

Fire Apparatus – An Industry Far from Complete Recovery

On Behalf of
FAMA
2018 Spring Meeting

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Introduction: Analyzing an Industry Critical to Public Safety

FAMA tasked Sage Policy Group, Inc. (Sage) with organizing and analyzing FAMA data in order to generate insights regarding observed industry trends and likely future performance.

The report provides:

- “ A discussion of the performance of FAMA members relative to historic norms along key dimensions like orders/sales;
- “ An analysis of the state of the U.S. firefighting fleet;
- “ An identification of economic, demographic and policy factors that appear to be shaping industry performance.

Two Primary Research Questions Addressed

There are two key questions that the analysis endeavored to answer:

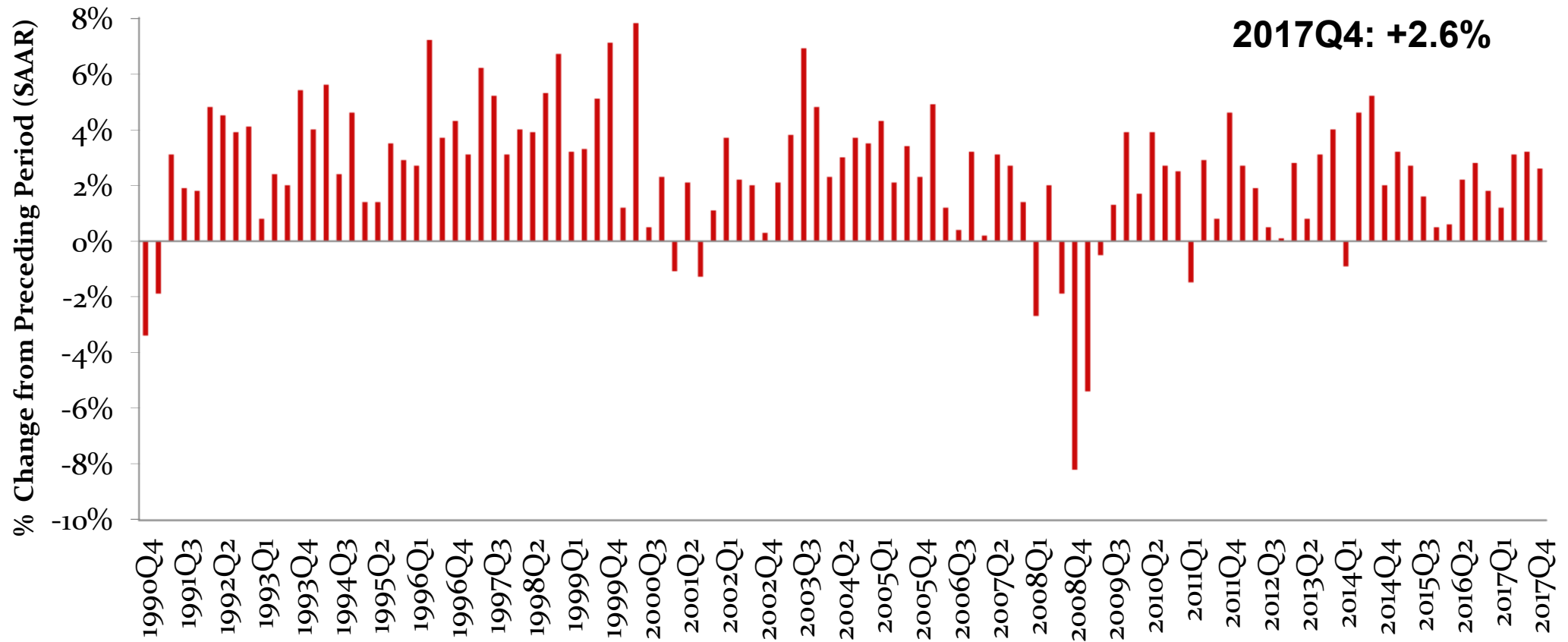
1. Why has the North American firefighting fleet failed to recover in conjunction with the broader economy in terms of units booked?
2. What can the industry expect in light of broader economic forecasts and known demographics?

