

# VFCA and IAFC Survey Review and Analysis Final Report – Phase II

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## Executive Summary

- For the Phase II survey, Officials successfully administered the questionnaire to 1,404 Virginia firefighters. An additional 5% of firefighters (n=69) chose to complete only the status question.
- Descriptive statistics and visualizations (charts, graphs, etc.) give an overview of the responses from three groups of firefighters - Volunteer (n=687), Both (n=203), and Career (n=514).
- 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 92% (End of Survey).
- Overall, the top-five departments: Fairfax, Loudoun, Prince William, and Albemarle Counties, along with Hampton comprise 37% of the total entries for departmental locations.
- Referrals account for 66% of the “Reasons for Joining” the Fire Service.
- Thirty-eight percent of the “Initial Motivations” continue to motivate firefighters into their careers.
- The majority of firefighters become members within the first three months (98% in a year) and IDLH firefighters within a year (Volunteer (74%); Both (82%)).
- The leading certifications (minimum requirements) include Firefighter I and CPR.
- Geographically, the dispersed survey respondents list 665 unique ZIP Codes for their primary residences (Average 2.1 respondents/ZIP Code).
- The top-three Volunteer Primary Occupations are “Retired” (n=52 (8%)), “Fire Service” (n=39 (6%)), and “Management” (n=39 (6%)).
- Generally, the percent of volunteer firefighters in the older (60 and up) and younger (17-29) age cohorts is greater than the percent of Career firefighters. With the exception of the 30-39 Both cohort, the opposite is true in the middle-age cohorts (30 to 59).
- The top-two choices for effective recruitment tools by all respondent groups are “Firefighter Referral” and “Word of Mouth.”
- Firefighter opinions regarding effective retention strategies vary significantly by firefighter type. Career firefighters consider “Retirement/Pension,” “Training,” “Healthcare,” and “Continuing Education” to be of primary importance. Volunteer firefighters are more concerned with “Training,” “Annual Banquet,” “Awards,” “Uniforms,” and similar shorter-term perks.
- The top-five perceived reasons why others left the service are “Life Change,” “Time Commitment,” “Station/Department Politics,” “Retired,” and “Lack of Leadership.” Career firefighters are more likely to identify “Retired,” “Life Changes,” “Lack of Leadership,” and “Compensation Issues” as the reasons they believe others left the fire service. Volunteer firefighters focus on “Life Change” and “Time Commitment” as relevant issues.

- All firefighter groups list “Communication” as the leading area in need of improvement. Volunteer firefighters note that “Recruitment” and “Retention” are areas in need of improvement, whereas Career firefighters identify “Leadership” and “Motivating Personnel” as concerns.
- “Leadership” is the area identified as the most in need of training.

According to the Correlation Analyses:

- Fewer numbers of teenagers are being employed in the fire service, and the starting age of firefighters with fewer years in service is later than their counterparts who have more tenure.
- Firefighters with fewer years in service learned about the fire service more frequently than expected via Websites/Email/Internet/Brochures/Flyers and less frequently via Family/Friends/Word of Mouth/Community Events compared to counterparts who have more tenure.
- Although the findings indicate a wide variety of associations between “Years in Service” and “Areas in Need of Improvement,” a few significant trends emerge.
  - Firefighters with fewer service years are more likely to state that no areas need improvement.
  - As tenure increases, “Succession Planning,” “Motivating Personnel,” “Leadership,” and “Retention” become important areas in need of improvement.
  - Those with the most tenure do not identify a need to improve “Communication,” while all of the other cohorts with fewer years in service see this as a consideration.
- 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,” “Healthcare,” “EMS,” and “Unemployed” categories. As expected, the 10-29-year groups have more than expected numbers of firefighters in the fire service, and the most tenured group has higher than expected numbers of firefighters with a “Retired” response.
- Initially, firefighters in the 0-9-year group favor “Personal Fulfillment,” “Career Experience,” “EMS Response,” and “Service to my Community,” but this changes with employment to higher values mainly for “Career Experience.” Firefighters in the middle cohorts favor “Personal Fulfillment” and “Family Connection,” but these choices change with continuing service. The most tenured firefighters (30-69-year group) have higher than expected values for “Service to my Community,” and “Fire Response,” but with continuing service switch to “Personal Fulfillment,” and “Administrative Duties”– which corroborates the finding from Phase I.
- Overall, the “Reasons for Others Leaving the Fire Service” has the most disparity between “Years in Service” cohort groups.
  - Firefighters with fewer years in service consider “Station Politics” and “Fitting In” as reasons why others left the service. Firefighters with more years in service believe that others left due to “Time Commitment” and “Couldn’t Meet Training.”
  - In the correlation analysis, the groups with the least and most seniority have polar opposite results for eight of the twelve leading reasons why others have left the fire service.
- For the “Leadership Issues,” a few trends are noteworthy.
  - Firefighters early and late in their careers have lower than expected values for “Leadership Issues,” but nearly half of the respondents in the 0-9-year group note issues.
  - Conversely, the findings indicate that higher than expected number of firefighters in the 10-29-year groups have concerns with “Leadership.”
  - Among the ranks of firefighters, “Chiefs” and “Other” do not have concerns, but “Chief Officer,” “Company Officer,” and “Firefighters” have higher than expected numbers of firefighters with “Leadership Issues.”
  - Lower than expected numbers of Volunteer firefighters have issues with “Leadership.” However, 44% of the Volunteer respondents indicate that this is an issue.

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## **Introduction**

In the winter of 2013, the Virginia Fire Chiefs Association and the International Association of Fire Chiefs (IAFC) administered a survey regarding recruitment and retention issues as perceived by Virginia 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 (Survey Monkey). By the conclusion of the survey, the tally included 1,473 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 Virginia firefighters.

## **Background and Overview**

After careful review of the recruitment and retention survey results from Phase I, officials decided to expand the questionnaire for Phase II. The update from the previous format with 15 questions for each respondent now includes 44 questions; however, the format has two sections for the respondent population, 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 2-24), while Career firefighters respond to the second track of questions (Questions 25-44). 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 December 2013 and March 2014.

## **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 two to five questions that have multiple formats. See Appendix A for a list of the specific questions.

### **Service and Personal Information Categories**

1. Service information (Firefighter Status, Departmental Location, and Current Rank)
2. Service details (Months to Membership, Months to Become an IDLH Firefighter, and Years in Service)
3. Joining and Motivations (“Learning about the Fire Service,” Initial Motivations for Joining the Fire Service, and Continuing Motivations)
4. Personal demographics (ZIP Code, Occupation, and Age)

### **Firefighter Opinion Categories:**

5. Recruitment and Retention (Recruiting Methods, Retention Strategies, Retention Effectiveness, Reasons for Leaving the Fire Service, and Exit Interviews)
6. Leadership Issues (Leadership Issues and Levels of Leadership Issues)
7. Areas in Need (Areas in Need of Improvement and Areas that Need More Training)

