

Emerging Trends in Fire Safety Engineering in other countries

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Objectives

- * Challenges and trends in a constantly changing world, looking at drivers and systems
- * Guiliermo Rein Study 2016 – 72 experts replied
- * Industry expectations
- * Facts

Top drivers

- * Ageing and growing population
- * Better understanding of fire
- * Climate Change
- * Developing economies
- * Education
- * Energy efficiency and infrastructure
- * Fire service
- * Insurance companies
- * Interface with technology
- * Novel building architecture
- * Performance based design

Systems most affected

- * Design and architecture of new buildings
- * (Timber buildings)
- * Building facades
- * Batteries for energy storage
- * Tunnels and underground
- * Smart firefighting, smart buildings
- * Detailed experiments for state-of-the-art model validation
- * Bushfires
- * Flame retardancy
- * Photoelectric solar panels
- * Fiber composite panels, wind turbines, biomass fuels, IOT, cloud computing

Industry expectations

- * Flexibility in building design and construction (PBC)
- * Reduced costs for developers
- * Reduced cost of insurance
- * Business continuity for the owners and operators

Public expectations

- * Safe buildings
- * The changing demographics of society
- * New materials and technology that are being introduced Increasing concern about sustaining natural resources.

NFPA “Next 25 Years”

- * Assessing the hazards of changing building furnishings, storage contents, and configurations;
- * Developing performance criteria for advanced fire detection and suppression systems;
- * Determining performance issues for advanced firefighting equipment and tactics to ensure that they meet the real needs of first responders;
- * Evaluating the effectiveness of fire and electrical safety systems as they age in place;
- * Developing guidance on the fire and electrical safety infrastructure needed for alternative fuels and energy sources;
- * Analyzing fire safety strategies for the growing aging and disabled population; and
- * Developing fire protection strategies within the context of environmental considerations

Smart systems integration

- * IOT - Soft target for cybercrime? This is now biggest issue

Fire trends and impacts

An Analysis of Fire Service Trends and Impacts

By Rick Stoll - VERISK

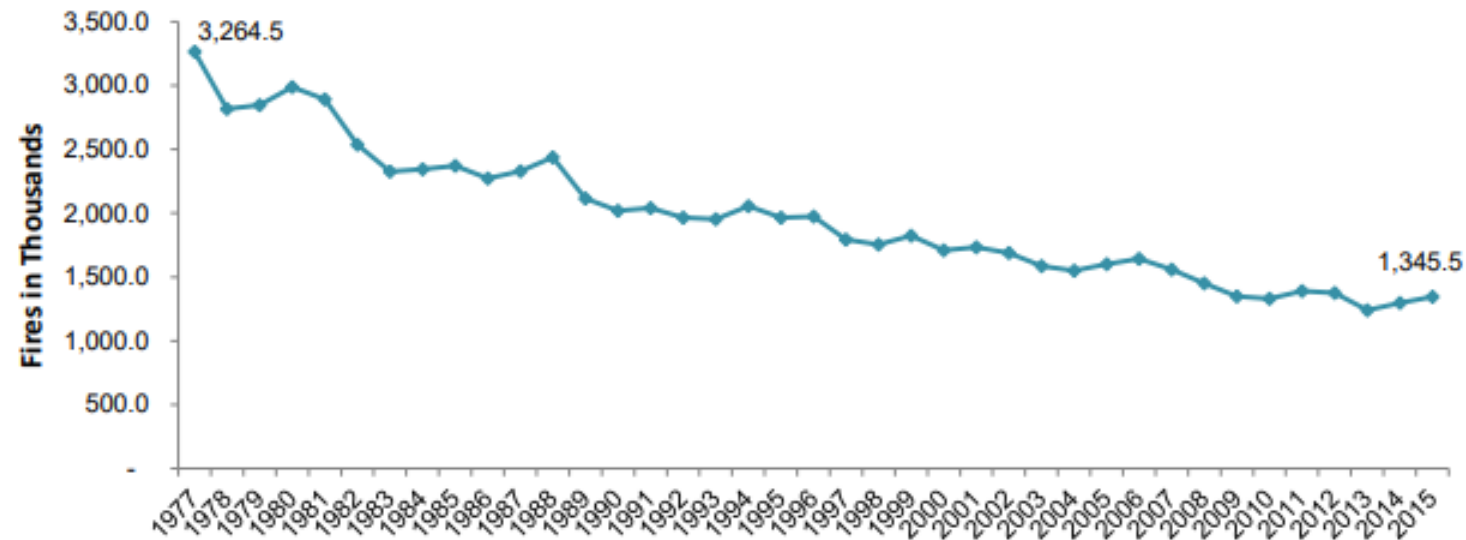
- * Significant reduction in fire frequency
- * Drastic increase in rate of fire burn (Plastics in construction?)
- * Greater risk of building collapse (The Address Downtown)
- * Improvements in available technology (detection, suppression, fire and rescue services)

Fire incident trends

(Trends and Patterns of U.S. Fire Loss January 2017 Marty Ahrens)

Figure 1 shows that reported fires fell 59% from 3,264,500 in 1977 to 1,345,000 in 2015. Table 1 shows that fires rose 4% from 2014 (1,298,000 fires) to 2015.

