

CFCA and IAFC Survey Review and Analysis Final Report – Phase II

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5/15/2017

Executive Summary

- For the Phase II survey, Officials successfully administered the questionnaire to 357 Connecticut firefighters. Eleven percent (n=39) of the respondents chose to complete only the first question regarding employment status.
- Descriptive statistics and visualizations (charts, graphs, etc.) give an overview of the responses from three groups of firefighters - Volunteer (n=256), Both (n=58), and Career (n=43).
- The survey questions are grouped into two main categories – Service/Personal Information (Service, Motivations, and Demographics) and Firefighter Opinions (Recruitment and Retention, Leadership Issues, Areas in Need, and Training Options). The response rate for questions varies between 100% (Beginning of Survey) and 74% (End of Survey).
- Overall, the top-two departments with survey participants are Windsor (11%) and Middlefield (6%).
- By Rank, the largest group is Firefighters (35%); Years in Service tallies peak at most 5-year increments – possibly due to nearest anniversary date.
- Referrals account for 73% of the “Reasons for Joining” the Fire Service.
- Twenty-nine percent of the “Initial Motivations” continue to motivate firefighters into their careers. Almost all of the respondents with an initial “Family Connection” motivation switch to another one during their careers.
- The majority of firefighters become members within the first three months (77% in a year) and IDLH (Immediately Dangerous to Life and Health) firefighters within a year (Volunteer (63%); Both (67%); n=357).
- The leading certifications (minimum requirements) include Firefighter I and HAZMAT Operations.
- Geographically, the dispersed survey respondents list 115 unique ZIP Codes for their primary residences (2 Unknown).
- The top-two Volunteer Primary Occupations are “Other” and “Retired” (n=21 (8%) tie).
- The percent of Volunteer firefighters in the older (70 and up) and younger (<20) age cohorts is greater than the percent of Career firefighters. For the Both group, 26% are 30-39 years old.
- The top-three choices for effective recruitment tools by all respondent groups are “Firefighter Referral,” “Word of Mouth,” & “Being asked by a Firefighter.”
- Firefighter opinions regarding effective retention strategies vary significantly by firefighter type. Career firefighters consider “Training,” “Retirement/Pension,” “EMS Training,” and “Continuing Education” to be of primary importance. Volunteer firefighters are more concerned with “Training,” “Annual Banquet,” “Awards,” “Tax Credit,” and similar shorter-term perks.
- Retention strategies with a “Very Effective” rating include Retirement (Career) & Tax Credit (Both).
- The top-five perceived reasons why others left the service are “Life Change,” “Time Commitment,” “Station/Department Politics,” “Lack of Leadership,” “Could Not Meet Training.”

- For Needed “Improvement” & “Training” Areas, the leading responses match (ordered differently) with “Communication” leading “Improvements” and “Leadership” at the top for “Training.”

According to the Correlation Analyses, the findings are limited due to higher p-values with most of the testing (not strong relationships).

- For “Primary Occupation,” firefighters with fewer than 10 years of experience have fewer than expected numbers of firefighters in the fire service, and higher than expected numbers in the “Student,” and “Maintenance, Repair, and Installation” categories. In the middle of their careers, the 30-39-year groups have more than expected numbers of firefighters in the fire service. As expected, the most tenured group has higher than expected numbers of firefighters with a “Retired” response.
- For the “Leadership Issues,” a few trends are noteworthy.
 - More than half of the firefighters in every group have “Leadership Issues” – particularly the Both group (64%).
 - Among the ranks of firefighters, “Chiefs” do not have concerns, but “Company Officer,” and particularly “Firefighters” have higher than expected numbers of responses for “Leadership Issues.”
 - The percentage of “No Response” entries is higher for the “Leadership Issues” question than the “No” responses, and Volunteer have the highest “No” response rate (23%).

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Introduction

In the winter of 2015 and spring of 2016, the Connecticut Fire Chiefs Association and the International Association of Fire Chiefs (IAFC) administered a survey regarding recruitment and retention issues as perceived by Connecticut firefighters. The survey was one component of an extended undertaking – Phase II of a SAFER-sponsored project. Prior to administering the survey in Phase II, several parties reviewed and revised the survey before finalizing it and making it available to the firefighters. The survey was presented to firefighters in digital form via an online survey system (SurveyMonkey). By the conclusion of the survey, the tally included 357 respondents. This document, which compiles the firefighter responses, serves to 1) describe the survey itself, 2) summarize the responses, and 3) analyze the responses in order to improve the understanding of recruitment and retention issues as perceived by a broad cross-section of Connecticut firefighters.

Background and Overview

After careful review of the recruitment and retention survey results from Phase I, officials decided to modify and expand the questionnaire for Phase II. The update from the previous format with 15 questions for each respondent now includes 48 questions; however, the format has a section for each of the two the respondent populations (volunteer and career), so firefighters do not answer every question. With the format restructure, the officials split the survey into dual tracks after the respondents' response to the first question. The question requires the firefighters to designate their status as Volunteer, Career, or Both. After responding to this question, Volunteer/Both firefighters continue by answering the beginning track of questions (Questions 2-26), while Career firefighters respond to the second track of questions (Questions 27-48). With a few exceptions for questions relating to occupation, membership, and status, the questions for each group are identical; however, the response options on two questions that inquire about retention methods and their effectiveness vary in the track of questions for the Career firefighters. All of the firefighter groups had the opportunity to respond via an online survey system between January and April 2016.

Survey Categories

For each of the groups (Volunteer/Both and Career), the survey includes a series of questions that relate to the firefighters' basic information and valued opinions in eight broad categories. Each category has five to seven questions that have multiple formats. See Appendix A for a list of the specific questions.

Background, Service, and Personal Information Questions:

- Service information (Firefighter Status, Departmental Location, and Current Rank)
- Primary occupation (for Volunteer/Both)
- Service details (Years in Service)
- Personal demographics (ZIP Code and Age)

Recruitment Information Questions:

- Recruitment motivation (How did you learn about opportunities, motivation to become a firefighter)
- Time to become a member (months after application, time to IDLH)
- What minimum certifications are required
- Opinions about effectiveness of recruitment methods

Retention Information Questions:

- Motivation to continue as a firefighter
- Retention methods used
- Opinions on effectiveness of retention methods and factors leading to failed retention

Leadership and Training Questions:

- Leadership Issues (Leadership Issues and Levels of Leadership Issues)
- Areas in Need (Areas in Need of Improvement and Areas that Need More Training)
- Training Options (Preferred Training Methods and Favored Training Times)

The Occupation, Months to Membership, and Months to Become an IDLH Firefighter questions only pertain to the Volunteer/Both groups.

Nature of the Survey Questions

Other than responses that are – by their nature – specific quantities (e.g. years in service or months to become a member) the data from the survey are primarily categorical in nature. That is, officials asked the firefighters to respond to questions by selecting from a discrete set of possible responses. For example, when asked which method they believe to be most effective in recruiting, the firefighters chose their responses from a list of possibilities including Fundraising Event, Radio, School Visit/Career Day, Brochures, etc. In one case – when asked which strategy is most effective in retention - the choices are ordered similar to a Likert Scale (Very Effective, Effective, Somewhat Effective, Not Effective). Overall, the respondents reply to two or four numerical questions, depending on status, and the remainder are categorical.

Potential Analytical Methods

Since many of these responses are categorical rather than continuous in nature, a detailed quantitative analysis has limitations. Because of these limitations, this report includes two types of analyses - descriptive and correlative – that are valid on these types of data. The descriptive analyses include statistics, such as averages or median values, and techniques, such as frequency distributions or histograms. The correlation analyses limit comparisons to pairs of variables; therefore, cross-tabulations and tests for independence are appropriate for an assessment. This report begins with an explanation of response rates, continues with descriptive statistics, and focuses on the methods for correlation analysis.

The answers to all of the questions are not mutually exclusive, and in several instances, the respondents had the opportunity to choose multiple responses. In addition, for some questions, the firefighters were given the option of answering “N/A” or “Not applicable,” or they had the option to leave questions blank. In these cases, the analysts removed the responses from the analyses of individual questions.

Response Rates

The SurveyMonkey tally includes responses from 357 firefighters. Of this group, 10.9% of the respondents (n=39) chose to answer only the first status question. It is unclear if this is a function of the revised dual-track questionnaire format or the firefighters’ desire not to respond to any further questions. However, it does correspond to similar response patterns in previous surveys where a small but significant portion of the respondents stop responding after the first question. (Figure 1).

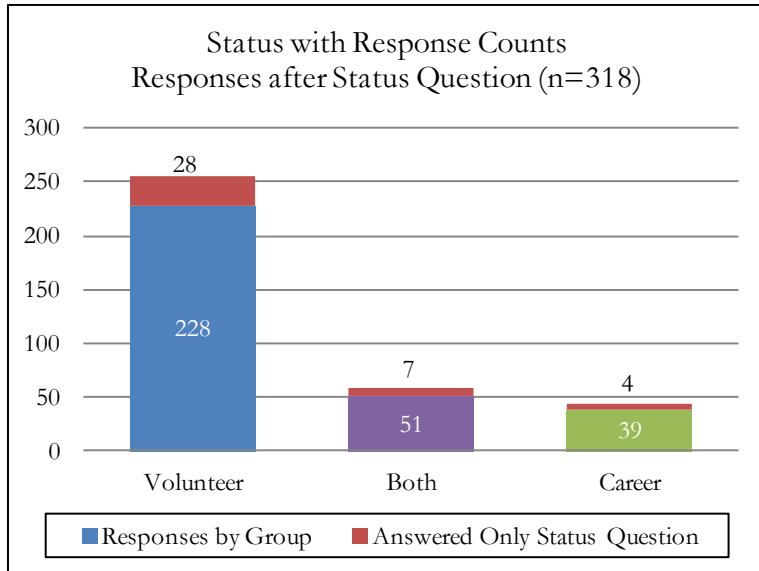


Figure 1: Status with Response Counts by Group

With the exception of the initial status question, the response rates for the questionnaire, which contains 25 questions for Volunteer/Both firefighters and 22 questions for the Career firefighters, vary by question. Generally, the responses for basic firefighter information at the beginning of the survey includes input from all of the firefighters in each of the three groups – Volunteer (n=228), Both (n=51), and Career (n=39). As the survey progresses, the questions become more complex and require the firefighter to form an opinion, as opposed to giving a factual response; therefore, with each subsequent question in a survey of this length, the response rates decrease (Table 1) – which is an expected progression given the survey format. Nine of the questions also have a multiple-choice format – which requires additional response effort. Firefighters may tire of answering questions of some length, but all of the questions have at least a 74% response rate.

Table 1: Group Response Rates throughout the Survey

Questions/Topics	Volunteer Respondents	Response Rate	Both Respondents	Response Rate	Career Respondents	Response Rate	Total Respondents	Response Rate
1 Status**	256		58		43		357	
2 Department Location	228	89%	51	88%	39	91%	318	89%
3 Primary Home ZIP Code	228	89%	51	88%	39	91%	318	89%
4 Primary Occupation	228	89%	51	88%	N/A	N/A	279	89%
5 Rank	228	89%	51	88%	39	91%	318	89%
6 Years in Service	228	89%	51	88%	39	91%	318	89%
7 Age	228	89%	51	88%	39	91%	318	89%
8 Learning about the Fire Service*	207	81%	47	81%	36	84%	290	81%
9 Initial Motivation	207	81%	47	81%	36	84%	290	81%
10 Months to Membership	207	81%	47	81%	N/A	N/A	254	81%
11 Months to IDLH Firefighter	207	81%	47	81%	N/A	N/A	254	81%
12 Minimum Certifications*	207	81%	47	81%	36	84%	290	81%
13 Recruitment Tools/Methods*	207	81%	47	81%	36	84%	290	81%
14 Most Effective Recruitment Method	207	81%	47	81%	36	84%	290	81%
15 Motivation to Continue Service	193	75%	47	81%	34	79%	274	77%
16 Retention Strategies*	193	75%	47	81%	34	79%	274	77%
17 Retention Strategies Effectiveness	193	75%	47	81%	34	79%	274	77%
18 Reasons for Leaving*	193	75%	47	81%	34	79%	274	77%
19 Exit Interviews	193	75%	47	81%	34	79%	274	77%
20 Negative Leadership Issues	186	73%	47	81%	32	74%	265	74%
21 Level of Leadership Issues*	186	73%	47	81%	32	74%	265	74%
22 Areas that Need Improvement*	186	73%	47	81%	32	74%	265	74%
23 Areas that Need Training*	186	73%	47	81%	32	74%	265	74%
24 Training Methods*	186	73%	47	81%	32	74%	265	74%
25 Preferred Training Time	186	73%	47	81%	32	74%	265	74%
Possible Respondents	256		58		43		357	
* Multiple-choice questions (n=9)								
** Respondents answering only Status question (Volunteer n=28; Both n=7; Career n=4)								
Questions with an opportunity to respond with a text explanation of an "Other" response (n=12) (See Table)								

‘Other’ Responses

Several questions give the respondent the opportunity to choose an “Other” response. With twelve of these questions (Table 1 - red text), the respondent has the opportunity to explain the choice of “Other” as a selection (Rank has “Other” options, but not an opportunity to explain). Usually, the response rates for these questions, which require additional effort on the part of the respondent, is lower than the response rate for “checking the box” for the “Other” selection. However, for this survey, the “Explanation” response rate for many questions is higher than expected – indicating that the entries may not relate to the “Other” response, but may clarify the overall responses by the respondents. By giving the opportunity for firefighters to add additional explanations, survey officials may be able to glean more information than expected for these twelve questions.

In total, the survey includes 167 responses in the twelve “Explain Other” options to questions (Table 2). Learning about the Fire Service lists 27 additions to the “Other” responses – the largest number for these types of questions. A review of the overall responses indicates slight variations to the options already listed as conventional responses – these generally offer more detail in the responses. In addition, many of these responses are unique entries. Divulging these responses may pinpoint an individual; therefore, the discussion within the question sections will include entries with multiple submissions that are exclusive to the question.

Table 2: "Other Explanations" Table

Other Explanations	Responses
1 Primary Occupation	20
2 Learning about FS/Joining	27
3 Initial Motivation	7
4 Minimal Certifications	19
5 Recruitment Tools	20
6 Most Effective Recruitment Tool	12
7 Continuing Motivation	8
8 Retention Methods	15
9 Reason Others Left	6
10 Negative Leadership Levels	17
11 Improvements Needed	12
12 Training Needed	4
Total	167

Non-mutually Exclusive Questions

For nine of the questions (Table 1 and Table 3), the respondent could choose multiple answers (All that apply) – making these questions non-mutually exclusive questions. In addition, with the exception of “Training Methods,” all of these questions have an option for the respondent to clarify an “Other” response as directed in the instructions. While higher response rates generally connote a positive response (Recruitment Methods and Retention Strategies), having a lower response rate may be beneficial also – depending on the wording of the question. For instance, a desired outcome can be either a higher response rate for naming “Retention Methods” to get more information with multiple responses or a lower response rate for listing “Levels of Leadership Issues” to indicate limited problems with fewer responses.

In the survey, “Areas in Need of Improvement” has the highest overall response rate (Career/Both - 6.0 responses per respondent), while “Levels of Leadership Issues” has the second lowest response rate with an average of 1.9 responses/respondent. “Learning about the Fire Service” has the lowest response rates for all of the groups (Volunteer – 1.4; Both – 1.4; and Career – 1.6 responses per respondent). The findings also indicate that due to full-time employment, Career firefighters have the highest response rate for the “Minimum Certifications” question. Overall, with the exception of choosing “Recruiting Methods” and “Areas in Need of Training”, the Career group has higher response rates for each of the multiple-choice questions (

Table 3 – red text).

Similarly, with another non-mutually exclusive “Reasons for Leaving the Fire Service” question, the respondents could choose three reasons why others left the fire service. The findings indicate the expected 3.0 response rate from each group. The question has 274 respondents and a total of 822 responses (Excluding the Explain Other responses).

Table 3: Response Rate per Multiple-choice Questions

Topic - Multiple-choice Responses		Volunteer			Both			Career			Total		
		Responses	Respondents	Rate	Responses	Respondents	Rate	Responses	Respondents	Rate	Responses	Respondents	Rate
8	Learning about the Fire Service	292	207	1.4	68	47	1.4	56	36	1.6	416	290	1.4
12	Minimum Certifications	478	207	2.3	117	47	2.5	118	36	3.3	713	290	2.5
13	Recruitment Methods	1063	207	5.1	249	47	5.3	145	36	4.0	1457	290	5.0
16	Retention Strategies	936	193	4.8	210	47	4.5	186	34	5.5	1332	274	4.9
18	Reasons for Leaving	579	193	3.0	141	47	3.0	102	34	3.0	822	274	3.0
21	Level of Leadership Issues	344	186	1.8	86	47	1.8	64	32	2.0	494	265	1.9
22	Areas that Need Improvement	1031	186	5.5	284	47	6.0	191	32	6.0	1506	265	5.7
23	Areas that Need Training	802	186	4.3	262	47	5.6	122	32	3.8	1186	265	4.5
24	Training Methods	409	186	2.2	109	47	2.3	81	32	2.5	599	265	2.3
	Possible Respondents		256			58			43			357	
Multiple-choice questions (n=9)													
Includes all "Other" responses but not additional comments													
Largest response rate for question - Areas that Need Improvement													

Since all of the respondents completed the survey in a digital format, officials and analysts could access the entire survey's results online. After minor restructuring of the responses for 44 questions, the survey format condenses easily into 24 questions. The report for this survey that follows includes an examination of findings from these 24 questions. It begins with summary descriptive analyses and concludes with correlative analyses.

Descriptive Analysis

For this descriptive analysis, the analysts discuss each of the 24 survey questions within three broad categories: Service-related firefighter information (8 questions), personal information (3 questions), and firefighter opinions (11 questions). Due to similarities in responses, two of the descriptive analyses combine questions for motivations (“Initial Motivations” and Continuing Motivations”) and memberships (“Months to Membership” and “Months to IDLH Firefighter”).

Service-related Firefighter Information

The first three questions that relate to firefighter service information include Firefighter Status, Departmental Location, and Current Rank. According to the responses for these questions, the leading categories for respondents are Volunteers (71.7%), Windsor (15%), and Firefighters (43%), respectively. Each question includes a response from all of the respondents who chose to answer questions in the survey (beyond the “Status” question).

Firefighter Status

With the first question, firefighters could designate their status as one of three groups - Volunteer, Career, or Both (combination of Volunteer and Career). Initially, 357 firefighters (Volunteer n=256; Both n=58; Career n=43) chose to access the survey online and answer this question. Subsequently, 39 firefighters (Volunteer n=28; Both n=7; Career n=4) did not continue beyond this question. Overall, for the respondents answering to survey questions, nearly two-thirds of the respondents have a Volunteer designation (71.7%) with the remaining designates as Both (16.2%) and Career (12%) (Figure 2).

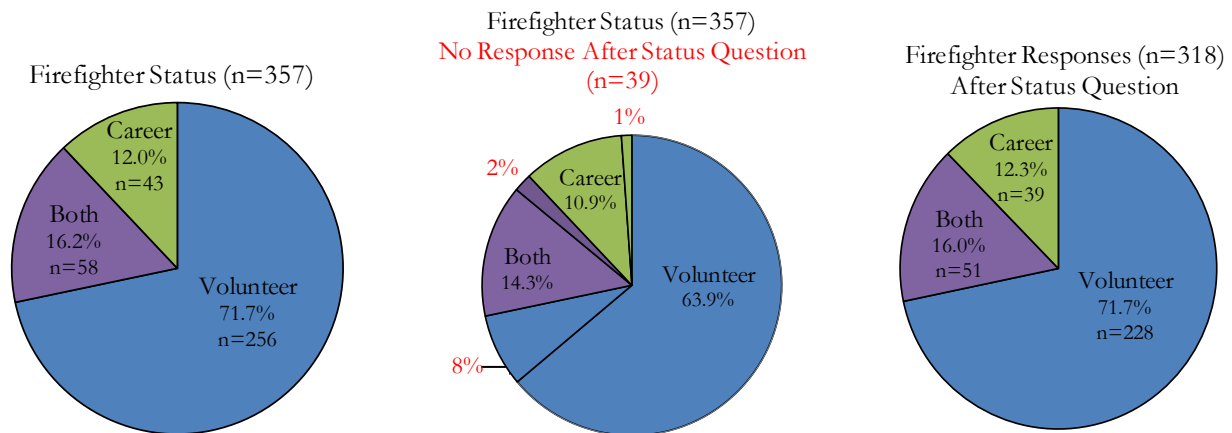


Figure 2: Firefighter Status - Total Respondents (left), Respondents Continuing the Survey (middle), and Respondents who answered the questions in Subsequent Analysis (right)

Connecticut Departmental Locations

In the second question, the firefighters list their departmental locations (Table 4). This table includes the leading locations, but does not list the responses with a single entry – to avoid detection of individuals within the survey. Depending on the distribution within the groups, the counts with one-four responses are grouped separately. For example, the analysis combines the Both and Career results from single entries into a group – similarly, due to the amount of responses in the Volunteers and ALL groups, the data are combined into groups for locations with 2, 3, or 4 responses.

Overall, Windsor (11%) and Middlefield (6%) have the greatest numbers and percentages of responses in the study. At the group level, Windsor leads with the Volunteer/Both groups (12-14%), but Enfield has the most entries for the Career respondents (12%). Generally, across all levels, the largest groups are responses with one or two entries for each department (70 entries).

