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Structure Fires in Eating and Drinking Establishments

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Abstract

U.S. fire departments responded to an estimated average of 7,410 structure fires per year in eating and drinking establishments between 2010 and 2014. These fires caused average annual losses of three civilian deaths, 110 civilian injuries, and $165 million in direct property damage each year. Three out of five (61%) of these fires involved cooking equipment.

These estimates are based on data 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 fire department experience survey.

Keywords: fire statistics, restaurant fires, bar fires, nightclub fires, cafeteria fires, eating and drinking establishments, structure fires, kitchen and cooking equipment, fatalities and injuries, US/National, property damage, lighting equipment

Acknowledgements

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

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

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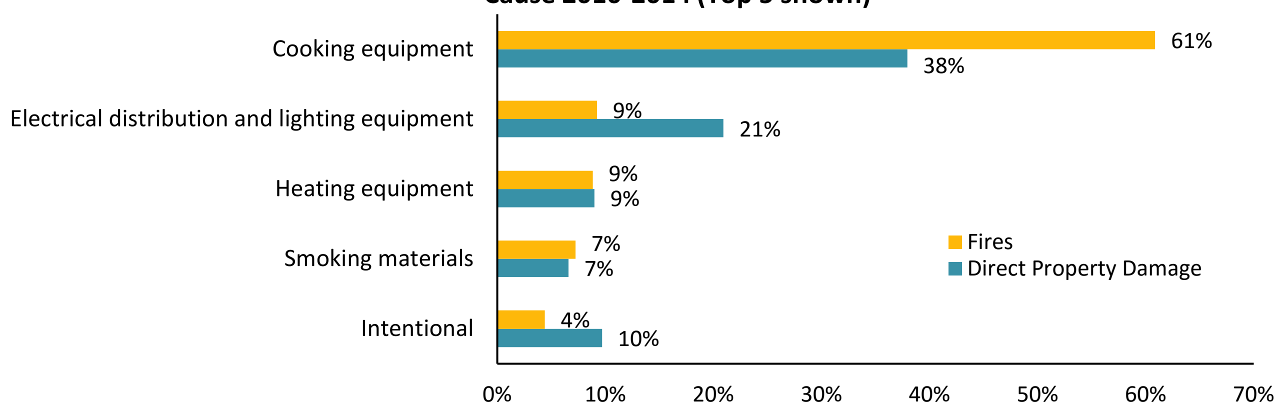
Structure Fires in Eating and Drinking Establishments Fact Sheet

During 2010-2014, an estimated average of 7,410 structure fires in eating and drinking establishments were reported to U.S. fire departments each year. These fires resulted in associated annual losses of:

- Three civilian deaths
- 110 civilian injuries
- $165 million in property damage

Cooking equipment was the leading cause of fires in these properties, accounting for three out of five fires (61%) and 38% of direct property damage. Electrical distribution and lighting equipment was responsible for 9% of fires, but 21% of direct property damage, while heating equipment was responsible for 9% of fires and 9% of direct property damage. Smoking materials caused 7% of fires and 7% of direct property damage. Four percent of fires had an intentional cause, but these fires caused 10% of direct property damage.

Structure Fires in Eating and Drinking Establishments by Major Cause 2010-2014 (Top 5 shown)



- Deep fryers were involved in one of five fires (21%) and ranges or cooktops were involved in 14% of fires.
- Two-thirds (68%) of fires in eating and drinking establishments were small and did not spread beyond the object of origin.
- Cooking materials were the item first ignited in 43% of the fires in eating and drinking establishments.
- Failure to clean was a factor in 22% of the fires in these properties.

U.S. fire departments responded to an estimated average of 7,410 structure fires per year in eating and drinking establishments between 2010 and 2014. These fires caused average annual losses of three civilian deaths, 110 civilian injuries, and $165 million in direct property damage each year. See Table A Below:

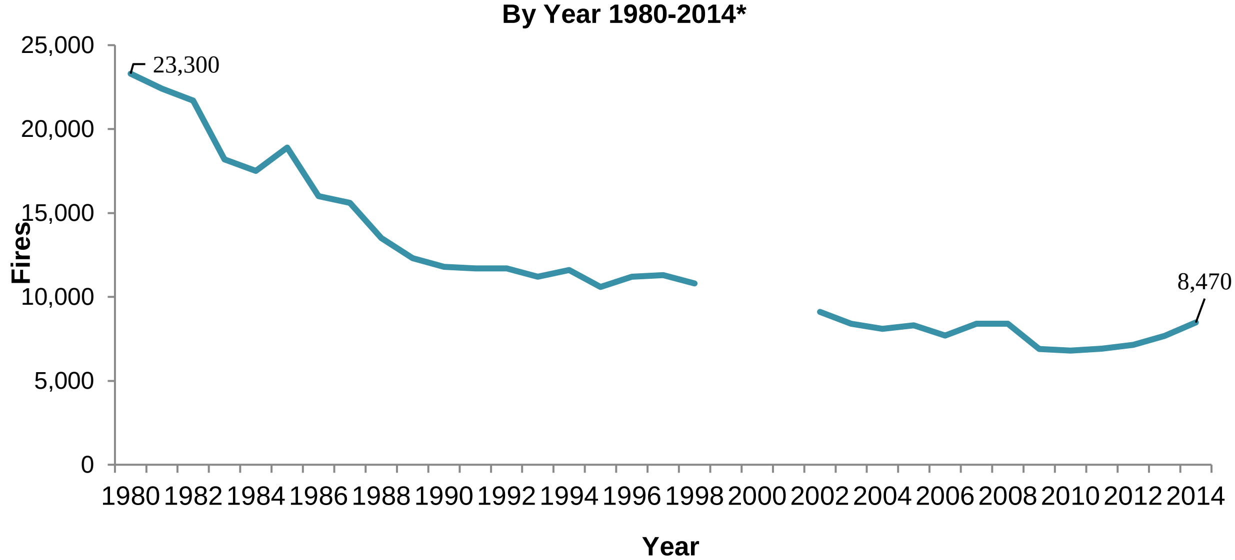
Table A.
Structure Fires in Eating and Drinking Establishments by Property Use
2010-2014 Annual Averages

Property Use	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Restaurant or cafeteria	5,810	(78%)	1	(40%)	91	(83%)	$119	(72%)
Unclassified eating or drinking places	830	(11%)	0	(0%)	7	(6%)	$19	(11%)
Bar or nightclub	770	(10%)	2	(60%)	12	(11%)	$27	(16%)
Total	7,410	(100%)	3	(100%)	110	(100%)	$165	(100%)

Source: NFIRS 5.0 and NFPA Fire Experience Survey

These fires followed a significant downward trend from 1980 to the late 1990s. Since then, they have followed a slight, but inconsistent downward trend, although the estimated 8,470 fires in 2014 was the highest 2002. (See Figure 1 below and Table 1)

Figure 1. Structure Fires in Eating and Drinking Establishments By Year 1980-2014*



Source: NFIRS 5.0 and NFPA Fire Experience Survey
*Because participation in NFIRS 5.0 was low in 1999-2001, estimates in these years are considered unstable and are not shown here.

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 of 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.

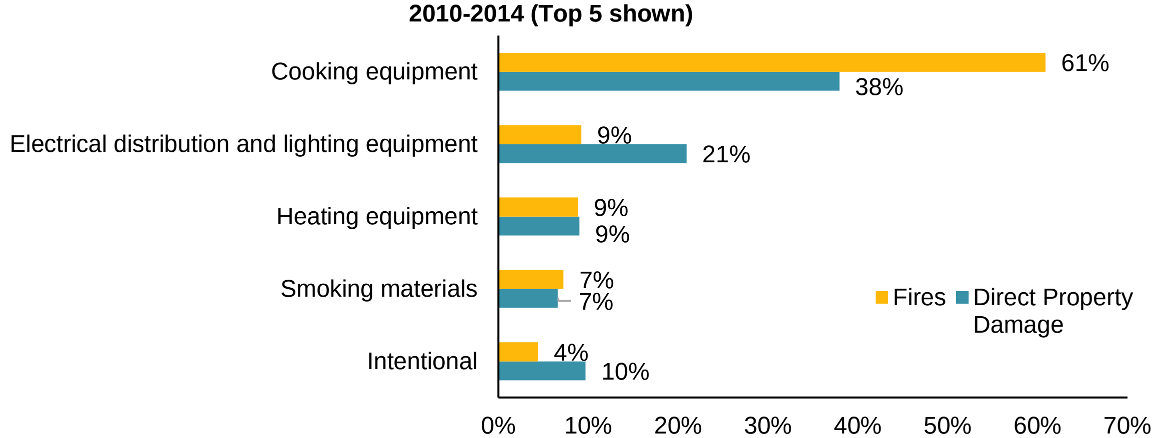
NFIRS 5.0 includes a category of structure fires collectively referred to as "confined fires," identified by incident type. These include confined cooking fires, confined chimney or flue fires, confined trash fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined incinerator fires (incident type 113-118). Losses are generally minimal in these fires, which are assumed to have been limited to the object of origin. Causal data is not required and not always provided for these fires. 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. Non-confined fires were analyzed for Equipment Involved in Ignition.

