



TAX SAVINGS AND ECONOMIC VALUE OF VOLUNTEER FIREFIGHTERS IN NEW YORK



*Including A Special Report:
Statewide Analysis of Response Times*

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I. Executive Summary

The Firemen's Association of the State of New York (FASNY) asked Economic Research Services, Inc. (ERS) to calculate the economic value volunteer firefighters provide to New York residents. To complete this assignment, we analyzed paid and volunteer fire departments throughout the state (excluding New York City). We calculated the cost and the increased taxes if a paid department replaced volunteers in each locality. We applied economic models to measure firefighting requirements in localities, using not only population but also density, service areas and local experience. In a complex state such as New York, this multi-factor approach improves the accuracy of the calculations as compared to estimates based solely on population as done, for example, in Delaware, which has less varied demographics and geography.

This report updates and expands the work done in 2003 by our then subsidiary American Economics Group. The new findings recognize many changes in firefighting that have occurred in the 10 years between 2003 and 2013. They also incorporate potential efficiencies in the relocation of fire stations, if tax base funding and paid firefighters were required throughout New York. (No one is seriously suggesting such an enormous conversion. However, the specter of conversion provides relevance to the huge increases in property taxes required and the concomitant economic value of volunteers to their communities.)

An important new section of this report focuses on firefighting response times and federal SAFER grants. It examines millions of incident reports throughout the state for the years between 2004 and 2013. The New York State Office of Fire Prevention and Control provided voluminous data covering reported incidents of firefighter activity. This enabled calculation of response times in each locality and showed the importance of SAFER grants for firefighter retention and recruitment.

A. Calculating Tax Savings to New York Residents

New York taxpayers realize significant savings because volunteer firefighters are not paid wages and benefits and because fundraising by volunteer organizations reduces tax levies for fire equipment and operations. To determine the amount of tax savings to households and businesses, we calculated how much additional taxes would be necessary to cover the costs of all-paid departments in every area now using volunteers.

In our approach, we statistically evaluated the factors that determine the actual level of staffing and the cost of paid units, and applied the results to all volunteer localities throughout the state. We incorporated the particular characteristics of each area that dictate the number of full-time paid firefighters that would be needed. We then estimated the matching level of firefighting equipment, specialized vehicles, and fire stations with appropriate living quarters. From this we calculated annual operating and capital cost and the resulting taxes to support them.

B. Volunteer Fire Departments Have a Strong Impact on New York

- The full savings of New York State volunteer fire departments totals \$9.3 billion, including one-time and recurring annual costs

Changing to fully paid departments would cost taxpayers \$3.35 billion annually in pay, benefits, operating and maintenance costs to support an additional 30,822 full time paid firefighters. Atop that would be a one-time \$5.95 billion cost of acquiring and equipping stations with sleeping and eating facilities, emergency equipment, vehicles and related items. If bonds were used to finance these one-time requirements, the annual costs to local government would rise to \$3.87 billion including this debt service.

Figure I-1

Summary: Added Cost If All Fire Protection Services by Paid Firefighters 2013	
	Statewide All Areas*
Additional paid firefighters (full time equivalent)	30,822
	One-Time Acquisition Cost
Cost of fire houses/structures	\$3,617,790,000
Cost of vehicles & equipment	\$2,333,506,557
Total one-time cost**	\$5,951,296,557
	Annual Cost of Operations
Pay and benefits	\$3,124,914,720
General operating costs***	\$153,105,327
Equipment & structures (ann. maint. etc.)	\$68,308,530
Annual operating cost	\$3,346,328,577
Annual debt service (for acquired structures & equip.)	\$519,830,417
Total annual cost	\$3,866,158,994

* Excludes New York City

** Is assumed to be financed by borrowing covered by annual debt service.

*** Includes all normal outlays such as heating/cooling, electricity, communications, fuel, supplies, insurance, clothing, etc.

- **Converting to an all-paid fire service would require additional 30,822 full-time equivalent firefighters and about 1,300 reconstructed or new fire stations across the state.**

The staffing standard follows practices prevalent in paid departments during 2013, and assumes sufficient firefighters to meet minimum deployment standards such as a two-in two-out rule. In general, if the proposed the National Fire Protection Association (NFPA) standard 1710's minimum staffing were implemented statewide, there might be additional firefighters needed in some stations. In an actual conversion, many stations would be relocated or combined or expanded to achieve cost savings.

- **Property taxes for general government would rise 26.5% without volunteers.**

Without volunteer firefighters, property taxes would rise between 3.3% and 123.0% in counties across the state. While the statewide average tax increase (outside New York City) would be 26.5%, there would be great variability among local areas. For example, some counties would have tax increases that exceed 70% (Cattaraugus, Clinton, Delaware, Essex, Franklin, Hamilton, Lewis, Schenectady, Schoharie and Sullivan). The lowest increase would be 8.6% in Westchester County.

Figure I-2

Summary: Significantly Higher Property Taxes If All Fire Protection Services by Paid Firefighters 2013	
	Statewide All Areas*
Existing real estate taxes (all local govt. except schools)*	12,615,296,734
Cost of existing paid fire service	\$1,022,862,727
Added Costs if All Paid Firefighters	
Pay and benefits	\$3,124,914,720
General operating costs**	\$153,105,327
Equipment & structures (ann. maint. etc.)	\$68,308,530
Annual operating cost**	\$3,346,328,577
Increase in existing property tax for general govt. (average all counties)	26.5%

* Excludes New York City

** Does not include debt service on structures and major equipment, which could add 4% more tax.

Currently, local governments (including fire districts) collect \$12.6 billion in property taxes of which \$1.0 billion is paid for firefighting services (including payments to all career, mixed and volunteer departments). Thus, the cost of fire services would rise more than threefold.

- **The cost of pay and benefits and the use of overtime vary widely among the departments and regions of the state.**

Statewide, excluding New York City, the median base wage for a full-time firefighter was \$63,021 in 2014. The lowest is found in the Syracuse region at \$52,650, while the highest was in the White Plains region at \$86,070. A top ranked, high seniority firefighter could earn well over \$100,000 in the highest paying departments. Salary schedule steps, longevity, health, retirement, social security and other benefits add significantly to this total and vary greatly in across the state.

- **Volunteer departments have different strategies than paid departments.**

While a paid department's success is partly measured by keeping its staffing lean and costs down, a volunteer department's success is partly measured by building a large membership and expanding the number of people in the community who have firefighting skills. The more volunteers, the quicker the response, other things equal. In contrast, all-paid departments can meet their response requirements with a smaller yet more costly complement, manning the stations 24-7. The cliché that one paid firefighter replaces several volunteers is meaningless.

- **Fire response time was reduced between 2010 and 2013, a period in which SAFER grants supported activities to recruit and retain volunteer firefighters.**

Overall, volunteer fire departments improved response time between 2010 and 2013. The 7.9 minutes average response in 2010 was reduced by 2.5% to 7.7 minutes in 2013. Suburban departments showed the greatest reduction, 10.0%, from 8.0 minutes in 2010 to 7.2 in 2013. Rural firefighters responded in at 9.4 minutes in 2010 versus 9.6 minutes in 2013, a small increase. Finally, remote areas shortened their response by 3.3%, from 12.1 minutes in 2010 to 11.7 minutes in 2013.

II. Organization of Firefighting in New York State

A. The Political Geography of Firefighting

The State's Municipalities

Outside New York City, the state's counties are composed of cities, towns, and villages. Some towns contain one or more villages within their boundaries, and although a village is a separate municipal corporation, a town may function for the entire area, including the village proper. A classification used by the state, "town outside village," describes the area of a town that functions separately from one or more villages within the town. Often, districts and special districts provide school, water, sewer, fire, and other services and can levy taxes and incur debt.

In a densely populated area such as Nassau County, the combined and overlapping jurisdictions may provide all the municipal services found in cities. The exact structure in any area of the state has evolved over time as populations have grown and shifted and as municipal services have expanded. Formerly, cities embraced entire urban areas, and towns were largely rural. This distinction has become less true over the last few decades as residents have moved from the more densely populated cities to the suburbs. Clustered around the large and medium-sized cities, heavily populated and separately governed communities have developed. Today, New York State has both rural and urban counties, towns, and villages, although cities still tend to be urban, villages to be rural, and towns to exhibit characteristics of both.

In New York, the structure of firefighting and the municipal structure of counties, cities, towns, villages and districts create a complex mosaic of both the distribution of fire services and the distribution of public funds to pay for them. These are described in the following sections.

Firefighting Organizations

New York State (excluding New York City) has 57 counties and 61 cities and nearly 2,000 towns and villages. Cities, towns, and villages organize their firefighting capabilities into municipal fire departments, fire districts, and fire protection districts. These organizations may encompass firefighters who are all-paid, all-volunteer or a combination of both. Outside New York City, in 2013 there were 1,793 fire departments¹, each administering the operations of one or more fire stations within it. Single-station departments are the rule in the smaller towns and villages, but in cities and larger towns a fire department usually has two or more stations. A contiguous urban area is likely to contain more than one multi-station department.

To provide fire protection to their communities, the fire departments rely on highly trained personnel and specialized vehicles, apparatus, and equipment. Station houses have personal apparatus, pumper equipment and vehicles, plus ladder and/or platform systems, and may have tanker equipment. Departments own and operate other types of

¹ Complete listing of fire departments: New York State Office of Fire Prevention and Control and data from New York State Fire Reporting System, New York Office of Homeland Security.

vehicles including staff vehicles for the fire chief and deputies, general utility and “bucket” vehicles, brush vehicles, rescue vehicles, HAZMAT control and decontamination vehicles, and boats and hovercraft. (In many departments personal vehicles are used for the chief and other staff purposes.) Firefighters use additional apparatus such as fireproof clothing and self-contained breathing apparatus, as well as special tools and accessories. (Note that many departments have ambulances and emergency medical equipment. These are beyond the scope of this study and are not included in the calculated costs and staffing levels for paid departments.)

