building fires; one firefighter injury for every 16 structure arsons; and one firefighter injury for every 45 structure fires[13].

The following graph illustrates this.

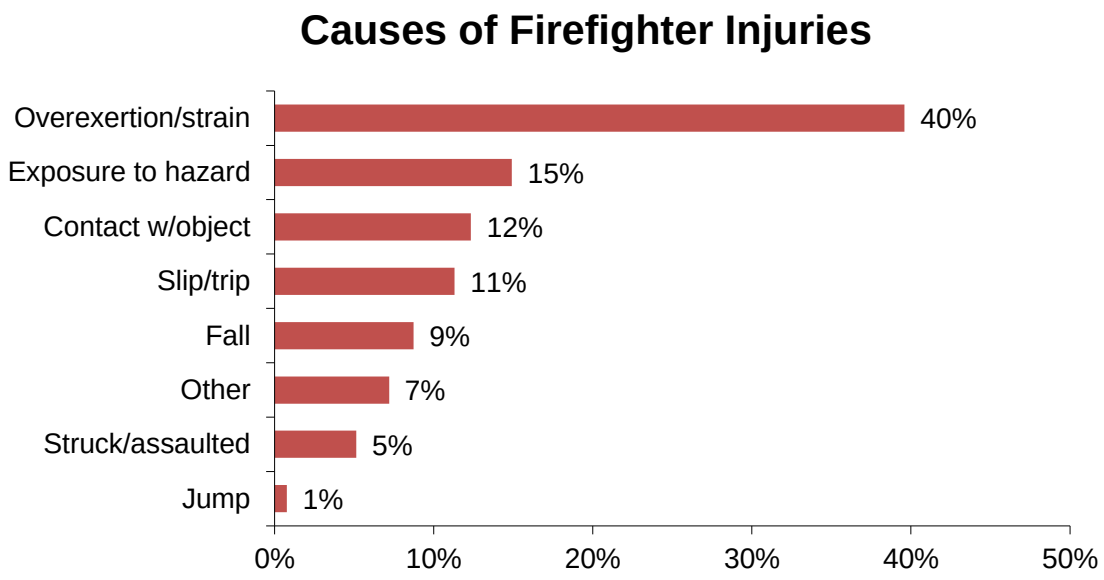


Almost 3/4 of Firefighter Injuries Minor
Seventy-two percent (72%) of reported firefighter injuries were minor.

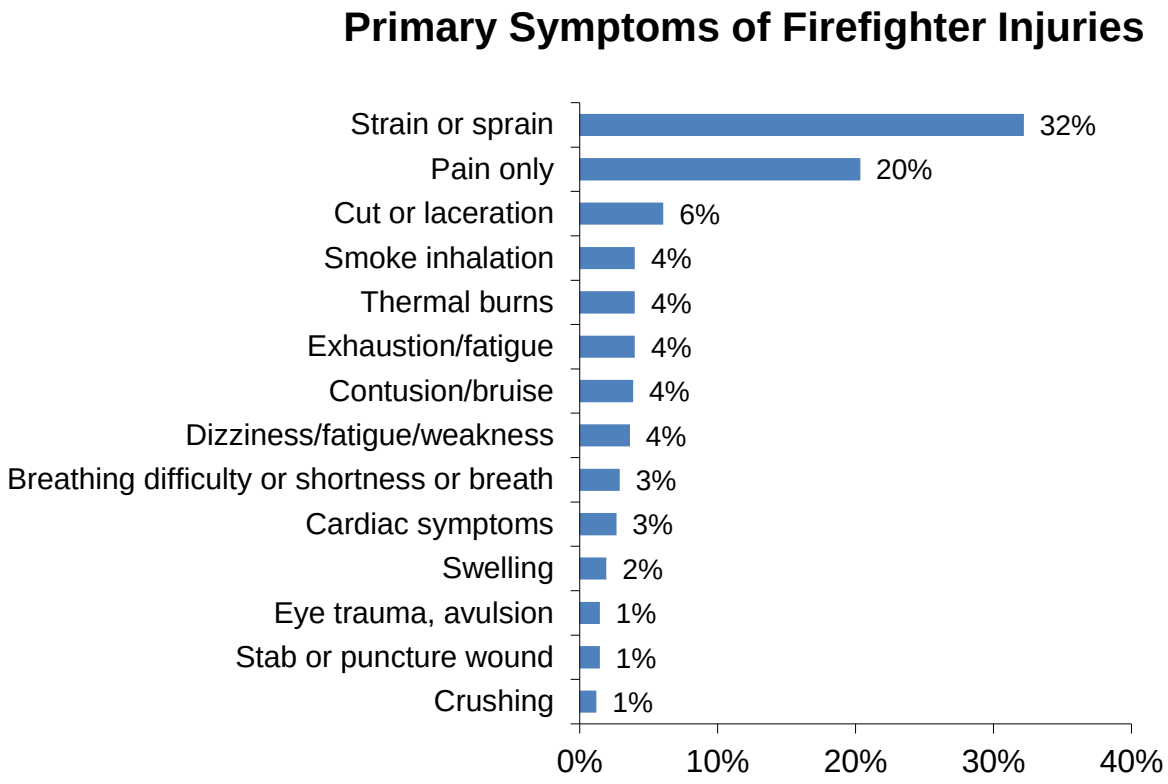
[13] On average there were 0.12 firefighter injuries at every vacant building fire; there were only 0.09 reported firefighter injuries per structure arson in 2017; and there were 0.02 reported firefighter injuries per structure fire in the Commonwealth in 2017.

Severity	# of FF Injuries	% of FF Injuries
Report only, including exposure	208	48%
First aid only	54	12%
Treated by physician, not a lost time injury	51	12%
Lost time injury, moderate severity	107	25%
Lost time injury, severe	13	3%
Lost time injury, life threatening	1	0.2%
Total Known	434	100%
Minor	313	72%

40% of Injuries from Overexertion or Strain
Forty percent (40%) of all reported firefighter injuries were from overexertion or strains.



32% Experienced Sprains or Strains & 20% of Firefighters Reported Pain
The leading *Primary Symptoms* for firefighter injuries were strains or sprains and only pain.



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.

18% 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. Sixty-three (63), or 18%, 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	38%
Contusion/bruise	15%

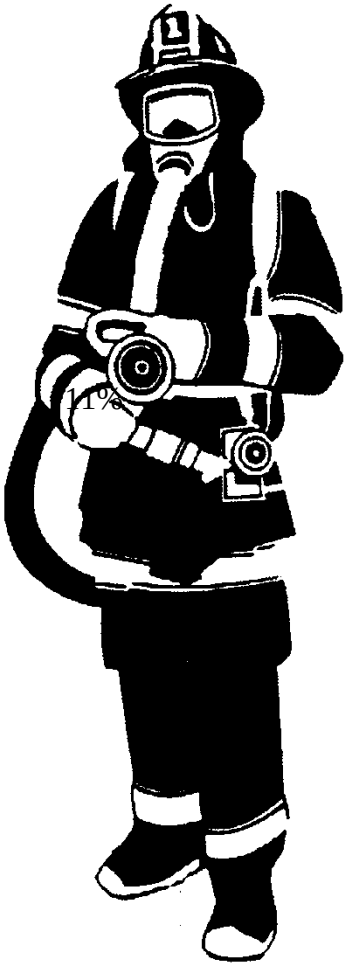
Trunk (63)
Strain or sprain	44%
Pain only	30%

Internal (28)
Smoke inhalation	54%
Breathing difficulty	11%
Cardiac symptoms	11%

Hand, Fingers (42)
Cut, laceration	42%
Stab/puncture wound	12%
Thermal burns	10%

Legs (9)
Strain or sprain	67%

Ears & Face (8)
Contusion/bruise	25%
Cut or laceration	25%
Thermal burns	25%



Back & Spine (36)
Strain or sprain	69%
Pain only	28%

Arms (30)
Strain or sprain	47%
Pain only	23%
Cut or laceration	7%

Wrists (12)
Strain or sprain	50%
Pain only	14%

Knees (41)
Strain or sprain	56%
Pain only	34%

Feet & Toes (10)
Strain or sprain	40%
Pain only	20%

Fatal Fire in Quincy Also Injures 13 Firefighters – Most Fire Service Injuries

- On February 11, 2017, at 1:24 a.m., the Quincy Fire Department was called to a fatal smoking fire in a three-family home. The fire was started by someone smoking while using home oxygen. The victims, a 19-year old man and a 67-year old woman were overcome while trying to escape. Thirteen (13) firefighters were injured at this fire. It was undetermined if alarms were present. The home did not have sprinklers. Damages from this fire were estimated to be $375,000.

Chelsea Fire Injures 10 Firefighters –2nd Most Fire Service Injuries

- On May 19, 2017, at 4:38 p.m., the Chelsea Fire Department was dispatched to an electrical fire started by a portable air conditioner in a three-unit apartment building. Ten (10) firefighters were injured. Alarms were present and alerted the occupants of the building. The building did not have any sprinklers. Damages from this fire were estimated to be $375,000.

Arson Fires

671 Arsons - 187 Structures, 68 Vehicles, 416 Other Arsons
Six hundred and seventy-one (671), or 2%, of the 27,895 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 187 structure arsons, 68 motor vehicle arsons, and 416 outside and other arsons caused four civilian deaths, accounting for 7% of civilian fire deaths, five civilian injuries and 13 fire service injuries. The estimated dollar loss from arsons was $114.3 million[15]. The average dollar loss per arson fire was $170,341. Total arson was down by 11% from the 754 in 2016.

774 Fires with Cause Still Under Investigation
In 2017, 774 Massachusetts fires were still listed as 'Cause Under Investigation'. There were 3,132 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.

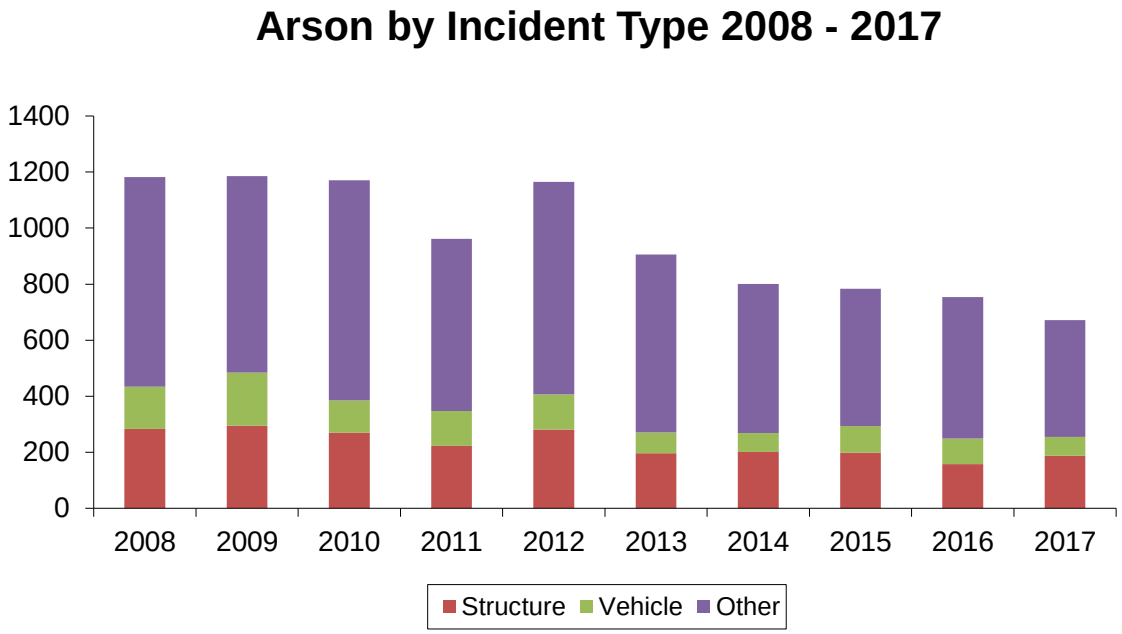
The following table and chart shows the total number of reported arsons for the past 10 years. The total is then broken down into the total number of reported structure, vehicle and all other types of arsons along with that subtotal's percentage of the total number of arsons. It also illustrates that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

ARSONS BY YEAR

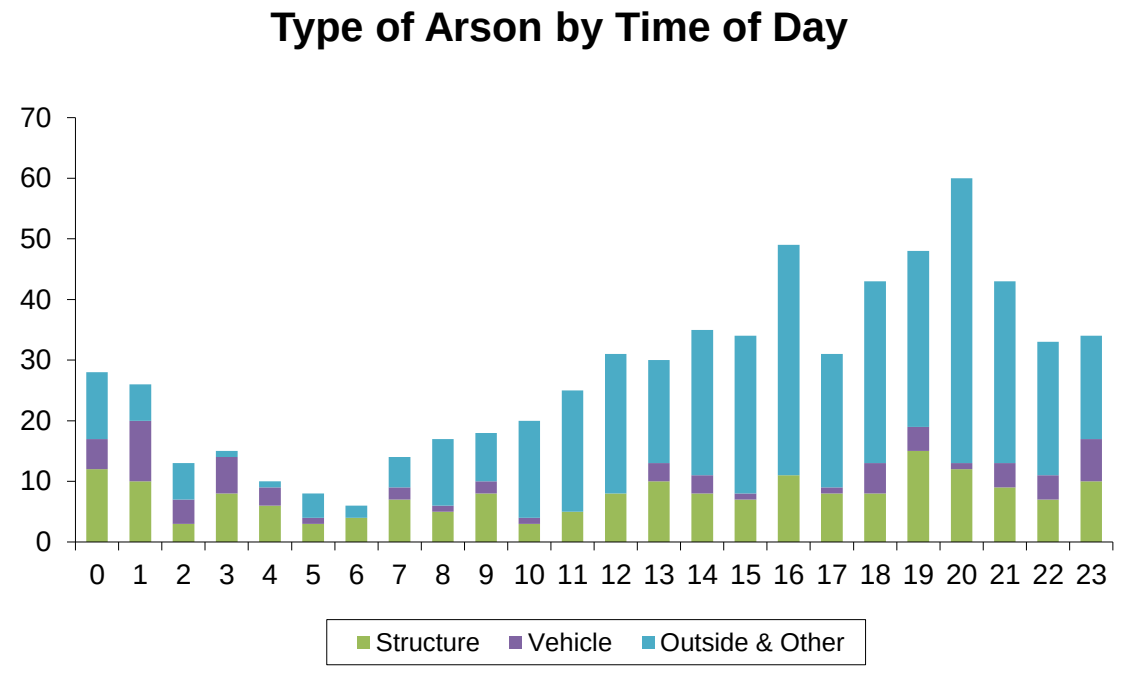
Year	Total Arsons	Structure Arsons	% All Arsons	Vehicle Arsons	%All Arsons	Other Arsons	% All Arsons
2017	671	187	28%	68	10%	416	62%
2016	754	158	20%	91	12%	505	68%
2015	803	208	25%	98	12%	497	62%
2014	810	203	25%	68	8%	539	67%
2013	907	196	22%	75	8%	636	70%
2012	1,169	284	24%	126	11%	759	65%
2011	976	224	23%	124	10%	628	67%
2010	1,189	269	23%	116	10%	804	66%
2009	1,196	295	25%	189	16%	712	59%
2008	1,180	283	24%	151	13%	746	64%

[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.

[15] One structure arson in Waltham of condominium apartments under construction cause $110 million, or 96%, of the total arson dollar loss.



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 4:00 p.m. to 10:00 p.m. The peak times for structure arsons were between 4:00 p.m. and 10:00 p.m. Motor vehicle arsons were most likely to occur between 11:00 p.m. and 4:00 a.m. Outside and other arsons peaked from 1:00 p.m. to 11:00 p.m.



Structure Arson

187 Arsons, 4 Civilian Deaths, 2 Civilian Injuries, 12 Fire Service Injuries
In 2017, there were 187 reported structure arsons. They caused four civilian deaths, two civilian injuries, 12 fire service injuries and an estimated dollar loss of $113.4 million. These 187 incidents accounted for 1% of the 17,099 structure fires in 2017, and were up 18% from the 158 reported structure arsons in 2016.

There were four civilian deaths in structure arsons in 2017. Three (3) of these deaths were suicides; and in the other case, the victim barricaded himself inside his home and set it on fire. The two civilian injuries accounted for 1% of the overall civilian injuries and 1% of all civilian injuries at structure fires. The 12 fire service injuries accounted for 3% of the total fire service injuries and 3% of the injuries firefighters sustained at all structure fires in 2017. The estimated dollar loss for structure arsons was $113,351,226, accounting for 29% of the overall dollar loss and 31% of the estimated dollar loss in all reported structure fires. The average loss per structure arson was $606,156.

In 2017, 394 Massachusetts structure fires were still listed as 'Cause Under Investigation'. There were 758 structure fires where the *Cause of Ignition* was listed as 'Undetermined'.

Structure Arsons Increased
Structure arsons increased by 29, or 18%, from the 158 reported in 2016.

Structure Arson Down 34% Since 2008
Structure arsons have been on a downward trend since 1991 when 1,974 structure arsons were reported to MFIRS. Structure arsons have decreased by 34% since 283 were reported in 2008. The above chart shows the trend of structure arsons in the past decade.

Building Arsons
In 2017 there were 181 building arsons. These accounted for 97% of all the structure arsons in Massachusetts. These building arsons caused all civilian deaths, all civilian and fire service injuries and all but $96,800 of the estimated dollar loss.