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. Fires are rounded to the nearest ten, 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.

No clear trends characterize fires in eating and drinking establishments by month of the year (Table 2). These fires are somewhat more likely to occur on Fridays and the weekend (Table 3). Fires are less common during the overnight hours (from midnight to 6 a.m.), though overnight fires cause more property damage, on average, than those in the daytime (Table 4).

Cooking equipment is the leading cause of these fires (61% of incidents), as shown in Table 5 and Figure 2. Deep fryers were involved in one of five of these fires (21%) and rangers and cooktops were involved in 14%. Electrical distribution or lighting equipment accounted for 9% of fires, but 21% of direct property damage. Heating equipment also caused 9% of fires. Table 6 shows fires by equipment involved in ignition, and is similar to Table 5 (which summarizes findings from several tables). Smoking materials caused 7% of fires and 7% of direct property damage.

Figure 2. Structure Fires in Eating and Drinking Establishments by Major Cause 2010-2014 (Top 5 shown)



Source: NFIRS 5.0 and NFPA Fire Experience Survey

One in five fires (19%) were caused by the failure of equipment or a heat source, and 4% were set intentionally (Table 7).

One in five fires (22%) in eating and drinking establishments had a failure to clean as a factor contributing to its ignition. An electrical failure or malfunction was a factor in another 14% of fires, and a mechanical failure or malfunction was involved in 12% (Table 8). Radiated or conducted heat from operating equipment and unclassified heat from powered equipment were the leading sources of heat in these fires, each with 19% of the total, while 11% of fires listed a spark, ember, or flame from operating equipment as the heat source (Table 9).

Not surprisingly, given the prevalence of cooking fires, most fires (59%) in eating and drinking establishments began in the kitchen or cooking area (Table 10). Fires otherwise originated in a number of areas of origin, with 3% of fires originating in an exterior wall surface, and several other areas of origin each receiving 2% of the total.

Fire Sprinklers in Eating and Drinking Establishments

John R. Hall Jr. June 2013 report, "U.S. Experience with Sprinklers" contains analysis of automatic extinguishing equipment in eating and drinking establishments. The report found that sprinklers are effective fire protection in these properties, and its findings are summarized below. Those interested in sprinkler protection should also consult *NFPA 13: Standard for the Installation of Sprinkler Systems*: www.nfpa.org/13

- In 2007-2011, 23% of reported eating or drinking establishment structure fires* indicated some type of sprinkler was present (79% wet pipe, 7% dry pipe, 14% other). In properties with more than one type of automatic extinguishing equipment present, only the type closest to the fire is reported, which mean sprinklers may have been present in some of the 40% of eating and drinking establishment structure fires where some type of non-water-based automatic extinguishing equipment was reported present.
- Wet pipe sprinklers operated in 93% of fires and operated effectively in 88% of fires.** When failure occurred, leading reasons were system shutoff (50%) and manual intervention defeated system (15%). When operating equipment was ineffective, it was most often because water did not reach fire (69%) or not enough water was released (31%).
- In eating or drinking establishments, direct property damage per reported fire was 75% lower when wet pipe sprinklers were present, compared to fires with no automatic extinguishing equipment present.

* Excluding buildings under construction.

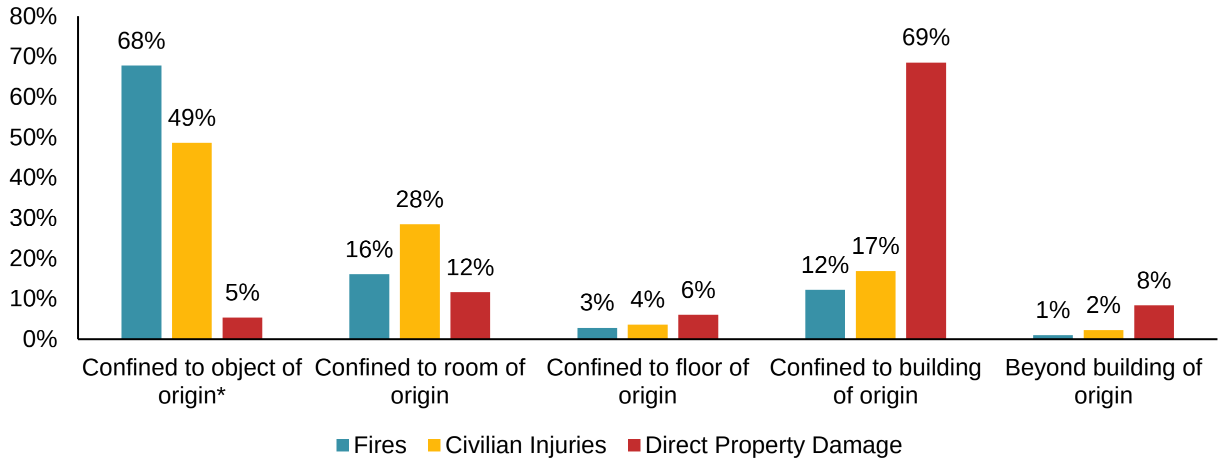
** Estimates of reliability and effectiveness are based only on fires and installations where the fire should have activated and been controlled by an operational system, therefore excluding buildings under construction, fires with sprinklers not in fire area reported as reason for failure or ineffectiveness, fires reported as too small to activate equipment, and fires reported as confined to cooking vessel, chimney or flue, fuel burner or boiler, commercial compactor, incinerator, or trash.

Flammable or combustible liquids or gases, piping or filter were the item first ignited in 9% of fires, but these fires accounted for 44% of civilian injuries. Electrical wire or cable insulation were the item first ignited in another 7% of fires.

Just over four in ten fires (43%) in eating establishments began with cooking materials, including food as the item first ignited (Table 11).

Most fires in these properties remained small, with 68% confined to the object of origin, as shown in Figure 3 and Table 12. Only 1% of the fire extended beyond the building of origin. The greatest share of property damage (69%) was caused by fires that were confined to the building of origin, but extended beyond the floor of origin.

Figure 3. Structure Fires in Eating and Drinking Establishments by Extent of Flame Damage, 2010-2014 Annual Averages



Includes confined fires identified by incident type

Source: NFIRS 5.0 and NFPA Fire Experience Survey

Table 1.
Structure Fires in Eating and Drinking Establishments
By Year, 1980-2014

Year	Fires	Civilian Injuries	Direct Property Damage (in Millions)	
			As Reported	In 2014 Dollars
1980	23,300	210	$188*	$541
1981	22,400	358	$176	$458
1982	21,700	297	$212	$520
1983	18,200	369	$203	$482
1984	17,500	225	$193	$440
1985	18,900	327	$210	$462
1986	16,000	280	$126	$273
1987	15,600	223	$129	$269
1988	13,500	299	$178	$357
1089	12,300	242	$146	$279
1990	11,800	240	$173	$314
1991	11,700	179	$174	$303
1992	11,700	190	$192	$324
1993	11,200	272	$163	$267
1994	11,600	204	$167	$267
1995	10,600	146	$129	$201
1996	11,200	195	$171	$259
1997	11,300	233	$173	$255
1998	10,800	166	$176	$256
1999	9,300	135	$412	$586
2000	8,280	127	$197	$271
2001	9,140	132	$255	$342
2002	9,090	129	$172	$226
2003	8,430	94	$174	$224
2004	8,140	74	$154	$194
2005	8,260	99	$173	$210
2006	7,710	106	$328	$385
2007	8,380	110	$190	$218
2008	8,370	112	$299	$329
2009	6,910	133	$220	$243
2010	6,830	116	$193	$210
2011	6,910	99	$169	$178
2012	7,150	120	$154	$159
2013	7,680	125	$167	$170
2014	8,470	90	$140	$140

Table 1.
Structure Fires in Eating and Drinking Establishments
By Year, 1980-2014 (continued)

*Estimate does not include MGM grand fire
Note: These 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. Fires are rounded to the nearest ten, civilian injuries are rounded to the nearest one, and direct property damage is rounded to the nearest million dollars. Inflation adjustments were based on the consumer price index found in the U.S. Census Bureau's Statistical Abstract of the United States, "Purchasing Power of the Dollar."

