Vacant Residential Building Fires

These topical reports are designed to explore facets of the U.S. fire problem as depicted through data collected in the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS). Each topical report briefly addresses the nature of the specific fire or fire-related topic, highlights important findings from the data, and may suggest other resources to consider for further information. Also included are recent examples of fire incidents that demonstrate some of the issues addressed in the report or that put the report topic in context.

Findings

- An estimated 28,000 vacant residential building fires are reported to U.S. fire departments each year and cause an estimated 45 deaths, 225 injuries, and $900 million in property loss.
- Vacant residential building fires are considered part of the residential fire problem and comprise approximately 7 percent of all residential building fires.
- Almost all vacant residential building fires are nonconfined fires (over 99 percent).
- Intentional is the leading cause of vacant residential building fires (37 percent).
- Half of vacant residential building fires spread to involve the entire building. An additional 11 percent extend beyond the building to adjacent properties.
- Bedrooms are the primary origin of all vacant residential building fires (12 percent). Following closely are common rooms such as dens, family and living rooms (10 percent), and cooking areas, kitchens (9 percent).
- Vacant residential building fires are more prevalent in July (9 percent), due in part to an increase in intentional fires on July 4 and 5.
- January 1, July 4 and 5, and October 31 have the highest incidence of vacant residential fires.

From 2006 to 2008, an estimated 28,000 vacant residential building fires were reported annually in the United States.[1,2] The number of vacant residential buildings has always been seen as an issue in our society. These buildings are rarely maintained and often serve as a common site for illicit or illegal activity. In addition, vacant residential buildings are sometimes used by homeless people as temporary shelters or housing. A major concern when a vacant building catches fire is that little is known about the building's overall condition. Many buildings are in disrepair and can be missing certain structures, such as staircases or portions of floors. If individuals are known to use the vacant building as a residence, the unknown condition of the building and the unknown number of people using the building as shelter can put the firefighters' lives in danger when they enter the building to attempt a rescue during a fire.

The surrounding nonvacant properties are also at risk when vacant residential buildings catch fire. It typically takes longer for vacant residential building fires to be detected as there are no occupants to be alerted by the smell or sound of the fires or respond to an alarm and the property loss is greater. In addition, if the fire has been intentionally set, especially with multiple ignition points, the damage can be greater, placing the lives of more individuals—firefighters, adjacent residents, and any squatters—in danger.

Fires in vacant residential buildings have become an even greater issue in the past few years. Many communities have seen an increase in the number of vacant residential buildings as the economy has declined; and with that an increase in the number of vacant residential building fires.[3,4] From 2006 to 2008, intentionally set fires was the main cause of all vacant residential building fires (37 percent, as discussed later in this report), posing a serious issue for the community. These types of fires continue to be a problem and concern within our society.

"Devil's Night" in Detroit, MI, is an example of the intentional fire issue in vacant properties. Prior to the late 1970s, October 30 or "Devil's Night," as it has been referred to in Detroit, was full of childhood pranks and minor vandalism acts.[5] It was not until the late 1970s that this night of mischief went from being innocent to terrifying when arson became the leading cause of fire on Devil's Night. Devil's Night activity peaked in 1984 when over 800 fires were set in Detroit alone.[6] This issue of arson was exacerbated as Detroit was seeing a decrease in real estate values, resulting in some owners of vacant residences using the fires as a means to collect insurance dollars. This situation exists currently in Detroit (as well as other cities).[7] In the 1990s, Detroit's mayor took a major step in fighting Devil's Night arson by renaming it "Angel's Night" and calling upon

police, firefighters, and local citizens to help patrol vacant properties that night and by cleaning up, or in some cases, removing the property entirely. The efforts have proved effective but there is concern that the increase of vacant property within the past few years may lead to an upswing in fires in vacant and abandoned buildings.[8,9]

This topical report addresses the characteristics of vacant residential building fires reported to the National Fire Incident Reporting System (NFIRS) from 2006 to 2008. Vacant residential building fires, as analyzed in this report, include properties where the building is under construction, under major renovation, vacant and secured, vacant and unsecured, and being demolished. The remaining building status categories (occupied and operating; idle, not routinely used; building status, other; and undetermined) are considered "nonvacant" but not necessarily occupied.

For the purpose of this report, the terms "residential fires" and "vacant residential fires" are synonymous with "residential building fires" and "vacant residential building fires," respectively. "Vacant residential fires" is used throughout the body of this report; the findings, tables, charts, headings, and footnotes reflect the full category, "vacant residential building fires."

Fire and Fire Loss Estimates

The data show that an estimated 28,000 vacant residential fires occurred annually between 2006 and 2008, resulting in an estimated total of 45 deaths, 225 injuries, and approximately $900 million in property loss each year (Table 1).

Table 1. Fire Loss Estimates

Building Status	Fires	Deaths	Injuries	Total Dollar Loss
Under construction	2,600	5	50	217,000,000
Under major renovation	2,400	5	50	105,000,000
Vacant and secured	11,100	15	75	369,000,000
Vacant and unsecured	10,900	20	50	197,000,000
Being demolished	1,000	5	0	13,000,000
Total	28,000	45	225	900,000,000

Source: NFIRS 5.0.
Note: Totals may not add due to rounding.

Type of Fire

Building fires are divided into two major categories of incidents: fires that are confined to specific types of equipment or objects (confined fires) and fires that are not (nonconfined fires). Confined fires are expected to have little, if any losses, while nonconfined fires generally have more substantial losses; some of which may be significant.[10,11] This latter category, nonconfined fires, accounts for nearly all vacant residential fires (Table 2). Because there are so few confined vacant residential fires (less than 1 percent), the subsequent analyses in this report include all vacant residential fires and do not distinguish between confined and nonconfined fires.