2/3 of Building Arsons Occurred in Residences
One hundred and twenty-one (121), or 67%, of the 181 building arsons occurred in residential occupancies. Educational facilities and mercantile and business properties each accounted for 7% of these arsons and public assembly properties accounted for 6%. 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

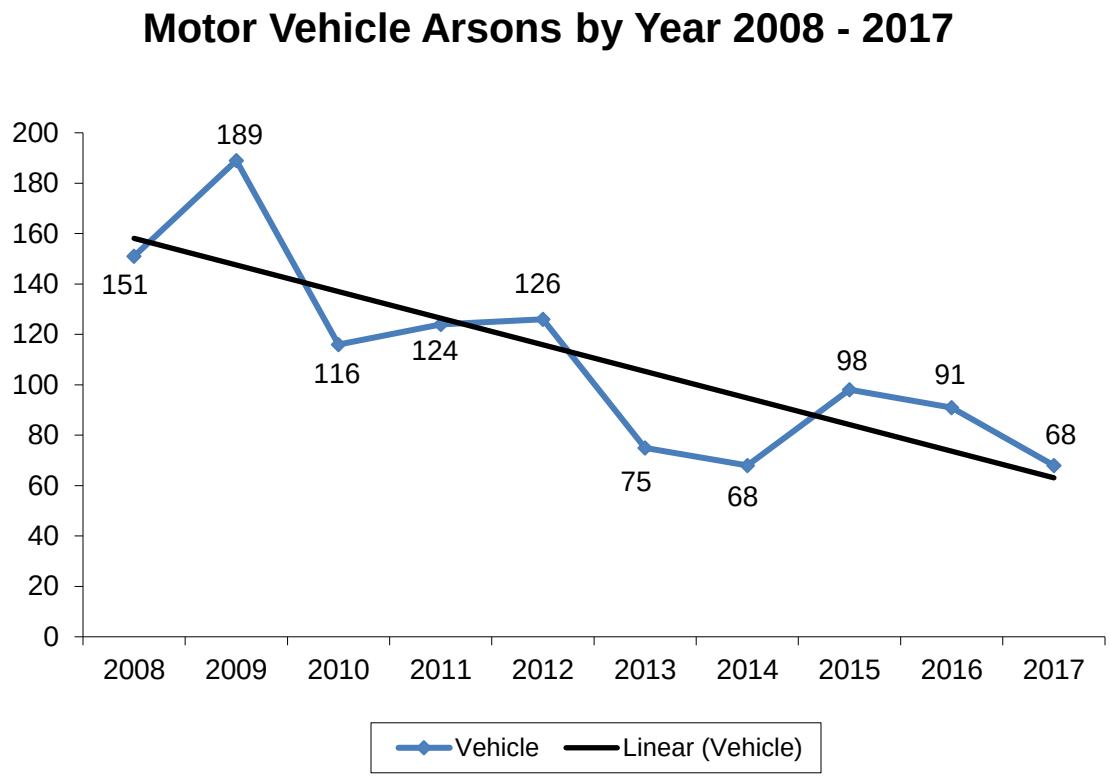
Occupancy	Building Arsons	Percent of Total	Injuries FF	Injuries Civ	Deaths FF	Deaths Civ	Dollar Loss
Assembly	10	6%	0	0	0	0	$11,790
Educational	13	7%	0	0	0	0	8,176
Institutional	3	2%	0	0	0	0	75,050
Residential	**121**	**67%**	**9**	**2**	**0**	**4**	**112,303,785**
1- & 2-Family	*56*	*31%*	*2*	*0*	*0*	*1*	*2,611,267*
Multifamily	*60*	*33%*	*7*	*1*	*0*	*2*	*2,041,550*
All Other Residential	*5*	*3%*	*1*	*1*	*0*	*0*	*139,000*
Mercantile, business	13	7%	2	0	0	0	446,025
Basic Industry	1	1%	0	0	0	1	0
Manufacturing	1	1%	0	0	0	0	0
Storage	7	4%	1	0	0	0	300,600
Special Properties	12	7%	0	0	0	0	112,000
Unclassified	0	0%	0	0	0	0	0
Total	**181**	**100%**	**12**	**2**	**0**	**4**	**$113,254,426**

Motor Vehicle Arson

68 Arsons – $930,220 in Damages
Sixty-eight (68), or 2%, of the 2,367 vehicle fires were considered intentionally set in 2017. There were no injuries or deaths in a motor vehicle arson in 2017. These arsons

caused an estimated dollar loss of $930,220, accounting for less than 1% of the overall fire dollar loss and 4% of the dollar loss associated with all the 2017 motor vehicle fires. The average loss per vehicle arson was $13,680. Passenger cars and vans accounted for 91% of the 68 motor vehicle arsons.

In 2017, 196 Massachusetts motor vehicle fires were still listed as 'Cause Under Investigation'. There were 601 motor vehicle fires where the *Cause of Ignition* was listed as 'Undetermined'.



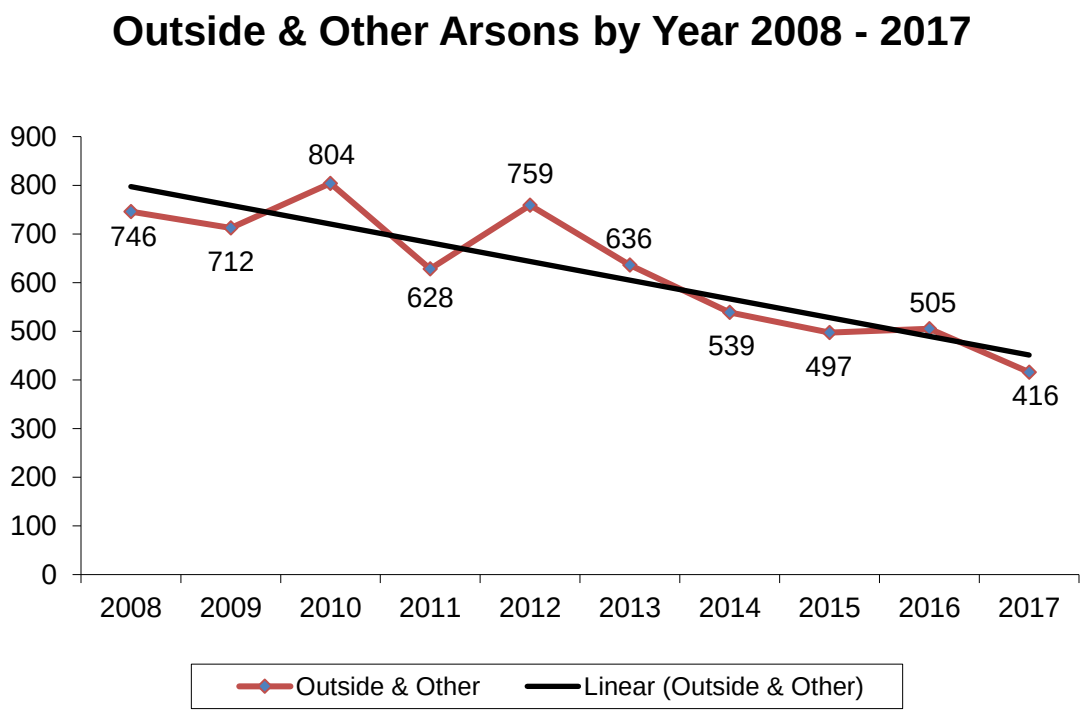
Motor Vehicle Arsons Decrease
Motor vehicle arsons decreased in 2017. These 68 arsons are a decrease of 23, or 25%, from the 91 reported in 2016. This continues the overall downward trend since 2009.

Outside and Other Arson

416 Arsons –3 Civilian Injuries
Four hundred and sixteen (416), or 5%, of the total outside and other fires were considered intentionally set in 2017. These arsons caused three civilian injuries accounting for 1% of the total number of civilian injuries, 8% of civilian injuries in all

outside and other fires; and one fire service injury. The estimated dollar loss for these arsons was $17,374. The average loss per outside and other arson was $42.

In 2017, 184 outside and other fires were still listed as 'Cause Under Investigation'. There were also 1,773 outside and other fires where the *Cause of Ignition* was listed as 'Undetermined'. This is a 41% decrease from the previous year when 2,983 outside and other fires were undetermined.



Outside & Other Arsons Down

Outside and other arsons decreased by 89, or 18%, from the 505 reported in 2016. Brush arsons decreased by 98, or 36%; outside rubbish arsons remained the same; special outside arsons decreased by 12, or 12% from the 98 reported in 2017; cultivated vegetation or crop arsons increased by four, or 80%; and unclassified arsons increased by 17, or 31%, from those reported in 2016.

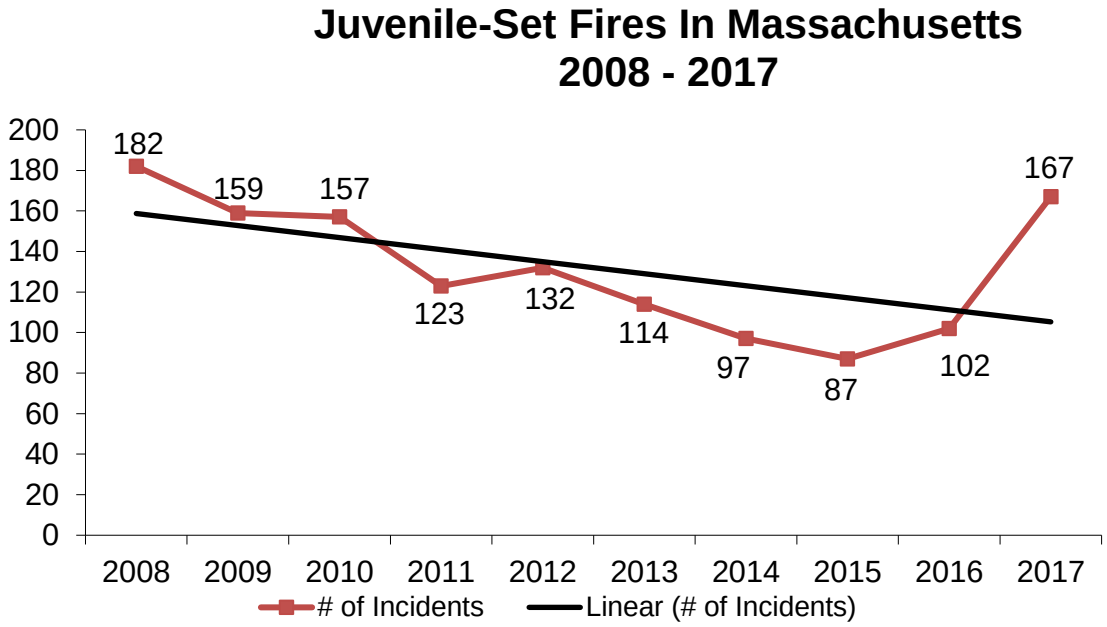
Waltham Had Largest Loss Arson in 2017

There was one reported arson where the dollar loss was greater than $1 million in 2017. There were 15 other arsons with a dollar loss between $100,000 and $999,999, totaling $2.7 million, or 2% of the total estimated dollar loss from arson.

- On July 23, 2017, at 3:47 a.m., the Waltham Fire Department was called to an intentionally set fire at the 265-unit apartment building under construction at 20 Cooper St. The fire started on the second floor. Four (4) firefighters were injured at this fire. Alarms were present but did not operate because there was no power. The building did have sprinklers but they were shut off. Damages from this fire were estimated to be $110 million.

Juvenile-set Fires

Children Playing With Fire Caused 167 Fires & 1 Civilian Injury
In 2017, children playing[16] with matches, lighters and other heat sources caused 167 reported fires, one civilian injury, two fire service injuries and an estimated dollar loss of $1.5 Million. The average dollar loss per fire was $8,847. These fires were up 64% from 102 incidents in 2016.



40 Structure Fires, 2 Motor Vehicle Fire & 125 Outside & Other Fires
The 167 fires set by children and youth included: 40 structure fires, two motor vehicle fires, 104 brush, tree or grass fires, two outside rubbish fire, eight special outside fires, and 11 fires that could not be classified further.

Juvenile-set Fires Caused 1 Civilian Injury
These 167 fires caused one civilian injury, two fire service injuries and $1.5 Million in estimated damages in 2017.

35% of All Juvenile-set Building Fires Occur in Apartments
Thirty-five percent (35%) of the 40 building fires caused by juveniles occurred in multi-family homes; 33% occurred in one or two-family homes; 8% occurred in high schools, junior high schools or middle schools; 5% occurred in elementary schools. Twenty

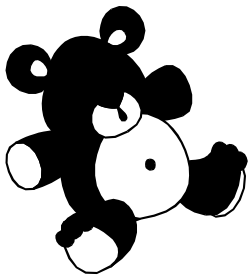
[16] The U.S. Fire Administration (USFA) determines the codes for the National Fire Incident Reporting System (NFIRS) & uses the code children playing to describe juvenile-set fires. We fully realize this term is inadequate to describe all child and youth-set fires & try to limit use of the phrase to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

percent (20%) of the juvenile-set fires started in bathrooms; 18% in bedrooms and 13% began in kitchens.

58% of Fires Set by Juveniles Using Smoking Materials

Fifty-eight percent (58%), of juvenile-set fires were started by smoking materials[17]. Thirty-five percent (35%) of the fires were started using lighters, 13% with cigarettes, 10% were started with matches; and 1% with undetermined smoking materials. Hot embers or ash caused 12% of these fires and fireworks caused 4%. 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	39	35%
Cigarette	14	13%
Hot ember or ash	13	12%
Match	11	10%
Hot or smoldering object, other	9	8%
Fireworks	5	4%
Flying brand, ember, spark (from another fire)	3	3%
Heat from operating equipment, other	3	3%
Heat from other open flame or smoking materials	3	3%
Explosives, fireworks, other	2	2%
Other	2	2%
Spark, ember, flame from operating equipment	2	2%
Candle	1	1%
Flame/torch used for lighting	1	1%
Heat from direct flame	1	1%
Heat from undetermined smoking material	1	1%
Radiated or conducted heat from operating equipment	3	1%
Warning or road flare	1	1%



Juvenile-set Fire in Saugus Is Largest Loss

In 2017 there were three juvenile-set fires that caused over a $100,000 in estimated damages. These three fires caused an estimated total dollar loss of $1.3 Million, or 88%, of the total dollar loss for all juvenile-set fires.

- On May 3, 2017, at 3:57 p.m., the Saugus Fire Department was called to a fire in a three-unit apartment building caused by a youth playing with matches in a bedroom. One (1) firefighter was injured at this fire. Alarms were present and operated. The building was not sprinklered. Total damages were estimated to be $500,000.

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

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 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 12,335 Fires, 2 Civilian Deaths & 78 Civilian Injuries
Unattended cooking, other unsafe cooking practices and defective cooking equipment caused 12,335 fires, two civilian deaths, 78 civilian injuries, 28 firefighter injuries and an estimated dollar loss of $9.8 million. The average dollar loss per fire was $792. Cooking fires accounted for 44% of the total 27,895 fires that occurred in 2017.

Ninety-eight percent (98%) of the fires caused by cooking occurred in structures. The 12,335 fires included: 12,145 structure fires, 64 special outside fires, three motor vehicle fires, one brush fires, one outside rubbish fire and 123 fires that could not be classified further.

Confined Cooking Fires Account for 42% of Total Fires
The majority of cooking fires, 11,745, were confined to a non-combustible container. These fires represent 42% of the total fires that occurred and is the largest single cause of fires in Massachusetts. Confined cooking fires increased by 3% from the 11,447 reported in 2016.

81% of Cooking Fires in Buildings Were Unintentional
In 1,560, or 81%, of the 1,923 cooking fires in buildings where the *Cause of Ignition* was reported, it was reported as unintentional. The 10,412, or 84%, of all cooking fires were fires contained to non-combustible containers that did not require having a cause reported.[18]

Cause of Ignition	# of Incidents	% of Total	% Completed
Confined fire, no fire module completed	10,142	84%	
Other	3	0.02%	0.2%
Intentional	25	0.2%	1%
Unintentional	1,560	13%	81%
Failure of equipment or heat source	97	1%	5%
Act of nature	0	0%	0%
Under investigation	19	0.2%	1%
Undetermined	219	2%	11%
Total	12,335	100%	
Total Known	1,923		

Unattended Cooking Starts 11% of These Fires – Stand by Your Pan!
Human error was responsible for the majority of cooking fires. Eleven percent (11%) 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.

[18] 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.

Factor Contributing to Ignition	# of Cooking Fires	% Known
Confined fire, no fire module completed	10,413	
None	998	57%
Equipment unattended	192	11%
Too close to combustibles	94	5%
Misuse of material or product, other	89	5%
Failure to clean	84	5%
Abandoned materials	48	3%
Other	40	2%
Accidentally turned on, not turned off	36	2%
Electrical failure, malfunction, other	25	1%
Operational deficiency, other	25	1%
Mechanical failure, malfunction, other	23	1%
Improper container or storage	21	1%

Cooking Was the Leading Cause of Injury in Fires in 2017

Cooking was the leading cause of injury in all types of fires in 2017. This is not surprising considering that almost two-thirds, or 65%, of residential fires start in the kitchen. Of the 78 cooking fire injuries, 51% of victims were male and 49% were female. People aged 25 to 54 accounted for 50% of the people injured in cooking fires.

Age	% of Known Injuries	% of Population	Difference
Under 5	5%	6%	-1%
5 to 9	1%	7%	-6%
10 to 14	1%	7%	-6%
15 to 24	8%	13%	-5%
25 to 34	18%	15%	3%
35 to 44	9%	17%	-8%
45 to 54	23%	14%	9%
55 to 64	19%	9%	10%
65 to 74	10%	7%	3%
75 to 84	3%	5%	-2%
85+	3%	2%	1%

80% of Victims in Room or Area of Fire Origin

Of the 61 cooking fire injuries where location at ignition is known, 80% of the victims were injured in the room or area of fire origin.

Location at Time of Incident	# of Cooking Fire Injuries	% Known
Not reported	10	
In area of origin and not involved	26	43%
Not in area of origin and not involved	9	15%
Not in area of origin but involved	3	5%
In area of origin and involved	23	38%
Undetermined	7	
Total	78	
Total Known	61	100%

58% of Cooking Injuries Occurred When Trying to Control Fire

Of the 59 cooking fire injuries for which activity at time of injury was known, 58% of victims were attempting to control the fire; of the 34 victims injured while attempting to control the fire, 53% 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	9	
Other	9	15%
Escaping	7	12%
Rescue Attempt	0	0%
Fire Control	34	58%
Return to vicinity of fire before control	4	7%
Return to vicinity of fire after control	0	0%
Sleeping	4	7%
Unable to act	1	2%
Irrational act	0	0%
Undetermined	10	
Total	71	
Total Known	61	100%

41% of All Cooking Injuries Were Breathing Related

Stovetop fires tend to produce a lot of smoke and when people choose to attempt to extinguish them, they run a great risk of being overcome by toxic smoke. Of the 64 cooking fire injuries where nature of injury was known, 25% suffered only from smoke inhalation; 9% suffered from burns and smoke inhalation; and 6% suffered from breathing difficulty or shortness of breath.

