

# Fire Chiefs Opinions 2008

*Prepared for*



*Prepared by*



Opinion Research Corporation

*September 9-19, 2008*

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## Background

- Since 1971, ISO (Insurance Services Office, Inc.) has been a leading source of information about risk.
- They supply data, analytics, and decision-support services for professionals in many fields, including property/casualty insurance, mortgage lending, healthcare, government, and human resources.
- ISO is the property/casualty insurance industry's leading supplier of statistical, actuarial, underwriting, and claims data. Their analytic and decision-support services help customers compete effectively.
- ISO serves insurers, reinsurers, agents and brokers, insurance regulators, risk managers, and other participants in the property/casualty insurance marketplace.

## Purpose

- The purpose of this research is to gain insight into fire departments throughout the country by talking to Fire Chiefs and other fire officials about:
  - Prefire plans
  - Staffing, recruiting, and training
  - Mutual aid and collaboration
  - Water supply
  - Emergency incidents

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# Survey Summary

## Prefire Plans

- More than four in five (87%) fire departments prepare prefire plans for the commercial buildings in their fire protection area.
  - The vast majority (82%) are made available as paper reports.
  - Most are updated at least every three years (86%).
  - While paper reports are the most common form of prefire plans, one-third (32%) are also made available electronically via individual computers, on a wireless network, with GIS capabilities, and on command vehicles.
- The most significant obstacle to preparing prefire plans is finding the time to do it (78%), followed by having the expertise (65%).
  - Some volunteered obstacles to preparing prefire plans include lack of manpower (13%), access to the building (8%), and cooperation from business owners (7%).

## Staffing, Recruiting, and Training

- Two-thirds (63%) of fire departments always or almost always assign at least 4 firefighters to responding apparatus for first-alarm structure fires from 7:00am to 7:00pm. Slightly more (69%) do so between 7:00pm and 7:00am.
- Nearly all (93%) respondents indicate a significant obstacle to recruiting and/or retaining volunteers is the time commitment. Small size of available volunteer pool (84%) and education and training requirements (83%) are also significant obstacles.
  - Some volunteered obstacles to recruiting and/or retaining volunteers include lack of interest (11%), age/not many young people (6%), don't get paid (4%), and funds available to recruit, train, and equip volunteers (4%).
- One-third (36%) of fire departments spend less than 10 hours per firefighter per month on training. Forty-two percent spend between 10 and 20 hours and nearly one-quarter (22%) spend more than 20 hours.
  - The average number of training hours spent on structure fires (42%) is double that spent on rescue incidents (21%) as well as EMS or other medical services (21%).

## Mutual Aid and Collaboration

- Nearly all (98%) fire departments have the capacity to communicate by radio directly with fire departments in neighboring communities as well as local EMS (95%).
  - Slightly fewer are able to communicate with the local office of emergency management (86%) and the local police department (84%).
- Four out of five (82%) fire departments call on neighboring fire departments to respond on the initial alarm for a structure fire.
  - The top reason for doing so is the need for more responders (96%).
  - Less cited reasons are the need for specialized apparatus or equipment (60%) and being close to the response area than any station in their fire district (47%).
  - Volunteered reasons for calling on neighboring fire departments include needing more water / water supply (26%), size / type of structure fire (7%), and mutual aid agreements (7%).
- One-third (33%) of fire departments have a response area with populated sections that are closer to a fire station in a neighboring fire district than to any fire station in their own district.
  - About three in five (61%) of those indicate that the fire station in the neighboring district responds on automatic aid to fires in the district.

## Water Supply

- Three-quarters (73%) of fire departments have their water service for firefighting provided by a municipal authority.
- More than four in five (84%) fire departments have their response area protected by hydrants, with one-half (52%) having all or almost all of their response area protected.
  - The majority (70%) of hydrants are flow tested at least once a year, while two-thirds (66%) of respondents indicate their hydrants are maintained by a public or government agency.

## Emergency Incidents

- The majority (88%) of fire departments have a written emergency-operations plan.
- Of those with a written emergency-operations plan, the majority use them during drills (89%) as well as during major emergency incidents (87%).
  - Two-thirds (68%) conduct emergency-operations plan drills at least once a year.
- Nearly all (98%) respondents are familiar with NIMS and use it as their incident-command system (95%).
  - Four in five (79%) of those who are familiar with NIMS believe their fire department complies with all of its recommendations.

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# Detailed Findings

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# Prefire Plans

## Prefire Plans

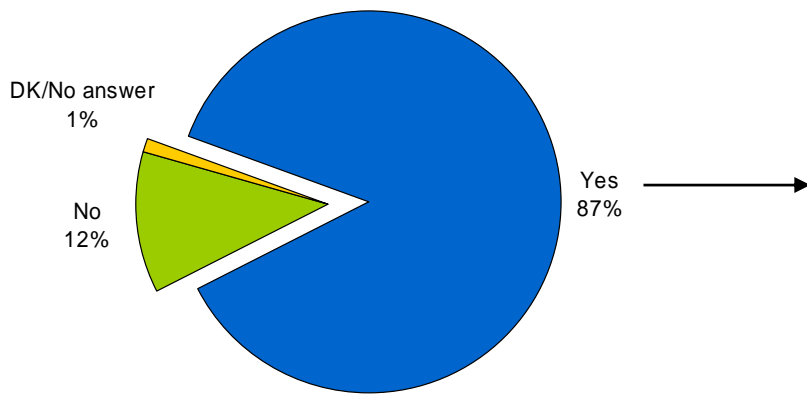
- More than four in five (87%) fire departments prepare prefire plans for the commercial buildings in their fire protection area.
  - Prefire plans exist more among fire departments that are paid-career (94%) or a combination of paid-career and volunteer (97%), rather than just volunteer (74%).
  - Prefire plans are also more prevalent among fire departments that spend more hours per firefighter per month on training (94% of those who spend 10 hours or more vs. 73% of those who spend less than 10 hours).
  - Fire departments with their response areas protected by hydrants are also more likely to have prefire plans (95% all or almost all and 84% some vs. 69% none/almost none).
  - Fire departments with written emergency-operations plans are also more likely to have prefire plans (89% vs. 73% of those who don't have written emergency-operations plans).
  - Less populated fire protection areas are less likely to have prefire plans (82% less than 15K population vs. 97% 15K or more population).
  - Rural areas are least likely to have prefire plans (77% vs. 98% urban, 94% suburban, and 92% mixed).
- The vast majority (82%) are made available as paper reports. Most are updated at least every three years (86%).
  - Prefire plans are made available as paper reports by more of those with a written emergency-operations plan (84% vs. 71% of those without a written emergency-operations plan).
- While paper reports are the most common form of prefire plans, one-third (32%) are also made available electronically via individual computers, on a wireless network, with GIS capabilities, and on command vehicles.
  - Prefire plans are made available via electronic files by fewer departments that are only volunteer (16% vs. 54% paid-career and 35% combination paid-career and volunteer).
  - This is also the case among fire departments that spend few hours per month per firefighter for training (17% less than 10 hours vs. 39% 10 hours or more).

## Prefire Plans

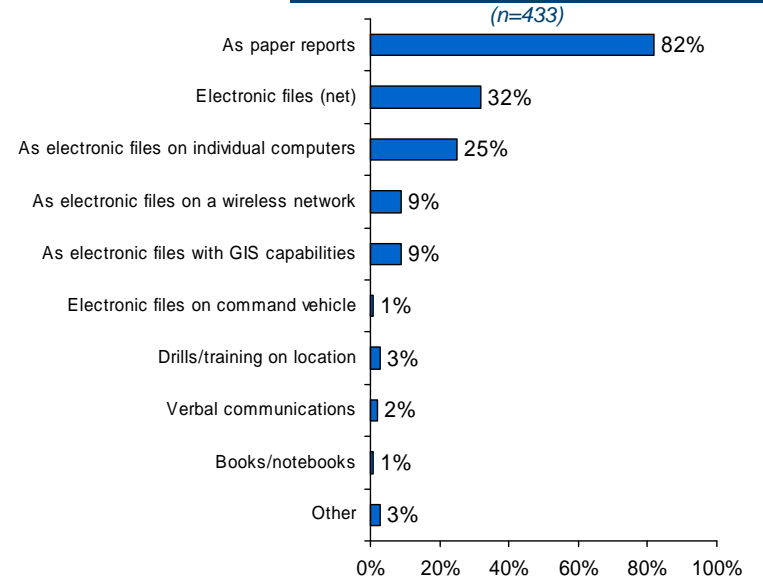
- Electronic files are also used by more fire departments that don't call on neighboring fire departments for the initial alarm for a structure fire (39% vs. 30% sometimes, always or almost always) as well as those whose response area is protected by hydrants (42% all or almost all vs. 24% some and 15% none or almost none).
  - Urban areas are most likely to make prefire plans available via electronic files (59% vs. 36% suburban, 36% mixed, and 18% rural).
  - Fire departments that conduct emergency-operations plan drills more frequently are more likely to make prefire plans available via electronic files (40% at least once per year vs. 16% 1 year or longer).
- The most significant obstacle to preparing prefire plans is finding the time to do it (78%), followed by having the expertise (65%).
- Finding the time is a very significant obstacle for fire departments that actually do prepare prefire plans (50% vs. 36% of those who don't), and those who call on neighboring fire departments for the initial alarm on structure fires (51% vs. 37% never or almost never).
  - Having the expertise is a very significant obstacle for fire departments that prepare prefire plans (38% vs. 23% of those who don't), volunteer (37%) and combination of paid-career and volunteer (41% vs. 23% paid-career) departments, and those that have a written emergency-operations plan (38% vs. 23% of those who don't).
- Some volunteered obstacles to preparing prefire plans include lack of manpower (13%), access to the building (8%), and cooperation from business owners (7%).

