FIRE APPARATUS MANUFACTURERS' ASSOCIATION

The Fire Apparatus Industry: An Update

(Report V3)

Developed By: Sage Policy Group, Inc. for the Members of FAMA

Sage Policy Group, Inc.

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The Fire Apparatus Industry: An Update

Submitted by:

Sage Policy Group, Inc.

Submitted to:

The Fire Apparatus Manufacturers' Association (FAMA)

March 2020

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The Fire Apparatus Industry: An Update

Executive Summary

- Persistent and Complete Recovery Remains Elusive

The Fire Apparatus Manufacturers' Association (FAMA) tasked Sage Policy Group, Inc. (Sage) with organizing and analyzing FAMA data in order to generate insights regarding current industry trends and likely future performance. There are two key questions that this analysis endeavors to answer:

a. Why has the North American firefighting fleet recovered so slowly in terms of units book in recent years despite the strong performance of the overall U.S. economy?
b. What can the industry expect in light of economic forecasts, capital budgeting, the age of the current fleet, and known demographics?

The market for new fire apparatus achieved its peak during the 2006-2008 period when more than 6,000 new apparatus were booked in North America. As the Great Recession began to take its toll, municipal budgets were devastated and fire departments were required to truncate their budgets and forestall capital expenditures. The impact was gradual and grinding as opposed to sudden. Sales did not attain a cyclical nadir until 2012, three years after the recession ended.

The market has generally improved since, but complete recovery remains elusive and performance has been erratic. Recent data indicate that units booked declined 9.0 percent during 2019's final quarter after increasing by more than 25 percent during the third. Units booked were up 1.7 percent on a year-ago basis during last year's fourth quarter, but sales remain low by historic standards. Average sales during Q1:2019-Q4:2019 were 0.5 percent below the quarterly average observed over the past 16 years.

The study team identified four primary factors explaining the lack of complete recovery despite more than a decade of uninterrupted economic recovery/expansion:

1. State and local governments are collectively taking on less debt to finance capital expenditures in part because of rising Medicaid expenditures and still underfunded pensions. Accordingly, between 2007-2017, total fire protection capital outlays declined 1.0 percent annually after rising at a 4.1 percent annual rate during the prior decade;
2. Federal Assistance to Firefighters Grants (AFG) program funding has shrunk dramatically since FY2009. That year, grants totaled more than $500 million. By FY2018, grant funding stood at approximately $315 million;
3. There have been sharp declines in units booked per 100,000 housing units in parts of the American Midwest, South, and Northeast as many shrinking communities have lost the financial capacity to re-invest in fire safety and emergency response;
4. Many communities do not have fire safety equipment replacement plans. In lieu of defined strategies, many communities apply for federal grants. Waiting for federal monies can result in years of under-investment in firefighting technologies and deterioration in responsiveness, reliability, and capacity.

- Looking Ahead

The most likely outcome is for units booked to expand over the next few years, with faster growth registered in communities recently ravaged by wildfires and/or those associated with surging metropolitan area populations (e.g. Los Angeles, Dallas, Nashville, Phoenix). While state and local government finances have generally improved recently, many state/local budgets have tilted heavily toward other priorities (e.g. education) and that is unlikely to change.

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Introduction

The Fire Apparatus Manufacturers' Association (FAMA) tasked Sage Policy Group (Sage) with analyzing FAMA and other data in order to generate insights regarding observable industry trends and likely future performance. The report is organized as follows:

1. A discussion of the performance of FAMA members relative to historic norms along key dimensions like orders/sales;
2. A discussion of FAMA's State of the Fire Service (SOFS) and Industry Outlook surveys;
3. An analysis of the condition of the U.S. firefighting fleet;
4. An identification of key economic, demographic, and policy factors shaping performance;
5. An economic outlook.

- Two Primary Research Questions Addressed

There are two key questions that this analysis endeavors to answer:

a. Why has the North American firefighting fleet required such a lengthy period to recover in terms of units booked in the aftermath of the Great Recession?
b. What can the industry expect in light of economic forecasts, capital budgeting, the state of the fleet, and known demographics?

There are a number of candidate explanations for industry performance, including the slow and erratic pace of economic recovery during its early years, concomitantly slow recovery in public revenues, and a perception that existing equipment has not yet sufficiently depreciated to justify significant new investment in additional capital. While these explanations are plausible, there exist reasons to at least partially dismiss them.

First, while the economic recovery was not especially robust during much of its initial 8 years, it has been protracted. As of this writing, the U.S. economy has completed nearly 11 years of economic expansion, rendering it the lengthiest in American history. While output growth has been erratic, the nation has created about 22 million jobs since the end of the downturn, helping to push unemployment to a recent 50-year low of 3.5 percent. Aggregate societal wealth has surged as a result of a combination of economic growth and unusually low interest rates, prompting both stock and housing values to surge.

The pace of Canadian economic growth has generally been softer than that in the U.S., but after a period of economic softness during the middle years of the prior decade, due in large measure to plummeting commodity prices, the Canadian economy has begun to expand more aggressively of late. The acceleration in economic growth has been particularly pronounced in large metropolitan areas like Toronto, Montreal, and Vancouver, which tend to be less dependent on commodity prices than Calgary or other energy-centric markets.

In short, the broader economic context in which the North American fire apparatus manufacturing segment operates has become quite positive. While there are concerns regarding the future of the global economy given episodes such as coronavirus and massive levels of public and private indebtedness, the persistence of economic growth would leave one to conclude that the North American fire apparatus industry should presently be thriving. The question is, "is it?".

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I. FAMA Industry Performance

Current & Historic Performance

The market for new fire apparatus achieved its peak during the 2006-2008 period when more than 6,000 new apparatus were sold (measured as units booked) in North America (FAMA members). As the Great Recession began to take its toll in earnest after the failure of Lehman Brothers on September 15, 2008, municipal budgets were devastated and fire departments were required to truncate their budgets and forestall capital expenditures.[1]

The impact was gradual and grinding as opposed to sudden. Sales did not reach a cyclical nadir until 2012, three years after recession's end. By that point, bookings were down 35 percent from their pre-established peak. This is consistent with the notion that the condition of public finances tends to lag the performance of the overall economy.

Exhibit 1. FAMA Members' Units Booked: Recent Historic Highs & Lows

	Time Period	Units Booked
Low	2012 Quarterly Average	982
Highs	2006 Quarterly Average	1,529
	2008 Quarterly Average	1,507

The market has generally improved since, but complete recovery remains elusive. While total sales of new fire apparatus in North America (measured in terms of units booked) had been begun an ascent in 2012, they declined 11 percent in 2016 itself. In 2017 units booked rebounded, growing by 9.0 percent. Since then the volume of units booked has grown between 1.5-2.0 percent annually.

Recent data indicate that units booked declined 9.0 percent during 2019's final quarter after increasing by more than 25 percent during the third. Units booked were up 1.7 percent from a year ago during last year's fourth quarter, but sales remain low by historic standards. Average sales during Q1:2019-Q4:2019 were 0.5 percent below the quarterly average observed over the past 16 years.

This seems remarkable given not only the improved performance of the economy and state/provincial/local budgets, but also given the significant attention given to wildfires in California and elsewhere in recent years. Moreover, with more North Americans aging into their 70s, 80s, and 90s, the demand for emergency response of various types is on the rise. One might think that that by itself would have triggered more aggressive recovery in units booked by FAMA members.

[1] FAMA. "Big Data in The Fire Service" https://www.fama.org/forum_articles/big-data-fire-service/.

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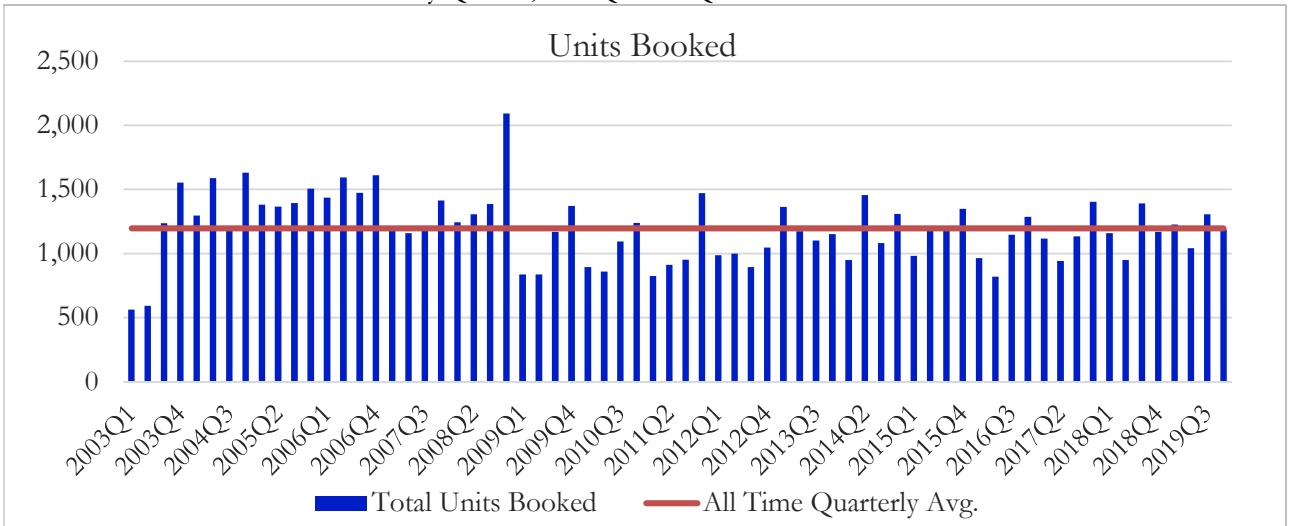
Exhibit 2. Total Units Booked by Quarter, 2003Q1-2019Q4



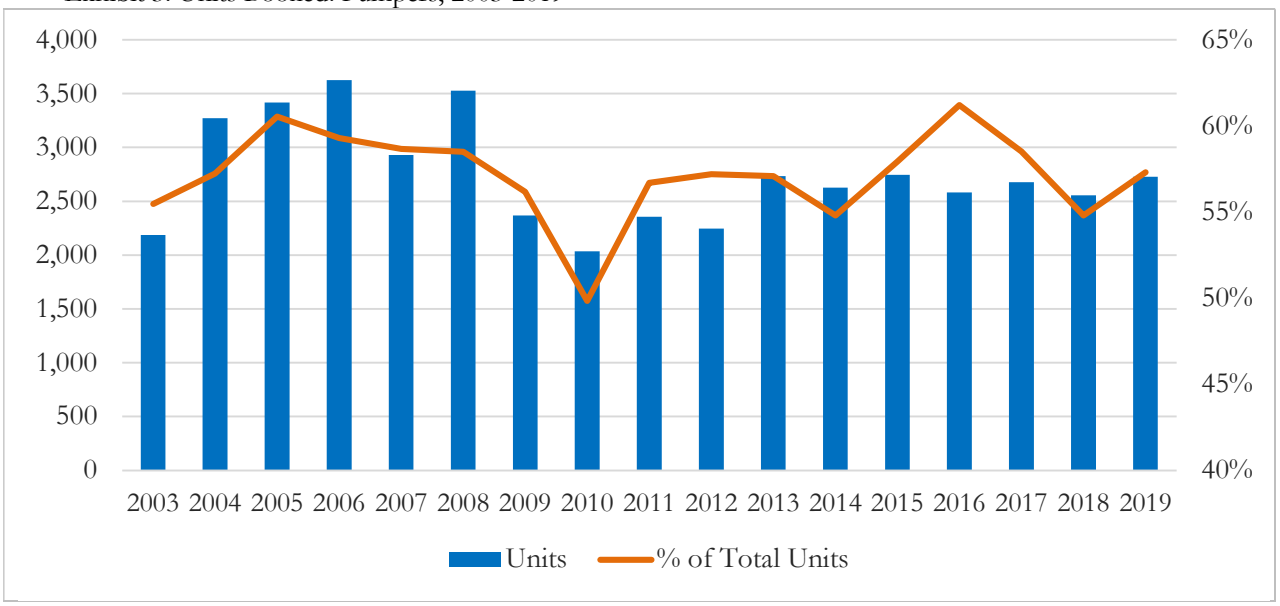
	2012 Low	2006 High	2008 High	All Time Q Avg.
Current Quarter vs.	21.1%	-22.2%	-21.1%	-0.7%

Source: FAMA; Sage

Vehicle Class

Pumpers represent the majority of sales, historically around 57 percent of all units booked. There has been a declining sales trend for pumpers overall, however, with sales down 2.3 percent annually on average from 2008-2019 (compound annual growth rate). After experiencing a compound annual growth rate (CAGR) of -5.0 percent from 2008-2013, pumpers recovered slightly and grew at a 0.8 percent CAGR from 2014-2019. Pumper sales grew by 6.8 percent in 2019.

Exhibit 3. Units Booked: Pumpers, 2003-2019



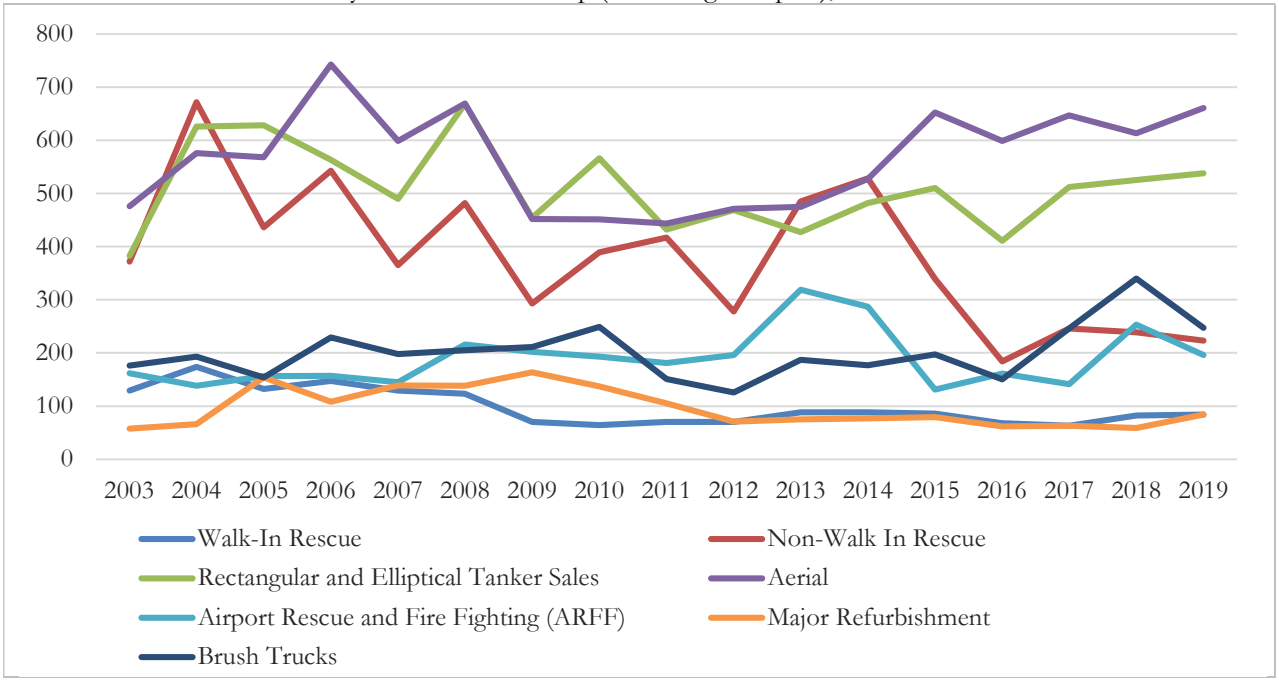
Source: FAMA; Sage

Aerial apparatus, rectangular and elliptical tankers, and non-walk in rescue collectively represent the next largest source of sales. Brush trucks and aerial apparatus are the only categories to experience significant growth in sales in recent years, with units booked expanding 6.9 percent and 4.6 percent annually on average from 2014-2019 (CAGR).

Rectangular and elliptical tanker sales have grown modestly, experiencing a 2.2 percent annual growth in booking activity during the 2014-2019 period. Within that category, rectangular tankers have far outpaced elliptical tankers. Elliptical tankers have declined from around 46 percent of tanker sales in 2003 to just 9.5 percent of tanker sales in 2019, while rectangular tankers have grown from a market share of approximately 54 percent to more than 90 percent of tanker sales. This may be because rectangular tankers can provide more capacity.[2]

Non-walk in rescue had been recovering nicely after 2012, largely in response to the shift toward firefighters responding to more medical emergencies and improving economic/fiscal performance.[3] However, sales of non-walk in rescue units declined significantly in more recent years, particularly from 2014-2016. Indeed, between 2014 and 2019, sales of non-walk in rescue units have declined from 528 units to just 223, which translates into a compound annual growth rate of -15.8 percent.

Exhibit 4. Units Booked by Vehicle Class Group (Excluding Pumpers), 2003-2019



Source: FAMA; Sage

[2] FAMA. "Changes in Fire Apparatus Now and in the future". https://fama.org/wp-content/uploads/2015/09/1441730972_55ef119c7b1f3.pdf.
[3] Ibid.

Exhibit 5. Units Booked by Vehicle Class, Compound Annual Growth Rate (CAGR) Over Select Periods

Vehicle Class	CAGR	
	2008-2013	2014-2019
Pumpers	-5.0%	0.8%
Walk-In Rescue	-6.5%	-0.9%
Non-Walk In Rescue	0.1%	-15.8%
Rectangular and Elliptical Tanker Sales	-8.6%	2.2%
Aerial	-6.6%	4.6%
Airport Rescue and Fire Fighting (ARFF)	8.1%	-7.3%
Major Refurbishment	-11.5%	1.8%
Brush Trucks	-1.8%	6.9%
Total Units Booked	**-4.5%**	**-0.1%**

Source: FAMA; Sage

The most recent full year of data indicates an overall increase in units booked of 2.0 percent across all vehicle classes. Orders for brush trucks, which had been steady for a number of years, experienced the largest decrease, falling by 27 percent from 2018 to 2019. However, orders spiked in 2018, rendering 2019's decline more pronounced. Brush trucks also experienced the fastest rate of growth in booking over the past five years among all types of apparatus. Undoubtedly, this is at least partially in response to devastating wildfires, including in California.

Wildfires are hardly novel. The Peshtigo Fire in 1871 represents the deadliest wildfire in U.S. history. That fire burned through 1.2 million acres in Wisconsin and killed 1,200 people. The Cloquet Fire of October 1918 ravaged 250,000 acres in Minnesota and proved fatal to 450 people.

This form of tragedy has continued into contemporary times. As an example, the 2013 Yarnell Hill Fire in Arizona burned through 8,400 acres and killed 19 members of the Granite Mountain Hotshots, a team within the Prescott Fire Department with a mission to fight wildfires. Violent wildfires have been ravaging California with regularity since at least 1990.

Exhibit 6. Units Booked by Vehicle Class, 2018 v. 2019

Vehicle Class/Units Booked	2018	2019	2018 v. 2019	
			Net	%
Pumpers	2,556	2,729	173	6.8%
Walk-In Rescue	82	84	2	2.4%
Non-Walk In Rescue	239	223	-16	-6.7%
Rectangular and Elliptical Tanker Sales	525	538	13	2.5%
Aerial	613	661	48	7.8%
Airport Rescue and Fire Fighting (ARFF)	253	196	-57	-22.5%
Major Refurbishment	59	84	25	42.4%
Brush Trucks	340	247	-93	-27.4%
Total Units Booked	**4,667**	**4,762**	**95**	**2.0%**

Source: FAMA; Sage

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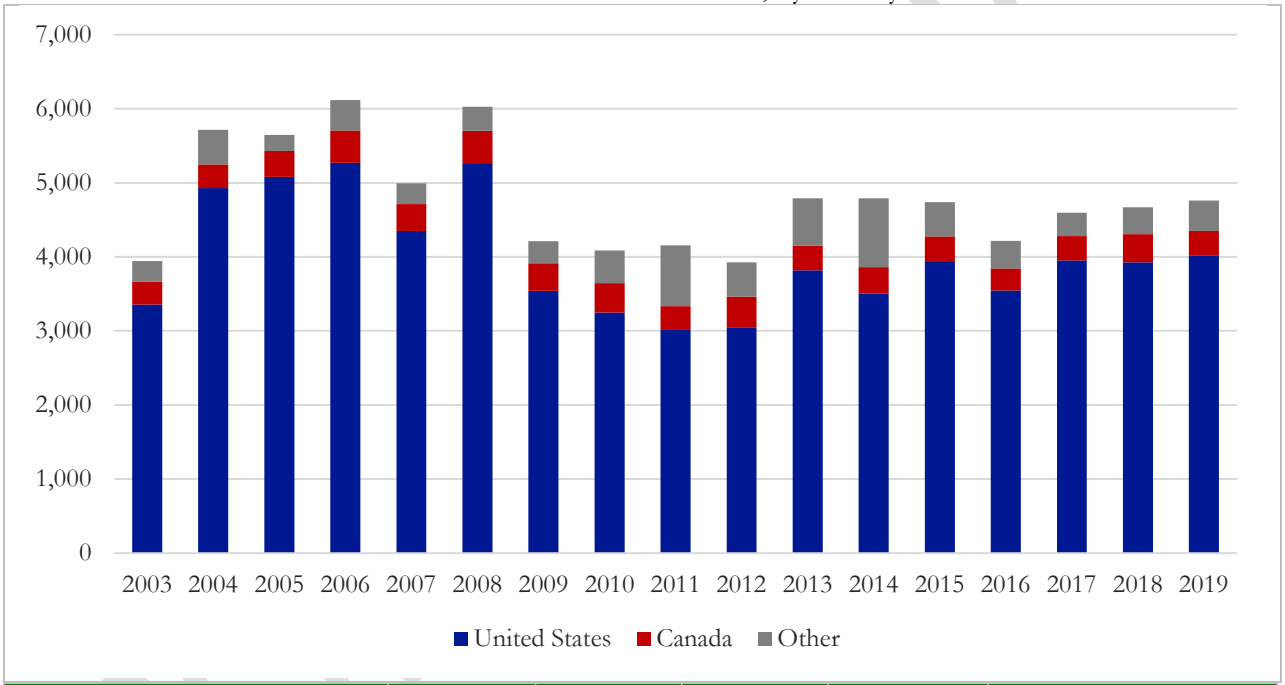
State, Provincial & Regional Trends

Given the fact that the U.S. is the largest economy in the world and Canada is tenth, it comes as little surprise that the majority of sales in North America originates in the U.S. U.S. GDP was in the neighborhood of $21.7 trillion last year. Canadian nominal GDP is in the range of $1.8 trillion measured in US dollars.[4]

Sales in the U.S. have been relatively steady, growing by 2.4 percent in 2019. Canadian economic growth picked up sharply in 2017 after stumbling in 2015 and 2016. As a result, more local governments appear to feel empowered to move forward with equipment purchases. But Canadian GDP growth slowed yet again in 2018. Units booked in Canada were down by nearly 14 percent in 2019.

Exhibit 7. 2003-2019 Historic Performance: Total Units Booked, By Country

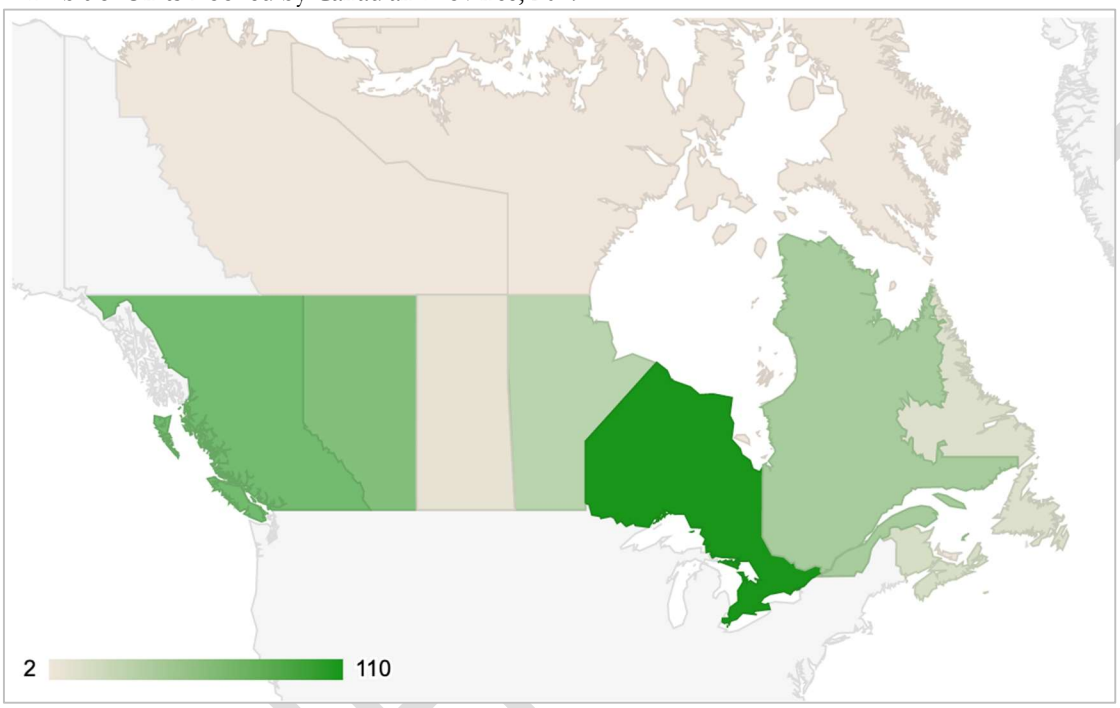


Total Units Booked	2014	2018	2019	2014 v. 2019 % Chg.	2018 v. 2019	
					Net	%
United States	3,502	3,927	4,022	14.8%	95	2.4%
Canada	362	381	328	-9.4%	-53	-13.9%

[4] Business Insider India, "Top 10 largest economies in the world 2019", 11/27/2019. https://www.businessinsider.in/top-10-largest-economies-in-the-world/articleshow/70547252.cms.