Table 2. Vacant Residential Building Fires by Type of Incident (2006–2008)

Incident Type	Percent
Nonconfined fires	99.6
Building fires	90.1
Fires in structures other than a building	1.4
Fires in mobile homes and other mobile/portable buildings	8.1
Confined fires	0.4
Cooking fire, confined to container	0.2
Chimney or flue fire, confined to chimney or flue	0.1
Fuel burner/boiler malfunction	0.1
Trash or rubbish fire, contained	0.1
Total	100.0

Source: NFIRS 5.0.
Note: Total may not add to 100 percent due to rounding.

Loss Measures

Table 3 presents losses, averaged over this 3-year period, of reported vacant residential fires and nonvacant residential fires.[12] Fires in vacant residential buildings have lower casualty (fatality and injury) rates than fires in nonvacant residential buildings but higher property loss rates.

Table 3. Loss Measures for Vacant and Nonvacant Residential Building Fires (3-year average, 2006–2008)

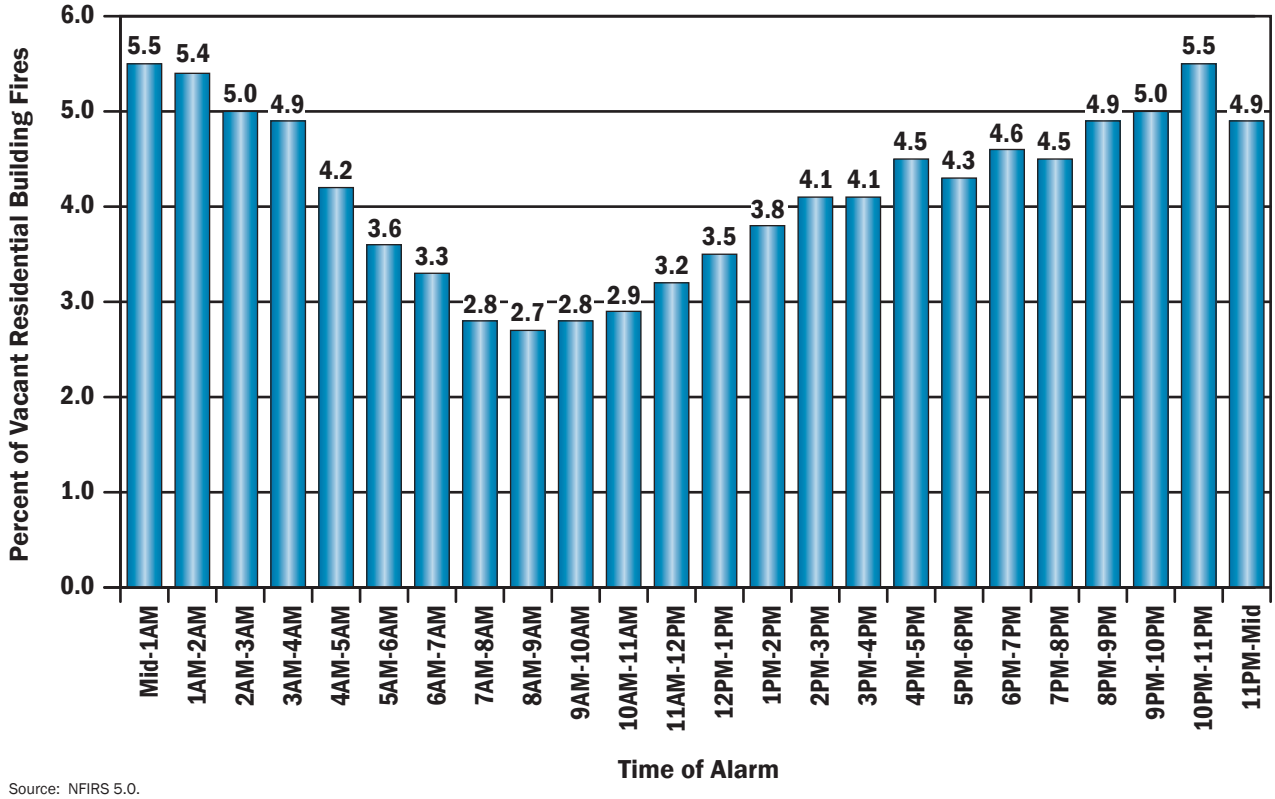
Measure	Vacant Residential Building Fires	Nonvacant Residential Building Fires
Average Loss:		
Fatalities/1,000 fires	1.4	5.7
Injuries/1,000 fires	6.8	29.6
Dollar loss/fire	$30,040	$15,100

Source: NFIRS 5.0.
Note: Average loss for fatalities and injuries is computed per 1,000 fires; average dollar loss is computed ***per fire*** and is rounded to the nearest $10.

When Vacant Residential Building Fires Occur

As shown in Figure 1, vacant residential fires occur most frequently in the late night to early morning hours, peaking from 10 p.m. to 2 a.m. They then gradually decline throughout the early morning, reaching the lowest point during the midmorning hours (7 to 10 a.m.). The fire incidences then begin to rise steadily from 10 a.m. to late afternoon and plateau around the dinner hours between 4 and 8 p.m. before rising again (except for a small dip between 11 p.m. and midnight). The peak period (10 p.m. to 2 a.m.) accounts for 21 percent of vacant residential fires.[13]