More than four in five fire departments prepare prefire plans for commercial buildings. The vast majority are made available as paper reports. Most are updated at least every three years.

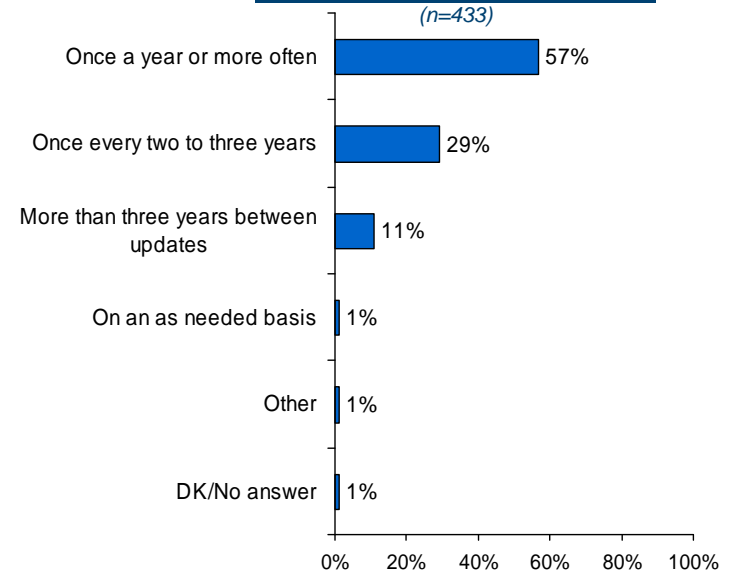
**Prefire Plans Prepared for Commercial Buildings**  
(n=500)



**How Prefire Plans are Made Available**



**How Often Update Prefire Plans**



Q1: A prefire plan is a report on conditions firefighters can expect to find at a particular building in case of a fire. Does your fire department prepare prefire plans for the commercial buildings in your fire protection area?

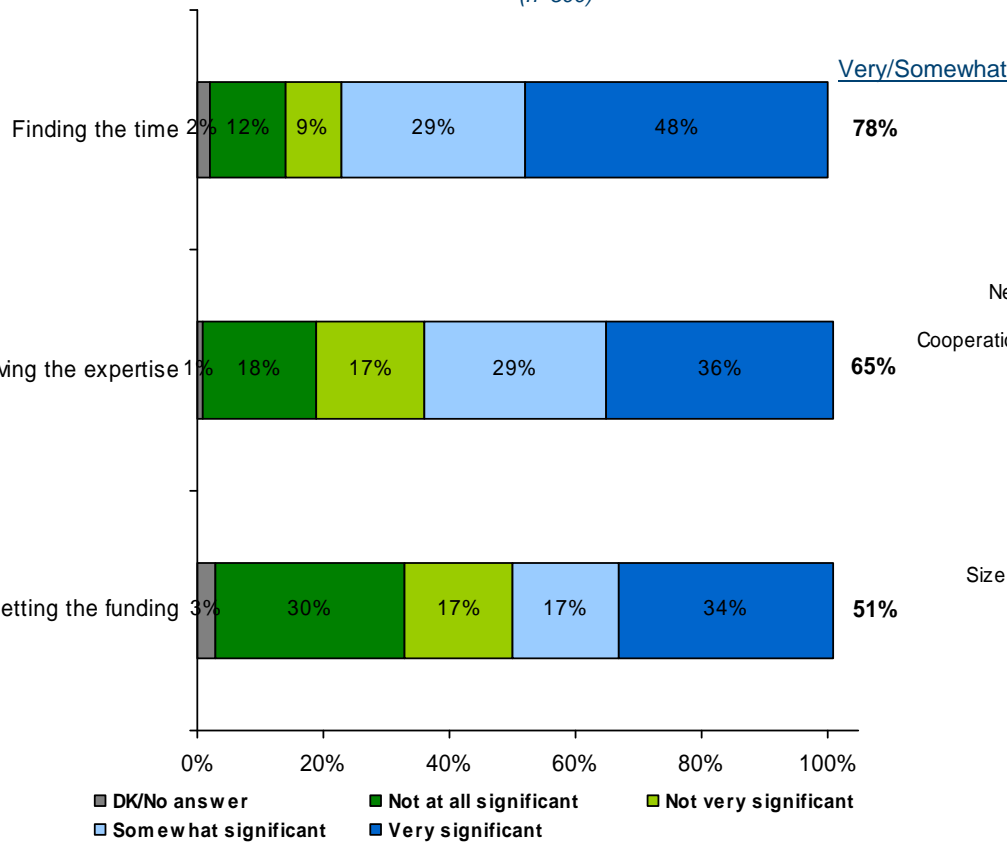
Q2: How does your department make prefire plans available to firefighters at the scene of a fire?

Q3: Which of the following BEST describes how often your fire department updates your prefire plans?

The most significant obstacle to preparing prefire plans is finding the time to do it, followed by having the expertise.

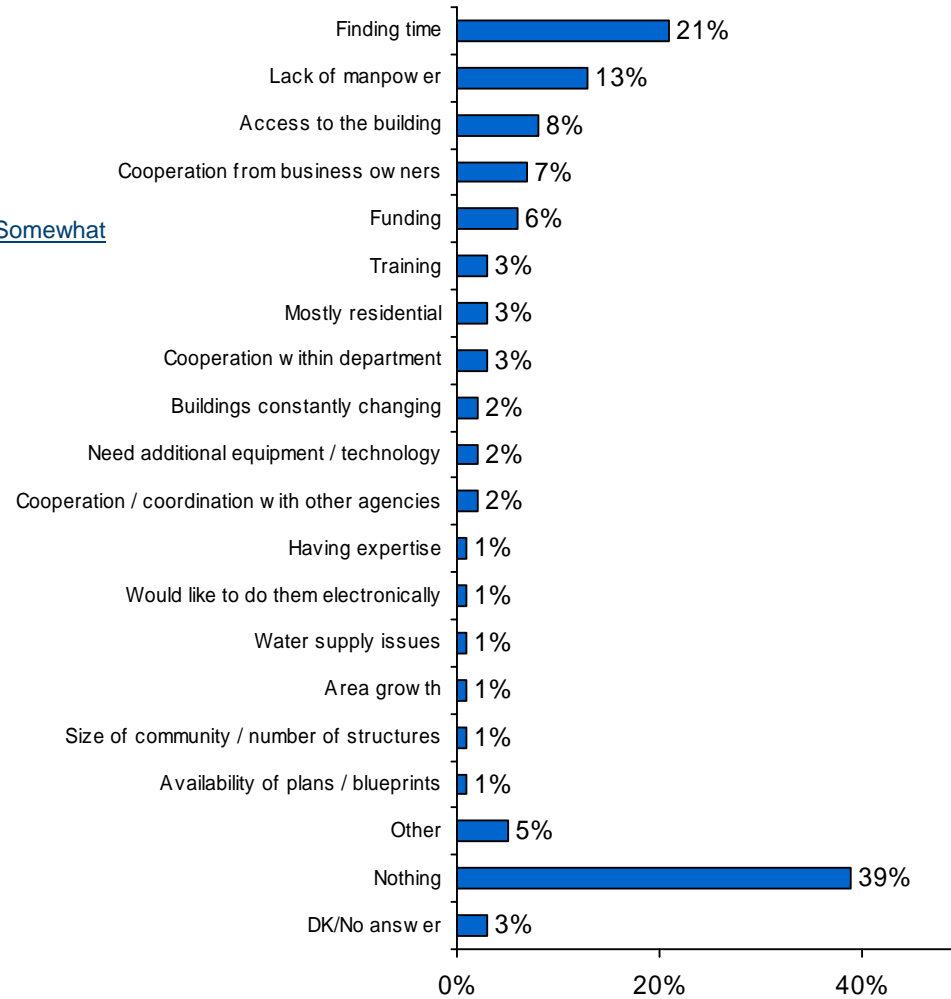
**Obstacles to Preparing Prefire Plans for Commercial Buildings**

(n=500)



**Obstacles to Preparing Prefire Plans for Commercial Buildings – Volunteered Responses**

(n=500)



Q4: I'm going to read some possible obstacles to preparing prefire plans for commercial buildings in your fire protection area. Please tell me whether each obstacle is very significant, somewhat significant, not very significant, or not at all significant in your community.

Q5: What other obstacles to doing prefire plans are significant in your community, if any?