**Figure 1. U.S. Fire Incident Trends
1977-2015**



Rates of reported fires per 1,000 population fell even more sharply than total fires over the past three decades. According to the U.S. Census, the resident population of the US grew 46% from 1977 to 2015. Figure 2 shows that the rate of reported fires per 1,000 population fell 72% from 14.8 in 1977 to 4.2 in 2015.

Fire incident trends

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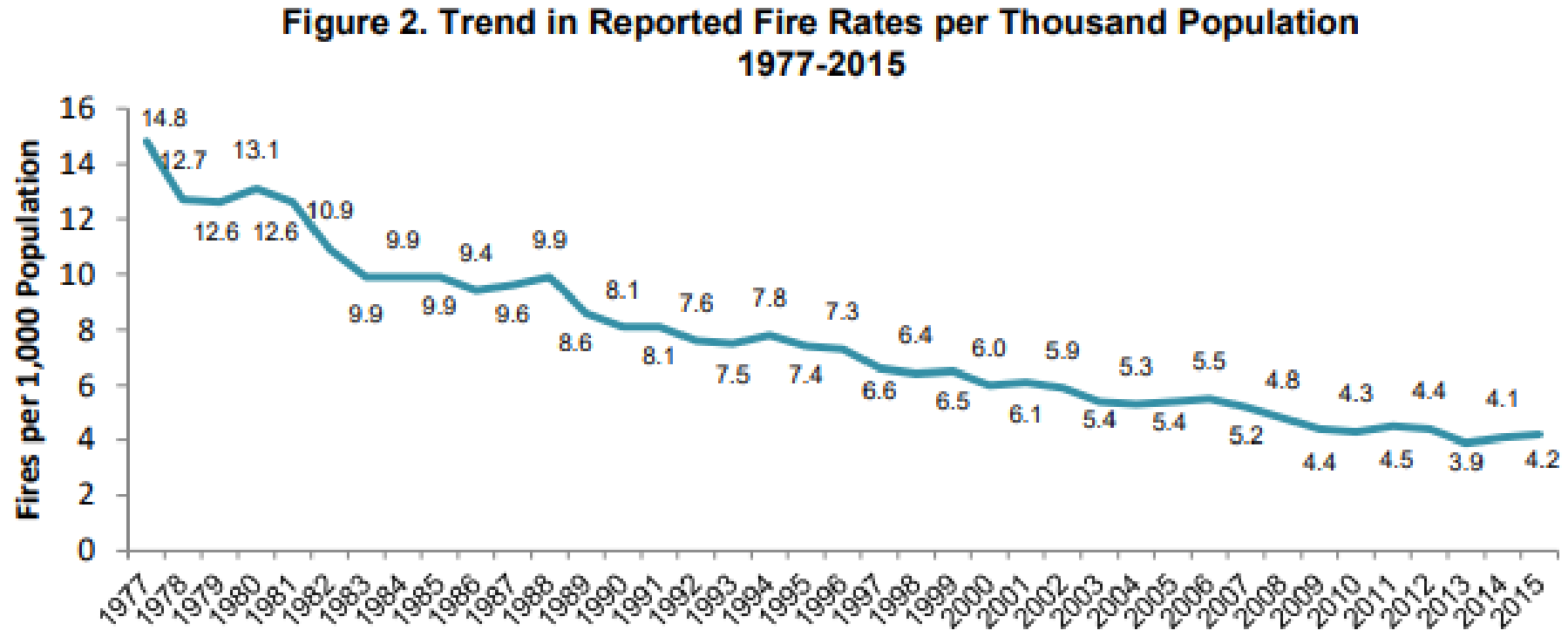


Figure 3. Reported Fire Incidents in 2015 by Major Property Class or Incident Type

Home Sprinklers

- * While only 5 percent of American homes have sprinklers, they reduce the fire death rate by 82 percent and property damage per fire by 68 percent (U.S. Experience with Sprinklers 2013; John R. Hall Jr.)