U.S. STRUCTURE FIRES IN RELIGIOUS AND FUNERAL PROPERTIES

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June 2013

National Fire Protection Association
Fire Analysis and Research Division

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Abstract

Religious and funeral properties include churches, temples, mosques, religious education facilities, funeral parlors and related properties. During 2007-2011, an estimated average of 1,780 structure fires were reported in these properties, causing an annual average of two civilian deaths, 19 civilian fire injuries, and $111 million in direct property damage. These estimates are based on data from the U.S. Fire Administration's (USFA) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA) annual fire department experience survey. Cooking equipment was the leading cause of these fires, followed in equal numbers by fires caused by heating equipment and intentionally set fires. Although approximately one-third (31%) of the fires took place between 9:00 p.m. and 9:00 a.m., they accounted for 65% of the direct property damage.

Keywords: fire statistics, church fires, funeral parlors, public assembly fires

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The National Fire Protection Association (NFPA) is an international non-profit organization established in 1896 with a mission of reducing the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA thanks all the fire departments and state fire authorities which participate in the National Fire Incident Reporting System (NFIRS) and the annual NFPA fire experience survey. These respondents are the original sources of the detailed data that make this analysis possible. Their important contributions allow us to estimate the size of the fire problem.

We also express thanks to the U.S. Fire Administration for its work in developing, coordinating, and maintaining NFIRS.

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Executive Summary

From 2007 to 2011, U.S. fire departments responded to an average of 1,780 structure fires in religious and funeral properties each year. NFPA estimates that these fires resulted in an annual average of two civilian fatalities, 19 civilian injuries, and $111 million in direct property damage. The largest share of fires involved religious properties, with just four percent taking place in funeral parlors. Since 1980, the average number of reported fires in religious and funeral properties has fallen by 54%, from 3,500 per year to 1,660 in 2011.

Religious properties are used for a variety of purposes besides worship. Many religious properties also have office space and kitchen facilities. Halls or function rooms may also host meals, community meetings, celebrations, or other events. They may also provide religious education. Sunday was the peak day for fires in religious and funeral properties, with Saturday ranking second. However, as might be expected, these results reflect the predominance of religious over funeral properties in the analysis. When analyzed separately, the peak days for fires in funeral properties Tuesday and Friday, with the fewest fires on Sunday and the second fewest on Saturday.

Almost one-third of the fires in religious and funeral properties were caused by cooking equipment (30%). Heating equipment and intentionally set fires each accounted for 16% of the fires. Electrical distribution or lighting equipment caused 10% of fires, while lightning and candles each caused four percent of the fires.

Nearly one-quarter (23%) of fires in religious and funeral properties began in the kitchen or cooking area. Heating equipment rooms, with seven percent of the total, represented the second most common area of fire origin, followed by small assembly area, unclassified outside area, and attic, ceiling/roof assembly, each of which accounted for four percent of total fires. Sprinklers were present in only 12% of these fires in 2007-2011. The average loss per fire when no automatic extinguishing equipment was present was $67,000. The average loss per fire dropped to $18,000 when wet pipe sprinklers were present, 73% lower than when no automatic suppression equipment was present.

Comprehensive safety information for reducing the risk of fire and promoting fire safety in buildings of all types is available in *NFPA 101: Life Safety Code.* Individuals interested in keeping religious properties safe from fire may additionally consult *NFPA 909: Code for the Protection of Cultural Resource Properties – Museums, Libraries, and Places of Worship* for information about fire prevention in these properties. In addition, a lesson plan for religious organizations interested in promoting fire safety among their members can be found at: http://www.nfpa.org/itemDetail.asp?categoryID=2795&itemID=60497.

Table of Contents

List of Tables and Figures

U.S. Religious and Funeral Property Structure Fires Fact Sheet

U. S. fire departments responded to an estimated average of **1,780** structure fires on religious and funeral properties per year during 2007-2011. These fires caused annual averages of:

- **2** civilian deaths
- **19** civilian fire injuries
- **$111** million in direct property damage

Only 4% of these fires were in funeral parlors. Fires in religious and funeral properties fell from 3,500 in 1980 to 1,660 in 2011, a 53% decrease.

Leading Causes of Structure Fires in Religious and Funeral Properties, 2007-2011

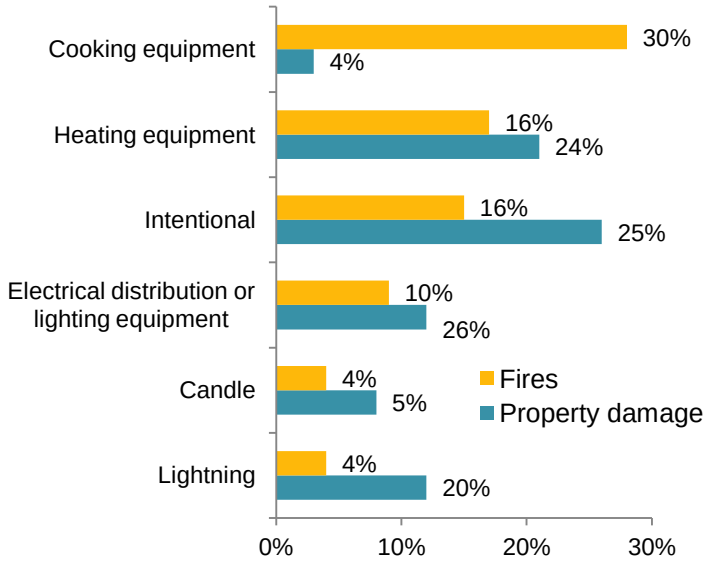
Three of every ten fires in these properties were caused by cooking. Most of these fires were minor.

Heating equipment was the second leading cause.

16% of these fires were intentional, but they accounted for 25% of the direct property damage.

Electrical distribution or lighting equipment was involved in 10% of these fires and 26% of the direct property damage.

Candles caused 4% of the fires and 5% of the dollar loss. Lightning also caused 4% of these fires but 20% of the dollar loss.



Note: This table summarizes findings from multiple fields, meaning that the same fire may be listed under multiple causes.

Protecting These Properties

- During 2007-2011, fires were least likely to take place during the overnight hours, with the 12-hour period between 9 p.m. and 9 a.m. accounting for 31% of the fires.
- 40% of these fires occurred in properties with no fire detection equipment.

Sprinkler systems were present in only 12% of these fires. When wet pipe sprinklers were present in the fire area, the average loss per fire was 73% lower than when no automatic suppression systems were present. Properties under construction were excluded from these calculations.

Structure Fires in Religious and Funeral Properties

This report presents national estimates of structure fires in churches, temples, mosques, religious education facilities, funeral parlors, and related properties that were reported to local fire departments from 2007 to 2011. The report updates information that was last published by the National Fire Protection Association in 2010. It should be noted that the report does not include information about fires in parochial schools, which are considered educational properties. Also note that the information about fire-related injuries and fatalities published in this report is limited to the civilian population.

Information about how fires occur and the factors that contribute to them is essential for guiding prevention measures. The statistics about fires and associated losses in this report are national estimates of fires reported to U.S. municipal fire departments. The analysis does not include information reported only to federal or state agencies or industrial fire brigades. These national estimates are projections based on the detailed information collected by the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0) and an annual fire department experience survey conducted by the National Fire Protection Association.

The National Fire Incident Reporting System is a comprehensive reporting system through which local fire departments collect detailed information on each of the incidents to which they respond, including when and where the incident occurred, the nature and causes of the fire, the resources used in mitigation, estimates of financial loss, and other key incident variables. NFIRS was designed by the U.S. Fire Administration and serves as the most detailed data source on the fire experience in the United States.

NFIRS maintains a detailed classification of property categories to identify the type of property in which a fire occurred. Religious and funeral properties are combined in this analysis due to an overlap in the NFIRS property use coding structure that assigns a common code to unclassified places of worship and funeral parlors. See Appendix B for more details on methodology. It should be noted that religious properties account for 90% of the fires in this classification, with just four percent taking place in funeral parlors, and another six percent taking place in properties that are unclassified as to religious or funeral property. These results are consistent with those found in prior reports.

Fires are in many ways predictable phenomena – resulting from such practices as leaving cooking materials unattended, failing to monitor the condition of electrical wires, or improperly storing combustible materials – and they are largely preventable. We accordingly strive in this report to recognize that there is nothing inevitable about fires and that through education and appropriate steps, it is possible to reduce the burden they impose on life and property.

Data Sources, Definitions and Conventions Used in this Report

Unless otherwise specified, the statistics in this analysis are national estimates of fires reported to U.S. municipal fire departments, and so exclude fires reported only to federal or state agencies or industrial fire brigades. These estimates are projections based on the detailed information collected in Version 5.0 of the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0) and the annual fire department experience survey conducted by the National Fire Protection Association.

Except for calculations involving property use and incident type, fires with unknown or unreported data were allocated proportionally in calculations of national estimates. In general, any fire that occurs in or on a structure is considered a structure fire, even if the fire was limited to contents and the building itself was not damaged. Religious and funeral properties were identified by NFIRS property use codes in the 130-139 range.

NFIRS 5.0 includes a category of structure fires collectively referred to as "confined fires," identified by incident type. These include confined cooking fires, confined chimney or flue fires, confined trash fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined incinerator fires (incident type 113-118). Losses are generally minimal in these fires, which by definition, are assumed to have been limited to the object of origin. Although causal data is not required for these fires, it is sometimes present.

Confined and non-confined fires were analyzed separately and summed for Cause of Ignition, Heat Source, Factor Contributing to Ignition, Area of Origin, and Item First Ignited, as well as for the Detection and Automatic Suppression estimates. Non-confined fires were analyzed for Equipment Involved in Ignition. Other types of confined fires were not broken out further and were grouped by incident type with the non-confined fires.

Casualty and loss projections can be heavily influenced by the inclusion or exclusion of one unusually serious fire. Property damage has not been adjusted for inflation, with the exception of Table 1. Fires are rounded to the nearest ten, civilian deaths and injuries to the nearest one, and direct property damage to the nearest million. Due to the very small number of deaths, they have been omitted from trend and cause tables. Additional details on the methodology may be found in Appendix A and Appendix B.

Structure Fires in Religious and Funeral Properties

On average, 1,780 structure fires were reported in religious and funeral properties per year between 2007 and 2011. These fires caused an annual average of two civilian fatalities, 19 civilian injuries, and $111 million in direct property damage. The vast majority of these fires took place in religious properties, with funeral properties representing four percent of the total and another six percent representing unclassified religious or funeral properties. A breakdown of this information is presented below in Table A.