Canada. Within Canada, apparatus sales tend to be concentrated in Ontario, Alberta, and British Columbia. This is also hardly shocking given that many of the nation's primary metropolitan areas, including Toronto, Ottawa, Calgary, Edmonton, and Vancouver are in these populous provinces. Ontario represented the bulk of the decline in Canadian units booked from 2018 to 2019. Units booked in Alberta and British Columbia grew modestly in 2019.

Exhibit 8. Units Booked by Canadian Province, 2019



Source: FAMA; Sage.

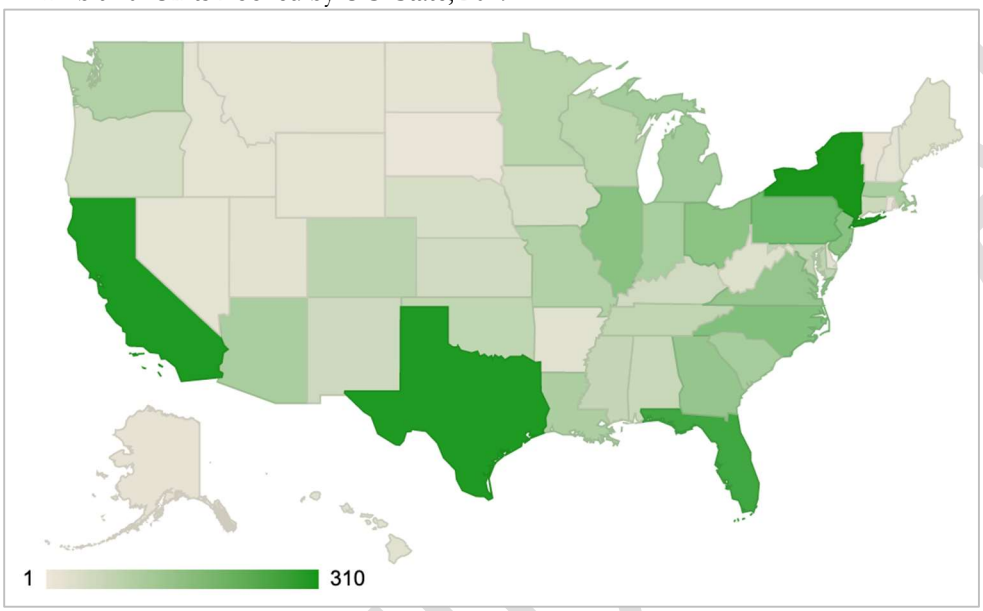
Exhibit 9. Units Booked by Canadian Province, 2018 v. 2019

State	2018	2019	2018 v. 2019	
			Net	%
Alberta	53	55	2	3.8%
British Columbia	59	62	3	5.1%
Manitoba	32	28	-4	-12.5%
New Brunswick	18	12	-6	-33.3%
Newfoundland and Labrador	2	8	6	300.0%
Nova Scotia	19	12	-7	-36.8%
Northwest Territories	2	2	0	0.0%
Nunavut	3	2	-1	-33.3%
Ontario	145	100	-45	-31.0%
Prince Edward Island	1	3	2	200.0%
Quebec	29	37	8	27.6%
Saskatchewan	14	7	-7	-50.0%
Yukon	4	0	-4	-100.0%
Total Canada	**381**	**328**	**-53**	**-13.9%**

Source: FAMA; Sage.

United States. Within the U.S., large states like California, Texas, New York, and Pennsylvania unsurprisingly represent large shares of total sales. New York, Arizona, Missouri, New Jersey, and Florida experienced the largest net increases in units booked from 2018-2019. California experienced the largest net decline. This may be due to the fact that units booked in California jumped in 2017 and 2018 and may now be returning to the more normal level observed over the past decade.

Exhibit 10. Units Booked by U.S. State, 2019



Source: FAMA; Sage

Exhibit 11. Units Booked by U.S. State, 2018 v. 2019

Rank	State	Chg. in Units Booked	Rank	State	Chg. in Units Booked	Rank	State	Chg. in Units Booked
1	New York	46	16	South Carolina	6	35	Alabama	0
2	Arizona	38	16	Virginia	6	35	Connecticut	0
3	Missouri	33	16	Wyoming	6	35	Iowa	0
4	New Jersey	32	21	Alaska	4	38	Pennsylvania	-2
5	Florida	28	21	Tennessee	4	39	Georgia	-6
6	Oklahoma	22	23	Indiana	3	40	North Dakota	-7
7	Maryland	18	23	Rhode Island	3	40	South Dakota	-7
8	Illinois	16	25	Vermont	2	42	North Carolina	-10
9	New Mexico	14	25	Wisconsin	2	42	New Hampshire	-10
10	Oregon	11	27	Idaho	1	44	Arkansas	-12
11	Ohio	10	27	Kansas	1	44	Colorado	-12
12	Mississippi	9	27	Louisiana	1	44	Michigan	-12
13	Massachusetts	8	27	Minnesota	1	44	Utah	-12
13	Texas	8	27	Montana	1	44	Washington	-12
15	District of Columbia	7	27	Nebraska	1	49	Delaware	-14
16	Kentucky	6	27	West Virginia	1	50	Nevada	-17
16	Maine	6	27	Hawaii	1	51	California	-131
							Total U.S.	**95**

Source: FAMA; Sage. Notes: 1. There were 0 units booked in 2018 for the following areas: American Samoa, Guam, and Northern Marianas. There were 2 units booked in Puerto Rico and 2 units booked in the Virgin Islands in 2018. 2. See Appendix for more data regarding units booked by state in 2018-19.

State of the Fire Service Survey

The 2018 FEMSA/FAMA annual State of the Fire Service (SOFS) survey focused on disaster preparedness, budget constraints, purchasing decisions, and staffing/retention among other issues. Among other things, the survey asked respondents to rate the impact of recent natural disasters or any mass casualty or domestic terrorism incidents faced in North America in 2017 on their departments' budgets.

The majority of departments (62%) indicated that these events had no impact on their budget. Nearly 23 percent of respondents indicated that their budgets had decreased in some measure due to these events (9.5% minimal decrease; 8.6% moderate decrease, 4.6% severe decrease). Only 15 percent of departments stated that their budgets had increased as a result of natural disasters or related incidents.

The fact that a surprisingly small proportion of departments saw their budgets increase for this reason may be because many communities did not experience a natural disaster/related emergency in 2017 (between 34-39 percent of respondents indicated their community did not experience such an event). However, among departments that did face natural disasters in their communities in 2017, only 12.3 percent indicated that they made fire, rescue or aerial apparatus purchases, 28.8 percent indicated that they made loose equipment purchases, and 11.0 percent indicated that they made personnel/staff changes in response.

Nearly 30 percent of respondents indicated that they made no changes in response to disasters experienced in their communities in 2017. This is important, because intuition would suggest a relatively tight relationship between disasters and the purchase of fire apparatus. In large measure, this appears not to be the case, perhaps because disasters result in lower tax payments from impacted parts of the community. Alternatively, it may that many policymakers promote policies that expend more resources on repairing that which has been damaged rather than expanding the capacity to respond to the next disaster/crisis.

Departments were asked if recent disasters and the evolution of the fire equipment marketplace had changed the way they purchase equipment. More than 40 percent of departments suggested that these factors had led them to purchase more through distributor sales personnel to take advantage of value-added services. Other responses included purchasing more online (28%) and participation in cooperative purchasing agreements (22%).

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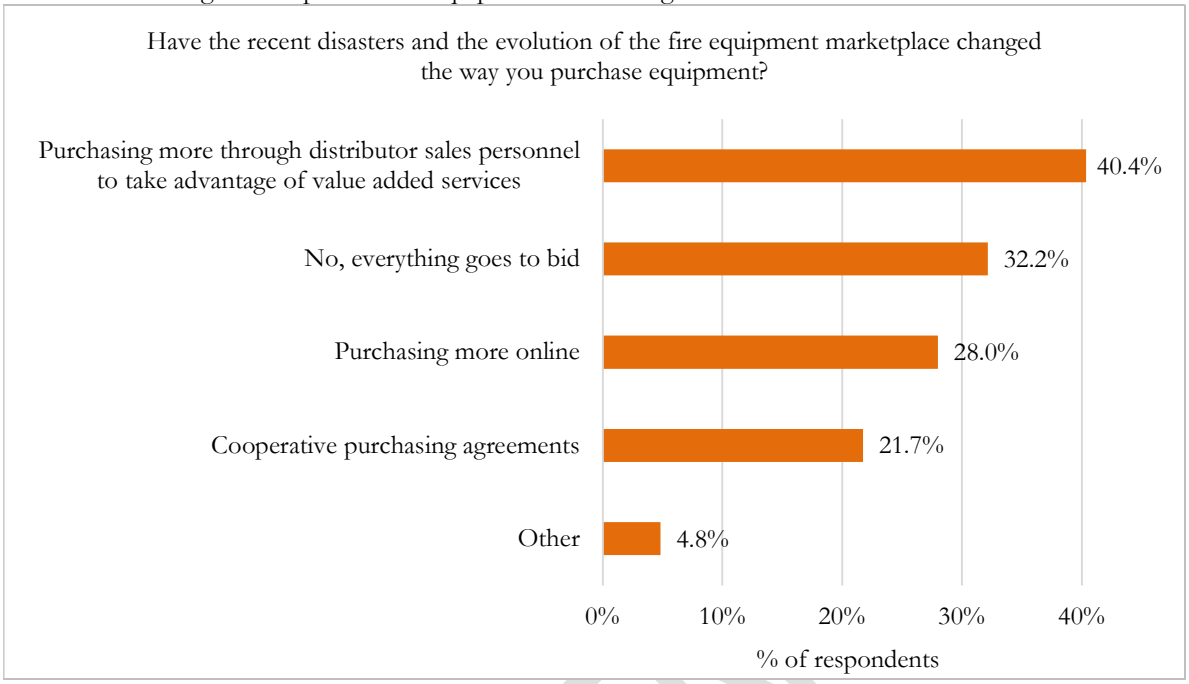
Exhibit 12. Changes in Departments' Equipment Purchasing



Source: FAMA; Sage. Note: Respondents may select more than one response, therefore the sum of individual categories does not equal 100%.

Regardless of natural disasters, 26 percent of respondents indicated that their equipment budget had increased, 22 percent said their equipment budget had declined, and 52 percent said their equipment budget was unchanged in 2018 compared to 2017. Respondents were also asked about plans for maximizing their 2018 budget purchasing capabilities. The most common response was that departments planned on delaying the replacement of equipment to maximize their 2018 budget purchasing capability (44.7% of departments). Approximately 20 percent of departments indicated that they planned on reducing the quantity of items purchased and nearly 15 percent planned to purchase less expensive alternative products.

Respondents were asked whether based on their 2017 experiences, they considered their departments' capabilities, in terms of both equipment and staff, to be adequate for the emergency response challenges they expect to encounter over the next 5 years. *More than half of respondents* replied that they did not consider their departmental capabilities to be adequate and another 14 percent were unsure. *Only 32 percent* appear to be confident that their department has the capacity to respond to expected emergency response needs in the near future.

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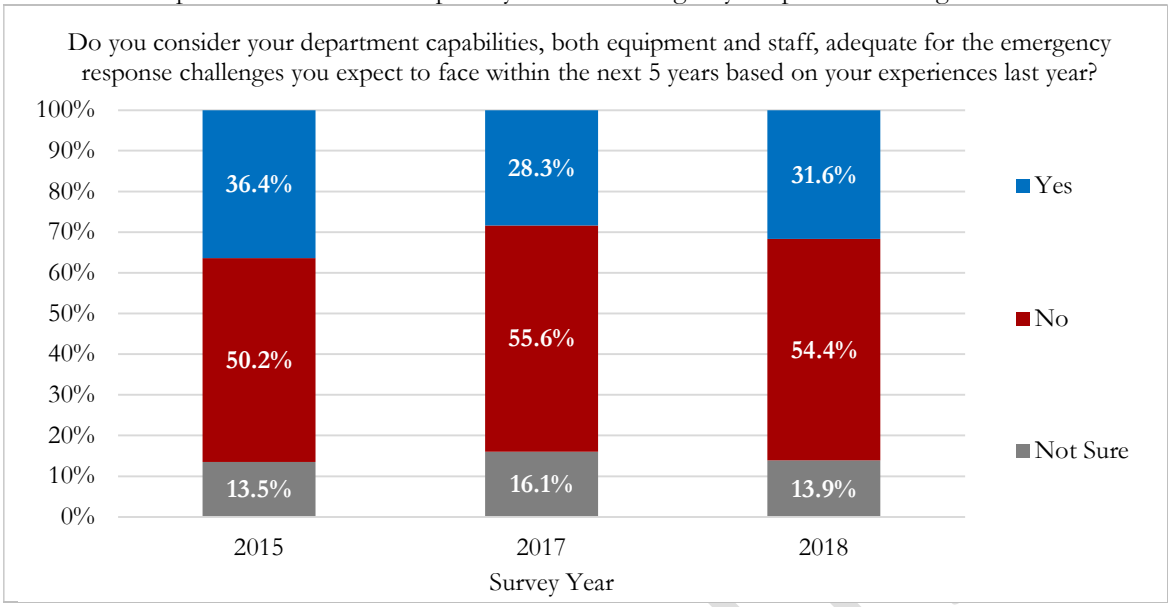
Exhibit 13. Departments' Views on Capability to Meet Emergency Response Challenges



Source: FAMA; Sage

Regarding future federal funding to support fire protection and emergency response, departments were asked if they would be willing to contact their local representative to re-authorize the AFG/SAFER grant programs (or to contact their provincial leaders to encourage them to support first responders if located in Canada). Nearly a third of respondents skipped this question.

Of those who responded, more than 80 percent said they would be willing to contact their local representatives. However, when asked whether or not they ever had done so before, only 44 percent of respondents indicated that they had contacted their local representative(s) in the past. Once again, about a third of respondents skipped the question. While that renders survey interpretation difficult, it strongly suggests that turning to local officials who represent communities at the national level is relatively rare.

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Industry Outlook Survey

Profile of Responding Departments

FAMA has been surveying fire departments regularly in recent years, thereby supplying industry stakeholders and others with an enormously valuable body of information. More than 680 fire department decisionmakers responded to FAMA's 2019 Industry Outlook survey.

The majority of FAMA respondents' organizations are volunteer/paid on-call departments (55.0%) or combination career/volunteer departments (17.1%). In general, this neatly reflects the overall U.S. fire fleet. The U.S. Fire Administration (USFA) National Fire Department Registry indicates that fire departments are predominately volunteer (70.5%) or mostly volunteer (15.9%).[5] A somewhat larger share of FAMA survey respondents are from career fire departments compared to the national average (14.5% v. 8.8% nationally).

More than 90 percent of responding departments service populations of 50,000 people or less. Departments serving communities of less than 5,000 people made up 42.7 percent of the survey responses and those serving communities of 5,001-50,000 represented 48.5 percent of responses.

Eighty percent of surveyed departments have combined front line and reserve fire apparatus fleets of less than 10 vehicles. This appears to align with statistics reported by the National Fire Protection Association (NFPA). The NFPA's Fourth Needs Assessment of the U.S. Fire Service indicates that the average fleet size per department was 7.94 vehicles in 2015.[6,7] The existence of many small fleets is consistent with the fact that most departments are volunteer and serve small-to-medium sized communities.

Respondents were also asked about the average age of their department's front-line apparatus. Almost 70 percent of respondents report having apparatus that is at least 10 years old, and 27 percent report that their department's apparatus is at least 16 years old. In 2015, approximately 43 percent of all fire department engines and pumpers in the U.S. were at least *15 years* old according to NFPA estimates.[8]

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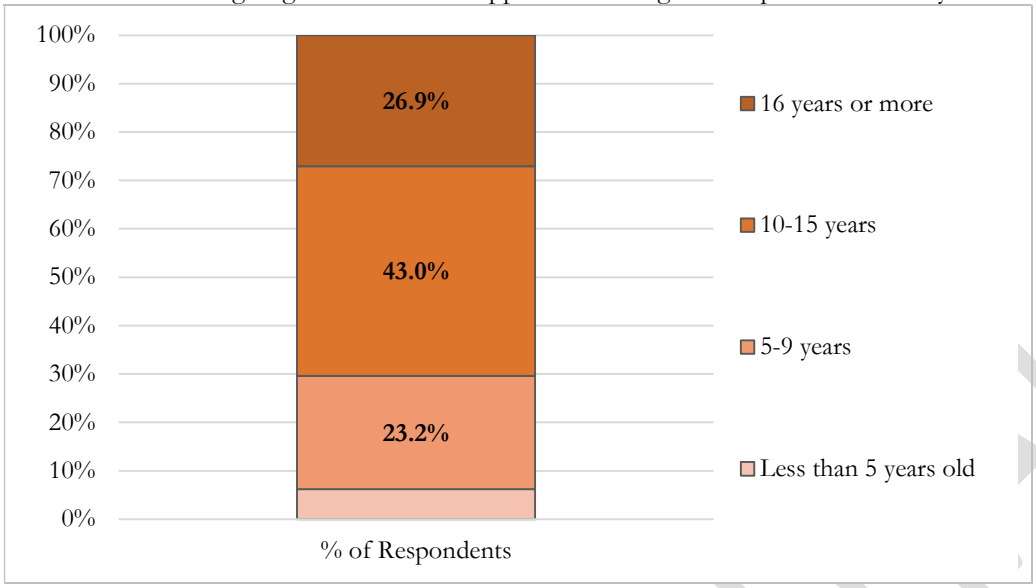
[5] U.S. Fire Administration (USFA). "National Fire Department Registry quick facts".
[6] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 124.
[7] Including in-service and reserve apparatus. Apparatus includes engines, ladders, tankers, ambulances, and other patient transport vehicles.
[8] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016.

Exhibit 14. Average Age of Front-Line Apparatus Among Fire Departments Surveyed



Source: FAMA; Sage

Apparatus Replacement Plans

Departments surveyed were asked about their apparatus replacement plans and processes. Asked whether their fire department maintains a formal or written apparatus replacement plan or process, only 37.3 percent indicated "yes". According to the NFPA, fewer than half of all departments in the U.S. have plans for replacing apparatus on a regular schedule (43% in 2015).[9]

Indeed, FAMA survey results indicate that fewer departments had apparatus replacement plans compared to previous survey years. However, the phrasing of the 2018-2019 survey question may have contributed to the decline in respondents answering "yes" to this question.

The survey questions were phrased as such:

> *Survey years 2015-2017: "Does your fire department have an apparatus replacement plan or process?"*
> *Survey year 2018-2019: "Does your fire department have a formal or written apparatus replacement plan or process?"*

It may be that more departments have replacement plans, but those plans are not necessarily formalized in an official or written way. Exhibit 15 summarizes.

[9] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 127.

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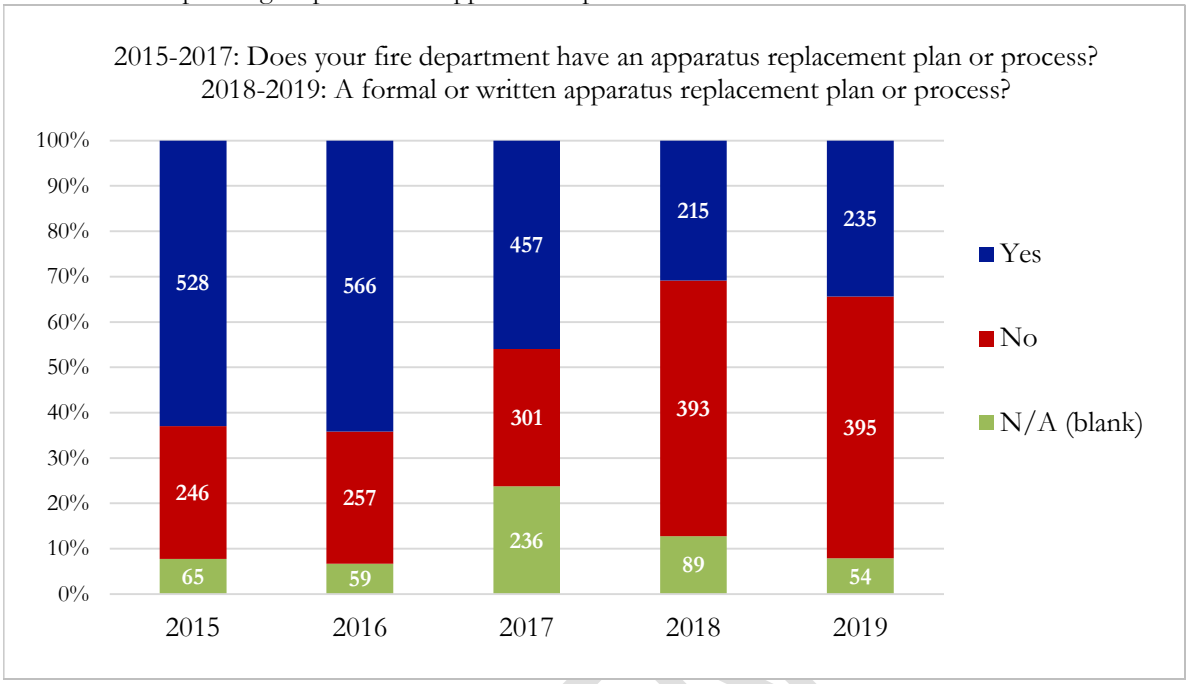
Exhibit 15. Responding Departments: Apparatus Replacement Plans



Source: FAMA; Sage

Respondents were also asked how their department determines that an apparatus is ready for replacement. Among responding departments (approximately 8 percent of respondents left this question blank), age of apparatus is the primary determinant of replacement (49.7% of respondents), second to cost of maintenance (31.9%).

The NFPA notes that while vehicle age alone is not sufficient to confirm the need for replacement, it is indicative of a potential need, which should be examined.[10] Furthermore, age and cost of maintenance are likely closely related, since the cost of maintenance presumably increases with the number of years apparatus has been in service all things being equal.

[10] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 124.

Choosing Equipment & Apparatus

Surveyed departments were asked to rank certain factors in order of how important those factors are in selecting a new piece of equipment or apparatus. Specifically, questions were asked regarding sources of information, brand loyalty, and service/manufacturer attributes.

Sources of Information. When seeking information regarding apparatus and equipment, person-to-person interaction or word of mouth appears to be the most important source of information. Respondents were asked to rank seven sources of information and more than a quarter (25.8%) ranked manufacturer/dealer salespersons as the number one most important source. Almost 44 percent of respondents ranked manufacturer/dealer salespersons as 1st or 2nd. The second most important source of information was word of mouth/colleagues, with almost 26 percent of respondents ranking this source of information as the most important and more than 41 percent ranking it as 1st or 2nd.

Trade publications and manufacturer/dealer websites appear to be less important than word of mouth information, and social media appears to be the least important source of information for departments considering new equipment or apparatus. More than half of respondents (51%) ranked social media as the least important source of information (7th) and almost 67 percent ranked it 6th or 7th. Exhibit 16 summarizes these survey findings.

Exhibit 16. Most Important Sources of Information on Apparatus & Equipment

Source	% of Respondents			
	Ranked 1 or 2	Ranked 3-5	Ranked 6-7	Total
Trade publications	23.0%	48.6%	28.4%	100%
Trade shows	28.4%	41.1%	30.5%	100%
Word of mouth, colleagues	40.9%	42.1%	17.0%	100%
Manufacturer/dealer websites	28.3%	57.6%	14.1%	100%
Manufacturer/dealer salespersons	43.7%	42.1%	14.3%	100%
Social media (Facebook/Twitter, etc.)	11.9%	21.7%	66.5%	100%
Fire industry website articles	23.9%	46.9%	29.2%	100%

Source: FAMA; Sage.

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Brand Loyalty-Equipment. Departments were asked to rank how certain factors contributed to their brand loyalty when purchasing a new piece of equipment. Quality appears to be the most important aspect related to brand loyalty for departments purchasing a new piece of equipment, followed by service, and then price.

Almost 68 percent of respondents ranked quality as 1st or 2nd as explaining their loyalty to a particular brand. Other popular responses were service (49% indicated this as a 1st or 2nd factor) and price (45%). Delivery timeframe and availability of customized options appear to play the smallest roles in terms of shaping brand loyalty in the context of new equipment purchase.