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# Staffing, Recruiting, and Training

## Staffing, Recruiting, and Training

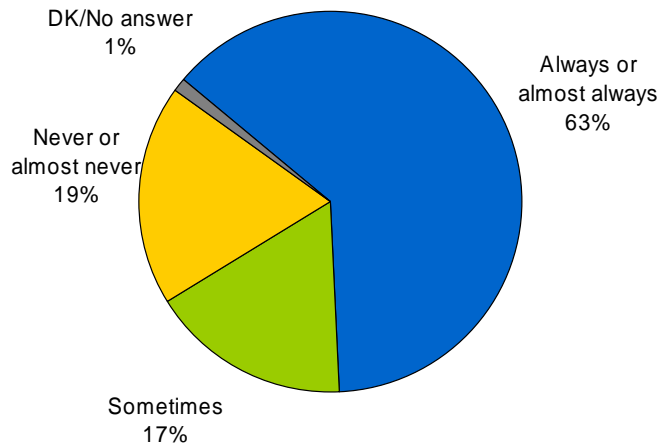
- Two-thirds (63%) of fire departments always or almost always assign at least 4 firefighters to responding apparatus for first-alarm structure fires from 7:00am to 7:00pm. Slightly more (69%) do so between 7:00pm and 7:00am.
  - Volunteer fire departments are more likely to assign at least 4 firefighters from 7:00pm to 7:00am than are paid-career fire departments (75% vs. 56%).
  - Fire departments with less populated protection areas are more likely to assign at least 4 firefighters to responding apparatus for both 7:00am to 7:00pm (67% less than 25K vs. 46% 25K or more) and 7:00pm to 7:00am (73% less than 25K vs. 48% 25K or more).
  - The same is true for rural (65% 7:00am to 7:00pm and 74% 7:00pm to 7:00am) and mixed (67% 7:00am to 7:00pm and 70% 7:00pm to 7:00am) areas versus urban areas (44% and 47%, respectively).
- Nearly all (93%) respondents indicate a significant obstacle to recruiting and/or retaining volunteers is the time commitment. Small size of available volunteer pool (84%) and education and training requirements (83%) are also significant obstacles.
  - Rural areas are most likely to indicate the small size of the available volunteer pool is a very significant obstacle to recruiting and/or retaining volunteers (68%).
  - Education and training requirements is a very significant obstacle for fire departments that have prefire plans (61% vs. 43% of those who don't).
- Some volunteered obstacles to recruiting and/or retaining volunteers include lack of interest (11%), age/not many young people (6%), don't get paid (4%), and funds available to recruit, train and equip volunteers (4%).

## Staffing, Recruiting, and Training

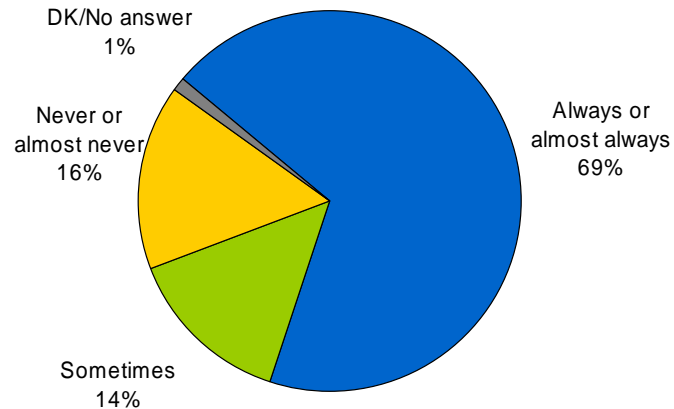
- One-third (36%) of fire departments spend less than 10 hours per firefighter per month on training. Forty-two percent spend between 10 and 20 hours and nearly one-quarter (22%) spend more than 20 hours.
  - The most time is spent on training per month by: Fire departments with prefire plans (16 hours, on average) and written emergency-operations plans (15 hours), paid-career departments (22 hours), departments that do not call on neighboring fire departments for the initial alarm for structure fires (17 hours), those whose response area is protected by fire hydrants (18 hours), and those with a smaller fire protection area (17 hours for those less than 20 square miles).
  - Less time is spent by: fire departments whose fire protection area is less populated (12 hours for those with less than 15K) and those in rural areas (11 hours).
- The average number of training hours spent on structure fires (42%) is double that spent on rescue incidents (21%) as well as EMS or other medical services (21%).
  - Training for structure fires is higher among fire departments with prefire plans (42% on average) as well as volunteer (45%) and combination volunteer and paid-career (41%) fire departments.
  - Training for EMS or other medical services is higher among those who spend more time per month per firefighter on training (26% on average for over 20 hours) and those with some response areas protected by hydrants (22%).

Two-thirds of fire departments always or almost always assign at least 4 firefighters to responding apparatus for first-alarm structure fires from 7:00am to 7:00pm. Slightly more do so between 7:00pm and 7:00am.

**Assign at least 4 firefighters from 7:00am to 7:00pm**  
(n=500)



**Assign at least 4 firefighters from 7:00pm to 7:00am**  
(n=500)

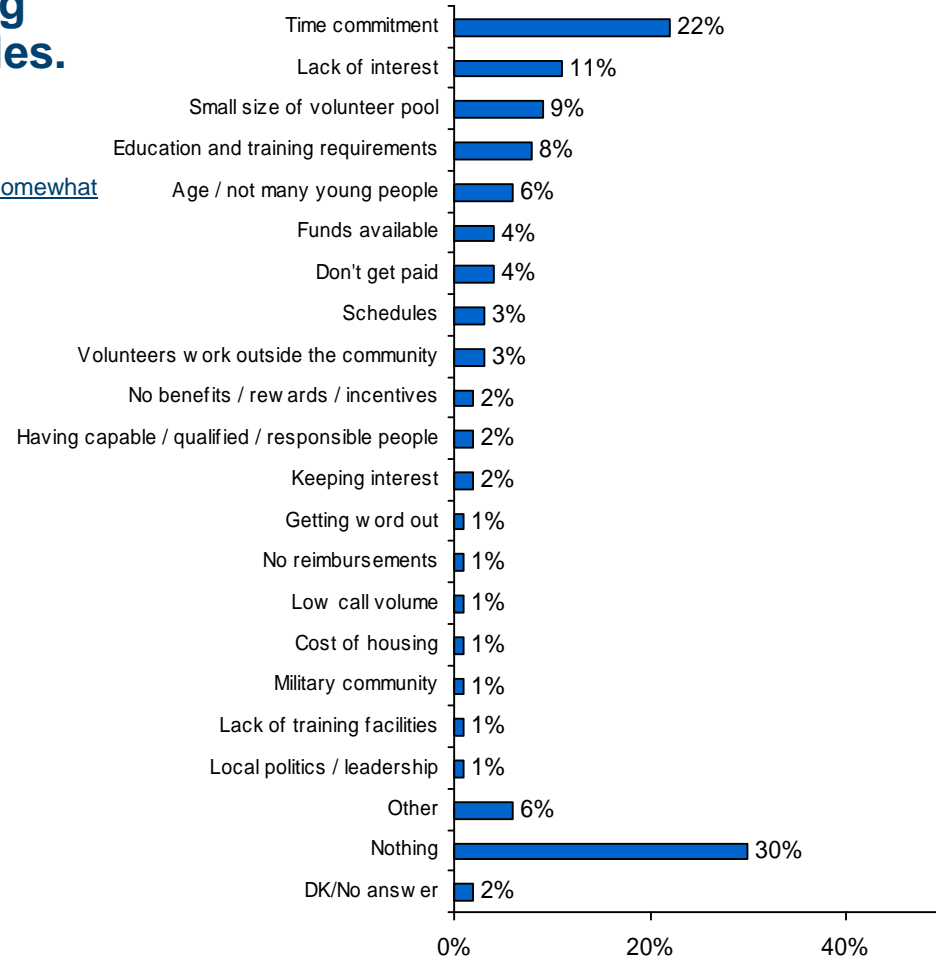
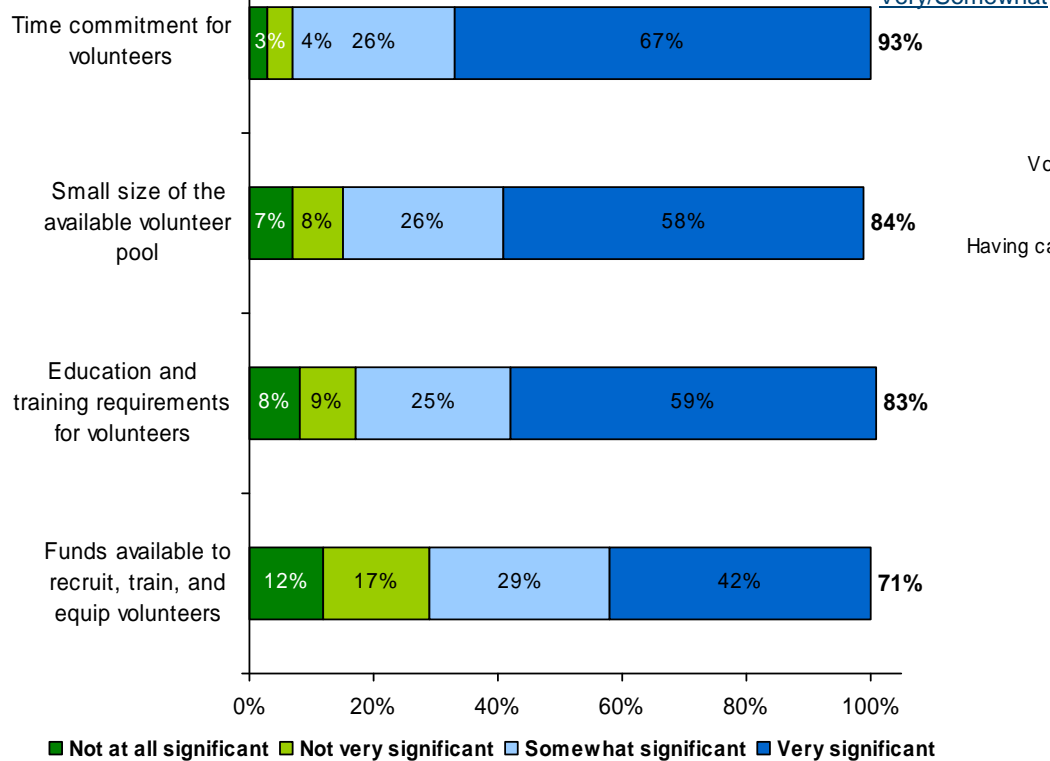


Q6: How often does your fire department assign at least 4 firefighters to responding apparatus for first-alarm structure fires? Would you say always or almost always, sometimes, or never or almost never during the hours of...