Table 4: Respondents' Departmental Locations by Group and Overall Leading Departmental Locations

Departmental Locations												
Volunteers (n=228)			Both (n=51)			Career (n=39)			Leading Departments (n=318)			
	Departments	Count	%	Departments	Count	%	Departments	Count	%	Department	Count	%
1	Windsor	31	12%	Windsor	8	14%	Enfield	5	12%	Windsor	39	11%
2	Middlefield	22	9%	North Branford	3	5%	East Hartford	3	7%	Middlefield	22	6%
3	Rocky Hill	19	7%	Bethel	2	3%	Suffield	3	7%	Cromwell	19	5%
4	Cromwell	18	7%	Groton	2	3%	Southington	3	7%	Rocky Hill	19	5%
5	Goshen	10	4%	Mansfield	2	3%	Wallingford	3	7%	Wolcott New	12	3%
6	Wolcott New	10	4%	Suffield	2	3%	Mansfield	2	5%	Groton	11	3%
7	Groton	7	3%	West Haven	2	3%	New Canaan	2	5%	Goshen	11	3%
8	Stonington	5	2%	Willington	2	3%	Groton	2	5%	Suffield	7	2%
9	Ansonia	4	2%	Wolcott New	2	3%	Willington	2	5%	Enfield	6	2%
10	Bethel	4	2%							Bethel	6	2%
11	Ellington	4	2%							Stonington	6	2%
12	Salem	4	2%							Wallingford	5	1%
										Ansonia	5	1%
										Count=4 (n=6)	24	7%
	Count=3 (n=5)	15	6%							Count=3 (n=10)	30	8%
	Count=2 (n=19)	38	15%							Count=2 (n=26)	52	15%
	Count=1 (n=37)	37	14%	Count=1 (n=26)	26	45%	Count=1 (n=14)	14	33%	Count=1 (n=44)	44	12%
	No Response	28	11%	No Response	7	12%	No Response	4	9%		39	11%
	Total	256	100%	Total	58	100%	Total	43	100%	Total	357	100%

Current Rank within the Fire Service

To categorize rank for the respondents, official designate five options - Chief, Chief Officer, Company Officer, Firefighter, or Other (other responses are not clarified with a comment for this question). The groups range from 10% for the Chief Officer and Other groups to 35% for the Firefighters. Eleven percent of the respondents did not answer this question.

On a percentage basis, the largest rank category for the Volunteer/Both groups is firefighters (40%), and the leading rank category for Career group is Chief (37%). The groups have less divergence in their percentages of Chief Officers and Company Officers rankings. Five to 12% of the groups have respondents with an “Other” ranking.

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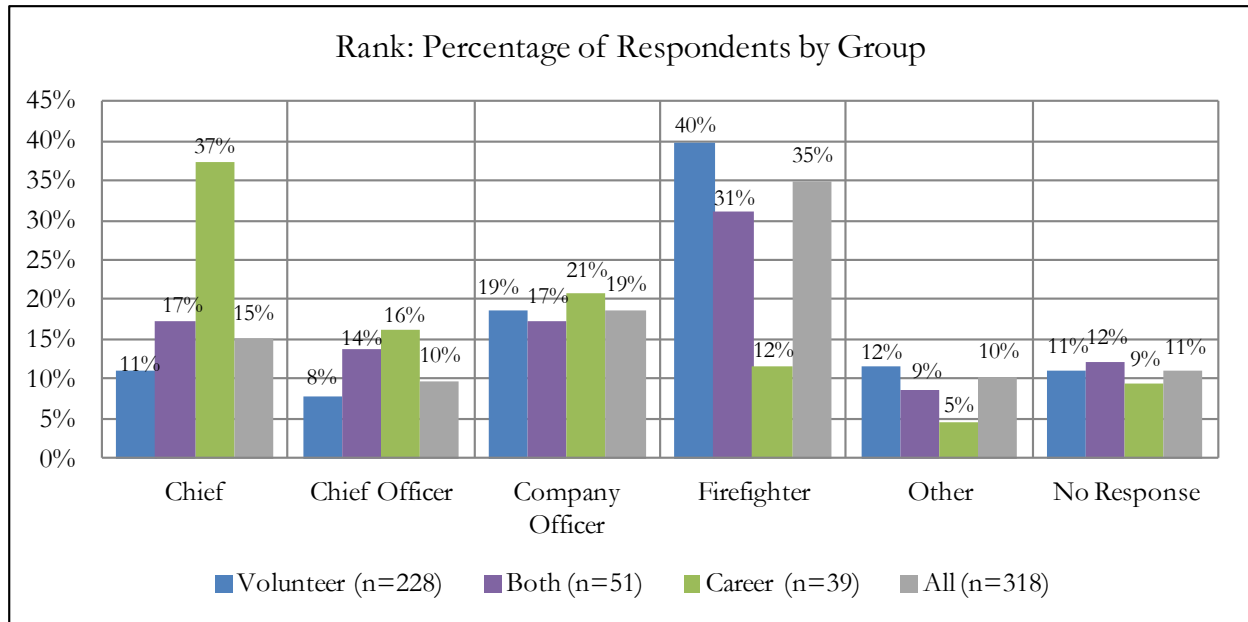


Figure 3: Current Rank within the Fire Service

Reasons for Joining - Learning about Opportunities within the Fire Service

For this question, the respondents have the opportunity to select from 17 options about joining the fire service. Adding comments to clarify an “Other” response is also a possibility. The top-three responses, each relating to referrals, for joining the fire service are consistent throughout every group.

Family and Friend Referrals dominate with 41% of the survey’s total responses, while Word of Mouth (17%), and Firefighter referrals (15%) rank second and third. At the group level, these responses explain 72% to 75% of the totals counts. Overall, these choices account for 303 of the total 416 responses for this question (Table 5).

Table 5: Reasons for Joining - Referral Responses and Overall Survey Percentages

Learning about the Fire Service	Volunteer		Both		Career		All	
1 Family or Friend Referral (History)	117	40%	34	50%	18	32%	170	41%
2 Word of Mouth	48	16%	11	16%	12	21%	71	17%
3 Firefighter Referral	45	15%	6	9%	11	20%	62	15%
Top-three Total	210	72%	51	75%	41	73%	303	73%
Overall Total	292		68		56		416	

Figure 4 shows all of the findings for this question. Two other means of learning about the fire service, “Other” and Fire Station/Open House are the only ones with greater than 5% of the total responses. More specifically, the Career group lists Newspaper/Magazine/Newsletter (7%) as a top-five contender, and the Both group selects Brochure/Flyer more often than their counterparts (6%). The question’s response rate, which is generally consistent at the group level, is 1.4 responses per firefighter.

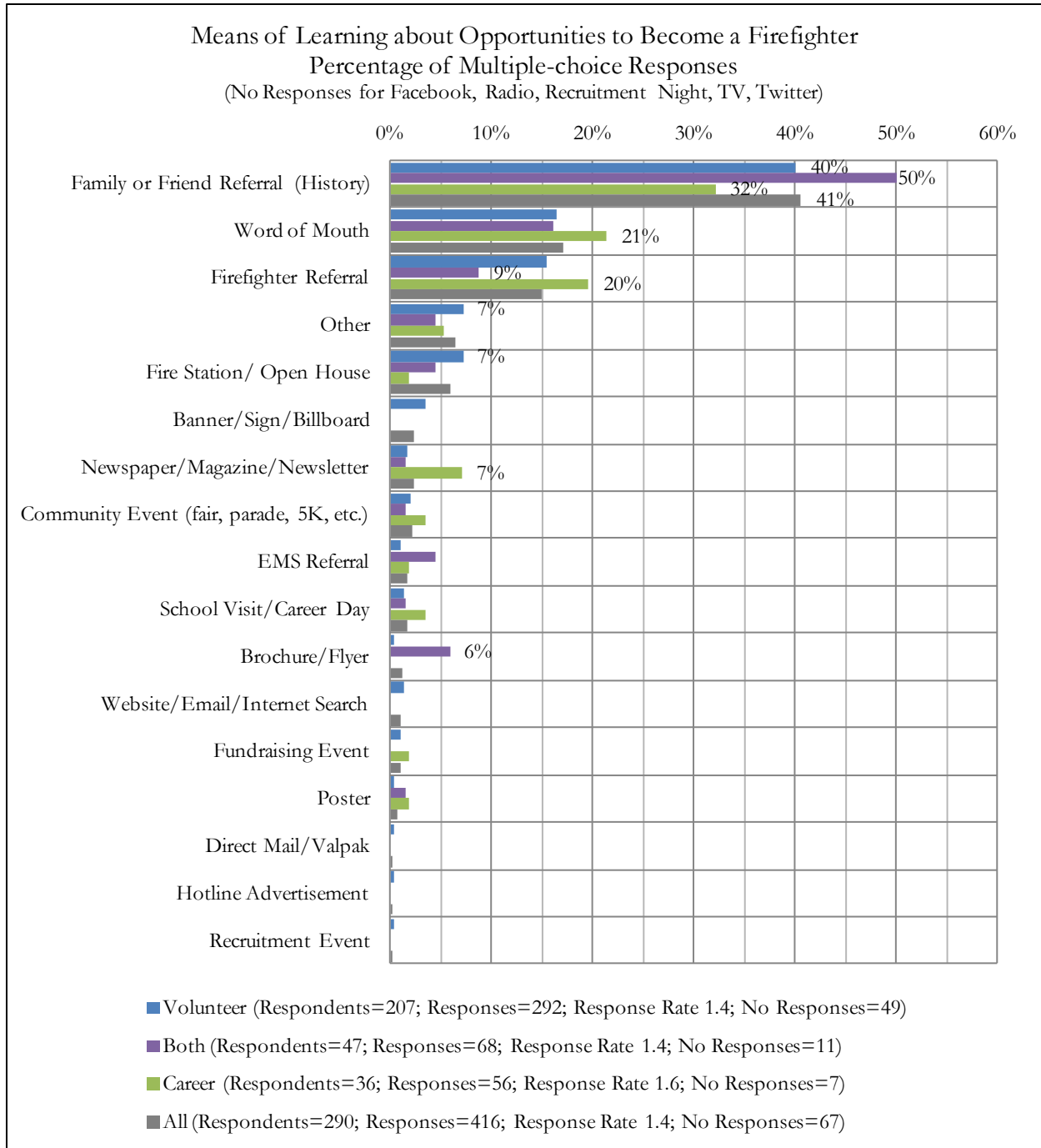


Figure 4: Reasons for Joining or Learning about the Fire Service – Percentage of Respondents per Group

Initial Primary Motivations and Primary Motivations for Continuing to Serve

To determine firefighter motivations, officials include two questions in the survey. The goal is to determine two levels of motivations – an initial response at the beginning with joining and a later response with continuing to serve within a department. In addition to these two levels, the changes over time are also relevant.

To demonstrate the motivational results, this section includes graphics at three levels – overall, group, and individual responses. Because these two questions have similar response structures and graphing the results together can easily demonstrate changes, Figure 5 shows the overall totals and differences throughout time. For comparison at the group level, Figure 6 includes combination graphics, and in a comparison for change, Table 6 specifies the individual responses between motivations throughout service.

With the exception of three motivational choices, the responses between initial and subsequent assessments of firefighter motivations are quite similar – usually within 4% of each other. Family Connection, Personal Fulfillment, and Service to my Community, the leading responses, change by -12%, +7%, and +6%, respectively. Apart from these three options, other changes account for less than 5% of the differences between motivational levels (Figure 5).

At the group level, most of the motivating factors remain relatively consistent throughout time as the respondents serve within the departments (within 3%) However, for discussion purposes, the changes at this level fall into two sections – overall leaders and group-specific others. Generally, Volunteer and Both firefighters have similar motivations while Career firefighters have diverse considerations.

For the previously discussed leading motivations, Family Connection has the only considerable decreasing values with -13%, -12%, and -9% drops in the Volunteer, Both, and Career groups, respectively. Personal Fulfillment increases by similar levels for the Volunteer (+5%) and Both groups (+2%), but the Careers show the greatest positive change (28%). With the Service selection, the Both group has the greatest change (+14%), while the other two groups have less dramatic, but opposing responses (Volunteer +6%; Career - 5%).

Consideration of the remaining motivations shows that the Volunteer/Both and Career groups generally differ in their responses. The Volunteer/ Both groups have similar findings outside of a 2% change with motivations. For these groups, Fire Response rates decrease by 3-5% while Personal Obligation rates increase by 3%. Career firefighters show a comparable change with Fire Response (-4%), but greater changes, both positive and negative, with four other motivations. As expected, with career longevity, financial decisions become motivating factors - Incentives/Financials and Retirement Benefits +5% each; however, Career Experience and Friendship/Camaraderie motivations decrease by greater amounts - 12% and 7%, respectively. For later consideration, none of the Career firefighters list Friendship/Camaraderie as a Continuing Motivation.

On an individual basis, 29% of the initial motivations continue to motivate firefighters during their careers. Conversely, 71% of firefighters make changes. Closer evaluation of the changes at this level (Table 6) may reveal additional findings that could be relevant for recruitment and retention. For this table, the totals on the right column are losses from the initial motivational count (rows), while the totals in the bottom row are the gains from other respondents changing their motivations into a category (columns). Most graphics just

indicate the total number of changes, but this one adds another level of information to see that respondents change out of one category from an initial response while others change to that response. For example the popular response, “Service to my Community” loses 37 respondents, but gains 58, which is not as simple as a mere gain of 21 responses. For motivations, Personal Fulfillment, Service to my Community, Family Connection, and Fire Response have the greatest amounts of change (highlights) and more than 10 respondent changes (red text).

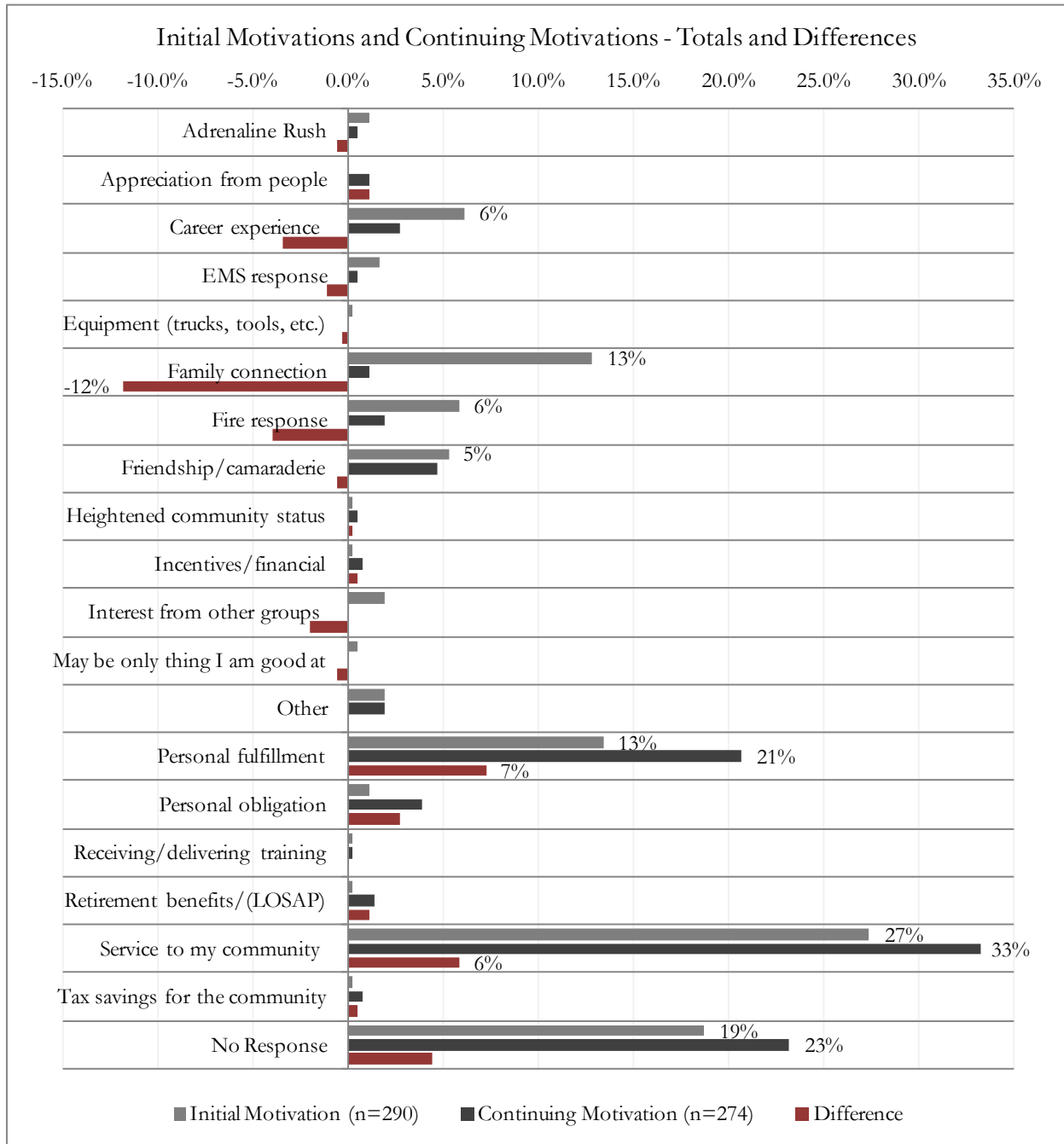


Figure 5: Initial Motivations and Continuing Motivations - Total Responses

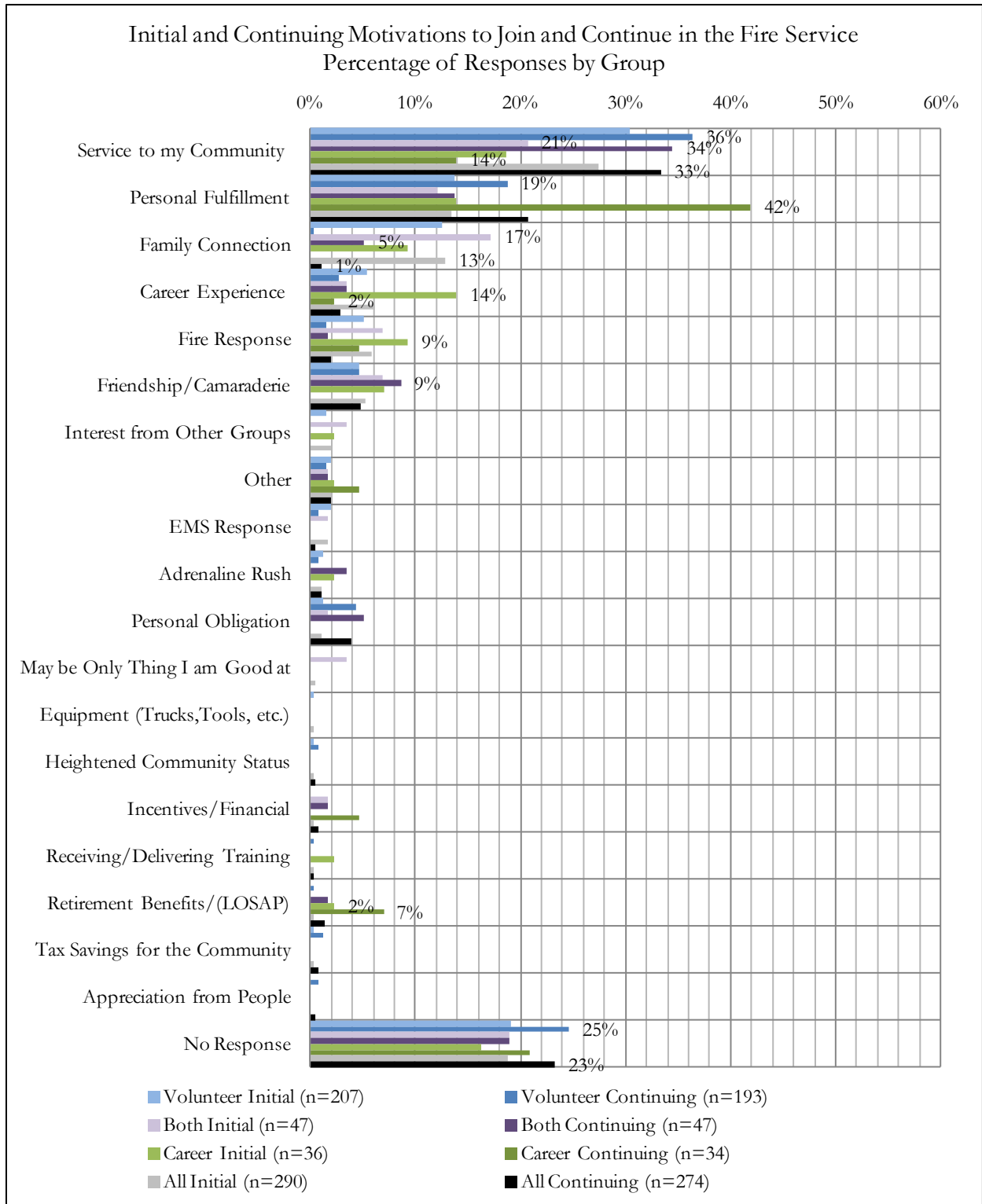


Figure 6: Group-level Motivations

Table 6: Motivational Changes - Initial (y) Losses and Continuing (x) Gains

Initial/Continuing Motivations Unchanged (diagonal boxes)		Motivations: Initial and Continuing Comparison with Service																	Grand Total	Losses from Initial Motivation						
		Continuing Motivations																								
		Adrenaline rush	Appreciation from Others	Career experience	EMS response	Equipment (trucks, tools, etc.)	Family connection	Fire response	Friendship/camaraderie	Heightened community status	Incentives/financial	Interest from other groups	May be only thing I am good at	Other	Personal fulfillment	Personal obligation	Receiving/delivering training	Retirement benefits/ (LOSAP)	Service to my community	Tax savings for the community	Blank (No Response)	Grand Total	Losses from Initial Motivation			
Initial Motivations	Adrenaline rush	0													1							1	4	4		
	Appreciation from Others		0																				0	0		
	Career experience			5																			1	22	17	
	EMS response				2																		3	1	6	4
	Equipment (trucks, tools, etc.)					0																	1	1	1	
	Family connection						3									1	13	4	1		14		2	46	43	
	Fire response							1								1	8						7	21	19	
	Friendship/camaraderie								1							1	4						7	1	19	15
	Heightened community status									0													1	1	1	
	Incentives/financial										1													1	0	
	Interest from other groups											2												1	7	7
	May be only thing I am good at												0										1	2	2	
	Other													2									3	1	7	5
	Personal fulfillment														2	1							1	1	48	27
	Personal obligation															2	1						1	4	3	
	Receiving/delivering training																	0						1	1	1
	Retirement benefits/ (LOSAP)																		1	0					1	1
	Service to my community															1	15	3		3	61	1	6	98	37	
	Tax savings for the community																				1	0		1	1	
	Blank (No Response)																						67	67	0	
	Grand Total		2	4	10	2	0	4	7	17	2	3	0	0	7	74	14	1	5	119	3	83	357	188		
	Gains from Initial Motivation		2	4	5	0	0	1	5	13	2	2	0	0	5	53	13	1	5	58	3	16	188			
Top-five Motivational Changes		Top-three Losses from Initial Motivation					Top-three Gains from Initial Motivation					>10 Respondents														

Years in Service

To visualize the responses to this question, the tally for the “Years in Service” question includes two graphics. The first one, Figure 7, categorizes the responses into groups, while Figure 8, graphs individual responses from firefighters. The responses for this question include a numerical submission from all of the firefighters completing the survey (n=318). Thirty-nine respondents (11%) did not complete the survey, and therefore, did not answer this question.

