

VACANT BUILDING FIRES

Marty Ahrens

April 2009



**National Fire Protection Association
Fire Analysis and Research Division**

Abstract

In 2003-2006, U.S. fire departments responded to an estimated average of 31,000 structure fires in vacant buildings per year. These fires resulted in an average of 50 civilian deaths, 141 civilian, 4,500 firefighter injuries, and \$642 million in direct property damage per year. Forty-three percent of these fires were intentionally set. From 2005 to 2006, vacant building fires in all properties rose 2%, while fires in vacant homes rose 11%. These estimates are based on data from Version 5.0 of 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.

Previously published incident descriptions are included in the Appendix to better illustrate how these fires can happen.

Keywords: fire statistics, vacant buildings,

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.

For more information about the National Fire Protection Association, visit www.nfpa.org or call 617-770-3000. To learn more about the One-Stop Data Shop go to www.nfpa.org/osds or call 617-984-7443.

Copies of this analysis are available from:

National Fire Protection Association
One-Stop Data Shop
1 Batterymarch Park
Quincy, MA 02169-7471
www.nfpa.org
e-mail: osds@nfpa.org
phone: 617-984-7443

NFPA No. USS79
Copyright© 2009, National Fire Protection Association, Quincy, MA

Table of Contents

| | |
|--|-----|
| Table of Contents | i |
| List of Tables and Figures..... | ii |
| Executive Summary | iii |
| Vacant Building Fires Fact Sheet | v |
| Vacant Building Fires | 1 |
| Appendix A. How National Estimates Statistics Are Calculated | 27 |
| Appendix B. Methodology and Definitions Used in “Leading Cause” Table..... | 35 |
| Appendix C. Previously Published Incident Descriptions..... | 38 |

List of Tables and Figures

| | |
|--|----|
| Figure 1. Structure Fires in Vacant Buildings by Year: 2002-2006 | 1 |
| Figure 2. Vacant Home and Non-Home Structure Fires by Year: 2002-2006 | 3 |
| Figure 3. Percent of Housing Units that Were Vacant, by Year: 1980-2008 | 3 |
| Figure 4. Vacant Housing Units, by Year: 1980-2008 | 4 |
| Figure 5. Reported Structure Fires in Vacant Buildings by Leading Items First Ignited: 2003-2006..... | 5 |
| Figure 6. Flame Damage Spread beyond Building of Origin, by Structure Status 2003-2006 | 6 |
| Figure 7. Reported Structure Fires in Vacant Buildings by Cause of Ignition and Structure Status:2003-2006..... | 7 |
| Figure 8. Structure Fires in Vacant Buildings by Day of Week: 2003-2006..... | 7 |
| Figure 9. Structure Fires in Vacant Buildings by Alarm Time: 2003-2006 | 8 |
| Table 1. Reported Structure Fires by Building Status | 12 |
| Table 2. Reported Structure Fires in Vacant Buildings by Property Use | 14 |
| Table 3. Percent of Reported Structure Fires by Property Use in Buildings that Are Vacant..... | 15 |
| Table 4. U.S. Total and Vacant Housing Units..... | 16 |
| Table 5. Reported Structure Fires in Vacant Buildings by Item First Ignited | 17 |
| Table 6. Reported Structure Fires in Vacant Buildings by Extent of Flame Damage | 18 |
| Table 7. Leading Causes of Reported Structure Fires in Vacant Buildings | 19 |
| Table 8. Reported Structure Fires in Vacant Buildings by Cause of Ignition | 20 |
| Table 9. Reported Structure Fires in Vacant Buildings by Equipment Involved in Ignition..... | 22 |
| Table 10. Reported Structure Fires in Vacant Buildings by Factor Contributing to Ignition..... | 23 |
| Table 11. Reported Structure Fires in Vacant Buildings by Heat Source | 24 |
| Table 12. Reported Structure Fires in Vacant Buildings by Area of Origin..... | 25 |

Executive Summary

Fires in vacant buildings have become a matter of increasing concern as the economy has weakened. In 2003-2006, U.S. fire departments responded to an estimated average of 31,000 structure fires in vacant buildings per year. These fires resulted in an average of 50 civilian deaths, 141 civilian injuries, and \$642 million in direct property damage per year. Based on annual averages for 2003-2006, the 31,000 reported vacant structure fires accounted for 6% of the 520,100 structure fires, 2% of the 3,125 civilian structure fire deaths, 1% of the 15,200 civilian structure fire injuries, and 7% of the \$9.0 billion in direct property loss.