Part I

FAMA Industry Performance

Gross Domestic Product

1990Q4 through 2017Q4*



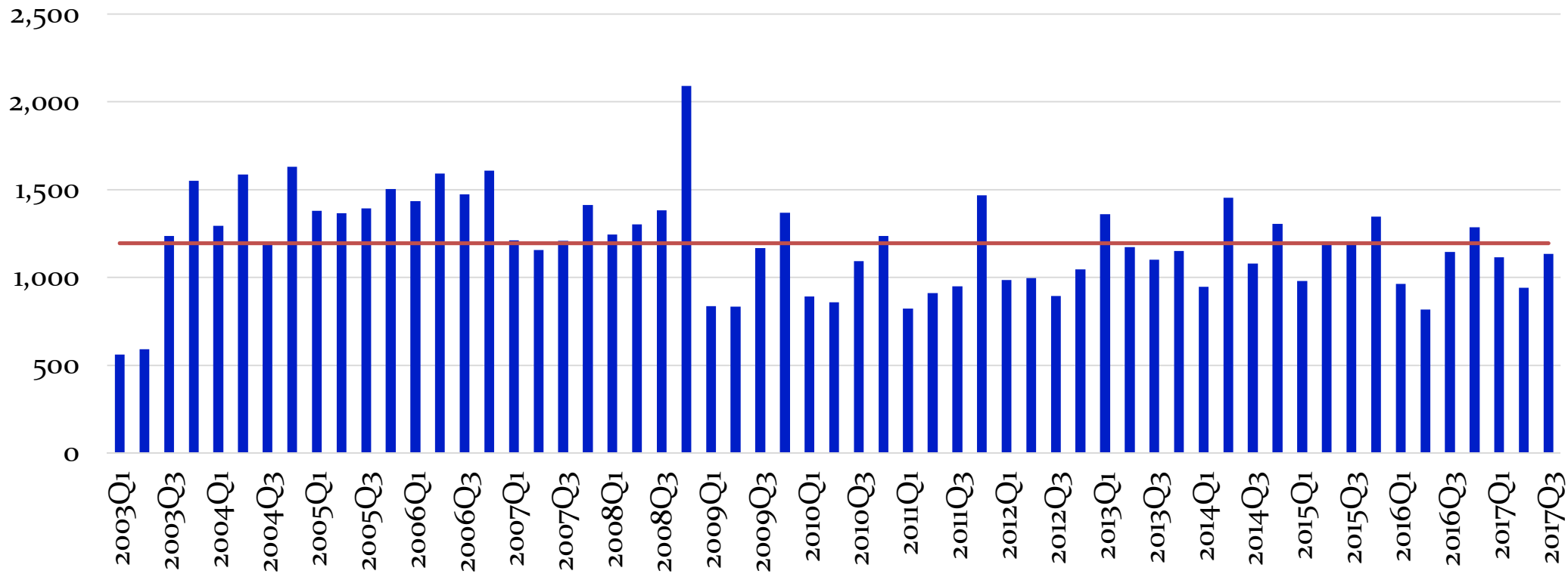
*1st (Advance) Estimate

Source: U.S. Bureau of Economic Analysis

FAMA Members: Total Units Booked by Quarter

2003Q1 – 2017Q3

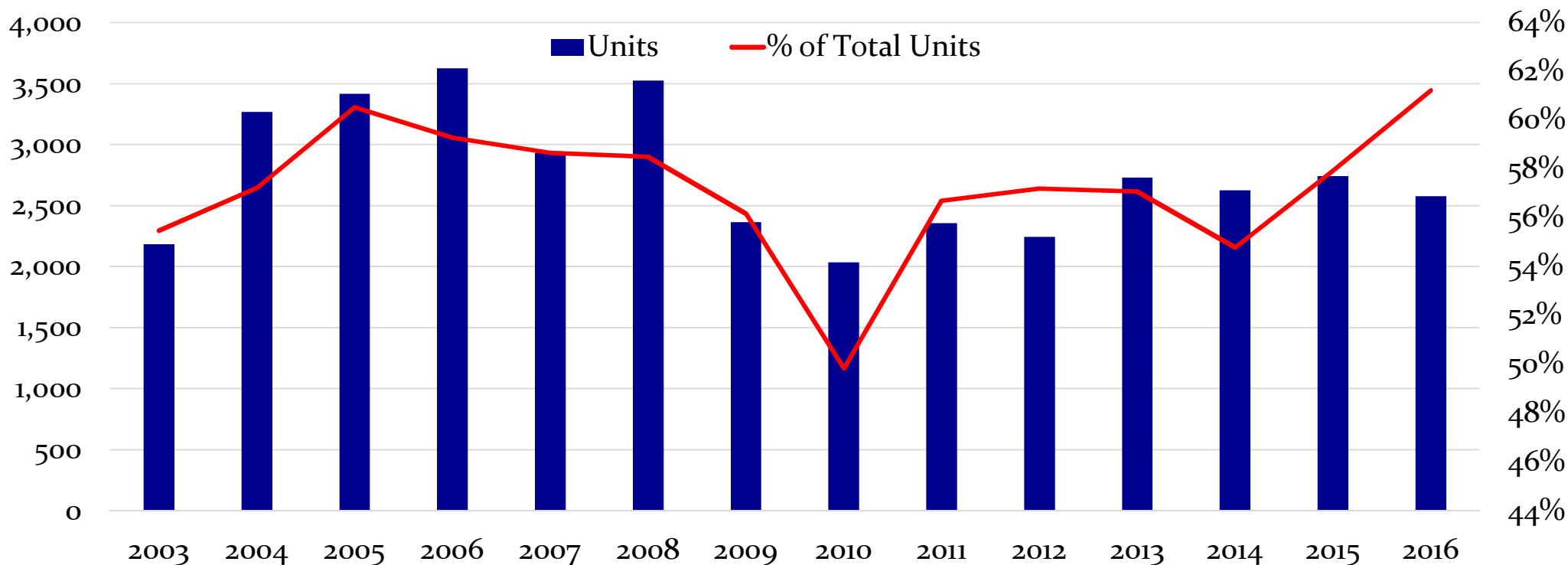
■ Total Units Booked — All Time Quarterly Avg.



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

Source: FAMA; Sage Policy Group

FAMA Members: Pumpers Booked, 2003 – 2016



“ Pumpers represent the majority of sales, historically around 57 percent of all units booked (61.3 percent in 2016).

“ Aerial apparatus, rectangular and elliptical tankers, and non-walk in rescue represent the next largest sources of sales.

FAMA Members: Units Booked by Vehicle Class

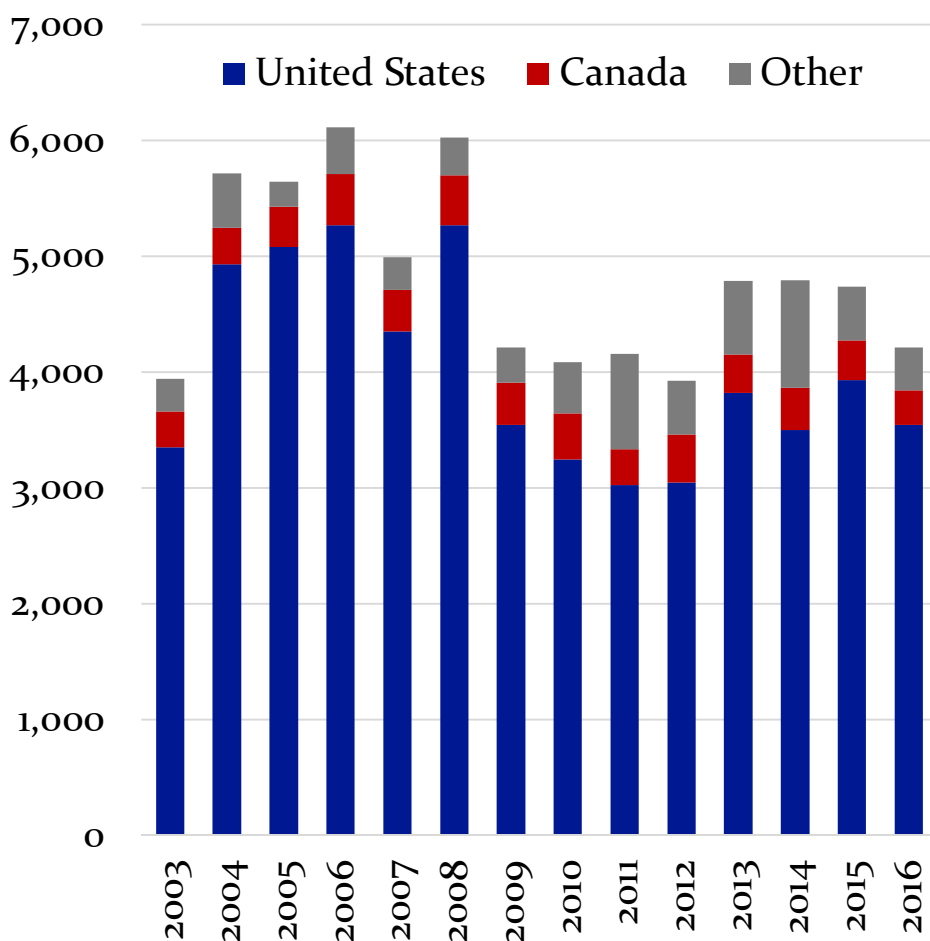
2015 v. 2016

Vehicle Class	Units Booked		2015 v. 2016	
	2015	2016	Net	%
Pumpers	2,745	2,581	-164	-6.0%
Walk-In Rescue	86	68	-18	-20.9%
Non-Walk In Rescue	339	184	-155	-45.7%
Rectangular & Elliptical Tanker Sales	510	411	-99	-19.4%
Aerial	652	599	-53	-8.1%
Airport Rescue & Fire Fighting (ARFF)	131	161	30	22.9%
Major Refurbishment	79	62	-17	-21.5%
Brush Trucks	197	150	-47	-23.9%
Total Units Booked	4,739	4,216	-523	-11.0%

Units Booked Fail to Recover Fully in Conjunction with Economic Expansion

- “ 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.
- “ The market has improved since, but complete recovery remains elusive. While units booked have risen 2012, they declined 11 percent in 2016.
- “ Sales during Q2:2017 were more than 20 percent below the quarterly average observed over the past 14 years. Sales in Q3:2017 were still more than 5 percent below the quarterly average.