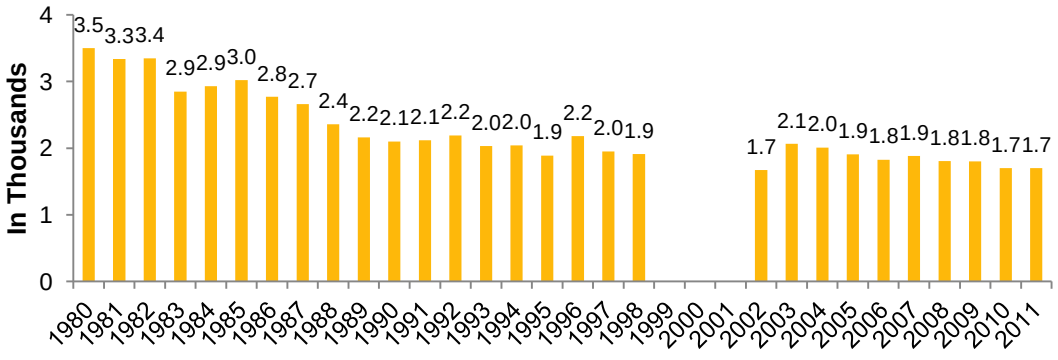
Table A.
Structure Fires in Religious and Funeral Properties
2007-2011 Annual Averages

Occupancy	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Church, mosque, synagogue, temple or chapel	1,600	(90%)	2	(100%)	16	(81%)	$105	(94%)
Funeral parlor	70	(4%)	0	(0%)	2	(9%)	$2	(2%)
Unclassified religious or funeral property	100	(6%)	0	(0%)	2	(10%)	$4	(4%)
Total	1,780	(100%)	2	(100%)	19	(100%)	$111	(100%)

Source: NFIRS 5.0 and NFPA survey.

Fires in religious and funeral properties have fallen substantially over the past 30 years, declining from 3,500 a year in 1980 to 1,660 in 2011 – a 53% decrease, as shown in Figure 1 below. Data are not included for the years between 1999 and 2001 because a new version of NFIRS (Version 5) was introduced in 1999 and gradually adopted by fire departments. Estimates for the transition years should be viewed with caution. While not shown in Figure 1, they are shown in Table 1.

Figure 1. Reported Structure Fires in Religious or Funeral Properties by Year, 1980-2011

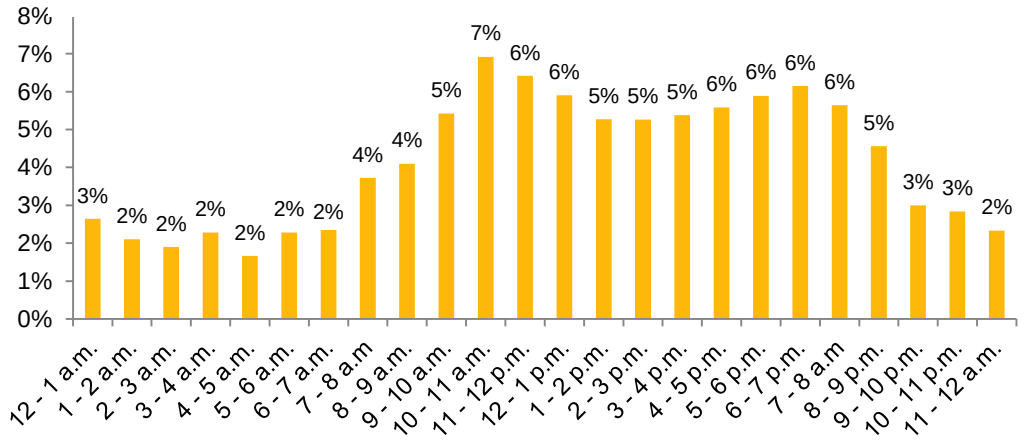


Source: NFIRS 5.0 and NFPA survey.

While the decrease in religious and funeral property fires since 1980 is encouraging, the social and economic costs of fire in religious and funeral properties nonetheless remain significant, and ongoing efforts are needed to promote prevention through regular inspections and maintenance, as well as the adoption of fire safety practices.

Fires in religious and funeral properties show some variation in the hour, day of week, or month of year in which they occur, as indicated in Figure 2 and Tables 2 through 4. In general, fires were least likely to take place during the overnight hours, with the 12-hour period between 9 p.m. and 9 a.m. accounting for 31% of the fires (Figure 2). During the 9 a.m.

Figure 2. Reported Structure Fires in Religious and Funeral Properties by Alarm Time, 2007-2011 Annual Averages



Source: NFIRS 5.0 and NFPA survey.

to 9 p.m. time frame when two-thirds of fires occurred, the peak periods came between 10 a.m. and noon and 6 p.m. to 7 p.m. Three-fourths of injuries (74%) also took place between 9 a.m. and 9 p.m.[1] Although there were fewer fires in the overnight hours of 9 p.m. to 9 a.m., they accounted for 65% of direct property damage.

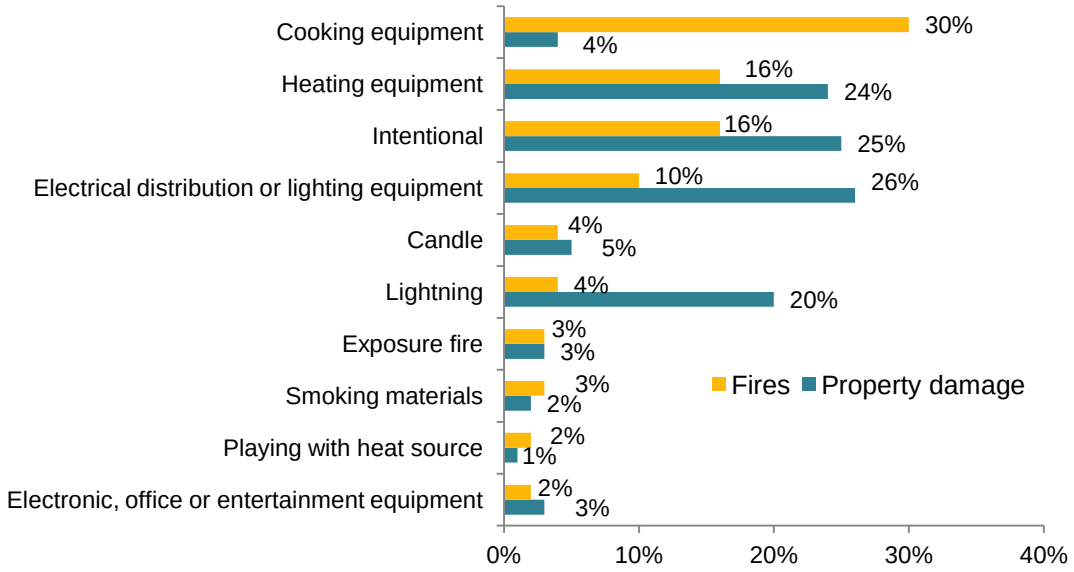
Seasonal factors appear to be an influence on the occurrence of fires in religious and funeral properties when measured on a monthly basis, as shown in Table 2. The summer months of July, August, and September recorded the fewest fires (7% in each month), while January and March each recorded 10% of the annual total, followed by April, October, and December, each with nine percent.

Fires in religious and funeral properties were concentrated on weekends, reflecting the comparative inactivity in many religious properties between Monday and Friday. As shown in Table 3, a higher share of fires took place on Saturday (17%) and Sunday (18%) than on weekdays. The lowest share of fires took place on Mondays.

[1] Although data on injuries is included in this report, the results should be interpreted cautiously due to the small numbers, which entail considerable instability.

Cooking equipment is the leading cause of fires in religious and funeral properties, accounting for 30% of the total, as shown in Figure 3. Fires caused by heating equipment and intentionally set fires each accounted for 16% of the fires in this property group, with electrical distribution and lighting equipment causing another 10% of the fires. Fires caused by candles

Figure 3. Leading Causes of Structure Fires in Religious and Funeral Properties 2007-2011 Annual Averages



Note: This table summarizes findings from multiple fields, meaning that the same fire may be listed under multiple causes. The methodology used is described in the appendix.

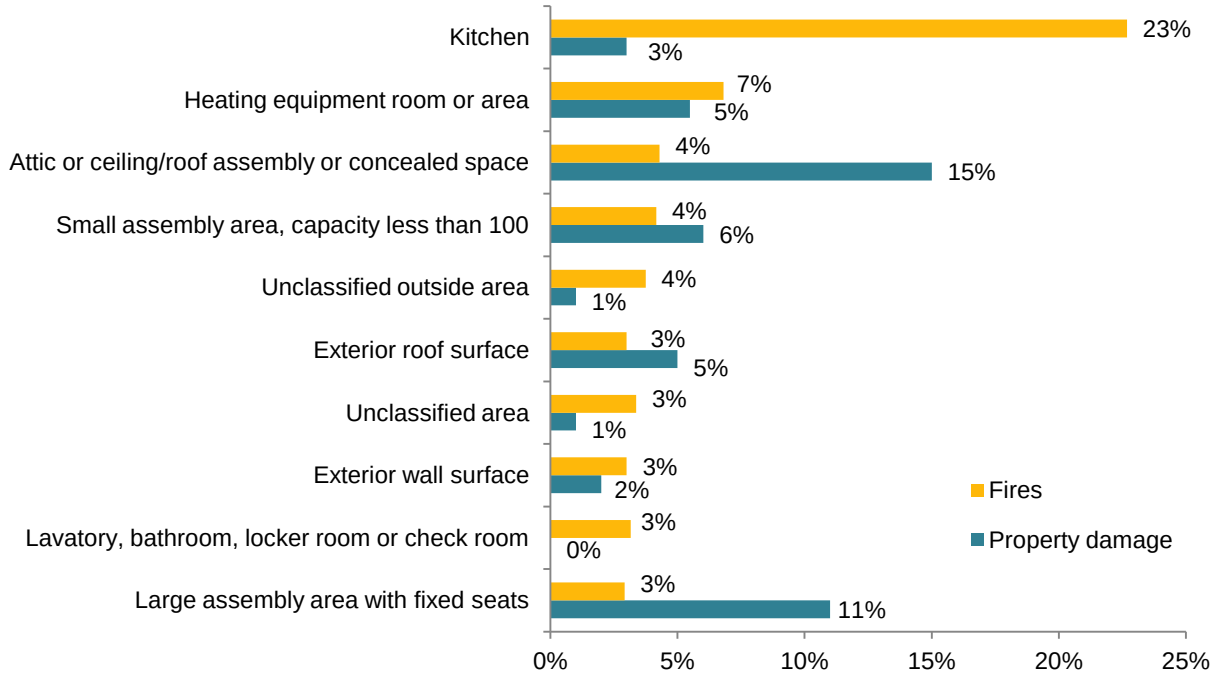
Source: NFIRS 5.0 and NFPA survey.

represented four percent of the total. The highest levels of property damage resulted from fires caused by electrical distribution or lighting equipment (26% of total), intentionally set fires (25%), and fires caused by heating equipment (24%). Fires caused by lightning strikes, which were the cause of four percent of the fires in this property use category, accounted for one-fifth of the direct property damage. Nearly two-thirds of lightning strikes were to the exterior roof surface (35%) or to the attic or ceiling/roof assembly (29%), an indication that religious properties may benefit from lightning protection systems.[2]

As shown in Figure 4 (and Table 10), fires originating in the *kitchen or cooking area* represented the single most frequent area of origin for fires in religious and funeral properties, with nearly one-quarter (23%) of the total. The second leading area of origin was *heating equipment room*, with seven percent, followed by *attic or ceiling/roof assembly or concealed space*, *small assembly area* (less than 100 person capacity), and *unclassified outside area*, each of which had four percent of the total.