Source: NFIRS 5.0 and NFPA Fire Experience Survey

Table 2.
Structure Fires in Eating and Drinking Establishments
By Month, 2010-2014 Annual Averages

Month	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
January	610	(8%)	11	(10%)	$18	(11%)
February	590	(8%)	6	(6%)	$16	(10%)
March	670	(9%)	8	(8%)	$12	(7%)
April	630	(8%)	10	(9%)	$13	(8%)
May	620	(8%)	14	(12%)	$14	(8%)
June	610	(8%)	8	(8%)	$12	(7%)
July	640	(9%)	8	(7%)	$14	(9%)
August	620	(8%)	9	(8%)	$13	(8%)
September	580	(8%)	9	(9%)	$12	(7%)
October	610	(8%)	5	(5%)	$13	(8%)
November	620	(8%)	10	(9%)	$13	(8%)
December	620	(8%)	11	(10%)	$14	(9%)
Total	7,410	(100%)	110	(100%)	$165	(100%)

Sums may not equal totals due to rounding.
Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 3.
Structure Fires in Eating and Drinking Establishments
By Day of Week, 2010-2014 Annual Averages

Day	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Sunday	1,100	(15%)	15	(14%)	$26	(16%)
Monday	1,020	(14%)	17	(16%)	$28	(17%)
Tuesday	990	(13%)	12	(11%)	$25	(15%)
Wednesday	1,040	(14%)	15	(14%)	$25	(15%)
Thursday	1,040	(14%)	16	(14%)	$23	(14%)
Friday	1,080	(15%)	22	(20%)	$18	(11%)
Saturday	1,130	(15%)	13	(11%)	$20	(12%)
Total	7,410	(100%)	110	(100%)	$165	(100%)

Sums may not equal totals due to rounding.
Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 4.
Structure Fires in Eating and Drinking Establishments
By Time of Day, 2010-2014 Annual Averages

Time of Day	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Midnight-12:59 a.m.	260	(4%)	2	(2%)	$9	(5%)
1:00-1:59 a.m.	230	(3%)	3	(2%)	$12	(7%)
2:00-2:59 a.m.	210	(3%)	3	(3%)	$15	(9%)
3:00-3:59 a.m.	210	(3%)	1	(1%)	$16	(9%)
4:00-4:59 a.m.	220	(3%)	1	(1%)	$15	(9%)
5:00-5:59 a.m.	240	(3%)	2	(2%)	$7	(4%)
6:00-6:59 a.m.	250	(3%)	0	(0%)	$6	(4%)
7:00-7:59 a.m.	270	(4%)	5	(5%)	$6	(4%)
8:00-8:59 a.m.	320	(4%)	6	(5%)	$5	(3%)
9:00-9:59 a.m.	410	(5%)	10	(9%)	$5	(3%)
10:00-10:59 a.m.	430	(6%)	8	(7%)	$5	(3%)
11:00-11:59 a.m.	380	(5%)	7	(7%)	$4	(2%)
12:00-12:59 p.m.	350	(5%)	7	(6%)	$4	(3%)
1:00-1:59 p.m.	330	(4%)	4	(4%)	$4	(3%)
2:00-2:59 p.m.	340	(5%)	7	(6%)	$5	(3%)
3:00-3:59 p.m.	350	(5%)	6	(6%)	$4	(3%)
4:00-4:59 p.m.	330	(4%)	7	(7%)	$4	(2%)
5:00-5:59 p.m.	340	(5%)	5	(5%)	$5	(3%)
6:00-6:59 p.m.	350	(5%)	7	(6%)	$7	(4%)
7:00-7:59 p.m.	360	(5%)	5	(5%)	$4	(3%)
8:00-8:59 p.m.	330	(4%)	2	(2%)	$3	(2%)
9:00-9:59 p.m.	320	(4%)	3	(3%)	$6	(3%)
10:00-10:59 p.m.	320	(4%)	5	(5%)	$8	(5%)
11:00-11:59 p.m.	260	(4%)	3	(2%)	$7	(4%)
Total	7,410	(100%)	110	(100%)	$165	(100%)

Sums may not equal totals due to rounding.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 5.
Structure Fires in Eating and Drinking Establishments
By Major Cause, 2010-2014 Annual Averages

Major Cause	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking equipment	4,510	(61%)	81	(74%)	$63	(38%)
Electrical distribution and lighting equipment	680	(9%)	7	(7%)	$34	(21%)
Heating equipment	660	(9%)	10	(9%)	$15	(9%)
Smoking materials	540	(7%)	4	(4%)	$11	(7%)
Intentional	330	(4%)	5	(4%)	$16	(10%)

*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 Fire Experience Survey.

Table 6.
Structure Fires in Eating and Drinking Establishments
By Equipment Involved in Ignition, 2010-2014 Annual Averages

Equipment Involved	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking equipment	4,510	(61%)	81	(74%)	$63	(38%)
Non-confined	1,140	(15%)	44	(40%)	$60	(36%)
Confined	3,370	(45%)	37	(34%)	$2	(2%)
Deep fryer	1,580	(21%)	30	(28%)	$27	(16%)
Non-confined	350	(5%)	20	(18%)	$26	(16%)
Confined	1,230	(17%)	10	(9%)	$1	(0%)
Range with or without oven, cooking surface	1,040	(14%)	20	(18%)	$12	(7%)
Non-confined	320	(4%)	12	(11%)	$11	(7%)
Confined	720	(10%)	8	(7%)	$0	(0%)
Grill, hibachi, barbecue	480	(6%)	8	(7%)	$7	(4%)
Non-confined	150	(2%)	6	(5%)	$7	(4%)
Confined	330	(4%)	2	(2%)	$0	(0%)
Oven, rotisserie	380	(5%)	4	(4%)	$6	(4%)
Non-confined	80	(1%)	1	(1%)	$5	(3%)
Confined	300	(4%)	3	(3%)	$1	(1%)
Portable cooking or warming equipment	370	(5%)	10	(9%)	$3	(2%)
Non-confined	110	(1%)	3	(3%)	$3	(2%)
Confined	260	(4%)	7	(7%)	$0	(0%)
Grease hood/duct exhaust fan	150	(2%)	3	(3%)	$7	(4%)
Non-confined	100	(1%)	3	(3%)	$7	(4%)
Confined	50	(1%)	0	(0%)	$0	(0%)
Other known cooking equipment	80	(1%)	0	(0%)	$1	(1%)
Non-confined	20	(0%)	0	(0%)	$1	(1%)
Confined	60	(1%)	0	(0%)	$0	(0%)
Confined cooking fire with other or no equipment	420	(6%)	7	(6%)	$0	(0%)
Electrical distribution and lighting equipment	680	(9%)	7	(6%)	$34	(21%)
Wiring and related equipment	400	(5%)	4	(4%)	$23	(14%)
Lamp, bulb or lighting	220	(3%)	1	(1%)	$8	(5%)
Other known electrical distribution or lighting equipment	60	(1%)	2	(2%)	$4	(2%)

Table 6.
Structure Fires in Eating and Drinking Establishments
By Equipment Involved in Ignition, 2010-2014 Annual Averages (continued)

