

# THE MASSACHUSETTS FIRE PROBLEM



## Massachusetts Fire Incident Reporting System

2018 Annual Report

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Division of Fire Safety • Fire Data and Public Education Unit

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## ABOUT THE COVERS

The drawings on the front and back covers of this report are the 2019, 1<sup>st</sup> and 2<sup>nd</sup> place winners of the 37<sup>th</sup> annual statewide **Arson Watch Reward Program Poster Contest**.

The contest is sponsored by the Massachusetts Property Insurance Underwriting Association (MPIUA) on behalf of all property and casualty insurance companies of Massachusetts. The poster theme was **Fire Prevention – Everyone/Everyday**.

A county-wide poster contest was held for all students in grade 6-8. Eleven out of 14 counties participated and about 1,100 posters were submitted. Posters were judged by an impartial panel. First and 2<sup>nd</sup> place county winners were chosen at MPIUA. All 1<sup>st</sup> place county winners were entered into the Massachusetts statewide contest. An award ceremony was held in honor of all county winners at the Crowne Plaza in Natick on June 5, 2019, and the three state winners were announced and presented with their awards.

The front cover drawing is by Madeline Fortier, a student at the Ovelook Middle School in Ashburnham, Massachusetts. Madeline's poster was the 1<sup>st</sup> place winner in the Worcester County poster contest, and was automatically entered into the statewide contest, along with 11 other county winners, where it was chosen as the 1st place state winner.

The back cover drawing is by Katie Carlisle, a student at the Holy Family Holy Name School in New Bedford, Massachusetts. Katie's poster was the 1st place winner in the Bristol County poster contest and was also automatically entered into the statewide contest where it was chosen as the 2nd place state winner.

MPIUA generously sponsored the printing of the *2018 Annual Report of the Massachusetts Fire Incident Reporting System (MFIRS)* and provided the cover posters. MPIUA has provided this sponsorship of the report and the poster contest for 37 years.

## DEPARTMENT OF FIRE SERVICES MISSION

The mission of the Department of Fire Services is, 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.

## EXECUTIVE SUMMARY

This is the *2018 Annual Report of the Massachusetts Fire Incident Reporting System* (MFIRS), which summarizes the Massachusetts fire experience for 2018. It is based on the 25,504 individual fire reports submitted by members of 366 fire departments and districts in compliance (98.1%) with the National Fire Incident Reporting System. 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.

## FIRES BY INCIDENT TYPE

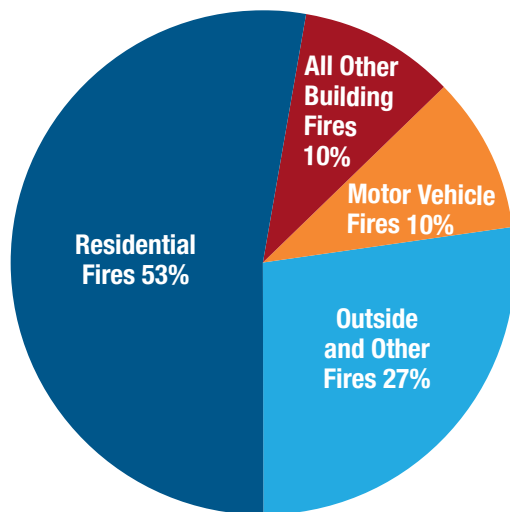
### 16,169 Structure Fires, 2,465 Vehicle Fires, 6,870 Outside and Other Fires in 2018

There were 25,504 fire and explosion incidents reported by fire departments to the Massachusetts Fire Incident Reporting System (MFIRS) in 2018. The 16,169 structure fires, 2,465 motor vehicle fires, and 6,870 outside and other fires caused 45 civilian deaths, one fire service death, 289 civilian injuries, 425 fire service injuries, and an estimated loss of \$229 million in property damages. See Figure 1.

Civilian deaths decreased by 13, or 22%, from the 58 fire deaths in 2017.

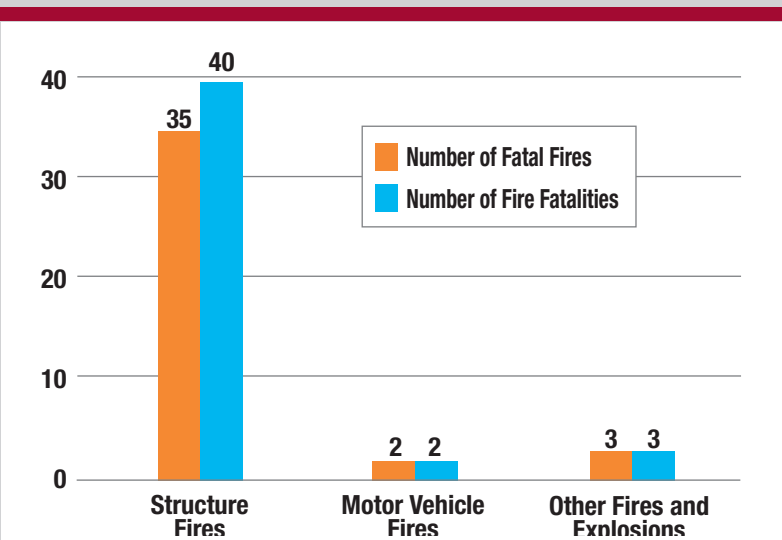
Figure 1

### FIRES BY INCIDENT TYPE



Twenty civilians over the age of 65 died in Massachusetts fires in 2018. These fatalities accounted for 44% of fire deaths in the state.

Figure 2  
**FATAL FIRES AND FIRE DEATHS**



**CIVILIAN FIRE DEATHS**

**45 Civilians Died in 40 Massachusetts Fires**

Forty-five (45) civilians died in 40 Massachusetts fires in 2018. Thirty-nine (39) of these deaths happened in residential structures. Sixty percent (60%), of these fire deaths happened where people feel safest, in their homes. Two (2) deaths occurred in two motor vehicle fires, and three people were killed in three outside fires. See Figure 2.

**More Than Half of People Died in Fires at Night**

Sixty (60%) percent of civilians died at night, at home, while they were sleeping. Many of these fire victims did not have working smoke alarms or residential sprinklers. See Figure 3.