[2] Richard Campbell, 2013. "Lightning Fires in Religious and Funeral Properties by Area of Origin," NFPA Fire Analysis and Research, Quincy, MA.

Figure 4. Leading Areas of Origin in Religious and Funeral Properties, 2007-2011



Source: NFIRS 5.0 and NFPA survey.

***Cooking materials (including food)* were the most frequent item first ignited in religious and funeral property fires, accounting for 17% of the total (while also accounting for just one percent of direct dollar loss).** After cooking materials, the most frequent items first ignited were: *flammable or combustible liquid*, *gas or associated part*; *electrical wire or cable insulation*; and *unclassified item*, each with eight percent of the total, followed by *rubbish, trash, or waste* (7%). The highest dollar loss was associated with fires in which the first item ignited was *electrical wire or cable insulation*, with $20 million in losses, 18% of the total. *Structural members or framing* accounted for $19 million in direct losses (17%), although they were the item first ignited in just six percent of fires. One-fifth of injuries (19%) were caused by fires in which the item first ignited was *flammable/combustible liquid, gas, or associated part*.

When sprinklers were present in the fire area, the average loss per fire was 73% lower than in fires in properties in which sprinklers were not present. As shown in Table B below, sprinklers were present in only 12% of fires in religious and funeral properties in 2007-2011. Properties under construction and properties with no sprinklers in the fire area were excluded from these calculations. The average estimated dollar loss per fire when no automatic extinguishing equipment was present ($67,000) was more than three times greater than the dollar loss in fires in which sprinklers were present ($18,000).

Table B.
Sprinkler Systems
in Religious and Funeral Property Structure Fires
2007-2011 Annual Averages*

Percent of fires in buildings with sprinklers	12%
Average loss per fire when wet pipe sprinklers were present	$18,000
Average loss per fire with no automatic extinguishing equipment	$67,000
Reduction in loss per fire when wet pipe sprinklers were present	73%

* Excludes properties under construction and fires where sprinklers were not present in the fire area.

Source: NFIRS 5.0 and NFPA survey.

Prioritizing Prevention

There are a variety of prevention measures available to religious and funeral properties that address common causes of fire in these properties. The role of cooking fires in this property use category underscores the need for religious properties equipped with kitchens to ensure that cooking equipment and appliances are used safely and that appliances are turned off and unplugged when not in use. To protect against heating equipment fires, it is also important for religious and funeral properties to ensure that electrical wiring is up to code and that any repairs or updates are handled by a qualified electrician, arranging for annual inspections of heating and air conditioning units by qualified personnel.

Prevention efforts are also called for to address intentional fires. In the mid-1990s, a spike in arsons targeting houses led President Clinton in 1996 to establish a National Church Action Task Force, which made the investigation of these arsons and prosecution of the perpetrators a top law enforcement priority.[3] The task force made a number of recommendations to reduce the risk of arson in religious properties. These include encouraging congregants to drive by the building during off-hours in order to increase visible activity, establishing relationships with local law enforcement and neighbors in order to heighten attention to suspicious activity, installing floodlights to the building exterior, securing ladders and stairways that provide roof access, increasing street visibility by cutting shrubbery and trees, and installing fire and burglar alarms.[4]

[3] *Second Year Report for the President: National Church Arson Task Force*, U.S. Department of Treasury, U.S. Department of Justice: Bureau of Alcohol, Tobacco and Firearms, Federal Bureau of Investigation, October 1998. Available at: http://www.usdoj.gov/crt/church-arson/arson98.html.

[4] Fourth Year Report for the President: National Church Arson Task Force, U.S. Department of Treasury, U.S. Department of Justice: Bureau of Alcohol, Tobacco and Firearms, Federal Bureau of Investigation, September 2000. Available at: http://www.atf.gov/pub/gen_pub/report2000.

Religious properties may be at greater risk for lightning fires relative to other property types. Certified lightning protection systems are available to protect against lightning strikes. The risk of candle fires can be reduced by using battery-operated flameless candles or by ensuring that lighted candles are kept at a safe distance from flammable materials, are placed on a sturdy heat resistant surface, and are never left unattended. Other precautionary measures to reduce the risk of fire include properly storing flammable and combustible materials (paint thinners, paint, cleaning solutions, etc.) in a safe environment away from furnaces or water heaters.

Resources are available to assist property managers or other relevant parties in guiding fire prevention efforts. NFPA 101, *Life Safety Code* is one of the most widely used sources for strategies to protect people from fire and related hazards in all types of occupancies. The *Life Safety Code* includes differing provisions for different types of buildings and includes requirements for egress, building features, and fire detection and extinguishment systems. Automatic sprinkler systems represent the single most effective method for controlling or extinguishing fire. Newly-constructed places of worship were exempt from *the Life Safety Code* requirements for sprinkler systems prior to publication of the 2006 edition. This exemption was removed for the 2006 edition, and newly constructed places of worship are now required to be provided with automatic sprinkler protection where they have an occupant load of 300 persons or more. (An exemption is provided for assembly occupancies housed in a single multipurpose room of less than 12,000 ft^2 that are not used for exhibition or display and not part of a mixed occupancy.) An additional fire protection resource for churches and other religious properties is NFPA 909, *Code for the Protection of Cultural Resource Properties – Museums, Libraries, and Places of Worship*.

Guidance on fire protection is also typically available from local fire departments or a property's insurer. In addition, a lesson plan for religious organizations interested in promoting fire safety among their members can be found at: http://www.nfpa.org/itemDetail.asp?categoryID=2795&itemID=60497.

Table 1.
Structure Fires in Religious and Funeral Properties by Year
1980-2011

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2011 Dollars
1980	3,500	23	$62	$169
1981	3,340	14	$79	$195
1982	3,350	58	$43	$100
1983	2,850	26	$114	$257
1984	2,930	45	$50	$108
1985	3,020	30	$61	$127
1986	2,770	29	$52	$107
1987	2,660	23	$52	$103
1988	2,360	14	$69	$131
1989	2,160	11	$59	$107
1990	2,100	17	$62	$107
1991	2,120	34	$57	$94
1992	2,190	28	$71	$114
1993	2,030	41	$58	$90
1994	2,040	25	$61	$93
1995	1,890	62	$52	$77
1996	2,180	27	$62	$89
1997	1,950	25	$44	$62
1998	1,910	25	$68	$94
1999*	1,290	34	$138	$187
2000*	1,390	0	$107	$140
2001*	1,550	36	$83	$105
2002	1,670	15	$114	$142
2003	2,060	11	$94	$114
2004	2,010	5	$87	$104
2005	1,910	14	$104	$119
2006	1,840	8	$86	$96
2007	1,890	22	$111	$120
2008	1,810	12	$123	$129
2009	1,800	10	$120	$126
2010	1,720	33	$105	$108
2011	1,660	19	$95	$95

Note: Sums may not equal totals due to rounding errors.
Source: NFIRS 5.0 and NFPA survey.
* Because of low participation in Version 5 of NFIRS 5.0 during 1999-2001, estimates for these years are highly uncertain and must be used with caution. Inflation adjustments were based on the consumer price index found in the U.S. Census Bureau's "Purchasing Price of the Dollar."

Table 2.
Structure Fires in Religious and Funeral Properties by Month
2007-2011 Annual Averages

Month	Number of Fires		Civilian Injuries		Direct Property Damage (in Millions)	
January	170	(10%)	3	(17%)	$14	(13%)
February	140	(8%)	1	(3%)	$8	(7%)
March	170	(10%)	1	(5%)	$10	(9%)
April	150	(9%)	1	(6%)	$13	(12%)
May	140	(8%)	1	(3%)	$8	(8%)
June	140	(8%)	2	(11%)	$8	(8%)
July	130	(7%)	3	(15%)	$9	(8%)
August	130	(7%)	1	(6%)	$9	(8%)
September	120	(7%)	1	(8%)	$5	(4%)
October	170	(9%)	3	(13%)	$10	(9%)
November	150	(8%)	0	(0%)	$6	(6%)
December	160	(9%)	2	(12%)	$10	(9%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Average	150	(8%)	2	(8%)	$9	(8%)

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA survey.

Table 3.
Structure Fires in Religious and Funeral Properties by Day of Week
2007-2011 Annual Averages

Day	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	320	(18%)	2	(8%)	$14	(13%)
Monday	210	(12%)	3	(13%)	$14	(13%)
Tuesday	220	(13%)	2	(13%)	$22	(20%)
Wednesday	240	(14%)	3	(17%)	$11	(10%)
Thursday	220	(13%)	2	(10%)	$15	(13%)
Friday	250	(14%)	1	(4%)	$15	(13%)
Saturday	300	(17%)	7	(34%)	$20	(18%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Average	250	(14%)	3	(14%)	$16	(14%)

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA survey.