FAMA Members: Total Units Booked, By Country



	Units Booked			2012 v. 2016 % Ch.	2015 v. 2016	
	2012	2015	2016		Net	%
United States	3,051	3,933	3,548	16.3%	-385	-9.8%
Canada	414	344	296	-28.5%	-48	-14.0%

	Units Booked Year-to-date		YTD 2016 v. 2017	
	2016Q3	2017Q3	Net	%
United States	2,413	2,708	295	12.2%
Canada	217	253	36	16.6%

Source: FAMA; Sage Policy Group

Part II

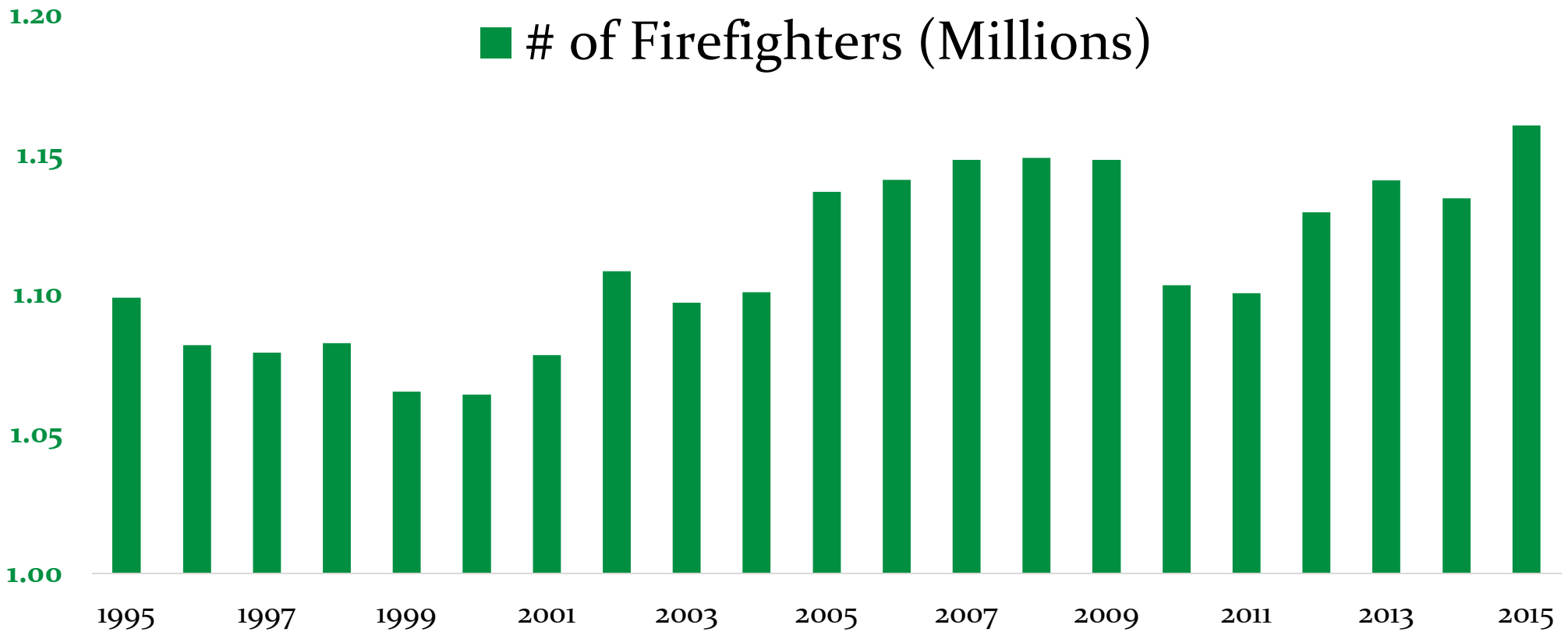
Industry Performance in Context



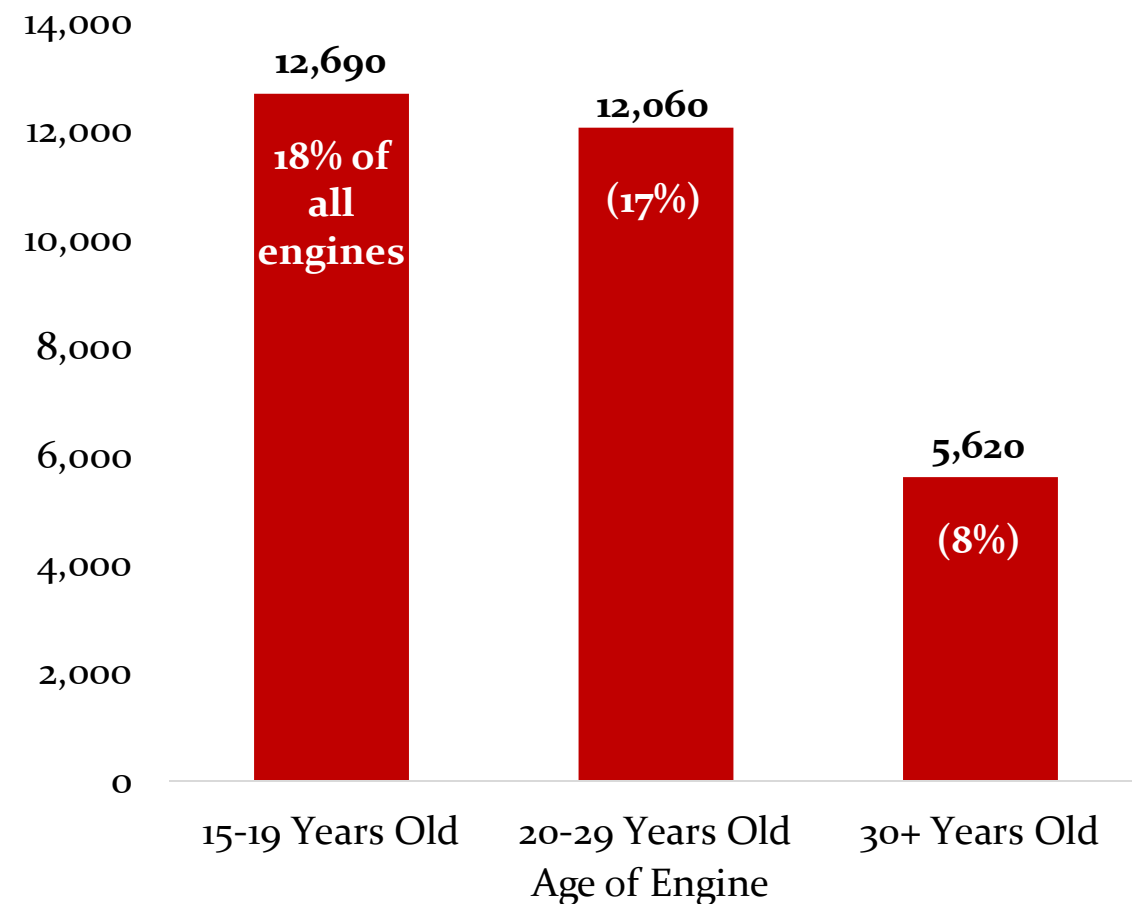
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The U.S. Fire Fleet: Fire Fighters