For the overall responses, the service years fits a general bell-shaped curve with the years categorized in 10-year increments. For this study, the respondents have an additional option for less than one year of service. The largest sector, within the 20-29 service-year category, comprises 20% of group (n=70 (20%)). At the ends of the service-year spectrum, the categories comprise 3% (<1 year of service) and 2% (50-50+) of the total survey population. Within the groups, these results vary slightly.

At the group level, the responses also fit the typical bell-shaped curve; however, with a comparison between the groups, the results are skewed. The Volunteers skew to fewer service years with the only entries in the less than one-year category (n=10 (4%)), and the largest entry in the 0-9 service-year sector. Because it is a combination of two groups, the Both group skews to slightly more years of service compared to the Volunteers, but less than the Careers. The largest sector for this group is 10-19 years of service. With the largest number of entries in the next sector (30-39 years of service), the Career group has more longevity compared to the other groups within the fire service.

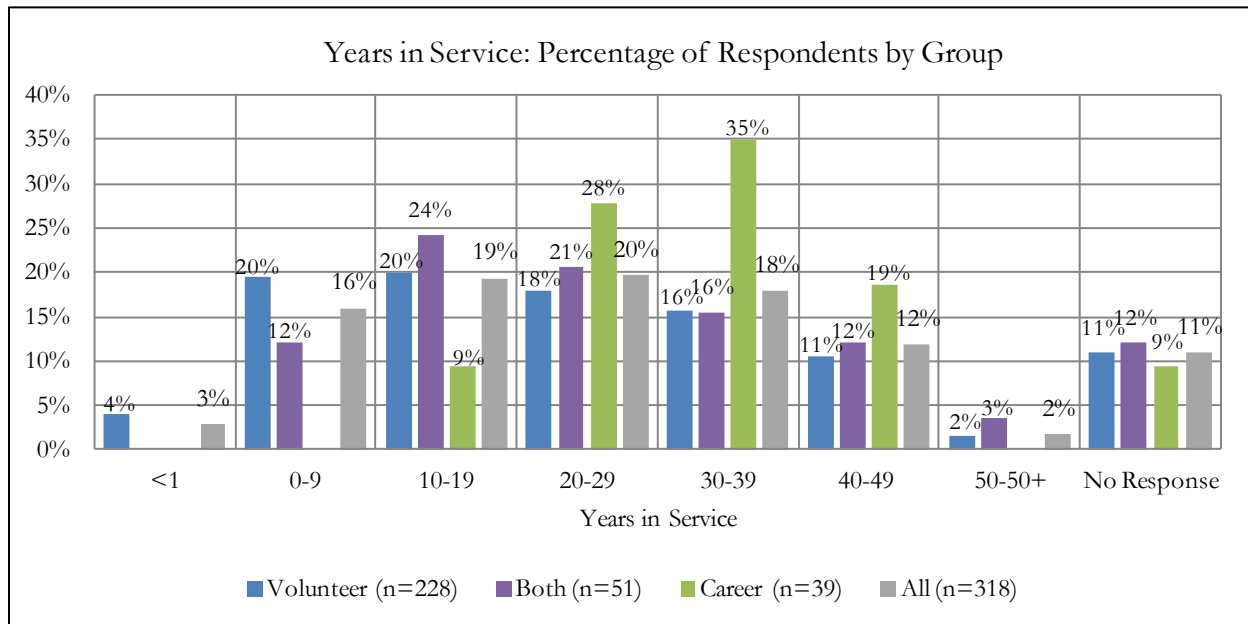


Figure 7: Years in Service - Categorized by Group (Insert: Number of Respondents <10 in Service)

For individuals (Figure 8), the largest group – Volunteers - influences the results. On an individual basis, the findings indicate peaks at many of the traditional five-year increments (5, 10, 15 . . . years of service). Of the ten milestone increments, the survey population has peaks in seven of these increments with the major ones at 5, 20, 25, and 35 years of service. These peaks at the 5-year increments indicate that firefighter may be estimating their years of service to the nearest milestone year of service.

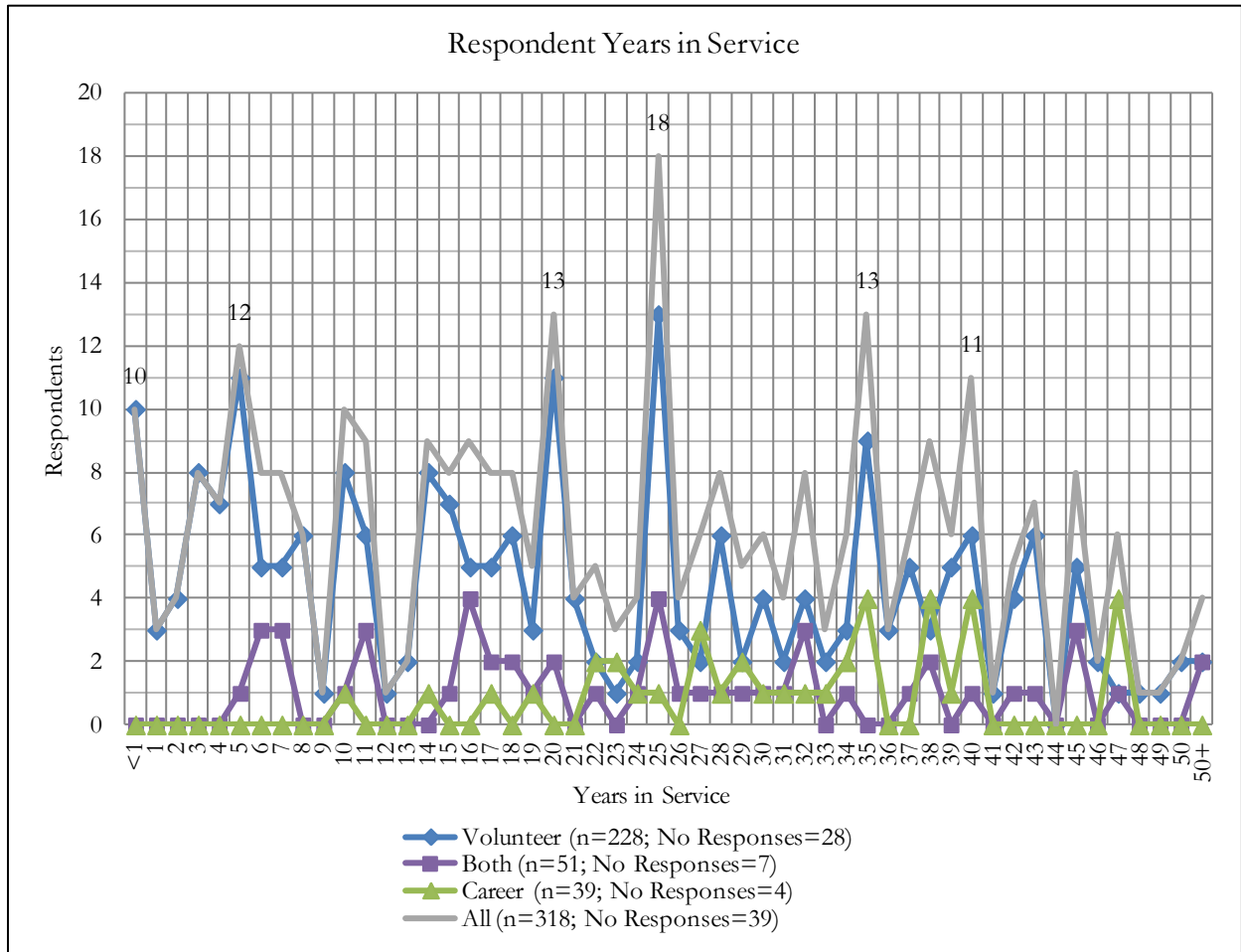


Figure 8: Individuals - Years in Service

Months to Become a Member/Months to Become an IDLH Firefighter (Volunteer and Both Only)

Although the officials requested a response for “Months to Become a Member” and “Months to Become an IDLH Firefighter” separately on the survey, similar response structures (Months) allows for graphing the results together. Because the Career firefighters are employees (not members), the questions do not apply to these firefighters and did not appear in their questionnaire. The results include separate responses from the Volunteer and Both groups. In addition to the numerical entries for the number of months to reach these milestones, each of these groups has “Probationary,” “Not Applicable,” and “Unknown” categories. “Unknown” includes respondents who do not remember specifics from years ago and others who do not know how long the process will take within their departments. Because the responses from the firefighters are not all numeric, some interpretation of the results into these categories is necessary (Figure 9); however only minor interpretations are necessary and the process is generally done to reduce the redundancy in response names.

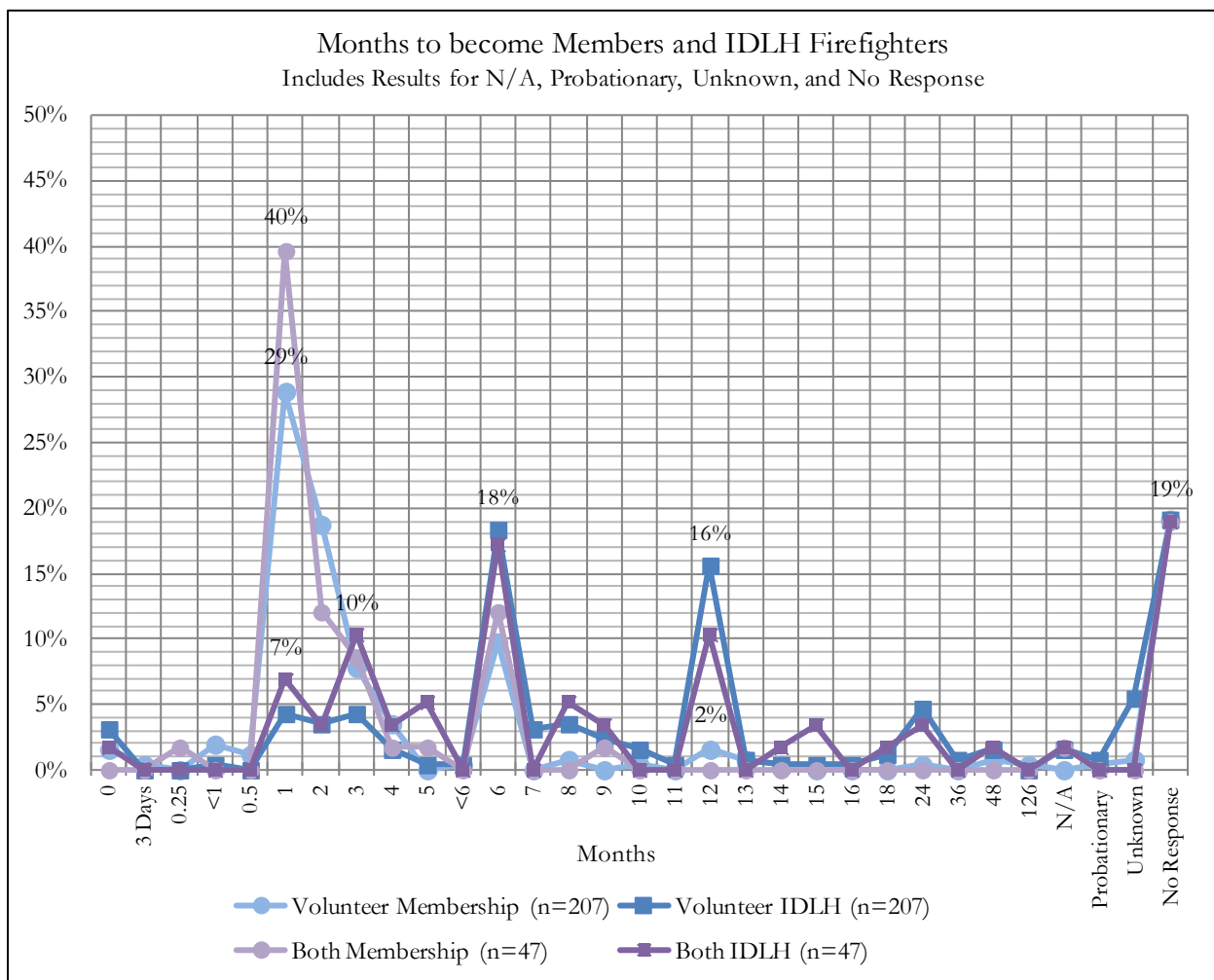


Figure 9: Months to Membership and IDLH Firefighter

Overall, the findings indicate peaks at 1, 6, and 12 months with smaller peaks at 3, 8, and 24 months. Three to four percent of the respondents become members or IDLH firefighter prior to one month, and 2% and 11% achieve these milestones after one year, respectively (Excluding N/A, Probationary, and Unknown). With the

combined groups, the most common time frame for members is at one month (31%), and for the IDLH firefighters, the most popular responses are at a 6-month interval (18%) and a one-year interval (15%).

For membership, the majority of Volunteer/Both respondents (separated into groups) become members within the first three months after filling out an application (Figure 9). In six months, 74% of the Volunteer respondents usually become members (Volunteer n=190), and 78% of the respondents in the Both group (n=45) complete the process for membership. Even though 19% of the respondents in all four categories did not answer this question, by twelve months, 95% of the Volunteer (Volunteer n=197) and 98% of the Both (Both n=46) group respondents become members.

Months to become an IDLH firefighter takes longer and fewer members achieve the designation prior to 6 months of service - 36% and 48% for the Volunteer and Both categories, respectively. The greatest numbers of firefighters become IDLH firefighters at six months (Volunteer n=47 (18%); Both n=10 (17%)). By the end of one year, the majority of respondents are IDLH firefighters (Volunteer n=161 (78%); Both n=39 (83%)), but the totals are less than the members within the same time period.

Minimum Certifications

For the multiple-choice minimum certifications question, the respondents could choose all of the applicable options from 15 responses (Including “Explain Other”) (Figure 10). In a survey-wide tally, the leading certifications (minimum) are Firefighter I and HAZMAT Operations with 35% and 18% of the overall respondents, respectively (Firefighter I - All n=250 and HAZMAT Operations - All n=130). CPR and HAZMAT Awareness are also leading responses with 14% each of the overall tally (All n=99 each). IN the survey, the top-four responses account for 81% of the minimum certifications.

At the group level, 12%-14% fewer Career firefighters (depending on the group comparison) require Firefighter I, as a minimal certification (Volunteer (38%); Both (36%); Career (24%)). However, nearly five times as many Career firefighters indicate that Firefighter II (Volunteer (2%); Both (1%); Career (9%)) and EMT-B (Volunteer (2%); Both (0%); Career (10%)) are minimally required certifications. In addition, at the group level, none of the Both respondents list EVOC 3, EMT-B, EMT-I, or EMT-P as departmental minimum certifications. From the “Other Explanations,” two respondents mention SCBA certifications as minimal requirements. Nearly half of the options, EVOC 2, EVOC 3, EMT-I, EMT-P, First Responder, None, and Other, account for fewer than 3% of the total 713 responses from 290 respondents in the survey (2.5 responses per firefighter).

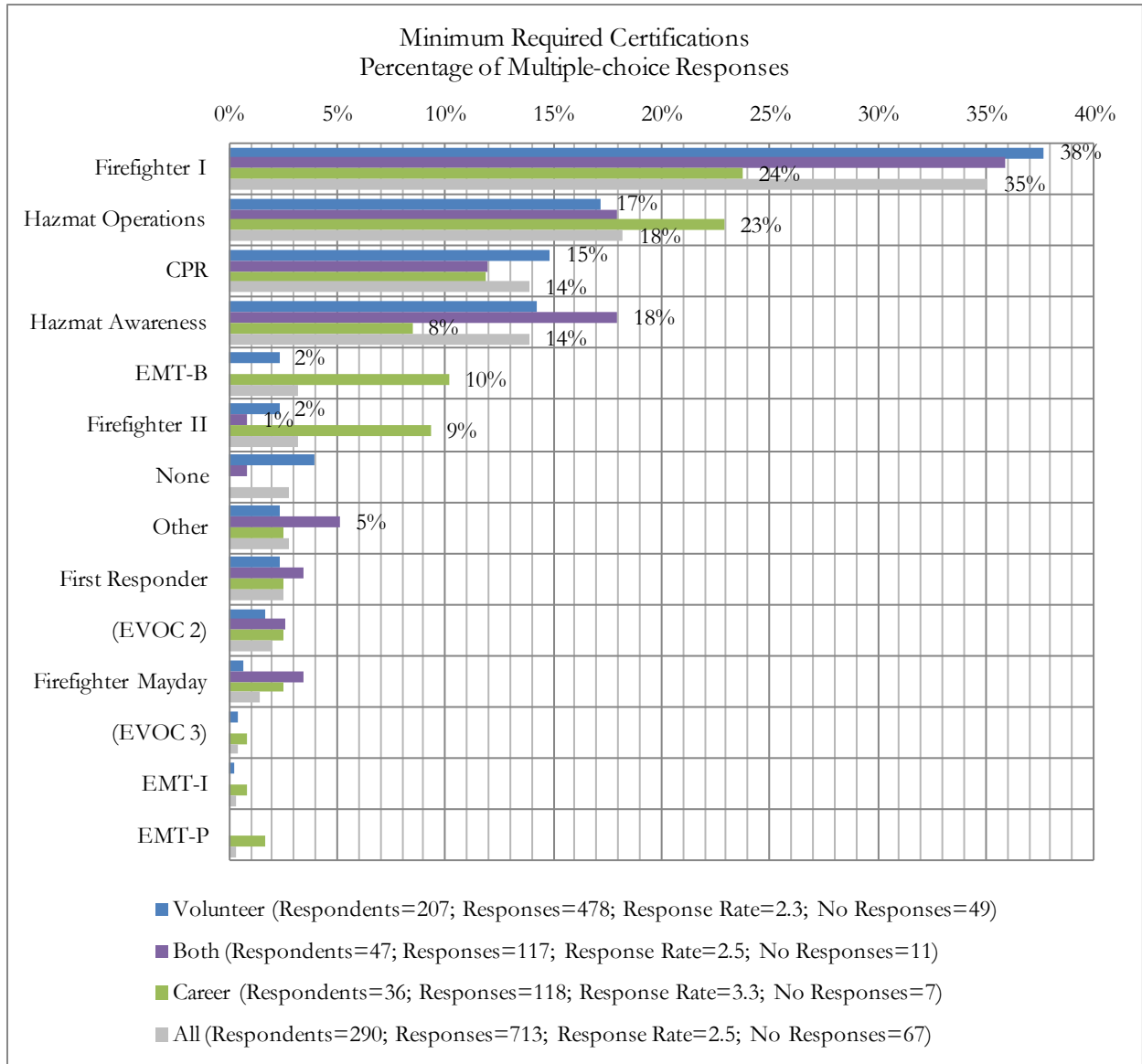


Figure 10: Minimum Certifications by Group

Personal Firefighter Information

This survey requests that the respondents answer three personal questions relating to ZIP Code, primary occupation, and current Age. The preferred ZIP Code is the primary residence of the firefighter. Since Career firefighters have employment within the fire service, the primary occupation question does not appear in their questionnaire. Only the Volunteer/Both groups have this question on their list. All of the firefighters have a numerical response question about their age – which allows for multiple groupings. The final tally for these three questions includes a response from all of the firefighters who completed the survey (39 did not complete the survey and respond to this question)..

Primary Residence ZIP Codes

The 318 respondents for this question list 115 unique ZIP Codes for their primary residence. For the responses, two entries are missing a digit and categorized as a single entry because it is not possible to determine the ZIP Code with 100% certainty. In addition, to avoid disclosing the identity of the respondents, Table 7 only lists ZIP Codes with 2 or more respondents – depending on the group breakdown. Although the counts vary, within the groups on a percentage basis, the only two ZIP Codes with more than 10% of its responses are 06095 (Windsor) and 06082 (Enfield) (Windsor - Volunteer 11% and Both 12%; Enfield – Career 14%). Only three of the leading ZIP Codes have respondents in two groups (06095 Windsor, 06279 Willington, and 06355 Mystic). None of the leading ZIP Codes is common to all three groups. Due to the diversity of respondent ZIP Codes, the entries with only one respondent account for the greatest percentage of entries in each group and the overall study (Volunteer=18%; Both=64%; Career=40%; and All=16%).