Figure 3  
**CIVILIAN FIRE DEATHS BY HOUR**

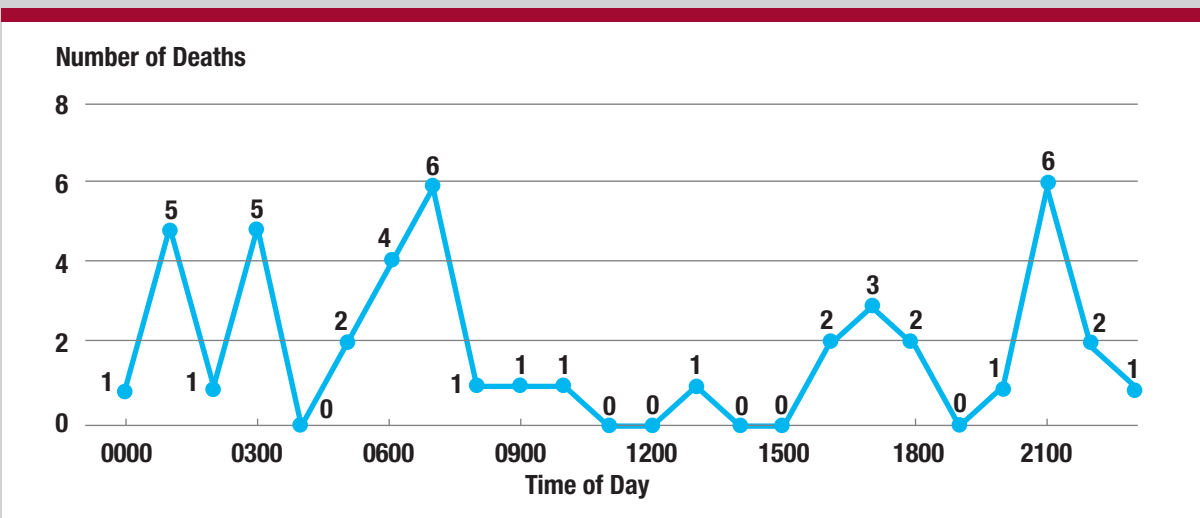
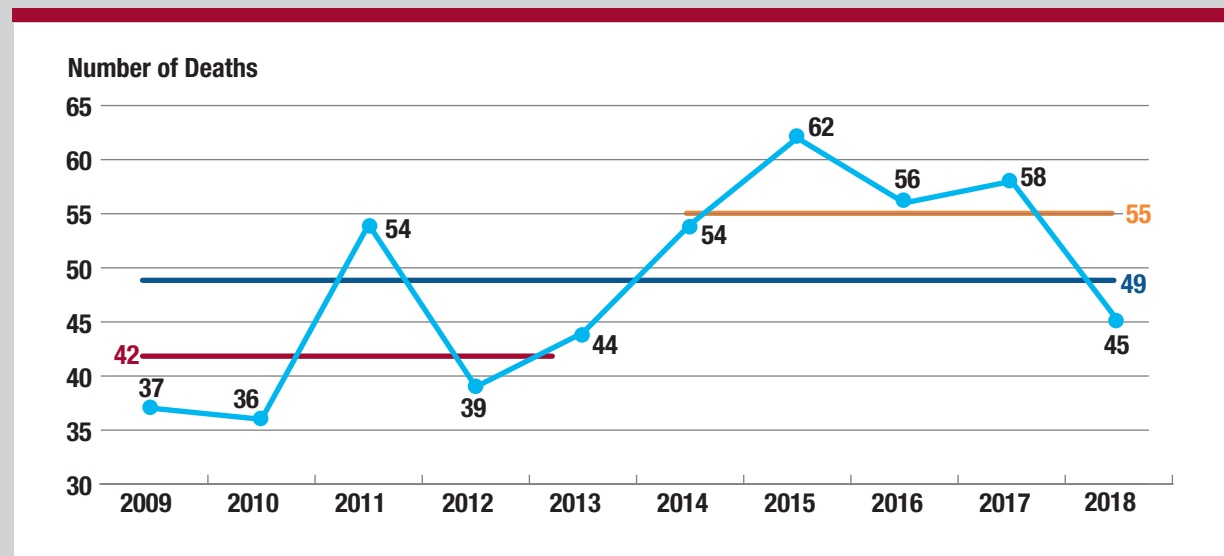


Figure 4

## CIVILIAN FIRE DEATHS BY YEAR



### 2018 Is Below the 5- and 10-Year Averages

The 45 fire deaths in 2018 are 18% below the five-year average and 8% below the 10-year average number of fire deaths. See Figure 4.

### 24 Men, 19 Women and 2 Children under 18 Died from Fires in 2018

Of the 45 fire deaths in 2018, 24, or 53%, were men, 19, or 42%, were women and two, or 5%, were children under 18. See Figure 5.

### 44% of Fire Deaths in 2018 Were People over the Age of 65

Twenty (20), or 44%, of civilian fire victims were over 65 years of age. This included nine elderly men and 11 elderly women. Two (2), or 5%, of the victims were under 18 years old. Twenty-three (23), or 51%, were adults between 18 and 65 years of age. See Figure 6.