Number of Firefighters in the U.S., 1995-2015

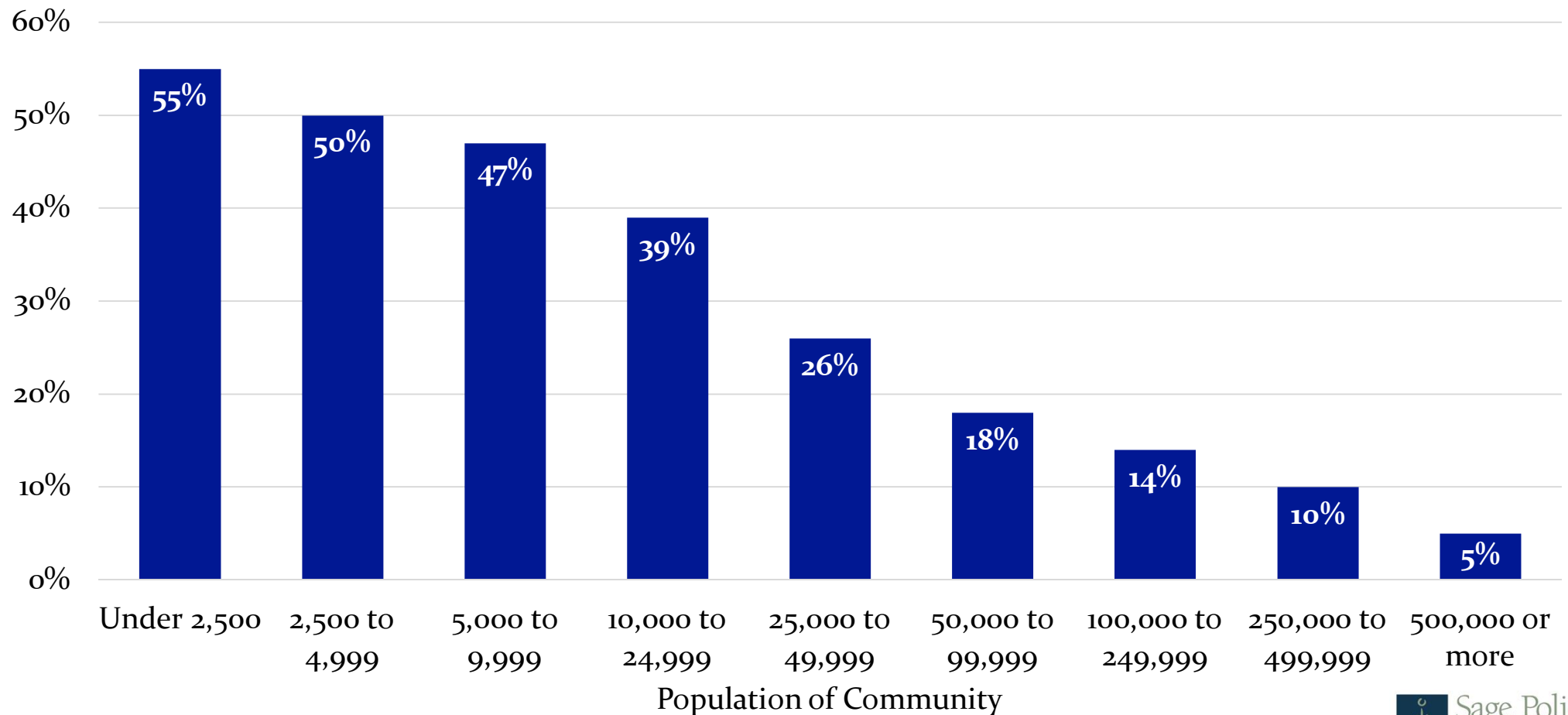


Number of Engines in Service that are 15+ Years Old in the U.S., as of 2013-2015



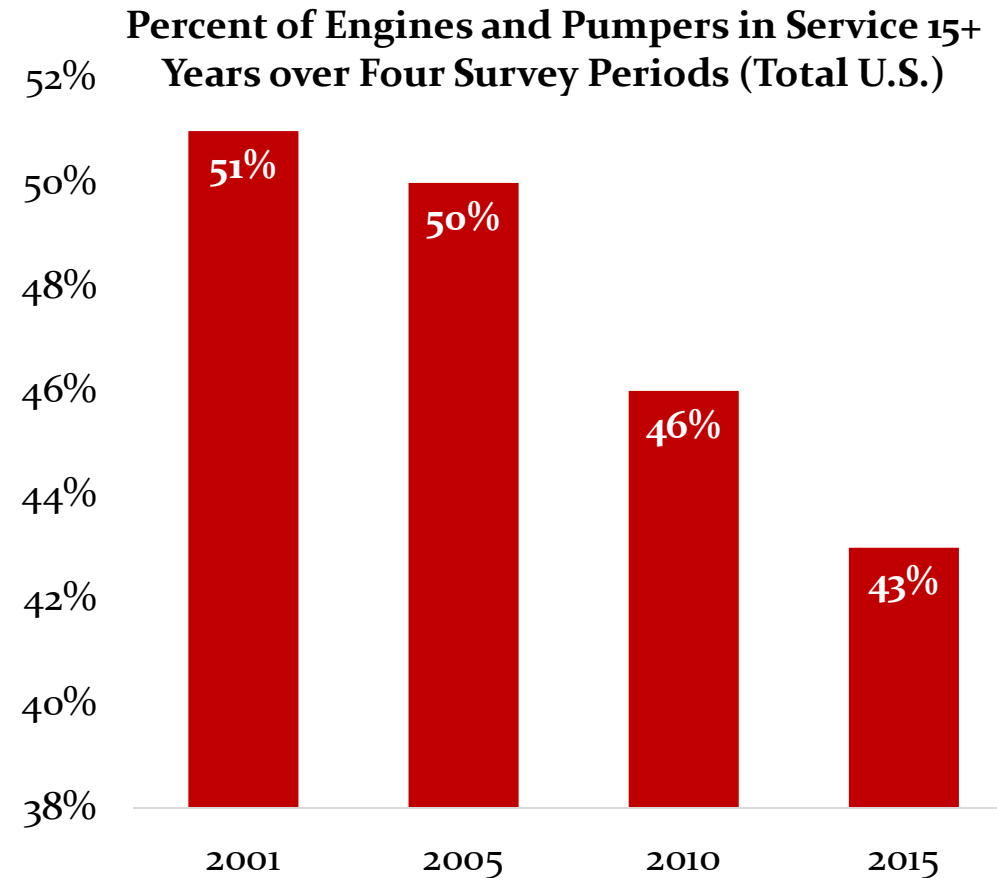
- “ In 2015, approximately 43% of all fire department engines and pumpers were at least 15 years old according to NFPA estimates. A quarter of all units are at least 20 years old.
- “ The NFPA notes that while vehicle age alone is not sufficient to confirm the need for replacement, it is indicative of a potential need, which should be examined.
- “ Based on this piece of data and others, there is clearly a significant amount of potential need for replacement.

