

# **Trends and Patterns of U.S. Fire Losses**

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

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**National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471  
[www.nfpa.org](http://www.nfpa.org)**

## **Abstract**

Projections from NFPA's annual fire department experience data reported in Michael Karter's annual reports on *U.S. Fire Loss*, particularly *U.S. Fire Loss During 2006*, are summarized in this analysis. Reported fires and fire deaths have fallen since 1977, the first year of available data. The drop in population-based rates is even sharper. In 2006, home structure fires accounted for 24% of the reported fires. However, these incidents caused 80% of all civilian fire deaths. Vehicle fires accounted for 17% of the reported fires and 15% of the civilian fire deaths. Roughly half of the reported fires were outside or other non-structure, non-vehicle fires.

Keywords: fire statistics, fires, fire deaths, fire loss

## **Acknowledgements**

The National Fire Protection Association thanks all the fire departments who participate in 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.

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National Fire Protection Association  
One-Stop Data Shop  
1 Batterymarch Park  
Quincy, MA 02169-7471  
[www.nfpa.org](http://www.nfpa.org)  
e-mail: [osds@nfpa.org](mailto:osds@nfpa.org)  
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# Trends and Patterns of U.S. Fire Losses

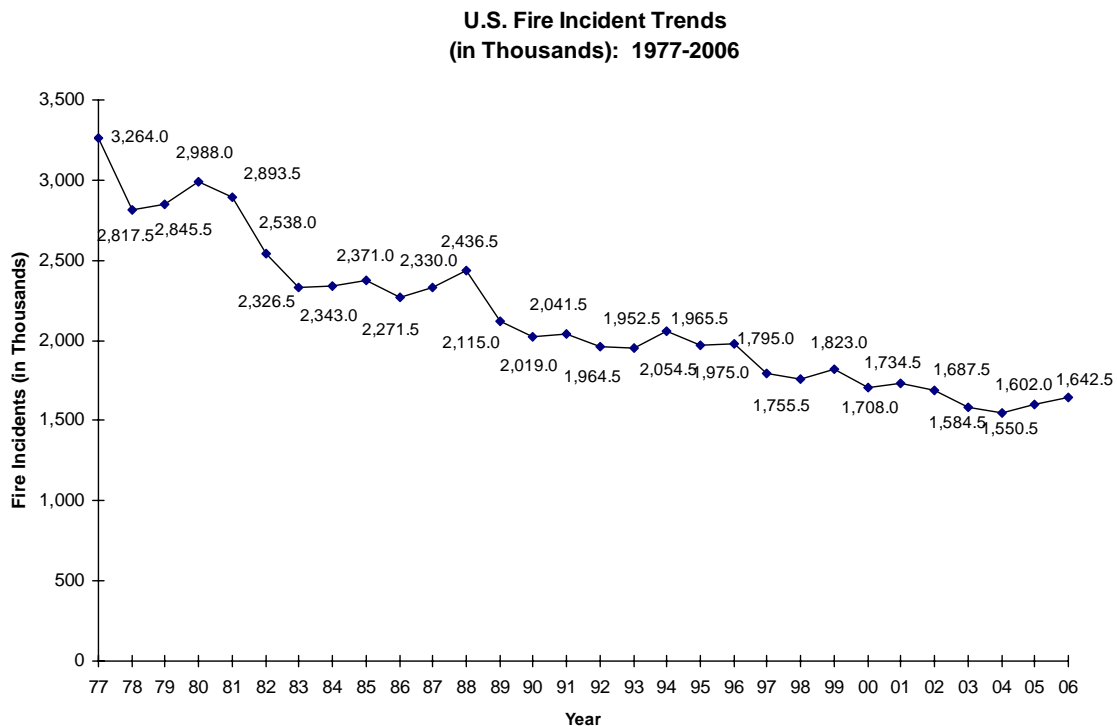
Except where otherwise noted, the statistics in this report were extracted from the annual reports, *Fire Loss in the United States*, by Michael J. Karter, Jr. These statistics are projections based on the results of NFPA's annual fire department survey. Only fires reported to municipal fire departments are included. Fires handled without fire department involvement, by private fire brigades or by state or federal firefighting authorities are not included in these statistics.