Figure 5

## CIVILIAN FIRE DEATHS BY GENDER

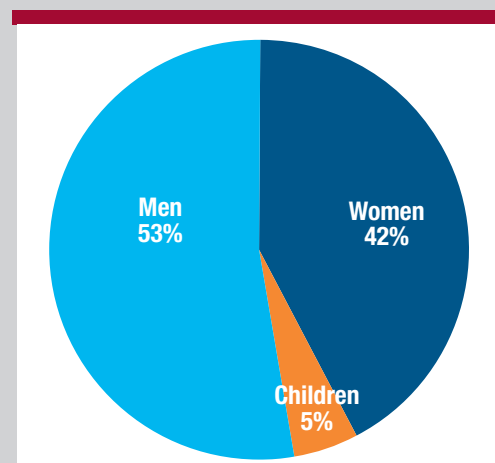


Figure 6

## CIVILIAN FIRE DEATHS BY AGE

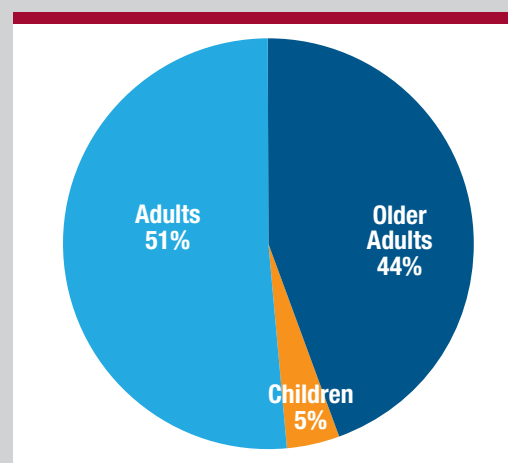


Figure 7

## FIRE DEATHS BY AGE COMPARED TO PERCENT OF POPULATION

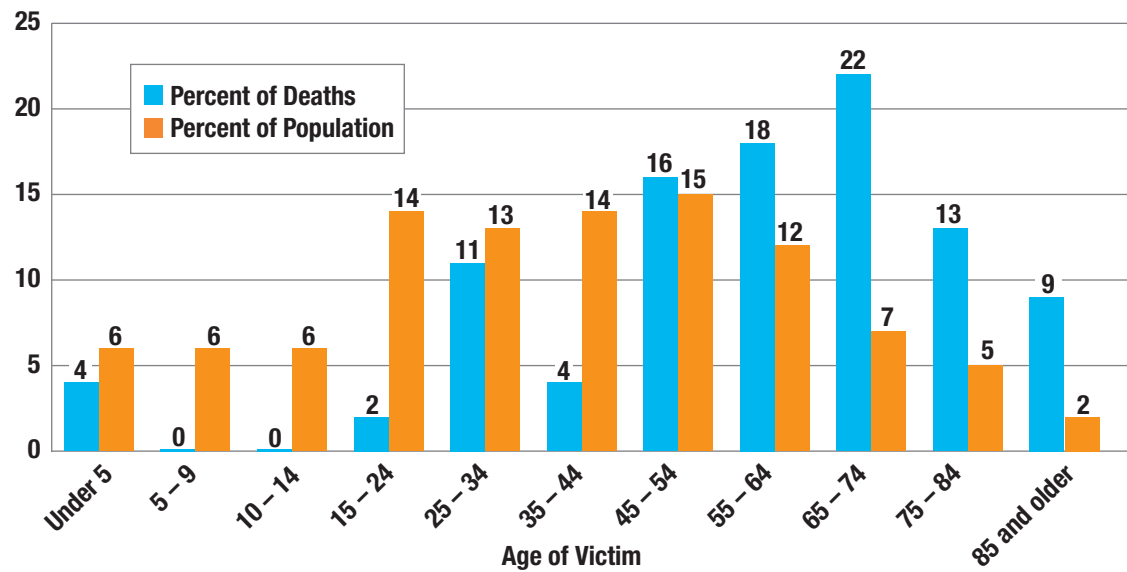


Figure 8

## CHILD FIRE DEATHS BY YEAR

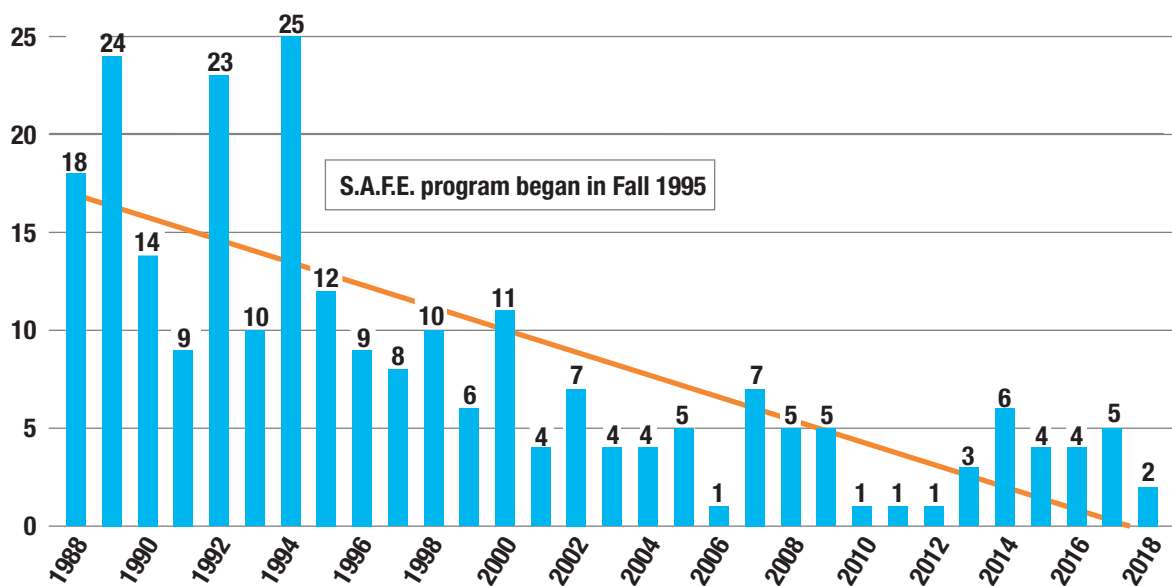
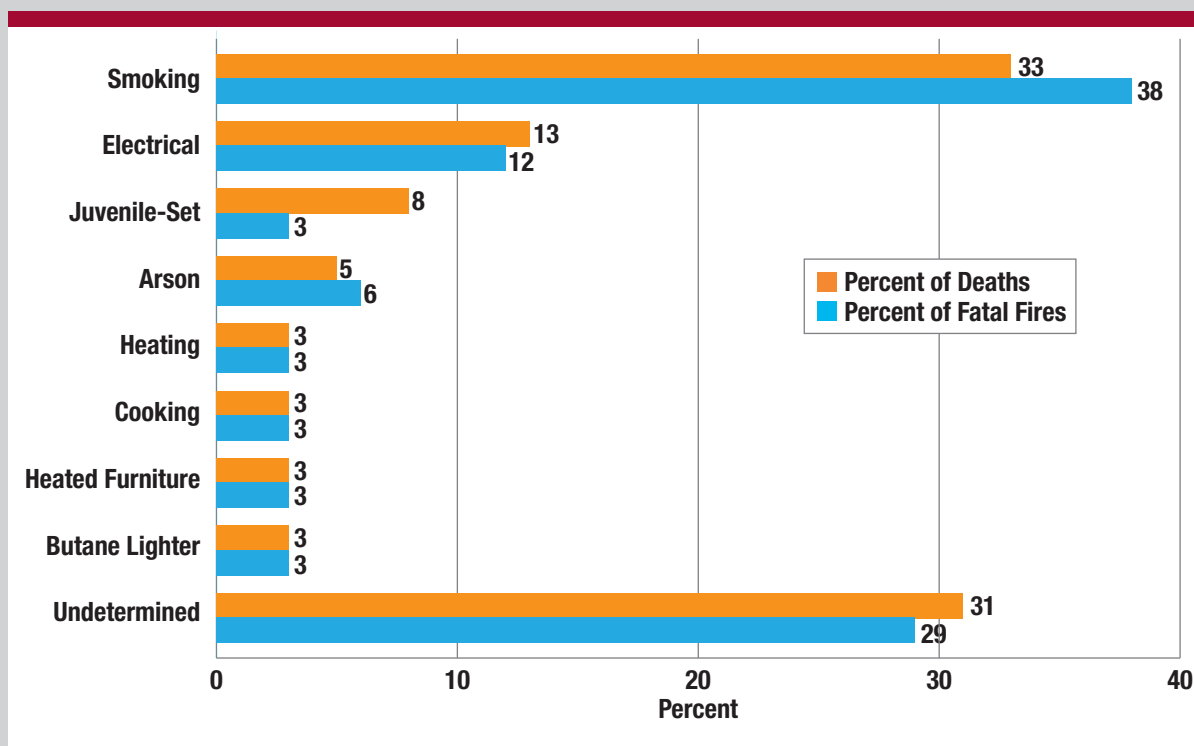




Figure 9

## CAUSES OF RESIDENTIAL FATAL FIRES AND FIRE DEATHS



### 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 9% of the fire deaths. The risk of fire death for these adults is 4.4. Figure 7 shows the percentage of fire deaths versus population percentage by age group in 2018.

### Average Annual Child Fire Deaths Down 76% Since the Start of S.A.F.E.

In the 23 full years since the S.A.F.E. Program began (1996 to 2018), the average number of child fire deaths per year was 4.9. In the 23 years prior to the S.A.F.E. Program (1972 to 1994), the average number of child fire deaths per year was 20.6. This 76% drop in the average number of child fire deaths is significant when compared to the 49% drop in the number of all fire deaths during the same years.

See Figure 8.