## 8. 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.

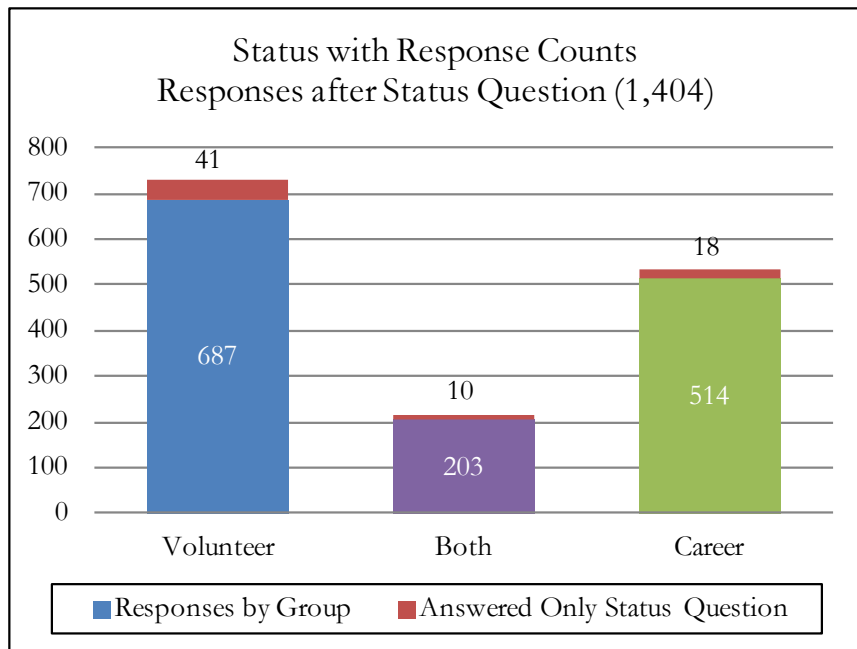
### **Potential Analytical Methods**

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 Chi Squared 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 Survey Monkey tally includes responses from 1,473 firefighters. Of this group, 4.7% of the respondents (n=69) 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 a similar response pattern in Phase I, where 4.8% of the firefighters (n=86 out of 1,805 respondents) did not respond to the majority of the questions. In the Phase I survey report, the analysis does not include respondents who left the majority of the questions blank. Similarly, this analysis excludes the 69 firefighters who did not respond beyond the initial status question. With the exclusion of non-responders, this Phase II analysis includes responses from 95.3% (n=1,404) of the original respondents (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 lists 23 questions for Volunteer/Both firefighters and 20 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=687), Both (n=203), and Career (n=514). 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 91% response rate, and the overall response rate is 2.6% higher than in Phase I (91.6% compared to 89% after excluding non-responders).

**Table 1: Group Response Rates throughout the Survey**

Topic	Volunteer Respondents	Response Rate	Both Respondents	Response Rate	Career Respondents	Response Rate	Total Respondents	Response Rate
1. Status***	728		213		532		1473	
2. Department Location	687	100%	203	100%	514	100%	1404	100%
3. Rank	687	100%	203	100%	514	100%	1404	100%
4. Primary ZIP Code	687	100%	203	100%	514	100%	1404	100%
5. Occupation	687	100%	203	100%	N/A	N/A	890	100%
6. Years in Service	687	100%	203	100%	514	100%	1404	100%
7. Age	687	100%	203	100%	514	100%	1404	100%
8. Learning about the Fire Service*	655	95%	197	97%	496	96%	1348	96%
9. Primary Motivation	653	95%	197	97%	496	96%	1346	96%
10. Months to Membership	655	95%	197	97%	N/A	N/A	852	96%
11. Months to IDLH Firefighter	653	95%	197	97%	N/A	N/A	850	96%
12. Minimum Certifications*	653	95%	197	97%	496	96%	1346	96%
13. Recruitment Methods*	654	95%	197	97%	496	96%	1347	96%
14. Motivations to Continue Service	635	92%	191	94%	473	92%	1299	93%
15. Retention Strategies*	638	93%	190	94%	474	92%	1302	93%
16. Retention Strategies Effectiveness	635	92%	191	94%	473	92%	1299	93%
17. Reasons for Leaving**	635	92%	191	94%	473	92%	1299	93%
18. Exit Interviews	635	92%	191	94%	473	92%	1299	93%
19. Leadership Issues	630	92%	189	93%	467	91%	1286	92%
20. Level of Leadership Issues*	630	92%	189	93%	467	91%	1286	92%
21. Areas that Need Improvement*	630	92%	189	93%	467	91%	1286	92%
22. Areas that Need Training*	630	92%	189	93%	467	91%	1286	92%
23. Training Methods*	630	92%	189	93%	467	91%	1286	92%
24. Training Times	630	92%	189	93%	467	91%	1286	92%
Possible Respondents	687		203		514		1404	100%
* Multiple-choice questions (n=8)								
** Multiple-choice questions with the option to pick three responses (n=1)								
*** Respondents answering only Status question (Volunteer n=41; Both n=10; Career n=18) - Not included								
Questions with an opportunity to respond with a text explanation of an "Other" response								

## ‘Other’ Responses

Several questions give the respondent the opportunity to choose an “Other” response. With ten of these questions (Table 1 - red text), the respondent has the opportunity to explain the choice of “Other” as a selection (Rank and Occupation have “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 ten questions (See individual questions for an analysis of these responses).