## Fire departments responded to 1,642,500 fires.

In 2006, U.S. municipal fire departments responded to an estimated 1,642,500 fires. These fires killed 3,245 civilians (non-firefighters) and caused 16,400 reported civilian fire injuries. Direct property damage was estimated at \$11.3 billion dollars. Eighty-nine firefighters died while on duty or of injuries incurred while on duty.<sup>1</sup> During 2006 the 524,000 structure fires accounted for 32% of the reported fires.

Figure 1 shows that reported fires fell 50% from 3,264,000 in 1977 to 1,642,500 in 2006, the fourth lowest point since data collection began. Reported fires rose 2% from 1,602,000 in 2005.

**Figure 1.**

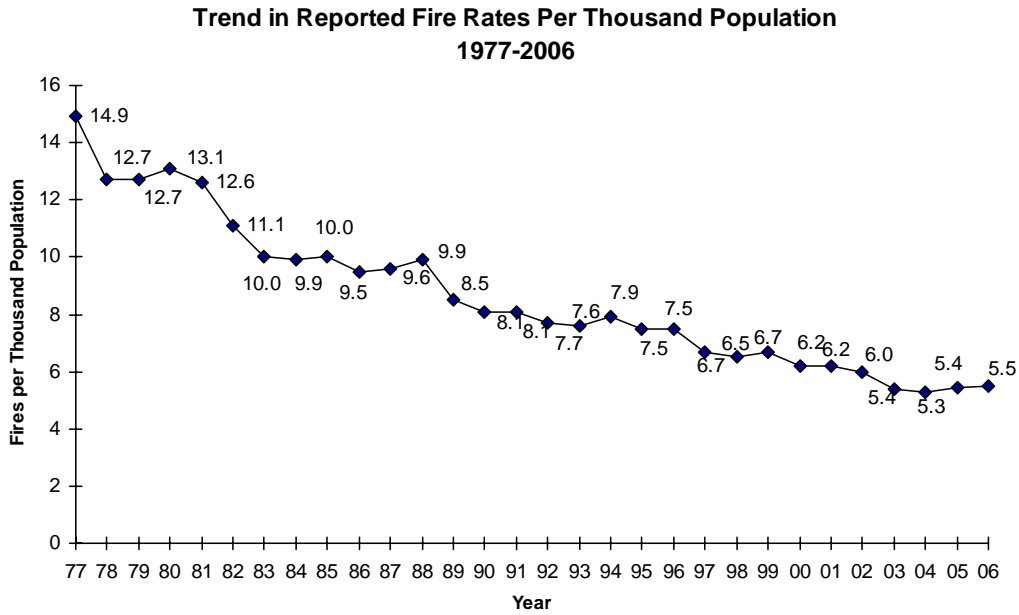


## Rate of reported fires fell even more sharply over the past three decades.

According to the U.S. Census, the resident population of the US grew 36% from 1977 to 2006. Figure 2 shows that the rate of fires per 1,000 population fell 63% from 14.9 in 1977 to 5.5 in 2006.

<sup>1</sup> Rita F. Fahy, Paul R. LeBlanc, and Joe Molis, *Firefighter Fatalities in the United States – 2006*, Quincy, MA: National Fire Protection Association, June 2007.