Table 4.
Structure Fires in Religious and Funeral Properties by Alarm Time
2007-2011 Annual Averages

Alarm Time	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	50	(3%)	1	(3%)	$7	(6%)
1:00-1:59 a.m.	40	(2%)	0	(0%)	$6	(5%)
2:00-2:59 a.m.	30	(2%)	0	(2%)	$10	(9%)
3:00-3:59 a.m.	40	(2%)	1	(4%)	$11	(10%)
4:00-4:59 a.m.	30	(2%)	0	(0%)	$4	(4%)
5:00-5:59 a.m.	40	(2%)	1	(6%)	$10	(9%)
6:00-6:59 a.m.	40	(2%)	0	(0%)	$4	(4%)
7:00-7:59 a.m.	70	(4%)	1	(3%)	$3	(3%)
8:00-8:59 a.m.	70	(4%)	0	(2%)	$2	(2%)
9:00-9:59 a.m.	100	(5%)	1	(5%)	$3	(3%)
10:00-10:59 a.m.	120	(7%)	3	(17%)	$3	(2%)
11:00-11:59 a.m.	110	(6%)	0	(2%)	$1	(1%)
12:00-12:59 p.m.	100	(6%)	1	(4%)	$2	(2%)
1:00-1:59 p.m.	90	(5%)	1	(7%)	$4	(4%)
2:00-2:59 p.m.	90	(5%)	1	(8%)	$3	(2%)
3:00-3:59 p.m.	100	(5%)	2	(10%)	$6	(6%)
4:00-4:59 p.m.	100	(6%)	1	(3%)	$3	(2%)
5:00-5:59 p.m.	100	(6%)	1	(3%)	$2	(2%)
6:00-6:59 p.m.	110	(6%)	1	(3%)	$4	(4%)
7:00-7:59 p.m.	100	(6%)	1	(5%)	$5	(4%)
8:00-8:59 p.m.	80	(5%)	1	(8%)	$4	(3%)
9:00-9:59 p.m.	60	(3%)	0	(0%)	$4	(3%)
10:00-10:59 p.m.	50	(3%)	0	(2%)	$6	(5%)
11:00-11:59 p.m.	40	(2%)	1	(4%)	$4	(4%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Average	74	(4%)	1	(4%)	$5	(4%)

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA survey

Table 5.
Leading Cause of Structure Fires in Religious and Funeral Properties
2007-2011 Annual Averages

Causes	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking equipment	540	(30%)	3	(13%)	$5	(4%)
Heating equipment	290	(16%)	3	(13%)	$27	(24%)
Intentional	280	(16%)	3	(15%)	$28	(25%)
Electrical distribution or lighting equipment	190	(10%)	2	(12%)	$28	(26%)
Lightning	70	(4%)	1	(5%)	$22	(20%)
Candle	70	(4%)	5	(27%)	$5	(5%)
Exposure fire	50	(3%)	0	(0%)	$4	(3%)
Smoking materials	50	(3%)	1	(7%)	$2	(2%)
Playing with heat source	50	(2%)	1	(3%)	$1	(1%)
Electronic, office or entertainment equipment	30	(2%)	0	(0%)	$3	(3%)

*Estimates of fires involving *electrical distribution or lighting equipment* and *electronic, office, or entertainment equipment* exclude confined fires.

See NFPA's detailed analysis of 2003-2007 non-home fires, "*Non-Home* Structure *Fires by Equipment Involved in Ignition*," by John R. Hall. Jr., for estimates that include confined fires.

Note: This table summarizes findings from multiple fields, meaning that the same fire may be listed under multiple causes. The methodology used is described in the appendix.

Source: NFIRS 5.0 and NFPA survey

Table 6.
Structure Fires in Religious and Funeral Properties by Equipment Involved in Ignition*
2007-2011 Annual Averages

Equipment Involved	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking equipment	**540**	**(30%)**	**3**	**(13%)**	**$5**	**(4%)**
Confined cooking fire	490	(27%)	1	(5%)	$0	(0%)
Range with or without oven, cooking surface	30	(2%)	2	(8%)	$4	(4%)
Portable cooking or warming equipment	10	(1%)	0	(0%)	$0	(0%)
No equipment involved	**420**	**(24%)**	**10**	**(51%)**	**$42**	**(38%)**
Heating equipment	**290**	**(16%)**	**3**	**(13%)**	**$27**	**(24%)**
Confined fuel burner or boiler fire	160	(9%)	0	(0%)	$0	(0%)
Fixed or portable space heater	50	(3%)	0	(0%)	$2	(2%)
Central heat	40	(2%)	3	(13%)	$24	(22%)
Confined chimney or flue fire	20	(1%)	0	(0%)	$0	(0%)
Water heater	10	(1%)	0	(0%)	$1	(1%)
Electrical distribution or lighting equipment	**190**	**(10%)**	**2**	**(12%)**	**$28**	**(26%)**
Wiring and related equipment	100	(6%)	2	(12%)	$7	(7%)
Lamp, bulb or lighting	50	(3%)	0	(0%)	$19	(17%)
Other	**340**	**(19%)**	**2**	**(11%)**	**$9**	**(8%)**
Air conditioner	40	(2%)	0	(0%)	$0	(0%)
Other known equipment	40	(2%)	2	(11%)	$4	(3%)
Electronic, office or entertainment equipment	30	(2%)	0	(0%)	$3	(3%)
Fan	30	(1%)	0	(0%)	$0	(0%)
Torch, burner or soldering iron	20	(1%)	0	(0%)	$0	(0%)
Clothes dryer	20	(1%)	0	(0%)	$0	(0%)
Heat pump	10	(1%)	0	(0%)	$0	(0%)
Confined incinerator overload or malfunction fire	10	(1%)	0	(0%)	$0	(0%)
Refrigerator, ice maker, freezer	10	(1%)	0	(0%)	$1	(1%)
Unclassified equipment involved in ignition	10	(1%)	0	(0%)	$0	(0%)
Contained trash or rubbish fire	120	(7%)	0	(0%)	$0	(0%)
Total	**1,780**	**(100%)**	**19**	**(100%)**	**$111**	**(100%)**

Table 6. (continued)
Structure Fires in Religious and Funeral Properties by Equipment Involved in Ignition
2007-2011 Annual Averages

*The estimates for equipment involved in ignition did not break out the confined fires further.

Note: Non-confined fires in which the equipment involved in ignition was unknown or not reported have been allocated proportionally among fires with known equipment involved. Fires in which the equipment involved in ignition was entered as none but the heat source indicated equipment involvement or the heat source was unknown were also treated as unknown and allocated proportionally among fires with known equipment involved. Non-confined fires in which the equipment was partially unclassified (i.e., unclassified kitchen or cooking equipment, unclassified heating, cooling or air condition equipment, etc.) were allocated proportionally among fires that grouping (kitchen or cooking equipment; heating, cooling or air conditioning equipment, etc.). Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA survey.

Table 7.
Structure Fires in Religious and Funeral Properties by Cause of Ignition
2007-2011 Annual Averages

Cause of Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unintentional	940	(53%)	11	(63%)	$41	(37%)
Non-confined fire	440	(25%)	11	(63%)	$41	(37%)
Confined fire	500	(28%)	0	(0%)	$0	(0%)
Failure of equipment or heat source	380	(21%)	3	(18%)	$17	(16%)
Non-confined fire	230	(13%)	3	(18%)	$17	(15%)
Confined fire	150	(8%)	0	(0%)	$0	(0%)
Intentional	280	(16%)	3	(15%)	$28	(25%)
Non-confined fire	180	(10%)	3	(15%)	$28	(25%)
Confined fire	110	(6%)	0	(0%)	$0	(0%)
Unclassified	100	(6%)	0	(0%)	$4	(4%)
Non-confined fire	50	(3%)	0	(0%)	$4	(4%)
Confined fire	50	(3%)	0	(0%)	$0	(0%)
Act of nature	70	(4%)	1	(5%)	$21	(19%)
Non-confined fire	70	(4%)	1	(5%)	$21	(19%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Non-confined fire	970	(54%)	18	(95%)	$111	(100%)
Confined fire	810	(46%)	1	(5%)	$0	(0%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See Appendix A for details.

Source: NFIRS 5.0 and NFPA survey.

Table 8.
Structure Fires in Religious and Funeral Properties by Factor Contributing to Ignition
2007-2011 Annual Averages

Factors Contributing to Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Electrical failure or malfunction	310	(17%)	2	(9%)	$21	(18%)
Non-confined fire	270	(15%)	2	(9%)	$21	(18%)
Confined fire	40	(2%)	0	(0%)	$0	(0%)
Mechanical failure or malfunction	230	(13%)	3	(13%)	$15	(13%)
Non-confined fire	90	(5%)	3	(13%)	$15	(13%)
Confined fire	140	(8%)	0	(0%)	$0	(0%)
Heat source too close to combustible	180	(10%)	4	(21%)	$10	(9%)
Non-confined fire	110	(6%)	4	(21%)	$10	(9%)
Confined fire	70	(4%)	0	(0%)	$0	(0%)
Unclassified factor	160	(9%)	2	(11%)	$19	(17%)
Non-confined fire	90	(5%)	2	(11%)	$19	(17%)
Confined fire	70	(4%)	0	(0%)	$0	(0%)
Misuse of material or product, other	140	(8%)	1	(7%)	$2	(2%)
Non-confined fire	60	(3%)	1	(7%)	$2	(2%)
Confined fire	80	(4%)	0	(0%)	$0	(0%)
Abandoned or discarded material or product	140	(8%)	1	(6%)	$2	(2%)
Non-confined fire	50	(3%)	1	(6%)	$2	(2%)
Confined fire	90	(5%)	0	(0%)	$0	(0%)
Equipment unattended	130	(7%)	1	(6%)	$2	(2%)
Non-confined fire	20	(1%)	1	(6%)	$2	(2%)
Confined fire	120	(7%)	0	(0%)	$0	(0%)
Storm	70	(4%)	1	(5%)	$21	(18%)
Non-confined fire	70	(4%)	1	(5%)	$21	(18%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Failure to clean	60	(3%)	0	(0%)	$1	(1%)
Non-confined fire	10	(1%)	0	(0%)	$1	(1%)
Confined fire	50	(3%)	0	(0%)	$0	(0%)
Exposure fire	50	(3%)	0	(0%)	$4	(3%)
Non-confined fire	50	(3%)	0	(0%)	$4	(3%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)
Playing with heat source	50	(3%)	1	(3%)	$1	(1%)
Non-confined fire	20	(1%)	1	(3%)	$1	(1%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)

Table 8. (continued)
Structure Fires in Religious and Funeral Properties by Factor Contributing to Ignition
2007-2011 Annual Averages

Factors Contributing to Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Accidentally turned on, not turned off	40	(2%)	0	(0%)	$1	(1%)
Non-confined fire	10	(1%)	0	(0%)	$1	(1%)
Confined fire	30	(2%)	0	(0%)	$0	(0%)
Rekindle	30	(2%)	0	(0%)	$1	(1%)
Non-confined fire	30	(2%)	0	(0%)	$1	(1%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Unclassified operational deficiency	30	(2%)	0	(0%)	$0	(0%)
Non-confined fire	10	(1%)	0	(0%)	$0	(0%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Other known factor	230	(13%)	4	(19%)	$15	(13%)
Non-confined	130	(7%)	4	(19%)	$15	(13%)
Confined	100	(6%)	0	(0%)	$0	(0%)
Total fires	1,780	(100%)	19	(100%)	$111	(100%)
Non-confined fire	970	(54%)	18	(95%)	$111	(100%)
Confined fire	810	(46%)	1	(5%)	$0	(0%)
Total entries*	1,850	(104%)	19	(100%)	$114	(103%)
Non-confined fire	1,010	(57%)	18	(95%)	$114	(103%)
Confined fire	840	(47%)	1	(5%)	$0	(0%)

* Multiple entries are allowed which can result in sums higher than totals.