Primary Apparent Symptom	# of Cooking Fire Injuries	% Known
Not reported	13	
Smoke inhalation	16	25%
Hazardous fumes inhalation	1	2%
Breathing difficulty/shortness of breath	4	6%
Burns & smoke inhalation	6	9%
Burns only; thermal	32	50%
Scald	2	3%
Cut or laceration	1	2%
Disorientation	1	2%
Emotional/psychological stress	1	2%
Undetermined	1	
Total	78	
Total Known	64	100%

2 Civilian Fire Deaths in 2017[19]

While cooking is the leading cause of residential building fires, it usually isn't the leading cause of civilian fire deaths. There were two civilian fire deaths attributed to cooking fires in 2017, accounting for 4% of residential fire deaths and 3% of all civilian fire deaths.

The importance of responding correctly to a clothing ignition – Stop, Drop 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 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.

[19] One of these two fatal fires is not coded in MFIRS as a cooking fire. The elderly female victim was basting a turkey with ethanol when it ignited, catching her clothing on fire. The victim was transported to a local hospital and succumbed to her injuries a couple of weeks later.

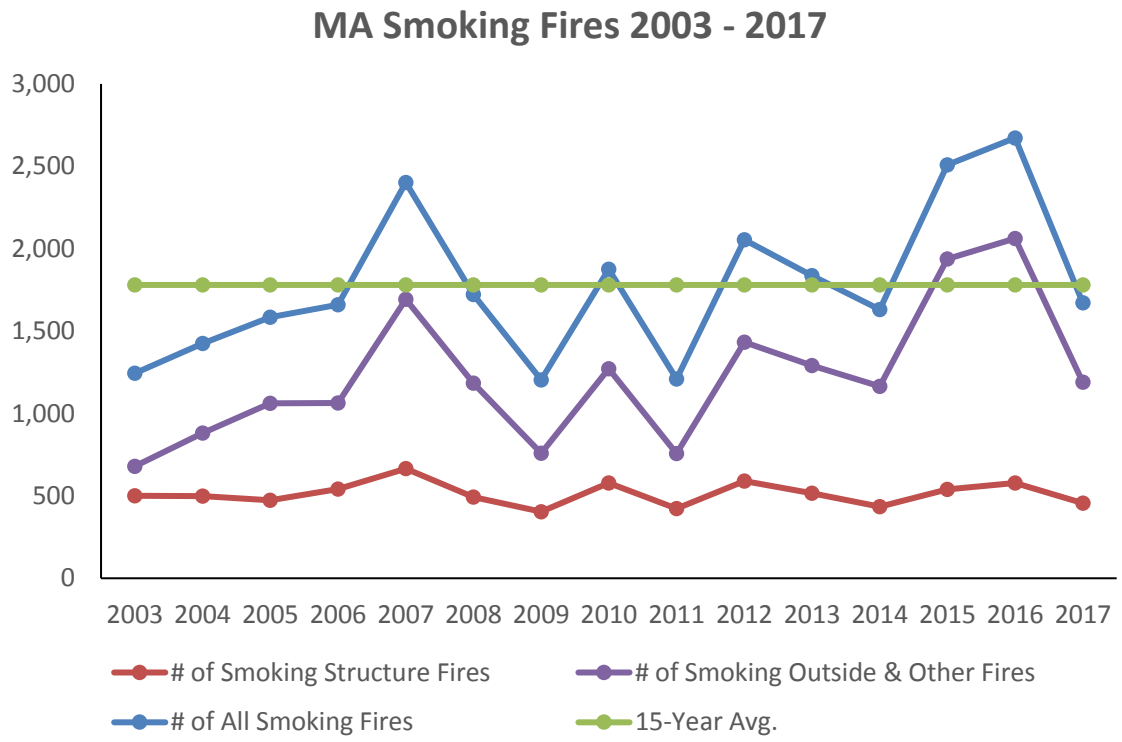
Fires Caused by Smoking

Smoking Caused 3% of Fires and 26% of Deaths
During 2017, 1,672, or 6%, of the 27,895 reported fire incidents were caused by the improper use or disposal of smoking materials. These 1,672 fires caused 15, or 26%, of the 58 civilian deaths and 15, or 29%, of the 51 structure fire deaths; one fire service death, 33 civilian injuries, 43 fire service injuries, and an estimated dollar loss of $17.8 million. The average dollar loss per fire was $10,652. The number of smoking fires decreased by 1,000, or 37%, from 2,672 in 2016.

456 Structure Fires – Down 21% From 2016
The 1,672 fires caused by smoking included 456 structure fires, down 122 from 578, or 21%, in 2016.

Incident Type	# of Smoking Fires	Fire Service Injuries	Civilian Injuries	Fire Deaths	Civilian Deaths	Dollar Loss
Fire, other	84	0	1	0	0	$ 44,310
Structure fires	456	39	30	1	15	$ 17,561,455
Mobile property used as a structure fires	1	0	0	0	0	$ 0
MV fires	27	1	1	0	0	$ 96,380
Brush fires	894	2	0	0	0	$ 81,574
Outside rubbish fires	77	1	0	0	0	$ 9,502
Special outside fires	128	0	1	0	0	$ 14,541
Cultivated vegetation or crop fires	6	0	0	0	0	$ 2,600
Total	1,672	43	33	1	15	$ 17,810,362

Over the last 15-years, smoking fires have been showing an upward trend. However, 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 1,780 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. 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.



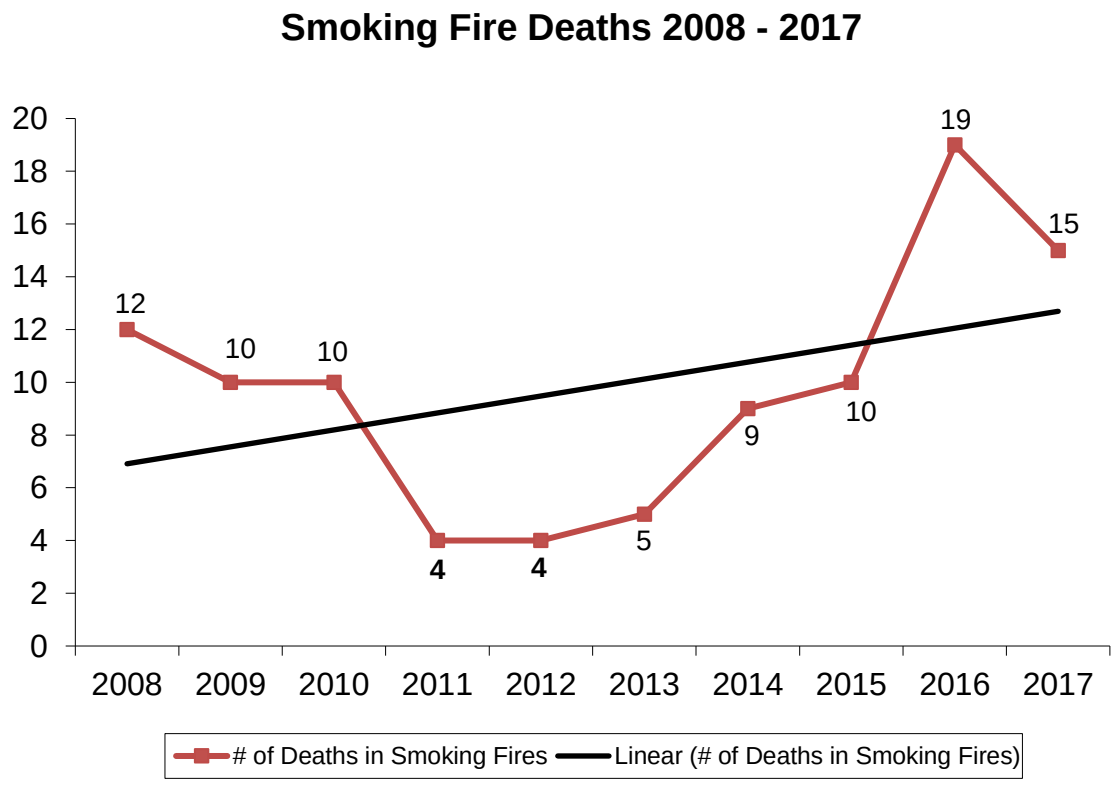
86% of All Smoking Building Fires Occurred in Residences
Three hundred and eighty-one (381), or 86% of the 444 smoking-related building fires occurred in residential occupancies. The occupancies with the next highest percentages of smoking-related building fires in Massachusetts in 2017 were mercantile and business properties at 4%.

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 Deaths	Civilian Deaths	Dollar Loss
Assembly	10	2%	0	0	0	0	$ 689,000
Educational	2	0.5%	0	0	0	0	$ 1,000
Institutional	7	2%	0	0	0	0	$ 33,500
Residential	381	86%	39	30	1	15	$ 16,164,935
Mercantile, business	18	4%	0	0	0	0	$ 479,520
Basic Industry	2	0.5%	0	0	0	0	$ 0
Manufacturing, processing	2	0.5%	0	0	0	0	$ 2,000
Storage properties	16	4%	0	0	0	0	$ 172,400
Special properties	6	1%	0	0	0	0	$ 7,800
Total Known	444	100%	39	30	1	15	$ 17,550,155

Smoking Leading Cause of Fire Deaths - Elders at Risk
The 456 smoking-related structure fires caused all 15 of the smoking-related fire deaths, one fire service death, 30 civilian injuries, 43 fire service injuries, an estimated dollar loss of $17.6 million and an average dollar loss of $38,512. Smoking fires accounted for 32% of the fatal structure fires and 29% of structure fire deaths in 2017. The unsafe and improper use of smoking materials caused 31% of residential structure fire deaths and 33% of fatal residential structure fires. Nine (9), or 41%, of the 22 home fire deaths to people over 65 were caused by smoking.

2017 Smoking Fire Deaths
In 2017, 15 people died in smoking-related fires of all types. These 15 deaths are above 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. However, smoking fire deaths are again on the rise in Massachusetts. 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.



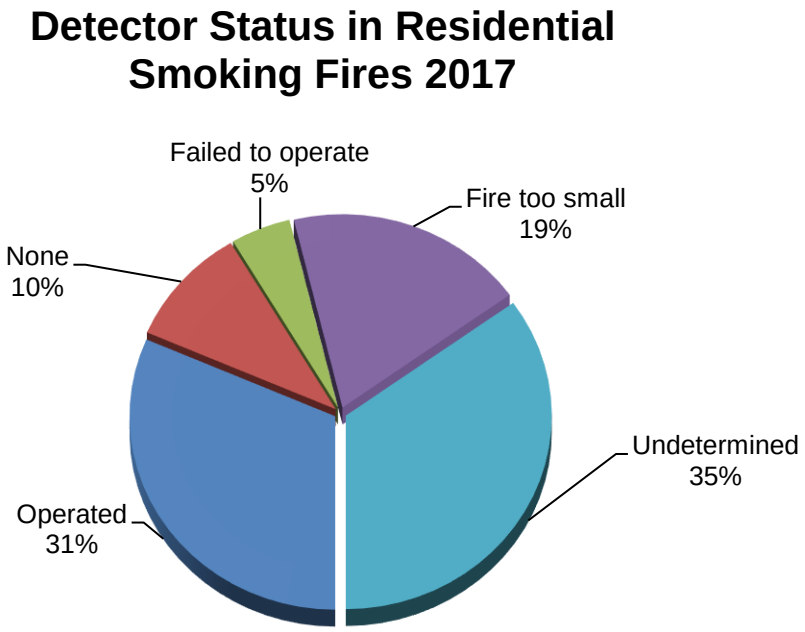
Working Alarms in 42% Fatal Smoking Fires
Five (5) of the 12 smoking fatal fires occurred in a structure where smoke alarms were present and operated. One (1) occurred in a fire where the alarm failed to operate; another occurred where there were no alarms. In one fire the alarm was present but the fire was too small to activate the alarm; and it was undetermined in four fires if there were any

alarms. Ten (10), or 67%, of these victims were intimately involved with the ignition; and three other victims, while not in the area of origin when the fire began, were involved in starting it. The smoke alarms helped prevent these fires from claiming any additional lives.

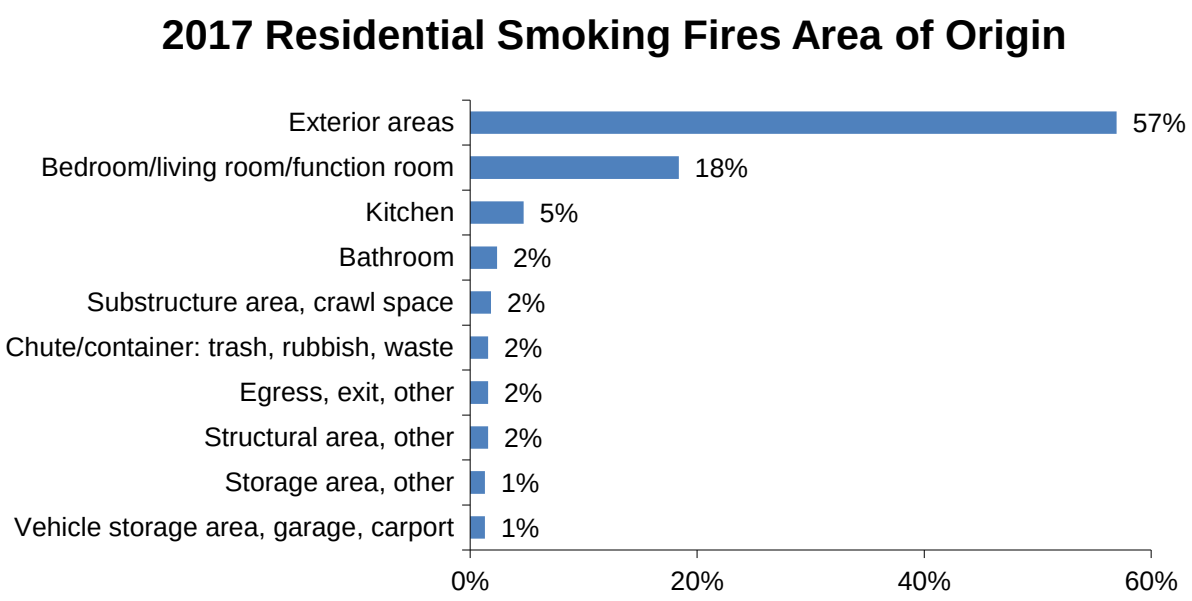
For a listing of all the smoking-related fire deaths in 2017, please refer to the *2017 Massachusetts Fire Deaths* section of this report.

Smoking on Oxygen
There were four fire deaths in three fires in 2017 that involved the use of oxygen while smoking.

Almost 1/3 of Building Smoking Fires had Operating Alarms
Of the 444 smoking-related building fires, 381, or 86%, occurred in residences. Smoke alarms operated in 31% of the smoking-related residential structure fires.



57% of Smoking Fires in the Home Start in the Exterior
Continuing the trend, 219, or 57% 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.



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 14% of residential smoking fires. The second leading cause was exterior sidewall coverings, accounting for 11% of these smoking 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	54	14%
Undetermined	46	12%
Exterior sidewall covering	42	11%
Organic materials, other	21	6%
Structural member, framing	20	5%
Upholstered sofa, chair	20	5%
Mattress, pillow	18	5%
Other	18	5%
Exterior trim, appurtenances	17	4%
Structural component, finish, other	14	4%
Light vegetation	13	3%
Bedding	12	3%
Box, carton, bag	12	3%

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 2017, 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 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."[20]

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."

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

1,411 Fires, 7 Civilian Deaths & 1 Fire Service Death
Massachusetts fire departments reported that some form of heating equipment was involved in 1,411, or 8%, of the 17,006 building fires in 2017. These heating equipment fires caused seven civilian deaths, one fire service death, 14 civilian injuries, 27 fire service injuries, and an estimated dollar loss of $7.2 million. The average loss per fire was $5,115. This is an 8% decrease from the 1,530 fires reported in 2016.

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

87% of All Heating Fires Were Confined Fires
In 2017, 87% of heating fires were confined to the container of origin. Seven hundred and forty-two (742), or 53%, of all heating related building fires in Massachusetts were coded as 'fuel burner/boiler malfunction, fire contained'. Four hundred and eighty-six (486), or 34%, were determined to be chimney or flue fires, confined to the chimney or flue.

The number of contained heating fires fell in 2017. Confined heating equipment fires decreased by 59 incidents, or 5%, from the 1,287 reported in 2016.