### Smoking Fires are Leading Cause of Fire Deaths

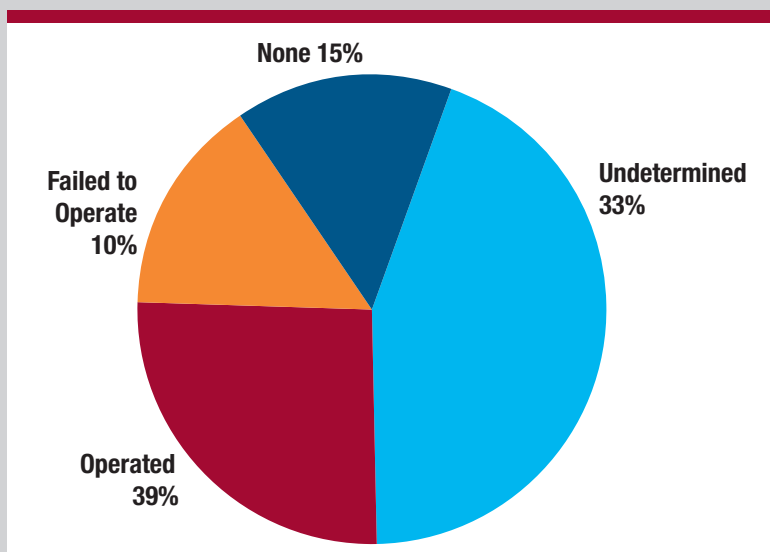
In 2018, improper disposal of smoking materials was the leading cause of residential fire deaths and fatal residential fires. These fires accounted for 13, or 33%, of residential fire deaths. Electrical problems were the second leading cause of fire deaths, accounting for five, or 13%, of residential fire deaths. See Figure 9.

Consistent, comprehensive, statewide, school-based fire safety education has improved fire safety for children in Massachusetts. All other age groups need comprehensive education to improve their fire safety too.

Smoke alarms notify occupants of danger whether they are asleep or awake, but smoke alarms don't guarantee escape. A practiced home escape plan, combined with working smoke alarms buys time, and time buys life.

Figure 10

## SMOKE ALARM OPERATION IN RESIDENTIAL FIRE DEATHS



## SMOKE ALARMS

In 2018, 39 people died in residential building fires. Smoke alarm performance was reported for 26 of the victims. In nine fires that killed 10 people (25% of deaths), victims were not alerted by smoke alarms. In five fires that killed six people (15% of deaths), no alarms were present. In another four fires and four deaths (10% of deaths), alarms were present but they failed to operate.

### One- and Two-Family Homes had Lowest Percentage of Operating Alarms

In 2018, people were more likely to die in a fire in a one- and two-family home than in any other residence. There were 44% more fire deaths in one- and two-family homes than in all other residences combined. Twenty-three (23) people died in 20 one- and two-family dwelling fires in 2018. Six (6), or 26%, of the fire deaths in one- and two-family homes occurred in fires with no alarms or with alarms that failed to operate. Of these deaths, one occurred in a home where smoke alarms failed to work. The other five deaths were in homes where no smoke alarms were present. See Figure 10.

## FIRE SERVICE INJURIES

### 425 Firefighters Injured in 2018

In 2018, 425 firefighters were injured while fighting the 25,504 reported fires in Massachusetts. On average, one firefighter was injured at one of every 60 fires in 2018.

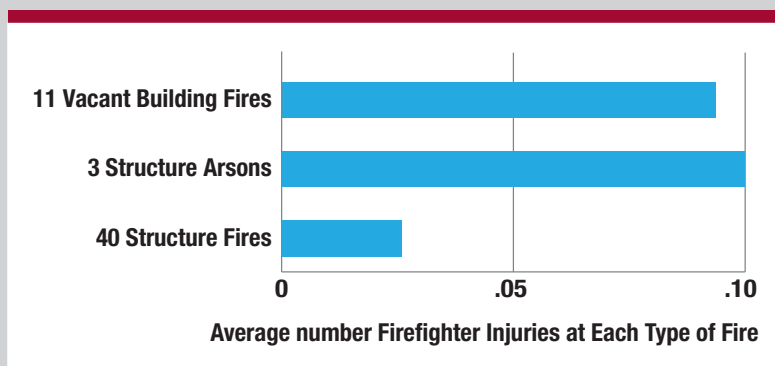
### Firefighters Injured at 1 of Every 3 Vacant Structure Arsons

Vacant building fires were one of the most dangerous types of fire for firefighters in 2018. These fires accounted for 22, or 5%, of all firefighter injuries. 2018 was the first year where firefighters were injured more frequently at structure arsons. An average of one firefighter was injured for every three structure arsons. There was one firefighter injury for every 11 vacant building fires and one firefighter injury for every 40 structure fires. See Figure 11.



Figure 11

## ONE FIREFIGHTER IS INJURED AT EVERY:



### 37% of Injuries from Overexertion or Strain

Thirty-seven percent (37%) of all firefighter injuries in 2018 were from overexertion or strain. See Figure 12.

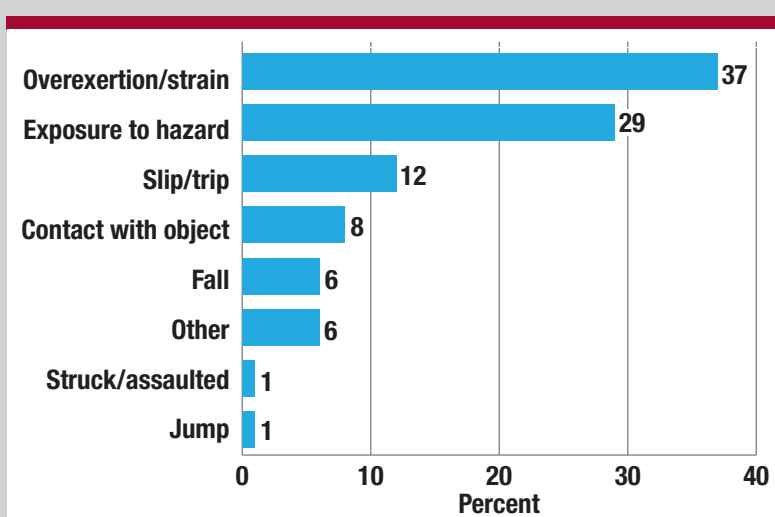
## CIVILIAN INJURIES

### 289 Civilians Injured in Fires in 2018 – Mostly at Home

Massachusetts' fires injured 289 civilians in 2018. Two hundred and thirty-six (236), or 82%, of civilian injuries occurred in structure fires. Two hundred and twelve (212) injuries occurred in residential building fires, accounting for 73% of all injuries and 90% of all structure fire injuries. Fourteen (14), or 5%, occurred in motor vehicle fires. Thirty-nine (39), or 13%, of civilian injuries occurred in outside and other fires. Special outside fires accounted for nine, or 3%, of all civilian injuries, and brush fires accounted for three, or 1%, of civilian fire injuries. Outside rubbish fires accounted for two, or 1% of all civilian fire injuries. Twenty-five (25), or 9%, of civilian injuries were caused by unclassified fires.