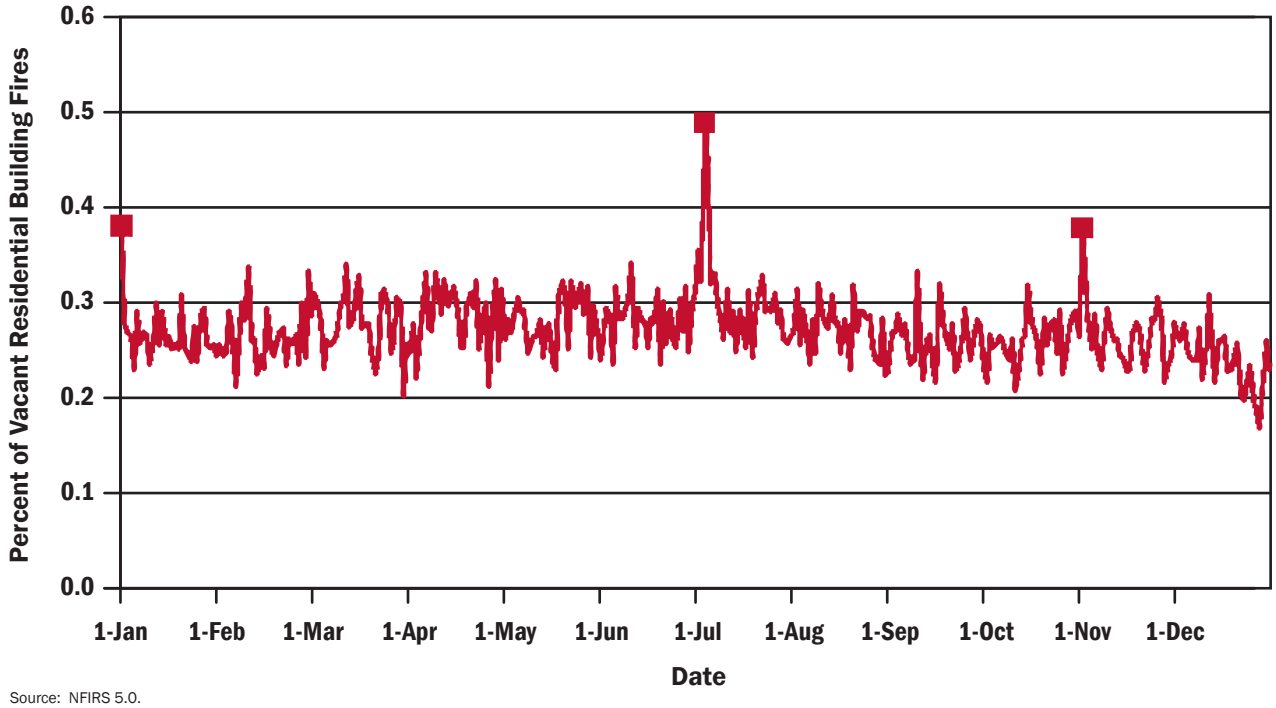
Figure 1. Vacant Residential Building Fires by Time of Alarm (2006–2008)



Source: NFIRS 5.0.

Figure 2 shows the total number of daily vacant residential fire incidences from 2006 to 2008. The four days of January 1, July 4 and 5, and October 31 produced more vacant residential fires than any other days of the year. October 31 has a higher percentage of intentionally set fires (45 percent) than the yearly average (37 percent).

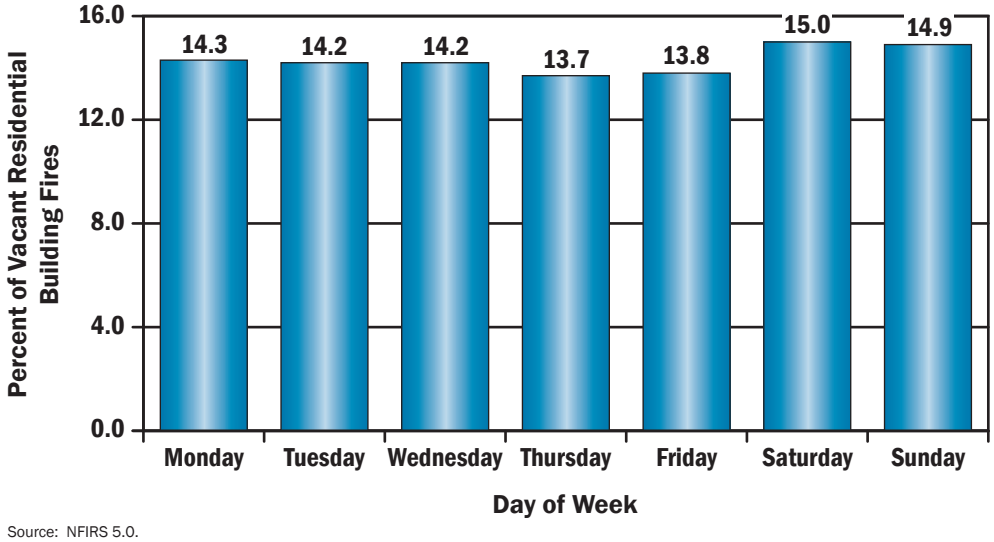
Figure 2. Daily Incidence of Vacant Residential Building Fires (2006–2008)



Source: NFIRS 5.0.

The lowest incidence of vacant residential fires occurs on Thursdays and Fridays; the highest incidence occurs on Saturdays and Sundays (Figure 3). The highest incidence of vacant residential fires overall is between 10 p.m. Saturday evening and 4 a.m. Sunday morning.

