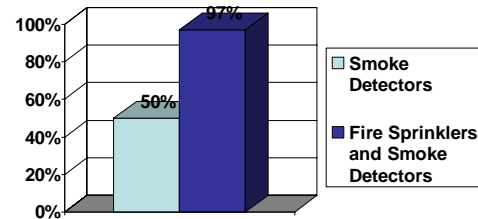




# The Case for Residential Fire Sprinklers



Chance of Survival



## Statistics

- In 2003 fire departments responded to 402,000 home fires in the U.S., which claimed the lives of 3,145 and injured another 14,075 not including firefighters.<sup>1</sup>
- 4 out of 5 deaths occur in homes<sup>1</sup>
- 2,500 children aged 14 or younger were injured or killed in residential fires (1/2 under age 5 and 70% under age 10)<sup>2</sup>
- 2,300 adults age 65 or older were injured or killed in residential fires (80% between ages 65-84)<sup>2</sup>
- Most victims of fires die from smoke or toxic gases and not from burns<sup>1</sup>
- 100 firefighters die per year, many in home fires<sup>3</sup>
- Smoking is the leading cause of fire-related deaths<sup>1</sup>
- Cooking is the primary cause of residential fires<sup>1</sup>

## Reasons for Residential Sprinklers

- Home fire sprinklers are designed to ensure a tenable atmosphere for escape<sup>9</sup>
- Fire sprinklers with smoke detectors increases chance of surviving a fire by over 97%<sup>10</sup>
- Smoke detectors aren't enough.<sup>8,10</sup> Smoke detectors are missing in 2/3 of deadly residential fires<sup>16</sup>
- Reduces property damage-controls the fire before it reaches the destructive phase
- 90% of all fires that occur in homes are quickly controlled by a single sprinkler head<sup>6</sup>
- A residential fire sprinkler system is like having a firefighter 24/7 with immediate response time<sup>10</sup>
- Will save future firefighter injuries and deaths (National average, 100 firefighters die per year, many in home fires)
- Most items will be saved
- Insurance savings (Possibly 5-15%)<sup>8</sup>
- Today only 2-4% of homes are equipped with fire sprinklers



## Common Questions

- ***Do residential sprinklers really save lives?***

The evidence on this point is overwhelming. There has not been a single residential fire fatality in a residence with a sprinkler system in either Napa, California or Cobb County, Georgia since the inception of those programs. There has not been a single fire fatality in Prince George's County, Maryland in a building with a sprinkler system<sup>13</sup>. Scottsdale, Arizona credits sprinkler systems with saving up to 13 lives since the ordinance passed in 1985.<sup>14</sup>

- ***Aren't residential fire sprinkler systems expensive?***

Cost-approximately \$1.00-\$1.50 per square foot<sup>8</sup> (or 1-1 ½% of total building cost).<sup>5</sup>

*Compare the Cost:*

- About the price of upgrading carpet<sup>13</sup>
- May be many times less than landscape sprinklers
- Amortized over 30 years approx. \$3-4/month-about the price of a Happy Meal<sup>7</sup>

The cost actually goes down when sprinklers are mandated  
Multipurpose plumbing/fire sprinklers systems decrease cost<sup>11</sup>

- ***Aren't fire sprinkler systems expensive to maintain?***

No. There is virtually no maintenance. The owner should:

1. Monthly-Visually inspect all sprinklers to insure against obstruction of spray.  
Sprinklers should never be painted.
2. Monthly-Inspect all valves to ensure they are open\*
3. Annually-Verify water flow alarm activation\*

\* not required for multipurpose systems

- ***Aren't sprinkler heads ugly?***

There are now a variety of residential sprinkler heads including concealed heads, which are hidden until they drop down upon activation. Also, all residential sprinklers can be factory painted to match ceiling and wall colors.



- ***Aren't there inherent built-in features that make newer houses safer?***

Whether or not a house is new ignores the fact that the contents are the fuel load that drives the fire. Modern furniture presents a huge fuel load, loaded with materials such as polyurethane foam which burns like gasoline. While some features make newer structures safer, other features do not. Smoke detectors can be disabled. Drywall has some fire resistant features, however, modern truss and composite I-joist construction, when exposed to fire, can actually lead to structural failure faster than conventional lumber.