Nearly all respondents indicate a significant obstacle to recruiting and/or retaining volunteers is the time commitment. Small size of available volunteer pool and education and training requirements are also significant obstacles.

Obstacles to Recruiting and/or Retaining Volunteers – Volunteered Responses  
(n=405)

Obstacles to Recruiting and/or Retaining Volunteers  
(n=405)

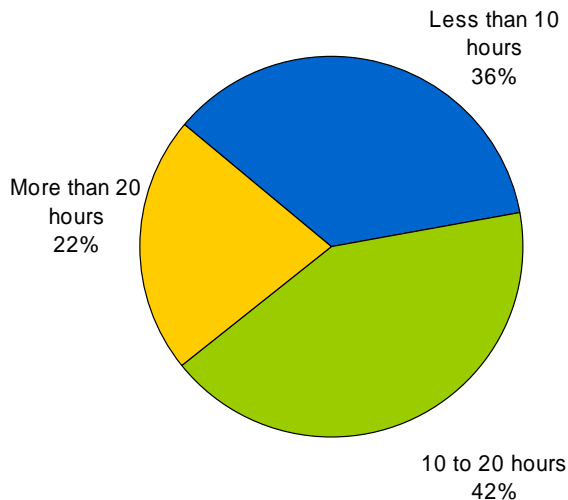


Q9: I'm going to read some possible obstacles to recruiting and/or retaining volunteers for your fire department. Please tell me whether each obstacle is very significant, somewhat significant, not very significant, or not at all significant in your community.

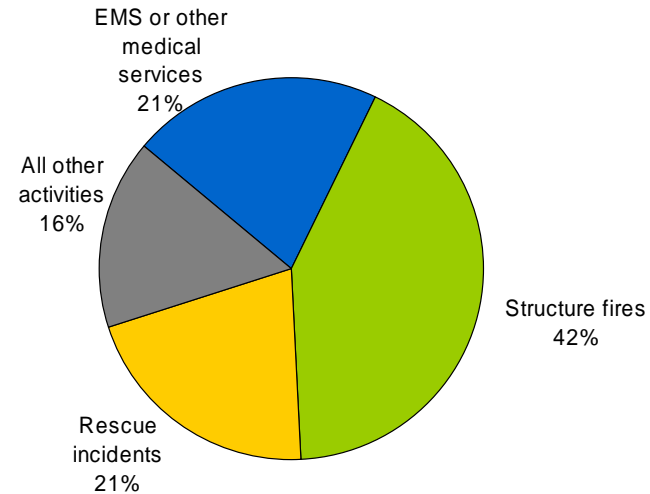
Q10: What other obstacles to recruiting and/or retaining volunteers are significant in your community, if any? Anything else?

One-third of fire departments spend less than 10 hours per firefighter per month on training. Forty-two percent spend between 10 and 20 hours, while nearly one-quarter spend more than 20 hours. The average number of training hours spent on structure fires is double that spent on rescue incidents as well as EMS or other medical services.

**Training Hours Per Firefighter Per Month**  
(n=500)



**Average Percentage of Training Hours Spent Per Month**  
(n=500)



Q11: On average, how many hours per firefighter PER MONTH does your fire department spend on training? Would you say...?

Q12: In a typical MONTH, what percentage of the total number of hours devoted to training does your fire department spend on the following activities: training for EMS or other medical services, training for structure fires, training for rescue incidents, and all other activities? Your total must add up to 100%

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# Mutual Aid and Collaboration

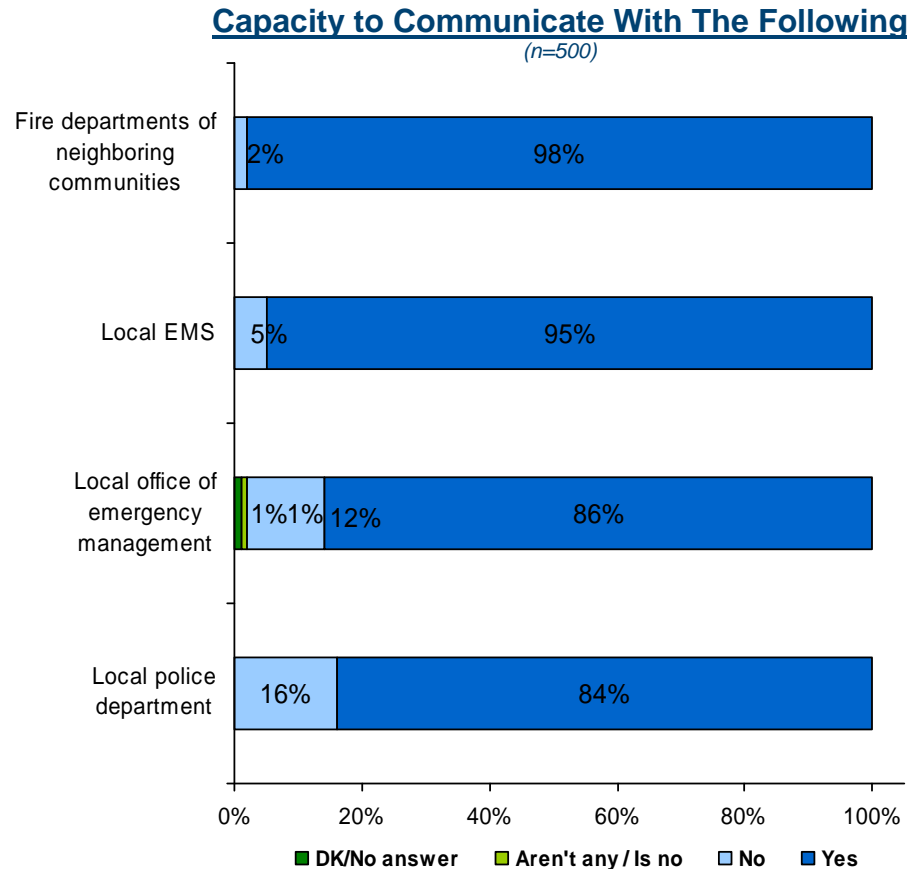
## Mutual Aid and Collaboration

- Nearly all (98%) fire departments have the capacity to communicate by radio directly with fire departments in neighboring communities as well as local EMS (95%).
  - More fire departments that are a combination of volunteer and paid-career (98%) are able to communicate by radio directly with local EMS, as well as those departments with a written emergency-operations plan (96%).
- Slightly fewer are able to communicate with the local office of emergency management (86%) and the local police department (84%).
  - More fire departments with written emergency-operations plans are able to communicate with the local office of emergency management (88%).
  - Paid-career fire departments are more likely than volunteer to be able to communicate with the local police department (91% vs. 81%).
- Four out of five (82%) fire departments call on neighboring fire departments to respond on the initial alarm for a structure fire.
  - Paid-career fire departments are least likely to call on neighboring fire departments (28% vs. 57% combination paid-career and volunteer and 63% volunteer).
  - Fire departments whose response area is protected by hydrants are less likely to call on neighboring fire departments (27% said never or almost never vs. 9% some/none/almost none).
- The top reason for doing so is the need for more responders (96%).
  - This is very significant for those who spend fewer hours per month per firefighter on training (81% less than 10 hours vs. 64% more than 20 hours).

## Mutual Aid and Collaboration

- Less cited reasons are the need for specialized apparatus or equipment (60%) and being close to the response area than any station in their fire district (47%).
  - Need for specialized apparatus or equipment is another very significant reason for those who spend fewer hours per month per firefighter on training (38% less than 10 hours vs. 24% 10 hours or more), as well as those who don't have prefire plans (47% vs. 27% of those who do).
- Volunteered reasons for calling on neighboring fire departments include needing more water / water supply (26%), size / type of structure fire (7%), and mutual aid agreements (7%).
  - Need for more water is a concern for volunteer fire departments (33%), those who spend fewer hours per month per firefighter on training (33%), and those whose response area isn't protected by hydrants (38% some, none, or almost none).
- One-third (33%) of fire departments have a response area with populated sections that are closer to a fire station in a neighboring fire district than to any fire station in their own district.
  - This is true for more fire departments with prefire plans (36% vs. 20% of those who don't) and those that spend more time per month on training (39% 10 hours or more vs. 24% less than 10 hours).
- About three in five (61%) of those indicate that the fire station in the neighboring district responds on automatic aid to fires in the district.
  - This is the case among fire departments that are a combination of paid-career and volunteer (70% vs. 42% paid-career) and those that spend more hours per month per firefighter on training (67% 10 hours or more vs. 47% less than 10 hours).