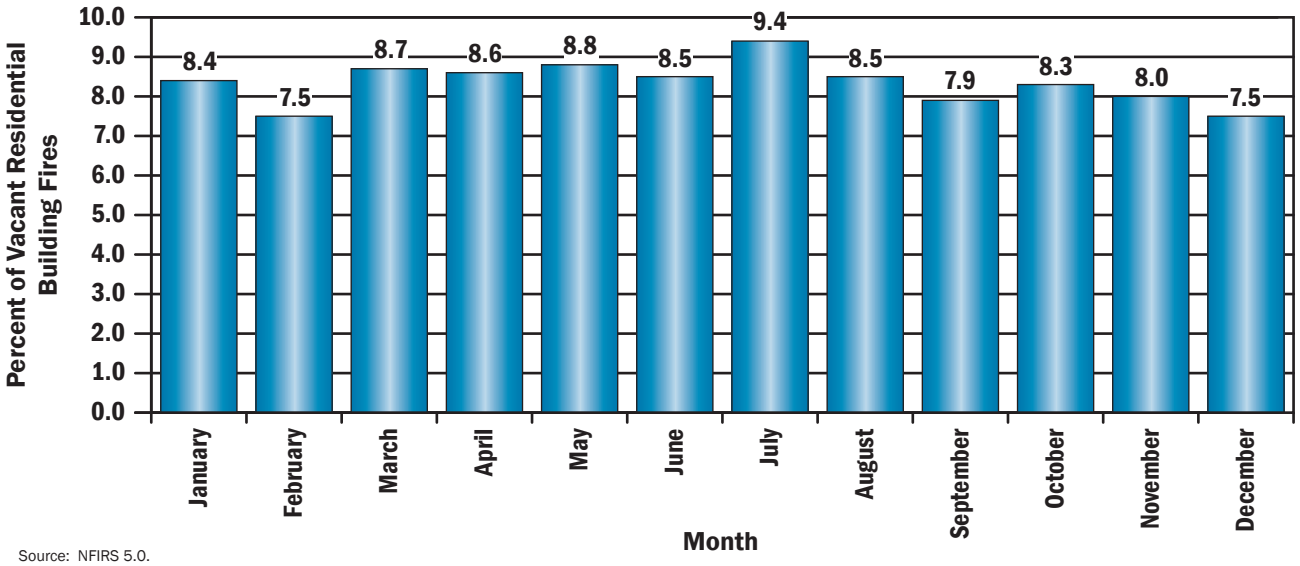
Figure 3. Day of Week Incidence for Vacant Residential Building Fires (2006–2008)



Source: NFIRS 5.0.

Figure 4 illustrates that vacant residential fires are slightly higher from March to August, and peak in July (9 percent). This increase in vacant fires is partially a result of intentional fires, which are the highest on July 4 and July 5. Overall, a total of 10 percent of all July's intentional fires occur on July 4 and July 5. The lowest number of fire incidents is seen in February and December. These two months contain the least number of intentional fires in vacant properties.

Figure 4. Vacant Residential Building Fires by Month (2006–2008)

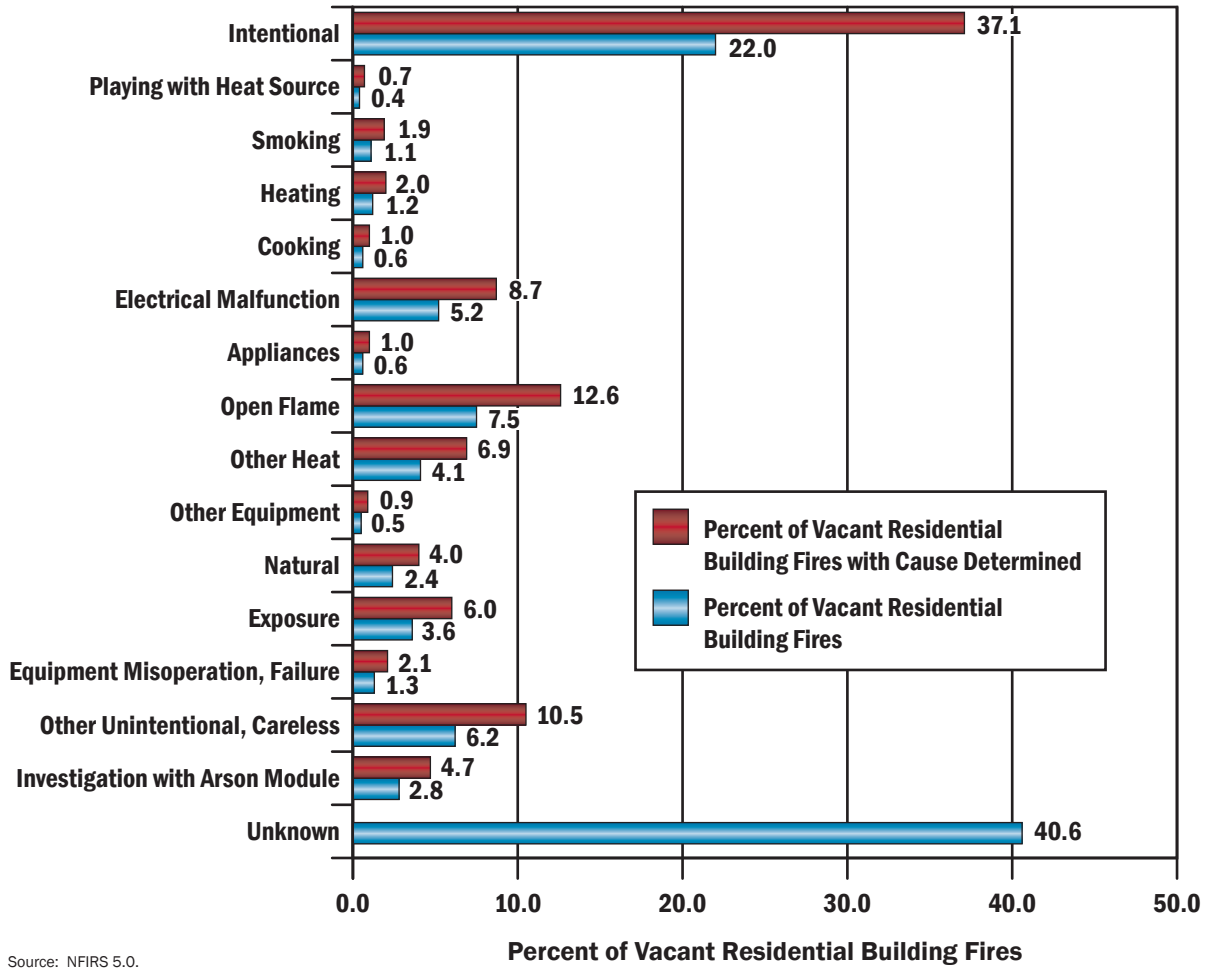


Source: NFIRS 5.0.