Figure 12

## CAUSES OF FIREFIGHTER INJURIES



In 2018, 40% of all firefighter injuries were from overexertion or strains. Fifteen percent were from exposure to hazards.

### Adults 25 to 34 at High Risk for Fire Injury

Adults between the ages of 25 and 34 represent 15% of the population and yet they accounted for 20% of the injuries in 2018. Fifty-one percent (51%) of the injuries happened when people tried to control the fire. Nineteen percent (19%) were injured trying to escape. People in this age group are most at risk of being injured in a fire because they are more likely to try to control the fire. See Figure 13.

## RESIDENTIAL BUILDING FIRES

### 84% of Building Fires Happened in Residential Occupancies

Massachusetts fire departments reported that 13,613, or 84%, of the 16,116 building fires occurred in residential occupancies. These fires caused 39 civilian deaths, one fire service death, 212 civilian injuries, 364 fire service injuries and an estimated loss of \$168.2 million.

### Almost Half of Residential Fires Happened in Multi-Family Homes

Almost half (49%), of residential building fires happened in multi-family apartment buildings in 2018. Thirty-four percent (34%) of these fires happened in one- and two-family homes. Dormitories accounted for 4% of the fires. Four percent (4%) happened in rooming houses. Residential board and care facilities and hotels each accounted for 1% of the residential fires. See Figure 14.

### Cooking & Heating were the Leading Causes of Fires in all Homes

Cooking caused 72% of fires in residential properties in 2018. Heating equipment caused 10% of these fires, electrical problems caused 4%. The unsafe use and disposal of smoking materials caused 2% and indoor rubbish fires caused 2% of the fires. Arson and candles accounted for 1% of residential fires. Clothes dryer fires, juvenile firesetting, fireworks, and Christmas tree fires caused less than 1% of the fires in residential properties in 2018. See Figure 15.

Figure 13

## CIVILIAN INJURIES BY AGE COMPARED TO PERCENT OF POPULATION

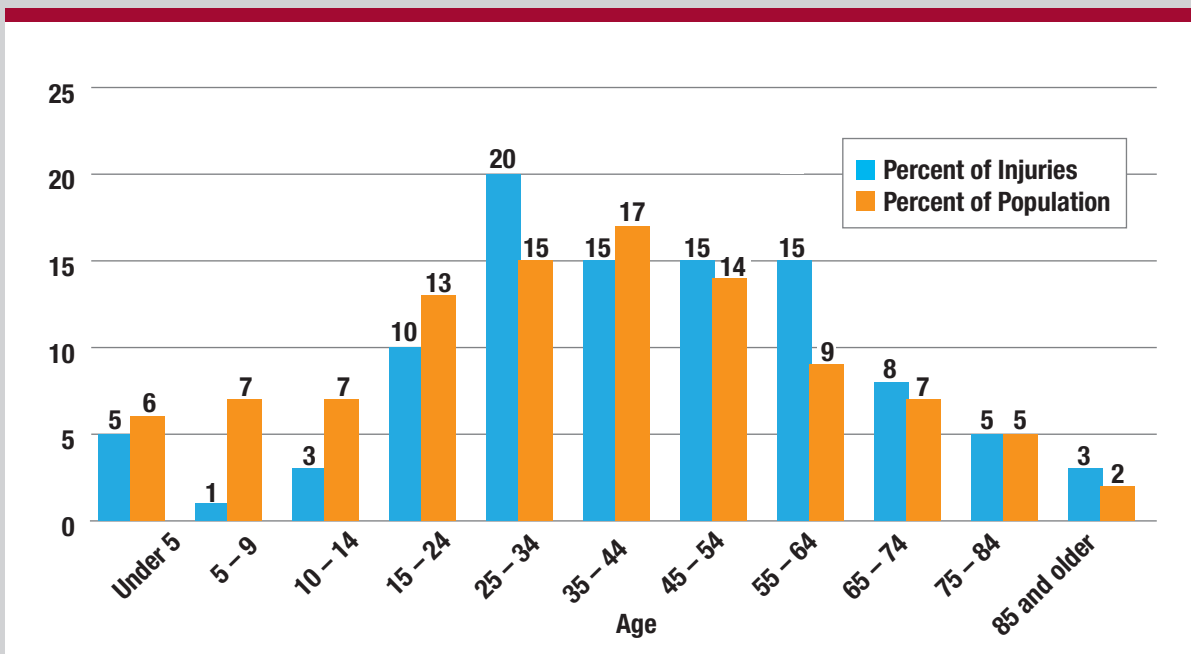
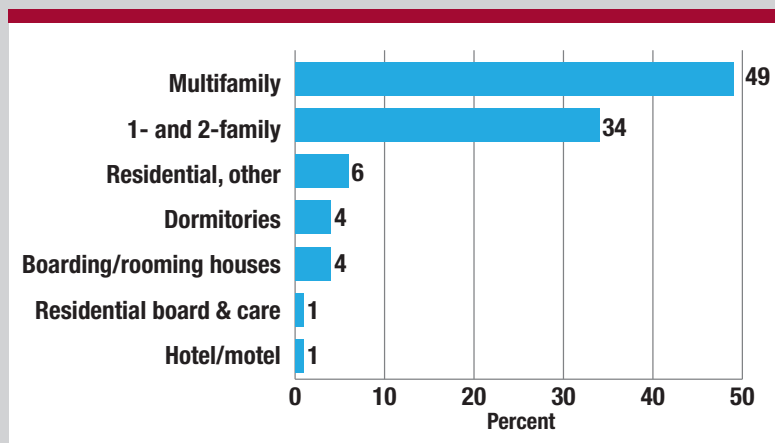