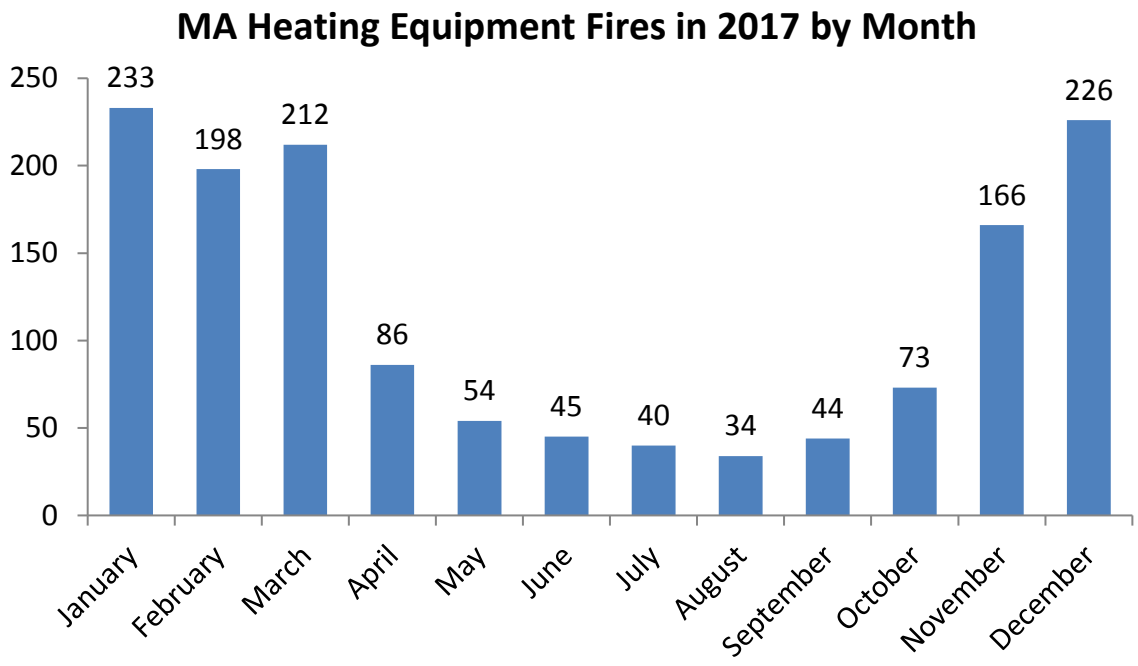
Types of Heating Equipment
Only one type of equipment per fire incident may be reported to MFIRS. Consequently, the totals for specific types of equipment should, in many cases, be considered underestimates. For example, sparks from a wood stove may ignite a fire in the chimney. The recorded equipment 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	766	54%	6	6	0	0	$ 1,987,025
Confined	*742*	*53%*	*6*	*4*	*0*	*0*	*$ 266,000*
Furnace, central heating unit	*15*	*1%*	*0*	*1*	*0*	*0*	*$ 1,589,025*
Boiler (power, process, heating)	*9*	*0.6%*	*0*	*1*	*0*	*0*	*$ 132,000*
Chimney, flue	502	36%	5	0	1	0	$ 1,928,594
Confined	*486*	*34%*	*2*	*1*	*0*	*0*	*$ 191,094*
Fireplace, chimney, other	*2*	*0.1%*	*2*	*0*	*0*	*0*	*$ 625,000*
Chimney connector, vent connection	*1*	*0.1%*	*0*	*0*	*0*	*0*	*$ 150,000*
Chimney, brick, stone, masonry	*6*	*0%*	*0*	*0*	*0*	*0*	*$ 324,500*
Chimney, metal, incl. stovepipe	*7*	*0%*	*1*	*0*	*1*	*0*	*$ 638,000*
Space heaters	24	2%	7	1	0	1	$ 922,240
Portable space heaters	*16*	*1%*	*7*	*0*	*0*	*1*	*$ 892,690*
Fireplace	7	0%	2	0	0	0	$ 28,000
Fireplace, masonry	*0*	*0%*	*0*	*0*	*0*	*0*	*$ -*
Fireplace insert/stove	*1*	*0.1%*	*0*	*0*	*0*	*0*	*$ 2,500*
Fireplace factory built	*6*	*0%*	*2*	*0*	*0*	*0*	*$ 25,500*
Water heater	11	1%	0	0	0	0	$ 71,550
Heating, vent. & air cond., other	41	3%	3	0	0	0	$ 510,525
All other reported equipment	9	1%	0	0	0	0	$ 243,450
Total	**1,411**	**100%**	**27**	**14**	**1**	**7**	**$ 7,217,584**

Most Heating Fires Occur During Colder Months
Sixty-eight percent (68%) 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.

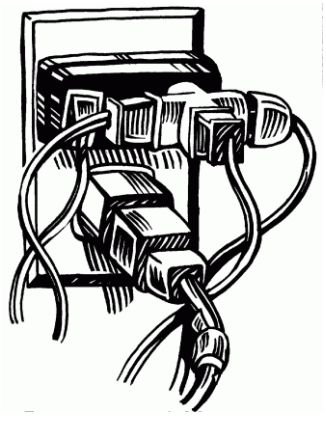
Space Heater Safety

- 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

703 Electrical Fires Caused 10 Civilian Deaths

Local fire departments reported that there were 703 structure fires caused by electrical problems in Massachusetts in 2017. These fires caused 10 civilian deaths, nine civilian injuries, 82 fire service injuries and an estimated dollar loss of $80.2 million, accounting for 21% of the total dollar loss to fire in 2017. The average loss per fire was $114,014.



Electrical Fires Were the 2nd Leading Cause of Fire Deaths
Electrical fires were the second leading cause of structure fire deaths in 2017. Five (5) fatal electrical fires, or 13%, of fatal structure fires caused 10, or 20%, of structure fire deaths in 2017. Electrical fires have been either the leading or second leading cause of structure fire deaths in the past 5 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 19% of Electrical Fires[21]
One hundred and thirty-six (136), or 19%, of electrical fires were caused by an unclassified electrical failure or malfunction.

Factor Contributing to Ignition	# of Electrical Fires	% of Electrical Fires
Electrical failure, malfunction, other	136	19%
Unspecified short-circuit arc	77	11%
Short circuit arc from defective, worn insulation	25	4%
Too close to combustibles	18	3%
Equipment overloaded	13	2%
Arc from faulty contact, broken conductor	11	2%
Worn out	10	1%
Mechanical failure, malfunction, other	8	1%
Short circuit arc from mechanical damage	8	1%
Arc, spark from operating equipment	7	1%

[21] *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%.

Equipment	# of Incidents	Fire Service Injuries	Civilian Injuries	Fire Service Deaths	Civilian Deaths	Dollar Loss
Electrical service, wiring, meter box and circuit breaker	212	31	3	0	4	$ 11,110,584
Lamp, lighting	64	2	2	0	0	$ 3,582,165
Ventilation and air conditioning	54	13	2	0	2	$ 1,059,215
Kitchen & cooking equipment	50	0	4	0	0	$ 1,303,605
Cord, plug	32	5	5	0	0	$ 1,081,250
Heating equipment	31	0	2	0	1	$ 120,520
Transformer, generator, battery, charger	29	5	3	0	1	$ 46,847,400
Household appliances (non-cooking)	19	0	0	0	0	$ 355,300
Electrical distribution, lighting & power transfer, other	15	2	0	0	0	$ 2,146,000
Electronic & other electrical equipment	10	3	2	0	2	$ 614,101
Shop tools & industrial equipment	5	0	0	0	0	$ 219,000
Decorative lighting, signs	3	1	0	0	0	$ 40,750
Commercial & medical equipment	1	0	0	0	0	$ 250
Garden tools & agricultural equipment	1	0	0	0	0	$ 17,500
Total Known Equipment	526	62	4	0	10	$ 68,497,640
Not reported (Null)	130	7	1	0	0	$ 8,300,851
Unclassified (Other)	5	0	0	0	0	$ 483,000
None	32	1	2	0	0	$ 2,170,092
Undetermined	10	1	2	0	0	$ 700,000
Total Unspecified	177	9	5	0	0	$ 11,653,943

Over 3/4 of Electrical Fires Occurred in Residential Occupancies

Over three-quarters of electrical fires occurred in residential occupancies. Of the 703 electrical fires, 550, or 78%, occurred in residential occupancies.

Occupancy	# of Electrical Fires	% of Known Electrical Fires
Residential	550	78%
Mercantile, business	48	7%
Assembly	28	4%
Storage properties	26	4%
Institutional	15	2%
Educational	15	2%
Basic industry	12	1%
Special properties	8	1%
Manufacturing, processing	6	1%
Total Known	703	100%

12% of Electrical Fires Began in Bedrooms

Eighty-two (82), or 12%, of electrical fires began in bedrooms. The following table shows the leading Areas of Origin of the electrical fires in Massachusetts in 2017.

Area of Origin	# of Electrical Fires	% of Electrical Fires
Bedroom	82	12%
Kitchen	65	9%
Bathroom	41	6%
Attic	26	4%
Living room	23	3%
Ceiling & floor assembly	21	3%
Wall assembly, concealed wall space	21	3%
Wall surface, exterior	19	3%
Laundry room	18	3%
Substructure area, crawl space	18	3%
Storage area, other	15	2%

Electrical Wiring Was the Item First Ignited in Over 1/4 of Electrical Fires

Electrical wiring or cable insulation was the item first ignited in 187, or 27%, 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 2017.

Item 1st Ignited	# of Electrical Fires	% of Electrical Fires
Electrical wire, cable insulation	187	27%
Undetermined	57	8%
Structural member, framing	49	7%
Appliance housing or casing	29	4%
Structural component, finish, other	24	3%
Exterior sidewall covering, surface, finish	23	3%
Other	20	3%
Thermal, acoustical insulation w/in wall, partition, floor/ceiling	13	2%
Floor covering or rug/carpet/mat	12	2%
Interior wall covering	10	1%
Bedding	10	1%

Large Loss Electrical Fires

There were five large loss ($1 million+) electrical fires in 2017. These five fires caused an estimated $49.2 million in damages, accounting for 61% of the total dollar loss from electrical structure fires in 2017. There were 93 fires with estimated damages between $100,000 and $999,999.

Boston Has Largest Loss Electrical Fire

- On June 28, 2017, at 2:32 p.m., the Boston Fire Department was called to an electrical fire in an 83-unit apartment building that was under construction. The fire was started by a generator on the roof. There were no injuries associated with this fire. Alarms were present but did not operate because the power wasn't turned on to them. The building did have sprinklers but they were shut off because it was under construction. Damages were estimated to be $45 million.

Chelsea Has Electrical Fire with Most Fire Service Injuries

- On May 19, 2017, at 4:38 p.m., the Chelsea Fire Department was called to an electrical fire in a three-unit apartment building. The fire was caused by arcing in a third floor bedroom. Ten (10) firefighters were injured at this fire. Alarms were present and alerted the occupants. Sprinklers were not present. Damages from this fire were estimated at $375,000.

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

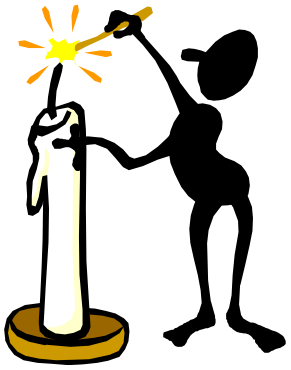
Just as all systems need maintenance and inspection, so does electrical wiring. As switches, receptacles and connections age, heat is generated and the risk of fires inside walls and at poor connections greatly increases. Because wiring is often hidden behind walls, electrical faults may be hard to detect, 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 2017, candles caused 92 fires of all types. These fires caused five civilian injuries, one fire service injury and an estimated dollar loss of $2.2 million in damages. There was a 9% decrease from the 101 fires of all types started by candles in Massachusetts in 2016.



79% of Candle Fires are Structure Fires
Of the 92 candles fires in 2017, 78, or 79%, were classified as structure fires. None were reported as motor vehicle fires. Nineteen (19), or 21%, were outside or other fires; one, or 1%, was a special outside fire; one, or 1%, was a brush fire, and 17, or 18%, were unclassified fires.

Candle Fires Happen Most During the Holidays
Between 2008 and 2017, the days of the year on which most candle fires occurred were:

1. December 24 (Christmas Eve) = 13 candle fires
2. December 25 (Christmas) and December 12 = 12 candle fires.
3. December 31 (New Year's Eve), December 14 and November 3 = 11 candle fires.
4. October 31 (Halloween) and December 19 = 10 candle fires;

Boston Has Largest Loss Candle Fire

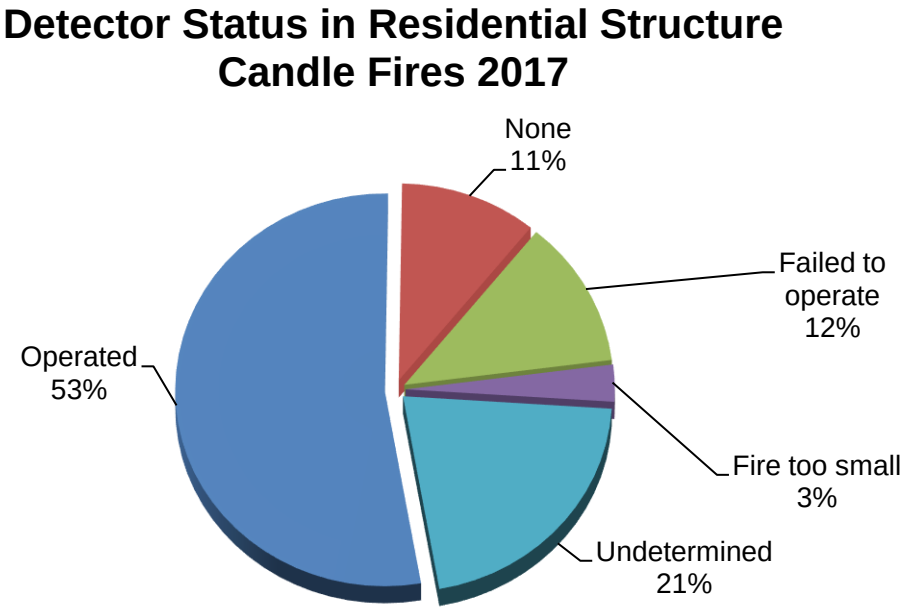
- On March 22, 2017, at 7:46 a.m., the Boston Fire Department was called to a candle fire in a single-family home. The candle ignited nearby combustibles in a bathroom. No one was injured at this fire. Alarms were not present and the building was not sprinklered. Damages from the blaze were estimated to be $300,000. The fire spread to an adjacent building and caused another $50,000 in estimated damages.

92% of Candle Fires Occurred in Homes
Of the 72 candle fires that occurred in buildings, all but six, or 92% were residential fires. These 66 residential fires caused three civilian injuries, one fire service injury and an estimated dollar loss of $1.9 million. Three (3) candle fires, or 4%, occurred in public assembly properties and one, or 1%, each in institutional facilities, mercantile or business properties and storage facilities.

1/3 of Candle Fires in Homes Occurred in the Bedroom
Of the 66 candle fires in residential structures, 33% occurred in the bedroom and 14% 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	22	33%
Living room	9	14%
Bathroom	8	12%
Kitchen	7	11%
Function room, other	5	8%
Bar area, cafeteria	4	6%

Smoke Alarms Operated in Over 1/2 of Candle Fires in Homes
Of the 66 candle fires in homes, smoke alarms operated in 53% 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

75 Incidents Involving Fireworks Caused $245,722 in Damages
There were 75 fire and explosion incidents reported that involved fireworks in 2017. This is a 41% decrease of fire and explosion incidents from the 127 reported in 2016. Incidents involving fireworks caused an estimated $245,722 in property damages. The average dollar loss per fireworks incident was $5,119.

Forty-four percent (44%) of the fireworks incidents were brush fires.

A fireworks explosion without fire is coded as an Incident Type 243 – Fireworks explosion (no fires). In 2017, 27 such incidents were reported.

42% of Fireworks Fires Occurred the Week of July 4th
Twenty (20), or 42%, of the 48 fireworks-caused fires in 2017 took place during the week of the 4th of July. Seven (7) occurred on July 4th.

Largest Loss Fireworks Fire –East Longmeadow House Fire

- On July 5, 2017, at 4:09 p.m., the East Longmeadow Fire Department was dispatched to a fireworks fire in a single-family home. Fireworks ignited some trash in the garage. No one was injured at this fire. Alarms were present and alerted the occupants. There were no sprinklers. Damages were estimated at $200,000.

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 no fireworks-related burn injuries reported to M-BIRS in 2017. 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

89 Incidents Involving Grills in 2017 Caused 3 Civilian Injuries
In 2017, there were 89 fire and explosion incidents reported to the Massachusetts Fire Incident Reporting System (MFIRS) involving open fired grills. These incidents caused three civilian injuries and an estimated dollar loss of $685,810. This is a 3% decrease from the 92 grill fires in 2016.

More than three-quarters, or 72%, 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 89 grill incidents, 80, or 90%, of the grills were gas grills. Solid fuels such as charcoal briquettes powered four grills, or 4% of these fires. Two (2), or 2%, were electrically powered. One (1) was a liquid fueled grill and two were undetermined. The 80 gas grill incidents caused three civilian injuries and $676,410, or 99% of the total damages.

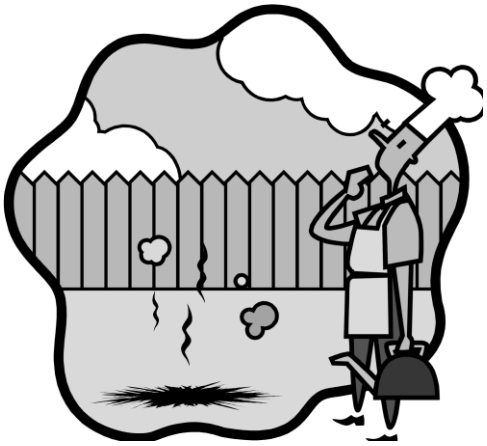
Woburn Had Largest Loss Grill Fire
Woburn had the largest loss grill fire at $500,000, or 73% of the total damages caused by grill fires in 2017.

- On August 20, 2017, at 6:57 p.m., the Woburn Fire Department was called to a fire in a single-family home. The fire was started by the gas grill on the rear porch No one was injured in this fire. It was undetermined if alarms were present. The building was not sprinklered. Damages from the blaze were estimated to be $500,000.