Causes of Vacant Residential Building Fires

Thirty-seven percent of all vacant residential fires are intentional fires as shown in Figure 5. The next four leading causes combined account for approximately 40 percent of vacant residential fires: fires caused by open flame (13 percent), other unintentional, careless fires (11 percent), electrical malfunction fires (9 percent), and other heat fires (7 percent).[14]

Figure 5. Vacant Residential Building Fires by Cause (2006–2008)

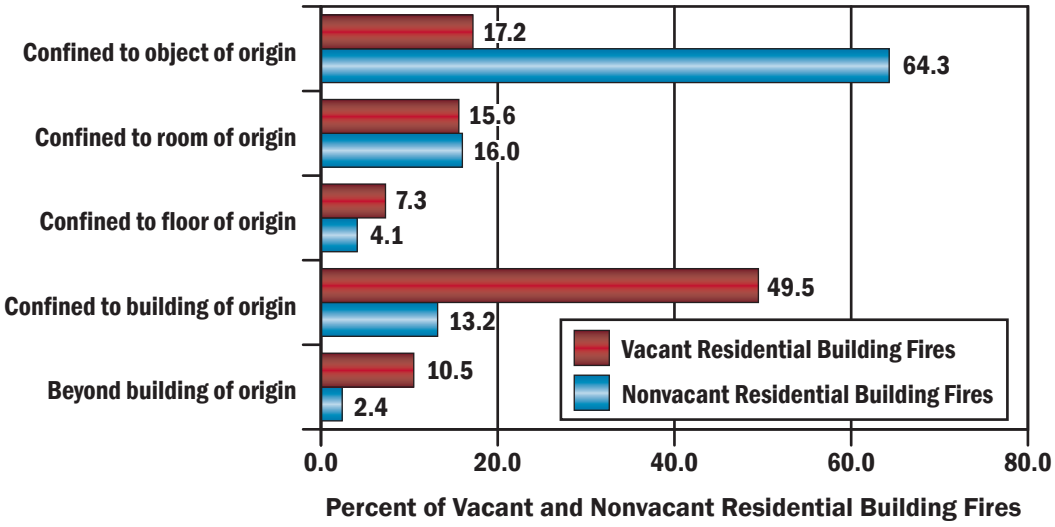


Source: NFIRS 5.0.

Fire Spread in Vacant Residential Building Fires

While 90 percent of vacant residential fires never leave the building of origin (Figure 6), half of the fires involve the entire building. An additional 11 percent extend beyond the building to adjacent properties. The spread of fires in vacant residential building is in contrast to nonvacant residential fires where most fires are confined to the object of origin (64 percent) and only 13 percent involved the entire building.

Figure 6. Extent of Fire Spread in Vacant and Nonvacant Residential Building Fires (2006–2008)



Source: NFIRS 5.0.

Where Vacant Residential Building Fires Start (Area of Fire Origin)

Twelve percent of vacant residential fires start in the bedroom (Table 4). Fires that begin in common rooms or lounge areas (10 percent) and cooking areas and kitchens (9 percent) are the next leading areas of fire origin. Less common are fires that start in function areas, other rooms or areas (6 percent), and exterior wall surfaces (6 percent).

Table 4. Leading Areas of Fire Origin in Vacant Residential Building Fires (2006–2008)

Areas of Fire Origin	Percent (Unknowns Apportioned)
Bedrooms	12.3
Common room, den, family room, living room, lounge	9.8
Cooking area, kitchen	8.8
Other rooms or areas	6.3
Wall surface: exterior	5.9