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



The U.S. Fire Fleet: Has a Replacement Cycle Begun in Earnest?

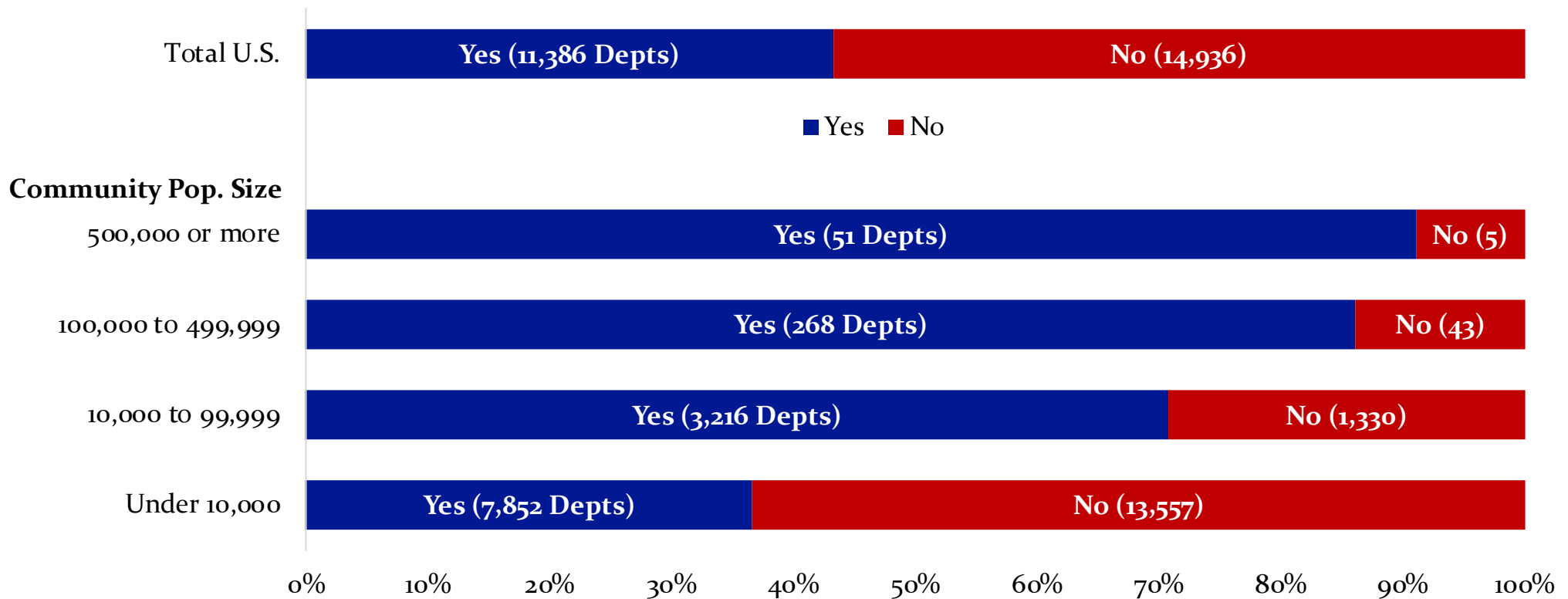
- “ NFPA survey responses hint that there has been some progress in reducing the age profile of the nation’s engines and pumpers in recent years.
- “ Across the NFPA’s four Needs Assessment Surveys, the share of engines/pumpers in service that are at least 15 years old has declined from 51% in 2001 to 43% in 2015.
- “ Thus, while the number of fire apparatus has not increased as one might have anticipated over time, there is some evidence suggesting that there has been a meaningful level of turnover in operating units.



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

Departments with Plans for Regular Apparatus Replacement by Community Size, 2013-2015

"Does Department Have a Plan for Apparatus Replacement on a Regular Schedule?"



Trends in Community Fire Protection Spending

Capital Expenditure Share in Decline

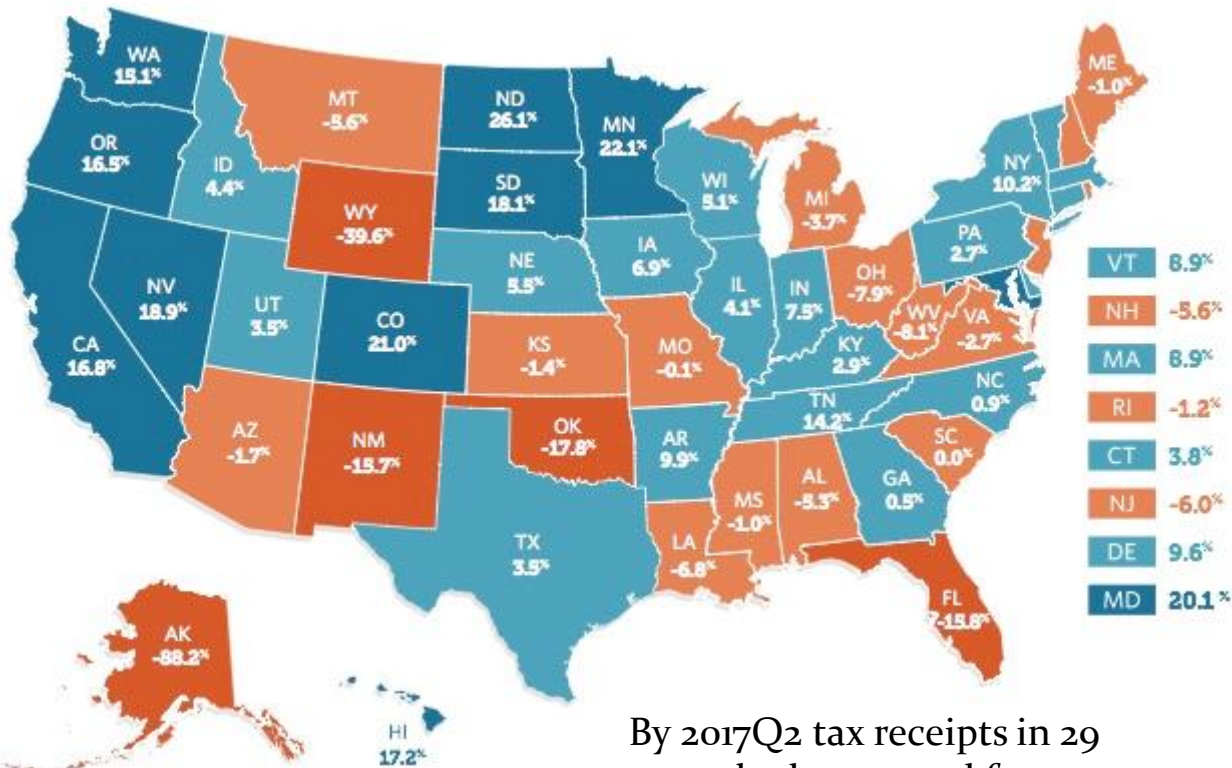
- “ Historically, capital outlays have represented a small portion of total expenditures on fire protection, but that share has slipped even lower in recent years.
- “ From 1980-2015, capital expenditures represented around 7.6% of total local fire protection spending on average, but in 2015, capital expenditures represented less than 6% of total spending.