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 — 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. Nine (9) civilians were reported to M-BIRS in 2017 with burn injuries from a grill. The youngest person with a burn injury from a grill was a 32-year old man and the oldest was a 59-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 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

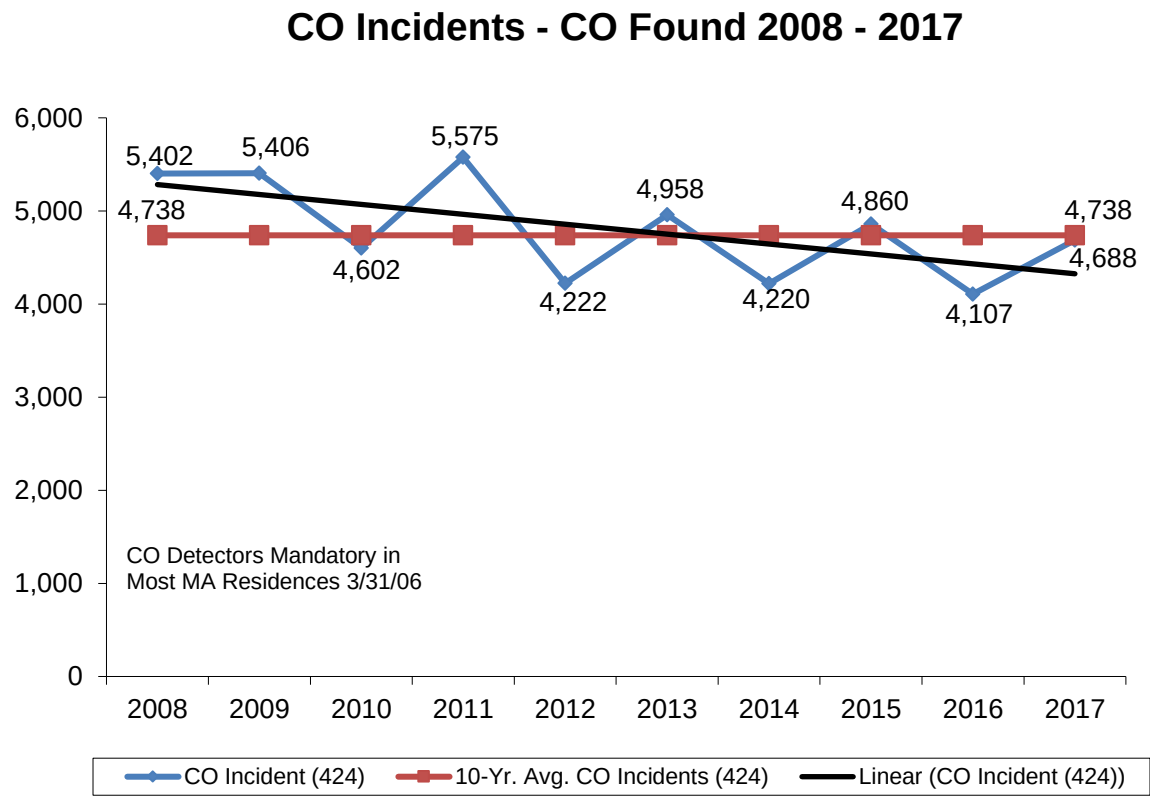
- Use only charcoal lighter fluid to start charcoal grills.
- Once the coals have been lighted, never add more lighter fluid to the fire — flames may travel up the stream of lighter fluid resulting in serious burns.
- Only use charcoal grills outside.

Carbon Monoxide Incidents

In 2017, 313 fire departments voluntarily reported 15,755 carbon monoxide (CO) incidents: hazards[22], carbon monoxide alarm activation due to malfunction[23], and carbon monoxide alarm activation – no CO[24]. 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 4,688 confirmed CO hazard incidents.

9% Increase from 2016

In 2017, the number of reported carbon monoxide incidents decreased by 1,358 calls, or 9%, from the 14,397 calls reported in 2016. CO calls of all types increased in 2006 to a high of 19,770 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. Overall, since 2009 CO calls have been on a downward trend. Some years there are spikes because of significant weather events that happen like the *Smowmageddon* snow storms in February of 2015.



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

92% of All CO Incidents Occur in Residences
Ninety-two percent (92%) of all carbon monoxide calls occurred in residential occupancies. 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	335	2%
Educational	152	1%
Institutional	268	2%
Residential	14,403	92%
Mercantile & business	330	2%
Basic Industry	13	0.1%
Manufacturing & processing	46	0.3%
Storage	103	1%
Special Properties	65	0.4%
Unclassified	40	0.3%
Total	15,755	100%

39% of All CO Calls Occur During the Winter
Thirty-nine percent (39%) of all the CO calls that occurred in 2017 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 5,508 in 2017. Worcester had the second highest number of reported fires at 1,270. Cambridge (1,103), Quincy (641), Framingham (574), and Brockton (561) rounded out the top six 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 Truro, Hawley and Sandisfield all reported less than 20 fires in 2017 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, *2017 Fires per 10,000 Population by Community,* on page 115, 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.

Topsfield, with 70 total fires, had the highest rate of 115 reported fires per 10,000 population. Lincoln was the next highest with 76 total fires and 114 fires per 10,000 population; Fitchburg had 458 fires and 114 fires per 10,000 population; Cambridge and Cohasset each had 105 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 4,083 in 2017. Cambridge had the second highest number of reported structure fires at 974. Worcester (852), Framingham (466), and Fitchburg (406) rounded out the top five communities in the Commonwealth in terms of reported structure fires.

The map titled *2017 Structure Fires per 10,000 Population by Community*, on page 116, 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.

Lincoln, with 73 structure fires, had the highest rate of 115 structure fires per 10,000 population. Topsfield was the next highest with 64 structure fires and 105 structure fires per 10,000 population; Fitchburg had 101; Cambridge had 93; and Cohasset had 81 structure fires per 10,000 population.

Boston & Cambridge Had the Most Reported Residential Building Fires
Boston reported having the most residential building fires, with 3,460 in 2017. Cambridge had the second highest number of reported building fires at 767. Worcester (753), Framingham (380), and Fitchburg (369) rounded out the top five communities in the Commonwealth in terms of reported residential building fires.

The map titled *2017 Residential Building Fires per 10,000 Population by Community*, on page 117, 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.

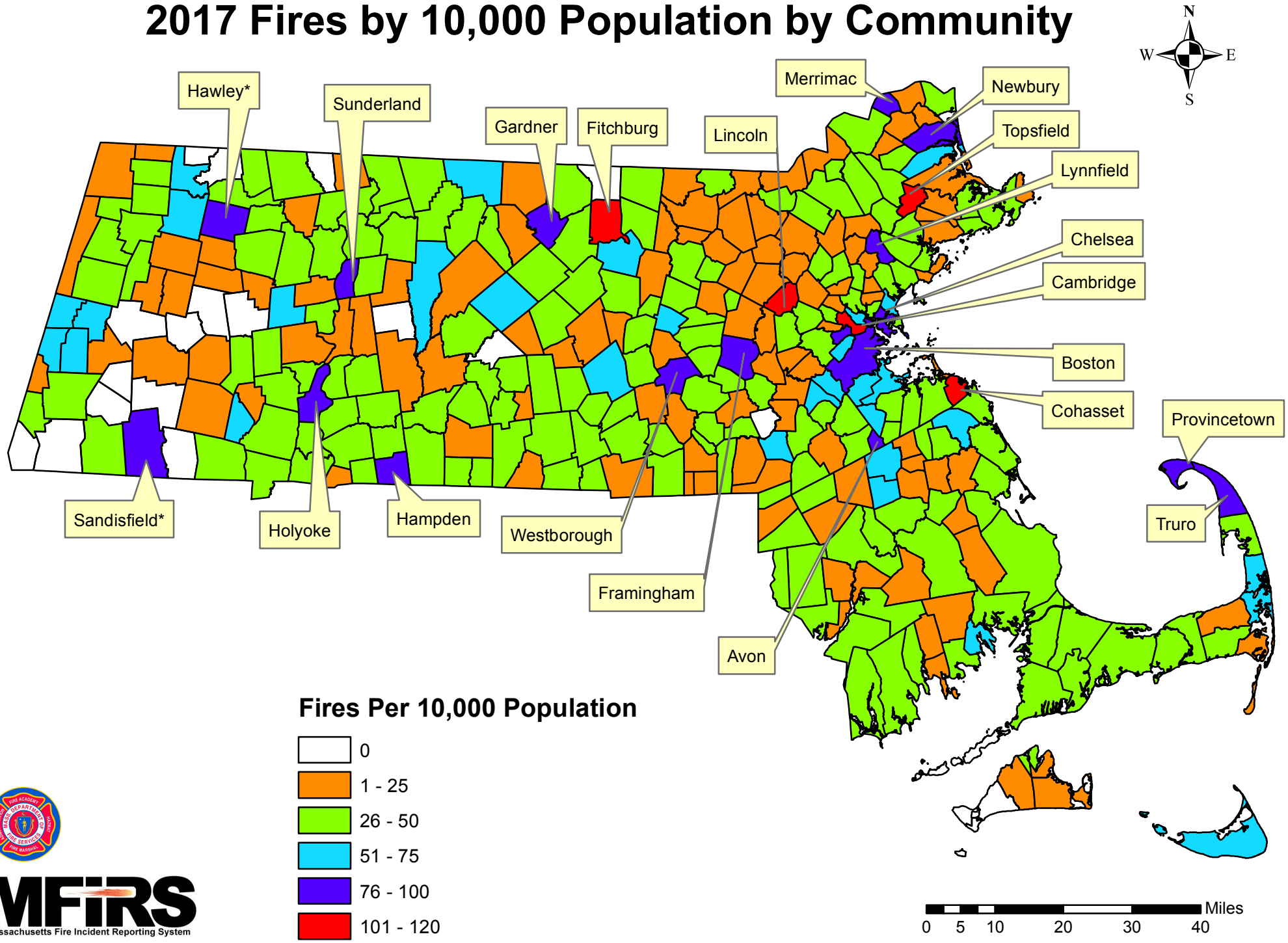
Lincoln, with 69 residential building fires, had the highest rate of 108 residential building fires per 10,000 population. Next highest was Fitchburg with 92 residential building fires per 10,000 population; Topsfield had 82; Cambridge had 73; Cohasset had 62, and Gardner also had 62 residential building fires per 10,000 population.

Boston & Holyoke Had the Most Reported Arsons
Boston reported having the most arsons, with 126 in 2017. New Bedford had the second highest number of reported arsons at 30. Fall River (24), Springfield (19), and Holyoke (16) rounded out the top five communities in the Commonwealth in terms of reported arsons.

The map titled *2017 Arsons per 10,000 Population by Community,* on page 118, 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 failed to report at all.

Rehoboth, with nine arsons, had the highest rate of any department reporting more than five arsons, with eight reported arsons per 10,000 population. Next highest was Medfield with seven arsons per 10,000 population, Mashpee had five, Lynnfield also had five; and Holyoke had four arsons per 10,000 population.

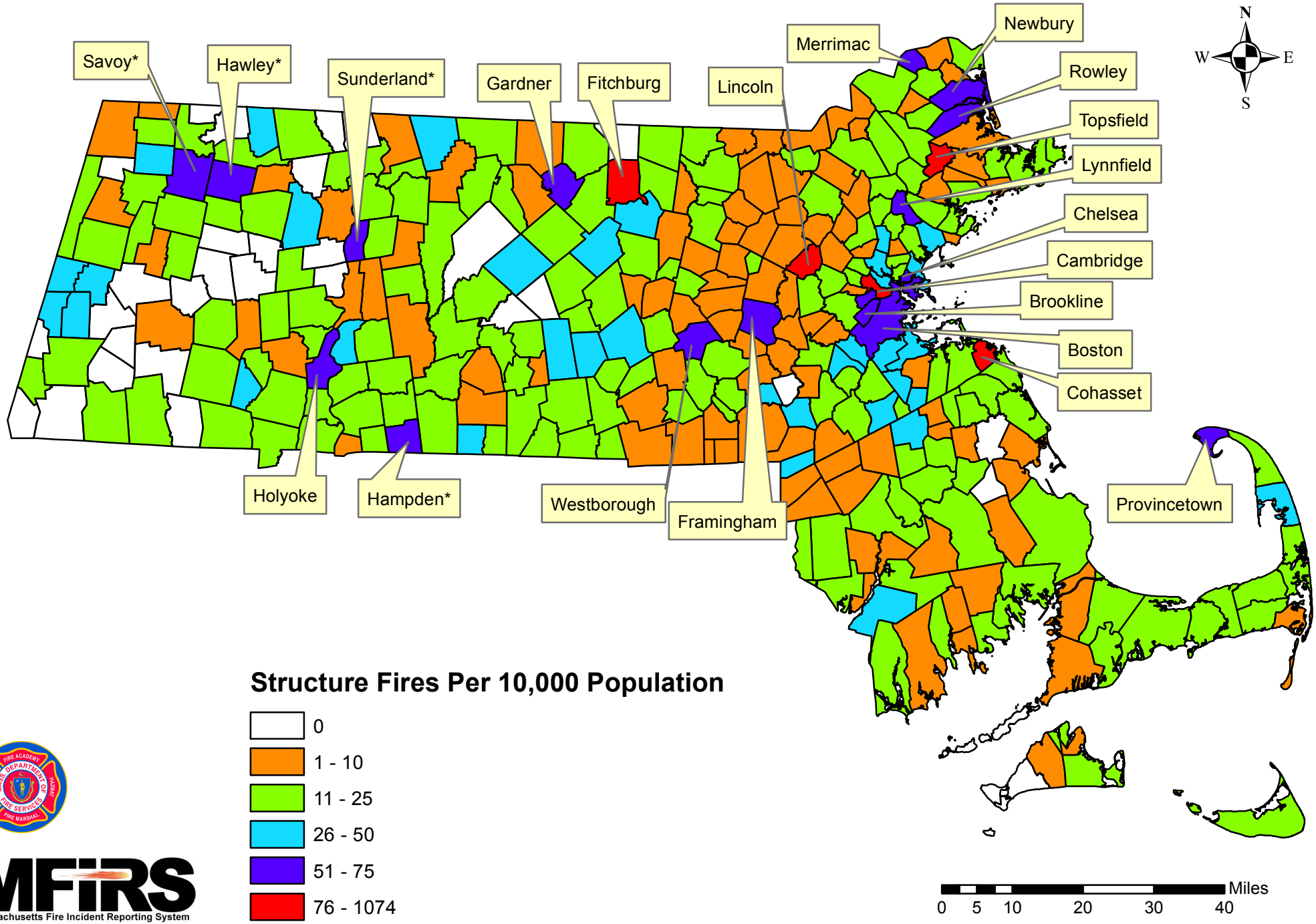
2017 Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 fires or less in 2017.

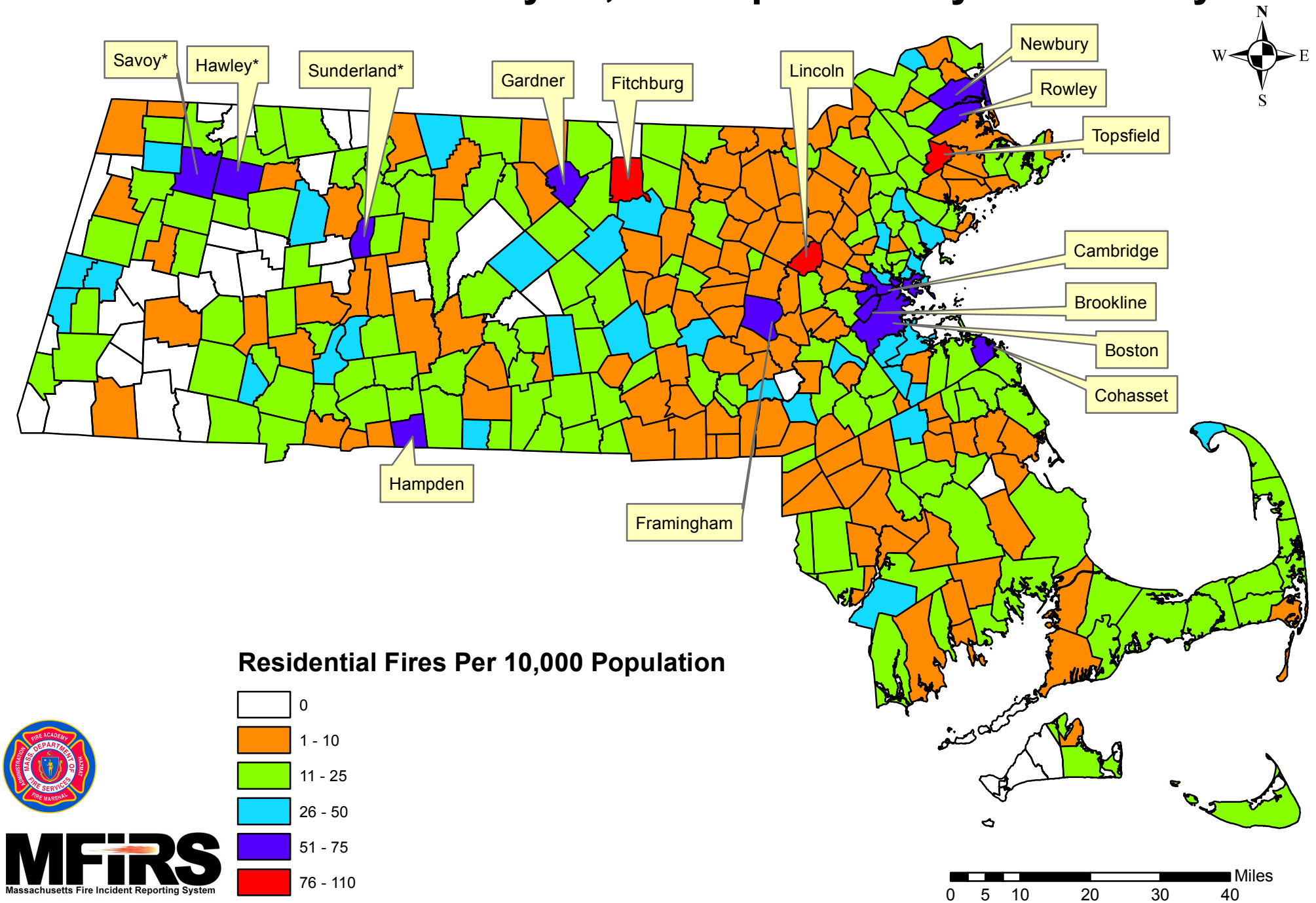
2017 Structure Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 or less structure fires in 2017.