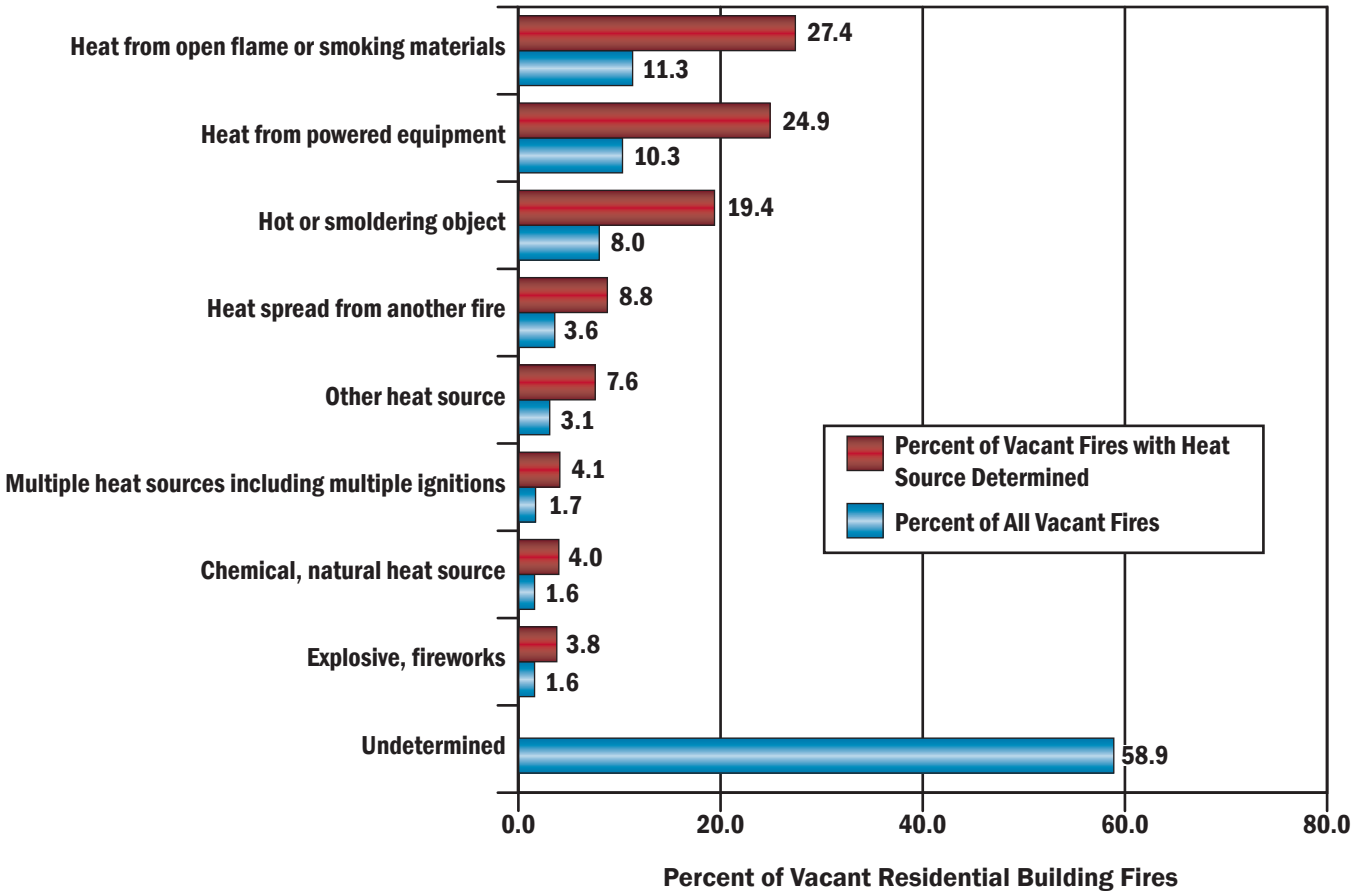
Source: NFIRS 5.0.

How Vacant Residential Building Fires Start (Heat Source)

Figure 7 shows sources of heat categories in vacant residential fires. The "heat from open flame or smoking materials" category accounts for 27 percent of all vacant residential fires. Within this category, heat from other open flames or smoking materials accounts for 11 percent, matches account for 5 percent, and lighters for cigarettes or cigars account for 4 percent of all vacant residential fires.

The "heat from powered equipment" category accounts for 25 percent of vacant residential fires. This category includes electrical arcing (11 percent), radiated or conducted heat from operating equipment (5 percent), heat from other powered equipment (5 percent), and sparks, embers, or flames from operating equipment (4 percent). The third largest category pertains to "hot or smoldering objects" (19 percent). This category includes items such as hot embers or ashes (10 percent) and miscellaneous hot or smoldering objects (8 percent).

Figure 7. Sources of Heat Categories in Vacant Residential Building Fires (2006–2008)



Source: NFIRS 5.0.

What Ignites First in Vacant Residential Building Fires

Structural member or framing (15 percent), exterior sidewall covering, surface, finish (10 percent), and structural component or finish (7 percent) are the specific items most often first ignited in vacant residential fires (Table 5). Floors and floor coverings (rugs and the like) account for 6 percent of the items first ignited. Multiple items and trash each account for an additional 5 percent.

Table 5. Leading Items First Ignited in Vacant Residential Building Fires (2006–2008)

Area of Fire Origin	Percent (Unknowns Apportioned)
Structural member or framing	15.1
Exterior sidewall covering, surface, finish	9.6
Structural component or finish, other	6.9
Floor covering or rug/carpet/mat, surface	6.4
Multiple items first ignited	5.4
Rubbish, trash, waste	5.3

Source: NFIRS 5.0.

Factors Contributing to Ignition in Vacant Residential Building Fires

Table 6 shows the categories of factors contributing to ignition in vacant residential fires. By far, the leading category is the "misuse of material or product" (40 percent). Abandoned or discarded materials or products (11 percent), misuse of materials or products (9 percent), and heat source too close to combustibles (9 percent) account for the majority of the fires in this category.

The "fire spread or control" category is a contributing factor in 24 percent of vacant residential fires. Rekindling of fires (11 percent) and exposure fires (9 percent) are the leading specific factors contributing to ignition in this category.

The categories "other factors contributing to ignition" and "electrical failure, malfunction" are the third and fourth leading factors at 14 and 13 percent respectively. The remaining categories account for 13 percent of vacant residential fires.

Table 6. Factors Contributing to Ignition for Vacant Residential Building Fires by Major Category (Where Factors Contributing to Ignition are Specified, 2006–2008)

Factors Contributing to Ignition Category	Percent of Vacant Residential Fires
Misuse of material or product	40.3
Fire spread or control	24.2
Other factors contributing to ignition	14.3
Electrical failure, malfunction	13.1
Operational deficiency	4.5
Natural condition	3.9
Mechanical failure, malfunction	3.2
Design, manufacture, installation deficiency	1.5

Source: NFIRS 5.0.
Notes: 1) Includes only incidents where factors that contributed to the ignition of the fire were specified.
2) Multiple factors contributing to fire ignition may be noted for each incident; total will exceed 100 percent.