## Non-mutually Exclusive Questions

For eight of the questions (Table 1 and Table 2), 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. Since many of the firefighters chose to include additional comments as well, the total number of responses also reflects these additions. While higher response rates generally connotes 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, “Retention Strategies” has the highest overall response rate (Career - 6.7 responses per respondent), while “Levels of Leadership Issues” has the second to lowest response rates for all of the groups (Volunteer – 1.6; Both – 1.8; and Career – 1.9 responses per respondent). “Learning about the Fire Service” (Enlistment) has the lowest response rate (Both - 1.5 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,” for the Volunteer group, Career or Both firefighter groups have the highest response rates for each of the multiple-choice questions (Table 2 – 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 for the Volunteer and Both groups (23 and 3 explanations/comments, respectively). However, because it reflects an additional 29 comments from firefighters, the Career response rate for this question (3.1 responses/respondent) is slightly higher than expected (17 associated with the 18 “Other” responses; 12 additional comments).

**Table 2: Response Rate per Multiple-choice Questions**

Topic	Volunteer			Both			Career			Total		
	Responses	Respondents	Rate	Responses	Respondents	Rate	Responses	Respondents	Rate	Responses	Respondents	Rate
8. Learning about the Fire Service*	1066	655	1.6	292	197	1.5	842	496	1.7	2200	1348	1.6
12. Minimum Certifications*	2530	653	3.9	775	197	3.9	2851	496	5.7	6156	1346	4.6
13. Recruitment Methods*	3646	654	5.6	939	197	4.8	2448	496	4.9	7033	1347	5.2
15. Retention Strategies*	2906	638	4.6	820	190	4.3	3161	474	6.7	6887	1302	5.3
17. Reasons for Leaving**	1928	635	3.0	576	191	3.0	1448	473	3.1	3952	1299	3.0
20. Level of Leadership Issues*	1030	630	1.6	346	189	1.8	899	467	1.9	2275	1286	1.8
21. Areas that Need Improvement*	3044	630	4.8	1223	189	6.5	2815	467	6.0	7082	1286	5.5
22. Areas that Need Training*	2886	630	4.6	1181	189	6.2	2535	467	5.4	6602	1286	5.1
23. Training Methods*	1588	630	2.5	437	189	2.3	1192	467	2.6	3217	1286	2.5
Possible Respondents		687			203			514			1404	
* Multiple-choice questions (n=8)												
** Multiple-choice questions with the option to pick three responses (n=1)												
Includes all responses ("Other" explanations or additional comments)												
Largest response rate for question												