Why the Lack of Strong Recovery in Fire Equipment Spending?

- “ State and local governments have been shifting expenditures toward non-infrastructure categories, including Medicaid, health insurance for employees, and underfunded pensions;
- “ States and local governments are collectively taking on less debt to finance capital expenditures. Correspondingly, between 2005-2015, total fire protection capital outlays fell by nearly 11 percent after rising 64 percent the prior decade;
- “ Federal Assistance to Firefighters Grants (AFG) program funding has shrunk dramatically since FY2009. That year, grants totaled \$500 million. By FY2016, grant funding was a bit more than \$300 million.
- “ There have been sharp declines in units booked per 100,000 housing units in many parts of the American Midwest and South as many communities have lost the financial capacity to re-invest in fire safety and emergency response.

Inflation Adjusted Tax Collections in 2017Q2 Compared with Each State's Peak (Adjusted for Inflation)

■ 15% or more below ■ 0 to 15% below ■ 0 to 15% above ■ 15% or more above

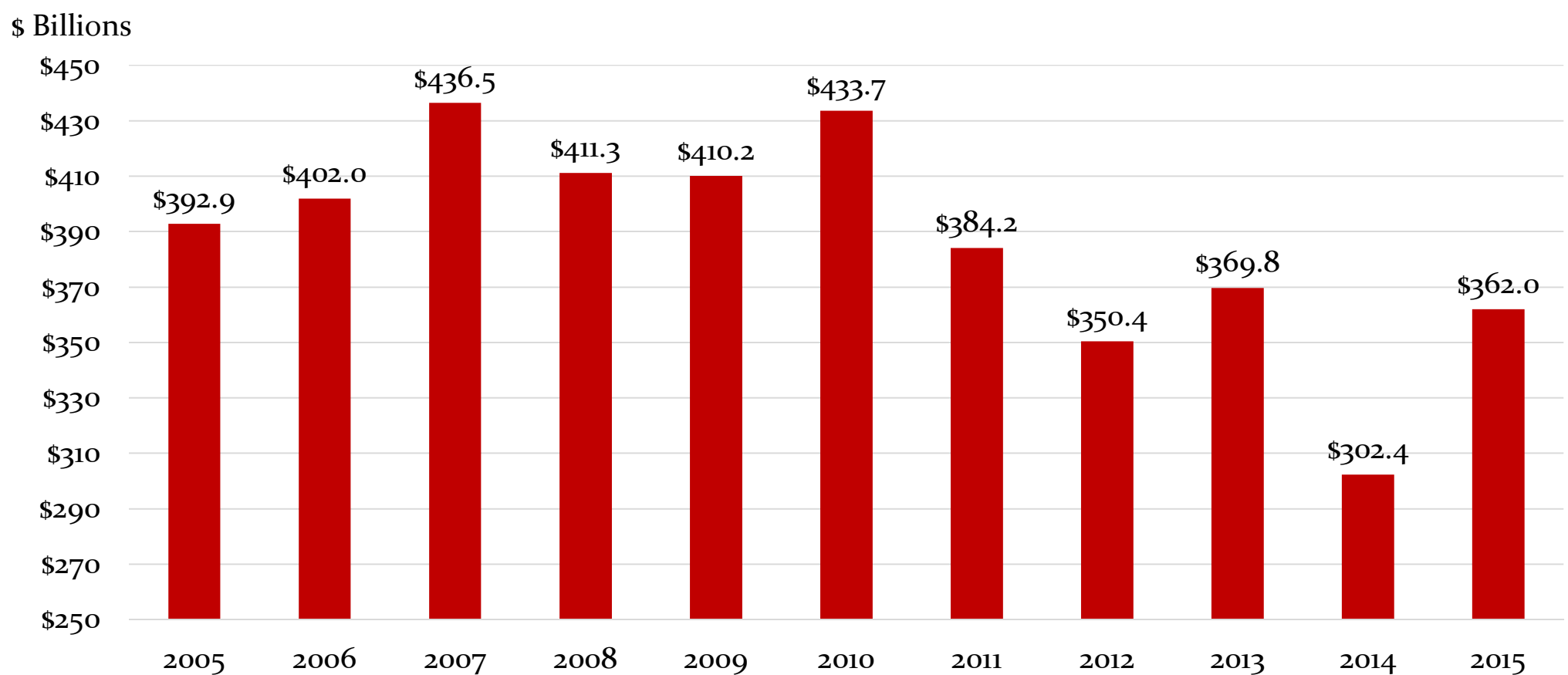


By 2017Q2 tax receipts in 29 states had recovered from losses in the recession.

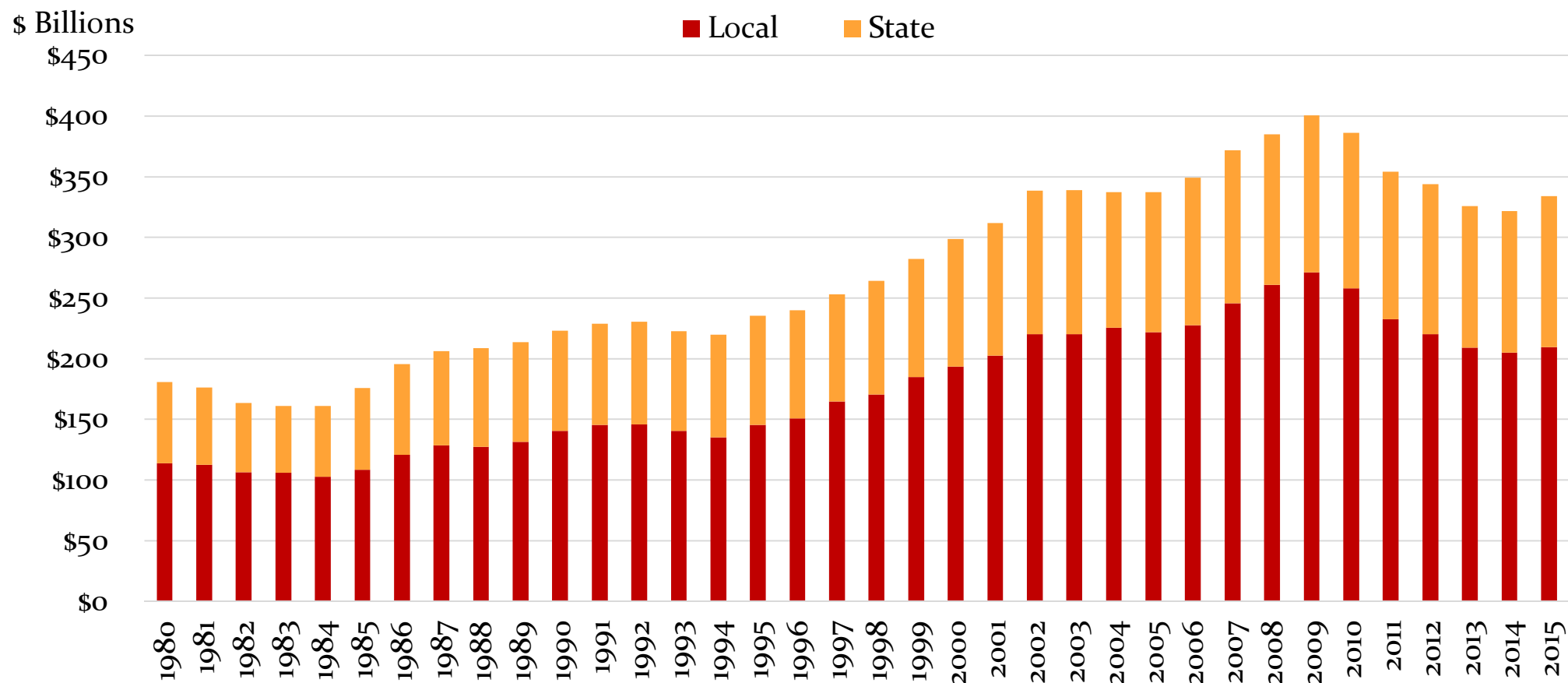
- “ All or mostly-volunteer fire departments (which make up more than 70% of all departments in the U.S.) derive a large share of their revenues from local taxes.
- “ For all/mostly-volunteer fire departments the share of revenues from taxes is between 83-88% for communities of 5,000 to 49,999 people.
- “ Apparatus constitute the principal costs for volunteer departments, so one would expect fire apparatus sales to neatly and predictably correlate with local tax revenues.