Exhibit 17. Most Important Aspects Related to Brand Loyalty When Purchasing New Equipment

Aspect	% of Respondents			
	Ranked 1 or 2	Ranked 3	Ranked 4-5	Total
Service	49.3%	31.9%	18.9%	100%
Price	45.3%	33.6%	21.1%	100%
Quality	67.8%	14.6%	17.6%	100%
Availability of customized options	20.0%	14.4%	65.6%	100%
Delivery time frame	17.6%	5.5%	76.9%	100%

Source: FAMA; Sage.

Service/Manufacturer Attributes-Apparatus. Respondents were asked to rank the importance of service/manufacturer attributes in purchasing new apparatus. When selecting new apparatus, after-sales service and parts is the most important service/manufacturer attribute among departments surveyed. More than a third of respondents (38%) ranked this attribute as the most important, and a full 58 percent ranked it as 1st or 2nd. Approximately 19 percent of survey participants ranked the existence of a local dealer 1st and another 17 percent of respondents ranked customer service experience 1st. Relationships with sales persons and brand appear to be the least important factors in choosing new apparatus.

Exhibit 18. Most Important Service/Manufacturer Attributes in the Purchase of New Apparatus

Service/Manufacturer Attribute	% of Respondents			
	Ranked 1 or 2	Ranked 3	Ranked 4-5	Total
Local dealer	33.0%	20.6%	46.4%	100%
Brand	30.4%	16.5%	53.1%	100%
Relationship with sales person	29.2%	29.3%	41.5%	100%
Customer service experience	48.8%	21.2%	30.0%	100%
After-sales service and parts	58.6%	12.4%	29.0%	100%

Source: FAMA; Sage.

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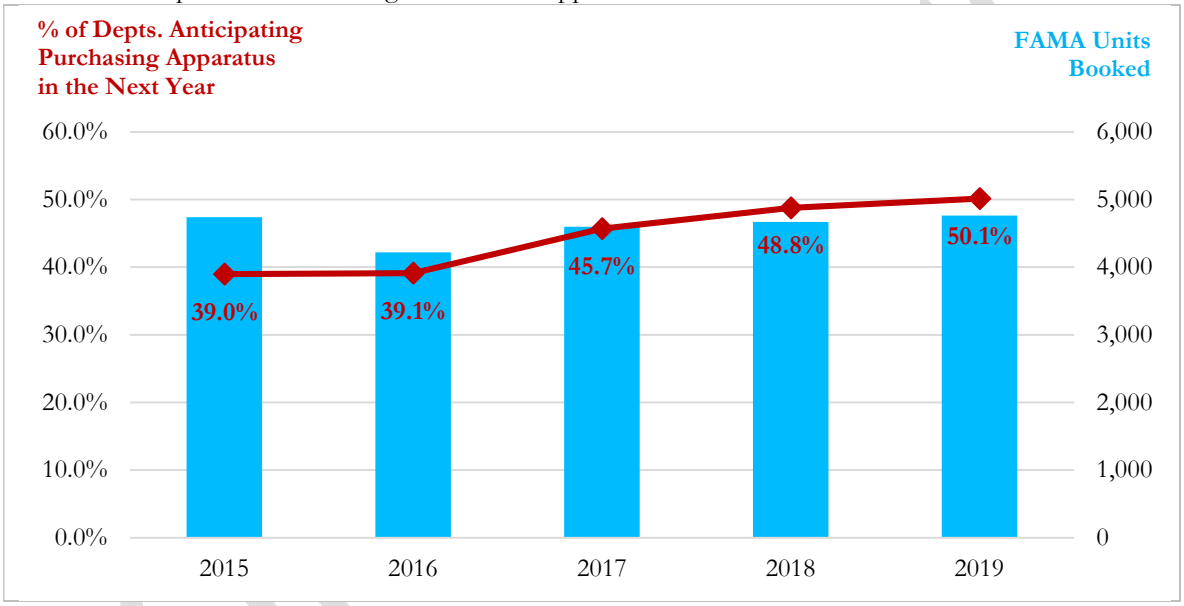
Industry Outlook

Respondents were asked whether they anticipated purchasing various supplies/inputs (apparatus, equipment, training, etc.) during the fiscal year to come. Approximately 75 percent of respondents (about 92 percent of respondents answered this question) indicated that their department plans to purchase equipment during the next fiscal year. Just over 50 percent plan to purchase apparatus, 40 percent plan to invest in training, and 27 percent of respondents plan to acquire computer hardware/software. Relatively few departments expect to spend a portion of their budgets to acquire new fire station furnishings (19.2%) or whole fire stations (12.9%).

In recent years, an increasing share of departments have indicated intentions to purchase apparatus, perhaps a reflection of improved state and local government finances.

Exhibit 19. Departments Intending to Purchase Apparatus v. FAMA Units Booked



Source: FAMA; Sage

Among the 50 percent of departments planning to purchase apparatus, 59 percent indicated an intention to purchase pumpers, which translates into approximately 30 percent of total respondents (see Exhibit 20 below). While pumper sales have been on the decline over the past decade, they still represent the largest share of sales. What's more, pumpers are the most common type of apparatus respondents intend to purchase during the next year.

Intention does not necessarily translate into purchases, however. For example, more than a quarter of total departments responding in 2017 planned to buy pumpers in the next fiscal year (2018) compared to fewer than 23 percent indicating such an intention the prior year. However, in 2018 itself, pumper units booked actually declined. This loose fit between intentionality and actual bookings has been apparent in many previous years as well. There

are many likely reasons for this, but one may relate to the uncertain nature of public budgets, which are after all forged out of political processes.

Funding uncertainty is one perpetual reason that large purchases may not ultimately transpire. For example, in 2017 departments were asked about applications for/awards of FEMA grants. More than 1-in-5 departments said they had applied for a grant for apparatus in the previous two years (from FEMA or other grant sources), but only 3.4 percent of departments reported receiving a FEMA grant to support the purchase of apparatus.

Economic conditions represent another source of uncertainty. In 2017 departments were asked if they expected to need to take certain actions in response to current economic conditions. Top responses related to apparatus were: "refurbish existing apparatus rather than purchase it new" (13.6% of respondents), "reduce number of planned purchases" (14.6%), and "postpone planned purchases" (20.7%).[11]

Exhibit 20. Apparatus Purchase Plans Among Fire Departments Surveyed

Which of the following apparatus do you anticipate purchasing in the next fiscal year?	% of Depts Intending to Purchase
Pumper	29.7%
Command Vehicle	12.1%
Other	11.4%
Tanker	10.5%
Wildland / Brush Truck	10.4%
Pre-Owned / Used	8.6%
Aerial	8.0%
Rescue	7.9%
UTV	4.2%
Refurbished Vehicle	3.7%
ARFF (Airport Rescue Firefighting)	2.3%

Source: FAMA; Sage. *Percentages do not sum to 100 because respondents may indicate intending to purchase multiple types of apparatus.

Finally, fire department decision-makers were asked about their expectations for staffing and funding levels over the next two years (2019 and 2020). Two thirds of those who responded expect staffing levels to remain the same over the next two years (66.2%). More than a quarter (27.1%) expect staffing levels to increase, and fewer than 10 percent (6.7%) expect to see the size of their staff shrink.

Similar to expectations regarding staffing, a minority of respondents expect budgets for apparatus to decrease over the next two years (7.3%). Most respondents expect budgets to be the same (66.0%), and a bit more than a quarter (26.7%) expect budgets to increase. Expectations for overall equipment budgets (excluding capital purchases like apparatus) are generally the same as expectations for apparatus budgets.

[11] The 2018-2019 surveys did not include questions regarding grant funding or actions taken in response to economic conditions.

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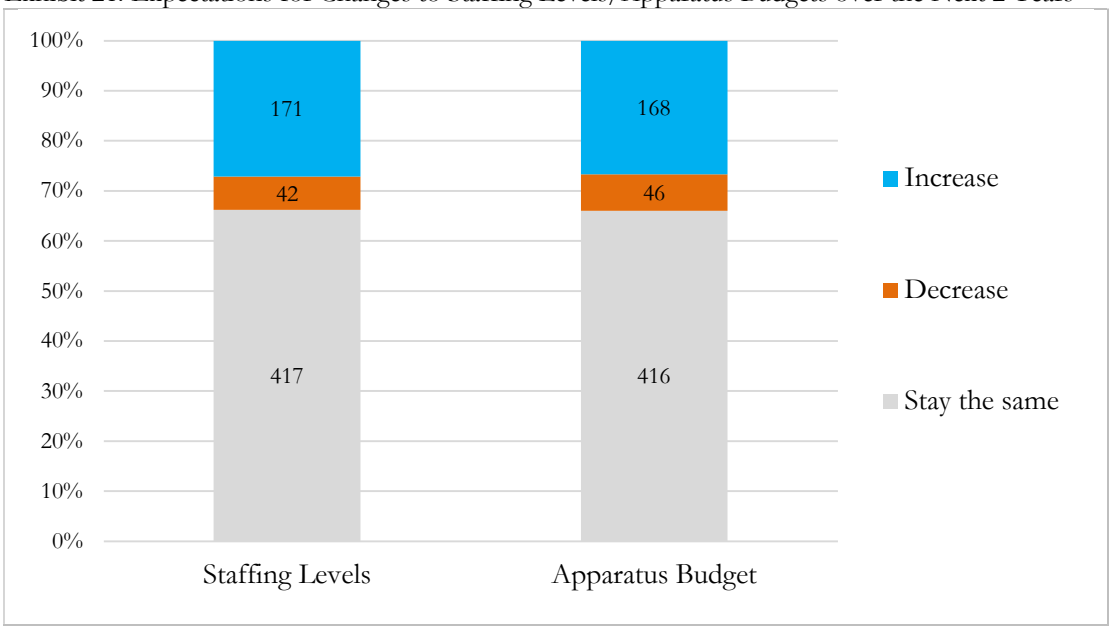
An analysis of prior survey results regarding expectations for spending on apparatus may be instructive as a leading indicator and to put the latest survey results in a more refined context. In 2016, FAMA asked fire departments if they anticipated their apparatus budgets to increase, decrease, or stay the same over the next two years, which would implicate the years 2016 and 2017. Nearly 11 percent (10.7%) of respondents indicated that they expected their apparatus budgets to decrease, down from 15 percent of those asked during the previous survey year. Indeed, there was predictive power in that response, with FAMA members booking more units in 2017 after declines were registered in 2015 and 2016.

When asked the same question in 2017, nearly 12 percent indicated an expectation that their apparatus budgets would decline, consistent with the notion that growth in the pace of units booked would slow in 2018. This is precisely what occurred in 2018, with units booked expanding only 1.5 percent. In 2018 a smaller share of respondents expected their apparatus budgets to decline (8.1%). Following that, units booked grew slightly faster in 2019 (2.0%).

This year, only about 7 percent of departments indicated that their apparatus budgets would decline. This, however, does not imply that budgets will necessarily expand. Two in three respondents indicated that they expect their apparatus budgets to remain roughly unchanged over the next two years. This represents the highest proportion of people responding to this question in this fashion in many years. This is consistent with an expectation that units booked will rise only modestly in 2019-20.

Exhibit 21. Expectations for Changes to Staffing Levels/Apparatus Budgets over the Next 2 Years



Source: FAMA; Sage

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II. Industry Performance in Context

Why has Industry Performance Lagged Broader North American Recovery?

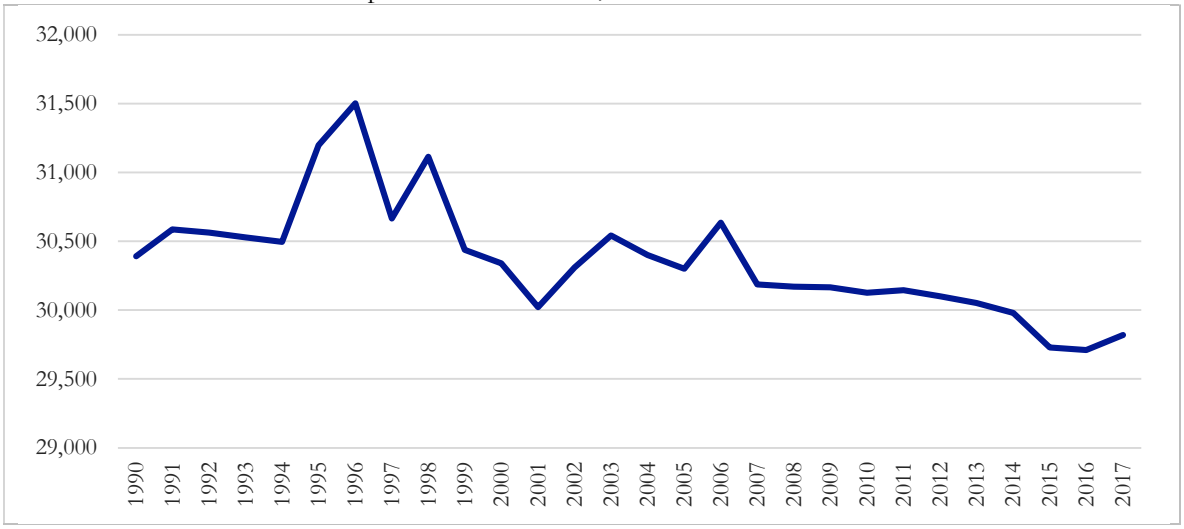
To put FAMA member performance into context, one must consider a range of influencing factors. These include the prevailing condition of the U.S. fire fleet, patterns of government spending, and other demographic and fiscal factors. This part of the report is devoted to considering these and other salient issues that shape industry performance. Much of the data referenced in this section of the report emerges from two publications by The National Fire Protection Association (NFPA): "U.S. Fire Department Profile-2017" (March 2019) and "Fourth Needs Assessment of the U.S. Fire Service" (November 2016).

The U.S. Fire Fleet

Fire Stations. According to the National Fire Protection Association (NFPA) Fire Service Inventory as well as surveys of fire departments, there were 29,819 fire departments in the U.S. as of 2017 (see Exhibit 22 below). As of January 2019, there were more than 27,000 fire departments listed with the U.S. Fire Administration (USFA) National Fire Department Registry, representing about 91 percent of all U.S. fire departments. Registration for the list is voluntary, which is one reason USFA estimates differ from NFPA estimates.

Registered fire departments encompass more than 51,000 fire stations. While the majority of fire departments have just one station, approximately 17 percent of fire departments have two stations and 15 percent have three or more stations.[12]

Exhibit 22. Number of Fire Departments in the U.S., 1990-2017



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. Note: A fire department is a public or private organization that provides fire prevention, fire suppression and associated emergency and non-emergency services to a jurisdiction such as a county, municipality, or organized fire district.

[12] U.S. Fire Administration (USFA). "National Fire Department Registry quick facts".

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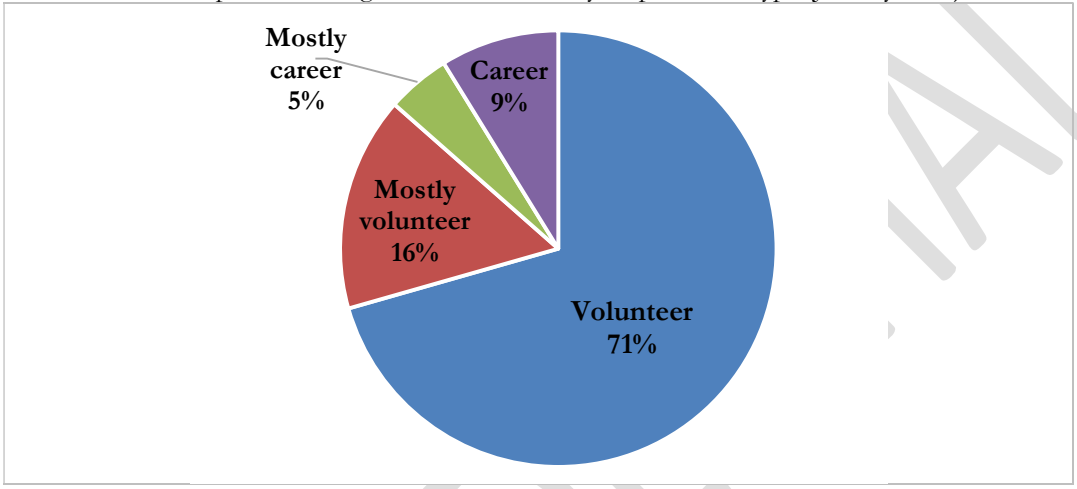
Local fire departments (which include career, volunteer, and combination departments) represent 96 percent of registered fire departments. Four percent of registered fire departments in the U.S. are state and federal government fire departments, contract fire departments, private or industrial fire brigades, transportation authority or airport fire departments.[13] Fire departments are predominately volunteer (71%) or mostly volunteer (16%). The propensity to operate primarily volunteer fire departments varies greatly by state as reflected in Exhibit 24.

Exhibit 23. Fire Departments Registered in the U.S. by Department Type (January 2019)



Source: 1. Sage; 2. U.S. Fire Administration (USFA). Note: Numbers do not sum to 100 due to rounding

Exhibit 24. Percentage of Registered Depts by Volunteer/Career Status, Top 20 States by Rank (Jan. 2019)

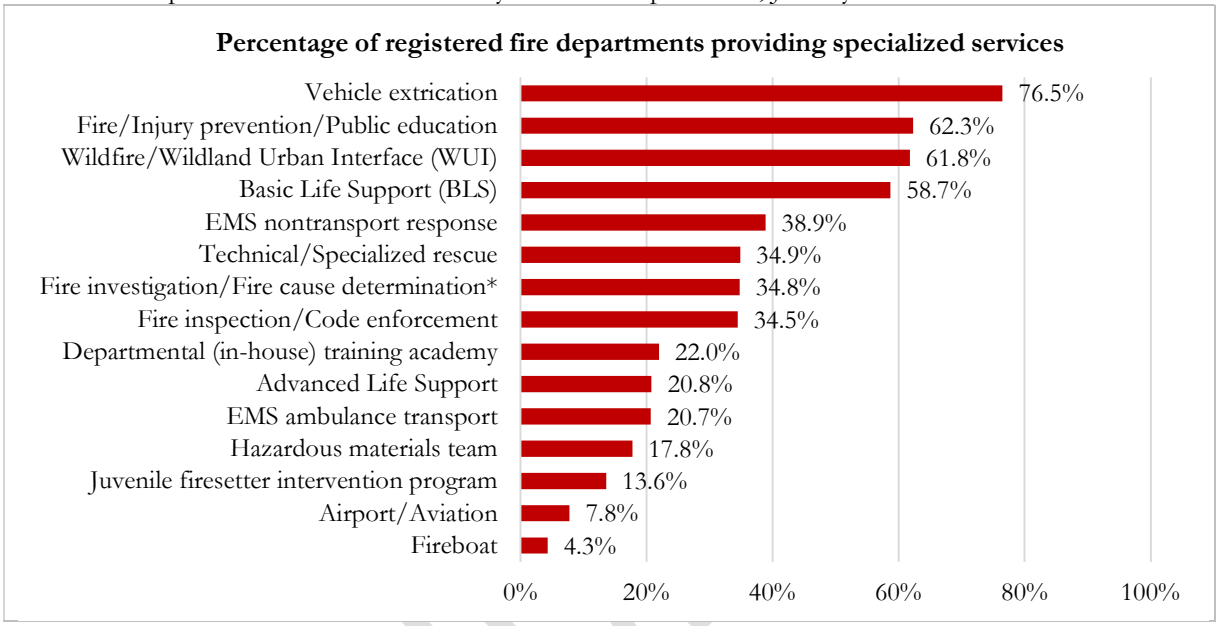
Volunteer & Mostly Volunteer			Career & Mostly Career		
Rank	State	%	Rank	State	%
1	Delaware	98.3%	1	District of Columbia	100.0%
2	Minnesota	97.2%	2	Hawaii	91.7%
3	Pennsylvania	96.8%	3	Florida	52.9%
4	North Dakota	96.6%	4	Massachusetts	45.0%
4	South Dakota	96.6%	5	Arizona	43.1%
6	Nebraska	96.1%	6	California	41.5%
7	Vermont	96.1%	7	Rhode Island	38.2%
8	Iowa	95.9%	8	Georgia	24.8%
9	West Virginia	95.5%	9	Colorado	22.7%
10	New York	94.4%	10	Washington	22.3%
11	Maine	94.4%	11	South Carolina	21.7%
12	Arkansas	93.6%	12	Nevada	19.7%
13	Montana	93.2%	13	Illinois	19.5%
14	Wisconsin	92.5%	14	Texas	17.8%
15	Oklahoma	91.8%	15	Ohio	17.5%
16	North Carolina	91.1%	16	Missouri	15.3%
17	Kentucky	90.7%	17	Connecticut	15.1%
18	Kansas	90.1%	18	Louisiana	14.8%
18	Oregon	90.1%	19	New Hampshire	14.6%
20	Idaho	89.8%	20	Utah	13.7%

Source: 1. Sage; 2. U.S. Fire Administration (USFA).

[13] U.S. Fire Administration (USFA). "National Fire Department Registry quick facts".

Exhibit 25 supplies statistical detail regarding the share of registered fire departments in the U.S. that supply a particular specialized service. With respect to emergency medical services (EMS), nearly 60 percent of all departments offer basic life support and just over 20 percent offer advanced life support. The most common specialized service is vehicle extrication, a service provided by more than 76 percent of registered fire departments.

Exhibit 25. Specialized Services Provided by U.S. Fire Departments, January 2019



Source: 1. Sage; 2. U.S. Fire Administration (USFA). Notes: EMS: Emergency Medical Services. *Of the departments that provide fire investigation/fire cause determination services, 18 percent have sworn investigators with power to arrest.

Firefighters. The National Fire Protection Association (NFPA) conducts a number of surveys of fire departments that generate data characterizing the active American fire fleet. Data characterizing firefighters and fire apparatus in this section of the report are sourced from NFPA reports and their extrapolations based on survey results. According to NFPA estimates based on 2017 National Fire Experience Survey data, the number of firefighters in the U.S. declined 3.1 percent in 2017 to 1,056,200.

Perhaps predictably, few firefighters fall beyond the ages of 20 and 59 years old. Thirty to thirty-nine year olds represent the largest share of firefighters (27.1%). Approximately 24 percent of firefighters fall in the 40-49 age group and approximately 21 percent fall in the 20-29 age group.

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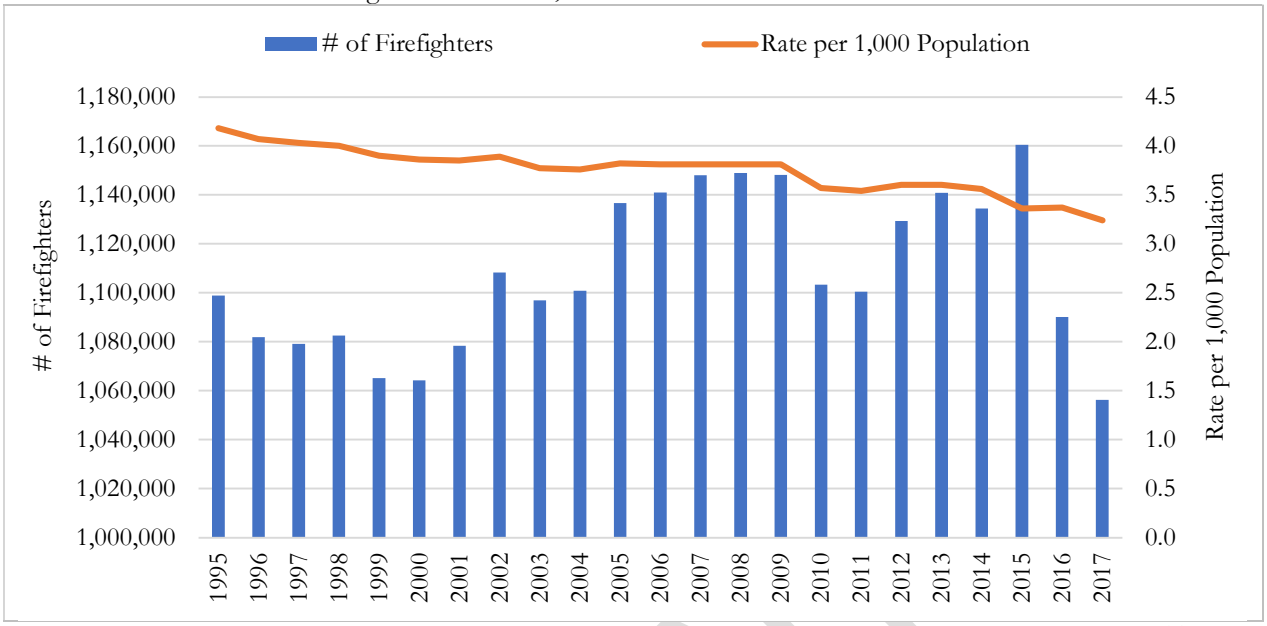
Exhibit 26. Number of Firefighters in the U.S., 1995-2017



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. Note: The NFPA's "U.S. Fire Department Profile" is based on two data sources: the annual NFPA Survey for U.S. Fire Experience, 2017, and the NFPA Fire Service Survey, 2015-2017. The U.S. Fire Experience Survey utilizes a sample of fire departments in the United States to generate national projections. The sample is stratified by the size of the community protected by the fire department. All U.S. fire departments that protect communities with a population of more than 5,000 are included in the sample. (National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. p. 2).