Equipment Involved	**Fires**		**Civilian Injuries**		**Direct Property Damage (in Millions)**	
Heating equipment	660	(9%)	10	(9%)	$15	(9%)
Confined chimney or flue fire	210	(3%)	0	(0%)	$0	(0%)
Fixed or portable space heater	150	(2%)	2	(2%)	$6	(4%)
Confined fuel burner or boiler fire	140	(2%)	3	(3%)	$0	(0%)
Water heater	90	(1%)	4	(4%)	$4	(3%)
Other known heating equipment	70	(1%)	0	(0%)	$4	(2%)
No equipment involved in ignition	540	(7%)	6	(5%)	$28	(17%)
Contained trash or rubbish fire	380	(5%)	0	(0%)	$0	(0%)
Fan	120	(2%)	0	(0%)	$2	(1%)
Clothes dryer	80	(1%)	3	(3%)	$4	(3%)
Refrigerator or refrigerator/freezer	70	(1%)	0	(0%)	$5	(3%)
Air conditioner	70	(1%)	0	(0%)	$2	(1%)
Unclassified equipment involved in ignition	60	(1%)	0	(0%)	$1	(1%)
Torch, burner or soldering iron	40	(1%)	0	(0%)	$2	(1%)
Other known equipment involved in ignition	200	(3%)	2	(2%)	$7	(5%)
Total	7,410	(100%)	110	(100%)	$165	(100%)

Note: Sums may not equal totals due to rounding

* The estimates of fires involving fireplaces or chimneys include all fires with the confined chimney or flue incident type regardless of what may have been coded as equipment involved. Likewise, the estimates of fires involving furnaces, central heat or boilers include all fires with confined fuel burner or boiler incident type. The estimates shown should be considered upper bounds. Except for confined cooking fires, the estimates for equipment involved in ignition did not break out the confined fires further.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 7.
Structure Fires in Eating and Drinking Establishments
By Cause, 2010-2014 Annual Averages

Cause of Ignition	**Fires**		**Civilian Injuries**		**Direct Property Damage (in Millions)**	
Unintentional	5,480	(74%)	80	(73%)	$107	(65%)
Non-confined	2,100	(28%)	49	(45%)	$105	(64%)
Confined	3,380	(46%)	31	(28%)	$2	(1%)
Failure of equipment or heat source	1,410	(19%)	25	(23%)	$37	(22%)
Non-confined	850	(11%)	17	(16%)	$35	(22%)
Confined	570	(8%)	8	(7%)	$1	(1%)
Intentional	330	(4%)	5	(4%)	$16	(10%)
Non-confined	230	(3%)	2	(2%)	$16	(10%)
Confined	100	(1%)	3	(3%)	$0	(0%)
Unclassified cause	150	(2%)	0	(0%)	$4	(3%)
Non-confined	90	(1%)	0	(0%)	$4	(3%)
Confined	70	(1%)	0	(0%)	$0	(0%)
Other known cause	30	(0%)	0	(0%)	$1	(1%)
Non-confined	30	(0%)	0	(0%)	$1	(1%)
Confined	10	(0%)	0	(0%)	$0	(0%)
Total	7,410	(100%)	110	(100%)	$165	(100%)
Non-confined	3,290	(44%)	68	(62%)	$162	(98%)
Confined	4,120	(56%)	42	(38%)	$3	(2%)

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 Fire Experience Survey.

Table 8.
Structure Fires in Eating and Drinking Establishments
By Factor Contributing to Ignition, 2010-2014 Annual Averages

Factor Contributing to Ignition	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Failure to clean	1,650	(22%)	10	(9%)	$16	(10%)
Non-confined	330	(4%)	7	(6%)	$15	(9%)
Confined	1,320	(18%)	3	(3%)	$1	(1%)
Electrical failure or malfunction	1,040	(14%)	8	(7%)	$45	(27%)
Non-confined	880	(12%)	8	(7%)	$45	(27%)
Confined	170	(2%)	0	(0%)	$0	(0%)
Mechanical failure or malfunction	880	(12%)	18	(16%)	$17	(10%)
Non-confined	390	(5%)	11	(10%)	$17	(10%)
Confined	490	(7%)	7	(6%)	$0	(0%)
Abandoned or discarded material or product	720	(10%)	7	(7%)	$10	(6%)
Non-confined	390	(5%)	2	(2%)	$9	(6%)
Confined	340	(5%)	5	(4%)	$0	(0%)
Heat source too close to combustibles	630	(9%)	14	(13%)	$17	(10%)
Non-confined	330	(5%)	10	(9%)	$17	(10%)
Confined	300	(4%)	4	(3%)	$0	(0%)
Equipment unattended	560	(8%)	5	(4%)	$6	(4%)
Non-confined	120	(2%)	3	(3%)	$6	(4%)
Confined	450	(6%)	1	(1%)	$0	(0%)
Unclassified factor contributed to ignition	450	(6%)	3	(2%)	$17	(10%)
Non-confined	180	(2%)	1	(1%)	$17	(10%)
Confined	260	(4%)	1	(1%)	$0	(0%)
Unclassified misuse of material or product	310	(4%)	9	(8%)	$6	(4%)
Non-confined	130	(2%)	9	(8%)	$6	(4%)
Confined	180	(2%)	0	(0%)	$0	(0%)
Accidentally turned on or not turned off	240	(3%)	1	(1%)	$5	(3%)
Non-confined	60	(1%)	0	(0%)	$5	(3%)
Confined	190	(3%)	1	(1%)	$0	(0%)
Unclassified operational deficiency	180	(2%)	7	(7%)	$3	(2%)
Non-confined	50	(1%)	4	(4%)	$3	(2%)
Confined	130	(2%)	3	(3%)	$0	(0%)

Table 8.
Structure Fires in Eating and Drinking Establishments
By Factor Contributing to Ignition, 2010-2014 Annual Averages (continued)

Factor Contributing to Ignition	**Fires**		**Civilian Injuries**		**Direct Property Damage (in Millions)**	
Equipment not operated properly	150	(2%)	2	(2%)	$1	(1%)
Non-confined	40	(0%)	1	(1%)	$1	(1%)
Confined	120	(2%)	1	(1%)	$0	(0%)
Improper container or storage	130	(2%)	9	(8%)	$4	(2%)
Non-confined	80	(1%)	3	(3%)	$3	(2%)
Confined	60	(1%)	6	(5%)	$0	(0%)
Flammable liquid or gas spilled	120	(2%)	8	(7%)	$2	(1%)
Non-confined	40	(1%)	3	(3%)	$2	(1%)
Confined	70	(1%)	5	(4%)	$0	(0%)
Other known factor contributing to ignition	700	(9%)	20	(16%)	$26	(15%)
Non-confined	460	(6%)	10	(11%)	$25	(15%)
Confined	240	(3%)	10	(5%)	$0	(0%)
Total fires	7,410	(100%)	110	(100%)	$165	(100%)
Non-confined	3,290	(44%)	68	(62%)	$162	(98%)
Confined	4,120	(56%)	42	(38%)	$3	(2%)
Total factors	7,770	(105%)	120	(109%)	$175	(106%)
Non-confined	3,470	(47%)	77	(70%)	$172	(104%)
Confined	4,300	(58%)	43	(39%)	$3	(2%)

Note: Sums may not equal totals due to rounding

Multiple entries allowed in this field, so total factors add up to more than total fires

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.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 9.
Structure Fires in Eating and Drinking Establishments
By Heat Source, 2010-2014 Annual Averages

Heat Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Radiated or conducted heat from operating equipment	1,440	(19%)	33	(30%)	$25	(15%)
Non-confined	470	(6%)	19	(17%)	$25	(15%)
Confined	980	(13%)	14	(12%)	$0	(0%)
Unclassified heat from powered equipment	1,440	(19%)	13	(12%)	$20	(12%)
Non-confined	470	(6%)	9	(9%)	$19	(12%)
Confined	970	(13%)	4	(4%)	$1	(0%)
Spark, ember or flame from operating equipment	830	(11%)	16	(15%)	$18	(11%)
Non-confined	300	(4%)	11	(10%)	$18	(11%)
Confined	540	(7%)	6	(5%)	$0	(0%)
Arcing	730	(10%)	6	(6%)	$32	(20%)
Non-confined	640	(9%)	6	(6%)	$32	(20%)
Confined	90	(1%)	0	(0%)	$0	(0%)
Smoking materials	540	(7%)	4	(4%)	$11	(7%)
Non-confined	330	(4%)	4	(4%)	$11	(7%)
Confined	210	(3%)	0	(0%)	$0	(0%)
Unclassified heat source	510	(7%)	2	(2%)	$11	(7%)
Non-confined	170	(2%)	2	(2%)	$10	(6%)
Confined	350	(5%)	0	(0%)	$1	(1%)
Unclassified hot or smoldering object	410	(6%)	4	(3%)	$6	(4%)
Non-confined	200	(3%)	2	(2%)	$6	(4%)
Confined	210	(3%)	1	(1%)	$0	(0%)
Heat from direct flame or convection currents	400	(5%)	10	(9%)	$9	(5%)
Non-confined	140	(2%)	7	(6%)	$8	(5%)
Confined	260	(4%)	3	(3%)	$0	(0%)
Hot ember or ash	300	(4%)	2	(2%)	$8	(5%)
Non-confined	150	(2%)	1	(1%)	$8	(5%)
Confined	150	(2%)	1	(1%)	$0	(0%)
Molten or hot material	130	(2%)	1	(0%)	$2	(1%)
Non-confined	40	(0%)	1	(0%)	$2	(1%)
Confined	100	(1%)	0	(0%)	$0	(0%)