Note: Sums may not equal totals due to rounding errors. Fires in which the factor contributing to ignition was coded as "none," unknown, or not reported have been allocated proportionally among fires with known factor contributing to ignition. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See Appendix A for details.

Source: NFIRS 5.0 and NFPA survey.

Table 9.
Structure Fires in Religious and Funeral Properties by Heat Source
2007-2011 Annual Averages

Heat Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified heat from powered equipment	330	(19%)	0	(0%)	$11	(10%)
Non-confined fire	120	(7%)	0	(0%)	$11	(10%)
Confined fire	210	(12%)	0	(0%)	$0	(0%)
Radiated, conducted heat from operating equipment	260	(15%)	3	(16%)	$14	(13%)
Non-confined fire	100	(6%)	3	(16%)	$14	(13%)
Confined fire	170	(10%)	0	(0%)	$0	(0%)
Arcing	200	(11%)	2	(12%)	$14	(13%)
Non-confined fire	190	(11%)	2	(12%)	$14	(13%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)
Spark, ember or flame from operating equipment	160	(9%)	2	(9%)	$7	(6%)
Non-confined fire	50	(3%)	2	(9%)	$7	(6%)
Confined fire	110	(6%)	0	(0%)	$0	(0%)
Unclassified heat source	150	(8%)	1	(3%)	$8	(8%)
Non-confined fire	60	(3%)	1	(3%)	$8	(8%)
Confined fire	90	(5%)	0	(0%)	$0	(0%)
Unclassified hot or smoldering object	120	(7%)	0	(0%)	$4	(4%)
Non-confined fire	60	(3%)	0	(0%)	$4	(4%)
Confined fire	60	(3%)	0	(0%)	$0	(0%)
Match	80	(4%)	0	(0%)	$1	(1%)
Non-confined fire	30	(2%)	0	(0%)	$1	(1%)
Confined fire	40	(2%)	0	(0%)	$0	(0%)
Lightning	70	(4%)	1	(5%)	$22	(20%)
Non-confined fire	70	(4%)	1	(5%)	$22	(20%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Candle	70	(4%)	5	(27%)	$5	(5%)
Non-confined fire	50	(3%)	5	(27%)	$5	(5%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)
Hot ember or ash	60	(3%)	0	(0%)	$4	(4%)
Non-confined fire	30	(2%)	0	(0%)	$4	(4%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)

Table 9. (continued)
Structure Fires in Religious and Funeral Properties by Heat Source
2007-2011 Annual Averages

Heat Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Lighter	50	(3%)	0	(0%)	$3	(3%)
Non-confined fire	30	(2%)	0	(0%)	$3	(3%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Smoking materials	50	(3%)	1	(7%)	$2	(2%)
Non-confined fire	30	(2%)	1	(7%)	$2	(2%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Heat from direct flame or convection currents	30	(2%)	0	(0%)	$3	(2%)
Non-confined fire	20	(1%)	0	(0%)	$3	(2%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)
Other known heat source	150	(8%)	3	(16%)	$10	(9%)
Non-confined fire	110	(6%)	3	(16%)	$10	(9%)
Confined fire	40	(2%)	0	(0%)	$0	(0%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Non-confined fire	970	(54%)	18	(95%)	$111	(100%)
Confined fire	810	(46%)	1	(5%)	$0	(0%)

Note: Sums may not equal totals due to rounding errors. The statistics on matches, lighters, smoking materials and candles include a proportional share of fires in which the heat source was heat from an unclassified open flame or smoking material. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See Appendix A for details.

Source: NFIRS 5.0 and NFPA survey.

Table 10.
Structure Fires in Religious and Funeral Properties by Area of Origin
2007-2011 Annual Averages

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	410	(23%)	2	(11%)	$4	(3%)
Non-confined	60	(3%)	2	(11%)	$4	(3%)
Confined	350	(20%)	0	(0%)	$0	(0%)
Heating equipment room	120	(7%)	1	(5%)	$5	(5%)
Non-confined	30	(2%)	1	(5%)	$5	(5%)
Confined	90	(5%)	0	(0%)	$0	(0%)
Attic or ceiling/roof assembly or concealed space	70	(4%)	0	(0%)	$16	(15%)
Non-confined	70	(4%)	0	(0%)	$16	(15%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Small assembly area, less than 100 person capacity	70	(4%)	3	(17%)	$7	(6%)
Non-confined	60	(3%)	3	(17%)	$7	(6%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Unclassified outside area	70	(4%)	0	(0%)	$1	(1%)
Non-confined	30	(2%)	0	(0%)	$1	(1%)
Confined	40	(2%)	0	(0%)	$0	(0%)
Exterior roof surface	60	(3%)	0	(2%)	$6	(5%)
Non-confined	60	(3%)	0	(2%)	$6	(5%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Unclassified area	60	(3%)	0	(0%)	$1	(1%)
Non-confined	30	(2%)	0	(0%)	$1	(1%)
Confined	30	(2%)	0	(0%)	$0	(0%)
Exterior wall surface	50	(3%)	2	(8%)	$2	(2%)
Non-confined	50	(3%)	2	(8%)	$2	(2%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Lavatory, bathroom, locker room or check room	50	(3%)	0	(2%)	$1	(0%)
Non-confined	30	(2%)	0	(2%)	$1	(0%)
Confined	20	(1%)	0	(0%)	$0	(0%)
Large assembly area with fixed seats	50	(3%)	0	(0%)	$12	(11%)
Non-confined	40	(2%)	0	(0%)	$12	(11%)
Confined	10	(1%)	0	(0%)	$0	(0%)

Table 10. (continued)
Structure Fires in Religious and Funeral Properties by Area of Origin
2007-2011 Annual Averages

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Office	40	(2%)	0	(0%)	$5	(4%)
Non-confined	40	(2%)	0	(0%)	$5	(4%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Unclassified function area	40	(2%)	1	(4%)	$4	(3%)
Non-confined	20	(1%)	1	(4%)	$4	(3%)
Confined	20	(1%)	0	(0%)	$0	(0%)
Duct for HVAC, cable, exhaust, heating, or air conditioning	40	(2%)	0	(0%)	$0	(0%)
Non-confined	20	(1%)	0	(0%)	$0	(0%)
Confined	20	(1%)	0	(0%)	$0	(0%)
Large open room without fixed seats	40	(2%)	1	(7%)	$3	(3%)
Non-confined	30	(2%)	1	(7%)	$3	(3%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Lobby or entrance way	30	(2%)	0	(0%)	$4	(3%)
Non-confined	30	(2%)	0	(0%)	$4	(3%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Wall assembly or concealed space	30	(2%)	0	(0%)	$3	(3%)
Non-confined	30	(2%)	0	(0%)	$3	(3%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Trash or rubbish chute, area or container	30	(2%)	0	(0%)	$0	(0%)
Non-confined	0	(0%)	0	(0%)	$0	(0%)
Confined	30	(2%)	0	(0%)	$0	(0%)
Unclassified storage area	30	(2%)	0	(0%)	$0	(0%)
Non-confined	20	(1%)	0	(2%)	$2	(2%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Common room, living room, family room, lounge or den	30	(2%)	1	(4%)	$0	(0%)
Non-confined	20	(1%)	1	(4%)	$2	(2%)
Confined	10	(1%)	0	(0%)	$0	(0%)
Other known area of origin	460	(26%)	7	(36%)	$33	(30%)
Non-confined fire	290	(17%)	7	(36%)	$33	(30%)
Confined fire	160	(9%)	0	(0%)	$0	(0%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Non-confined fire	970	(54%)	18	(95%)	$111	(100%)
Confined fire	810	(46%)	1	(5%)	$0	(0%)

Table 10. (continued)
Structure Fires in Religious and Funeral Properties by Area of Origin
2007-2011 Annual Averages

Note: Sums may not equal totals due to rounding errors. All fires with the confined chimney or flue incident type (NFIRS incident type 114) are shown separately. Chimney is longer an area of origin choice for non-confined fires. Other confined structure fires (NFIRS incident type 113, and 115-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See Appendix A for details.

Source: NFIRS 5.0 and NFPA survey.