Table 7: Primary Residence Locations and ZIP Codes

Leading Respondent Home ZipCodes																
Volunteer Home ZipCodes				Both Home ZipCodes				Career Home ZipCodes				All Home ZipCodes				
1	Windsor	06095	29	11%	Windsor	06095	7	12%	Enfield*	06082	6	14%	Windsor	06095	36	10%
2	Rocky Hill	06067	18	7%	North Branford	06471	3	5%	Southington	06489	3	7%	Rocky Hill	06067	18	5%
3	Middlefield	06455	14	5%	Suffield	06093	2	3%	Wallingford*	06492	3	7%	Middlefield	06455	14	4%
4	Cromwell	06416	12	5%	Willington*	06279	2	3%	Suffield	06078	2	5%	Cromwell	06416	13	4%
5	Goshen	06756	10	4%					Willington*	06279	2	5%	Goshen	06756	11	3%
6	Rockfall	06481	8	3%					Mystic*	06355	2	5%	Mystic*	06355**	8	2%
7	Waterbury	06716	7	3%					Guilford	06437	2	5%	Rockfall	06481	8	2%
8	Middletown	06457	5	2%					Stamford	06903	2	5%	Waterbury	06716	8	2%
9	Mystic*	06355	5	2%									Enfield*	06082	7	2%
10	Salem	06420	4	2%									Ansonia	06401	5	1%
11	Ansonia	06401	4	2%									Middletown	06457	5	1%
12	Groton*	06340	4	2%									Wallingford*	06492	5	1%
13	Ellington	06029	4	2%									Zips Count=4	n=10	40	11%
	Zips Count=3	n=8	24	9%									Zips Count=3	n=10	30	8%
	Zips Count=2	n=17	34	13%									Zips Count=2	n=27	54	15%
	Zips Count=1	n=46	46	18%	Zips Count=1	n=37	37	64%	Zips Count=1	n=17	17	40%	Zips Count=1	n=56	56	16%
	No Response		28	11%	No Response		7	12%	No Response		4	9%	No Response		39	11%
	Total		256	100%			58	100%			43	100%			357	100%
Shading=Common leading ZipCodes in two groups				*Multiple Jurisdictions within ZipCode				**Total for All Groups								

Occupation (Volunteer and Both Only)

The results in Figure 11 include all of the respondents from the Volunteer and Both groups, but none of the Career firefighters – assuming employment within the Fire Service as an occupation. For the Volunteers in the survey, the top-four Primary Occupations are Other (n=21 (8%)), Retired (n=21 (8%)), Fire Service (n=19 (7%)), and Public Safety (n=19 (7%)). A review of the “Other” responses indicates that the firefighters list occupations with detailed titles that could possibly fit with one of the more general designations for the category names. The remainder of the options (n=28) account for 5% or less (each) of the total respondents in the group. As expected, the majority of the firefighters that are Both (Career and Volunteer) list the Fire Service (n=40 (69%)) as their Primary Occupation. For the Both respondents, the only other response with 5% of the total in the group is Public Safety (Administration (3%) and Family Care (2%)). Overall, the Fire Service is the only response with more than 7% of the total responses (n=59 (19%)).

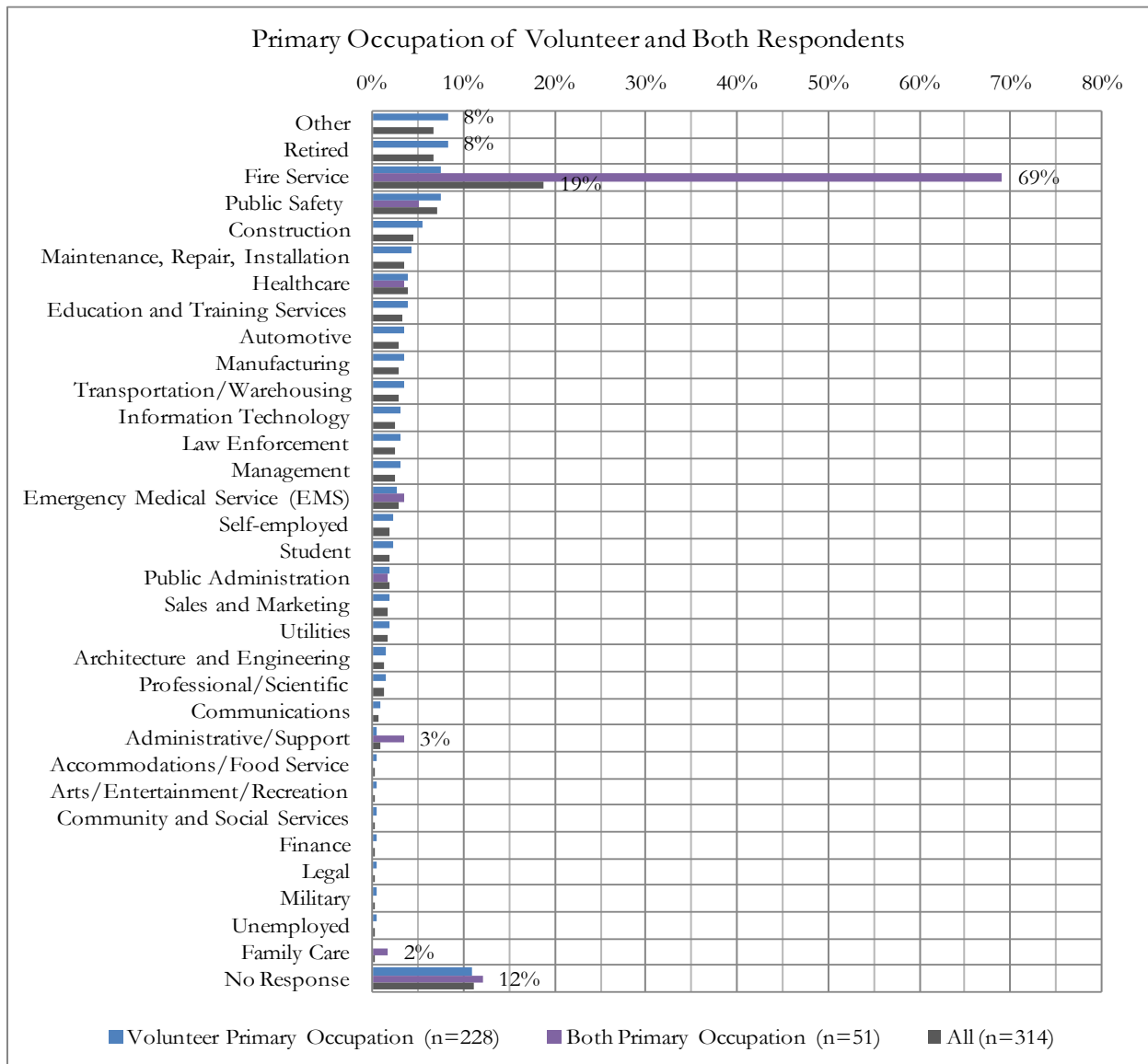


Figure 11: Primary Occupation

Age of Firefighters

For this question, each respondent lists his or her age in a numerical response. With the gathering of numerical responses, as opposed to categorical ones, the analyst can vary the groupings as needed. For the purpose of analysis, the majority of the categories are ten-year increments with smaller ones at the ends of the spectrum (<20 and >80 years of age) (Figure 12).

The findings include the ages of 318 firefighters who completed the survey. At 27% of the survey population, the largest group of respondents is 50-59 years of age. Only 3% or less of the respondents is in the outer ranges of 16-19 (1%) or 70-81 (3%) years of age. Eleven percent of the study respondents did not complete the survey and answer this question.

At the group level, largest percentage of Volunteers (27%) and Careers (42%) coincides with the overall largest category (50-59 years of age). Twelve percent of the Career respondents are younger than 40 years of age while more than twice as many of the Volunteer and Both groups (Volunteers n=74 (29%); Both n=22 (38%)) are younger than 40. In a younger age group, the majority of the Both respondents are 30-39 years of age (n=15 (26%)). Therefore, for the current ages, the Both group skews younger than the Volunteer and Career groups with 57% of its population under 50 compared to 45% and 28% for the Volunteer and Career groups, respectively.

On an individual basis, Figure 13 shows the ages of all of the respondents. Note the differences between the Volunteer and Both/Career respondents in their late teens and early twenties. Nine Volunteers are under 25, while the combined Both/Career groups have only one respondent younger than 25 years of age. Overall peak ages are 52 (n=13), 53 (n=13) and 55 (n=17) with slightly smaller peaks at 32 (n=12), 34 (n=11), and 47 (n=12).

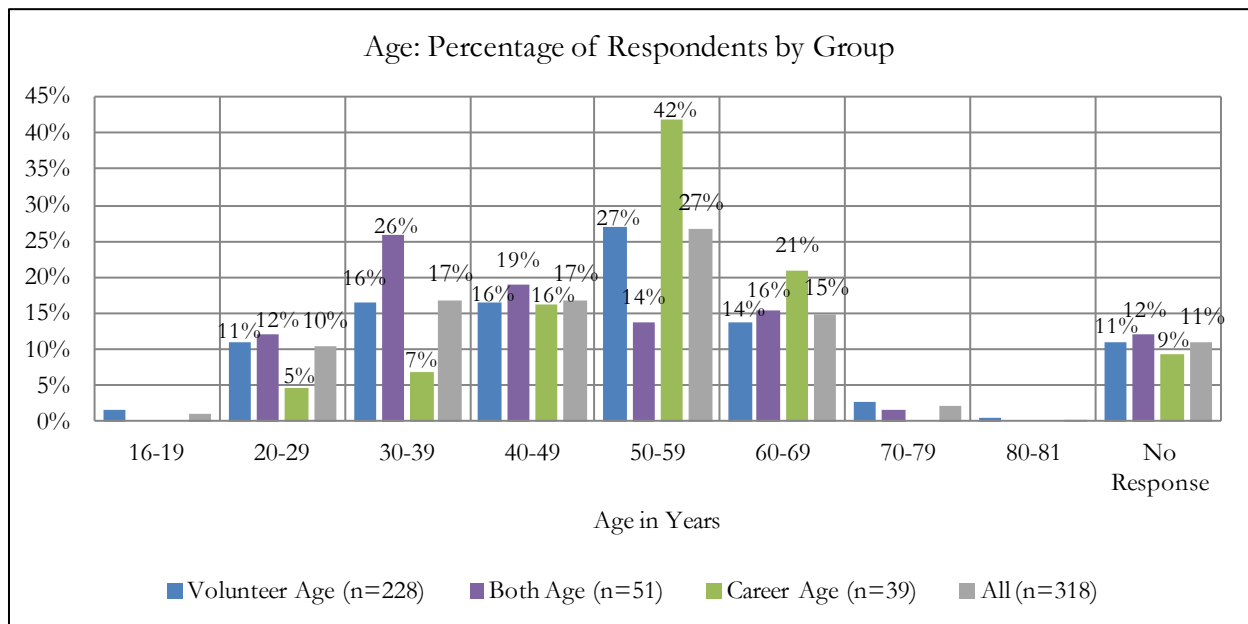


Figure 12: Age of Respondents Categorized by Group

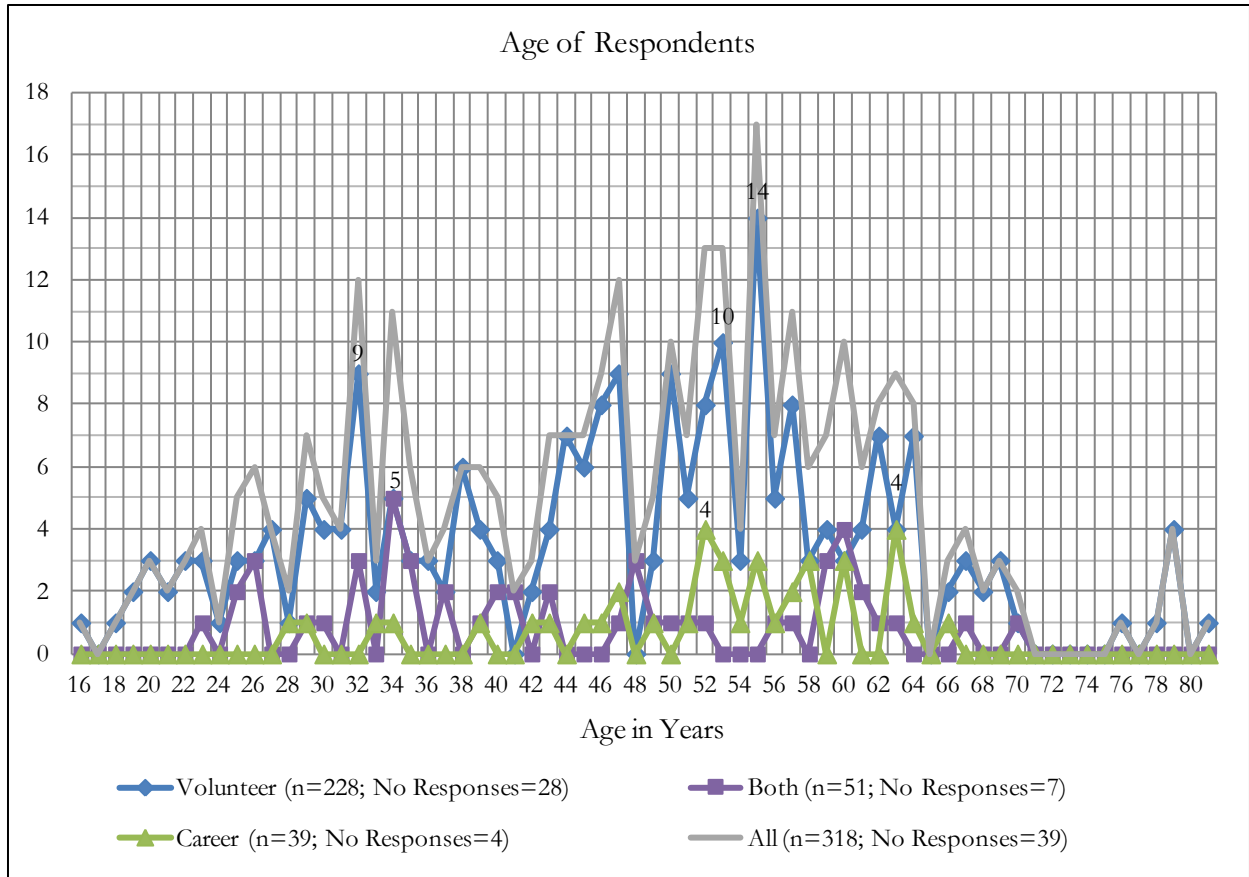


Figure 13: Age of Firefighters

Firefighter Opinions

In the survey, officials list a series of questions to poll firefighters on their opinions regarding recruitment and retention, leadership issues, improvement areas, and training options. More specifically, the officials want to know about effective recruitment tools, retention strategies, retention effectiveness, reasons for leaving, exit interviews, leadership issues, levels of leadership issues, improvement areas, training areas, preferred training times, and favored training methods. This analysis focuses on a segment of these topics – recruitment, retention, and leadership issues to glean information that improves recruitment and retention within the fire service.

Recruitment Options

To determine the most popular recruitment tools, the officials list 22 selections (including Explain Other) in this multiple-choice question. In total, the 290 respondent to this question indicate 1,457 recruitment tools/methods for an overall rate of 5.0 responses per firefighter.

According to the findings, the respondents favor three of these options (Figure 14) - Word of Mouth (n=167 (11%)), Firefighter Referral (n=164 (11%)), and Being Asked by a Firefighter (n=146 (10%)). These three selections account for at least 10% of the total number of overall respondents. The others, which account for less than 10% of the respondents, may prove to be effective for individual departments or specific events. A review of the “Other Explanations” indicates that four respondents mention the Junior/Explorer Programs as recruitment tools. Overall, the respondents chose each of the options listed for the question at least three times.

On a group basis, the top-three choices by overall respondents are also the leading ones; however, Fire Station/Open House is also popular or tied for third (Career) with the groups. On a percentage basis, Being asked by a Firefighter has the highest total with 13% of the Career responses. Careers also prefer School Visit/Career Day as a recruitment tool. Both respondents favor social media (Facebook and Website/Email slightly more than their counterparts, and the Volunteers favor Recruitment Events as options. All of the groups prefer Community Events as a recruitment option. At the group level, the Career firefighter response rate is 4.0 entries while the Volunteers and Both groups have slightly higher rates at 5.1 and 5.3, respectively.

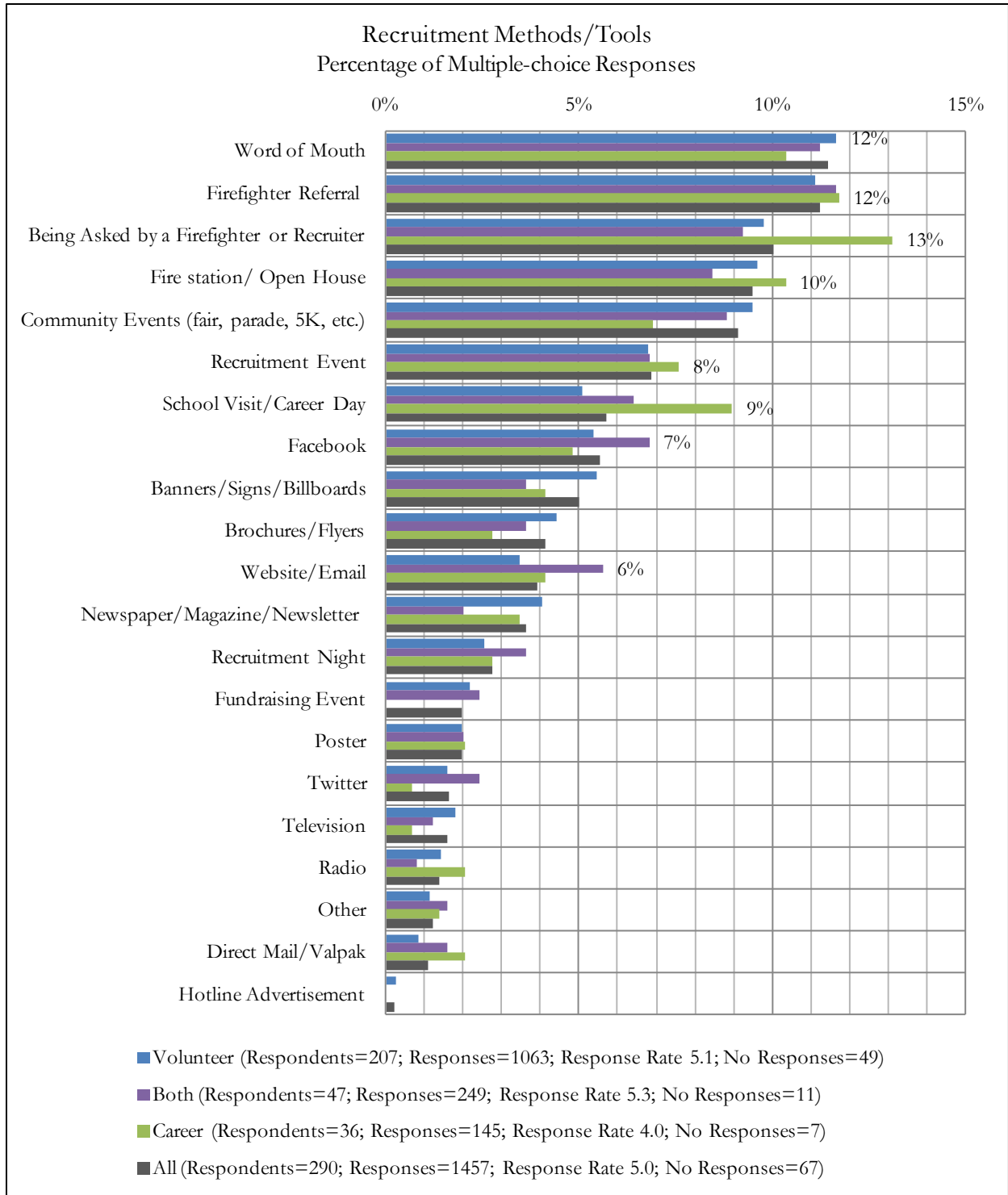


Figure 14: Recruitment Options (See Figure 15 below)

For this study, the officials include a question asking respondents to specify a most effective recruitment option (Figure 15). The top-four responses for this question match the ones for popular recruitment tools – but in a different order of effectiveness (Firefighter Referral, Word of Mouth, Being Asked by a Firefighter, and Fire Station/Open House). Firefighter referral tops the list with 23% (n=81) of the overall tally. With a fifth-place ranking, the only other selection with at least 5% of the responses is Recruitment Event. A review of the “Other Explanation” listing indicates that four respondents mention the Explorer/Junior Programs as the most effective recruitment tools. With the tally of all groups, the top-five selections account for slightly more than half of the responses (51%).

Although the most effective responses are similar among the groups, the tallies vary between them. The leading choice as most effective recruitment tool for the Career respondents is School Visit/Career Day, but this selection did not receive any responses from the Both group. Both respondents also do not prefer Word of Mouth or Newspaper/Magazine/Newsletter as most effective recruitment tools compared to their counterparts. Despite differences with individual selections, on a group basis, the top-five choices also account for about half of all the responses for this question.