Table 9.
Structure Fires in Eating and Drinking Establishments
By Heat Source, 2010-2014 Annual Averages (continued)

Heat Source	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Flame or torch used for lighting	130	(2%)	7	(6%)	$2	(2%)
Non-confined	50	(1%)	1	(1%)	$2	(1%)
Confined	80	(1%)	6	(6%)	$0	(0%)
Other known heat source	540	(7%)	10	(10%)	$20	(12%)
Non-confined	340	(5%)	10	(5%)	$20	(12%)
Confined	200	(3%)	10	(5%)	$0	(0%)
Total	7,410	(100%)	110	(100%)	$165	(100%)
Non-confined	3,290	(44%)	70	(62%)	$162	(98%)
Confined	4,120	(56%)	40	(38%)	$3	(2%)

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 Fire Experience Survey.

Table 10.
Structure Fires in Eating and Drinking Establishments
By Area of Origin, 2010-2014 Annual Averages

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Kitchen or cooking area	4,380	(59%)	75	(68%)	$58	(35%)
Non-confined	1,160	(16%)	40	(36%)	$56	(34%)
Confined	3,220	(43%)	35	(32%)	$2	(1%)
Exterior wall surface	220	(3%)	1	(1%)	$5	(3%)
Non-confined	220	(3%)	1	(1%)	$5	(3%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Confined chimney or flue fire	210	(3%)	0	(0%)	$0	(0%)
Exterior roof surface	170	(2%)	1	(1%)	$3	(2%)
Non-confined	170	(2%)	1	(1%)	$3	(2%)
Confined	10	(0%)	0	(0%)	$0	(0%)
Unclassified outside area	170	(2%)	1	(1%)	$1	(1%)
Non-confined	90	(1%)	1	(1%)	$1	(1%)
Confined	80	(1%)	0	(0%)	$0	(0%)
Lavatory, bathroom, locker room or check room	170	(2%)	2	(2%)	$2	(1%)
Non-confined	120	(2%)	2	(2%)	$2	(1%)
Confined	50	(1%)	0	(0%)	$0	(0%)
Wall assembly or concealed space	140	(2%)	1	(1%)	$4	(3%)
Non-confined	130	(2%)	1	(1%)	$4	(3%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Dining room, bar or beverage area, cafeteria	120	(2%)	1	(1%)	$9	(5%)
Non-confined	90	(1%)	1	(1%)	$9	(5%)
Confined	30	(0%)	0	(0%)	$0	(0%)
Unclassified equipment or service area	120	(2%)	1	(1%)	$2	(1%)
Non-confined	50	(1%)	0	(0%)	$2	(1%)
Confined	70	(1%)	1	(1%)	$0	(0%)
Attic or ceiling/roof assembly or concealed space	120	(2%)	1	(1%)	$14	(9%)
Non-confined	120	(2%)	1	(1%)	$14	(9%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Unclassified area of origin	120	(2%)	0	(0%)	$1	(1%)
Non-confined	50	(1%)	0	(0%)	$1	(1%)
Confined	60	(1%)	0	(0%)	$0	(0%)

Table 10.
Structure Fires in Eating and Drinking Establishments
By Area of Origin, 2010-2014 Annual Averages (continued)

Area of Origin	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Other known area of origin	1,480	(20%)	24	(22%)	$63	(38%)
Non-confined	1,090	(15%)	20	(18%)	$63	(38%)
Confined	380	(5%)	5	(4%)	$0	(0%)
Total	7,410	(100%)	110	(100%)	$165	(100%)
Non-confined	3,290	(44%)	68	(62%)	$162	(98%)
Confined	4,120	(56%)	42	(38%)	$3	(2%)

Sums may not equal totals due to rounding.

NFIRS 5.0 does not have a separate area of origin code for fires starting in chimneys. Any home fire with NFIRS incident type 114 - "Chimney of fire originating in and confined to a chimney or flue" is captured here.

Source: NFIRS 5.0 and NFPA Fire Experience Survey.

Table 11.
Structure Fires in Eating and Drinking Establishments
By Item First Ignited, 2010-2014 Annual Averages

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Cooking materials, including food	3,160	(43%)	31	(28%)	$30	(18%)
Non-confined	560	(8%)	14	(12%)	$29	(17%)
Confined	2,600	(35%)	17	(16%)	$1	(1%)
Flammable and combustible liquids or gases, piping or filter	680	(9%)	48	(44%)	$11	(7%)
Non-confined	250	(3%)	28	(25%)	$11	(6%)
Confined	440	(6%)	21	(19%)	$0	(0%)
Electrical wire or cable insulation	480	(7%)	4	(4%)	$13	(8%)
Non-confined	390	(5%)	4	(4%)	$13	(8%)
Confined	90	(1%)	0	(0%)	$0	(0%)
Unclassified item first ignited	410	(6%)	2	(2%)	$7	(4%)
Non-confined	170	(2%)	2	(2%)	$6	(4%)
Confined	240	(3%)	0	(0%)	$1	(1%)
Structural member or framing	320	(4%)	1	(1%)	$26	(16%)
Non-confined	320	(4%)	1	(1%)	$26	(16%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Rubbish, trash, or waste	290	(4%)	2	(2%)	$5	(3%)
Non-confined	80	(1%)	2	(2%)	$5	(3%)
Confined	200	(3%)	0	(0%)	$0	(0%)
Exterior wall covering or finish	240	(3%)	2	(1%)	$7	(4%)
Non-confined	240	(3%)	2	(1%)	$7	(4%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Appliance housing or casing	180	(2%)	2	(2%)	$3	(2%)
Non-confined	60	(1%)	2	(2%)	$3	(2%)
Confined	110	(2%)	0	(0%)	$0	(0%)
Box, carton, bag, basket, or barrel	150	(2%)	2	(1%)	$3	(2%)
Non-confined	70	(1%)	2	(1%)	$3	(2%)
Confined	70	(1%)	0	(0%)	$0	(0%)
Linen (other than bedding)	130	(2%)	1	(1%)	$3	(2%)
Non-confined	90	(1%)	1	(1%)	$3	(2%)
Confined	30	(0%)	0	(0%)	$0	(0%)
Exterior roof covering or finish	120	(2%)	1	(1%)	$5	(3%)
Non-confined	120	(2%)	1	(1%)	$5	(3%)
Confined	0	(0%)	0	(0%)	$0	(0%)

Table 11.
Structure Fires in Eating and Drinking Establishments
By Item First Ignited, 2010-2014 Annual Averages (continued)

Item First Ignited	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Unclassified organic materials	120	(2%)	1	(1%)	$1	(1%)
Non-confined	60	(1%)	0	(0%)	$1	(1%)
Confined	60	(1%)	1	(1%)	$0	(0%)
Unclassified structural component or finish	110	(2%)	0	(0%)	$8	(5%)
Non-confined	110	(1%)	0	(0%)	$8	(5%)
Confined	0	(0%)	0	(0%)	$0	(0%)
Other known item first ignited	1,020	(14%)	12	(11%)	$42	(26%)
Non-confined	750	(10%)	10	(9%)	$42	(26%)
Confined	270	(4%)	2	(2%)	$0	(0%)
Total	7,410	(100%)	110	(100%)	$165	(100%)
Non-confined	3,290	(44%)	68	(62%)	$162	(98%)
Confined	4,120	(56%)	42	(38%)	$3	(2%)

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 Fire Experience Survey.