A department usually serves a particular city, town, or village. A city, town or village may contain more than one department. When a department is composed of more than one station, those stations apportion territories within their city, town, or village. However, territorial boundaries are not rigid; they often overlap, and units frequently come to each other’s aid when a station is overburdened with simultaneous or a single extensive emergency or requires special equipment or apparatus.

New York State fire departments are grouped into major categories depending on the type of personnel involved: all-paid, all-volunteer or a combination of both. Though we discuss the characteristics of paid and volunteer fire departments later, it is useful to note that, while volunteer departments are often thought of as rural, many all-volunteer departments are located in urban or suburban communities, such as the Long Island cities of Hempstead, Oyster Bay, Brookhaven, Islip, Huntington, and Babylon. These have populations and densities, as well as property values and revenue, which exceed or are on par with urban, all-paid communities. These fire departments testify to the ability of volunteer firefighters to handle the rigorous responsibilities arising in high-density urban-residential areas.

City Firefighting

The state allows cities to levy taxes to support their fire departments, paying salaries and benefits for paid personnel as well as purchasing, repairing, and maintaining buildings, equipment, and vehicles. Cities that have volunteer departments in addition to taxes may depend upon other sources of revenue for most of their firefighting requirements. They may offer volunteers limited insurance and death benefits. Some of the most densely populated cities in the state depend on all-volunteer departments, including the city of Glen Cove in Nassau County.

Town Firefighting

Towns differ from cities and villages in the funding and administration of firefighting activities. They are not allowed to levy taxes directly to support fire departments. Instead, they may create *fire districts*, which can levy taxes and borrow money for the sole purpose of funding fire protection. A fire district may have its own department or contract with a neighboring municipality or district.

Alternatively, a town board may create one or more *fire protection districts*, which are geographical areas of the town that contract with a nearby city, village, fire district or fire company to provide fire protection services. The cost is met with an assessment on the real property within the district.

A fire district can be established as a separate public corporation. In this case, the district's operations are delegated to a separately elected five-member board of fire district commissioners, which has the power to levy taxes and issue debt. The board oversees procurement of goods and services, verification and approval of claims by fire departments and stations for equipment and uniforms, investment policy and management, funding of renovation projects for fire stations, travel advances for district and fire station personnel, payment to injured and retired firefighters, maintains and conserves fixed firefighting assets within the district, and general disbursement of funds. In addition, the board of fire commissioners of a district may ask the state comptroller for help on financial matters to operate more efficiently or to save costs (e.g., on fuel costs, on using electronic wire transfers, etc.).

Many combined fire districts also exist in the state. The governing boards of towns and villages are authorized to establish combined fire districts by resolution after a public hearing and subject to a permissive referendum. Town law provides uniform procedures for extending, financing, and operating joint fire districts.

Village Firefighting

As with cities, the state allows villages to raise taxes for firefighting. However, because some villages are not large enough to have a sufficient tax base to support their own departments, these often turn to all-volunteer departments. Villages may outsource their fire protection by contracting with one or more fire departments in neighboring municipalities. A village may also form a joint fire district with a neighboring town or village.

B. Paid and Volunteer Firefighters

Paid Firefighters

Paid fire departments comprise personnel who are full-time or part-time onsite staff. Outside New York City, 211 departments (11.8%), have paid firefighters. These generally operate in the larger urban centers, which have a higher population density and a sufficient tax base to support them.

The average population of municipalities containing all-paid departments is about 31,000, and the average population density is 3,797 people per square mile. The largest municipality outside NYC with all-paid departments is Buffalo, with a population of 261,310 while the relatively small city of Little Falls has a population of 4,946.

As employees, paid fire personnel receive salaries and benefits. Within a typical department, paid officers may include chief, deputy chief, assistant chief, tower captain, engine captain, rescue captain, tower lieutenant, engine lieutenant, and sergeant/fire marshal. Base salaries for these upper-level personnel generally range from about \$75,000 to over \$110,000, not including benefits. Base salaries for line firefighting personnel depend on experience, rank, and level of authority. They generally range from \$40,000 to over \$60,000. In addition, firefighters receive various benefits as part of their compensation and frequently earn overtime pay. Standard benefits paid (Social Security, health retirement, disability) average about 44% of base pay. Full compensation including all benefits, steps & longevity (which may counted as benefits in municipal budgets) average about 73% above base pay,

The costs of paid departments are covered or supported by taxes assessed by the jurisdiction, namely the city, town, village, or fire district, on behalf of a fire protection district. Approximately 94% of the taxes collected for paid fire departments go to paying salaries and benefits and are largely derived from property taxes. While most communities do collect sales and other taxes in addition to real property taxes, the latter are the final taxes adjusted to balance a budget each year² and are the first to be increased or decreased in response to changing fiscal needs. Thus, the mainstay of funding for paid fire departments comes from real estate taxes assessed against residential, industrial, commercial, utility, farm, and vacant property.

Regardless of the composition of their equipment and other capital items, paid departments have an added fire station expense not found in volunteer departments. They must provide sleeping, bathing, and eating quarters for paid personnel who often work 24-hour shifts, while their volunteer counterparts typically respond from home, go to the station then to the emergency site. Regulatory requirements often impose additional costs on paid departments, particularly federal OSHA standards.

Volunteer Firefighters

New York State as a whole relies heavily on volunteer fire departments. Of its 1,795 municipal fire departments, 89% are volunteer. Volunteer firefighters are most prevalent in smaller, suburban and rural communities that have a lesser tax base than larger towns and cities. That these communities rely on volunteers testifies to the cost savings from volunteer departments, and conversion to paid departments would be a particular burden for these localities.

By definition, volunteer firefighters do not receive salaries or benefits, although they handle the full range of fire-related duties. For obvious reasons, volunteer firefighters do not spend as much time as paid personnel at the fire station, as they are called to fires and other emergencies from their home or work. Typically, volunteers live in the community and, like other residents, have full-time jobs. They receive their wages and benefits from non-fire-related employers and pay federal, state, and local taxes on this income and property taxes on their homes. With enough active members strategically distributed throughout a community, volunteer departments can respond quickly and efficiently. Volunteer fire departments conduct fire-fighting activities and complex emergency responses under the same training regulations as their paid counterparts elsewhere.

In addition to not having to pay wages and benefits, volunteer fire stations do not require living or eating quarters, and often purchase used vehicles and equipment at reduced costs or receive donations from the state, other fire departments, or a variety of other sources. Nevertheless, most volunteer departments usually have the full range of vehicles, equipment, and apparatus required to handle any sort of fire or other emergency likely to be found in their jurisdiction. Volunteers have the reputation of maintaining their vehicles and facilities at high operating levels, and must adhere to the same maintenance standards as paid personnel, typically exceeding these standards.

² Thus, real property taxes are referred to as the "balancing residual" revenue source in a budget, the final revenue source adjusted to cover expenditures.

Training requirements vary across departments, but usually consist of regular training drills, extensive emergency operations exercises, and on-site experience. Highly active volunteers have proven to be as intensively prepared as paid personnel. In fact, New York State recommends minimum requirements for volunteer firefighters, special training tailored to various firefighting and emergency operations, and additional OSHA-related training. Overall, volunteers and paid firefighters are expected to receive similar training, as indicated by the Insurance Service Office's rating of volunteers on the same level as paid firefighters for type and intensity of training.

Although volunteer departments do receive some federal, state and local government subsidies, they do not burden the taxpayer with taxes to pay wages and benefits, expenditures that account for 94% of the operating budgets in paid departments. Volunteer departments receive their funds from a variety of sources, including local governments, federal grant programs, state grants, county subsidies, tax-exempt government bonds, and certain insurance premiums. The state may subsidize training (through state designated academies) and sell used vehicles and equipment to departments at little or no cost.

Also, volunteer departments are highly effective in fundraising to buy, repair, and maintain facilities, vehicles, apparatus, and equipment and to conduct other department activities. They may sell unneeded equipment and vehicles to other departments and solicit corporate and foundation donations from local, state, and national organizations. They generate money through door-to-door and phone solicitations; sales of products (calendars, photos, toys); rental of firehouse facilities to the public; and a host of local fundraising activities such as food sales, special breakfasts and dinners, raffles, car washes, entertainment and sports events.

The population for all-volunteer areas statewide is 8.9 million of a total population of 11.2 million outside New York City. Population density in volunteer areas is 192 people per square mile, significantly less than for all-paid departments. The statewide figure is 239 persons per square mile.

Figure II-1

Summary: Characteristics Relating to Scope of Fire Protection 2013

	Statewide All Areas*	Volunteer Areas
Land Area (sq. miles)	46,824	46,211
Population Density (per sq. mile)	239	192
Population	11,202,969	8,871,847
Property Tax Base (\$1,000)	1,118,913,506	976,858,746
Total Fire Department Incidents	892,654	626,308

*Excludes New York City

Long Island contains a number of large, all-volunteer municipalities. Although not formally cities, some of these have larger populations than Buffalo, the largest city with an all-paid fire department outside New York City. These municipalities are also densely populated. Even smaller ones, such as Great Neck Plaza and South Floral Park, have population densities many times that of Buffalo.

The smallest all-volunteer municipalities have official populations of less than 100. These villages and towns are a small fraction of the size of the smallest all-paid municipalities, and have population densities of less than 10 people per square mile.