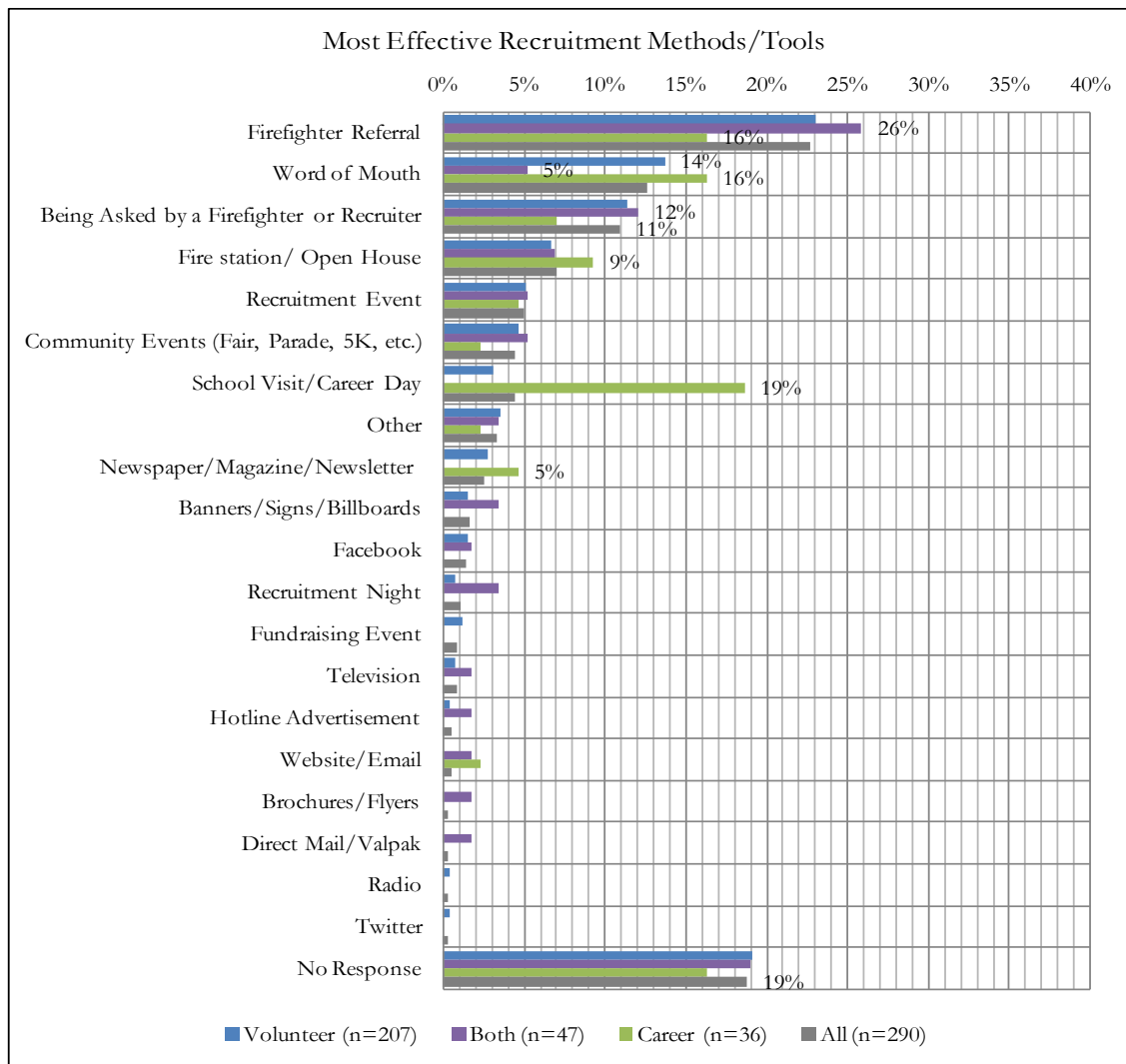


Figure 15: Most Effective Recruitment Methods and Tools and Methods (See Figure 14 Above)

Retention Strategies

Due to the unusual structure of this survey question, the analysis for this question will consider the overall responses and the ones at the group level – separated by the Volunteer/Both and the Career groups. Although each group has the same number of selections for the Retention Strategies question, the options vary for the Volunteer/Both and the Career Groups. Because of this difference, comparing the groups to each other becomes slightly challenging. Ideally, each group would have the same selection of choices, but as expected, the benefits differ with full-time employment for the Career group compared to the job rewards (perks) that help the part-timers in the Volunteer/Both groups; therefore, relevant options for selection will need to differ in this survey (Table 8).

Table 8: Retention Strategy Methods - Selection Options for each Group and Common ones for All Groups

All	Retention Strategy Selection Options	
	Volunteer/Both	Career
Annual Banquet	Discounts at Local Stores, Businesses	Career Development-Firefighters
Awards/Recognition	Meal Reimbursement	Career Development-Officers
Continuing Education/Tuition Reimbursement*	Mileage Reimbursement	EMS Training/Recertification
Mentoring Program	Pay per Call	Healthcare Benefits
Retirement Benefits/(LOSAP)	Tax Credit on Property Tax	Internal Advancement Opportunities
Training		
Uniforms		
None		
Other		
Explain Other		
*Combined for Career Firefighters		

Figure 16 includes the selections that are common for all of the respondents and the individual groups. Because not all of the selections are available for everyone, the number of respondents for each section will vary. The overall tally is the number of response for all of the options – regardless of the grouping. Overall, the top-four selections are Training (14%), Annual Banquet (14%), Awards/Recognition (13%), and Retirement Benefits/LOSAP (Volunteer (12%). Although the higher percentage of respondents in the Volunteer/Both selections influences the percentage of results, the fifth choice overall is Tax Credit on Property Tax (11%)(Volunteer/Both only). As expected, the percentages for the “Career Only” selections are lower due to the input from only 34 firefighters compared to 241 for the Volunteer/Both firefighters answering this question.

For the groupings, the Volunteer/Both firefighters consistently select options within 2% of each other. In addition to the overall top-four selections (above), the two groups also prefer Uniforms (Volunteer 9%; Both 8%) and Continuing Education Benefits (Volunteer 7%; Both 9%). As for the specific options, Tax Credit on Property Tax (Volunteer 13%; Both 11%) and Pay per Call (Volunteer 11%; Both 11%) are favored over Mileage, Discounts, and Meals, which are the least popular selections (1% each; Both mileage 3%).

For the Career group, the top selections from all of the options (common and group-specific selections) differ from the others with Training (12%), Retirement/Pension (11%), EMS Training (Recertification) (11%), and Continuing Education and Tuition Reimbursement (two combined into one selection) (10%), as

the leading choices. In the next slot, Career Development – Firefighters rates fifth (9%). A Mentoring Program is the least popular of the retention options for the Career group (1%). Surprisingly, for the group, Career Development – Officers and Healthcare Benefits tally only 6% of the retention responses.

Of the ten common choices for all of the groups (including “None,” “Other,” and Explain “Other,”) the Annual Banquet differs the most between the groups with the number of respondents (Volunteer (14%); Both (14%); Career (6%). Surprisingly, the Retirement Benefits/LOSAP percentage of responses does not differ significantly on a group level (Volunteer (12%); Both (11%); Career (11%). Overall, the firefighters made 1,332 selections (response rate=4.8) for this Retention Strategies question (Excluding Explain Other), and at the group level, the Career respondents averaged 5.5 entries per respondent.

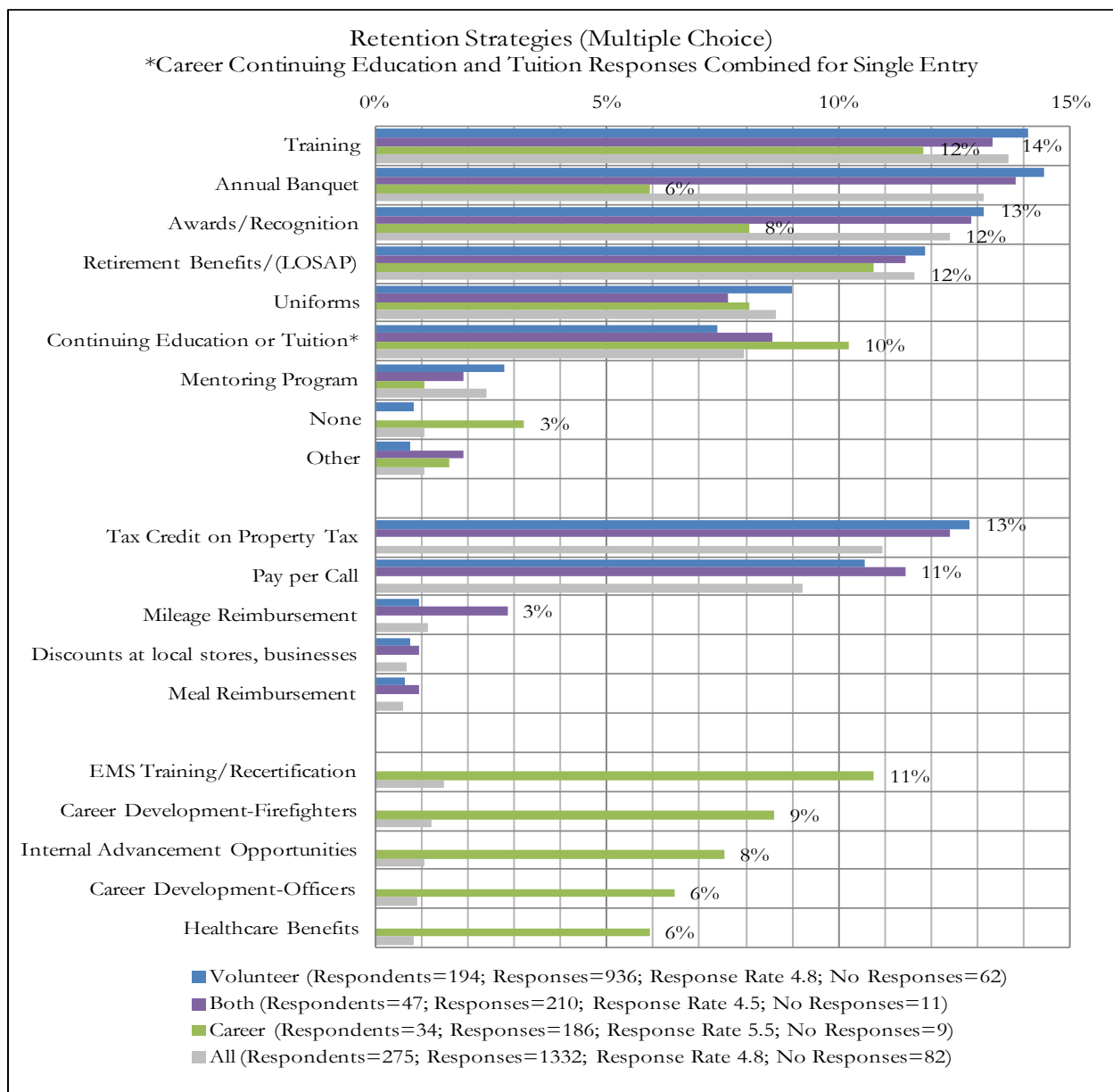


Figure 16: Retention Strategies - All Groups

Retention Effectiveness

Similar to the Retention Strategies, the question selections vary between the Volunteer/Both and Career groups. For this question, the officials split the Continuing Education/Tuition Reimbursement option for the Volunteer/Both groups into two choices for the Career firefighters. Other than this exception, the selection options for retention strategies are either Volunteer/Both, Career, or All. Table 9 includes the categorization of the options for Retention Strategy Effectiveness.

Table 9: Retention Strategies Effectiveness – Selections for All and Groups

Retention Strategy Effectiveness Selection Options		
All	Volunteer/Both	Career
Annual Banquet	Discounts at Stores, Businesses	Career Development - Firefighters
Awards/Recognition	Mileage Reimbursement	Career Development - Officers
Continuing Education or Tuition*	Pay per Call	EMS Training/Recertification
Meal Reimbursement	Tax Credit on Property Tax	Healthcare Benefits
Mentoring Program		Internal Advancement
Retirement Benefits/(LOSAP)		Tuition Reimbursement*
Training		
Uniforms		
*Split for Career Firefighters		

With each response, the firefighter rates the effectiveness of the retention strategy on a scale of increasing effectiveness. More specifically, the four options include “Not Effective,” “Somewhat Effective,” “Effective,” or “Very Effective.” Because this is a question with rating options, “Other,” “Explain Other,” and “None” are not options for selection. Respondents have the opportunity to evaluate 18 strategies.

In the survey-wide tally of retention strategy effectiveness (Table 10), 48% of the participants rated the strategies as “Somewhat Effective” or “Effective.” The majority believe that six strategies are “Somewhat Effective,” while nine are “Effective.” These 15 strategies account for 83% of the total number of strategies (n=18). Respondents rate the remaining strategies, Meals, Discounts, and Mileage as “Not Effective.” In the overall study, this ranking accounts for 17% of the responses. The remaining number of responses (n=519 (12%)) indicate strategies that are “Very Effective.” However, none of the strategies received a majority rating as “Very Effective.”

Similar to the survey-wide tally, at the group level (Figure 17), the respondents rate the majority of the strategies as “Somewhat Effective” or “Effective.” All three groups, Volunteer, Both, and Career, rate Meal Reimbursement as “Not Effective” but only the Volunteer respondents consider Discounts and Mileage as the least-effective strategies. For the Career respondents, Retirement Benefits/LOSAP rates in the top category as a “Very Effective” retention strategy. Tax Credit on Property Tax is popular with the Both respondents and rates as “Very Effective” by the majority in the group as well. However, as stated above, not every group has an opportunity to respond to every selection.

In a comparison between the most common retention strategies and the most effective ones, the respondents who indicate that Training is the overall tally leader for every group, rate the option as “Somewhat Effective.” As leading options for retention methods in the Volunteer and Both groups, the Annual Banquet and Awards rate in the “Somewhat Effective” category with the two groups as well. Another leading strategy, Continuing Education/Tuition Reimbursement, ranks sixth in popularity, but respondents measure it as being “Effective” as a retention strategy – which is higher rating than more popular retention strategy options. These are just a few examples of popularity and effectiveness differences.

Table 10: Retention Strategies – Combined Totals by Strategy

Retention Strategy Effectiveness - Totals per Strategy														
	Type	Retention Strategy	No Response		Not Effective		Somewhat Effective		Effective		Very Effective		Total	
1	All	Annual Banquet	83	23%	77	22%	114	32%	70	20%	13	4%	357	100%
2	All	Awards/Recognition	83	23%	35	10%	100	28%	95	27%	44	12%	357	100%
3	All	Continuing Education or Tuition	83	23%	32	9%	86	24%	110	31%	46	13%	357	100%
4	All	Meal Reimbursement	83	23%	131	37%	88	25%	46	13%	9	3%	357	100%
5	All	Mentoring Program	83	23%	62	17%	104	29%	75	21%	33	9%	357	100%
6	All	Retirement Benefits/(LOSAP)	83	23%	30	8%	72	20%	105	29%	67	19%	357	100%
7	All	Training	83	23%	26	7%	67	19%	116	32%	65	18%	357	100%
8	All	Uniforms	83	23%	73	20%	108	30%	68	19%	25	7%	357	100%
9	V/B	Discounts at Local Stores, Businesses	74	24%	101	32%	83	26%	45	14%	11	4%	314	100%
10	V/B	Mileage Reimbursement	74	24%	92	29%	88	28%	42	13%	18	6%	314	100%
11	V/B	Pay per Call	74	24%	33	11%	50	16%	86	27%	71	23%	314	100%
12	V/B	Tax Credit on Property Tax	74	24%	27	9%	39	12%	91	29%	83	26%	314	100%
13	Career	Career Development - Firefighters	9	21%	1	2%	9	21%	20	47%	4	9%	43	100%
14	Career	Career Development - Officers	9	21%	3	7%	10	23%	18	42%	3	7%	43	100%
15	Career	EMS Training/Recertification	9	21%	3	7%	13	30%	16	37%	2	5%	43	100%
16	Career	Healthcare Benefits	9	21%	5	12%	7	16%	12	28%	10	23%	43	100%
17	Career	Internal Advancement Opportunities	9	21%	3	7%	13	30%	10	23%	8	19%	43	100%
18	Career	Tuition Reimbursement	9	21%	1	2%	11	26%	15	35%	7	16%	43	100%
		Total Responses	1014	23%	735	17%	1062	24%	1040	24%	519	12%	4370	100%

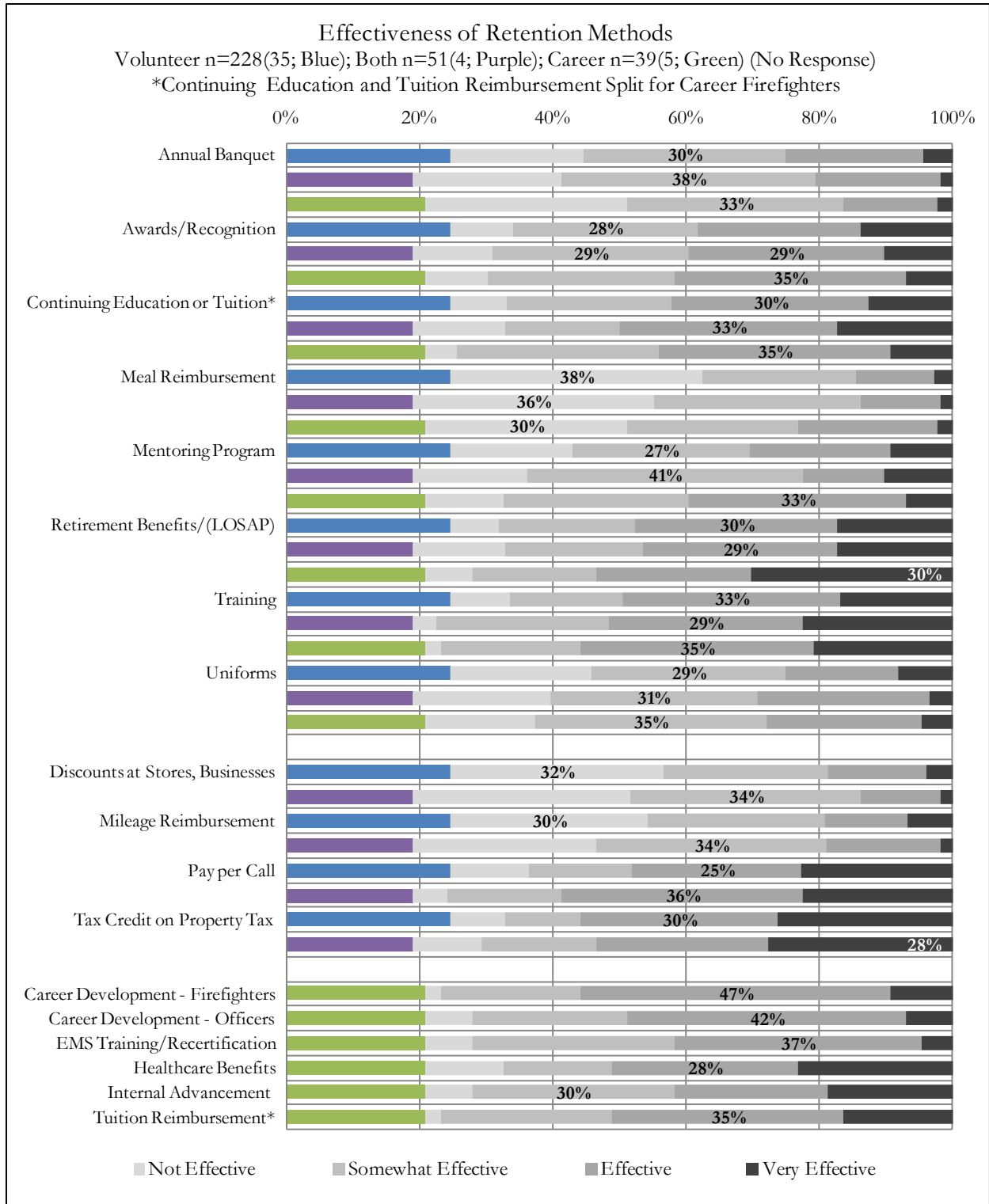


Figure 17: Retention Strategy Effectiveness

Reasons for Leaving

One of the survey questions tallies the impressions from firefighters about their beliefs regarding why others choose to leave the fire service. For this question, respondents could choose 3 reasons out of 22 selections for why they believed others had left the fire service (also an Explain “Other” option with additional responses). The top-five selections, which account for 71% of the responses (not respondents), dominate these reasons (Figure 18). Within the top-five reasons for others leaving the fire service, the top-two, Life Change (23%) and Time Commitment (22%) dominate the others with at least twice as many responses. Station Politics (10%), Lack of Leadership (8%), and Could Not Meet Training Requirements (8%) round out the remaining top-five choices (Figure 19).

Overall, the other options (n=17) explain 5% or less (each) of the remaining choices, but at the group level with respondents, the results vary slightly. In particular, Career respondents indicate that Retirement is a reason for others leaving 8% of the time, whereas, the Volunteer and Both groups register 5% and 1% of the responses, respectively. The group results also vary slightly with the top-five choices. Career respondents list Station/Department Politics (7%) to a lesser degree than their counterparts (Volunteer/Both 11%), while the Volunteer group mentions Could Not Meet Training less often as a response (Volunteer 7%; Career 11%) With a single exception, all of the options have at least one response. None of the respondents in the study indicates that Lack of Equipment is a reason why someone left the fire service. Generally, the response percentages for each option vary by 4% or less between the groups. In total, the survey includes the expected 822 responses from 274 respondents for this question (response rate=3.0).

