

Big Data in the Fire Service

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By Paul C. Darley

“Big Data” is a term used a lot these days. It basically describes the large volume of data—both structured and unstructured—that inundates us on a day-to-day basis.

But, it's not the amount of data that's important; it's what organizations do with the data that matters. In the business world, big data can be analyzed for patterns and insights that lead to better decisions and strategic business moves. In our world of firefighting, big data can be used to save lives and property while making fire departments more operationally efficient.

I often hear people in the fire service say, “There is so little data available to make decisions.” This actually couldn't be further from the truth. You just need to know where to look and then slice and dice the data to find trends.

Fire Apparatus Manufacturers' Association (FAMA) member companies may use data from the Web sites below to develop products that are intended to improve efficiencies and effectiveness of firefighting equipment. Additionally, FAMA has a host of useful data intended to improve the safety of our firefighters and help make decisions when procuring certain firefighting equipment.

Must-Visit Web Sites

If you want to conduct some research on megatrends in the fire service, there are three must-visit Web sites.

- National Fire Incident Reporting System (NFIRS). This system (<https://www.nfirs.fema.gov>) was created by the National Fire Data Center of the United States Fire Administration (USFA), a division of the Federal Emergency Management Agency (FEMA), after the 1973 report, “American Burning.” It is the central collection point to gather and analyze information on the magnitude of the nation's fire problem as well as detailed characteristics and trends. Its uniform data reporting methods assist state agencies in developing and reporting data. Roughly 23,000 of the estimated 30,000 fire departments in the United States report their calls to NFIRS. There is generally a six-month lag as reporting comes through coordinated state efforts.
- **United States Fire Administration.** Information from NFIRS is organized by the USFA (<https://www.usfa.fema.gov/data/statistics/>) so that it is discernable and actionable. You can download just

about any data relative to U.S. fire service statistics. At this Web site, you can quickly navigate to the data and statistics sections, which include everything from the causes, types, and number of fires to the damage caused and the socioeconomic demographics affected. There are also detailed reports ready for you to download.

- **National Fire Protection Association.** The National Fire Protection Association (NFPA, <http://www.nfpa.org>) actually conducts its own survey of U.S. public fire departments each year, and the results are similar to what the USFA reports. In September each year, the NFPA publishes its Annual Fire Loss Report. I literally check the Web site daily each September awaiting its release. When you go to the Web site, search for the “2015 Fire Loss Report.” While there, spend some time in the research and library areas.

What Do the Data Show?

When you view these Web sites, the first thing that jumps out is the declining total number of fires and fire fatalities. This is goal one for us in the fire service-whether you are a firefighter or someone building lifesaving equipment. For example, the USFA data show that there were 1.602 million fires in 2005 compared with only 1.24 million in 2013-a decrease of 23 percent.

As you dive deeper into the data, you will discover that while total reported fires have continued to decline over the years, it is primarily because of a drop in the number of vehicle fires as well as outside and unclassified fires. The decline in structure fires has been much smaller. Vehicle fires accounted for 15 percent of reported fires.

According to the 2015 NFPA Fire Loss Report, the number of reported fires was up 3.7 percent compared with 2014, with 1.345 million fires. In 2014, structure fires accounted for 38 percent of reported fires, with home structure fires representing 28 percent of the total. Home structure fires caused 78 percent of all deaths and represented 59 percent of total direct property damage. The fires today are larger and more expensive than those in the past. According to the data, from 1977 to 2015, excluding the events of September 11, 2001, the average loss per structure fire, when adjusted for inflation, was up 39.5 percent.

According to the same report, fire departments in the United States responded to more than 33.6 million calls in 2015. Of those calls, 64 percent were medical aid response, 16.8 percent were other response calls, 7.5 percent were false alarms, 4.4 percent were for mutual aid, and 4.0 percent were for fire incidents.

Other Fire Data Web Sites

Other Web sites you can use as a resource for fire data include the following:

- **Underwriters Laboratories (UL).** UL (<http://ulfirefightersafety.com>) is conducting research on everything from hover board fires to structural firefighting. It has published its results on this Web site, including posting its full-scale experiments on structural firefighting (June 17, 2016). Look for its new structural firefighting research paper to be released in April 2017.

- **Firefighter Safety Research.** This site (<http://modernfirebehavior.com/>) is a joint effort between firefighterclosecalls.com and UL and talks to the practical street experiences of firefighting. You will find great tips here.
- **National Institute of Standards and Technology (NIST).** This Web site (<http://www.nist.gov/fire/technology.cfm>) has data relative to firefighting research. NIST is completing its testing on compressed-air foam systems and expects to release it shortly.
- **University of Illinois (UI).** UI (<https://www.fsi.illinois.edu/content/research/>) is conducting a lot of testing on the impact of firefighting as it relates to everything from dealing with heat stress to cardiovascular issues to cancer. Here's a prediction: You are going to hear a lot more about the effects of cancer.
- Other Web sites with a lot of great data include the International Association of Fire Chiefs (www.iafc.org), National League of Cities (www.nlc.org), National Volunteer Fire Council (www.nvfc.org), and Fire Apparatus Manufacturers' Association (www.fama.org).

Market Data

The market for new fire apparatus hit its high point in 2008, when more than 5,500 new fire apparatus were sold in North America. As the recession hit in 2009, municipal budgets were among the hardest hit. With fire departments reigning in their budgets and avoiding capital expenditures, the market for new fire apparatus sales in North America hit a low in 2011-roughly 40 percent below the peak!

Since that time, the market has shown some significant signs of improvement. In 2015, the market bounced back up with sales of new fire apparatus just below 4,500 units in North America. Hopefully, this market will continue to grow as our departments try to meet the challenging needs of their constituents.

FAMA is committed to the manufacture and sale of safe, efficient emergency response vehicles and equipment. FAMA urges fire departments to evaluate the full range of safety features offered by its member companies.

PAUL C. DARLEY is chairman, CEO, and president of W.S. Darley & Co. He is a past president of the Fire Apparatus Manufacturers' Association (FAMA) and served on the board of directors of the Fire and Emergency Manufacturers and Services Association (FEMSA). He has visited fire services in more than 80 countries. He has a bachelor's degree in marketing and finance from Marquette University and a master's degree in business administration from Northwestern University's Kellogg School of Management.