III. Calculating Tax Savings from Volunteers

A. Simple Methods and Rules of Thumb

The Delaware Approach: new 2013 report

A common rule of thumb, which doesn't work for a diverse state like New York, is to assume that a fire station is needed for every so many residents and that each fire station has a fixed number of paid firefighters. The Delaware State Auditor prepared a report calculating the taxpayer savings from volunteer firefighters in that state, *Delaware Volunteer Fire Service 2013 Annual Report*. Its methodology assumed that the situation in the City of Wilmington, the state's only paid department, would be similar everywhere else in the state if volunteer departments were paid. That approach does not make sense for New York, which has widely varying population densities and huge differences in urban versus rural land plus a large variety of structures with varied fire protection needs.

It is easy to see why: consider a rural area with a population of 10,500. Using Delaware's methodology, only one fire stations with 24 paid firefighters would be needed. But if that population were split between two villages miles apart, two stations might be needed. Unfortunately, Delaware does take geography into account.

Consider another example of two town areas, one 95% residential and the other mostly industrial and commercial property with only 15% residential structures. While Delaware's population alone method would adequately service the first, it could dramatically under service the second. Using the Delaware formula in New York would undercount the required number of paid firefighters needed by about 33%.

B. Our Multi-Factor Approach

For each paid jurisdiction, we statistically evaluated the factors that determine the level of firefighting staffing and cost. We then applied the results to all volunteer units in the state to estimate the number of stations and firefighters needed to be employed, if the standards and staffing levels in paid department were applied everywhere. This approach goes well beyond the rule of thumb used in other studies by recognizing that the particular characteristics of each local area dictate the number of stations and firefighters, the amount of equipment, the annual operating cost, and the cost of capital equipment. There is no "one size fits all."

Our research shows that about 83% of the variability among paid fire departments in their level of staffing and their operating costs is explained by relative differences among them in four attributes: land area, population density, type of structures, and the fiscal capacity to raise tax revenue. By using econometric techniques to evaluate these factors simultaneously in all paid jurisdictions, we created a formula to apply to volunteer jurisdictions if they were to convert to paid departments. There is one overarching assumption in such a conversion: the newly paid departments will operate at the average level of efficiency and with the average level of resources and practices found in existing paid departments, after accounting for differences in the local conditions.

The Diversity across New York State

Figure III-2 describes the total area in each county covered by fire departments both volunteer and paid. As would be expected, there are large variations among counties. Note the wide range of population and population density. Hamilton County has both the lowest population at 4,836 and the lowest density of 3 persons per square mile, with residents spread over 1,717.4 square miles.

Nassau County's population of 1,339,531 is packed into 284.7 square miles, giving it a much higher density of 4,782 persons per square mile. Suffolk County, however, has a larger population at 1,493,350, but because of its larger area, 912.1 square miles, its density is lower at 1,637. This is resident population; many areas of the state also have a significant seasonal population that also requires fire protection.

The value of property also varies widely. Because the property tax is the backbone of local government finance, this creates great variability in the capacity to pay for fire protection and in the tax burden that fully paid fire departments would place on local residents. For example, combining both its low population and low value of property, Hamilton County has a property tax base of \$721,374 behind every resident. On the other hand Allegheny County has only \$37,431.

For about one half of the state, the countywide characteristics in Figure III-2 are not very much different from communities with volunteer firefighters. That is because in most counties only small areas or none are protected by paid firefighters. In some counties, however, there are significant differences. These can be seen, county by county, in Figure III-3, which contains the same information as III-2 but only for the areas in each county protected by volunteers.

Figure III-1, below, summarizes the mix of paid versus volunteer firefighters in all counties. Twenty-two counties of the 57 outside New York City have all-volunteer fire protection and are depicted in the 100% column at the far right of the chart. Albany and Westchester Counties are at the other extreme, in the 55% bar on the far left of the chart.

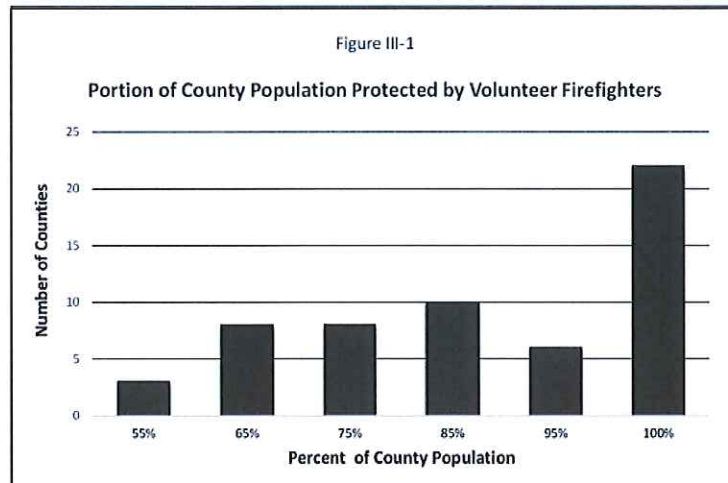


Figure III-2

Characteristics Related to Scope of Fire Protection Services
(County Totals 2013)

County	Land Area (square miles)	Pop. Density (persons/sq. mile)	Population (persons)	Property Base (X \$1,000)	Property Base per Person
Albany	522.8	582	304,204	23,103,153	75,946
Allegany	1,029.3	48	48,946	1,832,119	37,431
Broome	705.8	284	200,600	9,349,863	46,609
Cattaraugus	1,308.4	61	80,317	3,974,359	49,483
Cayuga	691.6	116	80,026	4,315,727	53,929
Chautauqua	1,060.2	127	134,905	6,784,530	50,291
Chemung	407.4	218	88,630	3,936,853	44,319
Chenango	893.6	56	50,477	2,372,790	47,007
Clinton	1,037.9	79	82,128	4,659,548	56,735
Columbia	634.7	99	63,096	7,502,862	118,912
Cortland	498.8	99	49,336	2,233,574	45,273
Delaware	1,442.4	33	47,980	5,576,028	116,216
Dutchess	795.6	374	297,488	30,653,742	103,042
Erie	1,042.7	881	919,040	47,138,287	51,291
Essex	1,794.2	22	39,370	6,647,150	168,838
Franklin	1,629.1	32	51,599	3,627,419	70,300
Fulton	495.5	112	55,531	3,138,490	56,518
Genesee	492.9	122	60,079	2,663,956	44,341
Greene	647.2	76	49,221	5,443,693	110,597
Hamilton	1,717.4	3	4,836	3,488,563	721,374
Herkimer	1,411.5	46	64,519	4,587,962	71,110
Jefferson	1,268.6	92	116,229	7,555,630	65,006
Lewis	1,274.7	21	27,087	1,886,869	69,652
Livingston	631.8	104	65,393	3,252,618	49,740
Madison	654.8	112	73,442	3,889,284	52,957
Monroe	657.2	1,133	744,344	39,321,367	52,827
Montgomery	403.0	125	50,219	2,146,517	42,743
Nassau	284.7	4,705	1,339,532	205,123,200	153,130
Niagara	522.4	414	216,469	9,440,523	43,611
Onesida	1,212.4	194	234,878	10,188,209	43,377
Onondaga	778.4	600	467,026	25,553,435	54,715
Ontario	644.1	168	107,931	8,108,042	75,122
Orange	811.7	459	372,813	31,809,549	84,787
Orleans	391.3	110	42,883	1,612,105	37,593
Oswego	951.7	126	122,109	5,854,973	47,949
Otsego	1,001.7	62	62,259	4,433,537	71,211
Putnam	230.3	433	99,710	13,461,203	135,004
Rensselaer	652.4	244	159,429	10,278,085	64,468
Rockland	173.6	1,795	311,687	35,907,909	115,205
St Lawrence	2,680.4	42	111,944	5,372,474	47,993
Saratoga	810.0	271	219,607	22,021,495	100,277
Schenectady	204.5	757	154,727	9,716,054	62,795
Schoharie	621.8	53	32,749	2,154,763	65,796
Schuyler	328.3	58	18,343	1,275,002	69,509
Seneca	323.7	109	35,251	1,852,157	52,542
Steuben	1,390.6	71	98,990	5,243,878	52,974
Suffolk	912.1	1,637	1,493,350	256,642,566	171,857
Sullivan	968.1	80	77,547	7,930,747	102,270
Tioga	518.6	99	51,125	2,420,373	47,342
Tompkins	474.7	214	101,564	6,442,186	63,430
Ulster	1,124.2	162	182,493	18,250,642	100,007
Warren	867.0	76	65,707	10,609,238	161,463
Washington	831.2	76	63,216	4,763,407	75,351
Wayne	603.8	155	93,772	4,650,762	49,596
Westchester	430.5	2,205	949,113	152,646,977	160,831
Wyoming	592.8	71	42,155	2,051,506	48,666
Yates	338.1	75	25,348	2,215,755	87,413
Statewide*	46,824.2	239	11,202,969	\$1,118,913,606	\$99,877