Nearly all fire departments have the capacity to communicate by radio directly with fire departments in neighboring communities as well as local EMS. Slightly fewer are able to communicate with the local office of emergency management and the local police department.

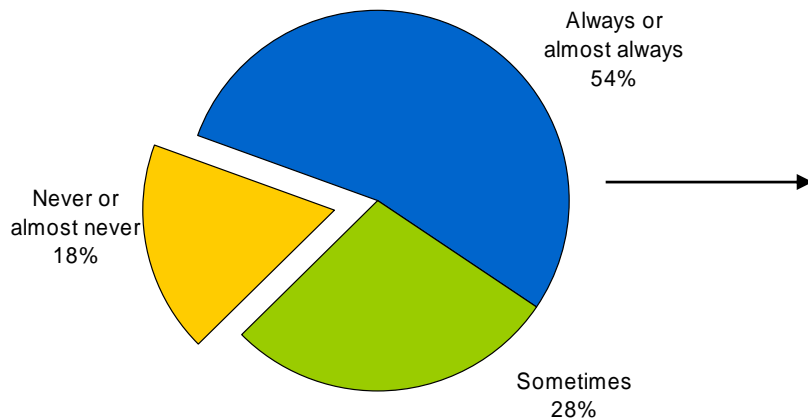


Q13: Does your fire department have the capacity to communicate by radio directly with fire departments of neighboring communities?

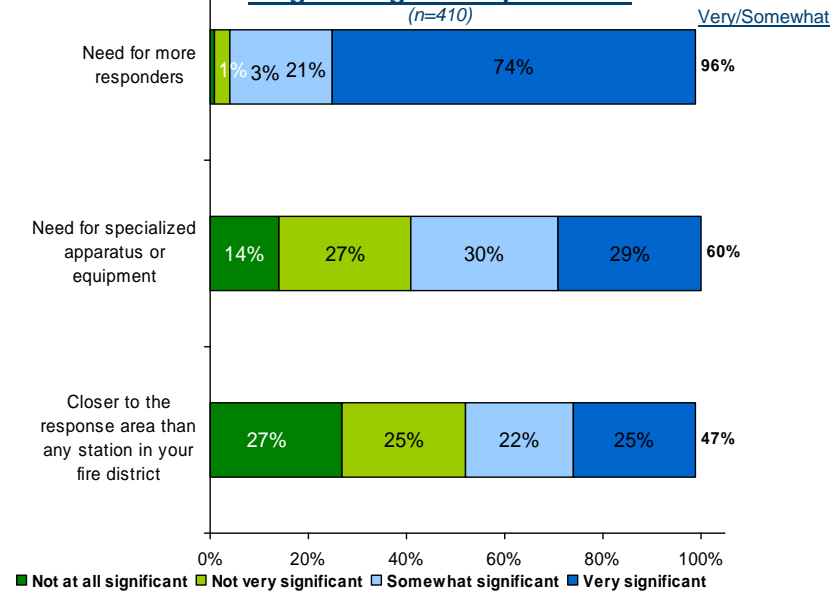
Q14: Does your fire department have the capacity to communicate by radio directly with each of the following local services?

Four out of five fire departments call on neighboring fire departments to respond on the initial alarm for a structure fire. The top reason for doing so is the need for more responders. Less cited reasons are the need for specialized apparatus and being closer to the response area.

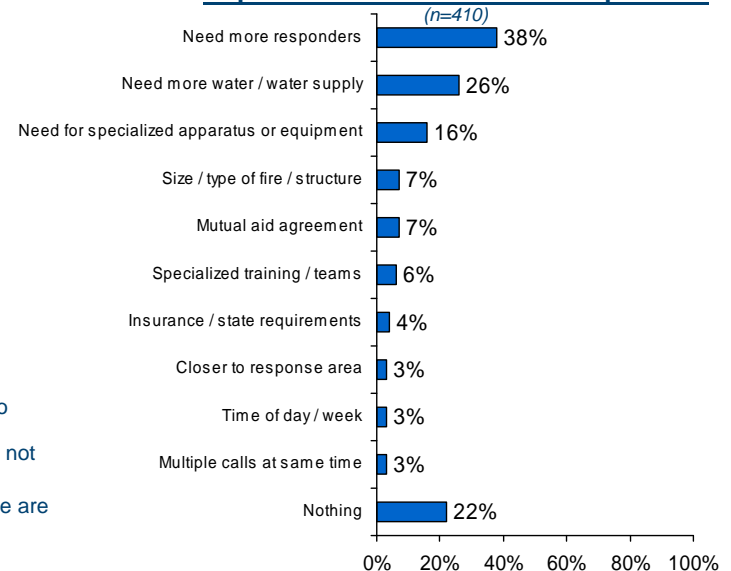
**How Often Call on Neighboring Fire Departments**  
(n=500)



**Reasons For Calling on Neighboring Fire Departments**  
(n=410)



**Reasons For Calling on Neighboring Fire Departments – Volunteered Responses\***  
(n=410)



Q17: In the normal course of fighting fires, how often does your department call on one or more neighboring fire departments to respond on the initial alarm for a structure fire? Would you say...

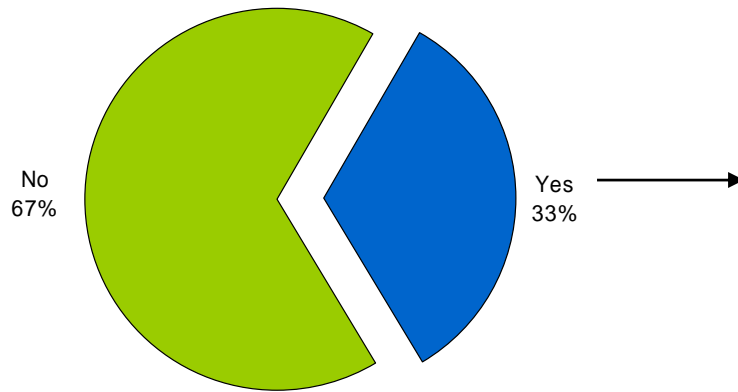
Q18: I'm going to read some possible reasons why your fire department might call on a neighboring fire department to respond on the initial alarm for a structure fire. Thinking about the times your department calls on a neighboring department to respond in that way, please tell me whether each reason is very significant, somewhat significant, not very significant, or not at all significant in your community.

Q19: What other reasons for calling on a neighboring fire department to respond on the initial alarm for a structure fire are significant in your community, if any? Anything else?

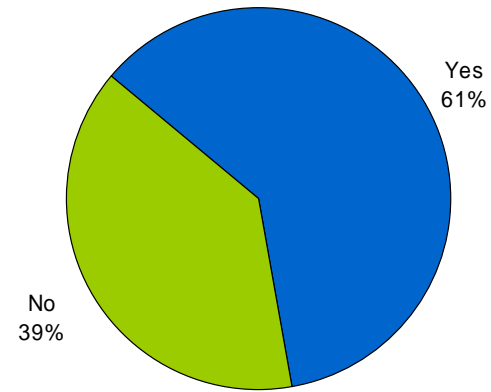
\*responses less than 3% not depicted

One-third of fire departments have a response area with populated sections that are closer to a fire station in a neighboring fire district than to any fire station in their own district. About three in five of those indicate that the fire station in the neighboring district responds on automatic aid to fires in the district.

**Response Area Has Sections Closer to Neighboring Fire District**  
(n=500)



**Fire Station in Neighboring District Responds on Automatic Aid to Fires**  
(n=167)



Q20: Does your response area have populated sections that are closer to a fire station in a neighboring fire district than to any fire station in your fire district?

Q21: Does the closer fire station in a neighboring district respond on automatic aid to fires in your fire district?