Table 12.
Structure Fires in Eating and Drinking Establishments
By Extent of Flame Damage, 2010-2014 Annual Averages

Extent of Flame Damage	Fires		Civilian Injuries		Direct Property Damage (in Millions)	
Confined fire identified by incident type	4,120	(56%)	42	(38%)	$3	(2%)
Confined to object of origin	900	(12%)	12	(11%)	$6	(4%)
Confined to room of origin	1,190	(16%)	31	(28%)	$19	(12%)
Confined to floor of origin	210	(3%)	4	(4%)	$10	(6%)
Confined to building of origin	910	(12%)	19	(17%)	$113	(69%)
Beyond building of origin	80	(1%)	3	(2%)	$14	(8%)
Total	7,410	(100%)	110	(100%)	$165	(100%)

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

Source: NFIRS 5.0 and NFPA Fire Experience 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. A copy of the article is available online at http://www.nfpa.org/osds or through NFPA's One-Stop Data Shop.

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.

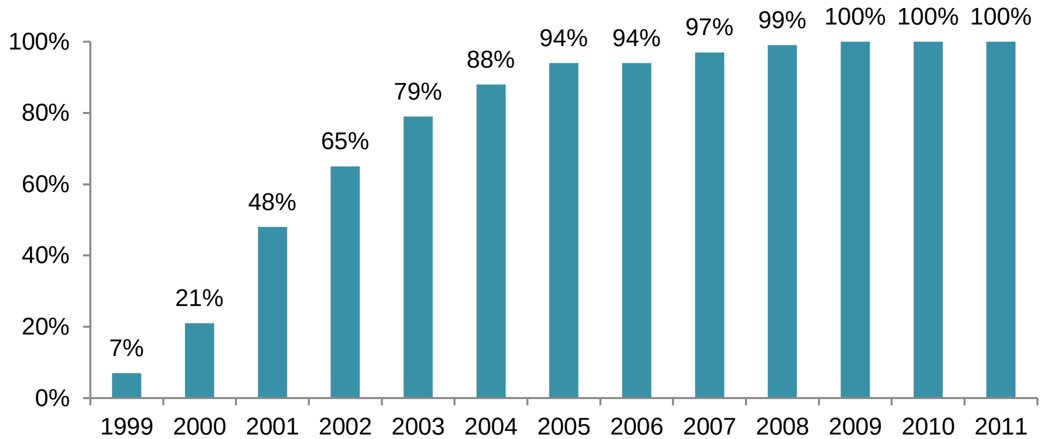
Figure A.1 shows the percentage of fires originally collected in the NFIRS 5.0 system. Each year's release version of NFIRS data also includes data collected in older versions of NFIRS that were converted to NFIRS 5.0 codes.

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

$$\frac{\text{NFPA survey projections}}{\text{NFIRS totals (Version 5.0)}}$$

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.

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



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.

Because this analysis focused on fatalities only, no distinction was made between confined and non-confined fires.

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.

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.

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: Recent Selected Published Incidents

The following are selected published incidents in eating and drinking establishments. 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.

Fire Causes $3 Million in Damage to Mixed Occupancy Building, Illinois

A fire heavily damaged a two-story building that housed a restaurant on the first floor and apartments above.

The building measured 50 feet by 100 feet, but the construction type was not reported. Smoke alarms were present and operated, but no information was available on the type and location of alarms.

Occupants called 911 to report alarms sounding in the building and a smell of smoke at 3:46 a.m. Firefighters arrived and evacuated upper-floor occupants and searched for the area of fire origin. Smoke pushing from floorboards and door frames of a first-floor restaurant led fire companies to the basement, where they found high heat conditions and increasing smoke density. After receiving a report that the floor on the first floor was spongy, command evacuated all firefighters from the building for a defensive fire attack. Fire was observed coming from the first floor and out the front windows of the restaurant.

Additional resources were called and a combination of three elevated master streams and several hose lines were used to extinguish the fire. One firefighter suffered minor injuries.

The building and contents, valued at $5 million, suffered losses estimated at $3 million.

Kenneth J. Tremblay, "Firewatch", *NFPA Journal*, January/February 2016

Stove's Proximity to Combustibles Starts Restaurant Fire, Oregon

Heat from a stove started a fire in a restaurant, but fire sprinklers were credited with controlling the fire until it was extinguished by firefighters.

The single-story, wood-frame building had a flat, built-up roof surface and covered an area of approximately 3,675 square feet. The structure was protected by a wet-pipe sprinkler system and a water flow alarm monitored by a fire alarm system.

Firefighters responded to a water flow and commercial fire alarm at the restaurant at 3:14 a.m. and arrived five minutes later. The property was closed for the night and unoccupied. Firefighters arrived to find smoke emitting from the roof and the interior charged with smoke. Command requested additional resources and began to size up the building until enough crews were on site to make an interior fire attack.

Upon entry, firefighters searched for the origin of the fire and found a single sprinkler operating in the kitchen. They opened the wall space behind a gas-fired stove and found the nearly extinguished fire in the wall cavity. There were no injuries.

Investigators determined the stove did not have the proper clearances to a combustible wall. Heat from the stove ignited the structural framing members.

The building was valued at $1 million dollars, with contents valued at $400,000. Damage was limited to $25,000 in structural losses and $5,000 in contents losses.

Kenneth J. Tremblay, "Firewatch", *NFPA Journal*, January/February 2016

Fire Damages Commercial Bakery, California

A wet-pipe sprinkler system controlled a fire in a cooler at a commercial bagel bakery until firefighters arrived to extinguish it.

The two-story bakery, which covered an area of approximately 100,000 square feet (9,290 meters), had concrete walls and a built-up roof surface. Inside the cooler, which was 25 feet (8 meters) in diameter and 13 feet (4 meters) high, were a series of plastic conveyor belts that carried freshly baked bagels around the structure to cool them. The cooler was not in use at the time of the fire, and its electrical power had been disconnected. The building's wet-pipe sprinkler system had a water flow alarm connected to a fire alarm system monitored by a central station alarm company.

An employee discovered the fire around 5:15 a.m. and activated a manual pull station. This was followed by several automatic alarms that alerted the company's 25 employees, who safely evacuated. By the time firefighters arrived, the entire building was filled with smoke, and water from the sprinkler had cooled the atmosphere, making visibility difficult. The ladder companies vented the roof, removing skylights, and helped direct hose streams to a section of burning roof material.

Investigators discovered that a ceiling-mounted halogen or metal halide light fixture over the cooler failed and caused hot debris to rain down on the cooler's plastic conveyor belts, which ignited and failed, falling to the bottom of the tower.

Damage to the building was estimated at $50,000. Damage to its contents was estimated $100,000.

Kenneth J. Tremblay, "Firewatch", *NFPA Journal*, July/August 2015

Large-Loss Fire in Pizza Parlor, $10 Million Dollar Loss, Maryland
This was a one-story pizza parlor of unprotected noncombustible construction in a strip mall that covered 240,000 square feet (22,297 square meters). Its operating status was not reported.

Fire Protection Systems
Neither automatic detection nor suppression equipment was present.

Fire Development
The fire, which was of undetermined cause, began in the food preparation and storage area. No further information was reported.

Contributing Factors and Other Details
Due to heavy smoke, extreme heat, and the lack of structural integrity of the building, firefighters abandoned their interior attack and went to a defensive attack. Damage to the structure was listed as $6 million, while damage to its contents was listed at $4 million

Stephen G. Badger, "Large-Loss Fires in the United States, 2014," NFPA, Quincy, MA

Large-Loss Restaurant Fire, $15 Million Dollar Loss, Missouri
This one-story restaurant of protected noncombustible construction covered 5,000 square feet (465 square meters). The restaurant was open at the time of the explosion and fire.

Fire Protection Systems
No information was reported on automatic detection equipment. A sprinkler system providing full coverage was operating when firefighters arrived, although no information on its effectiveness was reported.

Fire Development
This explosion and fire occurred when natural gas from a damaged line outside the restaurant leaked into the building and came into contact with heat from operating cooking equipment.

Contributing Factors and Other Details
Six buildings in the area were damaged to varying degrees. The fire killed one person and injured at least 15.

Stephen G. Badger, "Large-Loss Fires in the United States, 2014," NFPA, Quincy, MA

Restaurant Fire Spreads in Concealed Spaces, New Jersey
A fire that started in the mechanical room over a restaurant spread through the common roof assembly to additional occupancies in the building, destroying the structure.