*Excludes New York City

Figure III-3

**Volunteer Areas: Characteristics Related to Scope of Fire Protection Services
(County Totals 2013)**

County	Land Area (square miles)	Pop. Density (persons/sq. mile)	Population (persons)	Property Base (X \$1,000)	Property Base per Person
Albany	496.2	363	179,926	17,504,523	97,287
Allegany	1,029.3	48	48,946	1,832,119	37,431
Broome	687.6	181	124,658	6,699,055	53,739
Cattaraugus	1,296.5	46	60,050	3,389,577	56,446
Cayuga	683.3	77	52,339	3,371,490	64,416
Chautauqua	1,041.6	77	79,966	5,375,363	67,221
Chemung	400.1	149	59,630	3,300,945	55,357
Chenango	891.5	49	43,287	2,167,822	50,080
Clinton	1,032.9	60	62,139	3,762,149	60,544
Columbia	632.5	89	56,383	7,128,646	126,433
Cortland	494.9	61	30,132	1,709,810	56,744
Delaware	1,442.4	33	47,980	5,576,028	116,216
Dutchess	785.8	317	249,211	27,837,493	111,703
Erie	991.9	630	624,459	39,655,957	63,505
Essex	1,794.2	22	39,370	6,647,150	168,838
Franklin	1,629.1	32	51,599	3,627,419	70,300
Fulton	485.5	64	31,123	2,396,488	77,001
Genesee	487.7	91	44,614	2,132,458	47,798
Greene	647.2	76	49,221	5,443,693	110,597
Hamilton	1,717.4	3	4,836	3,488,563	721,374
Herkimer	1,402.6	31	43,777	3,969,277	90,670
Jefferson	1,259.6	71	89,206	6,409,386	71,849
Lewis	1,274.7	21	27,087	1,886,669	69,652
Livingston	631.8	104	65,393	3,252,618	49,740
Madison	632.7	98	62,049	3,398,091	54,765
Monroe	621.4	859	533,779	33,460,714	62,686
Montgomery	397.1	80	31,599	2,146,517	67,930
Nassau	263.4	4,782	1,259,566	185,174,717	147,015
Niagara	489.8	232	113,543	6,095,847	53,688
Oneida	1,120.8	124	138,918	7,534,112	54,234
Onondaga	750.3	419	314,034	20,781,862	66,177
Ontario	635.3	132	84,125	7,077,015	84,125
Orange	802.8	393	315,861	29,285,111	92,715
Orleans	391.3	110	42,883	1,612,105	37,593
Oswego	940.3	98	92,071	4,726,161	51,332
Otsego	997.3	48	48,358	4,023,807	83,209
Putnam	230.3	433	99,710	13,461,203	135,004
Rensselaer	638.8	156	99,908	8,021,558	80,289
Rockland	173.6	1,795	311,687	35,907,909	115,205
St Lawrence	2,675.4	38	100,816	5,097,208	50,560
Saratoga	781.9	247	193,021	18,282,784	94,719
Schenectady	192.0	421	80,863	7,102,544	87,834
Schoharie	621.8	53	32,749	2,154,763	65,796
Schuyler	328.3	56	18,343	1,275,002	69,509
Seneca	323.7	109	35,251	1,852,157	52,542
Steuben	1,384.7	57	79,244	4,492,959	56,698
Suffolk	909.8	1,633	1,485,949	255,326,608	171,827
Sullivan	968.1	80	77,547	7,930,747	102,270
Tioga	518.6	99	51,125	2,420,373	47,342
Tompkins	474.7	214	101,564	6,442,186	63,430
Ulster	1,116.7	142	158,600	16,719,097	105,417
Warren	863.1	59	51,007	9,677,357	189,726
Washington	831.2	76	63,216	4,763,407	75,351
Wayne	603.8	155	93,772	4,650,762	49,596
Westchester	364.3	1,284	467,854	93,132,103	199,062
Wyoming	592.8	71	42,155	2,051,506	48,666
Yates	338.1	75	25,348	2,215,755	87,413
Statewide*	46,210.6	192	8,871,847	\$976,858,746	\$110,108

*Includes only areas with volunteer firefighters; excludes New York City.

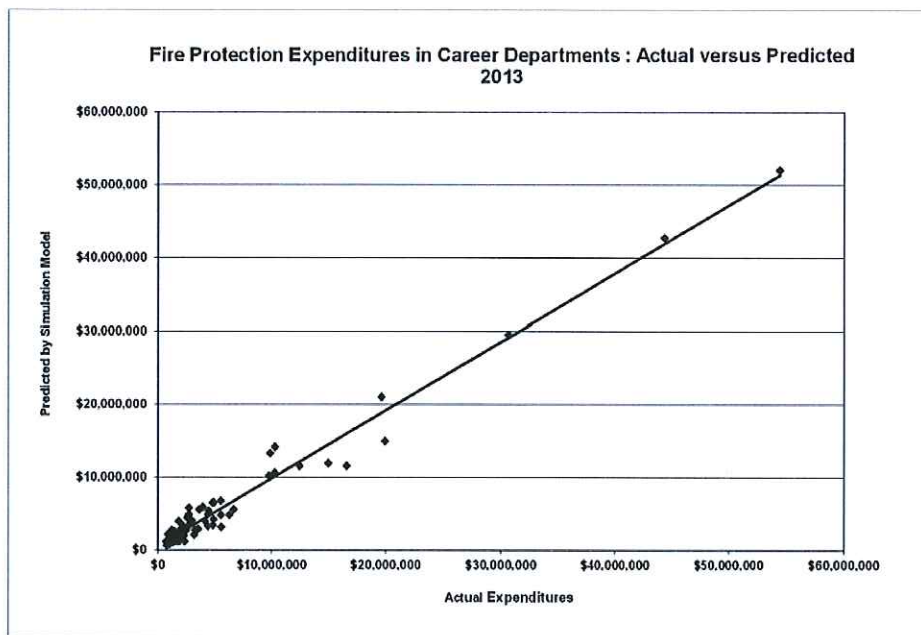
Looking at the table in Figure III-3 for volunteer areas, it is easy to see that the large variations in population, geographic area would make the Delaware approach, which is based on population alone, inapplicable to New York. And the large variation in property tax base would make the added tax burden of a paid fire department also highly variable and an important consideration in moving to an all pay force.

As noted earlier, 83% of the variability among paid fire departments in their level of staffing and operating costs is explained by differences in land area, population density, type of structures, and the fiscal capacity to raise tax revenue. The Delaware approach would have ignored the complexity found in New York.

The scatter graph in Figure III-4 attests to the accuracy of our multi-factor approach developed from statistical analysis of 75 career departments throughout New York State. The horizontal axis shows the value of each municipality's actual spending on firefighter wages and benefits in 2013, the last year available. The vertical axis shows the predicted value from the simulation model we constructed. Each dot represents a single paid department.

If all our predicted values exactly matched the actual values, the dots would form a straight line exactly over the solid line drawn on the graph. The closer the dots are to the line, the more accurate the formula. The graph and the statistical results of the analysis underscore the accuracy of our approach in predicting spending in the paid jurisdictions. Even though a specific department's spending might be above or below the predicted amount, the pluses and minuses balance each other and produce a highly accurate estimate for all departments taken together. The model explains about 83% of the variation among communities.

Figure III-4



To summarize the approach: For each of 75 fire departments with paid firefighters, we calculated the relationship between population, geography, community pay levels and adjusted for special conditions in each department. To estimate the cost of converting volunteer to paid departments, the results were applied to the same characteristics in each city, town, and village area volunteers now protect. Thus, we converted volunteer departments to paid departments, and we estimated the cost of all pay, benefits, maintenance and capital expenses for structures, vehicles and equipment that would be required.

C. Calculating the Cost If Volunteers Were Paid Firefighters

Avoiding False Comparisons between Volunteer and Paid Departments

Comparisons of the number of paid firefighters needed to “replace” volunteers in an area can be highly misleading. When a community has to impose taxes to pay firefighters, it has a strong incentive to keep the number of firefighters as low as possible. This manpower discipline is absent in volunteer departments, and is inappropriate to the task of building community support and strong membership. There are many good reasons to expect the number of volunteers to greatly exceed the number of paid firefighters necessary to cover a given area, and they have nothing to do with the volunteers' skill or efficiency at fighting fires.

The number of volunteers relative to firefighting needs varies greatly among communities for many reasons. Some communities have a stronger volunteering tradition than others, some have a stronger recruitment outreach, some are centers of a community's social life,

and some have leadership or training programs that attract a large membership. Huge differences among volunteer organizations have nothing to do with the size of the population they serve, the square miles they must cover, or the number of emergencies to which they respond.

A paid department's success is partly measured by keeping its staffing lean, while a volunteer department's success is partly measured by building a large membership and expanding the number of people in the community who have firefighting skills. The cliché that one paid firefighter replaces several volunteers is meaningless.

No relationship exists between the number of volunteers in a county and the number of paid firefighters required to staff a 24-7 operation adequately and to handle the equipment and respond to the average number of expected emergencies. In fact, the most successful volunteer departments would have the highest ratio of volunteers to paid firefighters in such a comparison. A high ratio shows that the department is effective in attracting members and spreading firefighting skills in their community, not that they are less efficient than paid departments. (Also, the number of reported volunteers includes EMT and ambulance services staff, which are otherwise excluded from this study and would require additional paid staffing beyond the paid firefighters calculated in this report for fire protection alone.)

Firefighter Compensation by Region on The State

Figure III-5 summarizes the levels of compensation paid to firefighters throughout New York State, outside New York City. The estimates are for 2014 and are based upon data from the U.S. Bureau of Labor Statistics.

Figure III-5

<i>Estimated Annual Firefighter Base Wages 2014</i>			
Area	<i>Average of Departments in Area</i>		
	Median	Lowest decile	Highest decile
Albany-Schenectady-Troy,Area	53,890	39,640	66,160
Binghamton Area	65,780	49,940	73,950
Buffalo-Niagara Falls Area	54,410	44,160	61,590
Nassau-Suffolk Area	59,120	42,690	103,240
White Plains Area	86,070	57,300	96,090
Poughkeepsie-New burgh-Middletow n Area	63,420	48,160	82,330
Rochester Area	68,830	38,790	80,130
Syracuse Area	52,650	40,190	60,380
Average of areas	\$63,021	\$45,109	\$77,984

Statewide, excluding New York City, the median base wage for a full-time firefighter was \$63,021 in 2014. The lowest is found in the Syracuse area at \$52,650, while the highest is in the White Plains area at \$86,070. A top ranked, high seniority firefighter could earn over \$100,000 in the highest paying departments on Long Island.