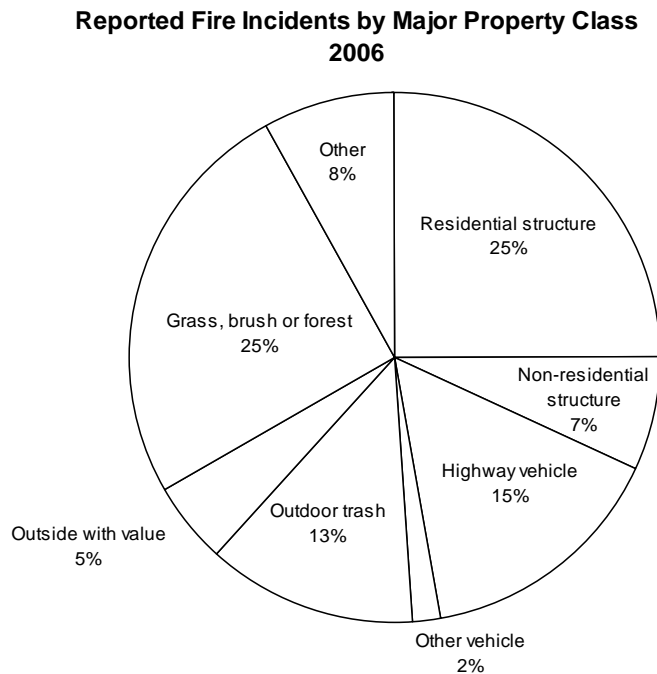
**Figure 2.**



**Structure fires account for one-third of the fires but the majority of losses.**

Figure 3 shows a breakdown of fires by major property class. The 524,000 reported structure fires caused 2,705 civilian fire deaths, 14,350 civilian fire injuries, and \$9.6 billion in direct property damage. Structure fires accounted for 32% of the reported fires, 83% of the civilian fire deaths, 88% of the civilian fire injuries, and 85% of the direct property loss. Reported structure fires fell 52% from 1,098,000 in 1977. From 2005 (511,000 structure fires) to 2006, they rose 3%. Generally speaking, any fire in or on a structure is considered a structure fire, even if only the contents were involved and there was no structural damage.

**Figure 3.**



**Home fires dominate the structure fire problem.**

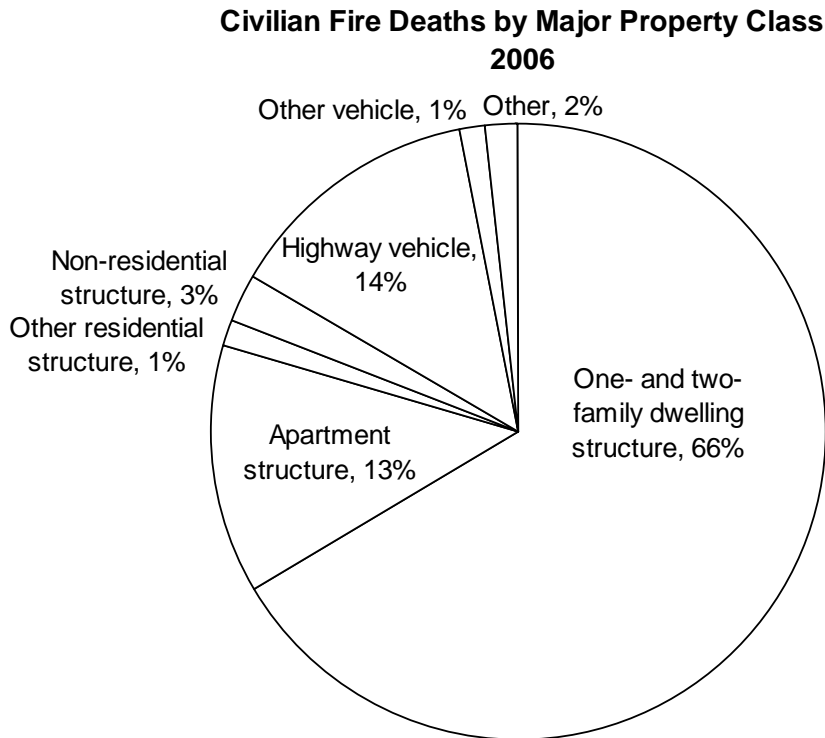
Seventy-nine percent (412,500) of the 524,000 structure fires occurred in residential properties, including homes, hotels, motels, rooming houses and dormitories; 76% (396,000) occurred in homes. (NFPA uses the term “home” to include one- and two-family dwellings, apartments and manufactured housing.) Home structure fires fell 45% from the 723,500 reported in 1977. They rose 4% from the 381,000 reported in 2005.