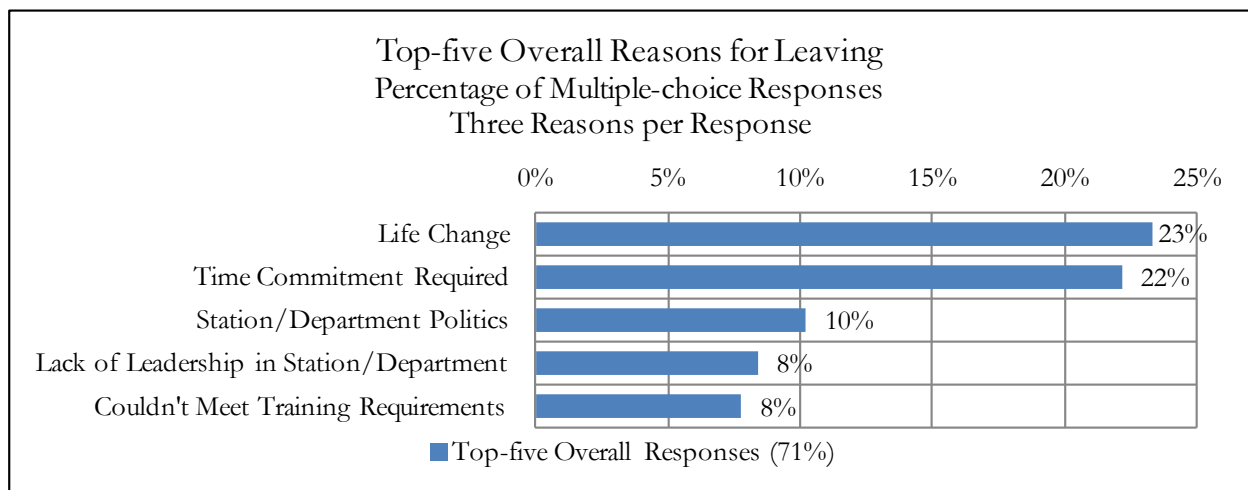


Figure 18: Overall Top-five Reasons for Leaving the Fire Service

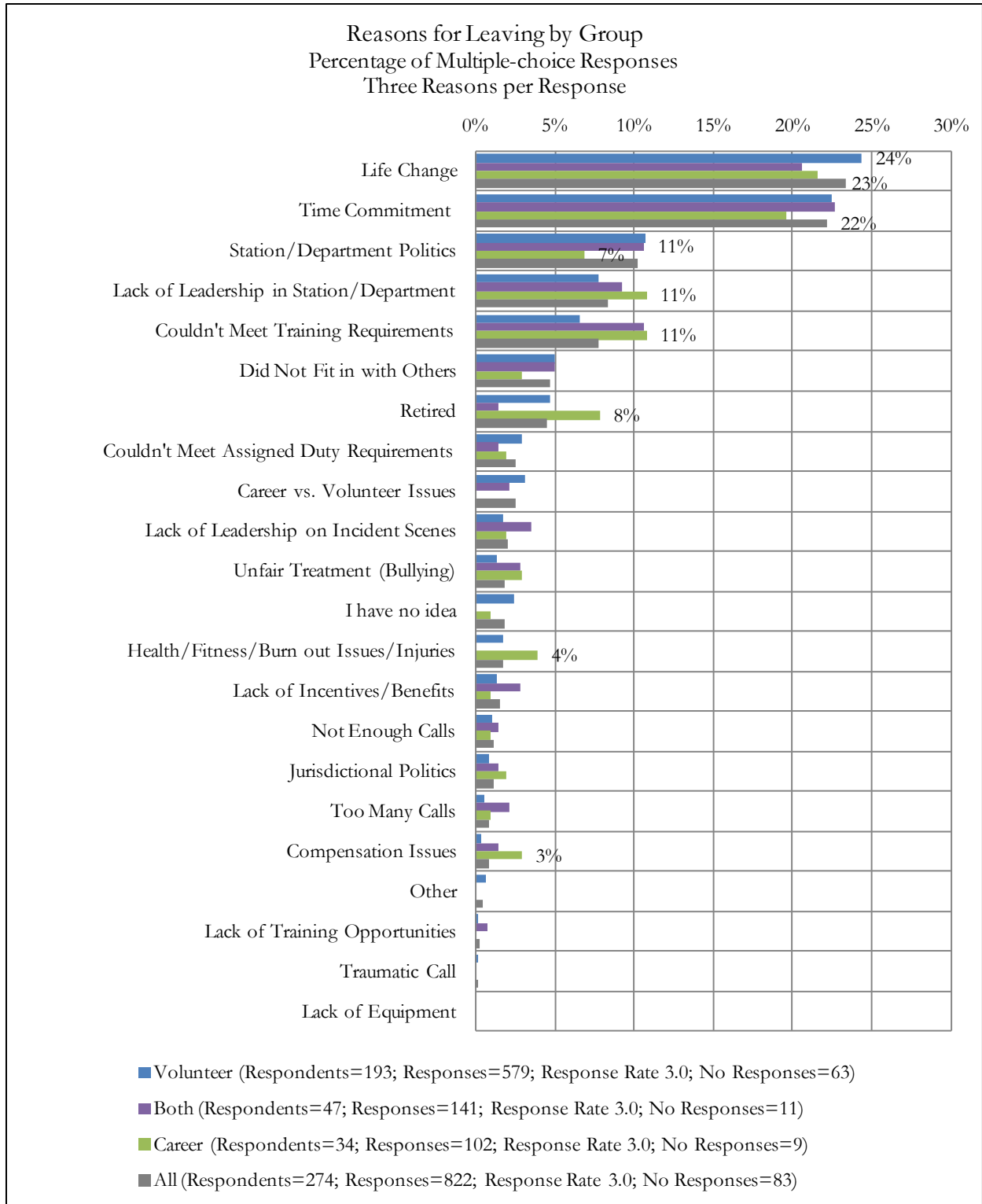


Figure 19: Reasons for Leaving

Exit Interviews

Within the study, the responses to the Exit Interview question indicate general findings at the study level and disparities at the group level (Figure 20). Generally, nearly half of the respondents (45%) indicate that Exit Interviews are not an option in their departments. Only 13% of the respondents have the prospect of an interview when leaving their departments. Overall, approximately 57% of the respondents know if their departments have or do not have exit interviews. Conversely, 43% of the respondents either did not respond to the question or do not know if their departments have exit interviews.

The findings also indicate that more than 40% of the respondents in each group do not have an opportunity for an exit interview, and the largest group without this opportunity is the Both respondents (57%). Twice as many Career respondents (23%) indicate the opportunity for an exit interview compared to their Volunteer (11%) and Both (10%) colleagues. Ten percent more Volunteers (22%) do not know if their departments have exit interviews compared Career firefighters (12%). Within each group, 19%-25% of the respondents did not answer this question.

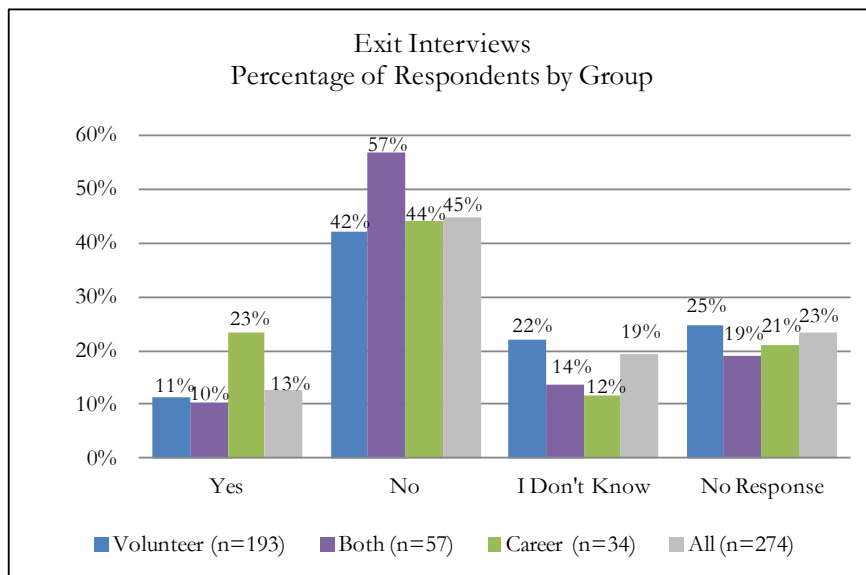


Figure 20: Exit Interviews

Leadership Issues

The “Leadership Issue” question has a unique format in this study for two reasons. First, it is a Yes/No format question, and second, the responses correlate with the subsequent question about the levels of leadership issues.

Figure 21 shows the percentages of overall responses (left) and group level findings (right). More than half of the respondents indicate “Leadership Issues” (52%) and 16% register a no response for the question.

At the group level, the findings are similar with more than 50% of each group’s respondents indicating issues with leadership. With the Both group, nearly 65% see issues with leadership as well. Overall, 26% of the respondents did not answer the question.

In a tie-in with the subsequent question on the level of leadership issues, 1% of the respondents with a Yes entry for this question do not designate a level of issue in the next question. Conversely, 5% of the respondents who have a No response for this question specify a level for issues later. See the following section for more details.

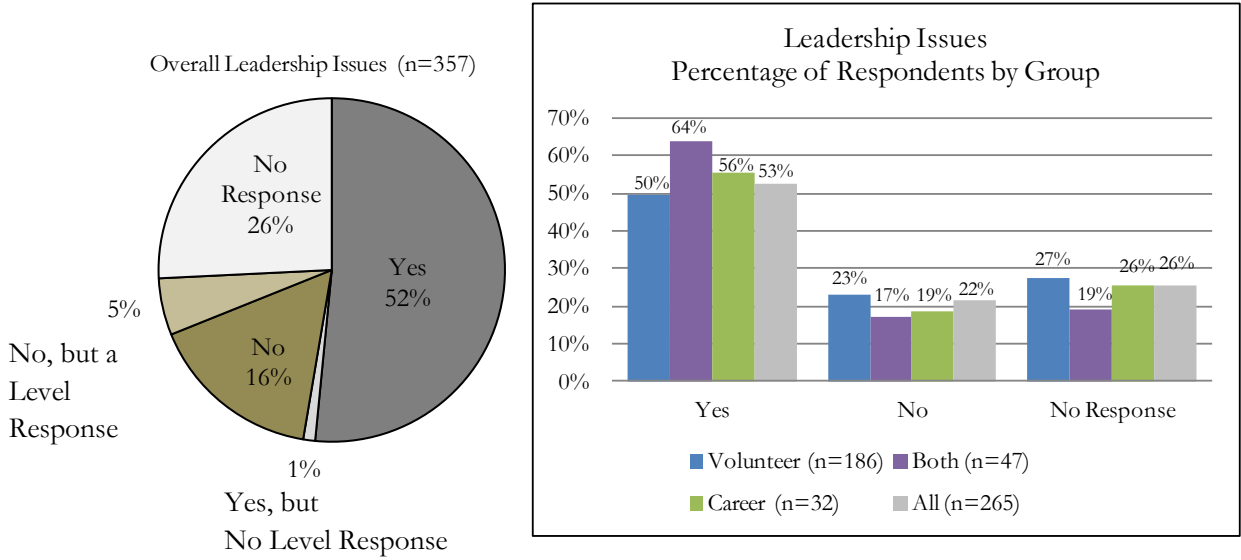


Figure 21: Leadership Issues – Overall and by Group

Levels of Leadership Issues

Respondents have the option to select four levels of leadership issues (Chief, Chief Officer, Company Officer, and Firefighter). Similar to other questions, this one has options for Other, Explain Other, and N/A (for those selecting No to answer the previous Leadership Issue question) (Figure 22). In decreasing percentages, the respondents indicate issues with the Company Officer (28%), Chief Officer (23%), Chief (18%), and Firefighter (16%).

Generally, the Volunteers and Both groups respond at nearly equal rates within a 4% difference - with one exception – the N/A response (Volunteer - N/A=49 (14%); Both – N/A=5 (6%)) – which ties-in with the previous question’s No response. The Careers differ from these groups by responding at higher rates for Company Officer (Volunteer/Both Average (27%); Career (31%)) and Firefighter (Volunteer/Both Average (15%); Career (20%)), but lower rates for Chief Officer (Volunteer/Both Average (25%); Career (17%)).

With 494 responses for this question and a response rate of 1.9, each respondent indicates nearly two levels of leadership issues. This response rate is consistent at the group level as well (1.8 to 2.0). Each of the categories, with the exception of Career – Other, has at least one response. For the four levels of leadership issues, the groups (Volunteer, Both, and Career) have total response rates of 82%, 90%, and 88%, respectively - indicating a slightly lower response level for these options from the Volunteers (Volunteer/Both response rate=1.8).

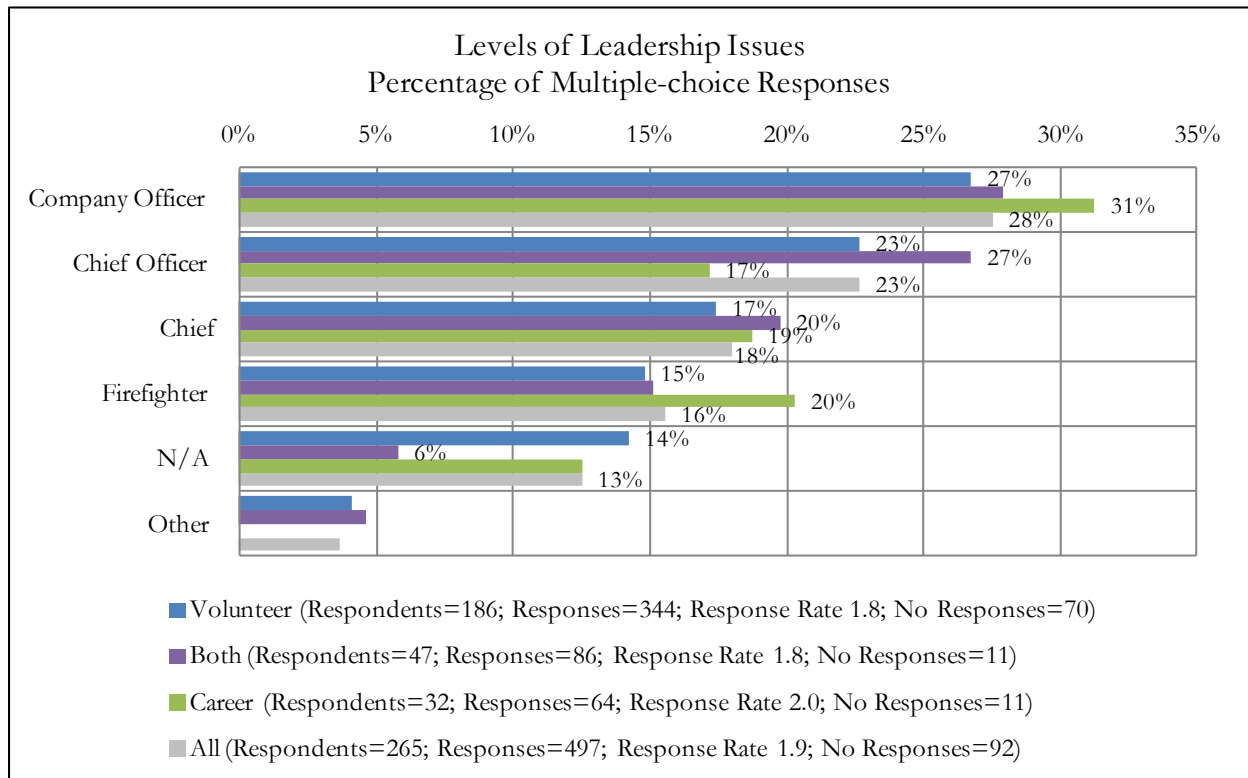


Figure 22: Levels of Leadership Issues

Areas in Need of Improvement

For this survey, the officials list 24 selections as “Areas in Need of Improvement.” After reviewing the findings, these options are split into two groups for graphing purposes. The first graphic includes the top-eleven results with more than 5% of the total responses (Figure 23), and the second graphic lists the results from the remaining options with 5% or less of the responses (Figure 24).

At the study level, the leading options in Figure 23 account for nearly 75% of the total responses. Communication (9%), Motivating Personnel (9%), and Leadership (8%) top the list of improvements with approximately 26% of the responses. Due to the large number of options for respondents, the leading choice accounts for less than 10% of the total responses. A review of the “Other Explanations” indicates that two respondents want to add Enforcing Bylaws/Rules to the list of areas in need of improvement. Firefighters are responsive to this question. At the study level, this question has the most responses (n=1,506) from 265 respondents with 5.7 selections/firefighter (Table 11).

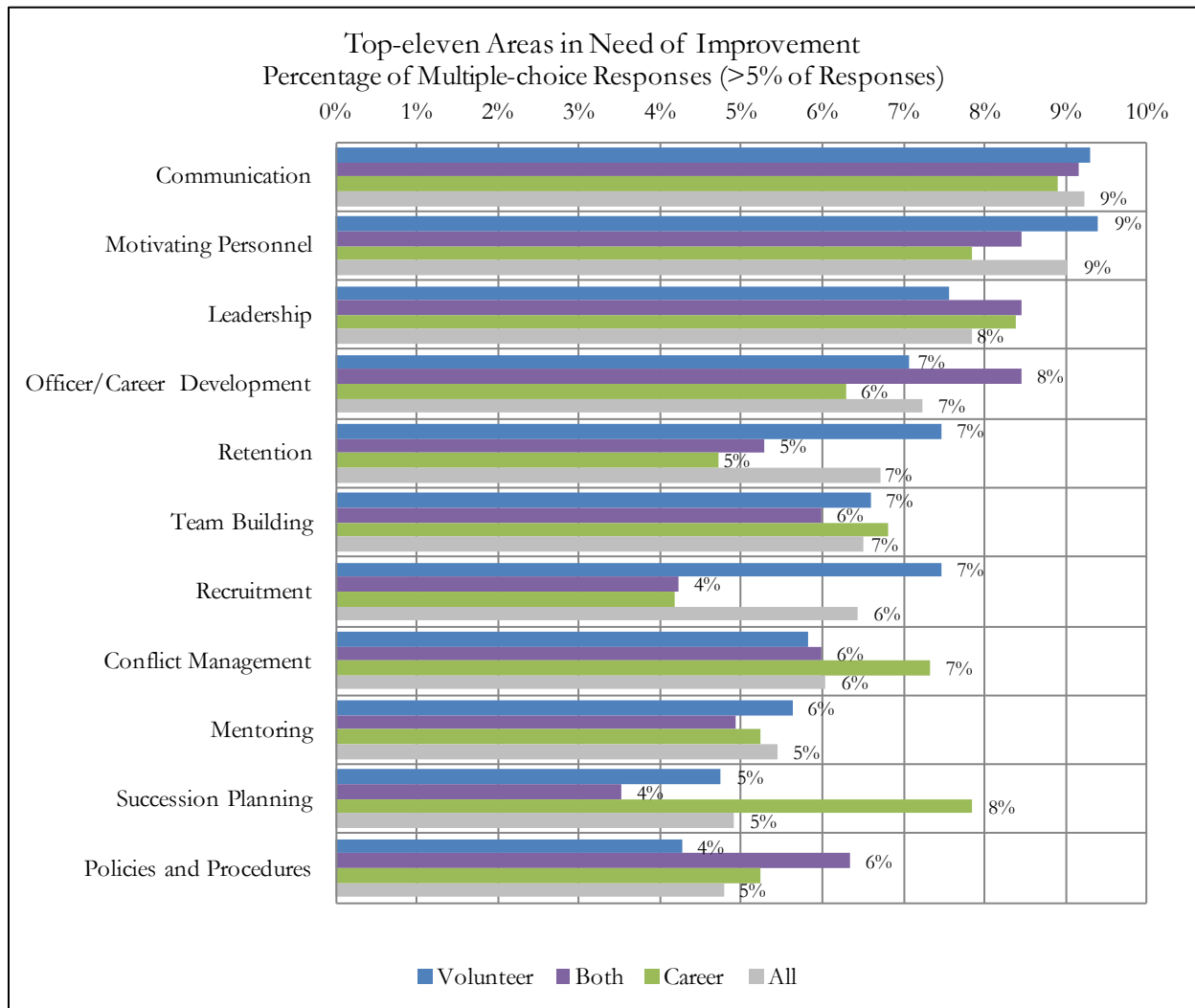


Figure 23: Top-eleven Areas in Need of Improvement

On a group basis, all of the results are within 4% of each other. With the greatest difference, Succession Planning captures 8% of the Career responses and 4% of the Both responses. For the findings in Figure 24, Career firefighters suggest that Supervision/Direction needs improvement while the Both firefighters indicate General Management and Public Relations need attention within the fire service; however, these option only account for 4%-5% of the total study responses. With the exceptions of “None” and “Other” for the Career firefighters, all of the options received at least one response.