In the cost calculations for converting volunteers to paid firefighters, the median base amount in each region is used and adjusted for salary steps and longevity. Benefits are calculated separately and added to wages to estimate total firefighter compensation.

Calculating the Cost of Pay and Benefits

Annual costs of paid departments are dominated by pay and benefits. Including base pay, all employer-paid benefits, and overtime pay, these payroll-related costs average 93.4% of the annual operating budget of New York's paid departments.

We applied the formula derived from our econometric analysis of paid fire departments, described above, and used specific regional pay from Figure III-5 to calculate the cost of converting volunteer departments to paid ones. The results, in Figure III-5, summarize by county the annual cost of pay and benefits for each of the new all-paid operations necessary to replace volunteers throughout New York State.

A total of 30,822 paid firefighters would be needed at current paid staffing levels to provide fire protection for the existing volunteer areas. These would staff stations 24 hours per day, seven days per week. The staffing standard follows practices prevalent in paid departments during 2013, and assumes sufficient firefighters to meet a two-in two-out rule.³ In general, the proposed NFPA standard 1710⁴ also would be met in most stations. If 1710's minimum staffing were implemented statewide, there may be additional firefighters needed in some stations, but such determination would require added study beyond the scope of this report. (Note that EMT and ambulance services are not included in the 30,822 firefighters required.)

Please note also, as discussed extensively above, these paid firefighters are not "replacing" volunteers on a one-to-one basis, but rather providing fire protection services for the areas now covered by volunteers at standards found in existing paid areas. There are valid reasons to have in any area a multiple of volunteers relative to the number of paid firefighters required. In fact, a successful volunteer department would be expected to have a multiple of paid firefighters for areas of similar size and complexity, as discussed earlier.

Statewide, as Figure III-6 shows, the cost of pay and benefits would be \$3,124,914,720 (\$3.1 billion) for the full year 2013. As would be expected, the most densely populated and largest counties, Suffolk and Nassau, top the list at an annual cost of \$292.9 million and

³ The two-in two-out rule established by OSHA requires two firefighters within a burning structure to have direct visual contact or voice communication between each other and with firefighters outside.

⁴ The National Fire Protection Association publishes NFPS 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. It has a companion publication for volunteer departments, NFPA 1710.

\$274.4million, respectively. The lowest cost counties were Cortland at \$12.6 million and Schuyler at \$7.6 million per year.

Two other annual cost categories make up the full bill for the year. The first, general operating costs⁵, totals \$153.1 million, while the second, the annual outlay for the maintenance of equipment and structures, amounts to \$68.3 million. Thus, the total annual cost of paid departments to replace volunteers would be \$3,346,328,577 (\$3.3 billion) in 2013.

Note that adding to that would be the cost of newly constituted stations with sleeping and eating facilities, as much as \$3.6 billion to acquire/build, while another \$2.3 would be needed for personal firefighting equipment, vehicles and other items. If bonds were used to finance these added capital requirements, the annual cost of \$3.3 billion to local government would rise by \$519 million to \$3.8 billion. This is discussed in the section capital equipment next.

It is important to point out that in the *Third Needs Assessment of the US Fire Service New York* conducted by NFPA 2010, there is inadequate or aging equipment in a substantial number of fire stations. Presumably these would all be brought to standard upon conversion to paid departments.

⁵ Includes all normal outlays such as heating/cooling, electricity, communications, fuel, supplies, insurance, clothing, etc.

Figure III-6

Annual Added Cost if All Volunteer Fire Protection Services Were Provided by Paid Departments
(County Totals 2013)

County	Additional Paid Firefighters	Pay and Benefits	General Operating Costs	Annual Outlay for Equipment & Structures	Total Annual Cost
Albany	761	75,310,324	3,689,832	1,646,233	80,646,389
Allegany	208	20,486,973	1,003,760	447,831	21,938,565
Broome	441	52,177,197	2,556,424	1,140,558	55,874,179
Cattaraugus	765	75,404,082	3,694,426	1,648,282	80,746,790
Cayuga	231	21,907,156	1,073,342	478,876	23,459,374
Chautauqua	340	33,470,790	1,639,903	731,649	35,842,342
Chemung	253	24,958,898	1,222,862	545,585	26,727,344
Chenango	196	18,118,326	887,708	396,054	19,402,089
Clinton	436	40,195,838	1,969,397	878,654	43,043,889
Columbia	256	23,599,824	1,156,274	515,876	25,271,975
Cortland	128	12,612,133	617,932	275,693	13,505,758
Delaware	484	44,628,092	2,186,555	975,540	47,790,187
Dutchess	1,132	104,310,445	5,110,695	2,280,156	111,701,295
Erie	2,114	213,151,571	10,443,370	4,659,350	228,254,291
Essex	407	37,665,865	1,845,441	823,350	40,334,656
Franklin	364	33,595,987	1,646,037	734,386	35,976,409
Fulton	338	31,264,629	1,531,812	683,424	33,479,865
Genesee	185	18,673,759	914,922	408,196	19,996,877
Greene	223	20,602,078	1,009,400	450,348	22,061,825
Hamilton	189	18,217,526	892,568	398,223	19,508,317
Herkimer	347	32,065,989	1,571,074	700,941	34,338,004
Jefferson	405	37,338,310	1,829,392	816,190	39,983,892
Lewis	271	24,942,741	1,222,071	545,232	26,710,043
Livingston	226	27,371,075	1,341,047	598,313	29,310,435
Madison	274	25,971,401	1,272,470	567,717	27,811,588
Monroe	777	94,008,807	4,605,965	2,054,869	100,669,741
Montgomery	143	13,226,165	648,016	289,115	14,163,296
Nassau	2,210	274,473,034	13,447,818	5,999,796	293,920,647
Niagara	471	47,524,872	2,328,483	1,038,862	50,892,217
Oneida	825	76,036,949	3,725,433	1,662,116	81,424,499
Onondaga	1,387	131,442,939	6,440,052	2,873,254	140,756,245
Ontario	291	35,211,592	1,725,193	769,702	37,706,488
Orange	1,435	132,207,653	6,477,519	2,889,970	141,575,143
Orleans	148	17,949,227	879,423	392,358	19,221,008
Oswego	406	38,537,492	1,888,146	842,404	41,268,042
Otsego	219	20,240,858	991,702	442,452	21,675,011
Fulton	453	41,734,893	2,044,803	912,297	44,691,993
Rensselaer	422	41,817,769	2,048,863	914,108	44,780,740
Rockland	563	51,909,412	2,543,304	1,134,705	55,587,421
St Lawrence	747	68,849,081	3,373,264	1,504,995	73,727,339
Saratoga	816	80,791,403	3,958,378	1,766,046	86,515,827
Schenectady	342	33,846,241	1,658,298	739,856	36,244,395
Schoharie	304	30,156,526	1,477,520	659,201	32,293,248
Schuyler	78	7,677,697	376,169	167,829	8,221,695
Seneca	149	14,754,756	722,910	322,529	15,800,195
Steuben	337	33,168,588	1,625,096	725,043	35,518,727
Suffolk	2,359	292,943,779	14,352,793	6,403,554	313,700,125
Sullivan	880	81,145,717	3,975,738	1,773,791	86,895,245
Tioga	180	21,399,021	1,048,446	467,768	22,915,235
Tompkins	432	42,510,908	2,082,824	929,260	45,522,992
Ulster	720	66,384,054	3,252,490	1,451,111	71,087,654
Warren	359	33,210,537	1,627,152	725,960	35,563,649
Washington	287	26,459,864	1,296,402	578,395	28,334,661
Wayne	324	39,249,467	1,923,029	857,867	42,030,464
Westchester	1,517	139,750,170	6,847,065	3,054,845	149,652,080
Wyoming	179	17,644,513	864,494	385,697	18,894,704
Yates	87	10,609,729	519,824	231,922	11,361,475
Statewide*	30,822	\$3,124,914,720	\$153,105,327	\$68,308,530	\$3,346,328,577

* Volunteer conversions only, excludes existing paid departments and excludes New York City

Calculating the Cost of Capital Equipment

Taxpayers rarely pay for large capital purchases all at once. Thus, even if replacing volunteers with paid firefighters necessitated purchasing billions of dollars of new equipment immediately, the taxes required for this would reflect only the annual payments to be made purchasing the equipment. Typically, this is the amount of annual debt service the fire department must pay for financing capital equipment and apparatus through a municipal bond issue. (Not unlike purchasing a family car and making loan payments.)

Figure III-7

Approximate Cost of Typical Capital Items 2013			
Single item of this type	Cost of Apparatus & Equipment	Years of Useful Life	Annual Debt Service*
Engine	\$446,000	15	\$42,969
Aerial truck	\$792,000	18	\$67,753
Tanker	\$412,000	15	\$39,693
Utility vehicle	\$54,000	8	\$8,355
Brush truck	\$58,000	10	\$7,511
Staff car	\$31,000	8	\$4,796
Rescue truck	\$588,000	15	\$56,649
Protective clothing & apparatus	\$7,000	10	\$907
Structure (avg. for 24 firefighters, 3 shifts)	\$2,885,000	20	\$231,500

**Annual interest & principal payments to finance purchase*

The Figure III-7, above, lists the common equipment a fire department may purchase, its cost new, its useful life, and the annual payment necessary to service the bonds that might be sold to make the purchase.