Fifty-eight percent (304,500) of all reported structure fires occurred in one- and two-family homes; 17% (91,500) occurred in apartments. NFPA produces a variety of reports about general and specific causes and circumstances of home fires. The general overview of home structure fires, free to all, is available at <http://www.nfpa.org/osds>. NFPA members may download more specific reports at no cost. Purchasing details for non-members are also found on the site.

**Four of every five fire deaths resulted from home structure fires.**

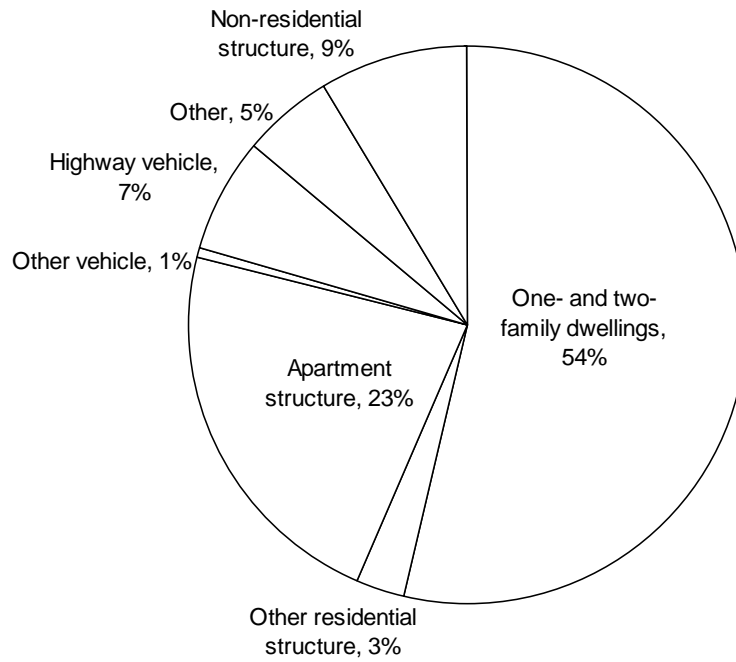
Eighty percent (80%) of the 3,245 civilian fire deaths were caused by home structure fires. Only 19% of all reported fires occurred in one- and two-family structures but these fires caused 66% (2,155) of the fire deaths. Apartment fires accounted for 6% of all reported fires, but resulted in 13% (425) of the deaths. Figures 4-6 shows breakdown of civilian fire deaths, civilian fire injuries, and direct property damage by type of fire and property class. Homes also account for the largest share of civilian fire injuries and direct property damage. Although non-residential structure fires accounted for only 7% of all reported fires, Figure 6 shows that these incidents caused 23% of the direct property damage.