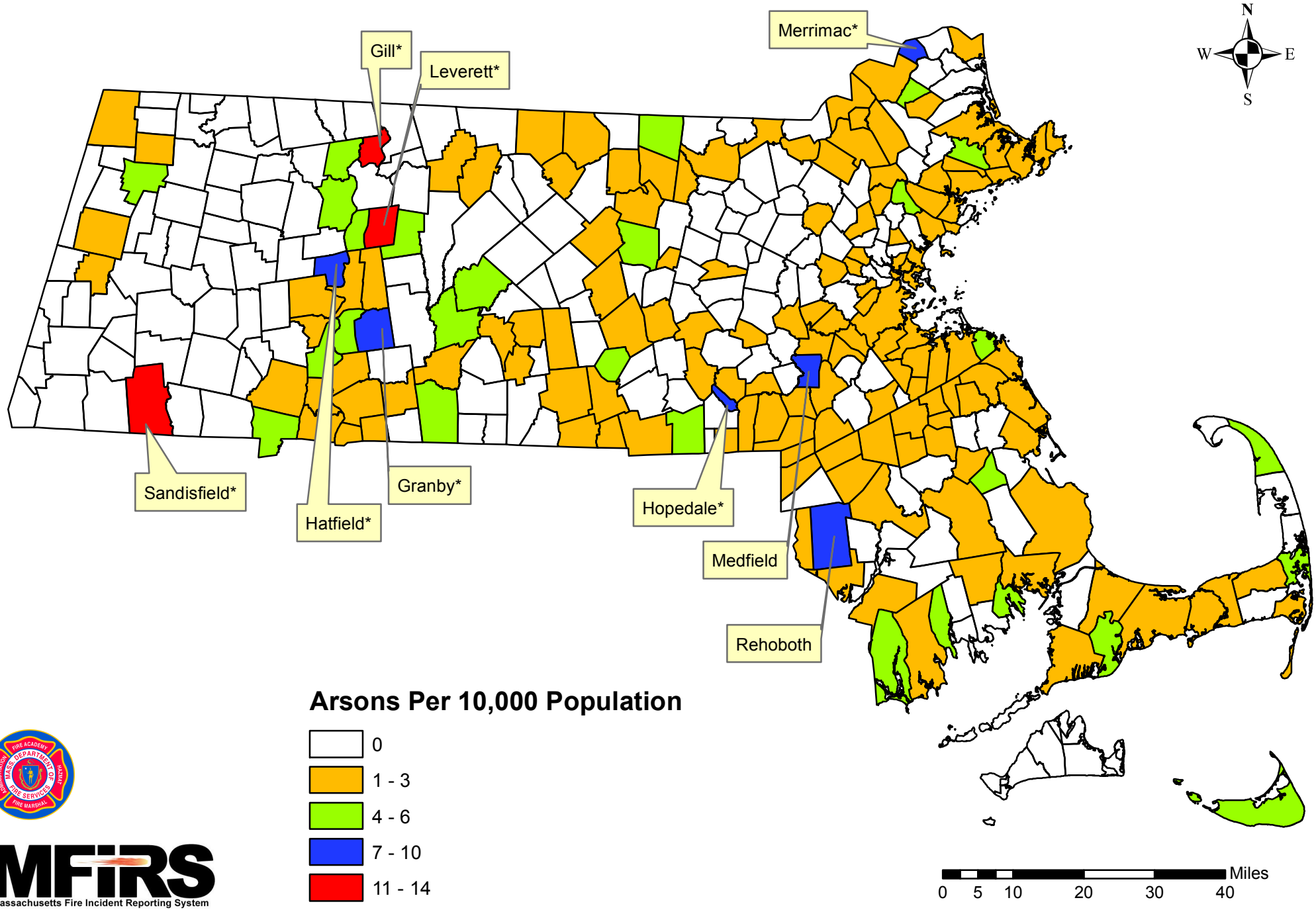
2017 Residential Fires by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 15 or less residential fires in 2017.

2017 Arsons by 10,000 Population by Community



MFIRS
Massachusetts Fire Incident Reporting System

*These departments reported 5 or less arsons in 2017.

Appendix

2017 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	39	13	3	23	1	1	0	0	$233,100
Acton	38	17	3	18	0	0	0	0	$986,423
Acushnet	12	8	1	3	0	0	0	0	$334,000
Adams	40	27	6	7	0	0	0	1	$836,042
Agawam	83	30	11	42	0	3	0	0	$1,107,245
Alford	1	0	1	0	0	0	0	0	$0
Amesbury	38	15	4	19	0	0	0	0	$79,176
Amherst	76	34	11	31	0	0	0	1	$579,140
Andover	98	51	16	31	0	0	0	0	$510,161
Aquinnah	0	0	0	0	0	0	0	0	$0
Arlington	76	43	4	29	0	2	0	0	$263,611
Ashburnham	20	8	2	10	0	0	0	0	$1,286,220
Ashby	0	0	0	0	0	0	0	0	$0
Ashfield	7	2	0	5	0	0	0	0	$120,000
Ashland	46	15	1	30	0	1	0	0	$33,300
Athol	45	22	7	16	0	0	0	0	$208,253
Attleboro	122	41	24	57	1	0	0	1	$370,510
Auburn	52	25	11	16	0	0	0	0	$7,920
Avon	35	7	8	20	0	0	0	0	$38,500
Ayer	18	8	2	8	0	1	0	2	$648,000
Barnstable Fire Districts									
Barnstable	*22*	*7*	*4*	*11*	*0*	*0*	*0*	*1*	*$111,650*
Cotuit	*5*	*2*	*0*	*3*	*0*	*0*	*0*	*0*	*$25,050*
C.O.M.M.	*49*	*16*	*6*	*27*	*0*	*1*	*0*	*0*	*$1,062,302*
Hyannis	*108*	*39*	*8*	*61*	*0*	*0*	*0*	*5*	*$936,302*
West Barnstable	*22*	*8*	*6*	*8*	*0*	*0*	*0*	*1*	*$717,171*
Barre	34	18	2	14	0	0	0	0	$492,100
Becket	2	1	0	1	0	0	0	0	$1,000
Bedford	13	6	2	5	0	1	0	1	$801,203
Belchertown	27	19	0	8	0	0	0	0	$300,000
Bellingham	50	13	8	29	0	1	0	0	$568,300
Belmont	72	54	2	16	1	0	0	3	$1,182,700
Berkley	16	5	6	5	0	0	0	0	$64,100
Berlin	18	5	4	9	0	0	0	0	$75,800
Bernardston	4	0	1	3	0	0	0	0	$1,000
Beverly	81	41	6	34	1	1	0	6	$1,907,155

2017 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	1	0	0	1	0	0	0	0	$0
Acton	0	0	0	0	0	0	0	0	$0
Acushnet	0	0	0	0	0	0	0	0	$0
Adams	2	0	0	2	0	0	0	0	$0
Agawam	1	0	0	1	0	0	0	0	$10
Alford	0	0	0	0	0	0	0	0	$0
Amesbury	0	0	0	0	0	0	0	0	$0
Amherst	4	1	1	2	0	0	0	0	$2,120
Andover	1	0	0	1	0	0	0	0	$0
Aquinnah	0	0	0	0	0	0	0	0	$0
Arlington	3	0	0	3	0	0	0	0	$100
Ashburnham	1	0	0	1	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	1	0	0	0	0	0	0	$0
Athol	2	1	0	1	0	0	0	0	$0
Attleboro	0	0	0	0	0	0	0	0	$0
Auburn	6	1	1	4	0	0	0	0	$0
Avon	0	0	0	0	0	0	0	0	$0
Ayer	0	0	0	0	0	0	0	0	$0
Barnstable Fire Districts									
Barnstable	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Cotuit	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
C.O.M.M.	*2*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Hyannis	*5*	*2*	*0*	*3*	*0*	*0*	*0*	*0*	*$6,000*
West Barnstable	*2*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*$1*
Barre	0	0	0	0	0	0	0	0	$0
Becket	0	0	0	0	0	0	0	0	$0
Bedford	1	0	0	1	0	0	0	0	$3
Belchertown	0	0	0	0	0	0	0	0	$0
Bellingham	1	1	0	0	0	0	0	0	$0
Belmont	1	0	0	1	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	2	1	0	1	0	0	0	0	$50

2017 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	94	46	15	33	0	1	0	5	$1,528,708
Blackstone	17	8	1	8	0	1	0	0	$11,715
Blandford	11	8	2	1	0	0	0	0	$454,600
Bolton	13	3	5	5	0	0	0	1	$64,500
Boston	5,469	4,077	219	1,173	2	19	0	3	$78,161,418
Bourne	46	17	7	22	1	1	0	1	$1,079,558
Boxborough	22	4	4	14	0	1	0	0	$350,000
Boxford	29	10	7	12	0	0	0	0	$1,745,216
Boylston	14	4	1	9	0	0	0	0	$20,000
Braintree	90	23	16	51	1	2	0	1	$929,550
Brewster	18	11	1	6	0	0	0	0	$30,505
Bridgewater	77	46	4	27	0	0	0	2	$982,989
Brimfield	4	2	1	1	0	0	0	0	$3,000
Brockton	561	313	43	205	0	17	0	15	$4,619,915
Brookfield	13	5	2	6	0	0	0	0	$0
Brookline	402	340	11	51	0	0	0	1	$372,150
Buckland	5	1	0	4	0	0	0	0	$200,700
Burlington	70	22	12	36	0	0	0	2	$921,500
Cambridge	1,103	974	11	118	0	6	0	30	$1,954,544
Canton	58	27	15	16	0	0	0	0	$1,116,835
Carlisle	2	2	0	0	0	0	0	0	$0
Carver	7	6	1	0	0	0	0	0	$444,700
Charlemont	5	2	1	2	0	0	0	0	$0
Charlton	60	32	16	12	0	4	0	1	$1,404,850
Chatham	6	1	1	4	0	1	0	0	$75,000
Chelmsford	37	15	17	5	0	0	0	0	$543,700
Chelsea	271	199	9	63	0	1	0	46	$3,022,140
Cheshire	10	6	1	3	0	0	0	0	$12,920
Chester	2	2	0	0	0	0	0	0	$111,000
Chesterfield	0	0	0	0	0	0	0	0	$0
Chicopee	183	93	22	68	0	5	0	5	$2,222,700
Chilmark	0	0	0	0	0	0	0	0	$0
Clarksburg	1	1	0	0	0	0	0	0	$16,500
Clinton	49	31	6	12	0	0	0	0	$397,000
Cohasset	79	61	4	14	0	1	0	0	$149,247

2017 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	0	0	0	0	0	0	0	0	$0
Blackstone	1	0	0	1	0	0	0	0	$0
Blandford	0	0	0	0	0	0	0	0	$0
Bolton	0	0	0	0	0	0	0	0	$0
Boston	126	32	11	83	0	1	0	0	$1,410,152
Bourne	0	0	0	0	0	0	0	0	$0
Boxborough	0	0	0	0	0	0	0	0	$0
Boxford	0	0	0	0	0	0	0	0	$0
Boylston	0	0	0	0	0	0	0	0	$0
Braintree	4	0	0	4	0	0	0	0	$0
Brewster	1	1	0	0	0	0	0	0	$30,000
Bridgewater	0	0	0	0	0	0	0	0	$0
Brimfield	0	0	0	0	0	0	0	0	$0
Brockton	10	4	1	5	0	1	0	0	$788,150
Brookfield	1	0	0	1	0	0	0	0	$0
Brookline	1	0	0	1	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	0	0	0	0	0	0	0	0	$0
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	2	0	1	1	0	0	0	0	$5,000
Chatham	1	0	1	0	0	0	0	0	$0
Chelmsford	0	0	0	0	0	0	0	0	$0
Chelsea	1	1	0	0	0	0	0	0	$600
Cheshire	1	0	0	1	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	1	1	0	0	0	0	0	$31,500
Chilmark	0	0	0	0	0	0	0	0	$0
Clarksburg	0	0	0	0	0	0	0	0	$0
Clinton	2	2	0	0	0	0	0	0	$51,000
Cohasset	4	0	0	4	0	0	0	0	$0

2017 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	8	4	1	3	0	0	0	0	$72,500
Concord	36	12	3	21	0	0	0	0	$91,925
Conway	9	7	0	2	0	0	0	0	$354,500
Cummington	1	0	0	1	0	0	0	0	$0
Dalton	19	14	0	5	0	2	0	0	$105,000
Danvers	82	17	11	54	0	1	0	2	$273,570
Dartmouth Fire Districts									
Dartmouth #1	*21*	*14*	*2*	*5*	*0*	*0*	*0*	*0*	*$420,700*
Dartmouth #2	*7*	*3*	*0*	*4*	*0*	*0*	*0*	*0*	*$0*
Dartmouth #3	*67*	*16*	*14*	*37*	*0*	*0*	*0*	*0*	*$376,264*
Dedham	146	78	9	59	0	2	0	0	$279,500
Deerfield Fire Districts									
Deerfield	*4*	*1*	*0*	*3*	*0*	*0*	*0*	*0*	*$0*
South Deerfield	*13*	*4*	*2*	*7*	*0*	*0*	*0*	*0*	*$100,000*
Dennis	54	25	7	22	0	1	0	2	$243,725
Devens	13	2	4	7	0	0	0	1	$45,000
Dighton	16	6	5	5	0	0	0	0	$174,500
Douglas	18	7	3	8	0	0	0	0	$27,000
Dover	11	7	0	4	0	0	0	0	$0
Dracut	53	29	4	20	0	5	0	1	$961,401
Dudley	41	19	4	18	0	0	0	0	$219,850
Dunstable	8	2	1	5	0	0	0	0	$40,500
Duxbury	40	12	3	25	0	0	0	0	$962,500
East Bridgewater	34	14	3	17	1	2	0	3	$465,150
East Brookfield	5	2	0	3	0	0	0	0	$0
East Longmeadow	43	22	5	16	0	3	0	0	$1,758,420
Eastham	25	8	2	15	0	1	0	1	$43,500
Easthampton	41	25	2	14	0	1	0	1	$321,350
Easton	45	18	5	22	0	0	0	0	$66,500
Edgartown	8	7	1	0	0	0	0	0	$236,000
Egremont	4	3	0	1	0	0	0	0	$0
Erving	6	2	2	2	0	0	0	0	$1,000
Essex	17	8	1	8	0	0	0	0	$3,000
Everett	106	59	9	38	0	2	0	1	$1,048,957
Fairhaven	30	11	7	12	0	0	0	0	$58,275

2017 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	0	0	0	0	0	0	0	0	$0
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	0	0	2	0	0	0	0	$0
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	*2*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Dedham	4	1	0	3	0	0	0	0	$0
Deerfield Fire Districts									
Deerfield	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
South Deerfield	*3*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*$0*
Dennis	1	0	0	1	0	0	0	0	$0
Devens	0	0	0	0	0	0	0	0	$0
Dighton	0	0	0	0	0	0	0	0	$0
Douglas	1	0	0	1	0	0	0	0	$0
Dover	0	0	0	0	0	0	0	0	$0
Dracut	1	0	0	1	0	0	0	0	$0
Dudley	2	1	0	1	0	0	0	0	$0
Dunstable	0	0	0	0	0	0	0	0	$0
Duxbury	1	0	0	1	0	0	0	0	$0
East Bridgewater	1	0	1	0	0	0	0	0	$10,000
East Brookfield	0	0	0	0	0	0	0	0	$0
East Longmeadow	1	0	0	1	0	0	0	0	$0
Eastham	0	0	0	0	0	0	0	0	$0
Easthampton	2	1	0	1	0	0	0	0	$35,000
Easton	3	0	0	3	0	0	0	0	$0
Edgartown	0	0	0	0	0	0	0	0	$0
Egremont	0	0	0	0	0	0	0	0	$0
Erving	0	0	0	0	0	0	0	0	$0
Essex	1	0	1	0	0	0	0	0	$0
Everett	6	2	0	4	0	0	0	0	$0
Fairhaven	0	0	0	0	0	0	0	0	$0

2017 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	431	263	41	127	2	7	0	4	$2,648,689
Falmouth	91	30	16	45	1	4	0	2	$3,228,750
Fitchburg	458	406	15	37	1	2	0	0	$793,548
Florida	4	1	3	0	0	0	0	0	$27,000
Foxborough	44	15	8	21	0	0	0	1	$584,450
Framingham	574	466	20	88	0	4	0	6	$1,849,150
Franklin	50	19	5	26	0	0	0	0	$0
Freetown	44	14	16	14	0	0	0	0	$365,660
Gardner	183	150	9	24	0	3	0	0	$346,865
Georgetown	29	17	5	7	0	0	0	0	$833,773
Gill	7	3	0	4	0	0	0	0	$30,000
Gloucester	87	42	10	35	0	1	0	2	$1,446,850
Goshen	2	0	1	1	0	0	0	0	$0
Gosnold	0	0	0	0	0	0	0	0	$0
Grafton	54	39	3	12	1	0	0	0	$956,300
Granby	21	9	4	8	0	0	0	0	$871,450
Granville	5	3	0	2	0	0	0	0	$200
Great Barrington	26	15	7	4	0	1	0	0	$60,973
Greenfield	58	30	6	22	0	0	0	2	$49,700
Groton	25	11	3	11	0	0	0	0	$113,640
Groveland	14	3	0	11	0	0	0	0	$302,400
Hadley	7	2	2	3	0	0	0	0	$105,200
Halifax	23	10	1	12	0	0	0	0	$72,352
Hamilton	12	6	0	6	0	0	0	0	$25,150
Hampden	50	32	1	17	0	0	0	0	$82,550
Hancock	1	1	0	0	0	0	0	0	$17,000
Hanover	47	20	6	21	0	1	0	0	$10,100
Hanson	22	8	1	13	0	0	0	0	$1,155,200
Hardwick	10	6	0	4	0	0	0	0	$540,500
Harvard	19	10	7	2	0	0	0	0	$46,700
Harwich	40	15	8	17	0	0	0	0	$814,400
Hatfield	9	0	1	8	0	0	0	0	$95,500
Haverhill	169	94	23	52	1	2	0	12	$837,495
Hawley	3	2	0	1	0	0	0	0	$0
Heath	3	2	1	0	0	0	0	0	$40,000
Hingham	66	34	4	28	0	1	0	2	$1,708,120

2017 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	25	10	8	7	0	0	0	0	$232,125
Falmouth	1	0	1	0	0	0	0	0	$0
Fitchburg	6	4	2	0	1	0	0	0	$93,000
Florida	0	0	0	0	0	0	0	0	$0
Foxborough	2	0	0	2	0	0	0	0	$0
Framingham	0	0	0	0	0	0	0	0	$0
Franklin	3	0	0	3	0	0	0	0	$0
Freetown	0	0	0	0	0	0	0	0	$0
Gardner	3	2	1	0	0	0	0	0	$19,010
Georgetown	1	0	0	1	0	0	0	0	$0
Gill	2	0	0	2	0	0	0	0	$0
Gloucester	1	0	1	0	0	0	0	0	$5,000
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	4	0	0	4	0	0	0	0	$0
Granville	0	0	0	0	0	0	0	0	$0
Great Barrington	0	0	0	0	0	0	0	0	$0
Greenfield	7	2	0	5	0	0	0	0	$0
Groton	2	0	1	1	0	0	0	0	$10,500
Groveland	3	0	0	3	0	0	0	0	$0
Hadley	1	0	0	1	0	0	0	0	$0
Halifax	2	1	0	1	0	0	0	0	$0
Hamilton	3	1	0	2	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	1	0	0	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	2	0	0	2	0	0	0	0	$0
Haverhill	4	3	0	1	0	0	0	0	$55,000
Hawley	0	0	0	0	0	0	0	0	$0
Heath	0	0	0	0	0	0	0	0	$0
Hingham	1	1	0	0	0	0	0	0	$3,500