Thus, a \$792,000 aerial truck fully equipped would require only the tax revenue needed to pay the \$67,753 in debt service per year during its useful life, not its full cost in any single year.

The breakdown of equipment and structures necessary to outfit and house the paid departments replacing volunteers for 2013 is summarized by county in Figure III-8. The cost of station construction is calculated to average about \$2.8 million per unit, but with variation around the state. The total value of constructing or acquiring station facilities is seen in the table to be \$3.6 billion, with Suffolk County the highest at \$395.2 million and Hamilton County the lowest at under \$3 million.

Personal equipment costs would total \$215.8 million. Suffolk County tops the list with a cost of \$16.5 million, while Schuyler County requires only \$546,000.

The largest capital cost is for vehicles and related equipment. The required statewide total in this category to cover all areas now protected by volunteers is \$2.1 billion. Total cost for structures and all equipment and apparatus is \$5.95 billion statewide. Suffolk County, the highest, stands at \$165.5 million, while Schuyler County, the lowest, stands at \$5.1 million.

As noted several times in the discussion, the cost of structures and all apparatus and equipment is not annual. Each item has a one-time cost that repeats after its useful life is exhausted. It is important to note that shifting from volunteers to paid departments would inevitably mean transfer of substantial existing equipment to the paid operations. However, a proper accounting of the transfer would not reduce annual charges for equipment (or indeed structures) if full replacement reserves were established along with expenditures to bring all items to standard.

D. Accounting for Firefighter Pay, Operating Cost, and Equipment

A word on cost may help in understanding the figures below. There are two main categories of cost that must be treated differently when thinking about the value of volunteers and their savings to taxpayers. One, the cost of operations, deals with annual *recurring costs* (such as pay, benefits, fuel, upkeep, etc.). The other, the cost of capital, deals with *infrequent costs* for large items (such as trucks, buildings, equipment, etc.).⁶

This enters a complex realm of accounting. Basically, calculating an annual charge that represents an appropriate portion of a capital item's useful life related to a year can be based upon debt service payments or upon some pro rata division of the cost of the equipment over its remaining useful life. A used piece of equipment, even if donated to the fire company, should have some accounting for the need to replace it eventually, and to account for the use of its services during the year and the funds to bring it to standard at the time of transfer.

⁶ An annual municipal budget (and the taxes to pay for it) includes the full amount of operating costs, but only the annual value of the capital costs. The latter may be the portion of its life span used up in the year or the portion of its cost paid in the year or the debt service require. Thus, a \$150,000 fire truck with a 10-year life might include only \$15,000 per year in the budget (under a straight line method) or about \$18,500 per year to repay a loan used for its purchase.

Figure III-8

Replacement Cost of All Structures, Vehicles and Equipment to Support Added Paid Firefighters*
(County Totals 2013)

County**	Value of Structures	Value of Personal Equipment	Value of Vehicles & Gen. Equip.	Total Value
Albany	89,435,000	5,327,000	52,352,800	147,114,800
Allegany	23,080,000	1,456,000	13,510,400	38,046,400
Broome	51,930,000	3,087,000	30,398,400	85,415,400
Cattaraugus	86,550,000	5,355,000	50,664,000	142,569,000
Cayuga	25,965,000	1,617,000	15,199,200	42,781,200
Chautauqua	40,390,000	2,380,000	23,643,200	66,413,200
Chemung	28,850,000	1,771,000	16,888,000	47,509,000
Chenango	23,080,000	1,372,000	13,510,400	37,962,400
Clinton	49,045,000	3,050,727	28,709,600	80,805,327
Columbia	28,850,000	1,792,000	16,888,000	47,530,000
Cortland	14,425,000	896,000	8,444,000	23,765,000
Delaware	57,700,000	3,391,111	33,776,000	94,867,111
Dutchess	135,595,000	7,924,000	79,373,600	222,892,600
Erie	253,880,000	14,801,434	148,614,400	417,295,834
Essex	46,160,000	2,848,000	27,020,800	76,028,800
Franklin	40,390,000	2,548,000	23,643,200	66,581,200
Fulton	34,620,000	2,368,800	20,265,600	57,254,400
Genesee	20,195,000	1,295,000	11,821,600	33,311,600
Greene	25,965,000	1,561,000	15,199,200	42,725,200
Hamilton	25,965,000	1,323,000	15,199,200	42,487,200
Herkimer	40,390,000	2,425,500	23,643,200	66,458,700
Jefferson	46,160,000	2,835,000	27,020,800	76,015,800
Lewis	31,735,000	1,894,200	18,576,800	52,206,000
Livingston	25,965,000	1,582,000	15,199,200	42,746,200
Madison	31,735,000	1,818,000	18,576,800	52,229,800
Monroe	92,320,000	5,435,500	54,041,600	151,797,100
Montgomery	14,425,000	1,001,000	8,444,000	23,870,000
Nassau	265,420,000	15,472,235	155,369,600	436,261,835
Niagara	54,815,000	3,297,000	32,087,200	90,199,200
Oneida	98,090,000	5,776,077	57,419,200	161,285,277
Onondaga	164,445,000	9,709,000	96,261,600	270,415,600
Ontario	34,620,000	2,037,000	20,265,600	56,922,600
Orange	170,215,000	10,045,000	99,639,200	279,899,200
Orleans	17,310,000	1,036,000	10,132,800	28,478,800
Oswego	46,160,000	2,842,000	27,020,800	76,022,800
Otsego	25,965,000	1,533,000	15,199,200	42,697,200
Putnam	51,930,000	3,171,000	30,398,400	85,499,400
Rensselaer	49,045,000	2,954,000	28,709,600	80,708,600
Rockland	66,355,000	3,942,324	38,842,400	109,139,724
St Lawrence	89,435,000	5,230,842	52,352,800	147,018,642
Saratoga	98,090,000	5,712,000	57,419,200	161,221,200
Schenectady	40,390,000	2,394,000	23,643,200	66,427,200
Schoharie	31,735,000	2,125,200	18,576,800	52,437,000
Schuyler	8,655,000	546,000	5,066,400	14,267,400
Seneca	17,310,000	1,043,000	10,132,800	28,485,800
Steuben	40,390,000	2,359,000	23,643,200	66,392,200
Suffolk	282,730,000	16,514,073	165,502,400	464,746,473
Sullivan	100,975,000	6,160,000	59,108,000	166,243,000
Tioga	20,195,000	1,260,000	11,821,600	33,276,600
Tompkins	51,930,000	3,024,000	30,398,400	85,352,400
Ulster	86,550,000	5,040,000	50,664,000	142,254,000
Warren	40,390,000	2,515,333	23,643,200	66,548,533
Washington	31,735,000	2,009,000	18,576,800	52,320,800
Wayne	37,505,000	2,268,000	21,954,400	61,727,400
Westchester	181,755,000	10,619,000	106,394,400	298,768,400
Wyoming	20,195,000	1,253,000	11,821,600	33,269,600
Yates	8,655,000	609,000	5,066,400	14,330,400
Statewide*	\$3,617,790,000	\$215,751,357	\$2,117,755,200	\$5,951,296,557

**During conversion from volunteer to paid service much existing equipment and structures would be transferred.

How ever, life cycle replacements will eventually become necessary.

* Excludes New York City

E. Additional Taxes Required to Cover Annual Cost

Having calculated the cost of shifting from existing volunteer departments to paid ones, the question arises of the amount by which local taxes would have to be raised to pay the bill. Arguably, federal and state revenues might be loosened to some extent, but these also rest upon the taxpayers' back, even if spread differently among them. Also, the amount of tax dollars used to support current volunteer operations would become available to the paid departments, but these are minor compared to the payroll needs of the additional firefighters hired.

Because real property taxes are typically the final adjustment to balance, the additional demand for funds will likely fall squarely on property owners. Each community has a different mix of residential, commercial, industrial, utility, farm, and vacant real estate. Thus, the added burden will shift among the owners of these from place to place.

To get an overview, it is useful to calculate the total percent increase in the property tax required to raise the additional funds the new paid fire services require in each county. Admittedly, in each community other spending may be reduced to offset the new costs to a degree, but other program reductions mean a shift of burden to someone else (who loses the payments), not its elimination. Thus, the measure of burden is best reflected in showing the full increase in fire protection costs as an increase in the property tax, the balancing item in local government budgets.

Figure III-9 does that. For each county, the total local property tax for all government services except schools in 2013 is listed in column one. Statewide outside New York City that totals \$33.2 billion. The next column shows the actual cost of fire protection included in the total tax (\$1.02 billion)⁷; this also includes fire districts. The next two columns repeat from Figure III-6 the additional pay, benefits and other costs required to shift to fully paid fire departments. Finally, those added costs are applied to the tax base to calculate the increase in existing property taxes to pay all costs of a paid fire service.

The average statewide real property tax increase would be 26.5%. There is a wide variation among the counties. The greatest tax increase would be in Hamilton County, an increase of 123.0%. The lowest increase would be in Westchester County, 8.6%.

Thus, without volunteers there would be significant and difficult increases in the levels of taxation throughout most of the state. These truly attest to the value of the volunteer fire service and to its strong presence throughout New York.

The extremely high tax increase in a number of counties underscores the difficulty of supporting the entire cost of the fire service with the property tax. There would certainly be a call for state or federal subsidies. There might also be a need to allow some mix of paid and volunteer firefighters in remote communities where the sparse population could not support sufficient nearby stations to meet response standards.