In addition to the restaurant, the one-story, wood-frame building, which covered and area of approximately 5,700 square feet (530 square meters), contained four other businesses, including a hair salon and a music store. The building had a common roof, and its interior walls were made of plaster and lath. It had no sprinklers or fire detection equipment, and there were no fire separations.

The fire department received a 911 call at 3:32 p.m. reporting smoke in the building, Police arrived on the scene before the firefighters and notified the fire department that the smoke was coming from the restaurant. Four minutes later, fire crews arrived and forced open the front door of the restaurant to find smoke up near the ceiling in the kitchen and banking down in the dining room. Upon further investigation, they found the fire above the bathrooms in the rear of the dining room. When they opened up the ceiling, they discovered fire spreading in all directions.

As interior crews tried to suppress the fire inside, additional crews began vertical ventilation. However, conditions continued to deteriorate as the fire burned through the roof, and the incident commander ordered a switch to defensive operations.

Investigators determined that the fire started above the bathrooms near the dining room, where a gas-fired hot water heater, fans, electrical extension cords, a small gas-fired furnace, and an air conditioning unit were located. However, they could not identify the cause of the blaze.

The fire destroyed the building, valued at more than $1.25 million, and its contents, valued at approximately $250,000. No one was injured.

Kenneth J. Tremblay, 2013," Firewatch", *NFPA Journal*, September/October 20.

Suppression Systems Control Restaurant Grease Fire, Pennsylvania
A kitchen extinguishing system and a sprinkler that activated during a fire in an Asian restaurant limited fire damage.

The single-story restaurant building, which was 20 feet (6 meters) wide and 40 feet (12 meters) long, was protected by a wet-pipe sprinkler system and a kitchen hood suppression system, both of which were connected to a monitored fire alarm system.

Investigators determined that the fire started in grease deposits that had formed in the bottom of smoke box cooking equipment and spread to a deep fat fryer, causing the hood extinguishing system to activate.

Additional heat fused a nearby sprinkler, which held the fire in check until the fire department arrived to extinguish the blaze. The kitchen's hood system extinguished the fire in the deep fryer.

Kenneth J. Tremblay, 2012, *NFPA Journal*, May/June, 38-39.

Suppression System Controls Kitchen Hood Fire, Utah
A fire suppression system controlled a fire that started in the hood duct of a restaurant kitchen, but the fire fed off the grease that had built up in the duct and continued to burn until firefighters extinguished it. The building was occupied when the fire broke out, but everyone had evacuated safely by the time firefighters arrived.

Someone called 911 to report the blaze at 4:20 p.m., and firefighters arrived four minutes later to find smoke coming from the roof. The restaurant owner told the incident commander that the hood had caught fire after they started the grill. It looked as though the hood suppression system had put the fire out, but firefighters on the roof reported that they could still see the fire burning in the ductwork some 8 feet (2 meters) below them. When they were unable to get water on the flames from their position, they recommended an interior attack.

Interior crews advanced a hose line into the kitchen and opened the ceiling around the duct work. Once the duct was exposed, they saw that the grease and creosote that had built up on the sides of it were still burning. Fortunately, the duct maintained its integrity, preventing the fire and heat from escaping into hidden areas before it was extinguished.

Investigators noted that the hood suppression system heads did not discharge properly.

Damage to the property and its contents was estimated at $5,000. There were no injuries.

Kenneth J. Tremblay, 2012,"Firewatch", *NFPA Journal*, May/June, 39.

Sprinklers Put Out Restaurant Fire, California

Two sprinklers extinguished a fire on a prep table near a deep fat fryer in the kitchen of a restaurant before it could do much damage to the property.

The restaurant, located in single-story, wood-frame strip mall, had a kitchen hood suppression system and a wet-pipe sprinkler system. The restaurant was closed for the night.

Firefighters responding to the 1:06 a.m. sprinkler system's monitored water flow alarm found light smoke in the restaurant and called for additional units before forcing the front door and advancing a hose line into the kitchen. Once inside, they discovered that the fire had already been extinguished by the operating sprinklers. Other fire department companies helped ventilate the restaurant and shut down the sprinkler system.

Investigators discovered a distinctive "V" pattern on the preparation counter to the left of a deep fat fryer where a plastic colander filled with tempura batter and soybean oil was draining into a plastic bowl. They determined that the bowl was the point of fire origin and that the cause of the fire was spontaneous ignition.

The fire did approximately $5,000 in damage. There were no injuries.

Kenneth J. Tremblay, 2011, "Firewatch," *NFPA Journal*, January/February, 26.

Restaurant Fire Causes Million-Dollar Loss, Missouri

A Mexican restaurant on the upper level of a two-story, L-shaped building and a game store below it were damaged by an early morning fire that burned undetected until a passerby saw smoke coming from the back door and called 911 at 6:34 a.m.

Firefighters arrived two minutes after the call to find smoke coming from the roof vent. The incident commander ordered several units to set up for a coordinated interior attack, and after stepping inside, firefighters heard the fire traveling through the walls and ceiling. The engine crew waited by the front door with a hose line while another company ventilated the rear of the restaurant.

Additional companies provided back up, removing walls and ceilings between the restaurant's seating area and the kitchen, where the fire was concentrated.

Investigators determined that the fire started in the kitchen in a machine used to warm tortilla chips, but they could not discover why.

Heavy black smoke filled both levels of the building and destroyed both the structure, which was valued at $650,000, and its contents, valued at $350,000. There were no injuries.

Kenneth J. Tremblay, 2011, "Firewatch", *NFPA Journal*, July/August, 18.

Kitchen Fire Damages Restaurant, Ohio

A restaurant suffered significant structural damage when a pressurized deep fat fryer malfunctioned and ignited cooking oil, starting a fire that caused more than a million dollars in property damage.

The single-story, wood-frame building covered an area of 16,625 square feet (1,545 square meters) and had a wood-frame roof covered in asphalt shingles. Smoke and heat detectors throughout the building were connected to a monitored fire alarm panel. A kitchen hood fire suppression system was installed in the kitchen, but it did not operate. There were no sprinklers.

Employees detected the fire and tried unsuccessfully to control it using portable fire extinguishers before the restaurant manager called the fire department at 9:17 a.m. The monitoring company did not report the alarm to the fire department until 20 minutes into the incident.

Firefighters arrived within four minutes of the manager's 911 call to find heavy smoke pouring from the back of the building and flames coming out the roof. First-in crews found flames from floor to ceiling at the end of the cooking line and abandoned their initial efforts to control the fire from inside, undertaking a defensive fire attack instead.

The building, valued at $2.1 million, and its contents, valued at $500,000, sustained damage estimated at $1.25 million and $250,000, respectively. There were no injuries

Kenneth J. Tremblay, 2011, "Firewatch," *NFPA Journal*, September/October 14.

Sprinklers Limit Fire Loss to Restaurant, New Hampshire

A single sprinkler controlled an early morning fire in the kitchen of a restaurant until firefighters arrived, limiting both fire and water damage.

The single-story building, which contained the restaurant and another occupancy, had a brick façade and a flat wooden roof covered with tar and gravel over rubber. It was protected by a wet-pipe sprinkler system with a monitored water flow alarm.

Firefighters responded to the 3:40 a.m. water flow alarm and arrived within four minutes to find smoke in the restaurant. After entering the building, they determined that the water flow was coming from the kitchen, where a sprinkler had nearly extinguished the blaze. Crews stopped the water from flowing from the sprinkler with a wooden wedge and used a portable fire extinguisher to put out items still burning on a shelving unit that had blocked the spray from the sprinkler.

Investigators determined that the fire started on a shelf containing cardboard take-out containers and metal serving dishes. They believe that the fire was unintentional but were unable to identify how it started.

The building, valued at more than $1 million, sustained approximately $5,000 in damage. Its contents sustained $10,000 in damage. There were no injuries.

Kenneth J. Tremblay, 2011, “Firewatch,” *NFPA Journal*, November/December, 20-21.

Grease Fire Destroys Restaurant, Maryland

Employees of a take-out restaurant had begun preparing to open for the day when they discovered a fire in the ductwork over two rotisserie ovens and a deep-fat fryer. They tried to put out the flames with fire extinguishers, but the fire spread through the ductwork to concealed spaces above.