Alerting/Suppression Systems in Vacant Residential Building Fires

Smoke alarm and automatic extinguishment system (AES) data presented in Tables 7 and 8 are the raw counts from the NFIRS data set and not scaled to national estimates of smoke alarms or national estimates of AES in vacant residential fires.

The evaluation of the operation and effectiveness of alerting and suppression systems is problematic in vacant properties. As the properties are vacant, it is not expected that power, or water in the case of AES, will be available to operate the systems. Therefore, the tables and analyses below only address data on the presence of these systems. As to be expected, both systems are largely absent in vacant residential fires.

Smoke Alarm Data

Smoke alarms were present in 13 percent of vacant residential fires and were known to have operated in 6 percent of vacant residential fires. In 55 percent of vacant residential fires, there were no smoke alarms present (Table 7). In another 32 percent of these fires, firefighters were unable to determine if a smoke alarm was present.

Table 7. NFIRS Smoke Alarm Presence for Vacant Residential Building Fires (NFIRS, 2006–2008)

Presence of Smoke Alarms	Count	Percent
Present	6,205	13.1
None present	25,730	54.5
Undetermined	15,291	32.4
Total Incidents	47,226	100.0

Source: NFIRS 5.0.
Notes: The data presented in this table are raw data counts from the NFIRS data set. They do not represent national estimates of smoke alarms in vacant residential building fires. They are presented for informational purposes. Total may not add to 100 percent due to rounding.

Automatic Extinguishment System Data

Overall, full or partial AES, mainly sprinklers, were present in just 1 percent of vacant residential fires (Table 8). The lack of suppression equipment (sprinklers) in vacant residential properties is not unexpected. Note that the data presented in Table 8 are the raw counts from the NFIRS data set and not scaled to national estimates of AES in vacant residential fires.

Table 8. NFIRS Automatic Extinguishing System (AES) Data for Vacant Residential Building Fires (2006–2008)

Presence of Automatic Extinguishing Systems	Count	Percent
AES present	474	1.0
Partial system present	32	0.1
AES not present	42,600	90.2
Unknown	4,120	8.7
Total Incidents	47,226	100.0

Source: NFIRS 5.0.

Notes: The data presented in this table are raw data counts from the NFIRS data set. They do not represent national estimates of AESs in vacant residential building fires. They are presented for informational purposes. Totals may not add to 100 percent due to rounding.

Examples

The following are some examples of vacant residential fires reported by the media:

- June 2009: Fire in a Chicago, IL, vacant home caused the evacuation of two nearby houses. No injuries or deaths were reported as a result of the vacant building fire. This was the second fire started at this residence within a 7-month period. The cause of the fire is being listed as "under suspect circumstances."[15]
- November 2009: A fire at a vacant apartment complex in Dallas, TX, took over 12 hours to extinguish. A total of seven firefighters were injured during the fire. The building's sprinkler system was still operational which helped the extinguishing effort. The cause of the fire is being listed as "undetermined, but electrical problems are suspected."[16]
- October 2009: A vacant house fire in Tampa, FL, caused about $50,000 worth of damage. No deaths or injuries were reported as a result of the incident. It was determined by the Tampa Fire Marshals Office that the fire was intentionally set.[17]
- January 2008: A fire that is being ruled as accidental destroyed a historic house in Tualatin, OR. Investigators are unsure of what may have caused the blaze but they believe it was "not intentionally set to harm or prompt financial gain." It was noted that the house was frequently used by transients for shelter. No deaths or injuries were reported.[18]

Resources

The number of vacant building fires each year in the United States has always been a concern. This concern escalates with the effects of downturns in the economy with overall increases in the number of vacant buildings, and incidentally, increases in the number of vacant building fires.

The National Vacant Properties Campaign provides information, tools, and assistance to support communities in an effort to revitalize vacant properties at http://www.vacantproperties.org.

NFIRS Data Specifications for Vacant Residential Building Fires

Data for this report were extracted from the NFIRS annual Public Data Release (PDR) files for 2006, 2007, and 2008. Only version 5.0 data were extracted.

Vacant residential fires are defined as:

- Incident Types 111 to 123:

Incident Type	Description
111	Building fire
112	Fires in structure other than in a building
113	Cooking fire, confined to container
114	Chimney or flue fire, confined to chimney or flue
115	Incinerator overload or malfunction, fire confined
116	Fuel burner/boiler malfunction, fire confined
117	Commercial compactor fire, confined to rubbish
118	Trash or rubbish fire, contained
120	Fire in mobile property used as a fixed structure, other
121	Fire in mobile home used as fixed residence
122	Fire in motor home, camper, recreational vehicle
123	Fire in portable building, fixed location

  Note that Incident Types 113 to 118 do not specify if the structure is a building.

  Incident Type 112 is included prior to 2008 as previous analyses have shown that Incident Types 111 and 112 were used interchangeably. As of 2008, Incident Type 112 is excluded.

- Aid Types 3 (mutual aid given) and 4 (automatic aid given) are excluded to avoid double counting of incidents.
- Property use 400-499 is included to specify residential buildings.

- Structure Type:
  - For Incident Types 113–118:
    - 1—Enclosed building,
    - 2—Fixed portable or mobile structure, and
    - Structure Type not specified (null entry).
  - For Incident Types 111, 112, and 120–123:
    - 1—Enclosed building, and
    - 2—Fixed portable or mobile structure.
- Structure Status:
  - 1—Under construction;
  - 4—Under major renovation;
  - 5—Vacant and secured;
  - 6—Vacant and unsecured; and
  - 7—Being demolished.