⁷ Because this only relates to local government finance, it does not include payments to firefighting entities from a 2% "Foreign Fire Tax" on fire insurance premiums written by out-of-state insurers on New York risks. In 2013 approximately \$46 million was distributed to fire departments and related associations.

Figure III-9

Significantly Higher Property Taxes if No Volunteer Fire Departments
(County Totals 2013)

County	Existing Real Estate Taxes*	Cost of Existing Fire Service	Increase in Pay & Benefits if No Volunteers	Total Increase in Annual Costs if No Volunteers	Increase in Existing Property Tax for General Govt.
Albany	690,734,171	43,426,785	75,310,324	80,646,389	35.4%
Allegany	101,222,746	1,612,045	20,466,973	21,938,565	34.6%
Broome	420,183,292	24,120,227	52,177,197	55,874,179	30.8%
Cattaraugus	174,648,512	6,264,701	75,404,082	80,746,790	78.0%
Cayuga	146,554,468	10,879,613	21,907,156	23,459,374	29.9%
Chautauqua	261,380,425	14,149,442	33,470,790	35,842,342	25.2%
Chemung	150,445,232	8,927,361	24,958,898	26,727,344	33.8%
Chenango	95,674,855	4,013,275	18,118,326	19,402,089	39.0%
Clinton	145,669,872	5,731,817	40,195,838	43,043,889	86.5%
Columbia	188,160,626	1,758,411	23,599,824	25,271,975	28.4%
Cortland	107,400,126	5,360,430	12,612,133	13,505,758	20.5%
Delaware	123,549,754	730,574	44,628,092	47,790,187	76.4%
Dutchess	809,258,910	13,198,917	104,310,445	111,701,295	45.2%
Erie	1,489,845,357	117,120,987	213,151,571	228,254,291	34.4%
Essex	95,417,926	1,194,514	37,665,865	40,334,656	108.6%
Franklin	86,047,527	1,076,198	33,595,987	35,976,409	97.0%
Fulton	114,862,548	6,435,974	31,264,629	33,479,865	52.2%
Genesee	116,515,335	5,954,340	18,673,759	19,996,877	36.8%
Greene	128,687,699	3,372,066	20,602,078	22,061,825	44.0%
Hamilton	32,771,659	169,694	18,217,526	19,508,317	123.0%
Herkimer	124,883,570	5,133,388	32,065,989	34,338,004	52.8%
Jefferson	176,043,098	13,808,089	37,338,310	39,983,892	38.2%
Lewis	50,869,323	619,005	24,942,741	26,710,043	90.6%
Livingston	120,928,322	978,588	27,371,075	29,310,435	49.7%
Madison	140,514,173	4,277,167	25,971,401	27,811,588	45.7%
Monroe	1,676,274,198	82,850,374	94,008,807	100,669,741	13.3%
Montgomery	97,535,699	4,329,950	13,226,165	14,163,296	27.2%
Nassau	6,696,779,075	86,691,385	274,473,034	293,920,647	12.1%
Niagara	398,455,959	35,603,055	47,524,872	50,892,217	25.8%
Oneida	393,199,700	30,145,439	76,036,949	81,424,499	45.2%
Onondaga	981,783,433	58,194,345	131,442,939	140,756,245	33.7%
Ontario	261,845,366	8,932,442	35,211,592	37,706,488	34.7%
Orange	1,025,012,510	21,433,545	132,207,653	141,575,143	45.3%
Orleans	73,879,624	703,557	17,949,227	19,221,008	51.4%
Oswego	239,027,879	15,192,012	38,537,492	41,268,042	40.5%
Otsego	95,869,671	3,935,806	20,240,858	21,675,011	68.1%
Pulnam	373,703,139	228,937	41,734,893	44,691,993	56.3%
Rensselaer	332,178,255	19,447,560	41,817,769	44,780,740	30.6%
Rockland	1,157,763,577	14,212,499	51,909,412	55,587,421	14.9%
St Lawrence	492,663,932	6,687,554	68,849,081	73,727,339	53.0%
Saratoga	344,165,474	13,050,905	80,791,403	86,515,827	55.6%
Schenectady	83,504,362	18,659,369	33,846,241	36,244,395	90.7%
Schoharie	36,341,716	1,214,822	30,156,526	32,293,248	139.3%
Schuyler	58,541,293	887,186	7,677,697	8,221,695	36.1%
Seneca	216,444,880	738,846	14,754,756	15,800,195	12.7%
Steuben	193,356,870	5,906,121	33,168,588	35,518,727	40.3%
Suffolk	5,623,868,819	36,252,274	292,943,779	313,700,125	19.5%
Sullivan	260,835,353	123,000	81,145,717	86,895,245	71.3%
Tioga	90,782,394	1,219,904	21,399,021	22,915,235	48.0%
Tompkins	222,822,283	5,934,569	42,510,908	45,522,992	45.4%
Ulster	540,170,908	9,044,255	66,384,054	71,087,654	40.1%
Warren	192,863,985	4,912,255	33,210,537	35,563,649	41.4%
Washington	130,831,976	1,011,580	26,459,864	28,334,661	41.1%
Wayne	186,842,545	1,618,126	39,249,467	42,030,464	51.1%
Westchester	4,549,520,723	231,092,774	139,750,170	149,652,080	8.6%
Wyoming	68,310,313	1,745,319	17,644,513	18,894,704	48.0%
Yates	55,311,868	549,356	10,609,729	11,361,475	33.8%
Statewide	\$33,242,657,525	\$1,022,862,727	\$3,124,914,720	\$3,346,328,577	26.5%

F. The Economic Benefits of Volunteer Firefighter Tax Savings

New York’s volunteer firefighting creates significant economic benefits in sales, jobs, and wages because it leaves about \$3.3 billion in the hands of taxpayers each year. We determined the full economic impact of volunteer fire departments by measuring its effects on local communities. Of course, switching from a volunteer to a paid fire service would place much of the taxes collected in the hands of paid firefighters, but the result would be a large-scale redistribution of wealth and income with an unknown mix of winners and losers—the families, businesses, and geographic areas across the state that would gain money or lose it.

The approach we take is to evaluate the economic impact of volunteer fire departments in the aggregate, not to calculate any offsetting or redistributive effect of converting volunteers to paid firefighters. The net impact of a complete shift to paid departments is uncertain and unknown.

To perform its economic impact analysis, ERS employed the well-respected input-output technique. This is a mathematical way of specifying the economic relationships among consumers, businesses, and the extensive network of supplier firms that generate jobs and wages and pay taxes within the community and throughout the state.

We measure each of the activities economists separate into “direct effects,” “indirect effects,” and “induced effects.” The direct effects relate to the initial purchases by households and businesses with their tax savings. The indirect effects represent inter-business purchases made in response to these direct sales, mostly purchases from suppliers and their suppliers. Finally, the induced effects add the result of household spending by the employees and owners of all industries benefiting from direct and indirect effects. Together these account for the full economic impact of the volunteer fire service.

Figure III-10 shows households and businesses purchased \$3.1 billion of goods and services using the \$3.3 billion in tax savings from lower property taxes. This resulted in \$4.2 billion in total purchases, adding \$549 million of indirect spending and \$576 million of induced spending. The total goods and services purchased required 25,860 workers who were paid \$1.1 billion in wages.

Figure III-10

Economic Impact of Tax Savings from Volunteer Fire Services				
New York State 2013*				
Activity	Direct	Indirect	Induced	Total
Jobs Created (non-fire)	17,487	3,634	4,739	25,860
Wages Paid (non-fire)	\$663,426,194	\$195,554,782	\$197,019,270	\$1,056,000,246
Spending by H'hlds & Firms	\$3,081,984,255	\$549,394,955.17	\$576,213,107.04	\$4,207,592,318

*Excludes New York City

IV. Analysis of Fire Response Time

A. Response Time⁸ and SAFER Grants

Firefighting exists to protect lives and prevent the destruction of property. Assuming the responding firefighters have the appropriate equipment and training, the single most important factor in their success is how fast they respond to alarms. Many emergencies require immediate response, for example, a fire can flashover and involve large areas of a structure in less than 10 minutes. Therefore, it is essential to process an incoming alarm expeditiously, quickly dispatch firefighters and arrive on the scene with appropriate equipment. Fire propagation speed underscores the importance of a fast response.

Other things equal, the closer a fire station is to a fire and the sooner firefighters are available, the shorter will be the response time. Thus, there is an inherent difference between paid firefighters on duty at the station 24/7 and volunteer firefighters who must respond from work, home or other places in, say, a rural community.

There are a number of elements in measuring response time: once a fire begins someone must notice it, alert the fire department, and equipment must be dispatched. NFPA standards are set for department notification time, turn out time, and firefighter response time. These area standards vary according to a number of factors which may intervene, such as the difference between population density and distance. That marks another contrast between paid and volunteer fire departments: the latter generally are located in rural or less dense suburban areas with concomitant longer distances between the location of firefighting equipment, firefighters and the scene of the fire in general.

Response standards are promulgated nationally in NFPA 1710 for career and NFPA 1720 for volunteer departments. These include fire recognition and notification time, firefighter turn out time, and firefighter response time. The standards incorporate the various factors noted above which may intervene.

This analysis is concerned with the segment of total response that measures the time between notification of the local fire department and the time the first equipment arrives at the scene of the fire. For paid firefighters, the NFPA standard includes firefighter turnout time of 80 seconds plus four minutes to arrive on scene. This is a total of 5.3 minutes from the moment the station receives notification until the first unit reaches the scene.