These statistics are national estimates of fires reported to U.S. municipal fire departments 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 National Fire Protection Association's (NFPA's) annual fire department experience survey.

Vacant building fires increased by 2% from 31,900 in 2005 to 32,700 in 2006. The increase was similar to the 3% increase in all structure fires. Fires in vacant homes increased more than vacant building fires overall. Vacant home fires increased 11% from 18,900 in 2005 to 21,000 in 2006 compared to a 4% increase in overall home fires during the same period. The U.S. Census Bureau's Housing Vacancy Survey found that the number of vacant housing units grew by 5% from 15.7 million in 2005 to 16.4 million in 2006, by 7% from 2006 to 17.7 million in 2007, and by 6% from 2007 to 18.7 million units in 2008.

During 2003-2006, 63% of the reported vacant building fires occurred in homes, including 58% in one-or two-family dwellings and 5% in apartments or multiple family properties. Home fires overall (including both vacant and occupied), accounted for 73% of reported structure fires during this time.¹

Vacant buildings should be secured and combustible materials removed. Section 10.13 of the 2009 edition of NFPA[®] 1, *Fire Code* requires owners or those in charge of vacant properties to remove waste and combustible materials and to secure the building to prevent unauthorized people from entering. Fire protection systems are to be maintained unless the authority having jurisdiction grants permission to have them removed from service. Despite these requirements, half of the reported vacant building fires were in properties that were unsecured.

Automatic extinguishing equipment was found in only 2% of vacant building fires. The equipment operated in two-thirds (68%) of fires considered large enough to activate the equipment, but failed to operate in 31%. In 82% of the fires in which the equipment failed to operate, the system had been shut off.

Fires in vacant buildings pose a danger to the neighborhood. Flame damage spread beyond the structure in 9% of the fires in secured vacant properties and 12% of unsecured properties, compared to only 3% of structure fires overall.

¹ Marty Ahrens. *Home Structure Fires*, Quincy, MA: National Fire Protection Association, 2009, p. 3.

Fires in vacant buildings are more likely to have been intentionally set than other structure fires. Forty-three percent of reported vacant building fires during this period were intentionally set, compared to 10% of structure fires overall. Vacant buildings accounted for 25% of all intentionally set structure fires. Intentional fires were much more common in unsecured vacant properties (57%) than in those that had been secured (31%). Other leading causes of vacant building fires were exposure to other fires (8%), heating equipment (also 8%), electrical distribution or lighting equipment (7%), cooking equipment (5%), someone, typically a child, playing with heat source (4%), and smoking materials (3%). When equipment is listed as the cause of the fire, it means that the equipment provided the heat that started the fire. It does not mean that the equipment malfunctioned or failed. Hot embers and ashes were the most common heat source in vacant building fires.

Vacant building fires are more common on weekends and less common between 6:00 a.m. and noon. Vacant building fires were spread out throughout the year, but certain holidays with some more raucous traditions stand out. The four peak days were July 4, July 5, January 1, and October 31.

Vacant building fires pose a threat to firefighters. During the ten-year period 1998-2007, a total of 15 firefighters were fatally injured at the scene of vacant structure fires. On average, 4,500 firefighters were injured at vacant building fires annually during 2003-2006. These account for 13% of the reported firefighter injuries incurred at structure fires per year during this period.