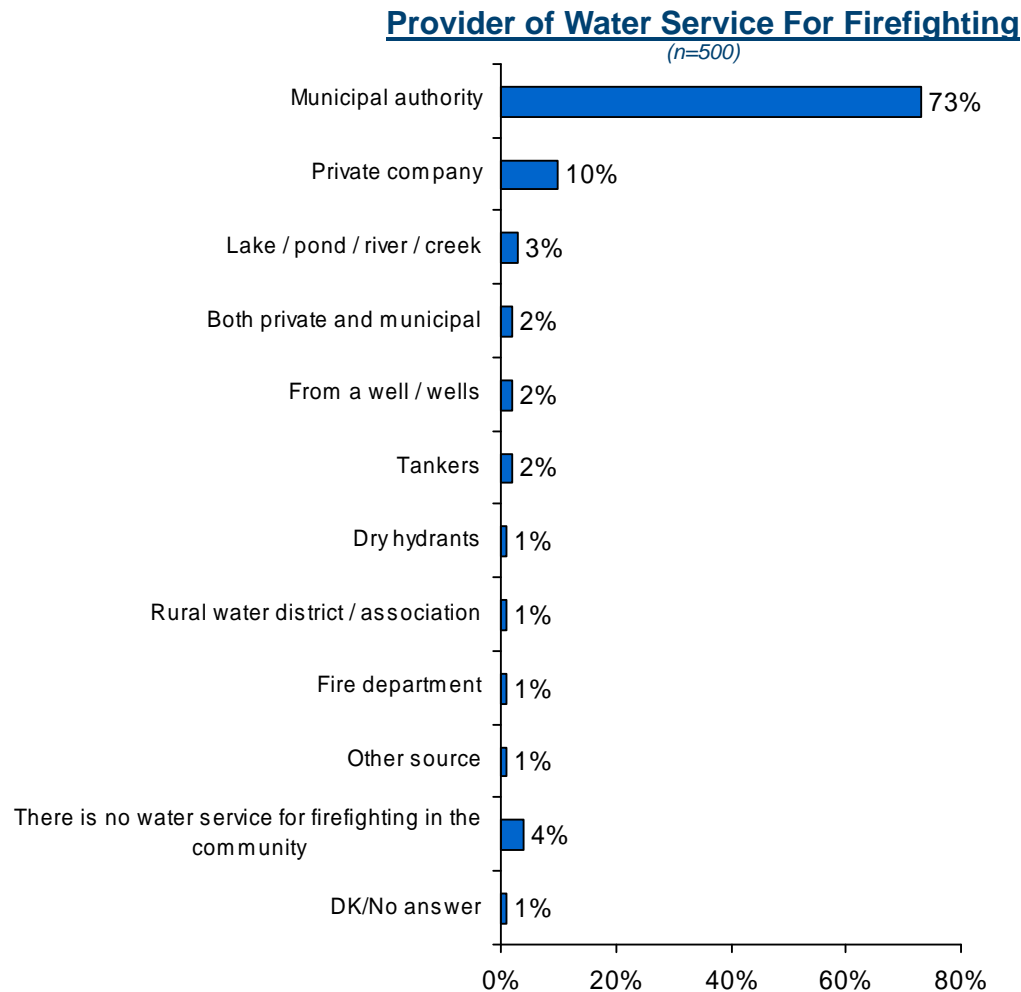
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# Water Supply

## Water Supply

- Three-quarters (73%) of fire departments have their water service for firefighting provided by a municipal authority.
  - More fire departments with prefire plans have their water service provided by a municipal authority (75% vs. 61% who don't). This is also true for fire departments whose response area is protected by hydrants (83% all, almost all, or some).
- More than four in five (84%) fire departments have their response area protected by hydrants, with one-half (52%) having all or almost all of their response area protected.
  - Fire departments with prefire plans (56%) and written emergency-operations plans (54%) are more likely to have all or almost all of their response area protected by hydrants.
  - Volunteer fire departments (26%), those in rural areas (20%), and those with a larger fire protection area (31% 50 or more square miles) are least likely to have all or almost all of their response area protected by hydrants.
- The majority (70%) of hydrants are flow tested at least once a year, while two-thirds (66%) of respondents indicate their hydrants are maintained by a public or government agency.
  - Hydrants are more likely to be flow tested at least once a year in areas whose fire department has prefire plans (73% vs. 47% who don't) and written emergency-operations plans (72% vs. 55% who don't).

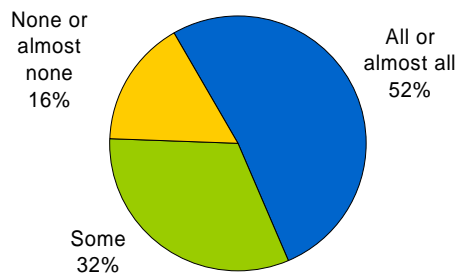
## Three-quarters of fire departments have their water service for firefighting provided by a municipal authority.



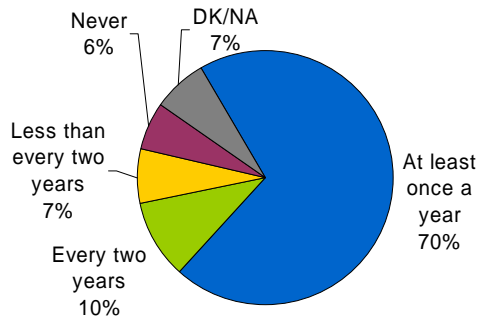
Q22: Who provides the water service for firefighting in your community? Would you say...

More than four in five fire departments have their response area protected by hydrants, with one-half having all or almost all of their response area protected. The majority of hydrants are flow tested at least once a year, while two-thirds of respondents indicate their hydrants are maintained by a public or government agency.

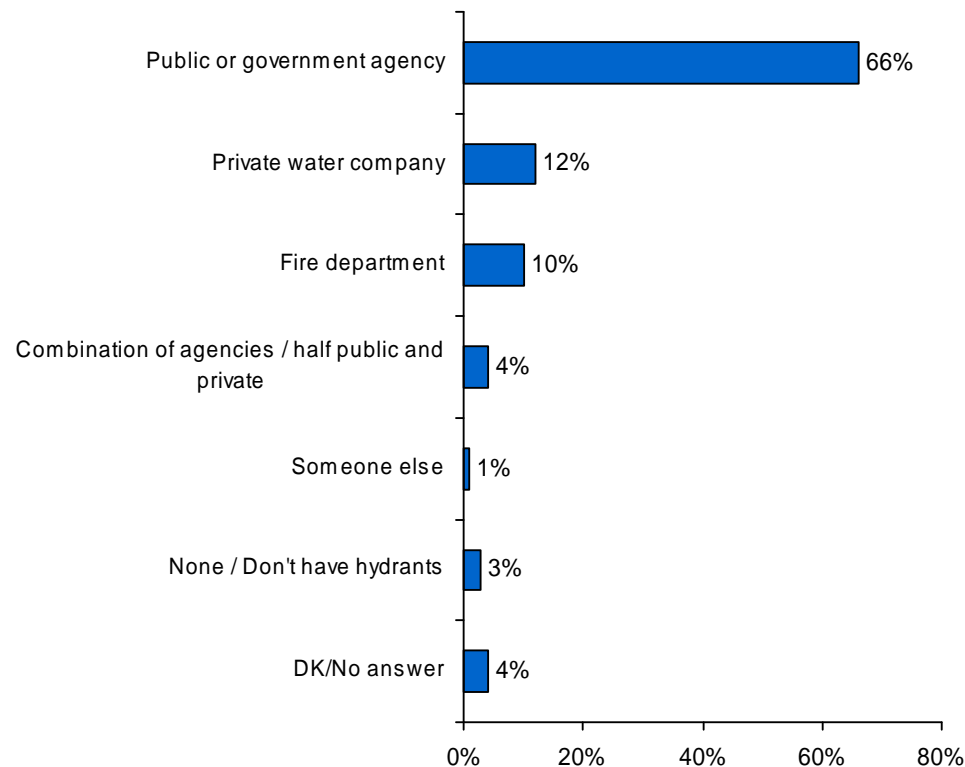
**Portion of Response Area Protected By Hydrants**  
(n=474)



**How Frequently Hydrants are Inspected and Flow Tested**  
(n=474)



**Who Maintains Hydrants in Response Area**  
(n=474)



Q23: Which of the following BEST describes the portion of your primary response area that is protected by hydrants? Would you say...

Q24: Which of the following BEST describes who maintains the hydrants in your response area?

Q25: Which of the following BEST describes how often the responsible organization or agency inspects and flow tests the hydrants in your primary response area? Would you say...

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# Emergency Incidents

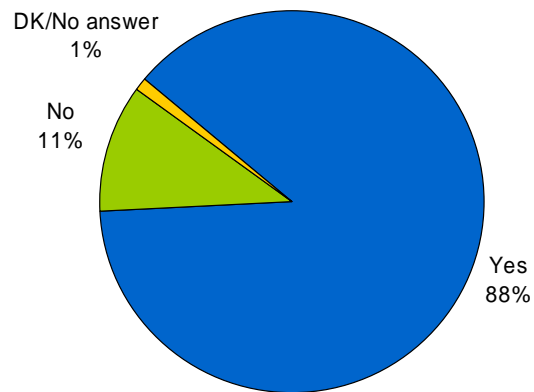
## Emergency Incidents

- The majority (88%) of fire departments have a written emergency-operations plan.
  - Written emergency-operations plans are more prevalent among fire departments that also have prefire plans (90% vs. 74% who don't), paid-career (93%) and combinations paid-career and volunteer (92%) fire departments, and those that use more hours per month on training (91% 10 or more hours).
- Of those with a written emergency-operations plan, the majority use them during drills (89%) as well as during major emergency incidents (87%).
  - Emergency-operations plans are used during drills by more of those with a smaller protection area (97% less than 10 square miles), those with prefire plans (90%), and those who spent more hours per month on training (95% more than 20 hours).
- Two-thirds (68%) conduct emergency-operations plan drills at least once a year.
  - Emergency-operations plan drills are conducted at least once a year by more paid-career (82%) fire departments, those that spend more hours per month on training (72% 10 hours or more), and those who have all or almost all of their response area protected by hydrants (76%).
- Nearly all (98%) respondents are familiar with NIMS and use it as their incident-command system (95%).
  - Familiarity with NIMS is higher among fire departments with prefire plans (99% vs. 90% of those who don't).
  - NIMS is used by more fire departments with prefire plans (96%), paid-career (98%) and combination of paid-career and volunteer (97%) fire departments, and those that spend more hours per month on training (97% 10 or more hours per month).
- Four in five (79%) of those who are familiar with NIMS believe their fire department complies with all of its recommendations.
  - This is the case among fire departments with prefire plans (81% vs. 60% of those who don't), paid-career (90%) and combination paid-career and volunteer (82%) fire departments, those that spend more hours per month on training (85% 10 hours or more per month), those whose response area is protected by hydrants (82% all, almost all, or some), and those in an urban area (98%).