Figure 14

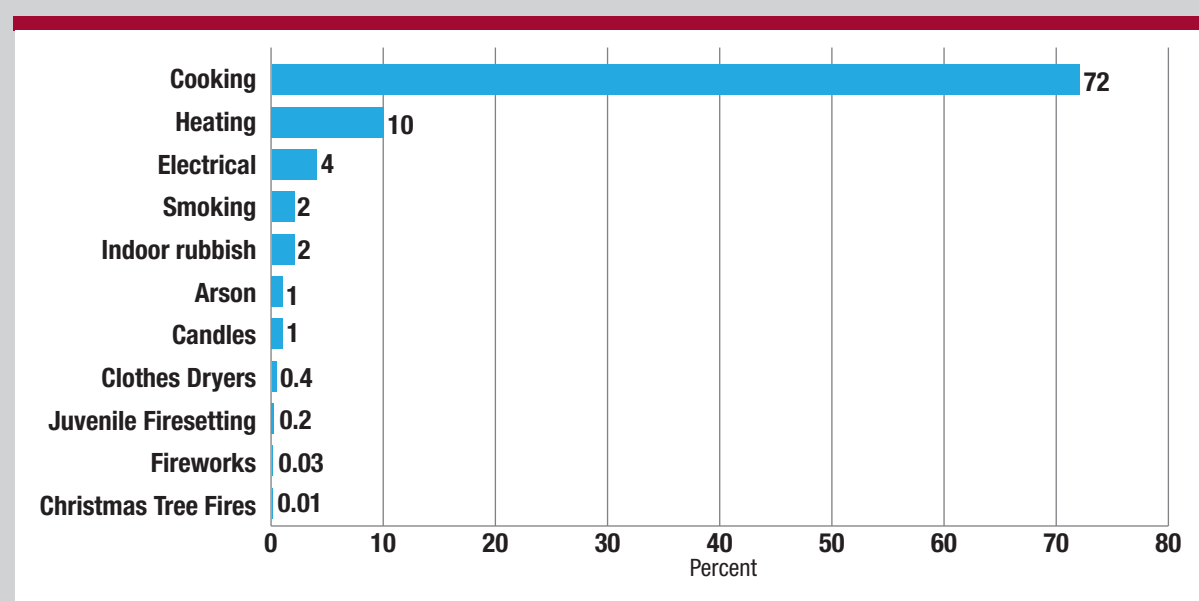
## RESIDENTIAL FIRES BY OCCUPANCY TYPE



Cooking caused 72% of fires in residential properties in 2018. Forty-nine percent of these fires happened in multi-family homes.

Figure 15

## CAUSES OF RESIDENTIAL FIRES



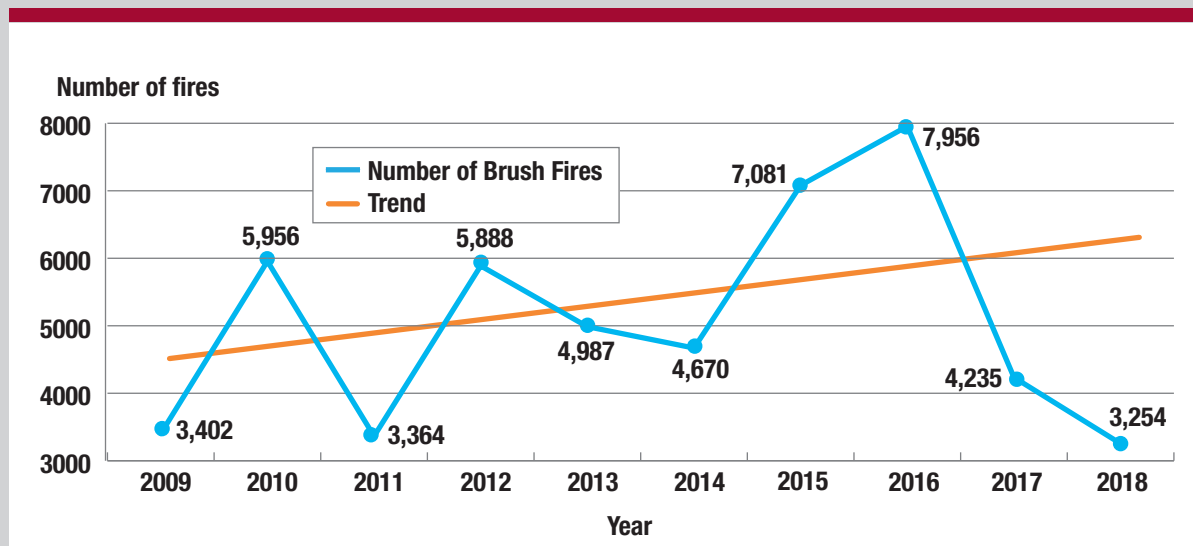
## MOTOR VEHICLE FIRES

### 2,465 Motor Vehicle Fires Account for 10% of all Reported Fires

The 2,465 motor vehicle fires in 2018 caused two (4%), civilian fire deaths, 14 civilian injuries, 11 fire service injuries, and \$22.9 million in property damage. The 2,465 motor vehicle fires in 2018 were an increase of 83 (3%), from the 2,385 motor vehicle fires reported in 2017, and 10% of total reported fire incidents in 2018.

Figure 16

## BRUSH FIRES BY YEAR



On September 13, 2018, Lawrence, Andover and North Andover experienced multiple explosions and fires that killed one person and injured many others. A large mobilization of state, fire and law enforcement resources supported the suppression and public safety needs of the three communities. An over pressurized Columbia Gas line caused this tragedy.

## OUTSIDE AND OTHER FIRES AND EXPLOSIONS

### 6,877 Brush, Trash, and Other Outside Fires

In 2018, 6,877 outside and other fires and explosions caused three civilian deaths, 39 civilian injuries, 13 fire service injuries, and an estimated loss of \$4 million. The 3,254 trees, grass and brush fires, 2,015 outside trash fires, 763 special outside fires, 42 cultivated vegetation or crop fires, and 803 other fires accounted for 27% of the total fire incidents in 2018. These fires decreased by 19% from the 8,477 incidents reported in 2017.

### Brush Fires

Brush fires are the most variable category 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 brush fires usually increases. In 2018, the reported number of brush fires decreased by 981 or 23%, from the 4,235 reported in 2017. 2018 had the fourth lowest number of reported brush fires since 1986. See Figure 16.

## ARSON FIRES

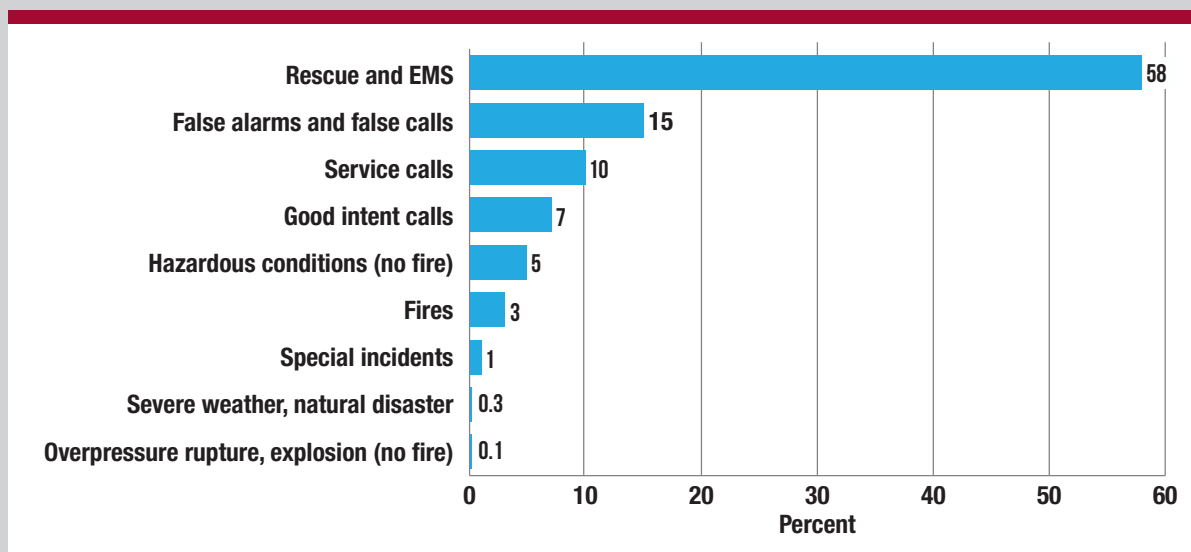
### 551 Arsons - 134 Structures, 78 Vehicles, and 339 Other Arsons

Five hundred and fifty-one (551), or 2%, of the 25,504 fire incidents reported to the Massachusetts Fire Incident Reporting System were considered to be intentionally-set, or arson<sup>1</sup>. The 134 structure arsons, 78 motor vehicle arsons, and 339 outside and other arsons caused four (9%) of civilian fire deaths, one fire service death, 13 civilian injuries and 43 fire service injuries. The estimated loss from arson was \$5.5 million. The average loss per arson fire was \$9,892. Total arson was down by 19% from the 681 in 2017.