The response standard for volunteers is quite different, recognizing the contrast in paid versus volunteer locations. There is no standard for turnout in NFPA 1710, and the response time between firefighters and equipment leaving the station to arriving on scene varies by the population and distances in the area protected. Standard volunteer response

⁸ Firefighters respond to many types of emergencies including fires, medical, rescues, explosions, spills, unauthorized burnings, false alarms and other calls for assistance. The analysis of response time in this section focuses only on fire incidents because unlike many other emergencies they have standard response expectations and the incident data provided by New York State Office of Fire Prevention and Control is more standardized for fires than for other emergencies and thus more comparable across time and among incidents reported.

time is 9 minutes for high density areas, but increasing to 14 minutes in low density areas or when travel distance is 8 miles or more.

NFPA 1720 standards are promulgated for four classifications: urban, suburban, rural and remote areas:

Urban area (more than 1,000 persons per sq. mile): 15 firefighters respond in 9 minutes 90% of the time

Suburban area (500-1,000 persons per sq. mile): 10 FFs to respond in 10 minutes 80% of the time

Rural area (less than 500 people per sq. mile): 6 FFs to respond in 14 minutes 80% of the time

Remote area (8 miles or more to fire): 4 FFs to respond in (depends on distance) 90% of the time

In 2011, FEMA established the Staffing for Adequate Fire and Emergency Response Program. As stated by FEMA, "SAFER grants intend to improve or restore local fire departments' staffing and deployment capabilities so they may more effectively respond to emergencies."

As pertains to volunteer fire departments, it makes sense that an increased number of members provide a larger pool of firefighters available at any given time to respond to an emergency. A greater number of volunteers makes it more likely that a critical number will be available sufficiently close to fire stations to get essential equipment to the scene within the expected response time. It also makes it more likely that supplementary apparatus can deploy from the station.

SAFER grants support activities to recruit and retain volunteer firefighters. These grants to fire departments and related support entities such as FASNY have the goal of creating additional competent and trained firefighters to respond to a fire departments' geographic protection area.

One measure of the success of SAFER grants would be direct counts of the number of volunteers before and after the period of a grant. This is difficult to do because there is no governmental repository of data on the number of volunteers, the training they undergo, or how active they are in firefighting versus other activities of volunteer departments.

There is an alternative approach, and one better-suited to judging how effective SAFER grants are in reaching their ultimate goal of reducing response times. That would be to measure response time directly from incident reports filed with the state.

B. Analysis of Response Time

For this analysis, the New York State Office of Fire Prevention and Control provided data on about 2.5 million incident reports from 1,750 fire departments in New York State for 2004, 2010 and 2013. The data are from The New York State Fire Reporting System (NYSRS form INC-1), and contain fire department identifying information and incident information including the type incident, time of dispatch and time the first unit arrived at the scene. (New York City is excluded from this analysis.)

The database is comprehensive and includes incidents from 93% of fire departments in 2010 and 97% in 2013, the latest year available. Participation in 2004 was less, at 83%, reflecting the newness of the reporting program. In 2013 all but three counties had a reporting rate greater than 90%. These were Otsego, Suffolk and Ulster, and even they had 82% to 85% participation. (Because reporting was less robust, 2004 response times are not included in the following analysis.)

Figure IV-1 summarizes the 892,651 incidents reported for 2013 by all departments outside New York City. The majority of incidents, 513,277, occur in high-density urban areas, as would be expected. The next largest is in rural areas, totaling 281,904 incidents in 2013. While there are certainly differences among urban, suburban, rural and remote areas, the distribution of incidents types is remarkably similar. In all, the majority of incidents are for medical and other rescues. Also each has a strikingly large number of false alarms and “good intention” calls for assistance for which there is no real need for firefighters, medical technicians or equipment but which require a full-fledged response nonetheless.

While firefighting incidents, per se, are under one-tenth of all incidents, they typically are more severe and require greater response because of their engulfing nature and the higher risk to life and property. For example, in one incident, a few fire department personnel may perform a vital service resuscitating and transporting a single accident victim, while in another incident numerous firefighters may rescue multiple persons from a burning structure, deploying significant apparatus and equipment.

Figure IV-1

Incidents Reported by all NY Fire Departments 2013					
Number Incidents	Fire Department Classification*				Total
	Urban	Suburban	Rural	Remote	
Fires	21,875	4,141	20,574	427	47,017
Medical & Other Rescues	296,194	53,955	155,527	2,322	507,998
Explosions/Spills (no fire)	32,175	5,543	20,044	343	58,105
Unauthorized Burning	33,945	6,756	24,482	343	65,526
False alarms / Good Intentions	125,428	22,447	57,680	676	206,231
Other	3,660	430	3,597	87	7,774
Total	513,277	93,272	281,904	4,198	892,651
Percent of Incidents					
	Urban	Suburban	Rural	Remote	Total
Fires	4.3%	4.4%	7.3%	10.2%	5.3%
Medical & Other Rescues	57.7%	57.8%	55.2%	55.3%	56.9%
Explosions/Spills (no fire)	6.3%	5.9%	7.1%	8.2%	6.5%
Unauthorized Burning	6.6%	7.2%	8.7%	8.2%	7.3%
False alarms / Good Intentions	24.4%	24.1%	20.5%	16.1%	23.1%
Other	0.7%	0.5%	1.3%	2.1%	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

* Includes all fire departments that reported fires in 2013; excludes NYC

To examine the impact SAFER grants in support of recruiting and retaining volunteer firefighters, we measured the change in response time of participating FASNY member

departments over the period 2010 to 2013. We derived the table in figure IV-2 by matching departments that responded to a SAFER funded manpower census conducted by FASNY with their incident records in the state OPFC database. As discussed earlier, an increase in the number of active volunteers at a station would be expected to reduce response time because of increased availability, other things equal.

IV-2 tabulates the average response time in each classification category for both 2010 and 2013. While the category definitions were discussed earlier, the “remote” designation require clarification. The NFPA standard for remote areas is based on 8 miles or more to a fire with the expectation that “four firefighters will respond 90% of the time;” an exact response time is not specified but noted to vary by distance.

Because the incident database does not include a distance from the responding station to the scene of the fire, there is no precise way to distinguish remote fire departments from rural fire departments. Based on simulations we performed that calculated distances from fire stations to fires based on the size of the area, its population and random locations of fires, we determined the following proxy for the remote designation: fire department response areas with more than 50 square miles per station and a population equal to or less than 25 persons per square mile. Of the 1,712 fire departments in the state database, 50 statewide are designated remote based on these criteria.

Overall, volunteer fire departments improved response time between 2010 and 2013. The 7.9 minutes average response in 2010 was reduced by 2.5% to 7.7 minutes in 2013. Suburban departments showed the greatest reduction, 10.0%, from 8.0 minutes in 2010 to 7.2 in 2013. Rural firefighters responded in at 9.4 minutes in 2010 versus 9.6 minutes in 2013, a small increase. Finally, remote areas shortened their response by 3.3%, from 12.1 minutes in 2010 to 11.7 minutes in 2013.

Figure IV-2

FASNY Fire Response Time NY: 2010 & 2013 compared					
<i>Average Response in Minutes*</i>					
	Fire Department Classification				Overall
	Urban	Suburban	Rural	Remote	
2010	5.9	8.0	9.4	12.1	7.9
2013	5.4	7.2	9.6	11.7	7.7
Change % 2010 to 2013	-8.5%	-10.0%	2.1%	-3.3%	-2.5%
Number of Fire Depts. Reporting	77	37	232	12	358
Number of Fire Incidents 2013	3,583	1,026	4,444	125	9,178

**Minutes from "Alarm Time" to "Arrival Time" as entered in NYS Fire Reporting System, form INC-1*

Average for reported fire incidents; compares same departments each year; excludes NYC.

Includes only fire departments with incident data that responded to a FASNY survey on volunteer membership.

How do the average response times for each fire department classification compare to the response standard promulgated by NFPA for that classification? Figure IV-3 addresses that based on our analysis of the distribution of incidents in 2013. Urban fire departments reported 21,875 fires in 2013. Of those, 19,777 met the standards of nine minutes or less 90% of the time.

Suburban fire departments reported 4,141 fires in 2013. Of those, only 3,125 met the standard of 10 minutes or less. That is a 75.5% rate, and below the 80% standard expected. Rural fire departments reported 20,574 fires with 15,877 meeting the 14 minute standard, 77.2% of the total and close to the 80% standard.

Because there is no exact standard set for response in remote areas, we tabulated several alternatives. In 2013, the time responding to 90% of rural fires was 25.1 minutes or less, for 80% of fires it was 19.8 minutes or less and for 70% of fires it was 14.2 minutes or less. The average for all fires in 2013 was 13.3 minutes.

Figure IV-3

Effectiveness at Meeting Response Standards: 2013				
Fire Department Classification*				
	Urban	Suburban	Rural	Remote
Number of Fires	21,875	4,141	20,574	427
Fire departments reporting	366	156	1,140	50
Response standard	9 mins. or less, 90% of fires	10 mins. or less, 80% of fires	14 mins. or less, 80% of fires	Depends on distance
Fires meeting standard or better	19,777	3,125	15,877	see below
Percent of fires	90.4%	75.5%	77.2%	see below
Remote Areas Summary				
	Number of fires	Percent of fires	Response time (mins.)	
Average response time all fires	427	100%	Average 13.3	
Response time for 90% of fires	384	90%	Within 25.1	
Response time for 80% of fires	342	80%	Within 19.8	
Response time for 70% of fires	299	70%	Within 14.2	

* Includes all fire departments that reported fires in 2013; excludes NYC