The majority of fire departments have a written emergency-operations plan.

Have Written Emergency-Operations Plan

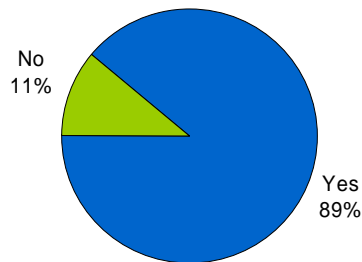
(n=500)



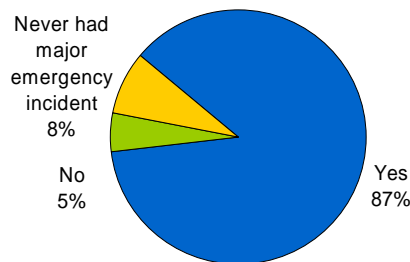
Q26: Does your community have a written emergency-operations plan that encompasses neighboring fire departments, EMS, police, environmental agencies, and public works?

Of those with a written emergency-operations plan, the majority use them during drills as well as during major emergency incidents. Two-thirds conduct emergency-operations plan drills at least once a year.

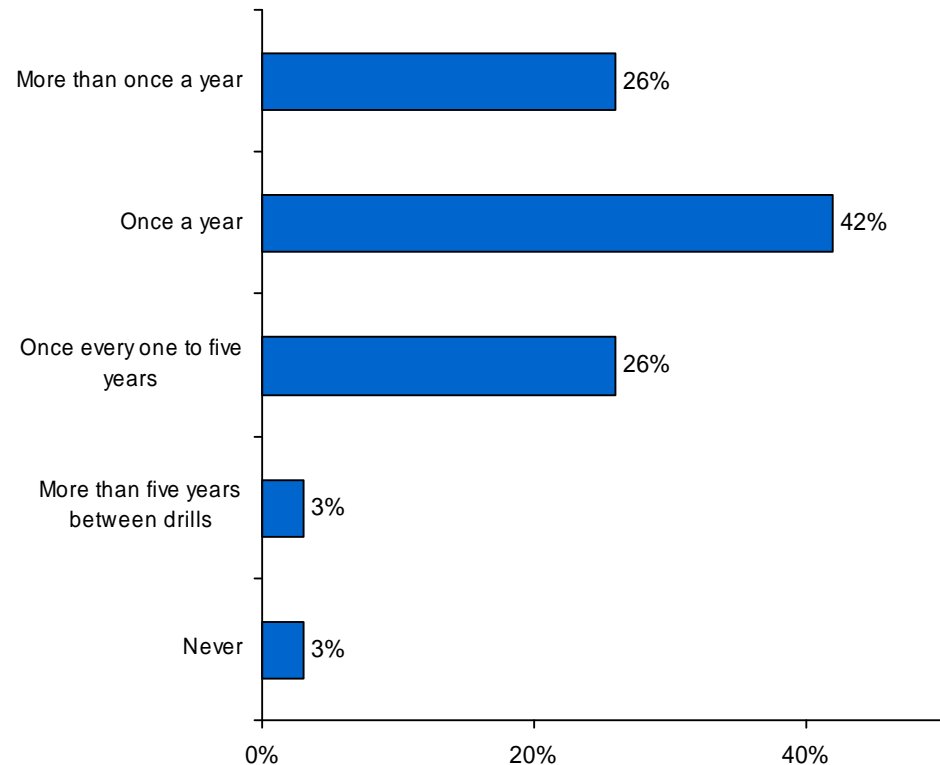
**Use Written Emergency-Operations Plan During Drills**  
(n=439)



**Use Written Emergency-Operations Plan During Major Incidents**  
(n=439)



**How Often Conduct Emergency-Operations Plan Drills**  
(n=439)

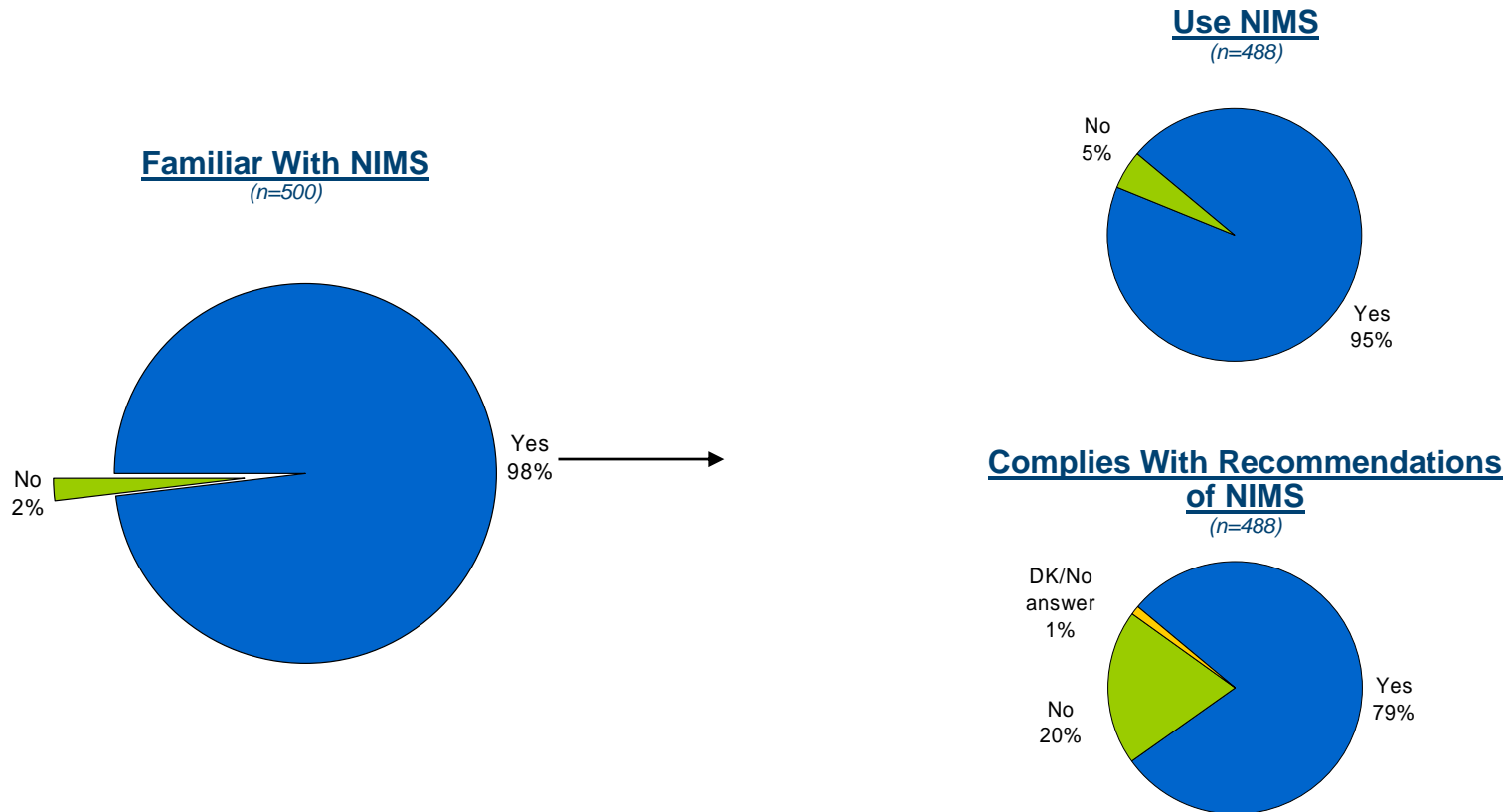


Q27: Do you use your written emergency-operations plan during drills?

Q28: Do you use your written emergency-operations plan during major emergency incidents?

Q29: How often does your community conduct emergency-operations plan drills? Would you say...

Nearly all respondents are familiar with NIMS and use it as their incident-command system. Four in five of those who are familiar with NIMS believe their fire department complies with all of its recommendations.



Q30: Are you familiar with the National Incident Management System, or NIMS?  
 Q31: Does your department use NIMS as your incident-command system?  
 Q32: Do you believe your fire department complies with all the recommendations of NIMS?