Source: 1. Sage; 2. National Fire Protection Association (NFPA). “Fourth Needs Assessment of the U.S. Fire Service”. November 2016; 3. 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.

U.S. State & Local Governments' Total Long-Term Debt Issued 2005-2015



U.S. State & Local Government Capital Outlays, 1980-2015



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 2015 dollars (inflation adjusted).

Growth in U.S. Local Government Capital Outlays by Function

1985-2015

- Between 1985 and 1995, total capital outlays in the fire protection category rose more than 27%.
- During the ensuing decade, fire protection-related capital outlays expanded more than 64%.
- But between 2005 and 2015, they fell by nearly 11%.

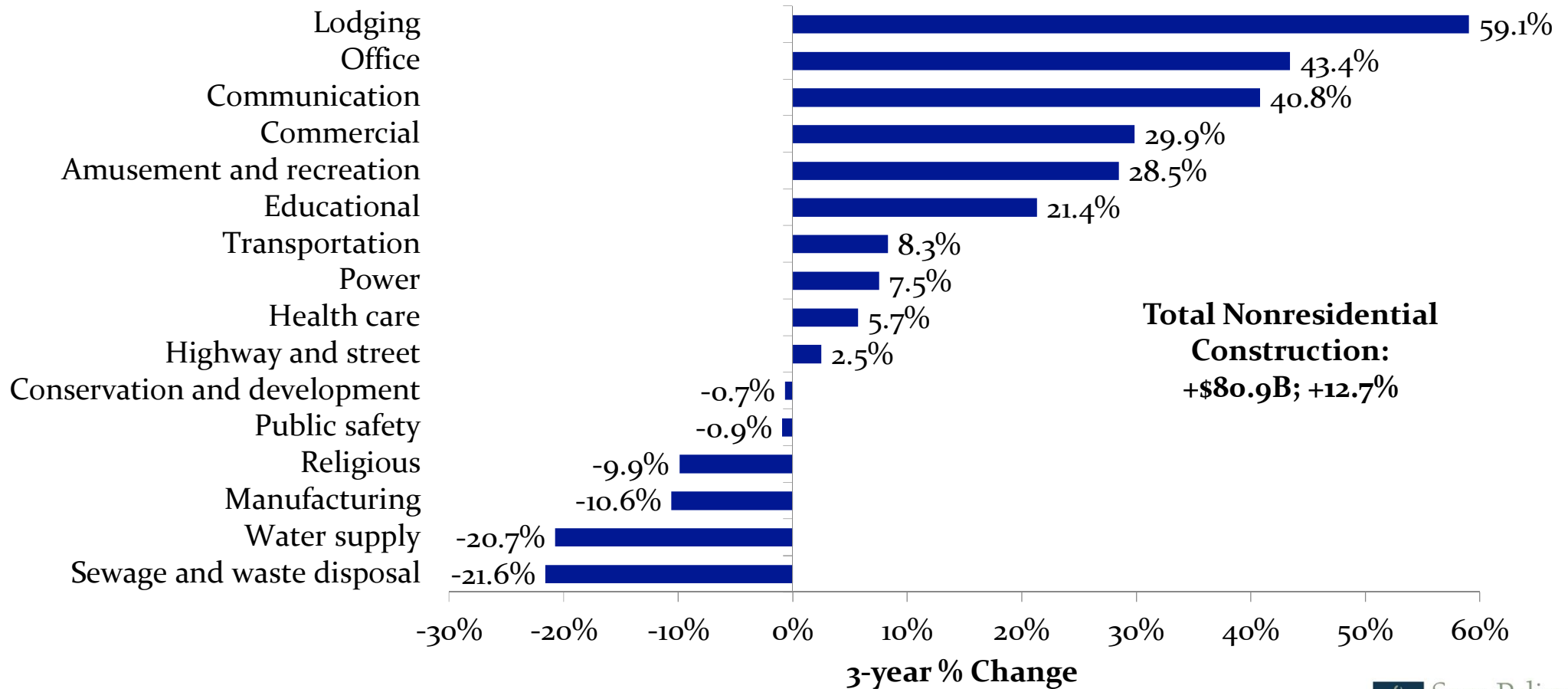
Period	% Change		
	1985-1995	1995-2005	2005-2015
Total Capital Outlays	34.2%	52.5%	-5.5%
<i>Construction</i>	22.7%	71.8%	-5.4%
<i>Other Capital Outlays</i>	68.3%	11.0%	-6.0%

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 2015 dollars (inflation adjusted).

Period	% Change		
	1985-1995	1995-2005	2005-2015
By Function			
Education	106.7%	73.9%	-18.9%
Fire Protection	27.4%	64.3%	-10.5%
Police Protection	48.2%	20.4%	6.7%
Corrections	19.3%	-17.5%	-40.6%
Financial Admin. & Gen Control	86.9%	51.2%	-27.9%
General Public Buildings	58.0%	18.5%	-15.1%
Health & Hospitals	4.8%	39.4%	13.9%
Highways	26.4%	29.8%	13.3%
Housing & Community Dev.	-3.6%	35.6%	-35.3%
Libraries	55.7%	55.5%	-28.2%
Natural Resources	0.1%	56.3%	-8.8%
Parks & Recreation	31.4%	64.0%	-16.7%
Utilities	2.2%	41.5%	22.4%
Sanitation	7.4%	21.6%	5.7%
Other	53.4%	89.3%	-13.5%