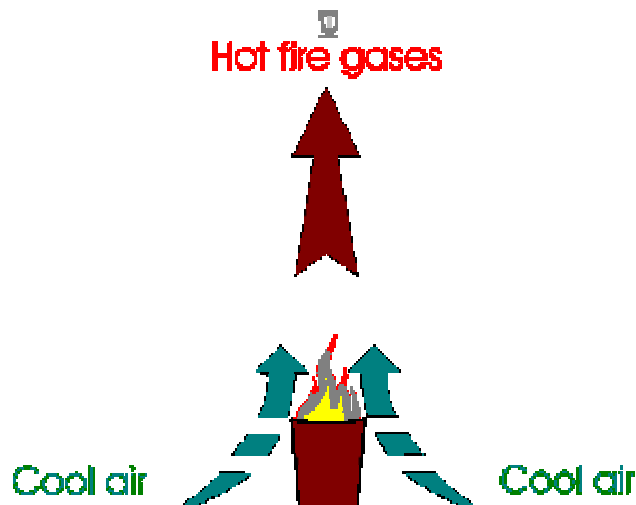
- ***Don't smoke detectors accomplish the same thing?***

No. While functioning smoke detectors can save lives, it has been estimated that at least 50% of detectors are removed, disabled or not powered. Smoke detectors are missing in 2/3 of deadly residential fires.<sup>16</sup> If a fire occurs while you are sleeping and you have no warning, the CO puts you into a deeper sleep until you die. If you are awakened by a working smoke detector during a fast growing fire, you might have a matter of seconds between when the detector alarms and the atmosphere becomes unsurvivable. During the escape, the smoke is often so heavy that you can not see your hand in front of you. You must crawl in darkness to safety. In addition, modern studies have been conducted which show that children will actually sleep through a sounding smoke detector. Without help, they will perish. Residential sprinklers are designed to control the fire before the atmosphere becomes unsurvivable. You are virtually guaranteed to survive a fire with residential fire sprinklers.<sup>10</sup>

- ***What about flooding my house?***

The scenes in Hollywood showing all the sprinkler heads activating at the same time throughout, flooding an entire occupancy, are misleading. It takes heat to set a sprinkler head off, 155-200 degrees F. 93% of all fires that occur in homes are quickly controlled by a single sprinkler head<sup>12</sup>, flowing 13-25 gallons per minute. Without fire sprinklers, fire continues to grow exponentially. The fire department arrives 5-10 minutes later, and puts hundreds to thousands of gallons on the out-of-control fire. Much more water is put into the suppression efforts with the delayed response, and the uncontrolled fire destroys much of the contents of the house. Tests conducted by a Los Angeles Fire Department and the US Fire Administration showed that damage caused by water in a sprinklered fire is substantially less than damage caused by fire department hose streams in an identical unsprinklered fire and far less than damage caused by a fire which escapes early detection and suppression<sup>13</sup>. In a residence equipped with fire sprinklers, almost all the items can be saved.

Loss records of Factory Mutual Research show that the probability of a sprinkler discharging accidentally due to a manufacturing defect is only 1 in 16 million sprinklers per year in service. Sprinkler systems are under the same pressure as the plumbing system but are tested at 2-3 times higher pressure during installation<sup>13</sup>.



## Benefit to Cities

- Safer community (less injuries and deaths)
- Less property damage
- Less risk to firefighters
- Saved \$\$\$-Less overtime for suppression and investigation efforts
- Less apparatus required for extended durations

## Benefits to Homebuilders

- Possible construction tradeoffs



## Case Studies

1. Scottsdale, AZ (15-year study)<sup>14</sup>
  - Over 50% of houses sprinkled
  - 13 lives saved
  - Over \$20 million in property loss prevented
  - Average fire loss was:
    - \$2,166 in residences equipped with fire sprinklers
    - \$45,019 in non-fire sprinklered residences
2. Prince George's County, MD (Residential Sprinkler, 1992)<sup>15</sup>

• Residential Sprinkler System Reported Incidents:	121
• Residential Sprinkler System Reported Fire Incidents:	117
• Residential Sprinkler Activations:	143
• Total Fire Loss:	\$ 401,220.00
• Potential Fire loss:	\$ 38,230,000.00
• Reported Lives Saved:	154
• Injuries Reported (All minor in nature):	7

## Videos/Slide Shows



HFSCtimeline.exe



sprinkleranimation.exe



WaterAnimation.exe

[Tale of Two Families](#)

[Oregon HFSC Slide Show](#)

## **References:**

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