**Figure 4.**



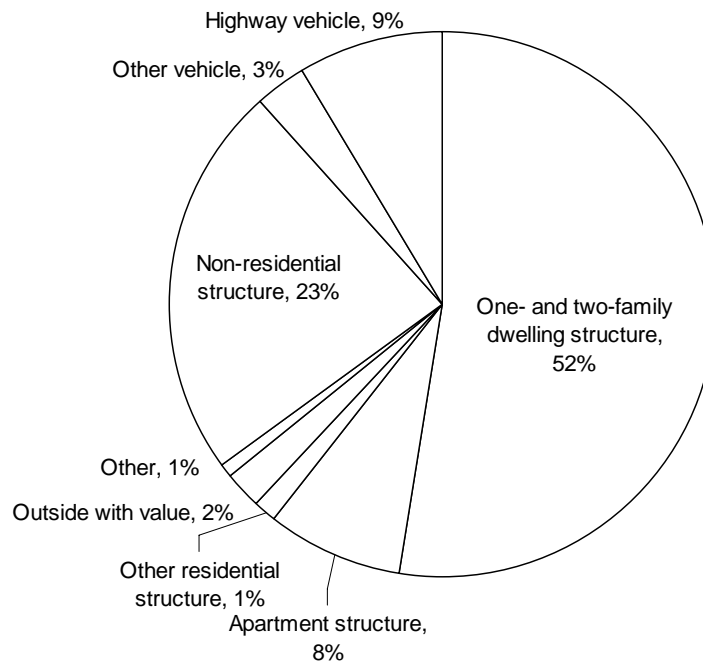
**Figure 5.**

**Reported Civilian Fire Injuries by Major Property Class  
2006**



**Figure 6.**

**Direct Property Damage by Major Property Class  
2006**



**Vehicle fires are also a significant cause of fire deaths.**

During 2006, the 278,000 reported vehicle fires caused an estimated 490 civilian deaths, 1,200 civilian injuries, and \$1.3 billion in direct property loss. Vehicle fires accounted for 17% of the reported fires, 15% of the civilian fire deaths, 7% of the civilian fire injuries, and 12% of the total direct property damage.

The 490 vehicle fire deaths accounted for nearly six times the 85 civilian deaths reported in non-residential structure fires and more deaths than occurred in apartment fires. During 2006, 14% of the civilian fire deaths were in highway-type vehicles such as cars, trucks, vans, and motorcycles. Only 1% occurred in non-highway vehicles such as planes, trains, ships or boats or construction equipment. Vehicle fires fell 45% from 508,000 in 1977. From 2005 to 2006, highway vehicle fires fell 11%, while non-highway vehicle fires fell 10%. NFPA members may download a report describing vehicle fires categorized by mobile property type category, *U.S. Vehicle Fire Trends and Patterns*, from <http://www.nfpa.org/osds>. The report may also be ordered from NFPA's One-Stop Data Shop at [osds@nfpa.org](mailto:osds@nfpa.org).

**Number of U.S. fire deaths in 2006 was the smallest since data collection began in 1977.**

Although the estimated total of civilian fire deaths fell 12% from 3,675 in 2005 to 3,245 in 2006, the lowest total since NFPA began collecting data, the one-year drop was not itself statistically significant. It would take several years of decline to determine whether this is a short term anomaly or the beginning of a new trend. Home structure fire deaths fell 15% from 3,030 during the same period. Total civilian fire deaths and home fire deaths specifically both fell 56%, from 1977 to 2006. Figure 7 shows that fire deaths have followed a generally downward trend since 1977. Because home fire deaths account for such a large share of the total fire deaths, the trends tend to be very similar.