2017 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	$90,000
Holbrook	42	32	5	5	0	0	0	1	$323,560
Holden	37	21	3	13	0	0	0	1	$1,447,400
Holland	10	5	1	4	0	0	0	0	$5,000
Holliston	8	8	0	0	0	0	0	0	$1,728,500
Holyoke	335	227	27	81	4	1	0	7	$395,155
Hopedale	19	8	3	8	0	0	0	1	$8,560
Hopkinton	42	19	5	18	0	0	0	1	$136,607
Hubbardston	14	6	1	7	0	0	0	0	$8,900
Hudson	57	17	7	33	0	0	0	1	$1,217,640
Hull	24	11	2	11	0	0	0	0	$183,501
Huntington	10	2	2	6	0	0	0	0	$2,000
Ipswich	21	8	2	11	0	1	0	1	$8,500
Joint Base C. C.	6	1	0	5	0	0	0	0	$0
Kingston	32	8	4	20	0	1	0	0	$30,000
Lakeville	8	4	2	2	0	0	0	0	$10,000
Lancaster	22	9	5	8	0	0	0	0	$1,029,700
Lanesborough	9	3	3	3	0	0	0	0	$5,000
Lawrence	215	74	43	98	2	4	0	14	$6,614,858
Lee	1	0	1	0	1	0	0	0	$0
Leicester	33	30	2	1	0	0	0	0	$123,000
Lenox	34	25	0	9	0	0	0	0	$8,800
Leominster	245	176	15	54	1	1	0	1	$1,140,607
Leverett	7	4	1	2	0	0	0	0	$0
Lexington	33	11	8	14	0	1	0	1	$418,037
Leyden	0	0	0	0	0	0	0	0	$0
Lincoln	73	73	0	0	0	0	0	0	$2,426
Littleton	19	5	6	8	0	0	0	0	$74,800
Logan Airport FD	39	5	8	26	0	0	0	0	$125,200
Longmeadow	24	12	9	3	0	0	0	0	$233,320
Lowell	385	261	33	91	1	2	0	2	$3,116,533
Ludlow	58	33	8	17	3	4	0	1	$1,156,601
Lunenburg	45	21	5	19	0	1	0	0	$57,750
Lynn	442	309	29	104	1	5	0	12	$460,554
Lynnfield	100	72	4	24	0	0	0	2	$256,500

2017 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	2	2	0	0	0	0	0	0	$500
Holden	2	0	0	2	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	16	5	1	10	0	0	0	0	$0
Hopedale	4	0	0	4	0	0	0	1	$0
Hopkinton	0	0	0	0	0	0	0	0	$0
Hubbardston	0	0	0	0	0	0	0	0	$0
Hudson	3	1	0	2	0	0	0	0	$60
Hull	0	0	0	0	0	0	0	0	$0
Huntington	0	0	0	0	0	0	0	0	$0
Ipswich	1	1	0	0	0	0	0	0	$0
Joint Base C. C.	0	0	0	0	0	0	0	0	$0
Kingston	0	0	0	0	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	16	2	6	8	0	0	0	0	$21,900
Lee	0	0	0	0	0	0	0	0	$0
Leicester	0	0	0	0	0	0	0	0	$0
Lenox	1	0	0	1	0	0	0	0	$0
Leominster	5	4	0	1	1	0	0	0	$375,200
Leverett	2	1	0	1	0	0	0	0	$0
Lexington	0	0	0	0	0	0	0	0	$0
Leyden	0	0	0	0	0	0	0	0	$0
Lincoln	0	0	0	0	0	0	0	0	$0
Littleton	0	0	0	0	0	0	0	0	$0
Logan Airport FD	0	0	0	0	0	0	0	0	$0
Longmeadow	1	0	0	1	0	0	0	0	$500
Lowell	4	0	2	2	0	0	0	0	$10,020
Ludlow	0	0	0	0	0	0	0	0	$0
Lunenburg	1	0	0	1	0	0	0	0	$0
Lynn	8	1	1	6	1	0	0	0	$3,002
Lynnfield	6	0	0	6	0	0	0	0	$0

2017 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	122	64	5	53	2	0	0	1	$217,000
Manchester	16	5	2	9	0	0	0	0	$14,050
Mansfield	59	13	17	29	3	0	0	1	$691,700
Marblehead	39	20	0	19	0	0	0	0	$269,120
Marion	26	7	8	11	0	0	0	0	$363,802
Marlborough	105	22	16	67	1	5	0	1	$1,613,827
Marshfield	100	41	6	53	0	2	0	1	$0
Mashpee	48	17	5	26	0	1	0	0	$264,800
Mattapoisett	17	7	1	9	0	0	0	0	$423,540
Maynard	27	19	1	7	0	0	0	2	$412,000
Medfield	25	5	0	20	0	0	0	0	$19,002
Medford	239	169	9	61	0	0	0	1	$91,300
Medway	52	39	1	12	0	0	0	0	$151,313
Melrose	20	15	4	1	1	0	0	0	$398,500
Mendon	6	1	2	3	0	0	0	0	$403,100
Merrimac	54	34	4	16	0	0	0	0	$0
Methuen	112	38	17	57	1	0	0	0	$500,000
Middleborough	78	37	18	23	0	1	0	4	$1,443,600
Middlefield	0	0	0	0	0	0	0	0	$0
Middleton	29	14	3	12	0	0	0	0	$22,600
Milford	104	50	13	41	0	7	0	2	$1,222,150
Millbury	55	30	5	20	0	0	0	2	$2,111,520
Millis	0	0	0	0	0	0	0	0	$0
Millville	4	2	1	1	0	2	0	0	$68,000
Milton	166	116	14	36	2	0	0	4	$484,400
Monroe	0	0	0	0	0	0	0	0	$0
Monson	25	13	5	7	0	0	0	2	$239,000
Montague Fire Districts									
Montague Center	*14*	*6*	*1*	*7*	*0*	*0*	*0*	*0*	*$20,510*
Turners Falls	*23*	*15*	*2*	*6*	*0*	*0*	*0*	*0*	*$12,515*
Monterey	0	0	0	0	0	0	0	0	$0
Montgomery	1	1	0	0	0	0	1	0	$500,000
Nahant	10	7	0	3	0	0	0	0	$3,300
Nantucket	54	19	13	22	0	0	0	1	$339,000
Natick	68	28	7	33	0	1	0	0	$317,610
Needham	53	13	11	29	0	2	0	0	$845,111

2017 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	1	0	0	1	0	0	0	0	$0
Mansfield	1	0	0	1	0	0	0	0	$0
Marblehead	0	0	0	0	0	0	0	0	$0
Marion	2	0	0	2	0	0	0	0	$0
Marlborough	0	0	0	0	0	0	0	0	$0
Marshfield	2	0	0	2	0	1	0	0	$0
Mashpee	8	0	0	8	0	0	0	0	$0
Mattapoisett	0	0	0	0	0	0	0	0	$0
Maynard	0	0	0	0	0	0	0	0	$0
Medfield	9	0	0	9	0	0	0	0	$2
Medford	0	0	0	0	0	0	0	0	$0
Medway	2	1	0	1	0	0	0	0	$503
Melrose	3	3	0	0	0	0	0	0	$13,000
Mendon	0	0	0	0	0	0	0	0	$0
Merrimac	4	0	0	4	0	0	0	0	$0
Methuen	6	1	0	5	0	0	0	0	$0
Middleborough	3	1	1	1	0	0	0	0	$30,525
Middlefield	0	0	0	0	0	0	0	0	$0
Middleton	0	0	0	0	0	0	0	0	$0
Milford	2	1	0	1	0	0	0	1	$250,000
Millbury	0	0	0	0	0	0	0	0	$0
Millis	0	0	0	0	0	0	0	0	$0
Millville	0	0	0	0	0	0	0	0	$0
Milton	3	0	0	3	0	0	0	0	$0
Monroe	0	0	0	0	0	0	0	0	$0
Monson	5	0	1	4	0	0	0	0	$0
Montague Fire Districts									
Montague Center	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Turners Falls	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Monterey	0	0	0	0	0	0	0	0	$0
Montgomery	0	0	0	0	0	0	0	0	$0
Nahant	1	1	0	0	0	0	0	0	$1,000
Nantucket	4	2	1	1	0	0	0	1	$155,000
Natick	1	1	0	0	0	0	0	0	$2,000
Needham	3	1	0	2	0	0	0	0	$60,010

2017 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	1	0	0	1	0	0	0	0	$0
New Bedford	453	229	53	171	0	15	0	1	$3,155,505
New Braintree	6	2	1	3	0	0	0	0	$231,000
New Marlborough	5	2	1	2	0	0	0	0	$0
New Salem	6	1	0	5	0	0	0	0	$500
Newbury	57	43	4	10	0	0	0	0	$100
Newburyport	13	9	2	2	0	0	0	0	$269,500
Newton	295	211	16	68	0	2	0	2	$1,556,233
Norfolk	71	53	1	17	0	3	0	0	$188,508
North Adams	36	20	7	9	1	0	0	0	$387,460
North Andover	82	53	9	20	0	1	0	0	$930,781
North Attleboro	40	13	6	21	0	0	0	0	$84,600
North Brookfield	20	8	0	12	0	0	0	1	$10,000
North Reading	34	23	3	8	1	0	0	0	$44,003
Northampton	57	30	9	18	0	0	0	1	$1,274,400
Northborough	32	11	5	16	0	2	0	0	$382,051
Northbridge	42	18	5	19	0	1	0	0	$964,725
Northfield	8	2	1	5	0	1	0	0	$3,502
Norton	25	6	4	15	0	0	0	0	$204,559
Norwell	54	20	9	25	0	1	0	1	$312,102
Norwood	89	34	9	46	0	3	0	1	$408,161
Oak Bluffs	3	2	1	0	0	0	0	0	$1,000
Oakham	4	0	2	2	0	0	0	0	$3,500
Orange	22	4	1	17	0	0	0	0	$21,250
Orleans	33	12	1	20	0	0	0	0	$601,500
Otis	0	0	0	0	0	0	0	0	$0
Oxford	61	32	6	23	1	1	0	4	$1,671,000
Palmer Fire Districts									
Bondsville	*4*	*1*	*0*	*3*	*0*	*0*	*0*	*0*	*$0*
Palmer	*28*	*10*	*11*	*7*	*0*	*0*	*0*	*0*	*$49,561*
Three Rivers	*6*	*4*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Paxton	12	9	0	3	0	2	0	0	$90,000
Peabody	153	73	16	64	0	0	0	0	$1,511,496
Pelham	0	0	0	0	0	0	0	0	$0
Pembroke	4	2	0	2	0	0	0	0	$0
Pepperell	26	14	1	11	0	2	0	0	$281,953

2017 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	30	18	9	3	0	0	0	1	$676,170
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	0	0	0	0	0	0	0	0	$0
Norfolk	3	1	0	2	0	0	0	0	$105,003
North Adams	0	0	0	0	0	0	0	0	$0
North Andover	3	0	0	3	0	0	0	0	$63
North Attleboro	2	0	0	2	0	0	0	0	$0
North Brookfield	1	0	0	1	0	0	0	0	$0
North Reading	1	1	0	0	1	0	0	0	$0
Northampton	3	2	0	1	0	0	0	0	$45,000
Northborough	0	0	0	0	0	0	0	0	$0
Northbridge	0	0	0	0	0	0	0	0	$0
Northfield	0	0	0	0	0	0	0	0	$0
Norton	3	2	0	1	0	0	0	0	$130,103
Norwell	3	0	0	3	0	0	0	0	$0
Norwood	0	0	0	0	0	0	0	0	$0
Oak Bluffs	0	0	0	0	0	0	0	0	$0
Oakham	0	0	0	0	0	0	0	0	$0
Orange	1	0	0	1	0	0	0	0	$0
Orleans	2	0	0	2	0	0	0	0	$0
Otis	0	0	0	0	0	0	0	0	$0
Oxford	1	0	1	0	0	0	0	0	$3,200
Palmer Fire Districts									
Bondsville	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Palmer	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Three Rivers	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Paxton	0	0	0	0	0	0	0	0	$0
Peabody	2	2	0	0	0	0	0	0	$2,000
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

2017 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	$125,000
Petersham	1	0	1	0	0	0	0	0	$5,000
Phillipston	5	2	0	3	0	0	0	0	$0
Pittsfield	193	107	16	70	0	3	0	1	$2,239,355
Plainfield	1	1	0	0	0	0	0	0	$0
Plainville	40	21	2	17	0	0	0	0	$20,320
Plymouth	176	81	30	65	0	10	0	4	$1,694,730
Plympton	8	0	0	8	0	0	0	0	$0
Princeton	14	13	0	1	0	0	0	2	$2,865,000
Provincetown	24	16	0	8	0	0	0	0	$1,150,000
Quincy	641	406	19	216	2	8	0	37	$1,891,710
Randolph	196	127	17	52	0	0	0	0	$60,000
Raynham	64	18	11	35	0	0	0	0	$90,900
Reading	58	28	10	20	0	0	0	1	$7,503,000
Rehoboth	45	15	8	22	0	0	0	2	$0
Revere	347	223	18	106	0	2	0	2	$1,221,574
Richmond	11	6	0	5	0	0	0	0	$0
Rochester	4	4	0	0	0	1	0	0	$0
Rockland	58	24	4	30	0	1	0	1	$430,225
Rockport	20	11	1	8	0	0	0	0	$0
Rowe	0	0	0	0	0	0	0	0	$0
Rowley	37	31	4	2	0	0	0	0	$313,901
Royalston	7	3	0	4	0	0	0	0	$0
Russell	11	5	1	5	0	0	0	0	$12,600
Rutland	22	13	0	9	0	1	0	0	$649,300
Salem	165	61	15	89	0	1	0	0	$963,696
Salisbury	39	9	5	25	0	0	0	0	$90,230
Sandisfield	7	1	2	4	0	0	0	0	$865,200
Sandwich	57	37	6	14	0	1	0	0	$163,225
Saugus	118	45	12	61	0	0	0	7	$1,134,860
Savoy	4	4	0	0	0	0	0	0	$0
Scituate	65	30	3	32	0	1	0	1	$703,425
Seekonk	53	18	7	28	0	1	0	1	$707,950
Sharon	41	25	4	12	0	0	0	0	$163,200
Sheffield	0	0	0	0	0	0	0	0	$0

2017 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	5	1	0	4	0	0	0	0	$11,000
Plainfield	0	0	0	0	0	0	0	0	$0
Plainville	1	0	0	1	0	0	0	0	$0
Plymouth	1	1	0	0	0	0	0	0	$800
Plympton	1	0	0	1	0	0	0	0	$0
Princeton	1	0	0	1	0	0	0	0	$0
Provincetown	0	0	0	0	0	0	0	0	$0
Quincy	9	0	0	9	0	0	0	0	$0
Randolph	8	4	0	4	0	0	0	0	$0
Raynham	0	0	0	0	0	0	0	0	$0
Reading	5	0	0	5	0	0	0	0	$0
Rehoboth	9	1	0	8	0	0	0	0	$0
Revere	2	0	1	1	0	0	0	0	$5,000
Richmond	0	0	0	0	0	0	0	0	$0
Rochester	1	1	0	0	0	1	0	0	$0
Rockland	2	1	0	1	0	0	0	0	$1,000
Rockport	1	1	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	0	0	0	0	0	0	0	0	$0
Russell	0	0	0	0	0	0	0	0	$0
Rutland	0	0	0	0	0	0	0	0	$0
Salem	1	1	0	0	0	0	0	0	$2,560
Salisbury	1	0	0	1	0	0	0	0	$0
Sandisfield	1	0	0	1	0	0	0	0	$0
Sandwich	2	1	0	1	0	0	0	0	$2,000
Saugus	0	0	0	0	0	0	0	0	$0
Savoy	0	0	0	0	0	0	0	0	$0
Scituate	4	0	1	3	0	0	0	0	$100
Seekonk	2	1	0	1	0	0	0	0	$500
Sharon	0	0	0	0	0	0	0	0	$0
Sheffield	0	0	0	0	0	0	0	0	$0

2017 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	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Shelburne Falls	*2*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*$0*
Sherborn	15	4	1	10	0	0	0	0	$10,411
Shirley	13	4	3	6	0	0	0	0	$500
Shrewsbury	99	54	14	31	0	0	0	0	$384,700
Shutesbury	2	1	0	1	0	0	0	0	$300
Somerset	39	16	8	15	0	0	0	0	$842,225
Somerville	433	334	16	83	0	2	0	14	$1,766,500
South Hadley Fire Districts									
South Hadley #1	*32*	*15*	*2*	*15*	*0*	*0*	*0*	*0*	*$38,100*
South Hadley #2	*51*	*43*	*1*	*7*	*0*	*0*	*0*	*0*	*$232,000*
Southampton	19	6	0	13	0	0	0	0	$110,000
Southborough	25	8	7	10	0	0	0	0	$130,050
Southbridge	36	21	12	3	0	4	0	0	$746,900
Southwick	27	14	5	8	0	1	0	0	$460,700
Spencer	56	39	3	14	0	2	0	3	$706,000
Springfield	503	314	76	113	2	2	0	34	$3,098,227
Sterling	21	8	6	7	0	0	0	0	$253,835
Stockbridge	10	5	2	3	0	0	0	0	$0
Stoneham	96	63	8	25	0	1	0	0	$75,000
Stoughton	108	76	9	23	0	1	0	0	$1,489,150
Stow	11	5	1	5	0	0	0	0	$0
Sturbridge	44	16	8	20	0	0	0	0	$12,000
Sudbury	8	6	0	2	0	0	0	1	$654,300
Sunderland	29	22	0	7	0	2	0	0	$403,000
Sutton	26	8	6	12	0	0	0	0	$289,100
Swampscott	27	10	1	16	0	0	0	0	$460,000
Swansea	60	30	15	15	0	1	0	1	$0
Taunton	156	70	15	71	0	0	0	0	$2,239,000
Templeton	11	9	0	2	0	0	0	0	$7,000
Tewksbury	81	25	15	41	0	0	0	1	$917,610
Tisbury	12	5	4	3	0	0	0	0	$118,000
Tolland	0	0	0	0	0	0	0	0	$0
Topsfield	70	64	0	6	0	0	0	0	$20,650
Townsend	23	14	1	8	0	0	0	0	$53,447
Truro	19	3	2	14	0	0	0	0	$41,100