According to NFPA, approximately 65 percent of firefighters are volunteers with the balance being career firefighters as of 2017. The number of career firefighters in the U.S. has tended to increase steadily and hit an all-time high in 2017 at 373,600. The number of volunteer firefighters declined during the late 1980s and late 1990s before reaching a high of 827,150 in 2008. The number of volunteers dipped after that, likely due to volunteers pursuing paid work during the recession and its aftermath. From 2012-2015 the number of volunteer firefighters grew, increasing 4.0 percent. Since then the number of volunteer firefighters has been declining and in 2017 the count fell to 682,000, the lowest estimate since NFPA began reporting this statistic in 1986.[14]

According to data reported to the NFPA, as of 2017 the median number of career firefighters per 1,000 population in the U.S. was 1.8, while the median number of volunteer firefighters per 1,000 population was 5.8. One reason for the higher rate of volunteer firefighters is that smaller communities often rely exclusively on this type of personnel, and there needs to be a minimum number of firefighters to staff a department irrespective of the size of community. Furthermore, because volunteer firefighters are often available only on a part-time basis, it may take more volunteers to ensure adequate response to each call.[15]

[14] National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. p. 3.
[15] National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

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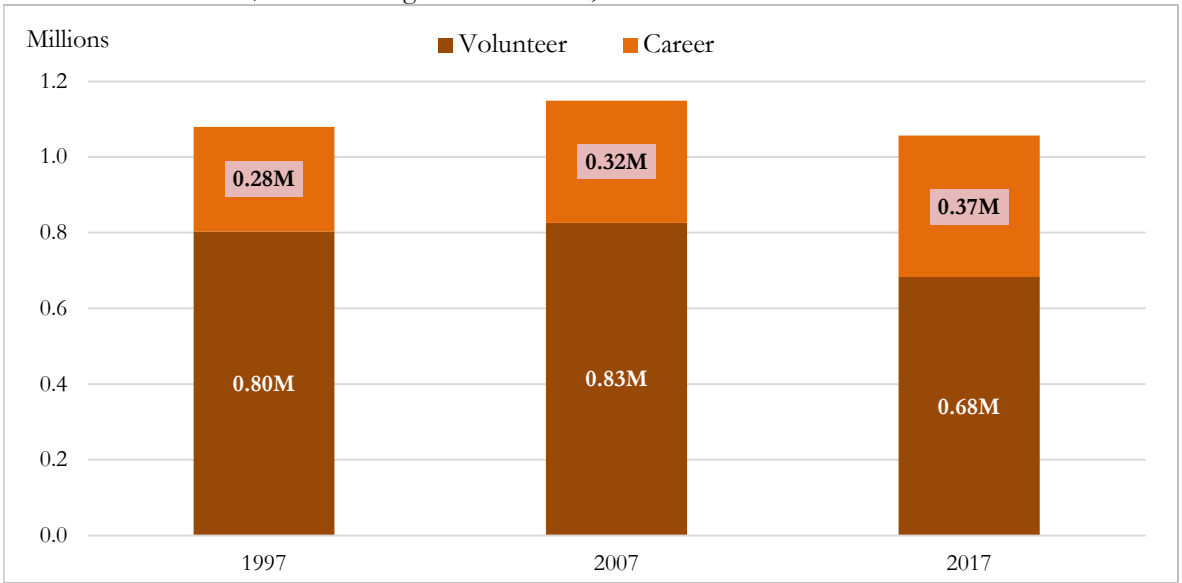
Exhibit 27. Volunteer/Career Firefighters in the U.S., 1997-2017



Year	Firefighters per 1,000 Population		
	Aggregate	Career	Volunteer
1997	4.03	1.73	7.12
2007	3.81	1.74	7.29
2017	3.24	1.80	5.80

Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

The rate of firefighters per capita can vary substantially by community size because departments in different communities may "face great variation in their specific circumstances and policies including length of work week, unusual structural conditions, types of service provided to the community, geographical dispersion of the community, and other factors."[16] Exhibit 28 shows the range of rates for career firefighters per 1,000 people in departments protecting at least 25,000 people and for volunteer firefighters in departments protecting populations less than 25,000.

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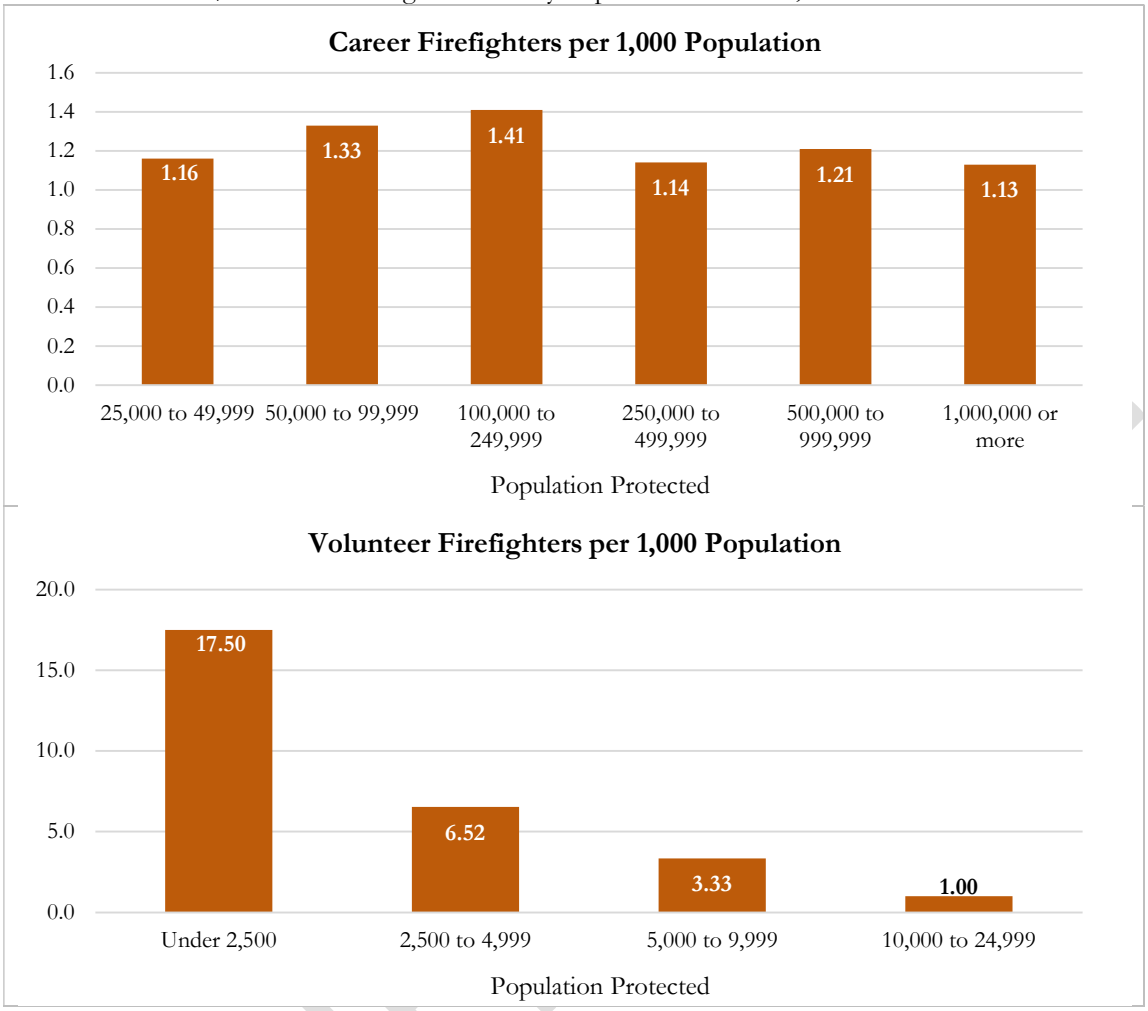
[16] National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. p. 7.

Exhibit 28. Career/Volunteer Firefighter Rates by Population Protected, 2017



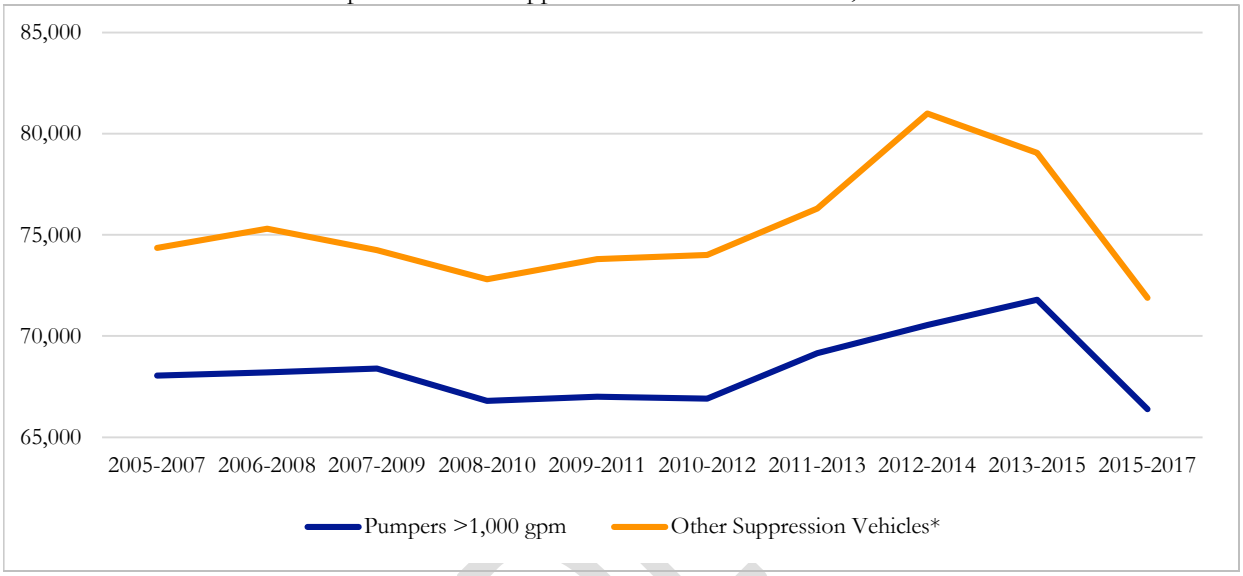
Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

Fire departments protecting communities of 25,000 people or more are associated with median rates of career firefighters per 1,000 people between 1.13 (1,000,000 or more) and 1.41 (100,000 – 249,999). For fire departments protecting communities with fewer than 25,000 people (where departments are much more likely to be all or mostly-volunteer), the median rate of volunteer firefighters per 1,000 people ranges from 1.0 to 17.5. This wide range reflects the fact that a minimum number of firefighters is needed to staff a department regardless of community size. The median volunteer firefighter rate declines as population protected increases.[17]

[17] National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. p. 4.

Fire Apparatus. NFPA estimates indicate that the number of fire apparatus in the United States included 66,400 pumpers, 7,200 aerial apparatus, and 71,900 other suppression vehicles as of 2015-2017. While the number of pumpers had exhibited an upward trend in recent years, it declined by 7.5 percent in the most recent survey year as reflected in Exhibit 29.

Exhibit 29. Number of Pumpers & Other Suppression Vehicles in the U.S., 2005-2017



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019. Note: * Other suppression vehicles include apparatus with pumps less than 1,000 gpm, hose wagons, brush fire vehicles, tankers, etc.

NFPA's Fourth Needs Assessment of the U.S. Fire Service, which is based on surveys sent to all departments in the NFPA fire service inventory and NFPA estimates for nonresponding departments, supplies estimates for apparatus usage by U.S. fire departments.[18] These estimates indicate that for each fire department there are 3.6 engines, 0.8 ladders, 1 tanker, and 1.5 ambulances on average.

Exhibit 30. Average Apparatus Per Department (All Community Populations), 2013-2015

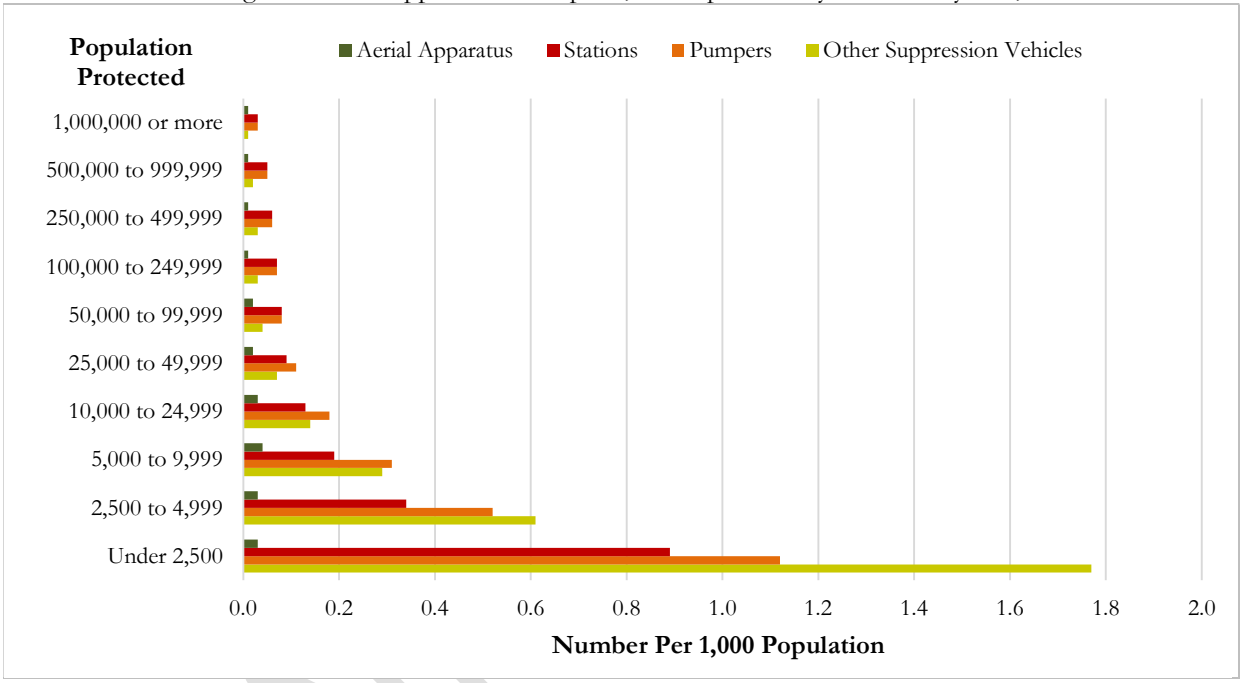
	Average Number Per Department			
	Engines	Ladders	Tankers	Ambulances*
In Service	3.55	0.81	1.05	1.52
In Reserve	0.81	0.16	0.04	N/A

Source: 1. Sage; 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016. Notes: *Ambulances include other patient transport vehicles.

[18] The "Fourth Needs Assessment of the U.S. Fire Service" was based on surveys NFPA sent out as a census, meaning that all U.S. fire departments with administrative and fire response responsibilities who were listed in the NFPA fire service inventory were contacted. In all, in 2015, 26,322 fire departments were included in the target population and a total of 5,106 fire departments responded to the survey (19%). In many of the results reported in the "Fourth Needs Assessment of the U.S. Fire Service" the numbers and percentages from respondent departments are projected within population size strata in order to sum to the total of 26,322 known fire departments. This assumes that the survey non-respondent departments are similar to respondents. The extrapolation allows for the calculation of an overall percent, which is based on the sum of the number of projected departments in each population group and not just on those respondent departments. (National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. xxxiv).

Average apparatus and station rates differ significantly by community size. Exhibit 31 presents the average number of apparatus per 1,000 people by the size of protected population. Numbers of stations, pumpers, and other suppression vehicles per 1,000 people are much higher for departments protecting smaller communities (under 2,500). This is because operating a fire department requires a minimum number of stations and apparatus irrespective of the number of people protected. The NFPA notes that these figures reflect average apparatus and station rates reported to NFPA, and not a recommended rate or defined fire protection standard.

Exhibit 31. Average Station & Apparatus Rates per 1,000 Population by Community Size, 2015-2017



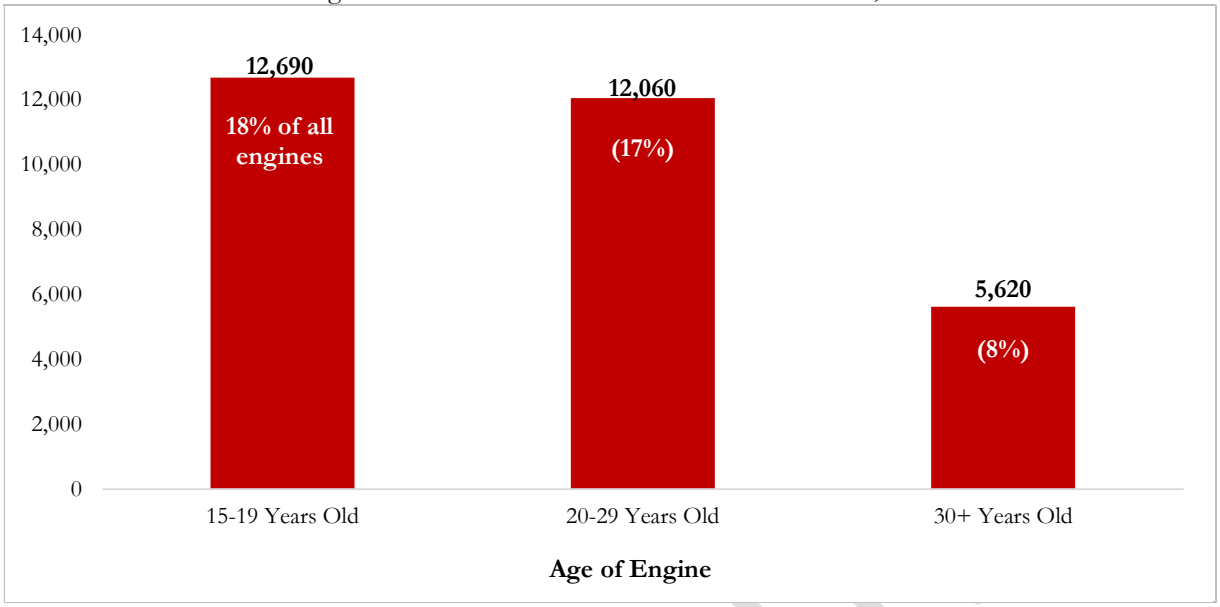
Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

In 2015, approximately 43 percent of all fire department engines and pumpers were at least 15 years old according to NFPA estimates. A quarter of all units is at least 20 years old. There are more than 5,600 engines in service that are at least 30 years old.

As stated earlier in this report, the NFPA notes that while vehicle age alone is not sufficient to confirm the need for replacement, it is indicative of a potential need, which should be examined.[19] Based on this piece of data and others, there is clearly a potential need for replacement.

[19] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 124.

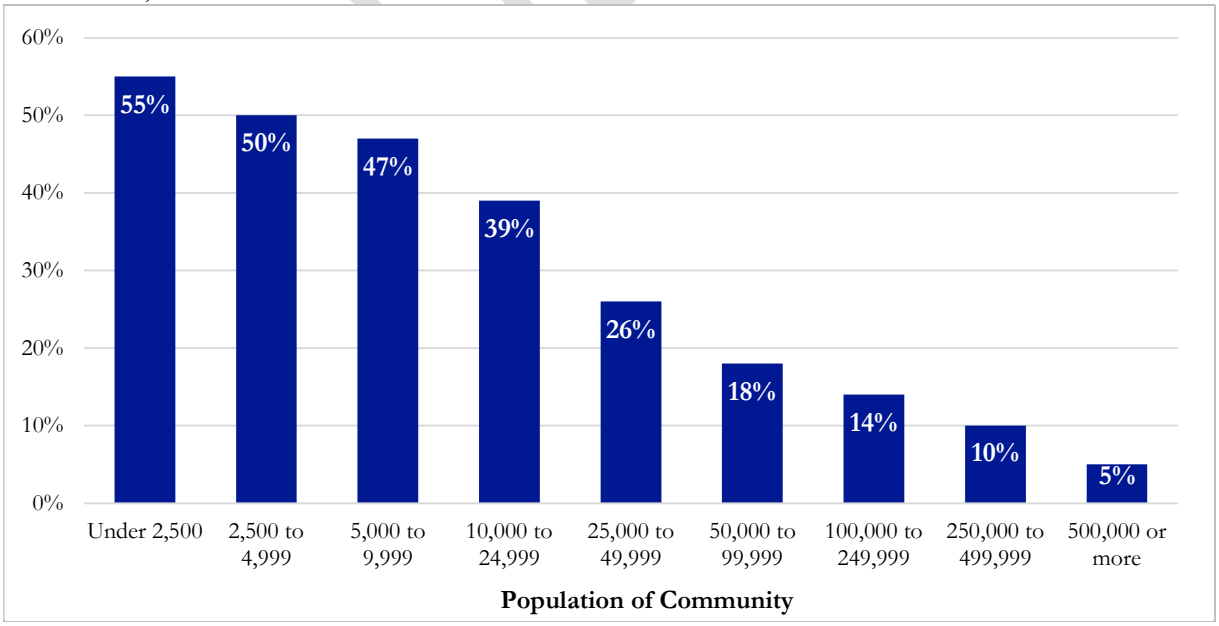
Exhibit 32. Number of Engines in Service that are 15+ Years Old in the U.S., as of 2013-2015



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016.

As Exhibit 33 indicates, smaller communities are much more likely to have aging fire apparatus relative to larger communities. In communities with fewer than 10,000 people, approximately one-half of engines and pumpers in service are at least 15 years old. This share falls steadily the larger the community on average.

Exhibit 33. Percent of Engines and Pumpers in Service that are 15+ Years Old by Size of Community Protected, as of 2013-2015



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016.

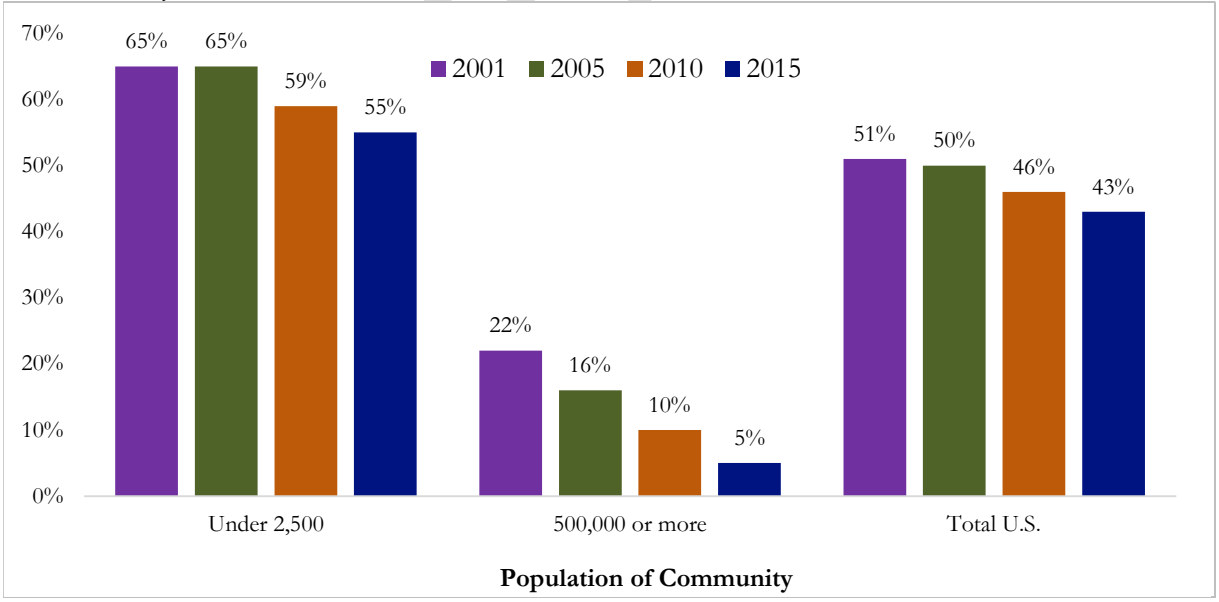
- Has a Replacement Cycle Begun in Earnest?

NFPA survey responses collectively hint that there has been some progress in reducing the age profile of the nation's engines and pumpers in recent years. Across the NFPA's four Needs Assessment Surveys, the share of engines/pumpers in service that are at least 15 years old has declined from 51 percent in 2001 to 43 percent in 2015.