InterFire has a number of resources related to vacant building fires and fire prevention on its website at <http://www.interfire.org/features/vacantbuildings.asp>, including a draft ordinance to address blight. The best way to prevent vacant building fires is to prevent vacant buildings. The National Vacant Properties Campaign's website <http://vacantproperties.org/strategies/tools.html> describes a number of strategies to address the problem of vacant properties and provides examples of how these strategies have been used. Based on the findings of the Urban Fire Safety Project, NFPA recommends that local fire departments and the national fire service partner with financial institutions and other organizations to prevent home foreclosures and home abandonment.”² Vacant building arson is also addressed in the Arson Prevention PowerPoint Presentation developed by NFPA and Columbus Division of Fire. The presentation, intended for use by local fire departments and community organizations is available at www.nfpa.org/assets/files/PDF/Public%20Education/NFPAarsonpresentation.ppt.

² Robert Adams, Judy Comoletti, Sharon Gamache, John Hall, and Pat Mieszala. *Urban Fire Safety Project: Report to the NFPA Board of Directors and the Metropolitan Fire Chiefs Association*, November 2007, p. 26, online at http://www.nfpa.org/assets/files/PDF/Member%20Sections/Urban_Report.pdf.



Vacant Building Fires Fact Sheet

In 2003-2006, U.S. fire departments responded to an estimated average of 31,000 structure fires in vacant buildings. These fires resulted in an average of 50 civilian deaths, 141 civilian injuries, and \$642 million in direct property damage per year.

- 4,500 firefighters were injured annually at these incidents.
- Only 6% of all reported structure fires were at vacant buildings, but they accounted for 13% of the firefighter injuries incurred at structure fires.
- From 1998 to 2007, 15 firefighters were fatally injured at vacant building fires.

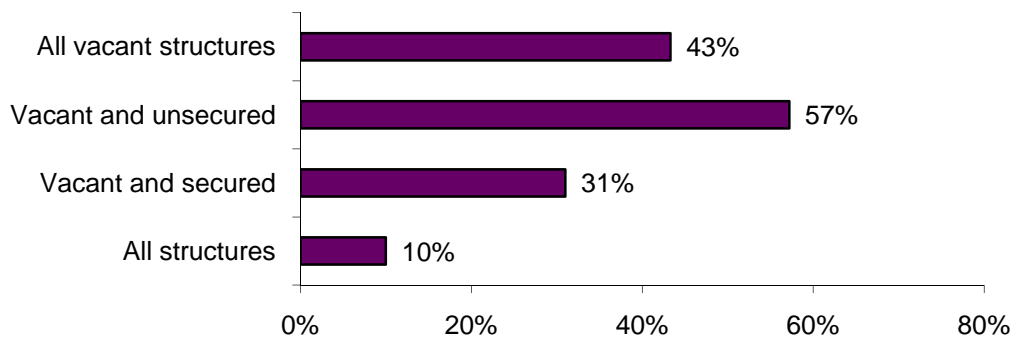
Vacant building fires increased by 2% from 31,900 in 2005 to 32,700 in 2006. The increase was similar to the 3% increase in all structure fires.

Sixty-three percent of vacant building fires in 2003-2006 occurred in homes, with 58% in one-or-two-family dwellings and 5% in apartments.

- Vacant home fires increased 11% from 18,900 in 2005 to 21,000 in 2006. Home fires in general increased by only 4%.
- The U.S. Census Bureau's Housing Vacancy Survey found that the number and percent of housing units vacant has been increasing steadily since 2005.

The four peak days for vacant building fires were July 4, July 5, October 31, and January 1.

Intentional Structure Fires by Structure Status: 2003-2006



Forty-three percent of vacant building fires were intentionally set. Vacant buildings accounted for 25% of all intentionally set structure fires.

- In unsecured properties, 57% of the fires were intentional.
- Only 31% of the fires in secured properties were intentional.

Vacant buildings that burned were evenly divided into secured (15,400) and unsecured (15,600).

- Flame damage spread beyond the structure in 9% of the fires in secured and 12% of unsecured properties.
- Flame damage extended beyond the structure of origin in only 3% of structure fires overall.