The single-story, wood-frame restaurant, which measured 100 by 30 feet (30 by 9 meters), was separated from adjacent stores by gypsum board walls. The restaurant had no smoke or fire detection equipment, and its kitchen hood system was not operational as heads were missing.

Approximately 30 minutes after a worker cleaned the overhead duct filters and ignited charcoal in the ovens, he noticed the fire and used several fire extinguishers in an unsuccessful effort to control the flames. After a delay of about eight minutes, a restaurant employee called 911 at 8:40 a.m.

Investigators determined that the fire began when heat from the ovens ignited a build-up of grease in the ductwork. A hole in the ductwork allowed the fire to spread into the concealed ceiling space, where it charred the combustible construction and ignited the roof assembly. The owner told investigators that the ductwork had been poorly cleaned two weeks earlier and that he had contacted another firm about future cleaning.

The structure, valued at $2 million, and its contents, valued at $500,000, were destroyed. There were no injuries.

Kenneth J. Tremblay, 2009, “Firewatch”, *NFPA Journal*, May/June, 43-44.

Fire Destroys Restaurant, Iowa
An early morning fire started by an electrical malfunction destroyed a bar and grill.

The one-story, wood-frame building, which was 62 feet (19 meters) long and 28 feet (9 meters) wide, had a basement and a wood roof covered by asphalt shingles. A fire detection system in the kitchen operated, but the only suppression system was installed over the cooking area.

Crews responding to a 2:30 a.m. alarm from the monitoring company forced a rear door open and entered the kitchen, where they found moderate heat and heavy smoke but no fire. They backed out and forced the front door open, entering the restaurant to find floor-to-ceiling smoke and high heat. As the firefighters crawled along the floor, they could feel the heat through their protective pants and suspected that the seat of the fire was in the basement.

Investigators determined that the fire started in the stairwell leading to the basement, which contained several pieces of electric-powered equipment. An electrical malfunction in one of them started the fire, which ignited manufactured wood products.

The building, valued at $500,000, and its contents, valued at $250,000, were destroyed

Ken Tremblay, 2009, "Firewatch", *NFPA Journal*, September/October, 27-28.

Restaurant Fire in Texas Causes $15 Million in Damage, 2008
This two-story restaurant was of unprotected ordinary construction. The ground floor area was not reported. The restaurant was closed due to a hurricane but three people, including two adults and a child, had taken refuge in the structure.

No information was reported on fire protection systems or fire development.

The hurricane’s winds hampered firefighting operations. The three occupants suffered burns over 70 percent of their bodies, but they survived.

Stephen G. Badger, 2009, “Large-Loss for 2008,” NFPA, Fire Analysis and Research, Quincy, MA.

Sprinkler Controls Kitchen Fire, Colorado
A natural gas line that terminated in a commercial kitchen was not properly capped and a cleaner mopping the floor accidentally hit the valve, turning it on slightly, causing leaking natural gas to ignite.

A single sprinkler controlled the fire. During investigation several fire and building code violations were noted, which led to the fire and subsequent loss.

The fire occurred in a 100 foot (30 meter) by 100 foot (30 meter) wood-framed building with a flat roof covered by tar and gravel. The building housed a grocery store that included a commercial kitchen located in the rear of the store. The building lacked a fire detection system, but did have a wet-pipe sprinkler system that operated and held the fire in check. At the time of the fire the building was closed for the evening, but was occupied by a cleaning crew.

The cleaner heard a sound and looked behind himself to find fire burning up from behind a stove that he had just cleaned. He called a co-worker, who then called 911 at 5:03 a.m. The fire department arrived within four minutes and found occupants evacuating and the sprinkler system operating. Using a hose line, the crew advanced into the kitchen and extinguished the remaining fire behind the stove. They also shut-off the flow of gas using the quarter turn valve. Other crews provided ventilation and gained access to the sprinkler valve to shut down the system.

Once the natural gas began to leak from the valve it was most probably ignited by standing pilots of the commercial gas-fired range. Investigators found the valve was not capped and several other fire safety violations. The water flow did not trip an alarm as required during the last inspection and had not been repaired. The wet-chemical system in an adjacent cooking area was past the required six month inspection date, as were fire extinguishers within the store.

The fire caused approximately $23,200 in loss and the building owner was cited for several violations and would not be able to operate the kitchen until they were corrected.

Kenneth J. Tremblay, 2008, “Firewatch”, *NFPA Journal*, January/February, 23- 24.

Aerosol Can Falls into Deep Fat Fryer, Starts Fire, Washington

Washington investigators searching for the cause of a fire that damaged a restaurant in a bed and breakfast facility believe an aerosol can of bug repellant fell into an operating deep-fat fryer and exploded, spewing hot oil around the first-floor kitchen. The resulting fire spread into wall voids.

The two-story, wood-frame building, which had an asphalt-shingled roof, was protected by a monitored fire alarm system that alerted the occupants. The deep fat fryer was protected by a dry-chemical hood suppression system, but it failed to operate because its cylinder had no pressure. There were no sprinklers. The restaurant’s lunch crowd had dispersed 20 minutes before the fire started.

Flames spread through the building’s concealed spaces until firefighters responding to the 12:21 p.m. alarm extinguished it.

The structure was valued at $1.5 million, and its contents at $700,000. Structural losses were estimated at $150,000; damage to the contents was estimated at $450,000. There were no injuries. The incident was still under investigation at the time of the report.

Kenneth J. Tremblay, 2006, “Firewatch”, *NFPA Journal*, May/June, 30.

Grease Build Up Ignites, Destroying Restaurant, Maryland

A fire that started in a restaurant’s cooking ventilation system spread to concealed spaces after the restaurant closed. The fire burned undetected until a passerby saw it and called the fire department.

The single-story, wood-frame building, which was 150 feet (45.7 meters) long and 150 feet (45.7 meters) wide, had a steel truss roof covered by a metal deck and a built-up roof. The building had no sprinklers and it was not reported to have had a fire detection system. A dry chemical system protected the cooking hood system and ventilation duct, but it did not operate during the fire for unknown reasons. The main floor of the building contained the service and dining areas, and a mezzanine contained mechanical equipment and storage.

The passerby called the fire department at 5:15 a.m., and responding firefighters found heavy smoke and flames coming from the roof. Once on the roof, they reported fire coming from the ventilation ducts and left just before the roof collapsed.

Investigators determined that the fire started in the first-floor kitchen just above a gas-fired broiler when heat from the broiler ignited a build-up of grease in ventilation hood. The links in the dry chemical system had fused, but the system did not activate.

The building, valued at $1.25 million, and its contents, valued at $750,000, were destroyed. There were no injuries

Kenneth J. Tremblay, 2006, “Firewatch”, *NFPA Journal*, March/April, 30.

Fire Damages Comedy Club, Ohio

Twenty minutes after the owner of a comedy club closed the building for the night, a passerby saw smoke coming from roof-mounted ventilation equipment and called 911 to report the fire at 11:51 p.m.

Built in the 1930s, the single-story building had concrete block walls supporting metal, bowstring roof trusses and a built-up metal roof. The first floor contained a bar and lounge, a kitchen, storage space, and two-level seating and dining areas, as well as an unoccupied apartment. There was also a small second floor that held an office and rest rooms. Originally designed as a movie theater, the building contained many types of occupancies over the years, including a church, a restaurant, and a nightclub, before it became a comedy club and dinner theater.

The owner and the bartender closed the club between 11:30 and 11:35 p.m., securing all the doors, shutting off the lights, and setting the alarm. They both left without detecting any fire or smoke. Around 20 minutes later, however, smoke could be seen coming from the roof, and an active fire was burning in a portion of the tiered seating areas.

Responding firefighters found fire and smoke filling the club’s seating area, and the police discovered an open door at one end of the building, raising suspicions that the fire had been deliberately set.

The cause of the fire, which investigators determined began in the seating area, has not been determined, but arson has not been ruled out. Based on the statement of the owner, investigators think someone moved the tables and chairs to the center of the room and ignited them by pouring a flammable liquid on the electrical outlets against one wall.

Damage to the building, valued at $600,000, was estimated at $400,000. Its contents, valued at $200,000, sustained $100,000 in damage. There were no injuries.

Kenneth J. Tremblay, 2006," Firewatch", *NFPA Journal*, January/February, 22.