However, this formulation may be misleading and likely understates the level of improvement, at least at first blush. This is because a significant amount of replacement is needed simply to hold the age of apparatus constant. According to the NFPA, "without engine replacement nearly all of the 19% of engines that were at least 20 years old in 2005 would have been at least 30 years old in 2015, but the actual percentage of engines that were at least 30 years old in 2015 was 8%."[20]

One of the important benefits of a replacement cycle is that the removal of older fire vehicles from service has the effect of promoting compliance with NFPA 1901, which recommends removing fire vehicles that are over 15 years old from first-line service and calls for departments to replace vehicles over 25 years old.[21] Thus, while the number of fire apparatus has not increased as one might have anticipated over time, there is a body of evidence suggesting that there has been a significant amount of turnover in operating units.

Exhibit 34. Percent of Engines and Pumpers in Service 15+ Years Old by Select Community Sizes over Four Survey Periods



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016.

[20] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 126.
[21] Federal Emergency Management Agency (FEMA). "Assistance to Firefighters Grant Program Performance Assessment System". Fiscal Year 2015 Annual Report to Congress. October 19, 2015.

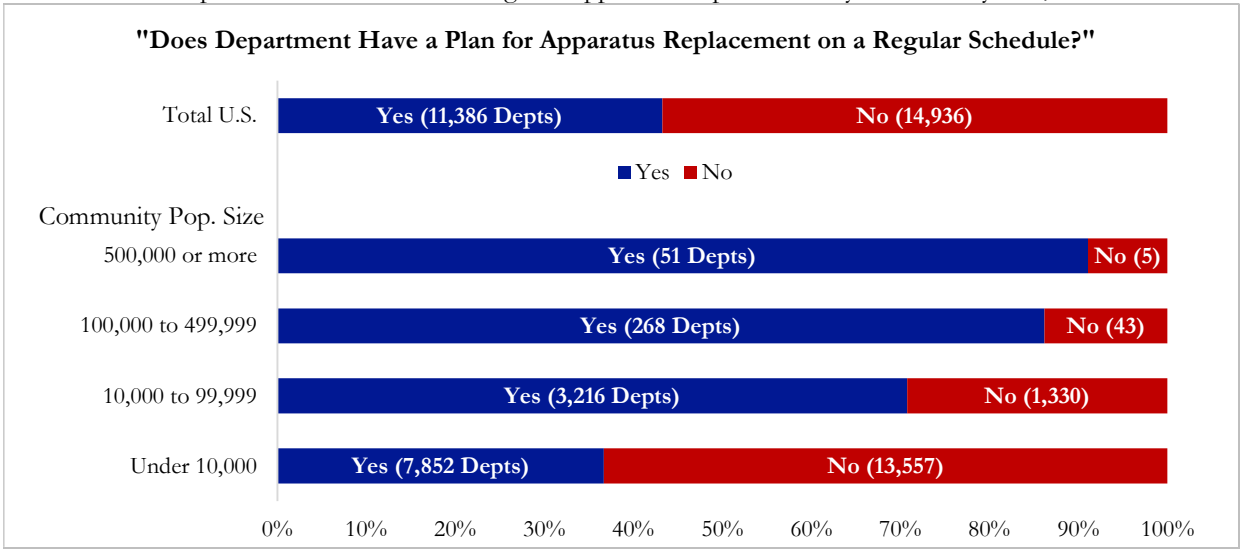
Exhibit 35 reflects NFPA survey results regarding fire department intentions for planned apparatus replacement on a specified schedule. Nationally, 43 percent of U.S. fire departments have plans to replace apparatus on a regular schedule.

Larger communities are far more likely to maintain regular replacement plans. This is not surprising since larger communities are more likely to be served by career or mostly career fire departments. These departments are more likely to be reflected in annual municipal or county budgets. Accordingly, department personnel, particularly department leadership, are better positioned to make equipment purchase requests to policymakers in the interests of public safety.

Larger communities are also likely to have substantial borrowing capacity and therefore are able to put forth long-range capital improvement plans. For communities where departments are protecting at least 10,000 people, at least 70 percent of departments have established plans for apparatus replacement. That compares to fewer than 37 percent for communities with populations under 10,000.

Still, there is an observable, upward trend with respect to replacement planning. An expanding share of departments (43%; 2015) have plans for replacing apparatus on a regular schedule, up from 39 percent in 2010 and 35 percent in 2001.[22] That said, there are nearly 15,000 departments lacking replacement plans. This means that fewer than half of all departments across the U.S. have replacement plans. Many are likely applying for federal or other grants in the hopes of serendipitous support.[23]

Exhibit 35. Departments with Plans for Regular Apparatus Replacement by Community Size, 2013-15



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016.

[22] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. 127.
[23] Ibid. p. xii.

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Trends in Community Fire Protection Spending

- There Has Been Growth Over Time (Just Not Lately)

Over the course of last several years, there simply has not been much change in underlying trends—the gradual recovery in fire apparatus remains gradual. Accordingly, readers of this section will find that while underlying data have been fully updated, much of the discussion reads similarly to Sage's prior report, when complete recovery in units book also remained elusive and a number of factors prevented a more profound rate of industry expansion.

Exhibit 36 supplies data characterizing inflation-adjusted local government expenditures on fire protection in the U.S. from 1980 to 2017 (2017 is the last year for which these data are available). Total expenditure grew more than 196 percent from 1980 to 2017, which seems impressive enough, but ultimately translates into a compound annual growth rate of 3.0 percent in real terms.

This trend is not unique to fire protection; other municipal service costs like police protection have expanded in a similar manner. Due in large measure to the Great Recession, spending on fire protection declined from 2009 to 2013 before reestablishing an upward trajectory.

Factors driving community fire protection costs higher include: (1) shrinkage of the work week for some departments, which results in a need to increase staffing and apparatus or to pay firefighters at overtime rates; (2) increased EMS responsibilities that require increased staffing and, in some communities, a more frequent replacement of apparatus; and (3) rising costs of retirement and health benefits.[24]

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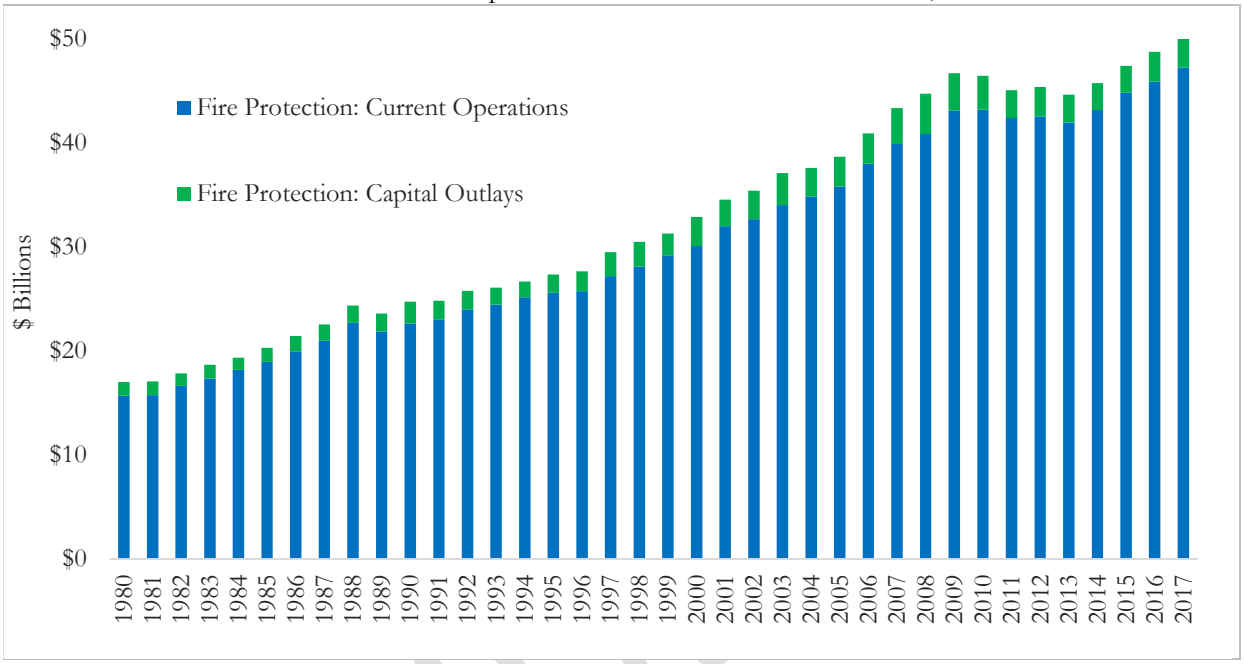
[24] National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

Historically, capital outlays have represented a small portion of total expenditures on fire protection, but that share has slipped even lower in recent years. From 1980-2017, capital expenditures represented around 7.0 percent of total local fire protection spending on average, but in 2017, capital expenditures represented 6.2 percent of total spending.

Exhibit 36. Local Government Direct Expenditures on Fire Protection in the U.S., 1980-2017



Source: 1. Sage. 2. Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: Figures are in 2017 dollars (inflation adjusted).

Exhibit 37 reveals a phenomenon that should be of enormous interest to fire apparatus manufacturers and distributors. Capital outlays for fire protection are remarkably volatile over time, tending to sag dramatically during and after recessions, and then surging during the very late stages of economic expansion cycles (e.g. 1989-90, 2007). Conceivably, we are now in the midst of the very late stages of the current expansion, which means that the next few years could prove challenging after a period of only partial recovery. Operating expenses, which tend to heavily reflect spending on human capital, are far more stable from year-to-year.

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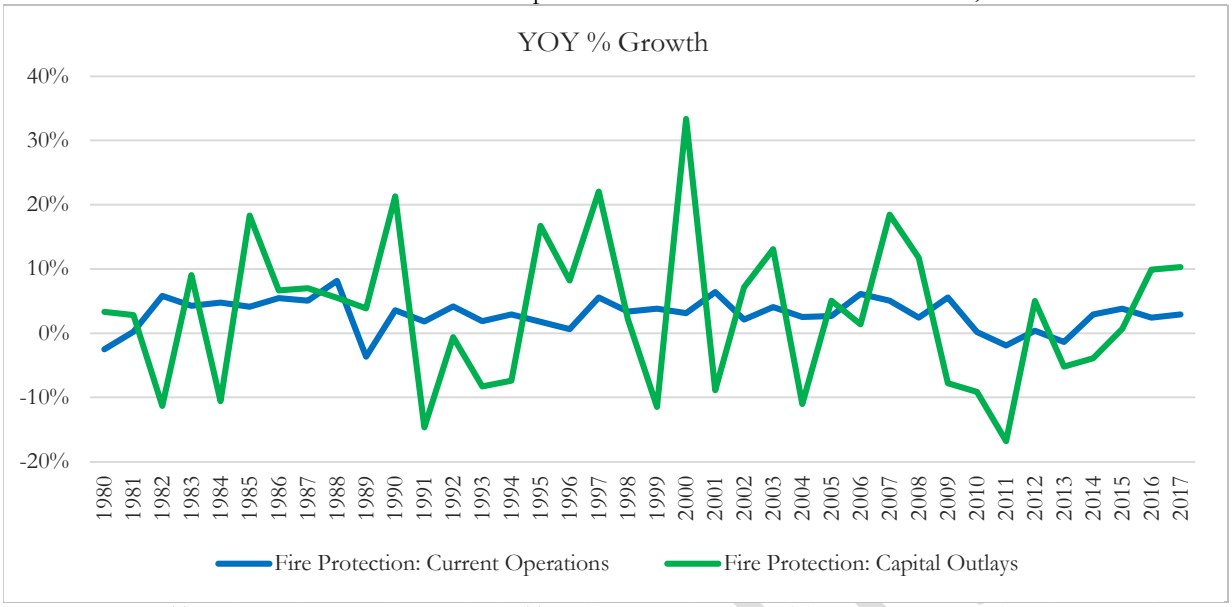
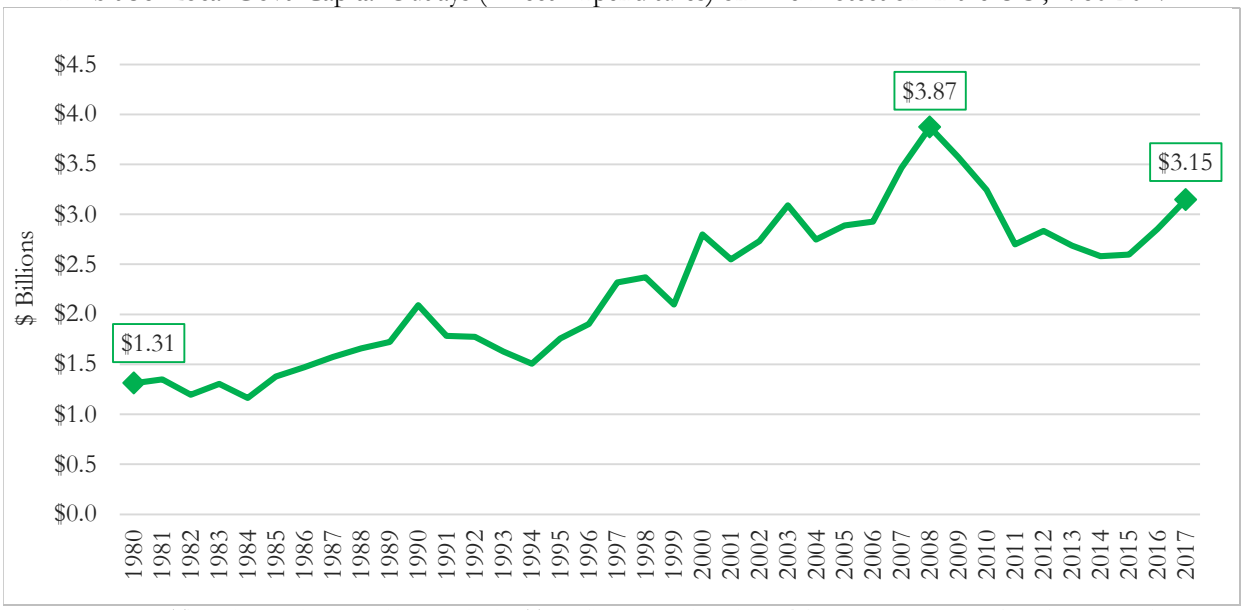
Exhibit 37. Growth in Local Govt. Direct Expenditures on Fire Protection in the U.S., 1980-2017



Source: 1. Sage. 2. The Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: Figures are in 2017 dollars (inflation adjusted).

As reflected in Exhibit 38, local government capital outlays for fire protection in the U.S. peaked in 2008 at $3.8 billion before declining to $2.6 billion by 2014. That represents a decline of more than 33 percent. Capital outlays have rebounded slightly since then, growing to $3.15 billion in 2017. Still, that was 18.7 percent below the 2008 peak.

Exhibit 38. Local Govt. Capital Outlays (Direct Expenditures) on Fire Protection in the U.S., 1980-2017

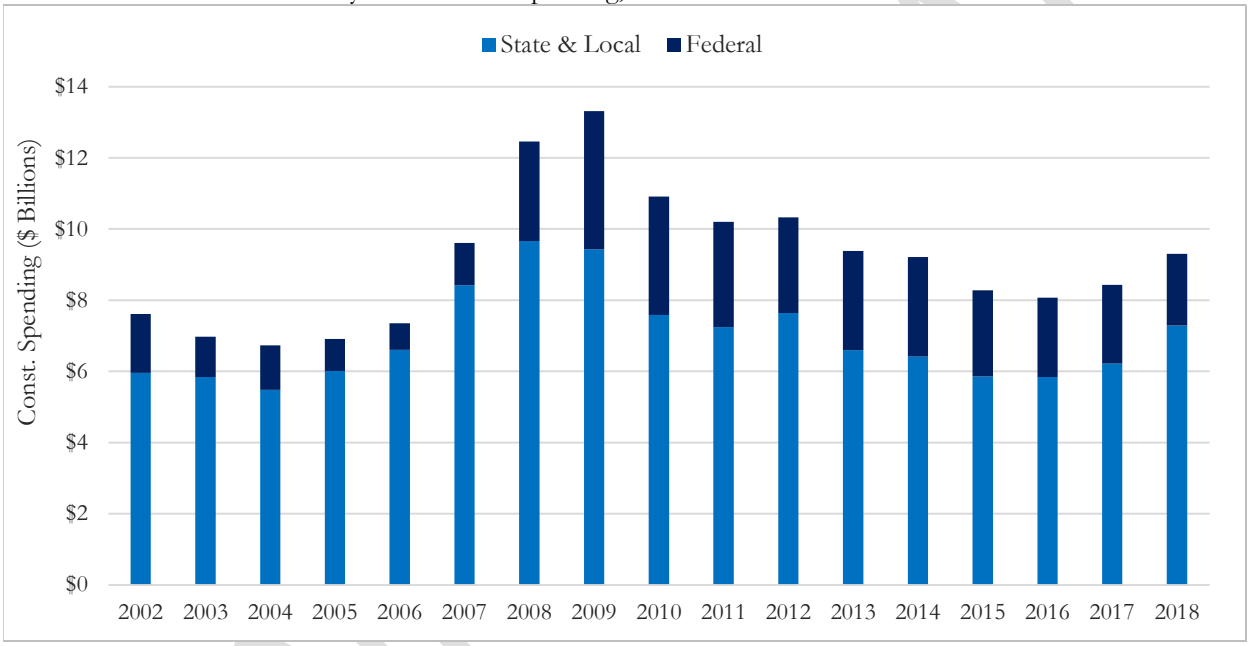


Source: 1. Sage. 2. The Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: Figures are in 2017 dollars (inflation adjusted).

Construction Spending. The lack of public investment is observable in many categories. Spending on many forms of physical infrastructure had been in decline during the early years of the economic expansion. This was especially true in the public safety category -- a category that among other things encompasses the construction of new fire stations.

Public safety construction spending has begun to experience some growth over the last few years, however. In 2017, public safety construction spending, which also encompasses police stations, prisons, and jails, expanded 4.5 percent and then grew by another 10.3 percent in 2018. Exhibit 39 summarizes.

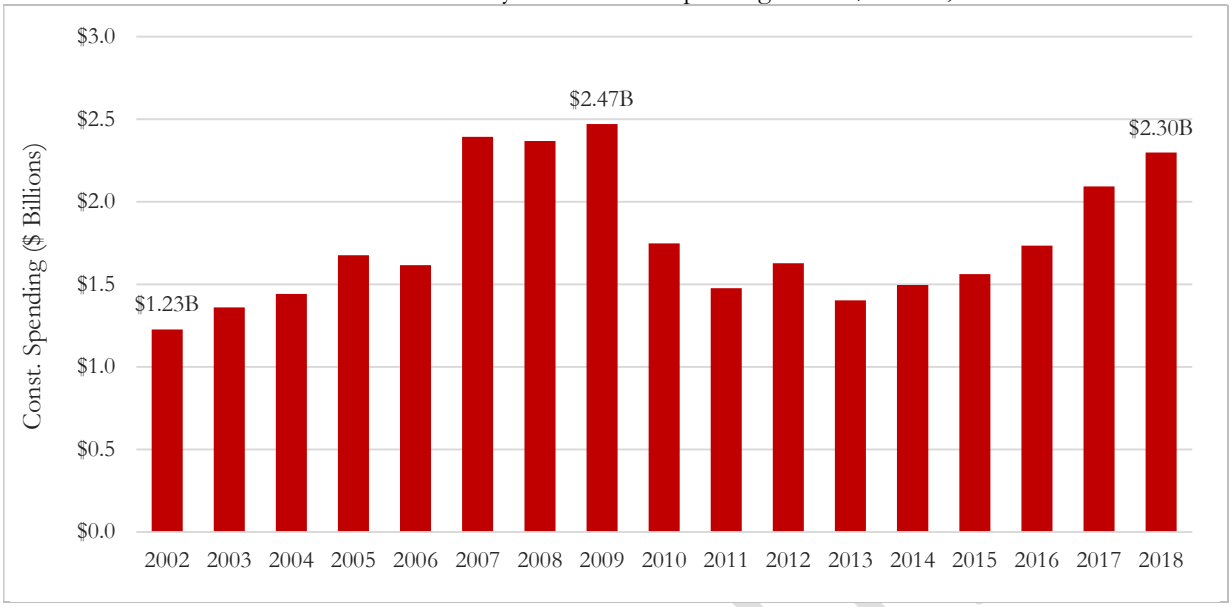
Exhibit 39. U.S. Public Safety Construction Spending, 2002-2018



Source: Sage; U.S. Census Bureau

State and local construction spending in the fire/rescue category totaled $2.3 billion in 2018. That was 7 percent lower than the peak level of spending recorded in 2009, when state/local construction spending in this category approached $2.5 billion. Though peak spending has proven elusive, spending in this category has grown by more than 63 percent since hitting a cyclical nadir in 2013.

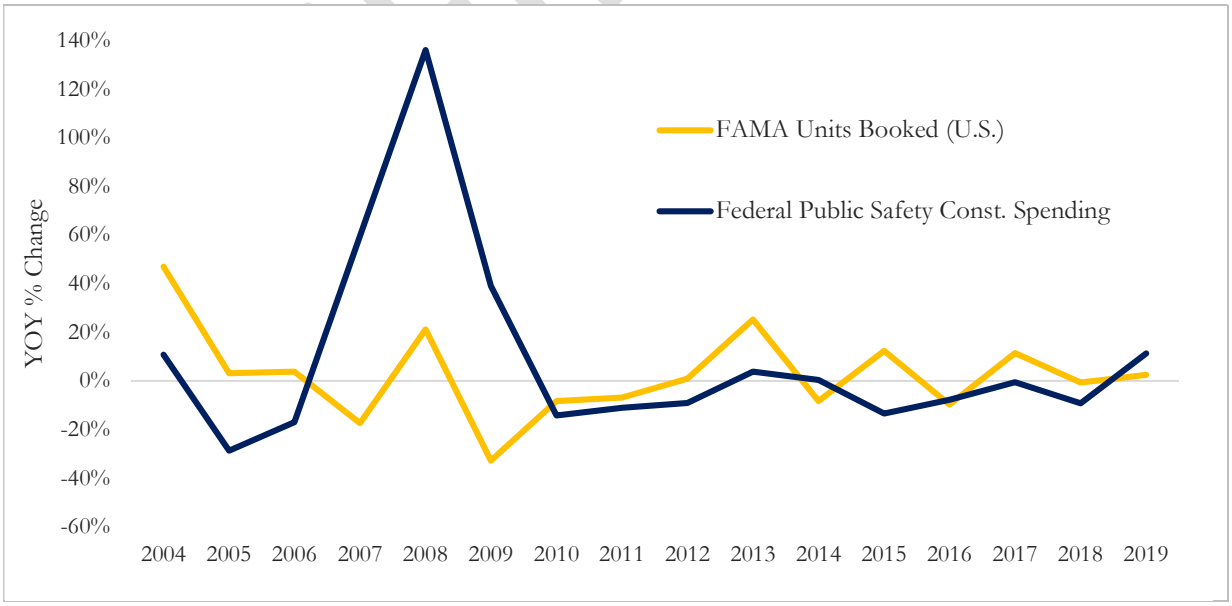
Exhibit 40. U.S. State & Local Public Safety Construction Spending on Fire/Rescue, 2002-2018



Source: Sage; U.S. Census Bureau

Interestingly, though virtually all direct spending on fire protection originates at the levels of state and local government, FAMA member performance in terms of units booked seems to closely mimic changes in federal public safety construction spending. This a likely reflection of the ongoing importance of federal grant funding as a source of revenue for state/local governments.

Exhibit 41. Annual Growth: U.S. Federal Public Safety Construction Spending & FAMA Units Booked, 2004-2019



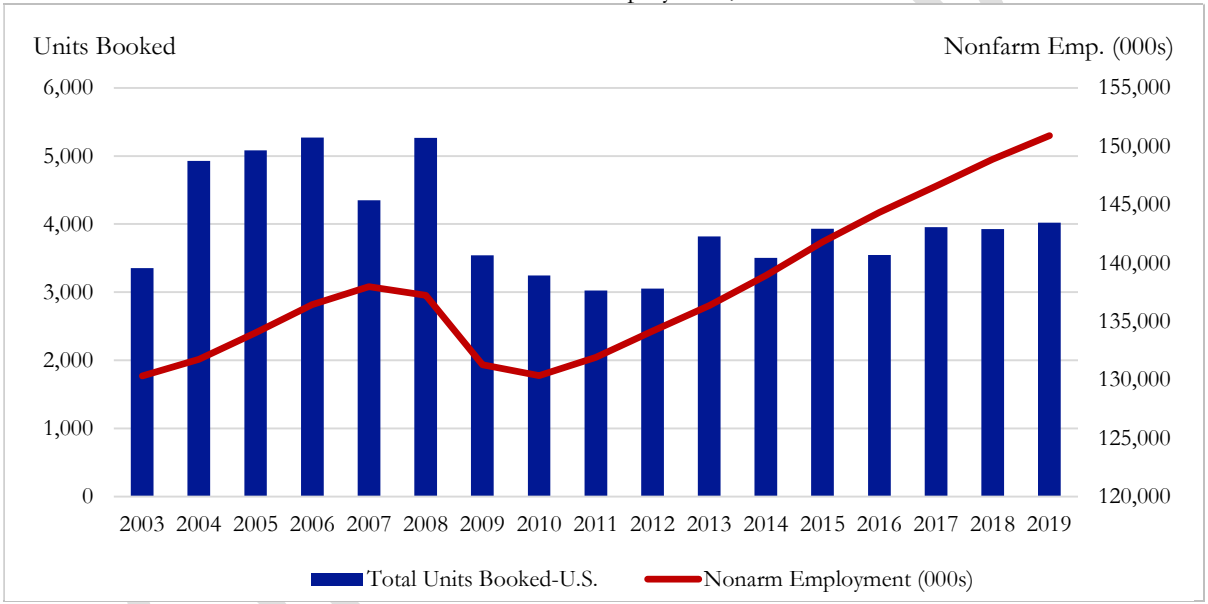
Source: Sage; FAMA; U.S. Census Bureau

Looking for Explanatory Factors: Demographics Factors & Economic Conditions

- Explaining the Mystery of Incomplete Recovery in Units Booked

Importantly, while the U.S. economy has gained steam in recent years (e.g. 2015, when U.S. output measured in terms of gross domestic product rose 2.9 percent, 2017 when the economy expanded 2.4 percent, and 2018 when it grew 2.9 percent), the FAMA units booked variable has failed to respond commensurately. This is reflected in Exhibit 42, which juxtaposes U.S. nonfarm employment with units booked. While this could be easily explained during the early years of economic recovery as reflecting weak state/local government finances or concerns regarding a double-dip recession, these rationales are far less compelling after more than 10 years of economic expansion.