<sup>1</sup> 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.

Figure 17

## RESPONSES BY INCIDENT TYPE



## NON-FIRE INCIDENTS

### 58% of all Massachusetts Calls were EMS Incidents

In 2018, 348 fire departments in Massachusetts reported 965,176 responses to MFIRS. 937,445 of these were non-fire calls. Rescue and EMS calls were the leading type of call that Massachusetts fire departments responded to, with 563,406 (58%), of all reported calls. See Figure 17.

## CONCLUSIONS

### Working Smoke Alarms Save Lives

Most people die in fires at night in the so-called safety of their own home. While the overall trend in the number of deaths continues to decline, smoking was the leading cause of all fatal fires in 2018. Yet cooking, something we do everyday, is still the leading cause of fires in the home and the leading cause of civilian fire injuries. We must all work to address this problem.

The lack of working smoke alarms or sprinkler systems are contributing factors to these tragedies. We have under 3 minutes to get out of a building if there is a fire. It is important to remember that properly maintained alarms provide early warning of a fire, and residential sprinklers provide the opportunity to safely escape. Having a practiced home escape plan in addition to working smoke alarms and sprinklers allows us to get out of our houses quickly. Time is of the essence in a fire.

Improper disposal of smoking materials remains the leading cause of fatal home fires. The lack of working smoke alarms or sprinkler systems are contributing factors in these tragedies.

## 2018 FIRES BY COUNTY

County	Total Fires	Structure Fires	Vehicle Fires	Other Fires	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	723	307	88	224	1	15	0	10	\$9,933,591
Berkshire	386	230	42	57	2	14	0	8	\$6,091,708
Bristol	1,678	782	292	401	6	48	0	14	\$14,425,040
Dukes	30	17	5	5	0	0	0	0	\$149,500
Essex	2,160	1,193	246	471	1	25	0	118	\$22,623,269
Franklin	295	146	39	69	3	8	0	5	\$3,347,277
Hampden	1,547	913	217	256	8	22	0	36	\$12,991,890
Hampshire	351	180	52	74	2	5	0	3	\$2,126,237
Middlesex	5,432	3,674	397	807	7	35	0	110	\$39,202,987
Nantucket	40	33	2	1	0	0	0	0	\$158,700
Norfolk	2,134	1,310	225	404	4	21	0	20	\$12,218,339
Plymouth	1,626	820	219	388	3	38	0	16	\$18,482,417
Suffolk	5,431	4,139	277	492	3	7	0	33	\$51,707,681
Worcester	3,671	2,425	364	404	5	51	1	52	\$35,456,995
<b>Total</b>	<b>25,504</b>	<b>16,169</b>	<b>2,465</b>	<b>4,053</b>	<b>45</b>	<b>289</b>	<b>1</b>	<b>425</b>	<b>\$228,915,631</b>