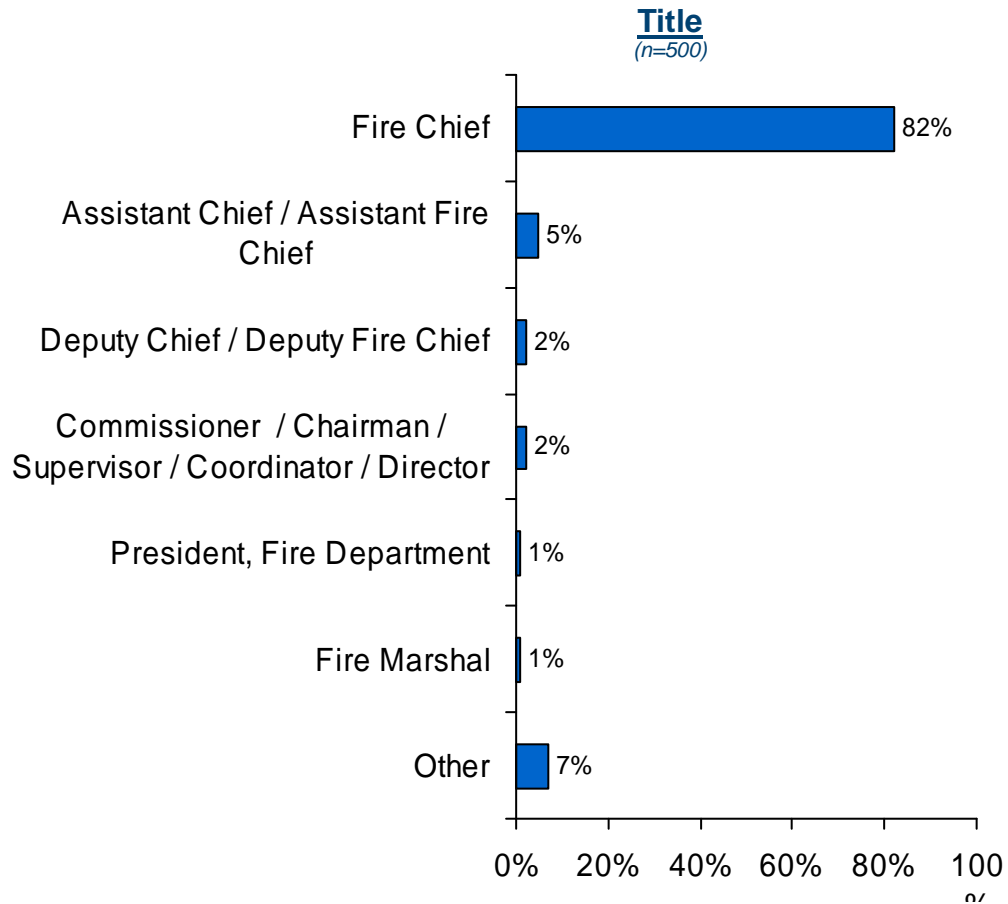
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# Profile

## Profile

- The majority (82%) of respondents are fire chiefs.
  - More of the fire chiefs work for fire departments that don't have written emergency-operations plans (93% vs. 80% of those who do), as well as being in a rural area (87%) versus an urban location (71%).
- Four in five (81%) fire departments consist of at least some volunteers, with two in five (43%) being a completely volunteer organization.
- The average population of fire protection areas is 19,000.
- The majority of fire protection areas are rural (41%) or mixed (37%), with the highest average percentage in the mixed area being rural (42%).
- The average size of fire protection areas is 45 square miles.

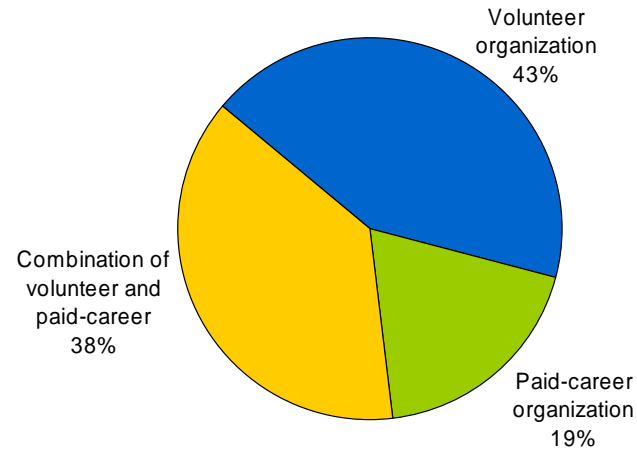
The majority of respondents are fire chiefs.



SB: Just for background purposes, what is your title?

Four in five departments consist of at least some volunteers.

**Organization of Fire Department**  
(n=500)



Q8: Is your fire department...

The average population of fire protection areas is 19,000. The majority of fire protection areas are rural or mixed, with the highest average percentage in the mixed area being rural. The average size of fire protection areas is 45 square miles.

(n=500)	FIRE PROTECTION AREA
<b>Population of Fire Protection Area</b>	
Less than 5,000	39%
5,000 to less than 15,000	29%
15,000 to less than 25,000	14%
25,000 to less than 50,000	11%
50,000 to less than 100,000	4%
100,000 to less than 200,000	1%
200,000 to less than 500,000	0%
500,000 or more	0%
Average	19,213
<b>Area Served</b>	
Urban	9%
Suburban	13%
Rural	41%
Mixed	37%
% Urban	34%
% Suburban	24%
% Rural	42%
<b>Size of Fire Protection Area</b>	
Less than 10 square miles	17%
10 to less than 20 square miles	18%
20 to less than 30 square miles	13%
30 to less than 50 square miles	18%
50 to less than 70 square miles	8%
70 or more square miles	26%
Don't Know/No Answer	1%
Average	44.6

Q33:What is the estimated population of your fire protection area? Would you say...

Q34:Would you describe the area you serve as urban, suburban, rural, or mixed?

Q35:Please tell me the approximate percentage of each of the following in your mixed area: urban, suburban, and rural. Your total must add up to 100%.

Q36:What is the size of your fire protection area in square miles? Would you say...

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# Appendix

## METHODOLOGY

This report presents the findings of a telephone survey conducted among a sample of 500 fire chiefs and other fire department officials. The client, Insurance Services Office, Inc. supplied the sample for this study. Respondents who completed the survey were confirmed to be the named respondent or an official directly in charge of fire department operations within their municipality.

Interviewing was completed during the period September 9-19, 2008. All data collection efforts took place at Opinion Research Corporation's telephone facility in Reno, Nevada.

As required by the Code of Standards of the Council of American Survey Research Organizations, we will maintain the anonymity of our respondents. No information will be released that in any way will reveal the identity of a respondent. Our authorization is required for any publication of the research findings or their implications.

Opinion Research Corporation has exercised its best efforts in the preparation of this information. In any event, Opinion Research Corporation assumes no responsibility for any use which is made of this information or any decisions based upon it.

Any Publication of the Work Product which cites ORC must be reviewed by ORC, acknowledge client sponsorship and in no way omit a material fact or be misleading in anyway.

## RELIABILITY OF SURVEY PERCENTAGES

Results of any sample are subject to sampling variation. The magnitude of the variation is measurable and is affected by the number of interviews and the level of the percentages expressing the results.

The table below shows the possible sample variation that applies to percentage results reported herein. The chances are 95 in 100 that a survey result does not vary, plus or minus, by more than the indicated number of percentage points from the result that would be obtained if interviews had been conducted with all persons in the universe represented by the sample.

Size of Sample on Which Survey Results Are Based	Approximate Sampling Tolerances Applicable to Percentages At or Near These Levels				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
1,000 interviews	2%	2%	3%	3%	3%
500 interviews	3%	4%	4%	4%	4%
250 interviews	4%	5%	6%	6%	6%
100 interviews	6%	8%	9%	10%	10%

## SAMPLING TOLERANCES WHEN COMPARING TWO SAMPLES

Tolerances are also involved in the comparison of results from independent parts of the sample. A difference, in other words, must be of at least a certain number of percentage points to be considered statistically significant – that is not due to random chance. The table below is a guide to the sampling tolerances in percentage points applicable to such comparisons, based on a 95% confidence level.

Size of Samples Compared	Differences Required for Significance At or Near These Percentage Levels				
	<u>10% or 90%</u>	<u>20% or 80%</u>	<u>30% or 70%</u>	<u>40% or 60%</u>	<u>50%</u>
1,000 and 1,000	3%	4%	4%	4%	4%
1,000 and 500	3%	4%	5%	5%	5%
1,000 and 250	4%	6%	6%	7%	7%
1,000 and 100	6%	8%	9%	10%	10%
500 and 500	4%	5%	6%	6%	6%
500 and 250	5%	6%	7%	7%	8%
500 and 100	6%	9%	10%	11%	11%
250 and 250	5%	7%	8%	9%	9%
250 and 100	7%	9%	11%	11%	12%
100 and 100	8%	11%	13%	14%	14%

## SIGNIFICANCE TESTING

When results from sub-groups of a sample appear in the detailed tabulations, an indicator of statistically significant differences is added to the tables. The test is performed on percentages as well as mean values. Each sub-sample is assigned a letter. When the percentage of one sub-sample is significantly different from the percentage of another sub-sample, the letter representing one of the two samples appears next to the percentage (or mean) of the other sample.

Significance testing is done to the 95% confidence level. The columns compared are listed at the bottom of each table.

A number of factors need to be considered when determining which type of t-test should be applied, such as whether the samples being compared overlap, whether they are means or percentages, etc. Opinion Research Corporation's software has the capability to perform the appropriate test.

Note that any statistical test becomes less reliable when the sample sizes are small. Even though the test mathematically can be performed on samples as low as thirty, sixty respondents is the reasonable lower bound on the size of the sample.