**Figure 7.**

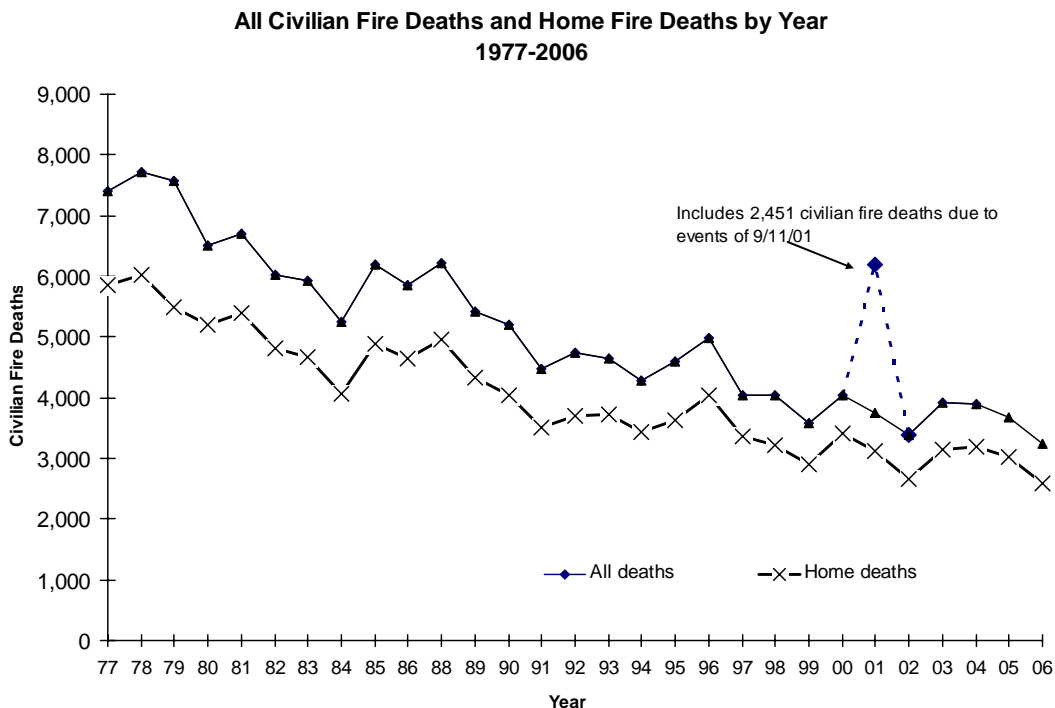
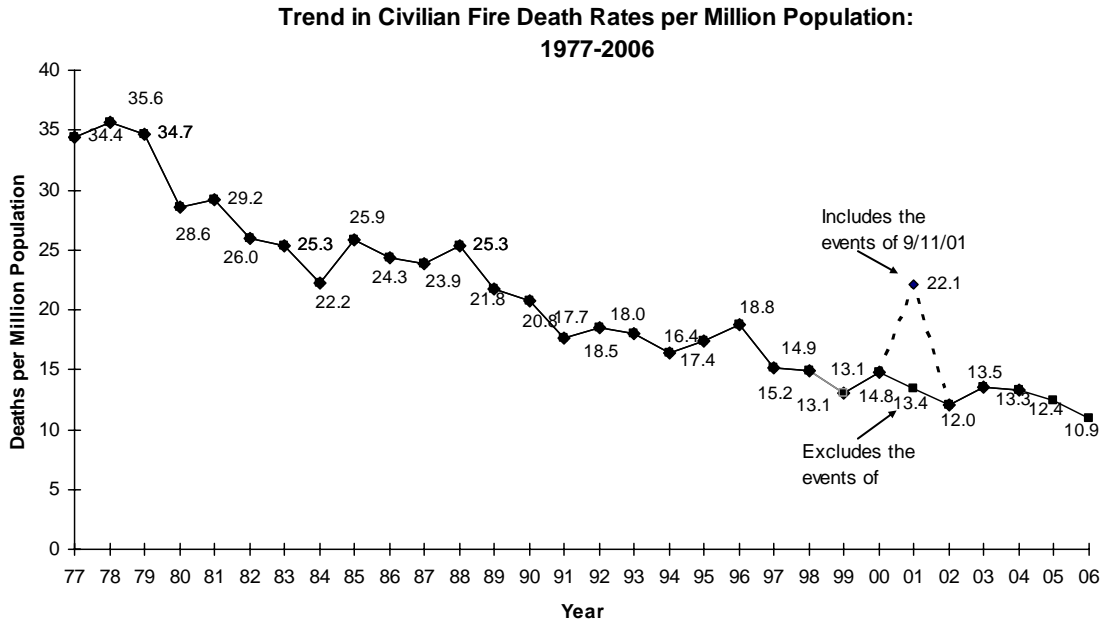


Figure 8 shows that the fire death rate per million population fell 68% from 1977 to 2006. From 2005 to 2006, the rate dropped 12%.

**Figure 8.**



**Half of the reported fires were considered “outside or other.”**

Figure 3 showed that 51% (840,500) of the 1,642,500 total reported fires were outside fires or fires other than structure or vehicle fires. These fires caused 50, or 2%, of the civilian deaths and 850, or 5%, of the civilian injuries. These fires rose 5% from 2005 to 2006.