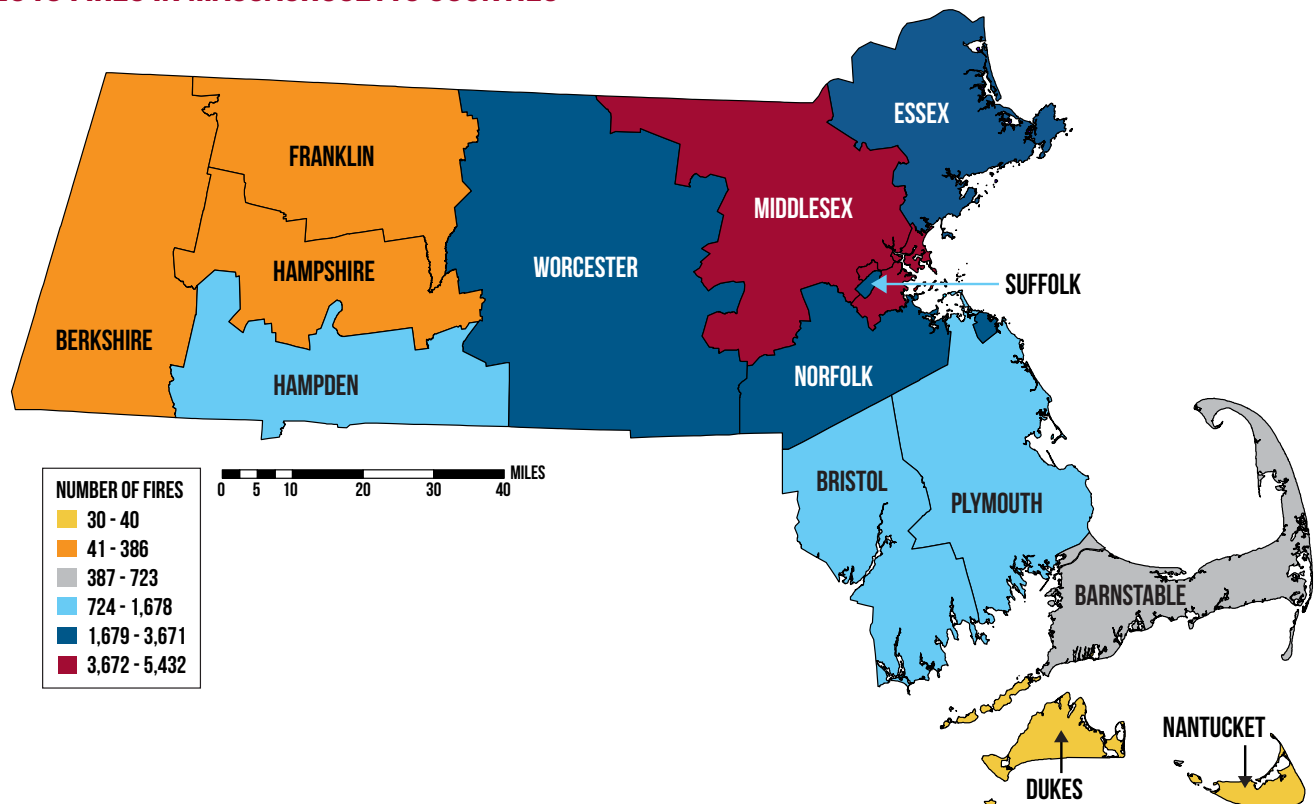
## 2018 ARSONS BY COUNTY

County	Total Arsons	Structure Arsons	Vehicle Arsons	Other Arsons	Civilian Deaths	Civilian Injuries	Fire Service Deaths	Fire Service Injuries	Dollar Loss
Barnstable	31	3	2	26	0	1	0	0	\$69,000
Berkshire	15	2	1	12	0	0	0	0	\$51,550
Bristol	53	12	22	19	0	4	0	1	\$343,951
Dukes	0	0	0	0	0	0	0	0	\$0
Essex	39	11	4	24	0	0	0	34	\$639,963
Franklin	11	2	0	9	0	0	0	1	\$50,000
Hampden	78	28	13	37	0	1	0	1	\$221,100
Hampshire	23	2	1	20	1	0	0	0	\$1,000
Middlesex	49	18	5	26	2	2	0	0	\$289,272
Nantucket	0	0	0	0	0	0	0	0	\$0
Norfolk	40	7	3	30	0	2	0	0	\$89,030
Plymouth	38	11	4	23	0	3	0	0	\$88,760
Suffolk	88	8	10	70	0	0	0	2	\$1,824,028
Worcester	86	30	13	43	1	0	1	4	\$1,782,692
<b>Total</b>	<b>551</b>	<b>134</b>	<b>78</b>	<b>339</b>	<b>4</b>	<b>13</b>	<b>1</b>	<b>43</b>	<b>\$5,450,346</b>

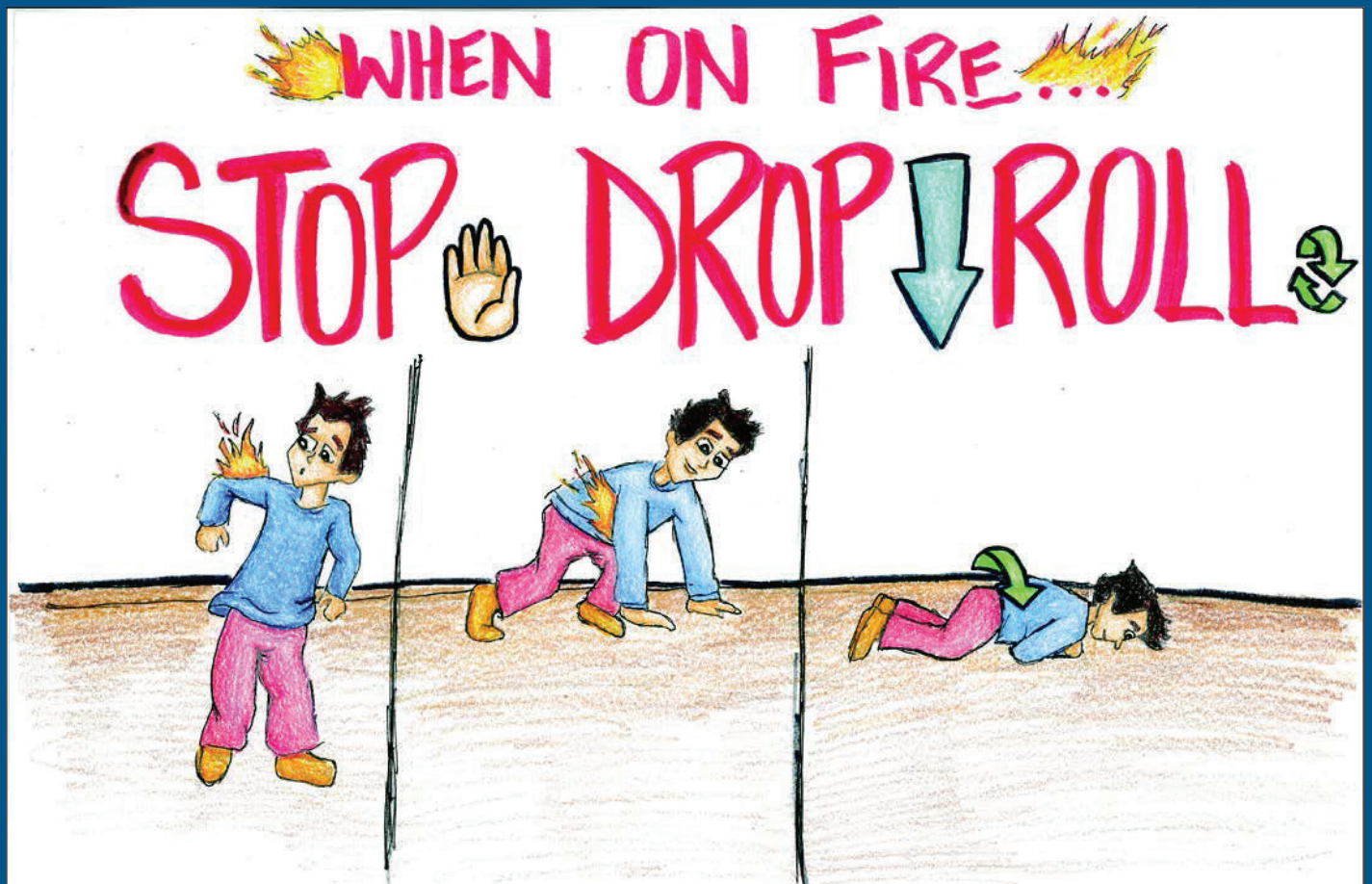
## 2018 NON-FIRE RESPONSES BY COUNTY AND BY INCIDENT TYPE

County	Total Non-Fire Responses	Over-pressure Rupture, Explosion (No-fire)	Rescue, EMS Incidents	Hazardous Conditions (No-fire)	Service Calls	Good Intent Calls	False Alarm Calls	Severe Weather, Natural Disaster	Special Incidents
Barnstable	60,237	59	41,404	3,463	4,682	2,574	7,597	249	209
Berkshire	12,711	19	6,746	794	1,826	766	2,455	31	74
Bristol	66,232	70	41,912	3,135	4,606	4,196	11,807	154	352
Dukes	1,458	2	76	148	72	400	748		12
Essex	110,727	114	62,076	5,436	15,439	8,210	18,644	487	321
Franklin	8,351	22	4,811	666	986	640	951	30	245
Hampden	48,558	74	30,053	1,894	3,984	4,327	8,081	27	118
Hampshire	18,177	27	12,279	753	951	1,014	3,046	18	89
Middlesex	201,732	146	117,946	11,722	21,765	12,261	32,392	420	5,080
Nantucket	2,611	4	1,296	83	26	71	1,123	2	6
Norfolk	102,389	127	62,988	6,685	10,187	6,022	14,632	305	1,443
Plymouth	92,861	81	60,875	6,164	8,430	5,763	10,554	746	248
Suffolk	106,439	65	52,459	4,843	17,236	10,160	20,507	43	1,126
Worcester	104,859	122	68,416	4,417	9,924	7,204	13,849	116	811
<b>Total</b>	<b>937,342</b>	<b>932</b>	<b>563,337</b>	<b>50,203</b>	<b>100,114</b>	<b>63,608</b>	<b>146,386</b>	<b>2,628</b>	<b>10,134</b>

## 2018 FIRES IN MASSACHUSETTS COUNTIES







**MFIRS**  
Massachusetts Fire Incident Reporting System

Department of Fire Services  
[www.mass.gov/dfs](http://www.mass.gov/dfs)  
(978) 567-3380