National Nonresidential Construction Spending by Subsector

December 2014 v. December 2017



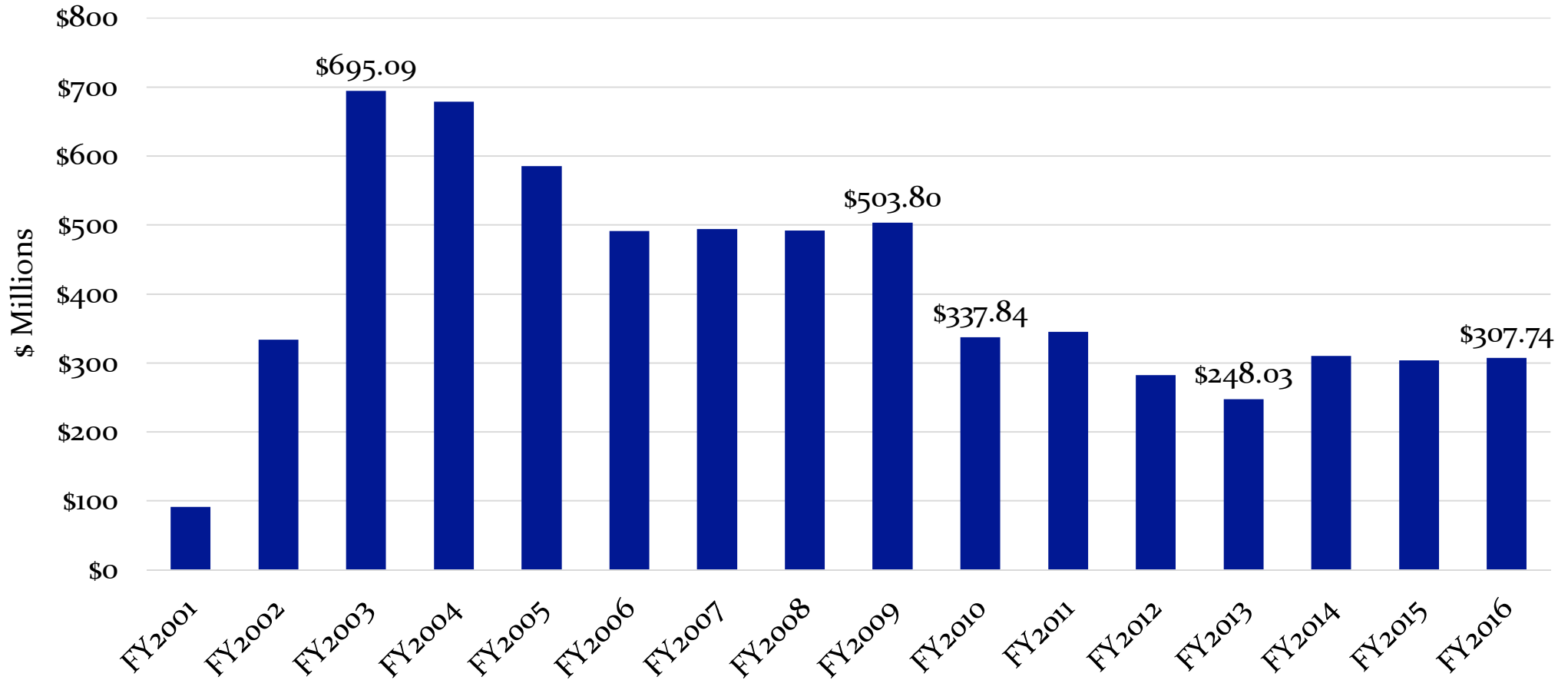
Looking for Explanatory Factors:

Federal Funding

- “ While funding for firefighting is predominately provided by state and local governments, there are several federal grant programs that support firefighting operations.
- “ For firefighting apparatus the most relevant grant program is the Assistance to Firefighters Grants (AFG) program operated by the Federal Emergency Management Agency (FEMA).
- “ 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.”
- “ The amount of AFG grants distributed has shrunk dramatically since FY2009. That year, grants totaled more than \$500 million. By FY2016, grant funding was a bit more than \$300 million.
- “ Even before FY2009, there had been a decline in funding. In FY2003, which came shortly on the heels of 9/11, AFG grant funding approached \$700 million.



Firefighter Assistance: FEMA AFG Grants Distributed FY2001-FY2016



AFG Grant Funding: Vehicle Replacement

- “ AFG grants used for vehicle replacement are used to replace sub-standard or unsafe vehicles.
- “ 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, only 201 applications were awarded grants (7.8%).
 - “ From FY2014-FY2016, funds for vehicles have represented around 44% of total funds requested by applicants. However, no more than 25% of available AFG grant funds may be used by recipients for the purchase of vehicles and 10% of that amount is set aside for ambulances.
- “ 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.”

Looking for Explanatory Factors:

Demographics/ Housing

- “ 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. As the data in this report indicate, that has simply not transpired.
- “ In much of the U.S., units booked per 100,000 housing units has remained remarkably stable over time (ex. Northwest & Western U.S.). The implication is that in much of the nation, the number of units booked has expanded at roughly the rate of household formation.
- “ However, in other communities, the ratio of units booked per 100,000 housing units has fallen sharply (South; Midwest). The likely explanation is that many communities in these states no longer have the wherewithal to invest in modern fire apparatus.

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	2016	2003	2016	2003	2016	2003 v. 2016
NORTHEAST	763	808	22,703,915	23,953,366	3.36	3.37	0.01
Division 1: New England	191	262	6,106,864	6,505,268	3.13	4.03	0.90
Division 2: Middle Atlantic	572	546	16,597,051	17,448,098	3.45	3.13	-0.32
MIDWEST	771	687	28,013,805	29,964,039	2.75	2.29	-0.46
Division 3: East North Central	461	435	19,459,396	20,574,376	2.37	2.11	-0.25
Division 4: West North Central	310	252	8,554,409	9,389,663	3.62	2.68	-0.94
SOUTH	1,187	1,322	44,996,117	52,151,021	2.64	2.53	-0.10
Division 5: South Atlantic	649	736	23,951,411	27,861,757	2.71	2.64	-0.07
Division 6: East South Central	225	182	7,627,908	8,422,853	2.95	2.16	-0.79
Division 7: West South Central	313	404	13,416,798	15,866,411	2.33	2.55	0.21
WEST	634	731	25,811,623	29,629,500	2.46	2.47	0.01
Division 8: Mountain	239	281	8,219,835	9,962,732	2.91	2.82	-0.09
Division 9: Pacific	395	450	17,591,788	19,666,768	2.25	2.29	0.04

Conclusions I

- “ Units booked among FAMA members have not fully recovered in conjunction with a strengthening economy.
- “ There are four primary factors that explain the sluggish recovery in units booked since the end of the financial crisis:

1. *State/local governments shifting expenditures toward non-infrastructure categories;*
2. *State/local governments collectively taking on less debt;*
3. *Shrinking Assistance to Firefighters Grants (AFG) program funding;*
4. *Sharp declines in units booked per 100,000 housing units in many parts of the American Midwest and South.*

Conclusions II

Looking Ahead:

- “ The most likely outcome is for units booked to stay relatively flat over the next few years 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.
- “ Healthcare costs will continue to rise, at least in the U.S.
- “ Moreover, in the current political environment, few policymakers are willing to raise taxes to finance capital expenditures.
- “ There will also be a growing need for communities to pay for professional firefighters as the number of available volunteers continues to decline.

Thank You

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