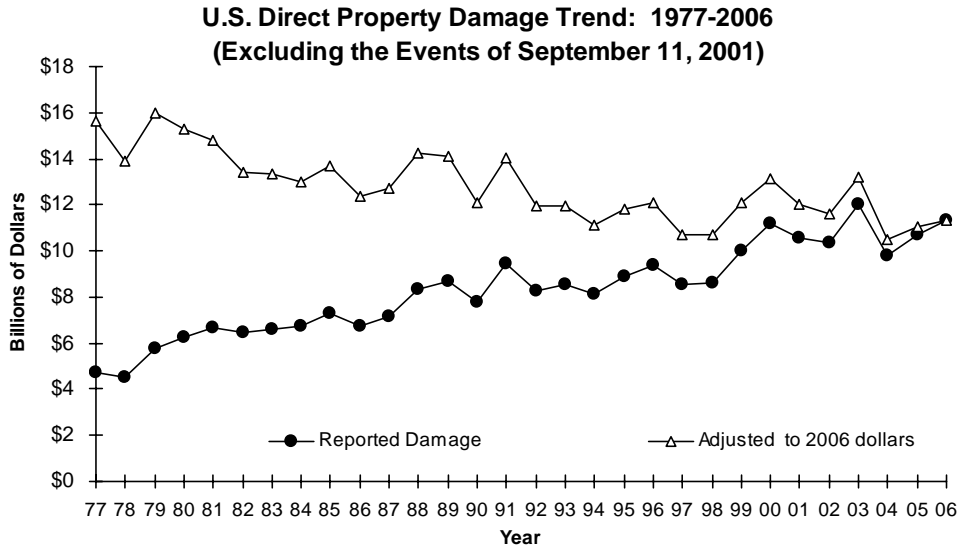
Outside and other fires reported in 2006 include:

- 82,500 outside fires involving property of value;
- 415,500 brush, grass, or wildland fires;
- 212,000 outside rubbish fires; and
- 130,500 other fires including outside spills or leaks with ensuing fires, explosions with no after-fire, and unclassified or unknown-type fires.

**Real annual dollar loss has been falling although the average loss per structure fire rose in past decades.**

Figure 9 shows that reported direct property damage from fire (excluding the events of September 11, 2001) has generally been rising. When adjusted for inflation, however, total annual fire damages were 28% lower in 2006 than in 1977. The adjusted loss per structure fire, however, was 47% higher in 2006 than in 1977.

**Figure 9.**



**Other comparative data is found in Table 1.**

Table 1 compares 2006 data with data from 2005, 1996, and 1986. Most measures show steady improvement over time. Table 2 provides a numeric summary of 2006 fires and associated losses by incident type.

These statistics were extracted from the annual reports *Fire Loss in the United States*, by Michael J. Karter, Jr. Summaries of these reports are published each year in *NFPA Journal*.<sup>®</sup> The 2006 report may be downloaded free of charge from <http://www.nfpa.org/osds>. Copies can also be obtained from NFPA's One-Stop Data Shop by calling (617) 984-7450 or emailing [osds@nfpa.org](mailto:osds@nfpa.org).

**Table 1.**  
**The U.S. Fire Problem in 2006 Compared to 2005, 1996 and 1986**

<b>Reported to Fire Departments</b>	<b>2006</b>	<b>2005</b>	<b><u>COMPARED TO</u></b>	
			<b>1996</b>	<b>1986</b>
Fire Incidents	1,642,500	Up 3%	Down 17%	Down 28%
Civilian Deaths	3,245	Down 12%	Down 35%	Down 45%
Firefighter Deaths	89	Up 2%	Down 7%	Down 26%
Civilian Injuries	16,400	Down 9%	Down 36%	Down 39%
Direct Property Damage	\$11,307,000,000	Up 6%	Up 20%	Up 69%
Adjusted for Inflation		Up 3%	Down 6%	Down 8%
Civilian Deaths per Thousand Fires	2.0	Down 14%	Down 22%	Down 23%
Civilian Deaths per Million Population	10.9	Down 12%	Down 41%	Down 55%
Property Damage per Structure Fire	\$18,390	Up 2%	Up 34%	Up 152%
Adjusted for Inflation		Down 1%	Up 4%	Up 37%

Sources:

Michael J. Karter, Jr. *Fire Loss in the United States*, (1986, 1996, 2005 and 2006), Quincy, MA: National Fire Protection Association, 1987, 1997, 2006, and 2007.