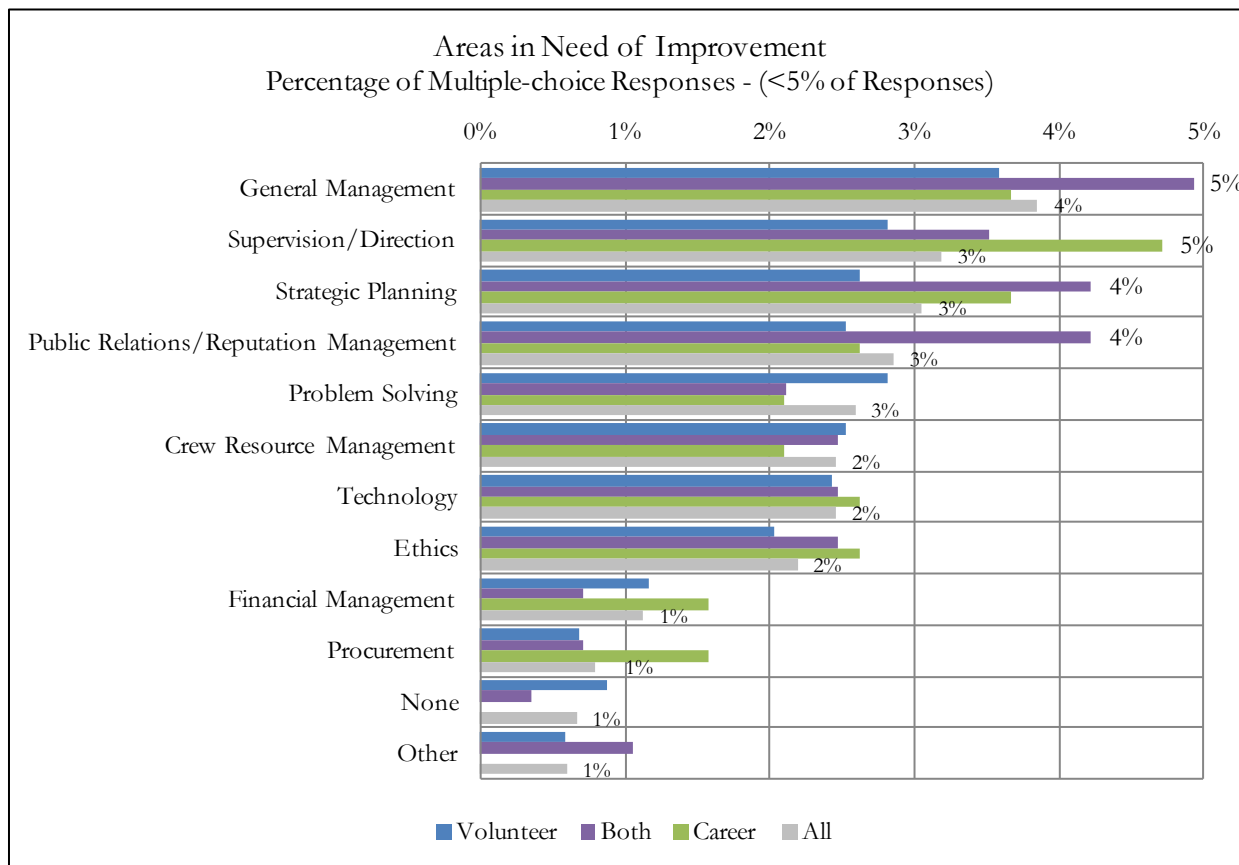


Figure 24: Areas in Need of Improvement (<5% of Overall Respondents)

Table 11: Areas in Need of Improvement - Respondents, Responses, and Response Rates

Areas in Need of Improvement				
	Volunteer	Both	Career	Total
Respondents	186	47	32	265
Responses	1031	284	191	1506
Response Rates	5.5	6.0	6.0	5.7
No Response	70	11	11	92
Total	256	58	43	357

Areas in Need of Additional Training

Similar to the previous question, due to the large number of response options, this section also splits the results into two graphics. The first graphic includes the top-eight “Areas in Need of Additional Training” (Figure 25) and the second one includes the remaining selections (Figure 26). The leading responses include the ones with greater than 5% of the responses.

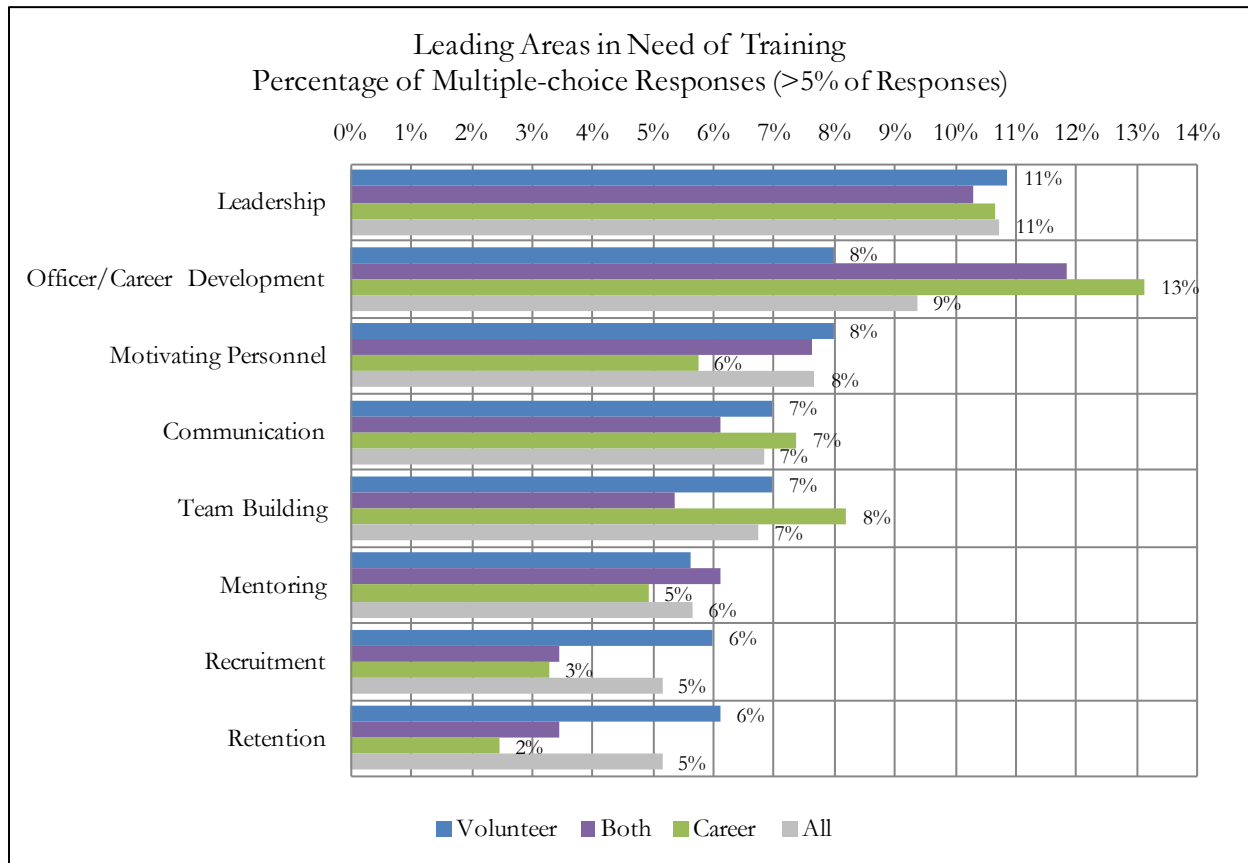


Figure 25: Leading Areas in Need of Training (>5% of Responses)

The top-three Training Areas include Leadership (11%), Officer/Career Development (9%), and Motivating Personnel (8%). With the remainder of the responses in Figure 25 (Communication, Team Building, Recruitment, and Retention), the total tally for the leading Training Areas accounts for 57% of the responses. For this question, the firefighters registered 1,186 responses for the Areas in Need of Training (Table 12). With 265 respondents, the response rate for this question is 4.5 responses for each firefighter, but at the group level, the rates vary with Volunteers averaging 4.3 entries, Both respondents answering with 5.6 submissions, and Careers responding an average of 3.8 times per firefighter.

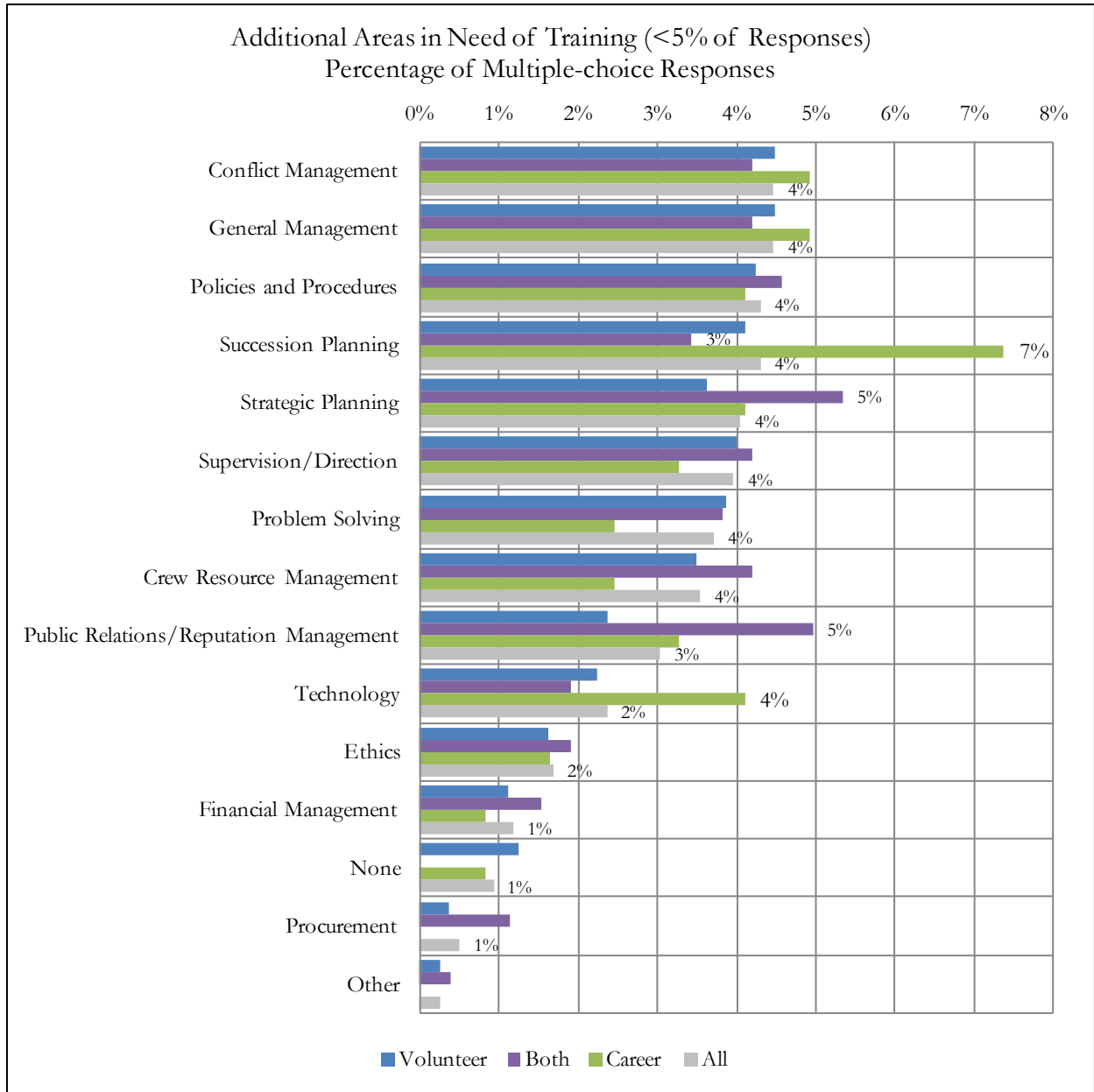


Figure 26: Areas in Need of Training (<5% of Overall Respondents)

Table 12: Areas in Need of Training - Respondents, Responses, and Response Rates

Areas in Need of Training				
	Volunteer	Both	Career	Total
Respondents	186	47	32	265
Responses	802	262	122	1186
Response Rates	4.3	5.6	3.8	4.5
No Response	70	11	11	92
Total	256	58	43	357

Table 13: Comparison of Leading “Needed” Responses

Comparison of Leading "Needed" Responses*			
	Improvement Needed	Training Needed	
1	Communication	Leadership	1
2	Motivating Personnel	Officer/Career Development	2
3	Leadership	Motivating Personnel	3
4	Officer/Career Development	Communication	4
5	Retention	Team Building	5
6	Team Building	Mentoring	6
7	Recruitment	Recruitment	7
8	Conflict Management	Retention	8
9	Mentoring		
10	Succession Planning		
11	Policies and Procedures		
	*Greater than 5% of Responses		

Communication, Motivating Personnel, Leadership, and Officer/Career Development are the top-four responses for the “Needed” Improvements and Training questions. For the remainder of the results, Team Building, Mentoring, Recruitment, and Retention complete the list of common leading options between the questions. With the exception of Conflict Management on the list of top-eight Improvements, the lists are identical, but ordered differently (Mentoring is 9th on the Improvements list). As discussed earlier, the response rate for Improvements is higher at 5.7 compared with Training at 4.5.

Preferred Training Methods

With this multiple-choice question, the firefighters have seven alternatives for preferred method or format of training (Figure 27). Individually, the top-three choices, Hands-on Training, Classroom, and Hybrid, account for approximately 75% of the responses at the study level, and these are the only ones with greater than 10% of the overall responses. At the group level, Books (9%) and DVDs (7%) have slightly higher responses compared to counterparts in the other groups. For this question, the tally for responses is 599 and the response rate is 2.3 selections per firefighter (Group range 2.2-2.5).

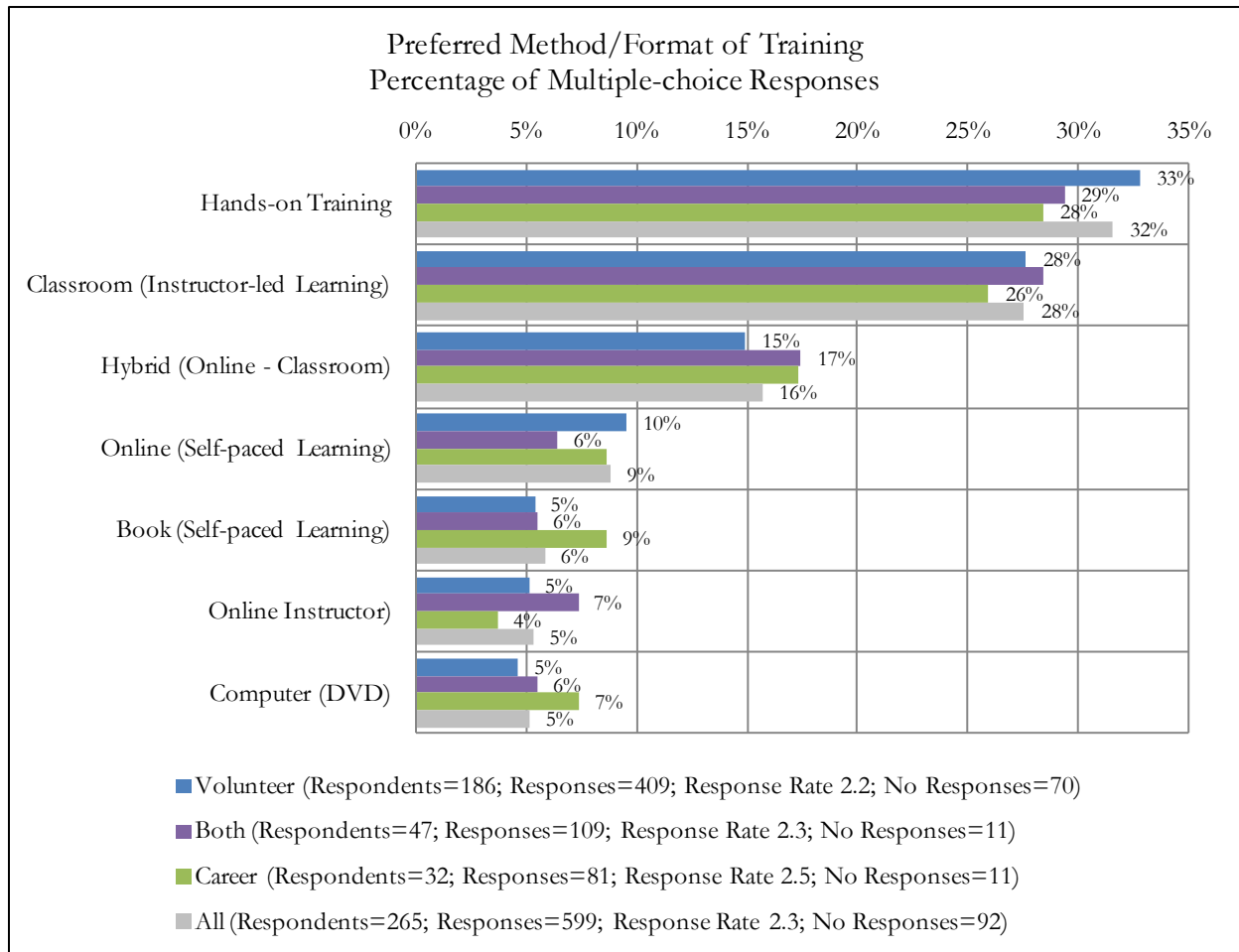


Figure 27: Preferred Training Methods

Favored Training Times

For the Favored Training Times, the officials list five options, Weekdays (Night and Day), Saturday, Sunday, and On-duty/On-shift (Figure 28). With a tally of the results, Weekdays (Night) captures the most responses (42%). Weekdays (Day) are a distant second with 13% of the responses. Because this is a “favored” question, the respondents have only one choice among the selections.

For this question, the preferred training times differ appreciably between the groups. Volunteers/Both groups favor Weekdays at Night with 47% and 40% of their group responses, respectively. With the largest proportion of the group responses (35%), Career firefighters prefer Weekdays during the daytime. On-duty/On-shift is also a popular choice within the group with 26% of the responses. To accommodate varying work schedules, the Volunteer/Both groups are willing to work on the weekends; however, this is not a choice for any of the Career firefighters.

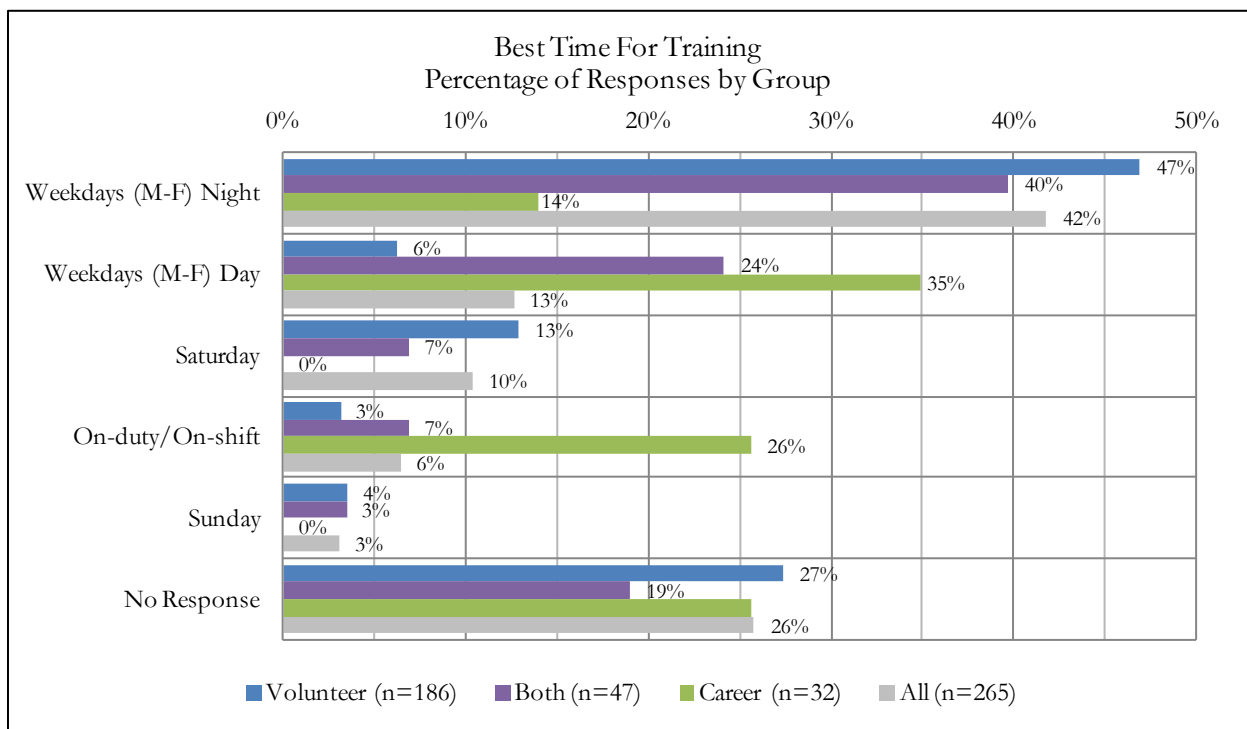


Figure 28: Favored Training Times

Correlation Analysis Methods

Cross Tabulations

Beyond examining the distribution of responses, analysts can – within limitations – derive quantitative correlations between the responses to pairs of questions. Determining the level of correlation between variables suggests what characteristics of firefighters might correlate with traits that are associated with long-serving firefighters (retention). In addition to these characteristics, other correlation traits might encourage firefighters to volunteer for service (recruitment).

Correlations begin by generating cross-tabulations between any two variables. This process essentially produces a two-dimensional frequency distribution with the categories for one variable tabulated in rows and the categories for the second variable tabulated in columns. The value in any cell of the resulting matrix is the count of respondents who chose both the category associated with the row variable and the category associated with the column variable. For example, the following table (Table 14) shows the cross-tabulation of the variables “Years in Service” and “Annual Banquet Effectiveness.”