Exhibit 42. FAMA Units Booked vs. U.S. Nonfarm Employment, 2003-2019



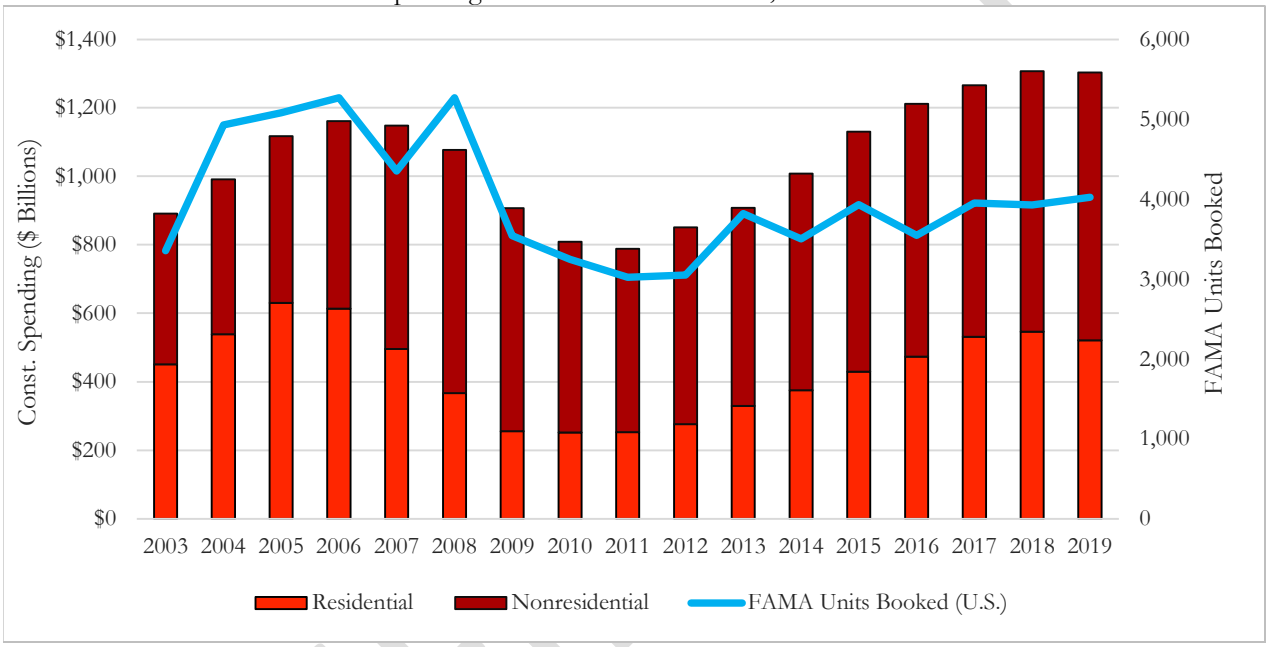
Source: FAMA; U.S. Bureau of Labor Statistics; Sage

This is not merely about available revenues or confidence among those who craft budgets. The current economic expansion has been associated with surging construction of new hotels, office buildings, apartments, casinos, fulfillment and data centers. As construction activity expands, fire departments have a larger stock of buildings to protect, which strongly implies growing demand for both firefighters and apparatus.

Historically, FAMA sales have closely tracked construction activity, but that has not been the case in recent years (since roughly 2013). During the middle years of the prior decade, public construction investment in many categories including water supply, flood control, highways/streets, sewage/waste disposal and public safety had been in sharp decline even as private construction spending has accelerated. Since commercial and residential property tax

bases have been expanding in recent years in many communities, one would think that rising demand for fire protection combined with expanding public resources would translate into brisk investment in public safety construction, aggressive hiring of professional firefighters and a sharp upward tilt in apparatus sales. As the data in this report indicate, that has simply not transpired with respect to the most prominent variable of interest – FAMA units booked. While the economy has persistently expanded and the U.S. stock market has boomed, FAMA units booked have recovered both slowly and erratically.

Exhibit 43. U.S. Construction Spending and FAMA Units Booked, 2003-2019



Source: Sage; FAMA; U.S. Census Bureau

In much of the U.S., units booked per 100,000 housing units has declined, helping to explain the overall weak recovery. For instance, in the Northeast and Midwest, units booked per 100,000 housing units were lower in 2018 compared to 2003. In the Northeast that ratio stood at 3.07 in 2018, down from 3.36 in 2003. In the Midwest, it fell from 2.75 to 2.69.

In South and West regions, however, the number of units booked per 100,000 housing units grew over the same time period. In the western United States, in 2003, the number of units booked per 100,000 housing units stood at 2.46. Fifteen years later, the ratio stood at 2.85. In the South the figure stood at 2.80, up from 2.64 in 2003.

Regional figures often mask more localized trends. For example, while the ratio of units booked per 100,000 housing in the Midwest has declined (albeit modestly), the ratio expanded in the East North Central subdivision (e.g. Illinois, Wisconsin, Michigan) and declined in the West North Central subdivision (e.g. Minnesota, Iowa, North Dakota). Similar trends in other regions are apparent.

Exhibit 44. FAMA Units Booked by U.S. Census Bureau Region & Division Per 100,000 Housing Units

Region/Division	Units Booked		Housing Units Estimate*		Units Booked Per 100,000 Housing Units		
	2003	2018	2003	2018	2003	2018	2003 v. 2018
NORTHEAST	**763**	**747**	**22,703,915**	**24,332,386**	**3.36**	**3.07**	**-0.29**
Division I: New England	191	204	6,106,864	6,627,000	3.13	3.08	-0.05
Division 2: Middle Atlantic	572	543	16,597,051	17,705,386	3.45	3.07	-0.38
MIDWEST	**771**	**818**	**28,013,805**	**30,395,220**	**2.75**	**2.69**	**-0.06**
Division 3: East North Central	461	537	19,459,396	20,822,144	2.37	2.58	0.21
Division 4: West North Central	310	281	8,554,409	9,573,076	3.62	2.94	-0.69
SOUTH	**1,187**	**1,495**	**44,996,117**	**53,421,190**	**2.64**	**2.80**	**0.16**
Division 5: South Atlantic	649	833	23,951,411	28,526,207	2.71	2.92	0.21
Division 6: East South Central	225	211	7,627,908	8,594,603	2.95	2.46	-0.49
Division 7: West South Central	313	451	13,416,798	16,300,380	2.33	2.77	0.43
WEST	**634**	**866**	**25,811,623**	**30,388,282**	**2.46**	**2.85**	**0.39**
Division 8: Mountain	239	289	8,219,835	10,309,766	2.91	2.80	-0.10
Division 9: Pacific	395	577	17,591,788	20,078,516	2.25	2.87	0.63

Source: Sage; FAMA; U.S. Census Bureau, Population Division. Notes: *Estimate as of July 1st.
NORTHEAST Region—Division I: New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont); Division 2: Middle Atlantic (New Jersey, New York, Pennsylvania).
MIDWEST Region—Division 3: East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin); Division 4: West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota).
SOUTH Region—Division 5: South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia); Division 6: East South Central (Alabama, Kentucky, Mississippi, Tennessee); Division 7: West South Central (Arkansas, Louisiana, Oklahoma, Texas).
WEST Region—Division 8: Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming); Division 9: Pacific (Alaska, California, Hawaii, Oregon, Washington).

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- Fiscal Considerations

Federal Funding. While funding for firefighting is predominately provided by state and local governments, there are several federal grant programs that support firefighting operations. In many instances, these programs were developed in response to local financial conditions prevailing during the 1990s, which were often characterized by fiscal shortfalls. Before the establishment of these federal grant programs, there had been few if any dedicated funding programs exclusively for firefighting.[25]

There are three primary firefighting grant programs operated by the Federal Emergency Management Agency (FEMA): 1) the Assistance to Firefighters Grants (AFG) program; 2) the Staffing for Adequate Fire and Emergency Response (SAFER) Grants program; and the 3) Fire Prevention and Safety (FP&S) Grants program. SAFER grants fund the hiring of salaried firefighters and costs of recruitment and retention of volunteer firefighters.[26] FP&S grants are dedicated to projects that enhance the safety of firefighters and the broader public from fire and related hazards.[27]

The AFG grant program is the most relevant to firefighting apparatus. AFG program funding targets "critically needed resources to equip and train emergency personnel to recognized standards, enhance operations efficiencies, foster interoperability, and support community resilience."[28] Program funds can be used for equipment (such as personal protective equipment, vehicles, and other operational equipment) as well as operational programs (such as projects to modernize facilities, deliver training, and develop health and fitness programs).[29]

Note that the amount of AFG grants distributed has shrunk dramatically since FY2009. That year, grants totaled more than $500 million. By FY2018, grant funding stood at around $315 million. Even prior to FY2009, there had been declines in funding. In FY2003, which came shortly on the heels of 9/11, AFG grant funding approached $700 million.

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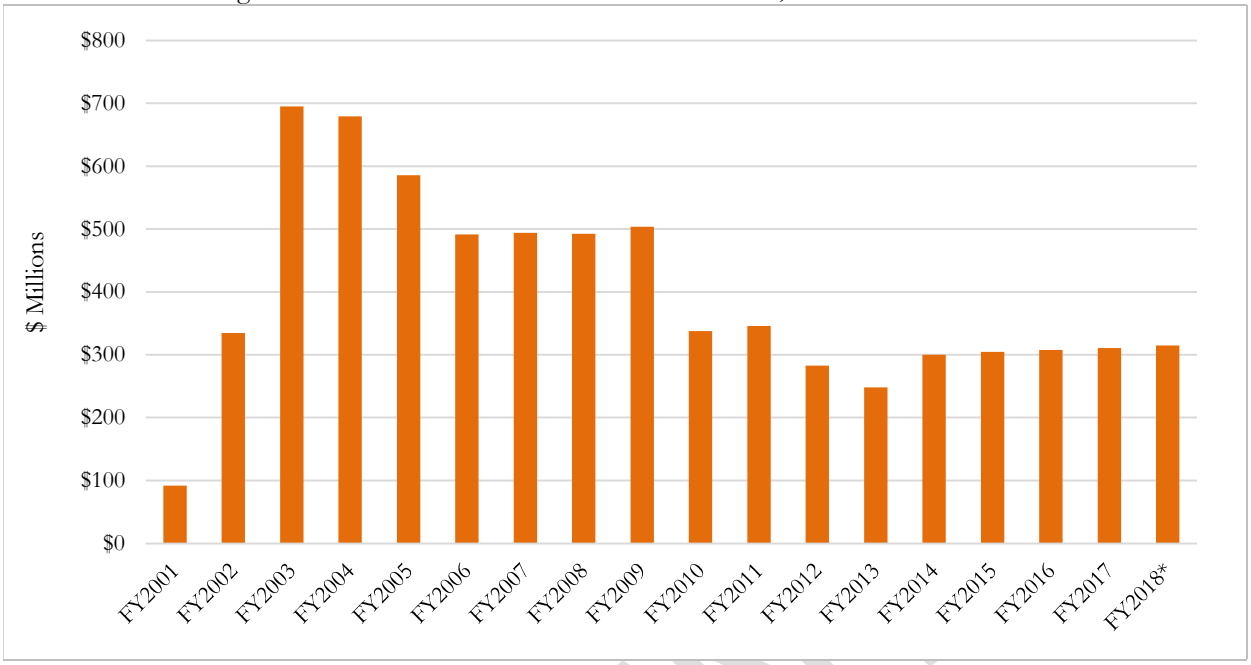
[25] Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". October 5, 2017. Author: Lennard G. Kruger, Specialist in Science and Technology Policy. p. 1.
[26] U.S. Government Accountability Office (GAO). "FIRE GRANTS: FEMA Could Enhance Program Administration and Performance Assessment", GAO-16-744. September 2016.
[27] Federal Emergency Management Agency (FEMA). *Fire Prevention & Safety Grants*. https://www.fema.gov/fire-prevention-safety-grants.
[28] Federal Emergency Management Agency (FEMA). *Assistance to Firefighters Grant Program*. https://www.fema.gov/welcome-assistance-firefighters-grant-program.
[29] U.S. Government Accountability Office (GAO). "FIRE GRANTS: FEMA Could Enhance Program Administration and Performance Assessment", GAO-16-744. September 2016.

Exhibit 45. Firefighter Assistance: FEMA AFG Grants Distributed, FY2001-FY2018



Source: Sage; Fema.gov; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy. Notes: AFG: Assistance to Firefighters Grants. *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

AFG grants used for vehicle replacement are used to replace sub-standard or unsafe vehicles. These replaced vehicles are typically older vehicles that are permanently removed from service. On average, more than 99 percent of fire vehicles that AFG grant recipients replaced during FY2008-FY2013 were at least 15 years old, and nearly 89 percent were 25 years old or older. Approximately 90 percent of grant recipients indicated that the vehicle had been permanently removed from service.[30,31]

AFG funds for vehicle replacement are in high demand. There were 2,585 applications submitted for AFG funds for vehicle acquisition in FY2014 alone. Of those, just 201 applications were awarded grants (7.8%).[32] From FY2014-FY2016, funds for vehicles have represented around 44 percent of total funds requested by applicants.[33] However, no more

[30] Federal Emergency Management Agency (FEMA). "Assistance to Firefighters Grant Program Performance Assessment System". Fiscal Year 2017 Annual Report to Congress. March 2018.
[31] Vehicles that are not permanently removed from service may be placed in reserve status or otherwise removed from front-line operations. (Federal Emergency Management Agency (FEMA). "Assistance to Firefighters Grant Program Performance Assessment System". Fiscal Year 2015 Annual Report to Congress. October 19, 2015.)
[32] U.S. Government Accountability Office (GAO). "FIRE GRANTS: FEMA Could Enhance Program Administration and Performance Assessment", GAO-16-744. September 2016.
[33] Mark Price and Brad Cole. "Assistance to Firefighters Grant" Presentation. May 19, 2017. https://www.preparingtexas.org/Resources/documents/2017%20Conference/Assistance%20to%20Firefighters%20Grant.pdf.

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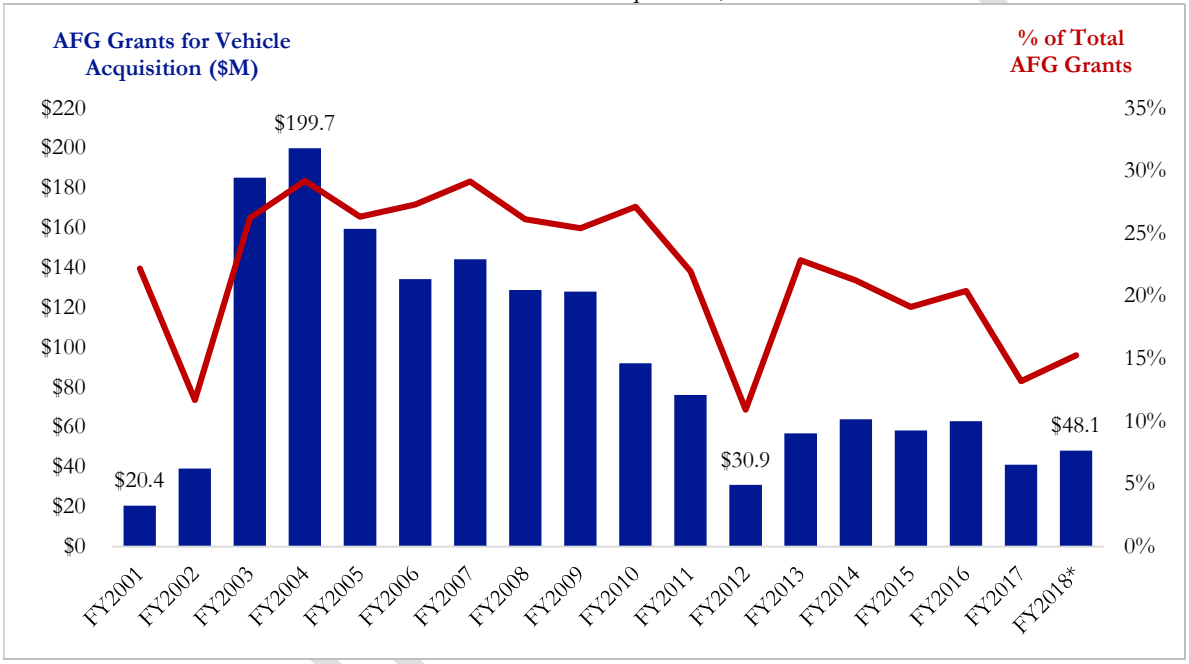
than 25 percent of available AFG grant funds may be used by recipients for the purchase of vehicles and 10 percent of that amount is set aside for ambulances.[34]

The NFPA's Fourth Annual Needs Assessment states: "Considering AFG funding, approximately 19% of 2011-2014 funds were distributed for vehicle acquisition. While this helps hold the line on the aging of vehicles and apparatus, it is far less than the need."[35] In FY2018, AFG grants for vehicle acquisition totaled $48 million and represented 15 percent of all AFG grants awarded (see Exhibit 46).

Exhibit 46. Distribution of AFG Awards for Vehicle Acquisition, FY2001-FY2018



Source: Sage; Fema.gov; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy. Notes: AFG: Assistance to Firefighters Grants. *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

[34] The Department of Homeland Security (DHS). "Notice of Funding Opportunity (NOFO). FY 2016 Assistance to Firefighters Grants (AFG)". https://www.fema.gov/media-library-data/1472840920028-6ecc836fb21bf4152f3c06ec942564cb/FY16_AFG_NOFO_final_v3_09_01_2016.pdf.

[35] NFPA. "Fourth Needs Assessment of the U.S. Fire Service". November 2016. p. xi.

Future of Grant Funding. In January 2018, the President of the United States signed the United States Fire Administration, AFG, and SAFER Program Reauthorization Act of 2017 (P.L. 115-98). The Act extends the AFG and SAFER authorizations through FY2023 and extends sunset provisions for AFG and SAFER through September 30, 2024.

The Act also: 1) provides that the U.S. Fire Administration (USFA) may develop and make widely available an online training course on AFG and SAFER grant administration; 2) expands SAFER hiring grant eligibility to include the conversion of part-time or paid-on-call firefighters to full-time firefighters; 3) directs FEMA, acting through the Administrator of USFA, to develop and implement a grant monitoring and oversight framework for the AFG and SAFER grant programs; and 4) makes various technical corrections to the AFG and SAFER statute.[36]

Exhibit 47. Recent and Proposed Appropriations for Firefighter Assistance (Millions of Dollars)

	FY2017	FY2018	FY2019		FY2020
	Consolidated Approp. Act (P.L. 115-31)	Consolidated Approp. Act (P.L. 115-141)	Admin. Request	Consolidated Approp. Act (P.L. 116-6)	Admin. Request
FIRE Grants (AFG)	$345	$350	$344	$350	$344
SAFER Grants	$345	$350	$344	$350	$344
Total	**$690M**	**$700M**	**$689M**	**$700M**	**$689M**

Source: Sage; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy.

Budget appropriations for AFG and SAFER remains an issue for Congress. As is the case with many federal programs, concerns regarding the federal budget deficit will likely impact AFG and SAFER budget levels, at least eventually. At the same time, firefighter assistance budgets will likely receive increased scrutiny from the fire community in the context of the local budgetary shortfalls that many departments face.[37] Exhibit 47 supplies recent and proposed appropriated funding for the AFG and SAFER grant programs.

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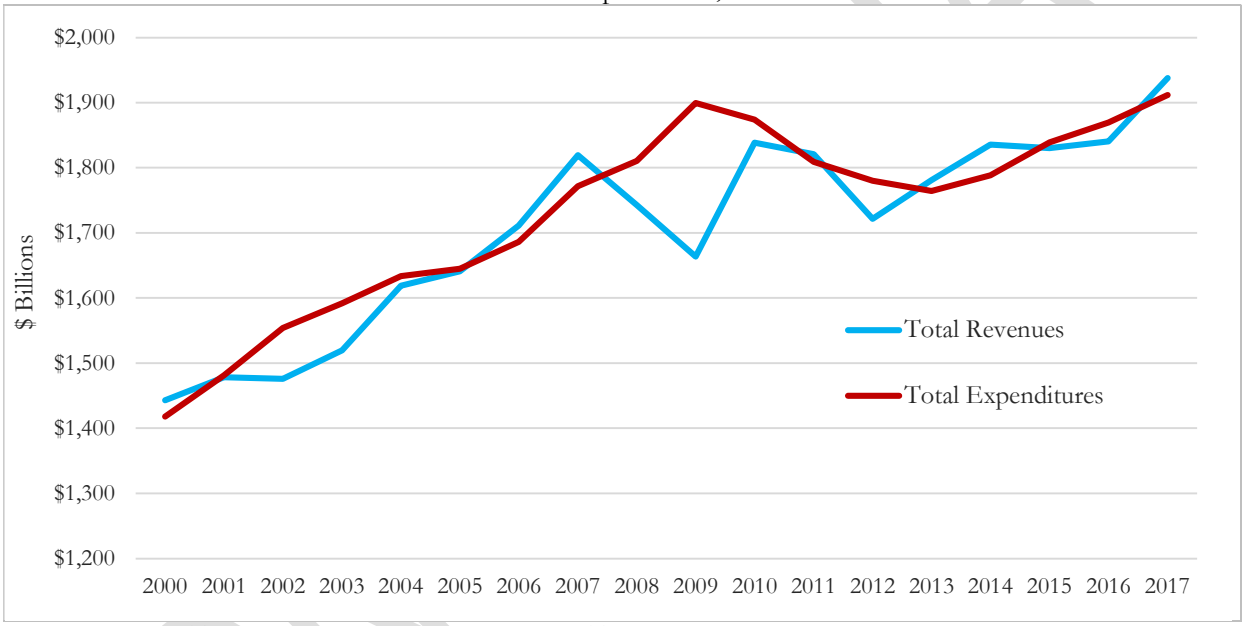
[36] Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". 4/25/2019. Author: Lennard G. Kruger, Specialist in Science and Technology Policy.
[37] Ibid.

State & Local Finances. Funding and overseeing firefighting activities are traditionally the responsibility of state and local authorities.[38] Over the past quarter century, total local government expenditures have generally trended higher in America, including during recent years.

All things being equal, this should translate into much better units booked readings than are presently observable. There is a strong implication that the share of local government monies being spent on firefighting has declined as other categories, whether education or public health, have gobbled up growing budget shares. In order to determine whether this state of affairs will persist, it is important to identify which categories have been securing greater local government expenditure share.