The analyses contained in this report reflect the current methodologies used by the United States Fire Administration (USFA). The USFA is committed to providing the best and most current information on the United States' fire problem, continually examining its data and methodology to fulfill this goal. Because of this commitment, data collection strategies and methodological changes are possible and do occur. As a result, analyses and estimates of the fire problem may change slightly over time. Previous analyses and estimates on specific issues (or similar issues) may have used different methodologies or data definitions and may not be directly comparable to the current ones.

To request additional information or to comment on this report, visit http://www.usfa.fema.gov/applications/feedback/index.jsp

Notes:

[1] National estimates here are based on 2006–2008 native version 5.0 data from the National Fire Incident Reporting System (NFIRS) and residential structure fire loss estimates from the National Fire Protection Association's (NFPA's) annual surveys of fire loss. Fires are rounded to the nearest 100, deaths to the nearest 5, injuries to the nearest 25, and loss to the nearest $million.

[2] In NFIRS, version 5.0, a structure is a constructed item of which a building is one type. In previous versions of NFIRS, the term "residential structure" commonly referred to buildings where people live. To coincide with this concept, the definition of a residential structure fire for NFIRS 5.0 has, therefore, changed to include only those fires where the NFIRS 5.0 structure type is 1 or 2 (enclosed building and fixed portable or mobile structure) with a residential property use. Such fires are referred to as "residential buildings" to distinguish these buildings from other structures on residential properties that may include fences, sheds, and other uninhabitable structures. Confined fire incidents that have a residential property use, but do not have a structure type specified are presumed to be buildings. Nonconfined fire incidents without a structure type specified are considered to be invalid incidents (structure type is a required field) and are not included.

[3] Kathleen M. Howley. "Arson Surges for Foreclosed Homes Lost to Subprime (Update 1)," www.bloomberg.com, July 3, 2008. http://www.bloomberg.com/apps/news?pid=20601109&refer=home&sid=aUk4WlFwycJc (accessed June 17, 2010).

[4] Nancy A. Fischer, and Denise Jewell Gee. "City's housing in rapid decline," www.allbusiness.com, March 22, 2009. http://www.allbusiness.com/economy-economic-indicators/economic-indicators-property/12230925-1.html (accessed June 17, 2010).

[5] "Detroit braces for Devil's Night arson battle in face of foreclosures, economic crisis," mlive.com, October 19, 2009. http://www.mlive.com/news/detroit/index.ssf/2009/10/detroit_braces_for_devils_night.html (accessed March 3, 2010).

[6] "Detroit Fights Devil's Night," time.com, October 29, 2009. http://www.time.com/time/photogallery/0,29307,1933241,00.html (accessed March 3, 2010).

[7] Robert Brignall. "Final figures on Devil's Night fires to be released Monday, but Angels look divine so far," *Detroit Crime Examiner*, October 31, 2009. http://www.examiner.com/x-19336-Detroit-Crime-Examiner~y2009m10d31-Detroits-devils-night-scoreboard-a-running-talley (accessed June 18, 2010).

[8] "Detroit Fights Devil's Night," time.com, October 29, 2009. (accessed March 3, 2010).

[9] Kathleen M. Howley. "Arson Surges for Foreclosed Homes Lost to Subprime (Update 1)," www.bloomberg.com, http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aelStm0.FmYo (accessed July 19, 2010).

[10] Confined building fires are small fire incidents that are limited in scope, confined to noncombustible containers, rarely result in serious injury or large content losses, and are expected to have no significant accompanying property losses due to flame damage. In NFIRS, confined fires are defined by Incident Type codes 113 to 118.

[11] NFIRS distinguishes between "content" and "property" loss. Content loss includes loss to the contents of a structure due to damage by fire, smoke, water, and overhaul. Property loss includes losses to the structure itself or to the property itself. Total loss is the sum of the content loss and the property loss. For confined fires, the expectation is that the fire did not spread beyond the container (or rubbish for Incident Type 118) and hence, there was no property damage (damage to the structure itself) from the flames. There could be, however, property damage as a result of smoke, water, and overhaul.

[12] The average fire death and fire injury loss rates computed from the national estimates will not agree with average fire death and fire injury loss rates computed from NFIRS data alone. The fire death rate computed from national estimates would be (1,000*(45/28,000)) = 1.6 deaths per 1,000 vacant residential building fires and the fire injury rate would be (1,000*(225/28,000) = 8.0 injuries per 1,000 vacant residential building fires.

[13] For the purposes of this report, the time of the fire alarm is used as an approximation for the general time the fire started. However, in NFIRS, it is the time the fire was reported to the fire department.

[14] The U.S. Fire Administration (USFA) cause hierarchy was used to determine the cause of vacant fire incidents: http://www.usfa.fema.gov/fireservice/nfirs/tools/fire_cause_category_matrix.shtm.

[15] "Fire Burns Vacant Building in Logan Square," cbs2chicago.com, June 18, 2009. http://cbs2chicago.com/local/logan.square.fire.2.1049524.html (accessed February 12, 2010).

[16] Robbie Owens, "Vacant Dallas Building Burns For Over 12 Hours," cbs11tv.com, November 24, 2009. http://cbs11tv.com/local/Vacant.Building.Fire.2.1330912.html (accessed February 12, 2010).

[17] Carly Timmons. "Vacant Tampa house fire was intentionally set," abcactionnews.com, October 7, 2009. http://www.abcactionnews.com/news/local/story/Vacant-Tampa-house-fire-was-intentionally-set/vC6gWFBS9Uu2y42F_YTPhg.cspx (accessed February 12, 2010).

[18] "Historic Nyberg house fire in Tualatin accidental," blog.oregonlive.com, January 9, 2009. http://blog.oregonlive.com/breakingnews/2008/01/historic_nyberg_house_fire_in.html (accessed February 12, 2010).