Rita F. Fahy, Paul R. LeBlanc, and Joe Molis, *Firefighter Fatalities in the United States – 2006*, Quincy, MA: National Fire Protection Association, June 2007.

Resident population was obtained from Tables 2 and 3 in the U. S. Census Bureau's *Statistical Abstract of the United States: 2007* (126<sup>th</sup> edition).

Inflation calculations were made with the Bureau of Labor Statistics Inflation Calculator which uses the consumer price index. The Inflation Calculator may be accessed at <http://data.bls.gov/cgi-bin/cpicalc.pl>.

**Table 2.**  
**U.S. Fires and Losses by Incident Type in 2006**

<b>Incident Type</b>	<b>Fires</b>		<b>Civilian Deaths</b>		<b>Civilian Injuries</b>		<b>Direct Property Damage (in Millions)</b>	
<b>Structure fires</b>	<b>524,000</b>	<b>(32%)</b>	<b>2,705</b>	<b>(83%)</b>	<b>14,350</b>	<b>(88%)</b>	<b>\$9,636</b>	<b>(85%)</b>
<i>Residential structure fires</i>	<i>412,500</i>	<i>(25%)</i>	<i>2,620</i>	<i>(81%)</i>	<i>12,925</i>	<i>(79%)</i>	<i>\$6,990</i>	<i>(62%)</i>
Home structure fires	396,000	(24%)	2,580	(80%)	12,500	(76%)	\$6,832	(60%)
One- or two-family dwellings, including manufactured homes	304,500	(19%)	2,155	(66%)	8,800	(54%)	\$5,936	(52%)
Apartments	91,500	(6%)	425	(13%)	3,700	(23%)	\$896	(8%)
Other residential structure fires	16,500	(1%)	40	(1%)	425	(3%)	\$158	(1%)
<i>Non-residential structure fires</i>	<i>111,500</i>	<i>(7%)</i>	<i>85</i>	<i>(3%)</i>	<i>1,425</i>	<i>(9%)</i>	<i>\$2,646</i>	<i>(23%)</i>
<b>Vehicle fires</b>	<b>278,000</b>	<b>(17%)</b>	<b>490</b>	<b>(15%)</b>	<b>1,200</b>	<b>(7%)</b>	<b>\$1,319</b>	<b>(12%)</b>
Highway vehicle fires	250,000	(15%)	445	(14%)	1,075	(7%)	\$982	(9%)
Other vehicle fires	28,000	(2%)	45	(1%)	125	(1%)	\$337	(3%)
<b>Outside and other fires</b>	<b>840,500</b>	<b>(51%)</b>	<b>50</b>	<b>(2%)</b>	<b>850</b>	<b>(5%)</b>	<b>\$352</b>	<b>(3%)</b>
Brush, grass and wildland fires with no value or loss involved	415,500	(25%)	*	*	*	*	*	*
Outside rubbish fires	212,000	(13%)	*	*	*	*	*	*
Outside fires involving property of value	82,500	(5%)	*	*	*	*	\$262	(2%)
All other fires	130,500	(8%)	*	*	*	*	\$90	(1%)
<b>Total</b>	<b>1,642,500</b>	<b>(100%)</b>	<b>3,245</b>	<b>(100%)</b>	<b>16,400</b>	<b>(100%)</b>	<b>\$11,307</b>	<b>(100%)</b>

\* NFPA survey does collect specific incident types for fire deaths and injuries caused by outside and other fires. Nor does it collect any dollar loss data for brush, grass, and wildland fires with no value or loss or for outside rubbish fires.

Source: Michael J. Karter, Jr. *Fire Loss in the United States during 2006*, Quincy, MA: National Fire Protection Association, September 2007.