Exhibit 48. U.S. Local Government Revenues & Expenditures, 2000-2017



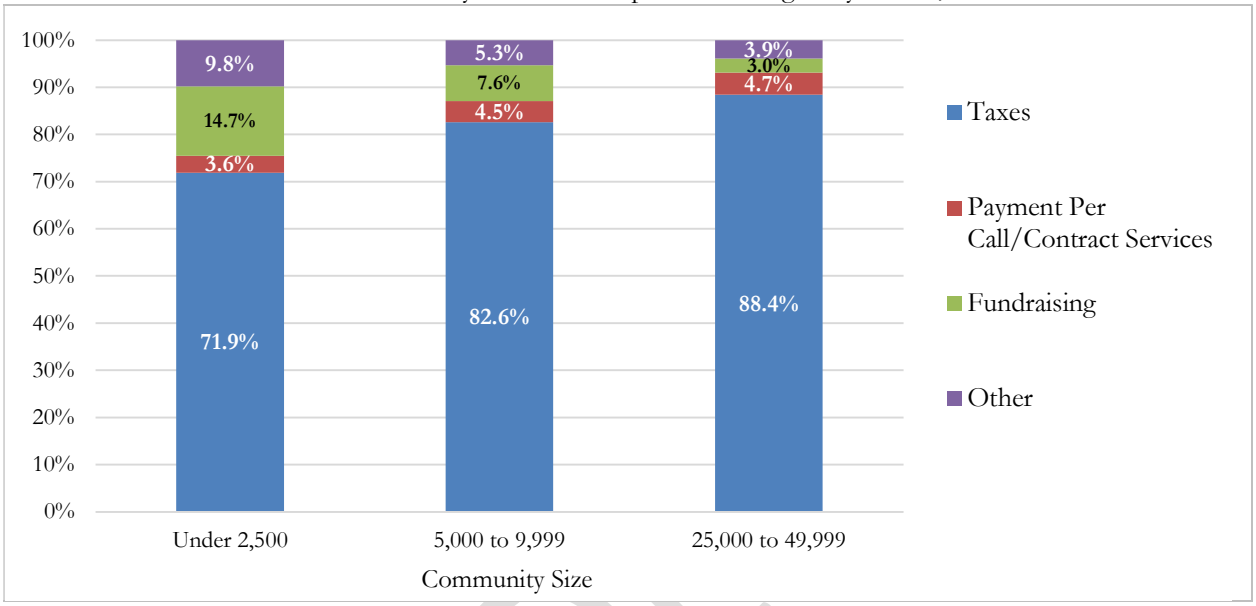
Source: 1. Sage. 2. The Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System.* Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: Figures are in 2017 dollars (inflation adjusted).

All or mostly-volunteer fire departments (which comprise more than 70 percent of all departments in the U.S.) derive a large share of their revenues from local taxes. Exhibit 49 indicates budgeted revenue sources for all-volunteer or mostly-volunteer fire departments by community size. Most revenues for all/or mostly-volunteer departments are covered by taxes, either a special fire district tax or some other tax.

[38] Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". April 25, 2019. Author: Lennard G. Kruger, Specialist in Science and Technology Policy. p. 1.

The share of revenues from taxes is approximately 72 percent for communities of less than 2,500 people and between 83-88 percent for communities of 5,000 to 49,999 people. Apparatus constitute the principal costs for volunteer departments, so one would intuitively expect fire apparatus sales to neatly and predictably correlate with local tax revenues.

Exhibit 49. Share of Volunteer/Mostly-Volunteer Department Budgets by Source, 2015



Source: 1. Sage. 2. National Fire Protection Association (NFPA). "Fourth Needs Assessment of the U.S. Fire Service". November 2016. Note: NFPA analyzed questions regarding revenue only for communities of less than 50,000 in population, which is the maximum community size for which at least 30% of departments are all- or mostly-volunteer.

In response to a number of sources of fiscal stress, state and local governments have been reshaping their finances since the Great Recession. Notable sources of stress include slow tax revenue growth, Medicaid spending growth driven by recession-related enrollment and the Affordable Care Act of 2010, and underfunded pensions. Responses to these strains have included cutting capital spending, cutting infrastructure investment, and cutting other budget categories.[39]

Since the 2007-09 recession, state tax revenues have been slower to rebound than after any of the three previous downturns, with trends varying widely by state. According to the Pew Charitable Trusts, in early 2017 inflation-adjusted tax revenue was lower in 22 states compared to the peak before or during the recession. More states than at any time since the end of the recession reported mid-year budget gaps in fiscal year 2017.[40] But circumstances

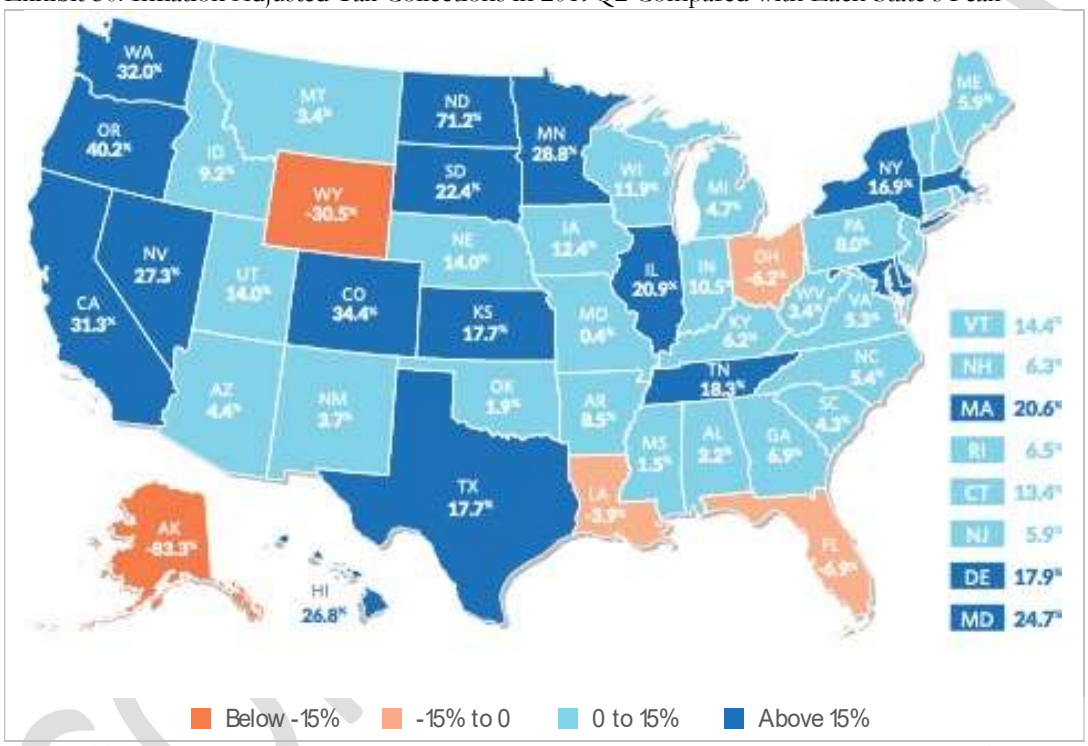
[39] Boyd and Dadayan. 2016. "State and Local Governments Reshape Their Finances". July 1, 2016. http://knowledgecenter.csg.org/kc/content/state-and-local-governments-reshape-their-finances.
[40] The Pew Charitable Trusts. "Weak Growth in State Tax Revenue Persists in 2017". *Fiscal 50: State Trends and Analysis*. October 17, 2017. http://pew.org/2il0kwl.

have improved markedly since then. By mid-2019, a decade after the Great Recession ended, tax revenue was lower in only 5 states compared to its peak, the fewest yet.[41]

Available data indicate that pressure on state finances has eased, with tax collections frequently surprising to the upside and many states posting budget surpluses. In 2019, growth in tax receipts provided widespread budget relief for a second consecutive year and additional revenue led many states to add to their rainy day funds.

Still, the speed of recovery has been uneven across states due to differences in economic conditions, population shifts, and tax policies. Even states that have recovered revenue may face financial and demographic pressures that could shape their budgets for years to come.[42]

Exhibit 50. Inflation Adjusted Tax Collections in 2019Q2 Compared with Each State's Peak



Source: The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. Note: figures are Pew Charitable Trusts' analysis of data licensed by the Nelson A. Rockefeller Institute of Government, which adjusts U.S. Census Bureau's quarterly summary of tax revenue.

[41] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. https://www.pewtrusts.org/en/research-and-analysis/articles/2014/05/19/fiscal-50-state-trends-and-analysis.

[42] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. "In 10th year of recovery, states' fiscal and economic prospects improve".

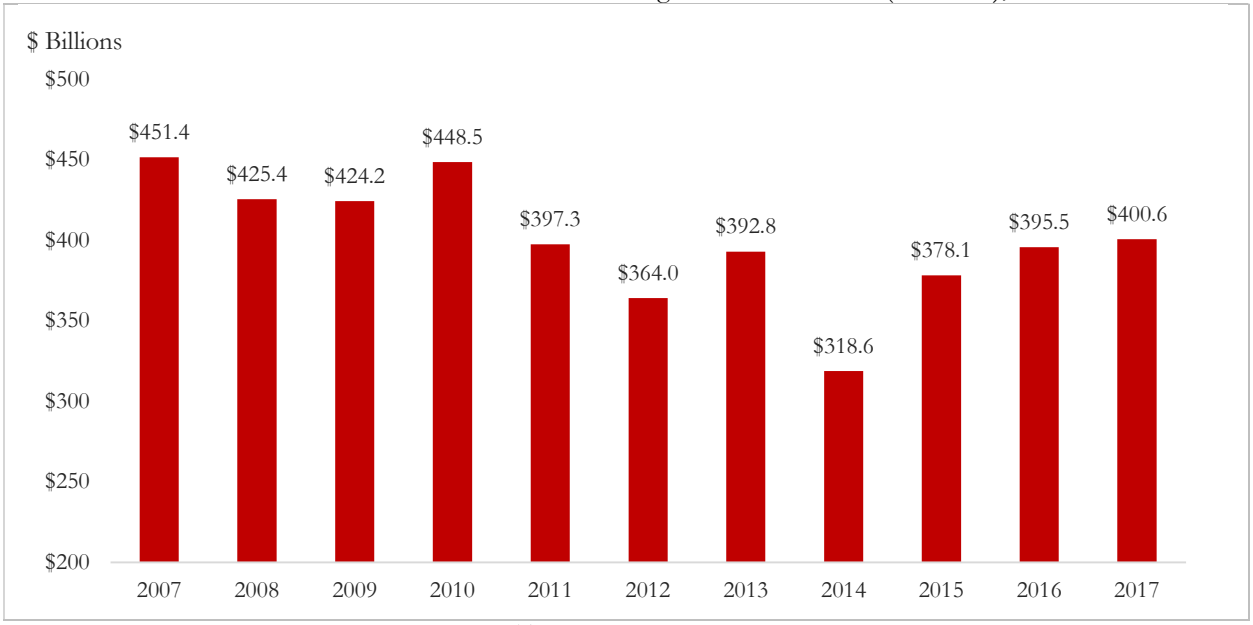
Some state governments face fiscal constraints due to inherited shortfalls in funding for public employees' pension and retiree health care benefits. Many of these states, like New Jersey and Illinois, are also characterized by weak population growth.[43]

There are many indicators hinting at lurking fiscal stress. For instance, in 2017, total state and local government expenditures were 4.6 percent higher than 2010 levels, but employee retirement expenditures were 31.4 percent higher.[44]

Indebtedness is another concern. Buoyed by stronger economic and fiscal performances, many state policymakers have decided to bulk up debt, including to fund school construction and other public needs. Low interest rates have served as another motivational factor.

Exhibit 51 reflects the decline in long-term debt issuance that prevailed from 2007 to 2014 (2010 was an exception, largely attributable to the passage of a federal stimulus package in February 2009). However, during the three-year period immediately thereafter, debt issuance has surged. In the short-term, the willingness of governments to borrow and spend strengthens economic performance. In the long-run, however, this indebtedness can become a source of risk, particularly during rocky economic times when meeting debt services becomes more challenging.

Exhibit 51. U.S. State & Local Governments' Total Long-Term Debt Issued ($ Billions), 2007-2017



Source: 1. Sage. 2. Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: 1. Figures are in 2017 dollars (inflation adjusted).

[43] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. "In 10th year of recovery, states' fiscal and economic prospects improve".

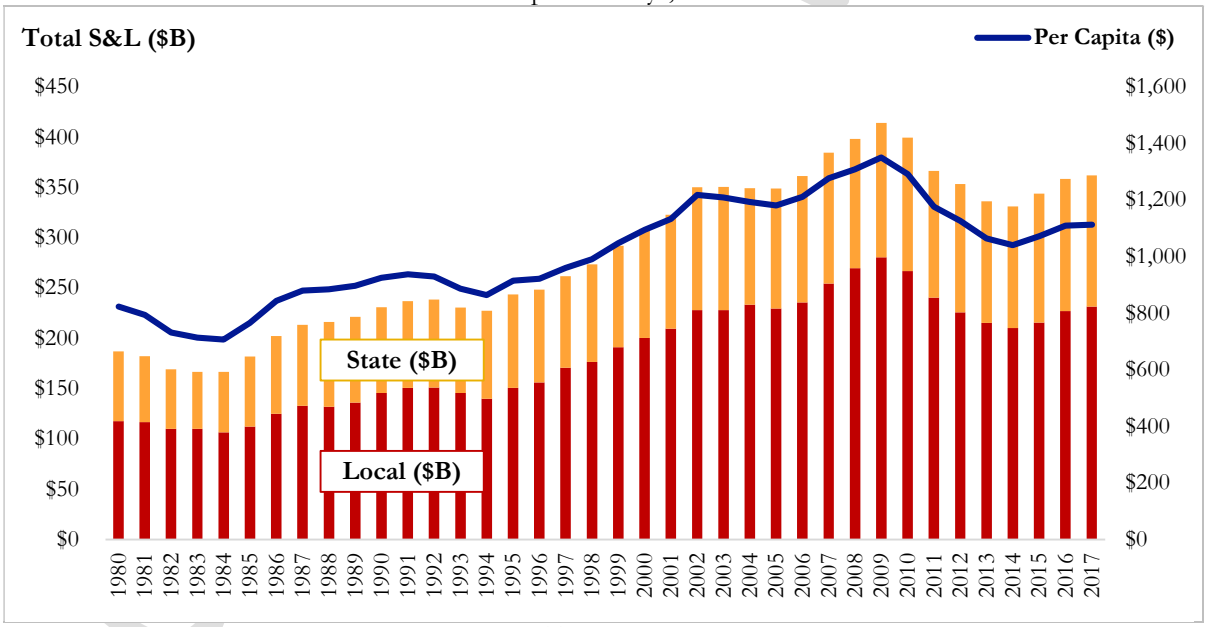
[44] Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances.

Still, stakeholders in the fire apparatus industry should take heart in the presence of larger rainy day funds. Past economic expansions also gave states the opportunity to build up rainy day funds to buffer against recession and ultimately make critical investments. Unfortunately, while some states have bulked up their reserves during this expansion, others have not.

According to an analysis by Moody's Analytics (2019), 22 states fell short of having enough reserves to offset even a moderate recession. Ten states were significantly ill-prepared to survive a recession (5 percentage points away from the level of reserves needed), which thankfully was down from 17 states in 2018.[45]

With a few exceptions (e.g. state gas taxes), state and local governments have responded to sharply constrained resources not by raising taxes, but by slashing capital spending and other areas of the budget.[46] According to U.S. Census Bureau data, capital expenditure cuts have been widespread. On a per capita basis, the level of real capital outlays by state and local governments was down by more than $100 per capita in 30 states (2017 compared to 2009 levels). Exhibit 52 supplies relevant statistical and visual detail.

Exhibit 52. U.S. State & Local Government Capital Outlays, 1980-2017



Source: 1. Sage. 2. Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: Figures are in 2017 dollars (inflation adjusted).

[45] Moody's Analytics. "Stress-Testing States 2019". October 2019. https://www.moodysanalytics.com/-/media/article/2019/stress-testing-states-2019.pdf.

[46] Boyd and Dadayan. 2016. "State and Local Governments Reshape Their Finances". July 1, 2016.

This pattern becomes even more apparent in Exhibit 53. Between 1987 and 1997, total capital outlays in the fire protection category rose 4.0 percent annually. During the ensuing decade, fire protection-related capital outlays expanded at an annual rate of 4.1 percent. But between 2007 and 2017, they fell 1.0 percent per annum.

Exhibit 53. Growth in U.S. Local Government Capital Outlays by Function, 1987-2017

Period	CAGR (%)		
	1987-1997	1997-2007	2007-2017
Total Capital Outlays	**2.5%**	**4.1%**	**-0.9%**
Construction	*2.5%*	*4.3%*	*-0.8%*
Other Capital Outlays	*2.6%*	*3.3%*	*-1.4%*
By Function			
Education	7.1%	4.7%	-1.7%
Fire Protection	4.0%	4.1%	-1.0%
Police Protection	3.8%	1.7%	-0.6%
Corrections	-5.6%	2.6%	-5.8%
Financial Admin. & Gen Control	5.8%	2.9%	-1.3%
General Public Buildings	0.7%	3.1%	-3.0%
Health & Hospitals	1.1%	4.8%	-0.1%
Highways	1.7%	3.4%	0.5%
Housing & Community Dev.	1.1%	1.0%	-3.3%
Libraries	4.1%	2.6%	-2.4%
Natural Resources	-2.5%	9.0%	-2.6%
Parks & Recreation	3.4%	4.0%	-1.7%
Utilities	-0.7%	4.1%	0.8%
Sanitation	-1.1%	3.4%	-0.5%
Other	4.5%	4.7%	-1.6%

Source: 1. Sage. 2. Urban Institute-Brookings Institution Tax Policy Center. *State & Local Government Finance Data Query System*. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances. Notes: CAGRs are based on figures in 2017 dollars (inflation adjusted).

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III. Economic Outlook

Recent data indicate units booked were up 1.7 percent from a year ago during 2019's fourth quarter. Sales growth and overall sales remain low by historic standards. In fact, average sales during Q1:2019-Q4:2019 were 0.5 percent below the quarterly average observed over the past 16 years.

Looking ahead, results of FAMA's 2019 Industry Outlook survey suggest that most fire departments expect budget and staffing levels to remain the same over the next two years, 2019-2020. Only about 26/27 percent expect budgets and staffing to increase.

A growing share of departments suggest they plan to purchase apparatus in the next fiscal year. In the 2019 Industry Outlook survey, just over 50 percent of departments indicated they plan to purchase apparatus, up from 48.8 percent in the previous survey year. As we have noted previously, intentions don't smoothly translate into bookings, however.

Population growth is estimated to have slowed in most U.S. states over the past 10 years, continuing a long-term trend. Population changes directly impact government finances and are tied to states' economic fortunes. A larger population typically translates into more workers and consumers adding to economic activity, which in turn generates more tax revenue. A growing economy can attract even more worker and families. For states with shrinking or slow growing populations, the reverse is usually true.[47]

For example, Illinois, West Virginia, Connecticut, Mississippi, and Rhode Island all fall near the bottom of both economic and population growth over the past decade. While a smaller population can lead to a reduction in some types of spending, it also means fewer residents to help cover the costs of long-standing obligations like debt and employee retirement benefits. The size of the population and annual growth also factors into how much each state receives from certain federal grants.[48]

U.S. population expanded by less than half a percentage point in 2019. This represents the third consecutive year of markedly decelerated growth and, according to the St. Louis Branch of the Federal Reserve Bank, might represent the slowest peacetime rate of population growth in the nation's history. This is largely attributable to political, demographic, and cultural forces, including shifting immigration policy and declining birth rates. International Monetary Fund projections published in late 2019 show population growth in the United States falling to around 0.5 percent in 2024. In Canada, population growth is projected to be higher, at around 0.9 percent in 2024, but still lower than growth

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[47] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. "Western, Southern States Gain Residents the Fastest", 2/27/2019. https://pew.org/2GLb5Tz.
[48] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis*. "Western, Southern States Gain Residents the Fastest", 2/27/2019. https://pew.org/2GLb5Tz.

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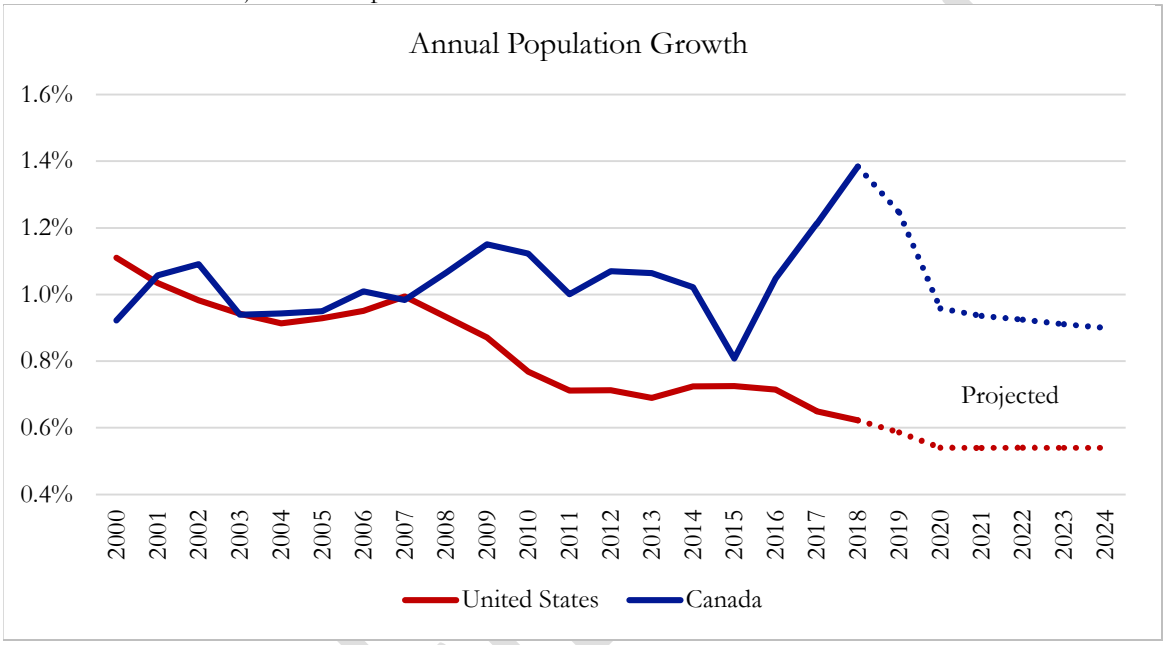
rates experienced in recent years. America's fertility rate of a bit more than 1.7 births per woman is the lowest on record.

State officials use population trends along with other measures to forecast residents' demands for services and revenue streams.[49] Expectations for slower population growth may impact budget planning, including for public safety investments. Moreover, the lack of available workers represents a primary constraint to economic growth in America.

Exhibit 54. IMF Projections: Population Growth in the U.S. and Canada



Source: 1. Sage. 2. International Monetary Fund, World Economic Outlook Database, October 2019.

While demographic forces represent a drag on growth of units booked—with the exceptions of rapidly growing states like Texas, Georgia, Tennessee, South Carolina, Florida, Arizona, Colorado, etc.—economic forces should be a net positive. Both U.S. and Canadian economies have been improving recently, with financial markets flourishing, unemployment falling, and job creation remaining steady. Moreover, both the Canadian and U.S. populations continue to age, which is consistent with significant growth in the number of service calls. This is a positive demographic factor that would tend to support greater bookings.

Despite improvement in the U.S. and Canadian economies, the most likely outcome is for units booked to expand only slowly and erratically, with occasional strong quarters followed by weak ones. This is because state and local government budgets appear to have heavily tilted toward other priorities and that is unlikely to change. Many state and municipal

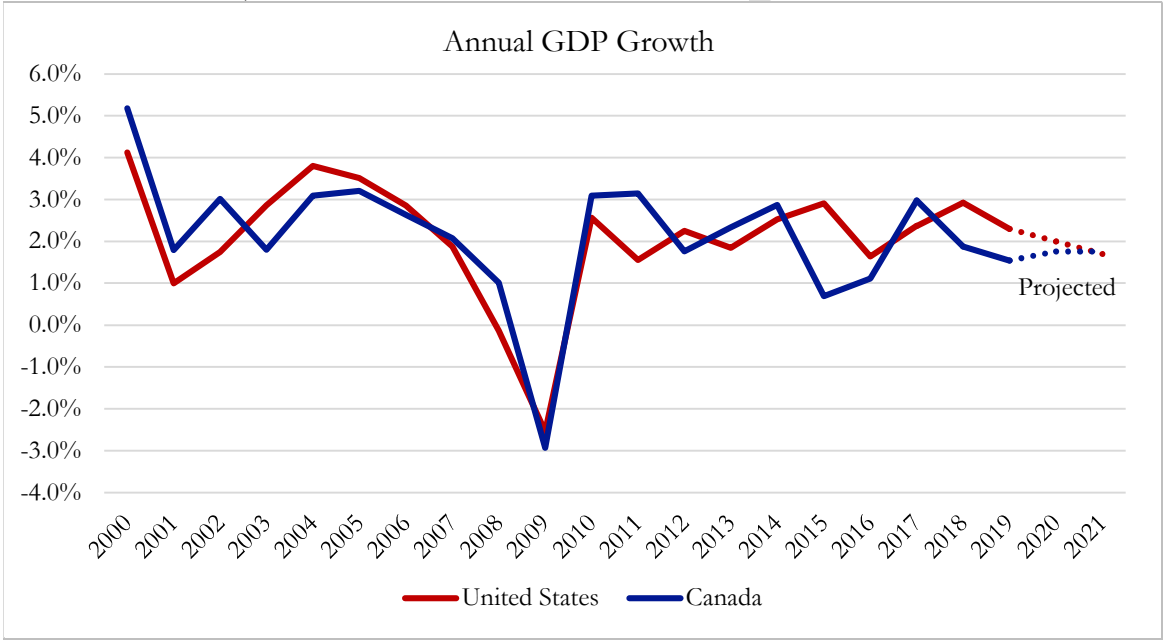
[49] The Pew Charitable Trusts. *Fiscal 50: State Trends and Analysis.* "Western, Southern States Gain Residents the Fastest", 2/27/2019. https://pew.org/2GLb5Tz.

pensions remain underfunded. Public healthcare costs are likely to continue to rise rapidly, at least in the United States, where Medicare is set for insolvency in 2026.