Table 11.
Structure Fires in Religious and Funeral Properties by Item First Ignited
2007-2011 Annual Averages

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, includes food	310	(17%)	0	(0%)	$1	(1%)
Non-confined fire	10	(1%)	0	(0%)	$1	(1%)
Confined fire	300	(17%)	0	(0%)	$0	(0%)
Flammable/combustible liquid, gas, or associated part	150	(8%)	4	(19%)	$4	(4%)
Non-confined fire	40	(2%)	4	(19%)	$4	(4%)
Confined fire	110	(6%)	0	(0%)	$0	(0%)
Electrical wire or cable insulation	140	(8%)	1	(3%)	$20	(18%)
Non-confined fire	130	(7%)	1	(3%)	$20	(18%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Unclassified item	140	(8%)	0	(0%)	$4	(4%)
Non-confined fire	70	(4%)	0	(0%)	$4	(4%)
Confined fire	70	(4%)	0	(0%)	$0	(0%)
Rubbish, trash, or waste	130	(7%)	0	(0%)	$1	(1%)
Non-confined fire	30	(2%)	0	(0%)	$1	(1%)
Confined fire	100	(6%)	0	(0%)	$0	(0%)
Structural member or framing	110	(6%)	0	(0%)	$19	(17%)
Non-confined fire	110	(6%)	0	(0%)	$19	(17%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)
Exterior roof covering or finish	70	(4%)	0	(3%)	$11	(10%)
Non-confined fire	70	(4%)	0	(3%)	$11	(10%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Exterior wall covering or finish	60	(3%)	2	(11%)	$6	(6%)
Non-confined fire	60	(3%)	2	(11%)	$6	(6%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Magazine, newspaper, writing paper	50	(3%)	1	(6%)	$1	(1%)
Non-confined fire	20	(1%)	1	(6%)	$1	(1%)
Confined fire	30	(2%)	0	(0%)	$0	(0%)
Unclassified structural component or finish	40	(2%)	0	(0%)	$8	(7%)
Non-confined fire	40	(2%)	0	(0%)	$8	(7%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Multiple items first ignited	40	(2%)	1	(4%)	$5	(5%)
Non-confined fire	30	(2%)	1	(4%)	$5	(5%)
Confined fire	10	(1%)	0	(0%)	$0	(0%)

Table 11. (continued)
Structure Fires in Religious and Funeral Properties by Item First Ignited
2007-2011 Annual Averages

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Appliance housing or casing	40	(2%)	0	(0%)	$1	(1%)
Non-confined fire	20	(1%)	0	(0%)	$1	(1%)
Confined fire	30	(2%)	0	(0%)	$0	(0%)
Interior wall covering. excluding drapes	40	(2%)	1	(7%)	$2	(2%)
Non-confined fire	40	(2%)	1	(7%)	$2	(2%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Box, carton, bag, basket, barrel	40	(2%)	1	(7%)	$2	(2%)
Non-confined fire	20	(1%)	1	(7%)	$2	(2%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Insulation within structural area	30	(2%)	0	(0%)	$1	(1%)
Non-confined fire	30	(2%)	0	(0%)	$1	(1%)
Confined fire	0	(0%)	0	(0%)	$0	(0%)
Unclassified organic materials	30	(2%)	0	(0%)	$0	(0%)
Non-confined fire	10	(1%)	0	(0%)	$0	(0%)
Confined fire	20	(1%)	0	(0%)	$0	(0%)
Other known item	330	(19%)	7	(41%)	$23	(20%)
Non-confined fire	250	(14%)	7	(41%)	$23	(20%)
Confined fire	90	(5%)	0	(0%)	$0	(0%)
Total	1,780	(100%)	19	(100%)	$111	(100%)
Non-confined fire	970	(54%)	18	(95%)	$111	(100%)
Confined fire	810	(46%)	1	(5%)	$0	(0%)

Note: Sums may not equal totals due to rounding errors. Confined structure fires (NFIRS incident type 113-118) were analyzed separately from non-confined structure fires (incident type 110-129, except 113-118). See Appendix A for details.

Source: NFIRS 5.0 and NFPA survey.

Table 12.
Structure Fires in Religious and Funeral Properties by Extent of Flame Damage
2007-2011 Annual Averages

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Confined or contained fire identified by incident type	810	(45%)	1	(5%)	$0	(0%)
Confined to object of origin	290	(17%)	3	(15%)	$3	(3%)
Confined to room of origin	260	(14%)	6	(30%)	$9	(8%)
Confined to floor of origin	70	(4%)	5	(28%)	$6	(5%)
Confined to building of origin	300	(17%)	4	(19%)	$73	(66%)
Beyond building of origin	40	(2%)	1	(3%)	$20	(18%)
Total	1,780	(100%)	19	(100%)	$111	(100%)

Note: Sums may not equal totals due to rounding errors.

Source: NFIRS 5.0 and NFPA survey.

Appendix A.
How National Estimates Statistics Are Calculated

The statistics in this analysis are estimates derived from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual survey of U.S. fire departments. NFIRS is a voluntary system by which participating fire departments report detailed factors about the fires to which they respond. Roughly two-thirds of U.S. fire departments participate, although not all of these departments provide data every year. Fires reported to federal or state fire departments or industrial fire brigades are not included in these estimates.

NFIRS provides the most detailed incident information of any national database not limited to large fires. NFIRS is the only database capable of addressing national patterns for fires of all sizes by specific property use and specific fire cause. NFIRS also captures information on the extent of flame spread, and automatic detection and suppression equipment. For more information about NFIRS visit http://www.nfirs.fema.gov/. Copies of the paper forms may be downloaded from http://www.nfirs.fema.gov/documentation/design/NFIRS_Paper_Forms_2008.pdf.

NFIRS has a wide variety of data elements and code choices. The NFIRS database contains coded information. Many code choices describe several conditions. These cannot be broken down further. For example, area of origin code 83 captures fires starting in vehicle engine areas, running gear areas or wheel areas. It is impossible to tell the portion of each from the coded data.

Methodology may change slightly from year to year.
NFPA is continually examining its methodology to provide the best possible answers to specific questions, methodological and definitional changes can occur. *Earlier editions of the same report may have used different methodologies to produce the same analysis, meaning that the estimates are not directly comparable from year to year.*

NFPA's fire department experience survey provides estimates of the big picture.
Each year, NFPA conducts an annual survey of fire departments which enables us to capture a summary of fire department experience on a larger scale. Surveys are sent to all municipal departments protecting populations of 50,000 or more and a random sample, stratified by community size, of the smaller departments. Typically, a total of roughly 3,000 surveys are returned, representing about one of every ten U.S. municipal fire departments and about one third of the U.S. population.

The survey is stratified by size of population protected to reduce the uncertainty of the final estimate. Small rural communities have fewer people protected per department and are less likely to respond to the survey. A larger number must be surveyed to obtain an adequate sample of those departments. (NFPA also makes follow-up calls to a sample of the smaller fire departments that do not respond, to confirm that those that did respond are truly representative of fire departments their size.) On the other hand, large city departments are so few in number and protect such a large proportion of the total U.S.

population that it makes sense to survey all of them. Most respond, resulting in excellent precision for their part of the final estimate.

The survey includes the following information: (1) the total number of fire incidents, civilian deaths, and civilian injuries, and the total estimated property damage (in dollars), for each of the major property use classes defined in NFIRS; (2) the number of on-duty firefighter injuries, by type of duty and nature of illness; 3) the number and nature of non-fire incidents; and (4) information on the type of community protected (e.g., county versus township versus city) and the size of the population protected, which is used in the statistical formula for projecting national totals from sample results. The results of the survey are published in the annual report *Fire Loss in the United States*. To download a free copy of the report, visit http://www.nfpa.org/assets/files/PDF/OS.fireloss.pdf.

Projecting NFIRS to National Estimates

As noted, NFIRS is a voluntary system. Different states and jurisdictions have different reporting requirements and practices. Participation rates in NFIRS are not necessarily uniform across regions and community sizes, both factors correlated with frequency and severity of fires. This means NFIRS may be susceptible to systematic biases. No one at present can quantify the size of these deviations from the ideal, representative sample, so no one can say with confidence that they are or are not serious problems. But there is enough reason for concern so that a second database -- the NFPA survey -- is needed to project NFIRS to national estimates and to project different parts of NFIRS separately. This multiple calibration approach makes use of the annual NFPA survey where its statistical design advantages are strongest.

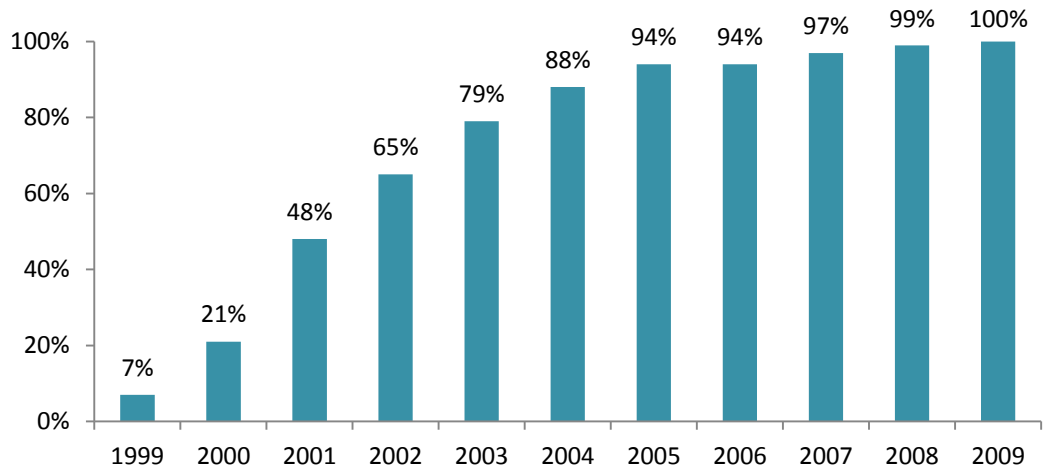
Scaling ratios are obtained by comparing NFPA's projected totals of residential structure fires, non-residential structure fires, vehicle fires, and outside and other fires, and associated civilian deaths, civilian injuries, and direct property damage with comparable totals in NFIRS. Estimates of specific fire problems and circumstances are obtained by multiplying the NFIRS data by the scaling ratios. Reports for incidents in which mutual aid was given are excluded from NFPA's analyses.

Analysts at the NFPA, the USFA and the Consumer Product Safety Commission developed the specific basic analytical rules used for this procedure. "The National Estimates Approach to U.S. Fire Statistics," by John R. Hall, Jr. and Beatrice Harwood, provides a more detailed explanation of national estimates.

Version 5.0 of NFIRS, first introduced in 1999, used a different coding structure for many data elements, added some property use codes, and dropped others. The essentials of the approach described by Hall and Harwood are still used, but some modifications have been necessary to accommodate the changes in NFIRS 5.0.

Figure A.1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

Figure A.1. Fires Originally Collected in NFIRS 5.0 by Year



From 1999 data on, analyses are based on scaling ratios using only data originally collected in NFIRS 5.0:

NFPA survey projections
NFIRS totals (Version 5.0)

For 1999 to 2001, the same rules may be applied, but estimates for these years in this form will be less reliable due to the smaller amount of data originally collected in NFIRS 5.0; they should be viewed with extreme caution.

NFIRS 5.0 introduced six categories of confined structure fires, including:

- cooking fires confined to the cooking vessel,
- confined chimney or flue fires,
- confined incinerator fire,
- confined fuel burner or boiler fire or delayed ignition,
- confined commercial compactor fire, and
- trash or rubbish fires in a structure with no flame damage to the structure or its contents.

Although causal and other detailed information is typically not required for these incidents, it is provided in some cases. Some analyses, particularly those that examine cooking equipment, heating equipment, fires caused by smoking materials, and fires started by playing with fire, may examine the confined fires in greater detail. Because the confined fire incident types describe certain scenarios, the distribution of unknown data differs from that of all fires. Consequently, allocation of unknowns must be done separately.