2017 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	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Sherborn	0	0	0	0	0	0	0	0	$0
Shirley	1	0	1	0	0	0	0	0	$0
Shrewsbury	2	1	0	1	0	0	0	0	$0
Shutesbury	0	0	0	0	0	0	0	0	$0
Somerset	0	0	0	0	0	0	0	0	$0
Somerville	1	0	0	1	0	0	0	0	$0
South Hadley Fire Districts									
South Hadley #1	*7*	*2*	*0*	*5*	*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	0	0	0	0	0	0	0	0	$0
Southbridge	0	0	0	0	0	0	0	0	$0
Southwick	3	1	0	2	0	0	0	0	$0
Spencer	1	0	0	1	0	0	0	0	$0
Springfield	20	8	7	5	0	0	0	0	$65,500
Sterling	3	1	0	2	0	0	0	0	$335
Stockbridge	0	0	0	0	0	0	0	0	$0
Stoneham	0	0	0	0	0	0	0	0	$0
Stoughton	1	1	0	0	0	0	0	0	$0
Stow	0	0	0	0	0	0	0	0	$0
Sturbridge	0	0	0	0	0	0	0	0	$0
Sudbury	0	0	0	0	0	0	0	0	$0
Sunderland	2	1	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	1	0	0	1	0	0	0	0	$0
Taunton	13	3	0	10	0	0	0	0	$22,000
Templeton	0	0	0	0	0	0	0	0	$0
Tewksbury	1	0	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	3	0	0	3	0	0	0	0	$2
Truro	1	0	0	1	0	0	0	0	$0

2017 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	25	11	7	7	0	0	0	1	$685,300
Tyringham	0	0	0	0	0	0	0	0	$0
Upton	14	10	0	4	0	0	0	0	$5,200
Uxbridge	36	11	6	19	0	0	0	0	$163,112
Wakefield	60	48	8	4	1	0	0	0	$150,000
Wales	9	6	0	3	0	0	0	0	$7,500
Walpole	79	43	4	32	0	0	0	0	$499,200
Waltham	165	67	21	77	0	2	0	9	$111,459,600
Ware	23	10	4	9	0	0	0	0	$20,550
Wareham Fire Districts									
Onset	*36*	*32*	*2*	*2*	*0*	*1*	*0*	*0*	*$35,750*
Wareham	*75*	*22*	*26*	*27*	*0*	*4*	*0*	*1*	*$698,500*
Warren	14	5	3	6	0	0	0	0	$36,500
Warwick	2	2	0	0	5	2	0	0	$155,500
Washington	0	0	0	0	0	0	0	0	$0
Watertown	40	17	4	19	0	1	1	2	$872,800
Wayland	21	11	1	9	0	0	0	0	$58,773
Webster	57	36	10	11	0	0	0	1	$466,882
Wellesley	53	25	7	21	0	0	0	0	$2,292,900
Wellfleet	19	10	3	6	0	0	0	0	$17,700
Wendell	3	1	2	0	0	0	0	0	$54,650
Wenham	7	3	0	4	0	0	0	0	$500
West Boylston	17	7	4	6	0	2	0	0	$212,100
West Bridgewater	44	11	11	22	0	1	0	0	$158,450
West Brookfield	10	6	3	1	0	0	0	0	$54,450
West Newbury	10	8	1	1	0	0	0	0	$150,000
West Springfield	90	44	19	27	1	0	0	1	$556,150
West Stockbridge	7	4	0	3	0	0	0	0	$7,700
West Tisbury	3	1	0	2	0	0	0	0	$0
Westborough	138	109	9	20	0	0	0	1	$1,645,750
Westfield	103	47	17	39	2	3	0	2	$1,035,490
Westford	45	17	5	23	0	1	0	2	$685,027
Westhampton	7	2	1	4	0	0	0	0	$410,000
Westminster	27	10	11	6	0	0	0	0	$106,200
Weston	30	13	9	8	0	2	0	0	$381,600
Westport	72	19	15	38	0	3	0	1	$644,550

2017 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	1	0	0	1	0	0	0	0	$0
Tyringham	0	0	0	0	0	0	0	0	$0
Upton	2	0	0	2	0	0	0	0	$0
Uxbridge	5	0	0	5	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	3	2	0	1	0	0	0	4	$110,000,000
Ware	3	0	0	3	0	0	0	0	$0
Wareham Fire Districts									
Onset	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*$0*
Wareham	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*$0*
Warren	0	0	0	0	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	5	2	1	2	0	0	0	0	$500
Wellesley	1	1	0	0	0	0	0	0	$0
Wellfleet	0	0	0	0	0	0	0	0	$0
Wendell	0	0	0	0	0	0	0	0	$0
Wenham	1	0	0	1	0	0	0	0	$0
West Boylston	0	0	0	0	0	0	0	0	$0
West Bridgewater	1	0	0	1	0	0	0	0	$0
West Brookfield	1	0	0	1	0	0	0	0	$0
West Newbury	0	0	0	0	0	0	0	0	$0
West Springfield	7	2	0	5	0	0	0	1	$0
West Stockbridge	0	0	0	0	0	0	0	0	$0
West Tisbury	0	0	0	0	0	0	0	0	$0
Westborough	5	3	0	2	0	0	0	0	$0
Westfield	1	0	0	1	0	0	0	0	$0
Westford	0	0	0	0	0	0	0	0	$0
Westhampton	0	0	0	0	0	0	0	0	$0
Westminster	0	0	0	0	0	0	0	0	$0
Weston	0	0	0	0	0	0	0	0	$0
Westport	6	1	0	5	0	1	0	0	$600

2017 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	105	63	10	32	0	2	0	0	$221,160
Weymouth	252	136	21	95	1	0	0	7	$16,693,607
Whately	3	0	0	3	0	0	0	0	$0
Whitman	32	11	4	17	0	0	0	0	$501,805
Wilbraham	37	19	3	15	0	1	0	0	$168,000
Williamsburg	16	6	1	9	0	0	0	0	$14,300
Williamstown	11	6	2	3	0	0	0	0	$24,700
Wilmington	22	5	9	8	0	2	0	2	$958,800
Winchendon	19	10	3	6	1	0	0	0	$513,741
Winchester	26	10	2	14	0	0	0	1	$105,200
Windsor	4	4	0	0	0	0	0	0	$0
Winthrop	70	51	2	17	1	3	0	0	$870,650
Woburn	164	75	20	69	0	0	0	0	$3,281,608
Worcester	1,270	852	70	348	0	1	0	31	$9,380,713
Worthington	0	0	0	0	0	0	0	0	$0
Wrentham	12	7	2	3	0	0	0	0	$37,622
Yarmouth	78	28	5	45	0	0	0	3	$307,200

2017 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	1	0	1	0	0	0	0	0	$0
Weymouth	4	3	0	1	0	0	0	0	$6,700
Whately	0	0	0	0	0	0	0	0	$0
Whitman	1	1	0	0	0	0	0	0	$25,000
Wilbraham	1	0	1	0	0	0	0	0	$9,000
Williamsburg	0	0	0	0	0	0	0	0	$0
Williamstown	1	0	0	1	0	0	0	0	$1,400
Wilmington	0	0	0	0	0	0	0	0	$0
Winchendon	1	0	0	1	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	1	0	0	1	0	0	0	0	$0
Worcester	11	8	3	0	0	0	0	4	$290,171
Worthington	0	0	0	0	0	0	0	0	$0
Wrentham	1	0	0	1	0	0	0	0	$20
Yarmouth	7	1	0	6	0	0	0	0	$200

2017 Fires By Incident Type

Incident Type	Total Fires	% of Total	Civilian Deaths	Civilian Inj.	Fire Service Deaths	Fire Service Inj.	Dollar Loss
Structure Fires	17,099	61%	51	210	2	382	$364,747,291
Vehicle Fires	2,367	8%	7	19	0	19	21,167,132
Brush Fires	4,206	15%	0	6	0	14	215,156
Outside Rubbish Fires	2,382	9%	0	1	0	7	161,426
Special Outside Fires	813	3%	0	14	0	2	1,003,785
Cult. Veg. & Crop Fires	66	0.2%	0	0	0	0	4,610
Other Fires	962	3%	0	19	0	10	3,182,861
Total Fires	**27,895**	**100%**	**58**	**269**	**2**	**434**	**$390,482,261**

2017 Arsons* By Incident Type

Incident Type	Total Fires	% of Total	Civilian Deaths	Civilian Inj.	Fire Service Deaths	Fire Service Inj.	Dollar Loss
Structure Arsons	187	28%	4	2	0	12	$113,351,226
Vehicle Arsons	68	10%	0	0	0	0	930,220
Brush Arsons	176	26%	0	1	0	1	81
Outside Rubbish Arsons	73	11%	0	0	0	0	11,030
Special Outside Arsons	86	13%	0	1	0	0	4,443
Cult. Veg. & Crop Arsons	9	1%	0	0	0	0	0
Other Arsons	72	11%	0	1	0	0	1,820
Total Arsons	**671**	**100%**	**4**	**5**	**0**	**13**	**$114,298,820**

*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.

2017 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	759	300	85	374	2	11	0	16	$10,901,238
Berkshire	442	257	52	133	2	6	0	2	4,829,650
Bristol	1,872	847	278	747	6	27	0	12	13,307,487
Dukes	26	16	6	5	0	0	0	0	355,000
Essex	2,474	1,293	256	925	6	17	0	57	21,957,642
Franklin	253	118	22	113	5	5	0	2	1,641,127
Hampden	1,641	939	222	480	12	23	1	52	13,411,119
Hampshire	384	190	41	153	0	1	0	3	4,127,990
Middlesex	5,294	3,501	379	1,414	8	48	1	98	154,635,597
Nantucket	54	19	13	22	0	0	0	1	339,000
Norfolk	2,990	1,808	220	962	6	25	0	53	29,827,456
Plymouth	1,746	822	199	725	3	45	0	35	16,993,556
Suffolk	6,196	4,555	256	1,385	3	25	0	51	83,400,982
Worcester	3,764	2,435	338	991	5	36	0	55	34,754,417
Total	**27,895**	**17,099**	**2,367**	**8,429**	**58**	**269**	**2**	**434**	**$390,482,261**

2017 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	35	6	2	27	0	0	0	0	$38,201
Berkshire	11	1	0	10	0	0	0	0	12,400
Bristol	95	36	16	43	0	1	0	1	1,057,498
Dukes	0	0	0	0	0	0	0	0	0
Essex	68	15	6	47	1	0	0	0	70,575
Franklin	18	4	0	14	0	0	0	0	0
Hampden	59	17	11	31	0	0	0	1	94,510
Hampshire	26	6	1	19	0	0	0	0	82,120
Middlesex	43	11	4	28	1	0	0	4	110,035,685
Nantucket	4	2	1	1	0	0	0	0	155,000
Norfolk	68	16	1	51	0	0	0	0	172,738
Plymouth	35	9	4	22	0	3	0	0	76,925
Suffolk	129	33	12	84	0	1	0	0	1,415,752
Worcester	80	31	10	39	2	0	0	6	1,087,416
Total	**671**	**187**	**68**	**416**	**4**	**5**	**0**	**13**	**$114,298,820**

2017 Fires, Arsons and Deaths by County and by Population*

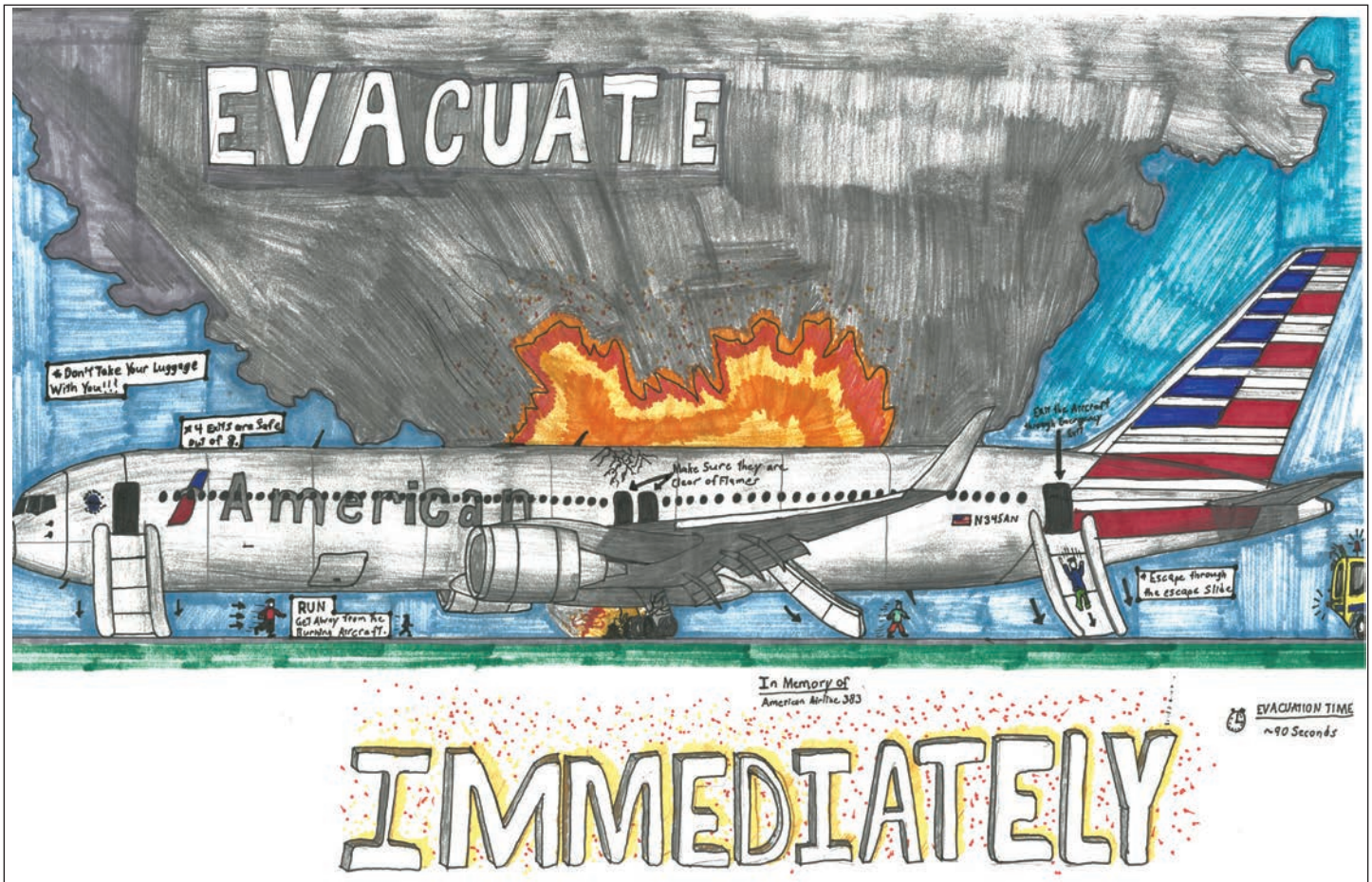
County	Population	Total Fires	Fires per 1,000 Pop.	Fire Deaths	Deaths per 1,000 Fires	Deaths per 10,000 Pop.	Total Arsons	Arsons per 1,000 Pop.
Barnstable	215,888	759	3.5	2	2.6	0.09	35	0.2
Berkshire	131,219	442	3.4	2	4.5	0.15	11	0.1
Bristol	548,285	1,872	3.4	6	3.2	0.11	95	0.2
Dukes	16,535	26	1.6	0	0.0	0.00	0	0.0
Essex	743,159	2,474	3.3	6	2.4	0.08	68	0.1
Franklin	71,372	253	3.5	5	19.8	0.70	18	0.3
Hampden	463,490	1,641	3.5	12	7.3	0.26	59	0.1
Hampshire	158,080	384	2.4	0	0.0	0.00	26	0.2
Middlesex	1,503,085	5,294	3.5	8	1.5	0.05	43	0.03
Nantucket	10,172	54	5.3	0	0.0	0.00	4	0.4
Norfolk	670,850	2,990	4.5	6	2.0	0.09	68	0.1
Plymouth	494,919	1,746	3.5	3	1.7	0.06	35	0.1
Suffolk	722,023	6,196	8.6	3	0.5	0.04	129	0.2
Worcester	798,552	3,764	4.7	5	1.3	0.06	80	0.1
Massachusetts	**6,547,629**	**27,895**	**4.3**	**58**	**2.1**	**0.09**	**671**	**0.1**

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

2017 Non-Fire Responses by County and by Incident Type

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 WX[1] & Natural Disaster	Special Incident Type
Barnstable	54,054	54	38,032	2,302	3,994	2,542	6,792	163	175
Berkshire	12,534	15	7,004	690	1,738	685	2,327	16	59
Bristol	68,364	65	45,620	2,669	3,982	4,307	11,255	66	400
Dukes	1,223	6	79	96	52	281	697		12
Essex	109,056	102	62,289	4,572	15,233	7,767	18,184	168	741
Franklin	8,048	25	4,548	683	900	675	918	48	251
Hampden	46,584	87	28,198	1,820	3,774	5,278	7,277	26	124
Hampshire	15,699	25	10,399	693	882	864	2,752	10	74
Middlesex	194,934	118	116,913	10,091	20,204	11,289	30,559	197	5,563
Nantucket	2,817	3	1,521	95	65	40	1,086	1	6
Norfolk	96,029	102	61,320	5,158	8,933	5,667	13,251	74	1,524
Plymouth	88,770	83	60,913	4,467	7,160	5,942	9,830	186	189
Suffolk	106,086	68	56,080	4,675	14,412	10,064	18,738	43	2,006
Worcester	103,315	113	68,929	4,153	8,786	7,144	13,239	58	893
Massachusetts	**907,513**	**866**	**561,845**	**42,164**	**90,115**	**62,545**	**136,905**	**1,056**	**12,017**

[1] WX is the abbreviation for Weather.



MFIRS
Massachusetts Fire Incident Reporting System

Department of Fire Services
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