Table 14: Cross-tabulation Table with "Years in Service" and "Annual Banquet Effectiveness"

"Years in Service" & "Annual Banquet Effectiveness"						
Annual Banquet Effectiveness Actual Values	Not effective	Somewhat effective	Effective	Very Effective	Grand Total	Percentage of Total
0-9	7	22	12	8	49	18%
10-19	15	30	17	1	63	23%
20-29	25	24	14	1	64	23%
30-39	18	21	16	2	57	21%
40+	12	17	11	1	41	15%
Grand Total	77	114	70	13	274	100%
Percentage of Total	28%	42%	26%	5%	100%	

This cross-tabulation allows comparisons to determine the correlations between these variables. In the example above, some trends are clear in these numbers. First, each category for “Years in Service” is about 20% of the total number of responses, so the groups are nearly equal in size (18%, 23%, 23%, 21%, and 15%, with increasing service years). Second, the majority of the respondents find the Annual Banquet to be a “Somewhat Effective” Retention Strategy (10%, 33%, 36%, and 14%, with increasing effectiveness). Third, more than twice as many respondents with 0-9 years in service find that the strategy is “Very Effective” compared to the most tenured respondents with 30-69 years in service (28%, 42%, 26%, and 5%, with increasing years in service).

While these relationships may not be extraordinarily strong (p -value=0.01), and while the correlation between these variables may not represent a causal relationship, the relationship exists nonetheless. Ideally, each group would have 50 or more responses, but this correlation serves as a test case. In this case, an interpretation of these results could mean that one may be able to encourage retention. Rewarding tenured fighters during an

Annual Banquet may help the strategy to become a “Very Effective” one because the largest percentage of advocates have the least amount of tenure (n=8; 61% in the 0-9 service-year group).

With the following cross-tabulation (Figure 29), the visualization displays the values of the matrix in three dimensions. In this case, the results include the counts of firefighters choosing their respective “effectiveness” categories. This three-dimensional visualization provides the ability to view the general trend of the responses across the two variables. Note the peak in the number of responses for firefighters with 10-19 years in service (remember to check the categories for comparable sample sizes when interpreting “counts” of grouped responses).

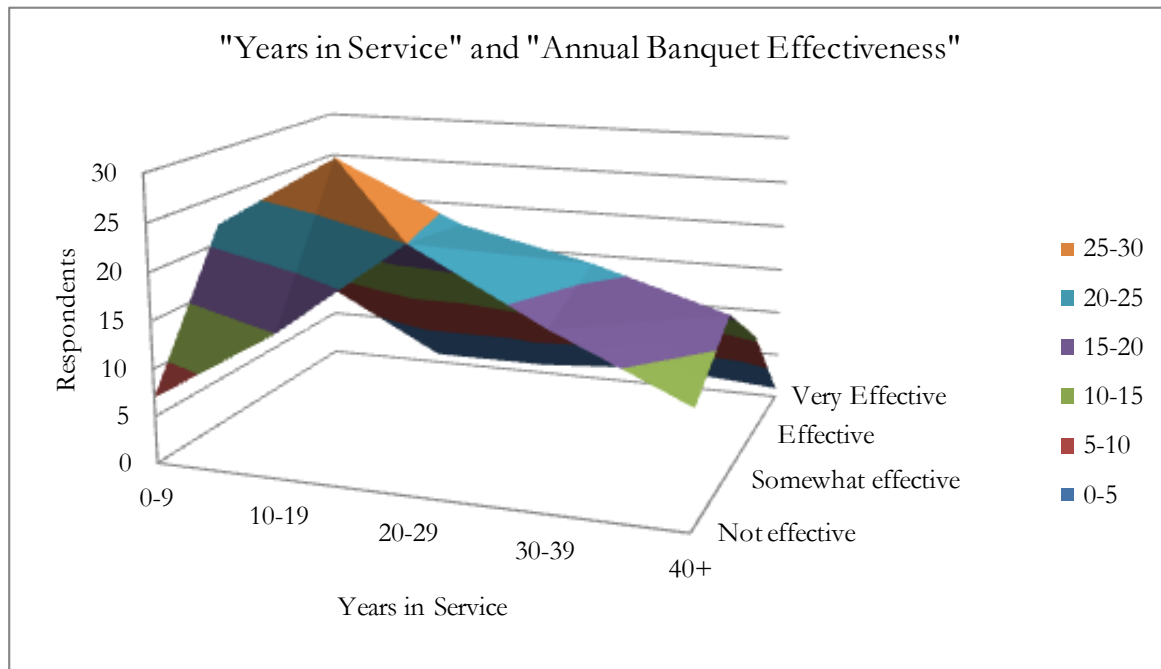


Figure 29: Three-dimensional Cross-tabulation for "Years in Service" and "Annual Banquet Effectiveness"

Chi-squared Test for Independence

Finally and perhaps most importantly, the Chi-squared test for independence uses these cross-tabulations to test the strength of the correlation relationship between two variables. This test is appropriate with two categorical variables from the same population, which is the case here. Moreover, the sampling strategy is simple-random sampling where no firefighter has a greater chance than any other to complete the survey, and the sample is no more than one-tenth the size of the population. In this case, the 357 responses are less than 10% (n=2,665) of the total number of firefighters in Connecticut – approximately 26,650 in 2013 (Department of Emergency Services & Public Protection for the State of Connecticut, 2016).

In order to determine the extent of a category of one variable from the category of the other variable, we first need to formulate our null and alternative hypotheses. In the case of this example, the hypotheses are:

- Null hypothesis $\rightarrow N_0$ = The responses to “Years in Service” are independent of the responses to “Annual Banquet Effectiveness”

- Alternative hypothesis → H_a = The responses to “Years in Service” are not independent of the responses to “Annual Banquet Effectiveness”
- If we can reject the null hypothesis, and therefore accept the alternative hypothesis, we can act with some certainty in the knowledge that we can predict the response to one variable from the response to the other. If we can predict “Years in Service” from the attitudes toward “Annual Banquet Effectiveness,” we can use this to our advantage in recruitment and retention efforts.

Once we have established our analytical framework, we can use the Chi-squared test for independence to determine whether we can reject the null hypothesis with some level of certainty. This test requires us to determine the number of degrees of freedom available for the test. Generally, the degrees of freedom are the number of independent pieces of information available to generate the value of the statistic.

In the Chi-squared test, the equation to calculate the degrees of freedom (d.f.) follows:

$$\text{d.f.} = (r - 1) * (c - 1)$$

where r is the number of categories for the row variable, and c is the number of categories for the column variable.

The Chi-squared test determines the level of correlation based on the difference between the expected frequencies and the observed (actual) frequencies in each cell of the cross-tabulation. We therefore must compute $r * c$ expected frequencies, according to the following formula:

$$E_{r,c} = \frac{(n_r * n_c)}{n}$$

where $E_{r,c}$ is the expected frequency count for level r of the row variable and level c of the column variable, n_r is the total number of sample observations at level r of the row variable, n_c is the total number of sample observations at level c of the column variable, and n is the total sample size. In the example using the cross-tabulation given above (Table 14), the calculation of the expected value for the 1st row and 4th column cell (with an observed frequency of 7) would be calculated as:

$$E_{1,4} = \frac{(49 * 77)}{274} = 14$$

The test statistic itself compares the observed and expected frequencies by using of the following equation:

$$X^2 = \sum_r \sum_c \frac{(O_{r,c} - E_{r,c})^2}{E_{r,c}}$$

where $O_{r,c}$ is the observed frequency count in cell r,c and $E_{r,c}$ is the expected frequency count for the same cell.

With a value for the Chi-squared test statistic in hand, and the appropriate degrees of freedom, we can compare the value of the test statistic against the reference Chi-squared distribution. This comparison allows us to determine the probability that the correlation we see in the data happened by random chance. If it is unlikely that the correlation is due to random chance, then we can reject the null hypothesis and act with certainty in the knowledge that the variables are related.

The probability level at which the null hypothesis is a subject of considerable debate, and is generally based on discipline or area specialty norms. A p-value of 0.05 is common, although there is substantial variation in accepted values. For the example above, the derived p-value is 0.01. This means that a value of this statistic found in this case, only occurs 1 times in 100 by random chance. Therefore, it is very unlikely that this relationship has occurred due to random chance, and with that level of certainty, we can reject the null hypothesis that these variables are independent.

In the following section, we use the cross-tabulations, their visualizations, and the Chi-squared test to examine a series of relationships and make suggestions about potentially significant relationships that may have consequences for recruitment and retention of firefighters.

Correlation Relationships that Suggest Actions for Recruitment and Retention

Since the survey results database has more than 200 variable columns that correspond to firefighter responses, it is theoretically possible to generate correlations from every possible pair of variables. However, these combinations would generate $200 \times 200 = 40,000$ correlations. For this analysis, calculating all of these correlations would be time-consuming and many of these would not make logical sense. For example, correlating a variable measuring why a firefighter is compelled to enlist with a variable describing why firefighters believe others have left the service would not generate actionable information. Second and perhaps most importantly, it would be extremely difficult to derive actionable information from such a large number of correlation data points.

In the light of the issues in this section, the analysis continues with selections of variables for correlation analysis that may give some insight into the motivations of firefighters to do their jobs and to stay in their jobs for an extended time. For correlations relating to recruitment and retention, the analysis focuses on the variable of “Years in Service” as it appears to be appropriate for measuring the characteristics of tenured firefighters. In addition to service, to delve deeper into issues which could have an effect on the recruitment and retention of firefighters, this analysis examines leadership as well.

The first group of correlations analyzes the relationships between “Years in Service” and six variables as designated by various questions in the survey. The goal of the analysis is to determine if any of the variables have an effect on retention – as “Years in Service” is a proxy for longevity in the fire service. More specifically, the correlation matrices address relationships with “Learning about the Fire Service,” “Improvement Areas,” “Primary Occupations,” “Motivations,” and “Reasons for Others Leaving the Fire Service.”

The second group of correlations analyzes the relationships between “Leadership Issues” and four additional variables designated by other questions in the survey. The goal of this analysis is to determine if any of the variables have an effect on leadership. Specifically, the correlations address “Years in Service,” “Rank,” “Status Type,” and “Exit Interviews.” By addressing leadership issues, in turn, recruitment and retention will also improve.

“Years in Service” and “Primary Occupation”

For this survey, the “Primary Occupation” question only pertains to the Volunteer and Both groups because the occupation of the Career group is employment in the Fire Service. However, this correlation analysis includes all of the groups (N/A = Career Firefighters), but because of this structural format, the Chi-squared statistic is strong in this case with a p-value of 8.9×10^{-7} . According to the results in Table 15, the 30-39 service-year group has more than expected numbers of firefighters (Career and Volunteer/Both) in the survey, while the 0-9 and the 10-19-year groups have fewer than expected in the Career Firefighter category. The responses for “Student” and “Maintenance, Repair, Installation,” have higher than expected numbers in the least tenured group. As expected, the most tenured group has higher than expected numbers of firefighters with a “Retired” response.

Table 15: Correlation Matrix - "Years in Service" and "Primary Occupation"

"Years in Service" and "Primary Occupation"																				
Actual Values	Automotive	Construction	Education and Training services	Emergency Medical Service (EMS)	Fire Service	Healthcare	Information Technology	Law Enforcement	Maintenance, Repair, Installation	Management	Manufacturing	N/A = Career Firefighters	Other	Public Administration	Public Safety	Retired	Self-employed	Student	Transportation/Warehousing	Grand Total
0-9	4	6	2	2	5	5	3	2	6	4	1	0	5	1	4	0	1	6	1	58
10-19	2	2	4	4	13	3	3	1	2	1	3	4	5	1	6	0	2	0	2	58
20-29	3	1	0	2	12	2	1	2	2	1	3	12	5	3	5	5	3	0	4	66
30-39	0	4	1	1	17	2	1	0	1	1	1	15	3	1	5	4	0	0	2	59
40+	0	1	3	0	12	0	0	3	0	1	1	8	3	0	2	12	0	0	0	46
Grand Total	9	14	10	9	59	12	8	8	11	8	9	39	21	6	22	21	6	6	9	287
Primary Occupation and Years in Service: Differences (Actual - Expected)																				
0-9	2	3	0	0	-7	3	1	0	4	2	-1	-8	1	0	0	-4	0	5	-1	0
10-19	0	-1	2	2	1	1	1	-1	0	-1	1	-4	1	0	2	-4	1	-1	0	0
20-29	1	-2	-2	0	-2	-1	-1	0	-1	-1	1	3	0	2	0	0	2	-1	2	0
30-39	-2	1	-1	-1	5	0	-1	-2	-1	-1	-1	7	-1	0	0	0	-1	-1	0	0
40+	-1	-1	1	-1	3	-2	-1	2	-2	0	0	2	0	-1	-2	9	-1	-1	-1	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Omission of Categories with five or fewer respondents																				
	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9		

Additional Testing

Other factors relating to these issues, such as “Learning about the Fire Service,” (p-value of 0.10) “Improvement Areas,” (p-value of 0.99), “Initial Motivations,” (p-value of 0.17), “Continuing Motivations,” (p-value of 0.30), and “Reasons for Others Leaving the Fire Service” (p-value of 0.18) have higher p-values with Chi-squared testing. Therefore, the null hypotheses are not rejected and these factors do not relate to “Years in Service.” Because of these findings, this analysis does not include an evaluation of these factors. Another issue that requires clarification and additional evaluation because of these findings and its impact on recruitment and retention is “Leadership.”

Correlation Relationships that Suggest Actions for Leadership Issues

One of the survey questions directly addresses “Leadership Issues,” but correlation matrices can help to show additional relationships beyond the initial responses with the topic question. This section briefly examines the relationships between “Leadership Issues” and “Years in Service,” “Rank,” “Status Type,” and “Exit Interviews”

One of these relationships, “Leadership Issues” and “Rank” is stronger than the others. It is the only one with a significant p-value. “Years in Service” (p-value of 0.08), “Status Type” (p-value of 0.32), and “Exit Interviews” (p-value of 0.054) have higher p-values with Chi-squared testing. Therefore, the null hypotheses are not rejected and these factors do not relate to “Leadership Issues” in this survey.

“Leadership Issues” and “Rank”

An examination of the relationship between “Leadership Issues” and “Rank” (Table 16 and Figure 30) indicates differences among the ranks. Higher than expected values for “Chiefs” with a “No” response indicates that this group does not have concerns with “Leadership Issues.” The remainder of the groups (“Chief Officer,” Company Officer, and Firefighters) have higher than expected “Yes” responses - confirming “Leadership Issues.” “Firefighters” have the greatest number of firefighters above the expected values. The Chi-squared statistic is strong with a p-value of 0.008.

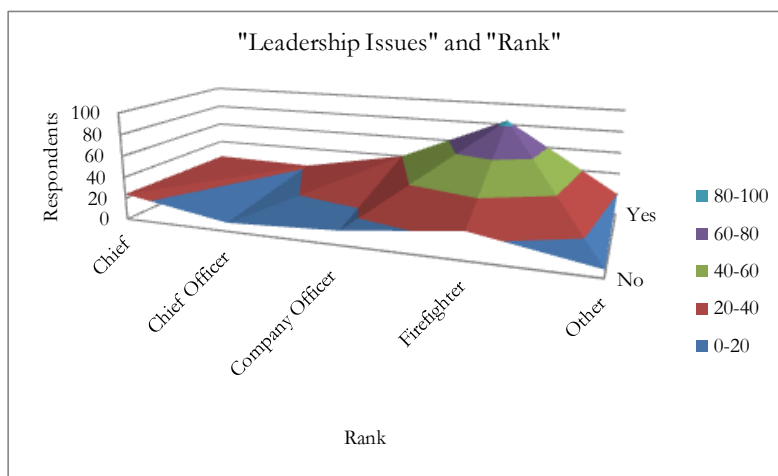


Figure 30: Correlation Matrix - "Leadership Issues" and "Rank"

Table 16: Correlation Matrix - "Leadership Issues" and "Rank"

Actual Values	Leadership Issues		
Rank	No	Yes	Grand Total
Chief	24	23	47
Chief Officer	8	21	29
Company Officer	13	40	53
Firefighter	25	84	109
Other	7	20	27
Grand Total	77	188	265
Differences	Leadership Issues		
Rank	No	Yes	Grand Total
Chief	10	-10	0
Chief Officer	0	0	0
Company Officer	-2	2	0
Firefighter	-7	7	0
Other	-1	1	0
Grand Total	0	0	0
Red Text - Higher than Expected Results			
Blue Text - Lower than Expected Results			

Correlations Summary

Within this survey, three correlations provide additional information; however, the findings are limited. Testing confirms differences between firefighters at the beginning, middle, and end of their tenures as firefighters. First, with respect to firefighter “Years in Service,” respondents with fewer years of service (0-9 years in service) are more likely to be Students and have a primary occupation in Maintenance, Repair, and Installation. According to the respondents in this group, fewer numbers than expected are employed by the fire service – in the Volunteer/Both and the Career groups. This “younger” group with fewer years in service also has the greatest percentage of respondent who consider the Annual Banquet to be a “Very Effective” retention strategy. For those in the middle of their careers, higher than expected numbers in the 30-39 years in service group are employed by the fire service. As expected, respondents with the most tenure have higher than expected values for retirement. These findings demonstrate the changes that affect firefighters throughout their careers.

Although the findings are limited in this survey, the non-significant testing rules out strong correlations between “Years in Service” and “Learning about the Fire Service,” “Initial Motivations,” “Continuing Motivations,” “Areas in Need of Improvement,” and “Reasons for Others Leaving the Fire Service.” For leadership issues, the responses indicate the lack of strong correlations with “Years in Service,” “Status Type,” and “Exit Interviews.” These “non-findings” can add information to the body of knowledge with firefighter issues. Knowing these changes and their impacts could help to improve recruitment and retention within the fire service.

For “Leadership Issues,” the correlation analysis indicates that Chiefs have higher than expected numbers with a “No” responses to issues. Conversely, firefighters have higher than expected numbers who have a “Yes” response to issues. A few more Company Officers than expected also note “Leadership Issues.”

Additional Relationships and Validity Issues

Lastly, there are several unreported relationships described in detail here. This is generally for one of two possible reasons. First, there is a rule of thumb that when conducting a Chi-squared test for independence - any one cell of the cross-tabulation matrix may not have fewer than five respondents. Although this did not occur frequently with the testing, it did occur. Other relationships have many cross-tabulation cells with fewer than five respondents per cell. Examples of such relationships include:

- "Years in Service" and "Motivations" (Initial and Continuing)
- “Years in Service” and Top-ten Responses for "Learning about the Fire Service"
- “Years in Service” and “Annual Banquet Effectiveness” (p-value of 0.01)
- “Years in Service” and Leading “Areas in Need of Improvement”
- “Years in Service” and Leading Responses for "Why Others Left the Fire Service"
- "Years in Service" and "Primary Occupation" (p-value of 8.9×10^{-7})

On examining these relationships, the small (or zero) values in many of the cells are due to near unanimity of answers across all categories. While answers that are uniform across categories certainly explain the likes and dislikes of firefighters, uniformity does not allow for discrimination between subgroups, or the use of differences between groups to discover advantages in recruitment or retention efforts.

Steps Moving Forward

We hope that the analyses above (and subsequent investigations) will be of continuing use. In the continuing research and applied recruitment and retention efforts, we see three primary areas. For immediate and medium-term contributions, see below.

Informing the Marketing Process

The intention of these analyses is to support the overall research effort designed and implemented by the CFCA on behalf of, and in conjunction with the IAFC. In the short term, the relationships described above can inform the developing marketing strategies. It is the hope that ongoing discussions with the marketing experts can lead to additional research questions that encourage greater success in recruitment and retention.

Additional Statistical Analyses

There are additional statistical analyses that may prove beneficial to overall future efforts. These generally separate into two groups:

- Ongoing additional descriptive analysis as identified by any of the interested parties, and
- Additional correlation analysis identifying relationships of interest based on ongoing discussions.

Recommendations for Future Surveys

It appears that the survey is successful in allowing several parties to generate useful descriptive and inferential statistics from the data. However, the results highlight areas for improvement when conducting additional future surveys. For example, in some variables it is possible to see that the questions did not capture the primary responses.

A good example of this is the “Learning about the Fire Service” question, but other questions have similar formats. For these questions, the respondents are able to check all possible options that have an influence on their enlistment. This is important information since many firefighters hear about the service from different venues. For the kind of analyses in this report, knowing the firefighters’ primary motivation for enlisting in the service would be useful to know. Although this is just one example that applies to several question formats, the larger consideration is discussing the results in order to assess the lessons learned for improving future ones.

Appendix A: Survey Questions (Unique)

Survey Questions: Phase II	
1	As of today, indicate the type of firefighter you are.
2	What county (or independent city) is your VOLUNTEER department located in?
3	What is your current rank?
4	What is your primary RESIDENCE zipcode?
5	Please choose what category BEST DESCRIBES your primary occupation. Choose ONLY ONE of the options below.
6	How many years have you been in the fire service? (If you serve as career and volunteer, please enter total number of years.)
7	What is your current age?
8	Thinking back to when you first enlisted as a firefighter, how did you learn about opportunities to become a firefighter? Select all that apply.
9	What was your PRIMARY motivation for INITIALLY becoming a firefighter? Select only ONE choice.
10	How many months did it take you to become a member after submitting your initial application?
11	How many months did it take you to become an IDLH firefighter after being accepted as a member?
12	What minimum certifications does your department require for you to be considered a firefighter? Check all that apply.
13	What do you believe are the most effective ways to recruit firefighters? Select all that apply.
14	What is your PRIMARY motivation to continue as a firefighter?
15	Which retention methods does your department use? Select all that apply.
16	Based on your personal experience and beliefs, please rate the effectiveness of the retention methods below (even if your department doesn't have all of them).
17	Think about the firefighters you know who have left the fire service. Why do you believe they left? Select the top three (3) reasons.
18	Does your department conduct exit interviews when someone leaves the department?
19	Do you feel that your department has leadership issues?
20	At what level do leadership issues exist? Select all that apply.
21	In which areas does your department need improvement? Select all that apply.
22	In what areas would you like to see more training? Select all that apply.
23	What type of training method/format do you prefer? Select all that apply.
24	Generally, when is the best time for you to attend classroom/live instructor-led training? Select only one answer.