Some analyses of structure fires show only non-confined fires. In these tables, percentages shown are of non-confined structure fires rather than all structure fires. This approach has the advantage of showing the frequency of specific factors in fire causes, but the disadvantage of possibly overstating the percentage of factors that are seldom seen in the confined fire incident types and of understating the factors specifically associated with the confined fire incident types.

Other analyses include entries for confined fire incident types in the causal tables and show percentages based on total structure fires. In these cases, the confined fire incident type is treated as a general causal factor.

For most fields other than Property Use and Incident Type, NFPA allocates unknown data proportionally among known data. This approach assumes that if the missing data were known, it would be distributed in the same manner as the known data. NFPA makes additional adjustments to several fields. *Casualty and loss projections can be heavily influenced by the inclusion or exclusion of unusually serious fire.*

In the formulas that follow, the term "all fires" refers to all fires in NFIRS on the dimension studied. The percentages of fires with known or unknown data are provided for non-confined fires and associated losses, and for confined fires only.

Cause of Ignition: This field is used chiefly to identify intentional fires. "Unintentional" in this field is a specific entry and does not include other fires that were not intentionally set: failure of equipment or heat source, act of nature, or "other" (unclassified)." The last should be used for exposures but has been used for other situations as well. Fires that were coded as under investigation and those that were coded as undetermined after investigation were treated as unknown.

Factor Contributing to Ignition: In this field, the code "none" is treated as an unknown and allocated proportionally. For Human Factor Contributing to Ignition, NFPA enters a code for "not reported" when no factors are recorded. "Not reported" is treated as an unknown, but the code "none" is treated as a known code and not allocated. Multiple entries are allowed in both of these fields. Percentages are calculated on the total number of fires, not entries, resulting in sums greater than 100%. Although Factor Contributing to Ignition is only required when the cause of ignition was coded as: 2) unintentional, 3) failure of equipment or heat source; or 4) act of nature, data is often present when not required. Consequently, any fire in which no factor contributing to ignition was entered was treated as unknown.

In some analyses, all entries in the category of mechanical failure, malfunction (factor contributing to ignition 20-29) are combined and shown as one entry, "mechanical failure or malfunction." This category includes:

21. Automatic control failure;
22. Manual control failure;
23. Leak or break. Includes leaks or breaks from containers or pipes. Excludes operational deficiencies and spill mishaps;
25. Worn out;
26. Backfire. Excludes fires originating as a result of hot catalytic converters;
27. Improper fuel used; Includes the use of gasoline in a kerosene heater and the like; and
20. Mechanical failure or malfunction, other.

Entries in "electrical failure, malfunction" (factor contributing to ignition 30-39) may also be combined into one entry, "electrical failure or malfunction." This category includes:

31. Water-caused short circuit arc;
32. Short-circuit arc from mechanical damage;

33. Short-circuit arc from defective or worn insulation;
34. Unspecified short circuit arc;
35. Arc from faulty contact or broken connector, including broken power lines and loose connections;
36. Arc or spark from operating equipment, switch, or electric fence;
37. Fluorescent light ballast; and
30. Electrical failure or malfunction, other.

Heat Source. In NFIRS 5.0, one grouping of codes encompasses various types of open flames and smoking materials. In the past, these had been two separate groupings. A new code was added to NFIRS 5.0, which is code 60: "Heat from open flame or smoking material, other." NFPA treats this code as a partial unknown and allocates it proportionally across the codes in the 61-69 range, shown below.

61. Cigarette;
62. Pipe or cigar;
63. Heat from undetermined smoking material;
64. Match;
65. Lighter: cigarette lighter, cigar lighter;
66. Candle;
67 Warning or road flare, fuse;
68. Backfire from internal combustion engine. Excludes flames and sparks from an exhaust system, (11); and
69. Flame/torch used for lighting. Includes gas light and gas-/liquid-fueled lantern.

In addition to the conventional allocation of missing and undetermined fires, NFPA multiplies fires with codes in the 61-69 range by

$$\frac{\text{All fires in range 60-69}}{\text{All fires in range 61-69}}$$

The downside of this approach is that heat sources that are truly a different type of open flame or smoking material are erroneously assigned to other categories. The grouping "smoking materials" includes codes 61-63 (cigarettes, pipes or cigars, and heat from undetermined smoking material, with a proportional share of the code 60s and true unknown data.

Equipment Involved in Ignition (EII). NFIRS 5.0 originally defined EII as the piece of equipment that provided the principal heat source to cause ignition if the equipment malfunctioned or was used improperly. In 2006, the definition was modified to "the piece of equipment that provided the principal heat source to cause ignition." However, much of the data predates the change. Individuals who have already been trained with the older definition may not change their practices. To compensate, NFPA treats fires in which EII = NNN and heat source is not in the range of 40-99 as an additional unknown.

To allocate unknown data for EII, the known data is multiplied by

$$\frac{\text{All fires}}{\text{(All fires – blank – undetermined – [fires in which EII =NNN and heat source <>40-99])}}$$

In addition, the partially unclassified codes for broad equipment groupings (i.e., code 100 - heating, ventilation, and air conditioning, other; code 200 - electrical distribution, lighting and power transfer, other; etc.) were allocated proportionally across the individual code choices in their respective broad groupings (heating, ventilation, and air conditioning; electrical distribution, lighting and power transfer, other; etc.). Equipment that is totally unclassified is not allocated further. This approach has the same downside as the allocation of heat source 60 described above. Equipment that is truly different is erroneously assigned to other categories.

In some analyses, various types of equipment are grouped together.

Code Grouping	EII Code	NFIRS definitions
Central heat	132	Furnace or central heating unit
	133	Boiler (power, process or heating)
Fixed or portable space heater	131	Furnace, local heating unit, built-in
	123	Fireplace with insert or stove
	124	Heating stove
	141	Heater, excluding catalytic and oil-filled
	142	Catalytic heater
	143	Oil-filled heater
Fireplace or chimney	120	Fireplace or chimney
	121	Fireplace, masonry
	122	Fireplace, factory-built
	125	Chimney connector or vent connector
	126	Chimney – brick, stone or masonry
	127	Chimney-metal, including stovepipe or flue
Fixed wiring and related equipment	210	Unclassified electrical wiring
	211	Electrical power or utility line
	212	Electrical service supply wires from utility
	213	Electric meter or meter box
	214	Wiring from meter box to circuit breaker
	215	Panel board, switch board or circuit breaker board
	216	Electrical branch circuit
	217	Outlet or receptacle
	218	Wall switch
	219	Ground fault interrupter
Transformers and power supplies	221	Distribution-type transformer
	222	Overcurrent, disconnect equipment
	223	Low-voltage transformer
	224	Generator
	225	Inverter
	226	Uninterrupted power supply (UPS)
	227	Surge protector
	228	Battery charger or rectifier
	229	Battery (all types)
Lamp, bulb or lighting	230	Unclassified lamp or lighting
	231	Lamp-tabletop, floor or desk
	232	Lantern or flashlight
	233	Incandescent lighting fixture
	234	Fluorescent light fixture or ballast

	235	Halogen light fixture or lamp
	236	Sodium or mercury vapor light fixture or lamp
	237	Work or trouble light
	238	Light bulb
	241	Nightlight
	242	Decorative lights – line voltage
	243	Decorative or landscape lighting – low voltage
	244	Sign
Cord or plug	260	Unclassified cord or plug
	261	Power cord or plug, detachable from appliance
	262	Power cord or plug- permanently attached
	263	Extension cord
Torch, burner or soldering iron	331	Welding torch
	332	Cutting torch
	333	Burner, including Bunsen burners
	334	Soldering equipment
Portable cooking or warming equipment	631	Coffee maker or teapot
	632	Food warmer or hot plate
	633	Kettle
	634	Popcorn popper
	635	Pressure cooker or canner
	636	Slow cooker
	637	Toaster, toaster oven, counter-top broiler
	638	Waffle iron, griddle
	639	Wok, frying pan, skillet
	641	Breadmaking machine

Equipment was not analyzed separately for confined fires. Instead, each confined fire incident type was listed with the equipment or as other known equipment.

Item First Ignited. In most analyses, mattress and pillows (item first ignited 31) and bedding, blankets, sheets, and comforters (item first ignited 32) are combined and shown as "mattresses and bedding." In many analyses, wearing apparel not on a person (code 34) and wearing apparel on a person (code 35) are combined and shown as "clothing." In some analyses, flammable and combustible liquids and gases, piping and filters (item first ignited 60-69) are combined and shown together.

Area of Origin. Two areas of origin: bedroom for more than five people (code 21) and bedroom for less than five people (code 22) are combined and shown as simply "bedroom." Chimney is no longer a valid area of origin code for non-confined fires.

Rounding and percentages. The data shown are estimates and generally rounded. An entry of zero may be a true zero or it may mean that the value rounds to zero. Percentages are calculated from unrounded values. It is quite possible to have a percentage entry of up to 100% even if the rounded number entry is zero. The same rounded value may account for a slightly different percentage share. Because percentages are expressed in integers and not carried out to several decimal places, percentages that appear identical may be associated with slightly different values.

Appendix B.
Methodology and Definitions Used in "Leading Cause" Tables

The cause table reflects relevant causal factors that accounted for at least 2% of the fires in a given occupancy. Only those causes that seemed to describe a scenario are included. Because the causal factors are taken from different fields, some double counting is possible. Percentages are calculated against the total number of structure fires, including both confined and non-confined fires. Bear in mind that every fire has at least three "causes" in the sense that it could have been prevented by changing behavior, heat source, or ignitability of first fuel, the last an aspect not reflected in any of the major cause categories. For example, several of the cause categories in this system refer to types of equipment (cooking, heating, electrical distribution and lighting, clothes dryers and washers, torches). However, the problem may be not with the equipment but with the way it is used. The details in national estimates are derived from the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS). This methodology is based on the coding system used in Version 5.0 of NFIRS. The *NFIRS 5.0 Reference Guide*, containing all of the codes, can be downloaded from http://www.nfirs.fema.gov/documentation/reference/.

Cooking equipment and heating equipment are calculated by summing fires identified by equipment involved in ignition and relevant confined fires. Confined fires will be shown if they account for at least 2% of the incidents. **Confined cooking fires** (cooking fires involving the contents of a cooking vessel without fire extension beyond the vessel) are identified by NFIRS incident type 113.

Confined heating equipment fires include **confined chimney or flue fires (**incident type 114) and **confined fuel burner or boiler** fires (incident type 116). The latter includes delayed ignitions and incidents where flames caused no damage outside the fire box. The two types of confined heating fires may be combined or listed separately, depending on the numbers involved.