While the North American economy is likely to expand in the near term, the longer term is of course shrouded in uncertainty. A recent Wall Street Journal monthly survey of economists indicated that 35 percent of economists expect the next U.S. recession to start in 2021.[50] The International Monetary Fund projects U.S. economic growth to slow to 2.0 percent in 2020 and 1.7 percent in 2021. In Canada, growth is expected to rebound slightly from 1.5 percent in 2019 to 1.8 percent in 2020-2021.[51] Still, Canadian performance is not expected to be extraordinary.

The good news is that economists tend to be wrong. Many had predicted that recession would arrive by now, with significant inflation and higher interest rates representing major culprits. Instead, inflation has remained benign and interest rates have tumbled, helping push homebuilder confidence to a 20-year high recently and to induce asset prices, whether stock or commercial real estate prices, to climb further. The best guess is that there will be a recession in North America at some point over the next three years, with elevated corporate, household, and government debt serving as contributing factors.

Exhibit 55. IMF Projections: GDP Growth in the U.S. and Canada



Source: 1. Sage. 2. International Monetary Fund, World Economic Outlook Database, October 2019; International Monetary Fund, World Economic Outlook Update, January 2020.

[50] The Wall Street Journal, Economic Forecasting Survey. February 2020 Edition. https://www.wsj.com/graphics/econsurvey/.
[51] International Monetary Fund, World Economic Outlook Update, January 2020.

Conclusion

- Agonizingly Soft Recovery in Units Booked despite Stronger North American Economy

Recent data indicate units booked were up 1.7 percent from a year ago during 2019's fourth quarter. Sales growth and overall sales remain low by historic standards. In fact, average sales during Q1:2019-Q4:2019 were 0.5 percent below the quarterly average observed over the past 16 years.

This seems remarkable given not only the improved performance of the economy and state/provincial/local budgets, but also given the significant attention given to wildfires in California and elsewhere in recent years. Moreover, with more North Americans aging, the demand for emergency response of various types is on the rise. One might have thought that this would have represented a perfect set of circumstances for robust growth in units booked by FAMA members. FAMA data indicate that that has not been the case.

This report supplies both summary detail regarding industry performance over time as well as an analysis of explanatory factors. We conclude that there are four factors that explain sluggish recovery in units booked since the end of the financial crisis.

1. State and local governments are collectively taking on less debt to finance capital expenditures in part because of rising Medicaid expenditures and still underfunded pensions. Accordingly, between 2007-2017, total fire protection capital outlays fell by 1.0 percent annually after rising at a 4.1 percent annual rate during the prior decade;
2. Federal Assistance to Firefighters Grants (AFG) program funding has shrunk dramatically since FY2009. That year, grants totaled more than $500 million. By FY2018, grant funding was around $315 million;
3. There have been sharp declines in units booked per 100,000 housing units in parts of the American Midwest, South, and Northeast as many shrinking communities have lost the financial capacity to re-invest in fire safety and emergency response;
4. Many communities lack a fire safety equipment replacement plan. In lieu of defined strategies, many communities simply apply for federal grants. Waiting for federal monies can produce years of under-investment in firefighting technology and massive deterioration in responsiveness, reliability, and capacity.

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Looking Ahead

A combination of economic and demographic forces suggests that units booked should climb going forward. Both the U.S. and Canadian economies have been improving recently, with financial markets flourishing, unemployment falling, and job creation remaining steady. Moreover, both the Canadian and U.S. populations continue to age, which is consistent with significant growth in the number of service calls.

Despite that, the most likely outcome is for units booked to expand only slowly and erratically, with occasional strong quarters followed by weak ones. This is because state and local government budgets appear to have heavily tilted toward other priorities and that is unlikely to change. Many state and municipal pensions remain underfunded. Public healthcare costs are likely to continue to rise rapidly, at least in the United States, where Medicare is set for insolvency in 2026.

Moreover, in the current political environment, few policymakers are willing to raise taxes in non-emergency situations (e.g. Illinois recently passed tax increases in a desperate attempt to pass a balanced budget) and there is a relative lack of appetite for debt accumulation in support of capital expenditures despite extraordinarily low interest rates. The U.S. government is wrestling with $23 trillion in debt and recently cut federal taxes, which may have stimulated faster economic growth in the short-term, but also appears to have expanded annual budget deficits beyond congressional expectations.

As a final point, there will also likely be increased expenditure on professional firefighters as the number of available volunteers continues to decline due to a host of factors, including the growing need for two incomes to support a given household. This will further reduce resources available for apparatus purchases. The future, therefore, may be associated with a growing number of professional firefighters working with inadequate physical capital.

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Appendix

FAMA Members: Units Booked

Exhibit A1. FAMA Members-Total Units Booked by U.S. State, 2018 v. 2019

State	2018	2019	2018 v. 2019	
			Net	%
Alaska	11	15	4	36.4%
Alabama	57	57	0	0.0%
Arkansas	34	22	-12	-35.3%
Arizona	59	97	38	64.4%
California	424	293	-131	-30.9%
Colorado	85	73	-12	-14.1%
Connecticut	51	51	0	0.0%
District of Columbia	5	12	7	140.0%
Delaware	34	20	-14	-41.2%
Florida	216	244	28	13.0%
Georgia	130	124	-6	-4.6%
Iowa	36	36	0	0.0%
Idaho	17	18	1	5.9%
Illinois	126	142	16	12.7%
Indiana	95	98	3	3.2%
Kansas	43	44	1	2.3%
Kentucky	41	47	6	14.6%
Louisiana	91	92	1	1.1%
Massachusetts	87	95	8	9.2%
Maryland	48	66	18	37.5%
Maine	20	26	6	30.0%
Michigan	115	103	-12	-10.4%
Minnesota	75	76	1	1.3%
Missouri	52	85	33	63.5%
Mississippi	53	62	9	17.0%
Montana	16	17	1	6.3%
North Carolina	160	150	-10	-6.3%
North Dakota	23	16	-7	-30.4%
Nebraska	34	35	1	2.9%
New Hampshire	27	17	-10	-37.0%
New Jersey	109	141	32	29.4%
New Mexico	34	48	14	41.2%
Nevada	33	16	-17	-51.5%
New York	264	310	46	17.4%
Ohio	127	137	10	7.9%

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State	2018	2019	2018 v. 2019	
			Net	%
Oklahoma	43	65	22	51.2%
Oregon	26	37	11	42.3%
Pennsylvania	170	168	-2	-1.2%
Rhode Island	6	9	3	50.0%
South Carolina	94	100	6	6.4%
South Dakota	18	11	-7	-38.9%
Tennessee	60	64	4	6.7%
Texas	283	291	8	2.8%
Utah	34	22	-12	-35.3%
Virginia	121	127	6	5.0%
Vermont	13	15	2	15.4%
Washington	97	85	-12	-12.4%
Wisconsin	74	76	2	2.7%
West Virginia	25	26	1	4.0%
Wyoming	11	17	6	54.5%
American Samoa	0	0	0	-
Guam	0	0	0	-
Hawaii	19	20	1	5.3%
Northern Mariana Islands	0	0	0	-
Puerto Rico	0	2	2	-
Virgin Islands	0	2	2	-
Total U.S.	**3,927**	**4,022**	**95**	**2.4%**

Exhibit A2. FAMA Members-Total Units Booked by Canadian Province, 2018 v. 2019

Province	2018	2019	2018 v. 2019	
			Net	%
Alberta	53	55	2	3.8%
British Columbia	59	62	3	5.1%
Manitoba	32	28	-4	-12.5%
New Brunswick	18	12	-6	-33.3%
Newfoundland and Labrador	2	8	6	300.0%
Nova Scotia	19	12	-7	-36.8%
Northwest Territories	2	2	0	0.0%
Nunavut	3	2	-1	-33.3%
Ontario	145	100	-45	-31.0%
Prince Edward Island	1	3	2	200.0%
Quebec	29	37	8	27.6%
Saskatchewan	14	7	-7	-50.0%
Yukon	4	0	-4	-100.0%
Total Canada	**381**	**328**	**-53**	**-13.9%**

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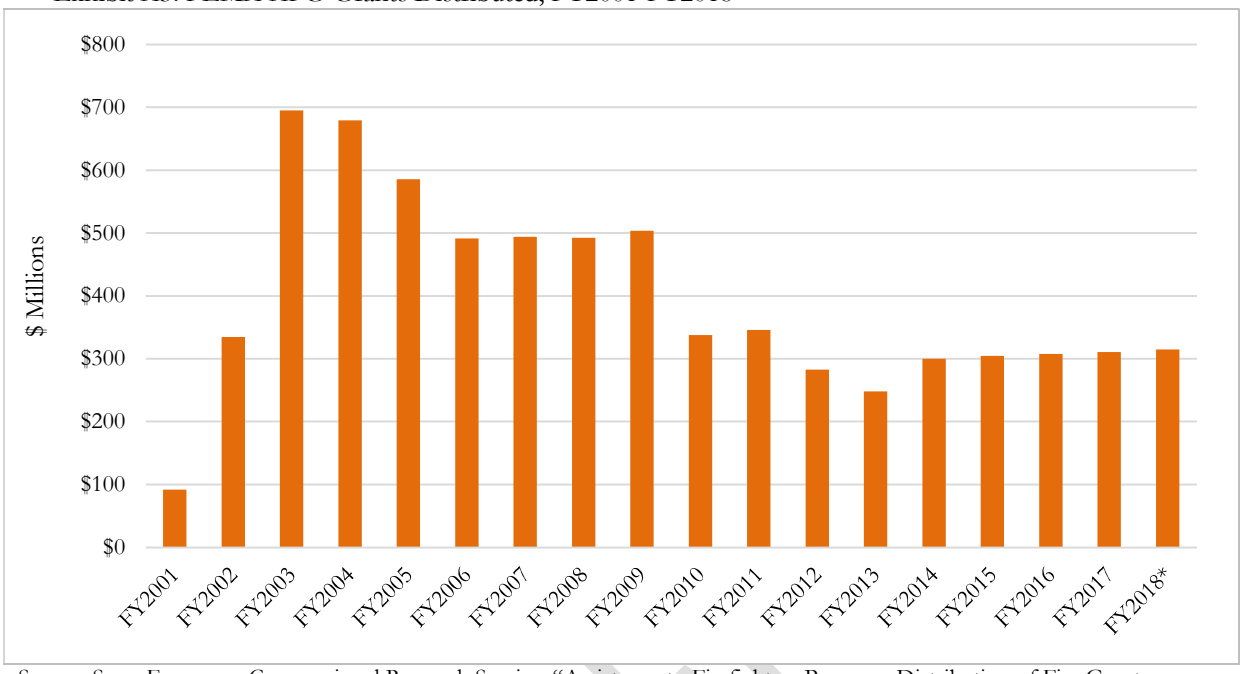
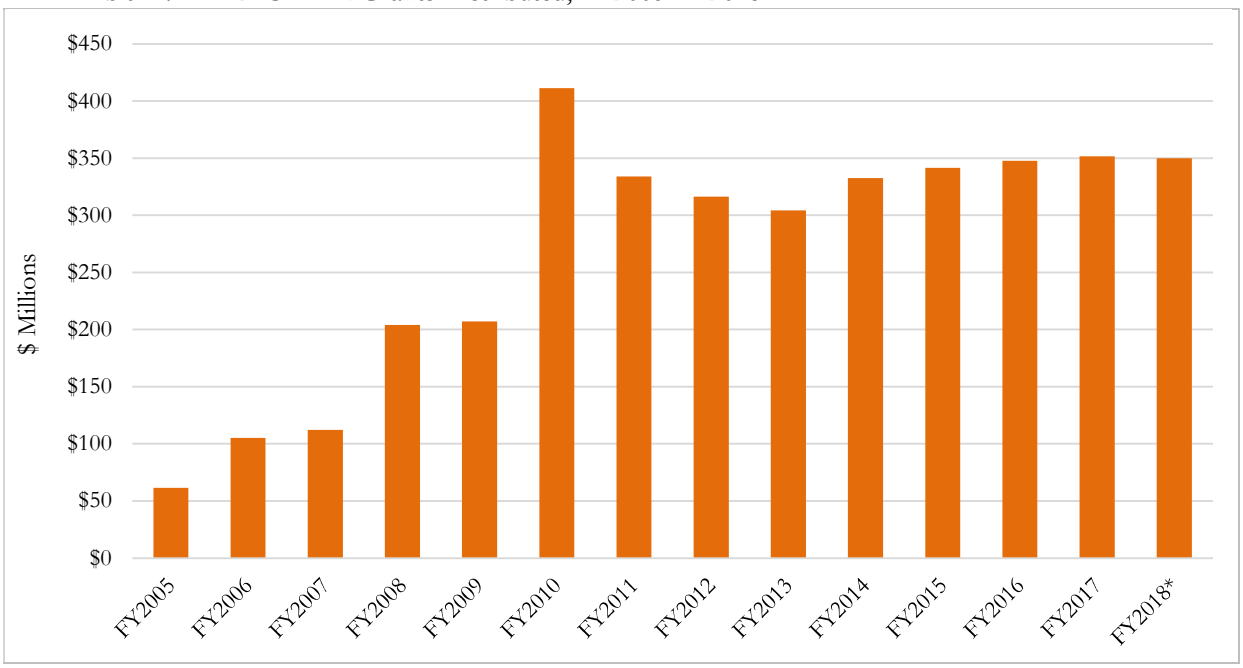
FEMA Grants

Exhibit A3. FEMA AFG Grants Distributed, FY2001-FY2018



Source: Sage; Fema.gov; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy. Notes: AFG: Assistance to Firefighters Grants. *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

Exhibit A4. FEMA SAFER Grants Distributed, FY2005-FY2018



Source: Sage; Fema.gov; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy. Notes: AFG: Assistance to Firefighters Grants. *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

Exhibit A5. AFG Awarded by State, FY2017 v. FY2018 & FY2005-FY2018 Total

State / AFG Grants ($ in Millions)	FY2017	FY2018*	Net Chg.	% Chg.	FY05-FY2018 Total
Alaska	$0.52	$1.58	$1.06	201.4%	$15.86
Alabama	$13.98	$20.19	$6.20	44.4%	$245.74
Arkansas	$1.23	$2.40	$1.17	95.0%	$69.66
Arizona	$5.84	$4.59	-$1.25	-21.4%	$66.84
California	$15.67	$17.32	$1.65	10.5%	$295.71
Colorado	$2.19	$3.11	$0.92	42.1%	$50.15
Connecticut	$5.47	$4.87	-$0.59	-10.9%	$67.94
District of Columbia	$0.00	$0.00	$0.00	-	$4.83
Delaware	$1.96	$0.80	-$1.16	-59.2%	$12.44
Florida	$6.38	$10.68	$4.31	67.5%	$143.68
Georgia	$3.02	$6.38	$3.36	111.1%	$93.61
Iowa	$5.11	$3.63	-$1.48	-29.0%	$90.83
Idaho	$2.18	$2.22	$0.03	1.5%	$33.59
Illinois	$12.76	$11.48	-$1.29	-10.1%	$220.82
Indiana	$6.51	$5.41	-$1.10	-16.9%	$126.59
Kansas	$2.20	$1.83	-$0.37	-16.9%	$51.32
Kentucky	$4.69	$4.95	$0.26	5.6%	$126.84
Louisiana	$3.37	$2.60	-$0.77	-22.8%	$77.37
Massachusetts	$16.57	$14.20	-$2.37	-14.3%	$154.73
Maryland	$7.88	$5.65	-$2.23	-28.3%	$86.78
Maine	$2.52	$3.21	$0.69	27.5%	$46.99
Michigan	$10.59	$10.81	$0.22	2.1%	$185.19
Minnesota	$6.64	$3.39	-$3.25	-48.9%	$146.28
Missouri	$4.52	$7.38	$2.85	63.0%	$125.54
Mississippi	$3.08	$2.12	-$0.96	-31.2%	$73.12
Montana	$1.93	$0.58	-$1.35	-69.8%	$42.69
North Carolina	$11.54	$13.40	$1.86	16.1%	$199.84
North Dakota	$0.23	$0.39	$0.15	66.6%	$20.61
Nebraska	$1.24	$1.85	$0.62	49.7%	$36.09
New Hampshire	$2.93	$2.23	-$0.71	-24.0%	$36.30
New Jersey	$8.63	$7.16	-$1.47	-17.0%	$144.13
New Mexico	$1.52	$0.46	-$1.07	-70.0%	$18.24
Nevada	$1.28	$1.19	-$0.09	-7.1%	$14.91
New York	$17.26	$18.25	$0.99	5.7%	$282.93
Ohio	$22.75	$20.86	-$1.89	-8.3%	$327.76
Oklahoma	$2.00	$2.25	$0.25	12.2%	$61.79
Oregon	$7.01	$9.00	$1.99	28.4%	$85.88
Pennsylvania	$35.46	$24.35	-$11.11	-31.3%	$434.61
Rhode Island	$4.58	$5.21	$0.63	13.8%	$38.91
South Carolina	$4.68	$4.40	-$0.28	-6.0%	$105.98
South Dakota	$1.00	$1.24	$0.23	23.2%	$22.50
Tennessee	$6.25	$9.61	$3.36	53.7%	$138.29
Texas	$4.74	$6.88	$2.14	45.1%	$165.47
Utah	$0.74	$2.45	$1.71	231.6%	$34.15
Virginia	$6.84	$9.20	$2.37	34.6%	$101.10
Vermont	$0.99	$2.03	$1.04	104.6%	$18.22
Washington	$11.74	$11.55	-$0.20	-1.7%	$148.07
Wisconsin	$4.79	$5.24	$0.45	9.3%	$136.68
West Virginia	$5.28	$2.91	-$2.37	-44.9%	$73.06
Wyoming	$0.35	$0.88	$0.53	150.8%	$10.44

Source: Sage; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy; Fema.gov. Note: *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

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Exhibit A6. SAFER Awarded by State, FY2017 v. FY2018 & FY2005-FY2018 Total

State / SAFER Grants ($ in Millions)	FY2017	FY2018*	Net Chg.	% Chg.	FY05-FY2018 Total
Alaska	$0.82	$0.51	-$0.31	-37.3%	$13.44
Alabama	$7.92	$2.37	-$5.55	-70.1%	$64.01
Arkansas	$1.89	$1.10	-$0.79	-41.6%	$20.94
Arizona	$10.09	$6.36	-$3.74	-37.0%	$114.94
California	$30.88	$40.60	$9.71	31.4%	$452.47
Colorado	$4.47	$1.85	-$2.61	-58.5%	$38.97
Connecticut	$3.28	$2.81	-$0.47	-14.3%	$52.25
District of Columbia	$0.00	$1.51	$1.51	-	$10.66
Delaware	$0.13	$0.00	-$0.13	-100.0%	$3.77
Florida	$20.11	$30.97	$10.86	54.0%	$314.86
Georgia	$7.38	$7.00	-$0.38	-5.1%	$91.81
Iowa	$2.50	$0.40	-$2.10	-84.0%	$15.74
Idaho	$2.27	$1.14	-$1.12	-49.6%	$15.35
Illinois	$8.84	$5.55	-$3.29	-37.2%	$77.68
Indiana	$8.84	$16.45	$7.61	86.1%	$80.57
Kansas	$5.79	$0.00	-$5.79	-100.0%	$19.66
Kentucky	$2.37	$1.08	-$1.30	-54.7%	$20.83
Louisiana	$1.98	$0.56	-$1.43	-71.9%	$46.82
Massachusetts	$17.47	$17.30	-$0.16	-0.9%	$196.72
Maryland	$13.23	$20.32	$7.10	53.6%	$97.34
Maine	$0.52	$0.00	-$0.52	-100.0%	$8.00
Michigan	$8.49	$7.59	-$0.90	-10.6%	$214.00
Minnesota	$0.49	$5.82	$5.33	1082.7%	$23.29
Missouri	$5.66	$5.95	$0.29	5.1%	$55.67
Mississippi	$3.56	$4.36	$0.80	22.4%	$18.82
Montana	$2.26	$1.89	-$0.37	-16.3%	$16.39
North Carolina	$9.57	$11.74	$2.18	22.8%	$101.08
North Dakota	$0.00	$0.50	$0.50	-	$9.96
Nebraska	$3.65	$0.90	-$2.75	-75.4%	$18.73
New Hampshire	$2.76	$0.66	-$2.11	-76.2%	$12.69
New Jersey	$7.45	$21.40	$13.95	187.3%	$279.45
New Mexico	$2.96	$1.40	-$1.55	-52.5%	$14.58
Nevada	$3.40	$3.01	-$0.39	-11.5%	$45.29
New York	$5.67	$14.34	$8.67	152.8%	$98.43
Ohio	$22.00	$12.46	-$9.54	-43.4%	$194.79
Oklahoma	$3.15	$3.09	-$0.06	-1.9%	$42.09
Oregon	$3.01	$5.41	$2.39	79.4%	$70.69
Pennsylvania	$24.40	$8.35	-$16.04	-65.8%	$137.90
Rhode Island	$3.87	$3.94	$0.07	1.8%	$50.48
South Carolina	$4.03	$7.78	$3.75	93.1%	$57.14
South Dakota	$0.00	$0.43	$0.43	-	$4.79
Tennessee	$18.69	$5.76	-$12.93	-69.2%	$67.34
Texas	$39.66	$32.06	-$7.60	-19.2%	$174.73
Utah	$3.80	$0.72	-$3.08	-81.0%	$22.77
Virginia	$6.36	$10.44	$4.09	64.3%	$91.67
Vermont	$0.00	$0.00	$0.00	-	$1.37
Washington	$11.05	$14.62	$3.57	32.3%	$143.94
Wisconsin	$0.00	$1.69	$1.69	-	$17.60
West Virginia	$1.22	$1.23	$0.01	0.4%	$23.12
Wyoming	$0.39	$0.49	$0.10	24.7%	$7.45

Source: Sage; Congressional Research Service, "Assistance to Firefighters Program: Distribution of Fire Grant Funding". Author: Lennard G. Kruger, Specialist in Science and Technology Policy; Fema.gov. Note: *FY2018 figures are the grant awards, which may vary from the dollar amount of funds actually distributed.

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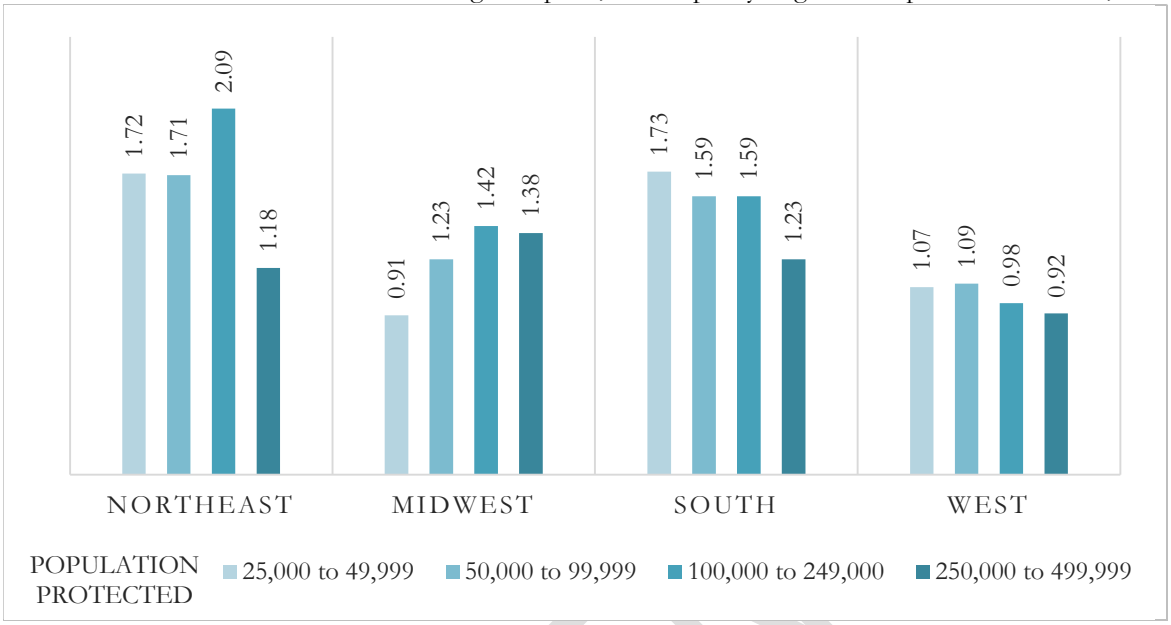
Median Rates of Career/Volunteer Firefighters in the U.S.

Exhibit A7. Median Rates of Career Firefighters per 1,000 People by Region & Population Protected, 2017



Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

Exhibit A8. Median Rates of Volunteer Firefighters per 1,000 People by Region & Population Protected, 2017

Source: 1. Sage; 2. National Fire Protection Association (NFPA). "U.S. Fire Department Profile-2017". March 2019.

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