Intentional fires are identified by fires with a "1" (intentional) in the field "cause." The estimate includes a proportional share of fires in which the cause was undetermined after investigation, under investigation, or not reported. All fires with intentional causes are included in this category regardless of the age of the person involved. Earlier versions of NFIRS included codes for incendiary and suspicious. Intentional fires were deliberately set; they may or may not be incendiary in a legal sense. No age restriction is applied.

Fires caused by **playing with heat source** (typically matches or lighters) are identified by code 19 in the field "factor contributing to ignition." Fires in which the factor contribution to ignition was undetermined (UU), entered as none (NN) or left blank are considered unknown and allocated proportionally. Because factor contributing to ignition is not required for intentional fires, the share unknown, by these definitions, is somewhat larger than it should be.

The heat source field is used to identify fires started by: **smoking materials** (cigarette, code 61; pipe or cigar, code 62; and heat from undetermined smoking material, code 63); **candles** (code 66), **lightning** (code 73); and **spontaneous combustion or chemical reaction** (code 72). Fires started by heat from unclassified open flame or smoking materials (code 60) are allocated

proportionally among the "other open flame or smoking material" codes (codes 61-69) in an allocation of partial unknown data. This includes smoking materials and candles. This approach results in any true unclassified smoking or open flame heat sources such as incense being inappropriately allocated. However, in many fires, this code was used as an unknown.

The equipment involved in ignition field is used to find several cause categories. This category includes equipment that functioned properly and equipment that malfunctioned.

Cooking equipment Non-confined fire refers to equipment used to cook, heat or warm food (codes 620-649 and 654). Fire in which ranges, ovens or microwave ovens, food warming appliances, fixed or portable cooking appliances, deep fat fryers, open fired charcoal or gas grills, grease hoods or ducts, or other cooking appliances) were involved in the ignition are said to be caused by cooking equipment. Food preparation devices that do not involve heating, such as can openers or food processors, are not included here. As noted in Appendix A, a proportional share of unclassified kitchen and cooking equipment (code 600) is included here.

Heating equipment Non-confined fire (codes 120-199) includes central heat, portable and fixed heaters (including wood stoves), fireplaces, chimneys, hot water heaters, and heat transfer equipment such as hot air ducts or hot water pipes. Heat pumps are not included. As noted in Appendix A, a proportional share of unclassified heating, ventilation and air condition equipment (code 100) is included here.

Confined fires are excluded from the tallies of the remaining categories of fires involving equipment.

Electrical distribution and lighting equipment (codes 200-299) include: fixed wiring; transformers; associated overcurrent or disconnect equipment such as fuses or circuit breakers; meters; meter boxes; power switch gear; switches, receptacles and outlets; light fixtures, lamps, bulbs or lighting; signs; cords and plugs; generators, transformers, inverters, batteries and battery charges.

Torch, burner or soldering iron (codes 331-334) includes welding torches, cutting torches, Bunsen burners, plumber furnaces, blowtorches, and soldering equipment. As noted in Appendix A, a proportional share of shop tools and industrial equipment (code 300) is included here.

Clothes dryer or washer (codes 811, 813 and 814) includes clothes dryers alone, washer and dryer combinations within one frame, and washing machines for clothes. As noted in Appendix A, a proportional share of unclassified personal and household equipment (code 800) is included here.

Electronic, office or entertainment equipment (codes 700-799) includes: computers and related equipment; calculators and adding machines; telephones or answering machines; copiers; fax machines; paper shredders; typewriters; postage meters; other office equipment; musical instruments; stereo systems and/or components; televisions and cable TV converter

boxes,, cameras, excluding professional television studio cameras, video equipment and other electronic equipment. Older versions of NFIRS had a code for electronic equipment that included radar, X-rays, computers, telephones, and transmitter equipment.

Shop tools and industrial equipment excluding torches, burners or soldering irons (codes 300-330, 335-399) includes power tools; painting equipment; compressors; atomizing equipment; pumps; wet/dry vacuums; hoists, lifts or cranes; powered jacking equipment; water or gas drilling equipment; unclassified hydraulic equipment; heat-treating equipment; incinerators, industrial furnaces, ovens or kilns; pumps; compressors; internal combustion engines; conveyors; printing presses; casting, molding; or forging equipment; heat treating equipment; tar kettles; working or shaping machines; coating machines; chemical process equipment; waste recovery equipment; power transfer equipment; power takeoff; powered valves; bearings or brakes; picking, carding or weaving machines; testing equipment; gas regulators; separate motors; non-vehicular internal combustion engines; and unclassified shop tools and industrial equipment. . As noted in Appendix A, a proportional share of shop tools and industrial equipment (code 300) is included here.

Medical equipment (codes 410-419) includes: dental, medical or other powered bed, chair or wheelchair; dental equipment; dialysis equipment; medical monitoring and imaging equipment; oxygen administration equipment; radiological equipment; medical sterilizers, therapeutic equipment and unclassified medical equipment. As noted in Appendix A, a proportional share of commercial and medical equipment (code 400) is included here.

Exposures are fires that are caused by the spread of or from another fire. These were identified by factor contributing to ignition code 71. This code is automatically applied when the exposure number is greater than zero.

Appendix C
Selected Published Incidents

The following are selected published incidents involving religious and funeral properties. Included are short articles from the "Firewatch" or "Bi-monthly" columns in *NFPA Journal* or it predecessor *Fire Journal* and incidents from either the large-loss fires report or catastrophic fires report. If available, investigation reports or NFPA Alert Bulletins are included and provide detailed information about the fires.

It is important to remember that this is anecdotal information. Anecdotes show what can happen; they are not a source to learn about what typically occurs.

NFPA's Fire Incident Data Organization (FIDO) identifies significant fires through a clipping service, the Internet and other sources. Additional information is obtained from the fire service and federal and state agencies. FIDO is the source for articles published in the "Firewatch" column of the *NFPA Journal* and many of the articles in this report.

Church Damaged by Fire, Massachusetts
Firefighters responding to a 6:37 a.m. fire alarm at a large, unoccupied church found a fire spreading u a wall into the second floor and attic. They initiated an interior attack, but pulled back to an outside defensive stance when the size of the fire made that necessary. After the flames were sufficiently knocked down, they reinitiated the interior attack for final extinguishment.

The four-story, wood-frame church, which was 110 feet (34 meters) long and 60 feet (18 meters) wide, was built of heavy timber with balloon construction and an asphalt-shingle roof. The building had a fire detection system connected to a municipal radio master box. There were no sprinklers.

Investigators found an electric heater on the first floor at the rear of the building, the electric wiring of which passed through the floor to a basement electrical panel. The fire started where the wiring passed through the floor and wall when resistance heating ignited the wood.

Damage to the building, valued at $2 million, was estimated at $1 million. Its contents, valued at $1 million, sustained $600,000 in damage. Three firefighters suffered minor injuries.

Ken Tremblay, 2010, "Firewatch", *NFPA Journal*, July/August, 23.

Utah
Date, Time of Alarm, Dollar Loss
December, 2:34 a.m., $15 million

Property Characteristics and Operating Status
This large church, which was equal in height to four stories, was of heavy-timber construction with masonry walls. It covered 8,064 square feet (749 square meters). The church was closed at the time of the fire.

Fire Protection Systems
The alarm system of unreported type and coverage activated. There was no automatic suppression equipment.

Fire Development
A 300-watt light bulb in the attic 44 feet (13 meters) above the floor ignited a wooden enclosure of an audio speaker. The fire spread throughout the plywood ceiling and up a stairway to the truss roof.

Contributing Factors and Other Details
When the alarms activated, a security guard reset the alarm and left the building. Sometime later, another guard nearby noticed smoke rising from the top of the building. He notified a third guard, who entered the church and discovered a fire on a stage and flames coming through a hole in the ceiling. He left the building and notified the fire department. Factors contributing to fire spread and fire loss were listed as an inadequate detection and notification system (this was not explained in the report), lack of automatic sprinklers, an additional fuel load (a set had been added for a play), and human error. The loss to the structure was estimated at $10 million and to its contents at $5 million.

Stephen G. Badger, 2011, "*Large-Loss Fires in the United States in 2010",* NFPA Fire Analysis and Research, Quincy, MA.

State: Texas
Dollar Loss: $15 million
Month: January
Time 5:23 a.m.

Property Characteristics and Operating Status
This three-story church of unprotected wood-frame construction covered 15,000 square feet (1,394 square meters) and contained offices and classrooms. It was unoccupied at the time of the fire.

Fire Protection Systems
No detection system was present. There was a wet-pipe sprinkler system that was not in the area of ignition, but it activated and helped contain the fire.

Fire Development
This incendiary fire was set in a second-story hallway and stairwell area using ordinary combustible materials found in the hallway. The fire then spread to and through the common attic.

Contributing Factors and Other Details
Fire walls and fire doors activated and helped reduce the spread of the fire. One firefighter was injured.

Stephen G. Badger, 2011, "*Large-Loss Fires in the United States in 2010*", NFPA Fire Analysis and Research, Quincy, MA.

State: Iowa
Dollar Loss: $6,500,000
Month: April
Time: 02:43 am

Property Characteristics and Operating Status:
This three-story church was of unprotected ordinary construction and covered 15,000 square feet (1,390 square meters). At the time of the fire, the church was closed.

Fire Protection Systems:
There was an automatic detection system present. Its type and coverage were not reported, but the system did operate and notified the fire department who responded in two minutes. There was no suppression equipment present.

Fire Development:
This fire was set to cover a break-in at the church. Where or how the fire was ignited was not reported.

Contributing Factors and Other Details:
An arrest has been made in this case.

Stephen G. Badger, 2008, *"Large-Loss Fires in the United States in 2007",* NFPA Fire Analysis and Research, Quincy, MA

State: Texas
Dollar Loss: $5,000,000
Month: February
Time: 03:50 am

Property Characteristics and Operating Status:
This two-story church was of unprotected ordinary construction and covered 18,750 square feet (1,740 square meters). At the time of the fire, the church was closed.

Fire Protection Systems:
There was an automatic detection system present. Its type and coverage were not reported, but it did operate. There was no suppression equipment present.

Fire Development:
This fire broke out when a lamp on a second-story hallway table ignited nearby combustibles.

Contributing Factors and Other Details:
The loss was estimated at $4,250,000 to the structure and $750,000 to the contents.

Stephen G. Badger, 2008, *"Large-Loss Fires in the United States in 2007",* NFPA Fire Analysis and Research, Quincy, MA