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

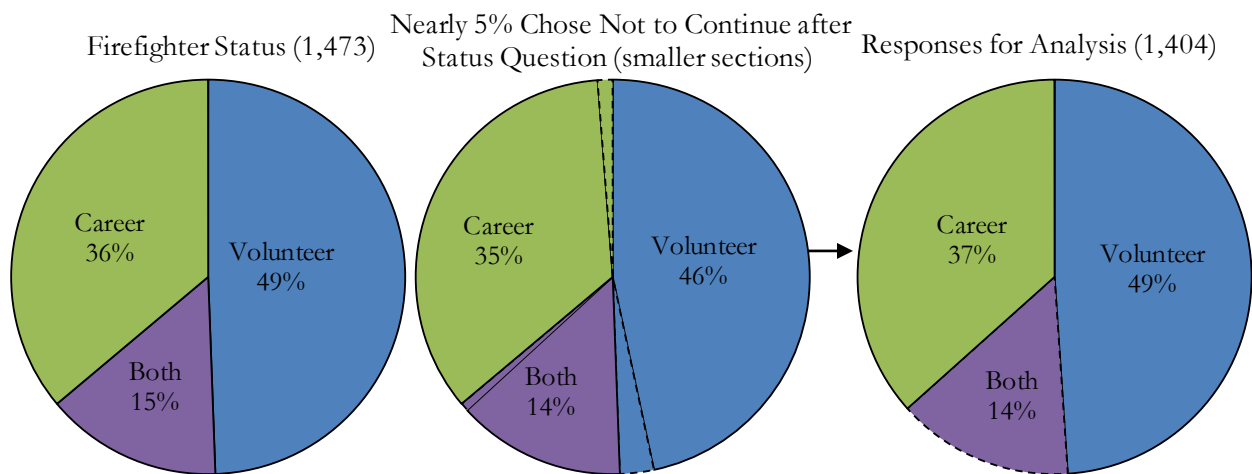
For this descriptive analysis, the analysts discuss each of the 24 survey questions within three broad categories: Service-related firefighter information (8 questions), personal information (3 questions), and firefighter opinions (11 questions). Due to similarities in responses, two of the descriptive analyses combine questions for motivations (“Initial Motivations” and Continuing Motivations”) and memberships (“Months to Membership” and “Months to IDLH Firefighter”). Question 1, which is a service-related question, breaks down the respondents into groups that remain for the rest of the survey questions.

### 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 (49%), Fairfax County (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, 1,473 firefighters (Volunteer n=728; Both n=213; Career n=532) chose to access the survey online and answer this question. Subsequently, 69 firefighters (Volunteer n=41 (3%); Both n=10 (1%); Career n=18 (n=1%)) did not continue beyond this question. Consequently, this analysis does not include the 69 non-respondents to further questions. Overall, nearly half of the respondents have a Volunteer designation (49%) with the other half designated as Both (14%) and Career (37%) (Figure 2).



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

## Departmental Locations

In the second question, the firefighters list their departmental locations. Table 3 lists all of the locations with greater than 2% of each group's responses (64% of Total Respondents). In total, the survey includes respondents from 123 unique locations (about 90% of Virginia's jurisdictions) (Volunteer 44%; Both 30%; Career 26%). Leading respondent locations within each group include Fairfax County (Career n=179), Loudoun County (Volunteer n=86), and Prince William County (Both n=11). In Table 3, the color-coded entries for leading departments show that Fairfax County is the only one that is common to all three groups. Overall, the top-five departments: Fairfax, Loudoun, Prince William, and Albemarle Counties, along with Hampton comprise 37% of the total entries for departmental locations.

**Table 3: Respondents' Departmental Locations by Group and Overall Leading Departmental Locations (inset)**

Leading Department Locations (Minimum 2% per Group)										
	Volunteer		Both		Career					
	Total Locations (n=99)		Total Locations (n=69)		Total Locations (n=58)					
1	Loudoun	13%	Prince William	5%	Fairfax County	35%				
2	Prince William	11%	James City	5%	Hampton	9%				
3	Albemarle	7%	Stafford	4%	Henrico	7%				
4	Fairfax County	3%	Fauquier	4%	Newport News	7%				
5	Culpeper	3%	Loudoun	3%	Albemarle	4%				
6	Fairfax City	2%	Southampton	3%	Williamsburg	4%				
7	Botetourt	2%	Shenandoah	3%	James City	4%				
8	Spotsylvania	2%	Gloucester	3%	Virginia Beach	2%				
9	Shenandoah	2%	Henry	3%	Chesterfield	2%				
10	Augusta	2%	Fairfax County	2%	Richmond (City)	2%				
11	King George	2%	Clarke	2%	Salem	2%				
12	Clarke	2%	Warren	2%						
13	Smyth	2%	Culpeper	2%	Overall Leading Locations	Count	Total			
14	Powhatan	2%	Rockbridge	2%				Fairfax County	208	15%
15			Powhatan	2%				Loudoun	93	7%
16			Spotsylvania	2%				Prince William	87	6%
17			Fluvanna	2%				Albemarle	66	5%
18			Augusta	2%				Hampton	51	4%
19			Hampton	2%						
Others	Other Locations (n=85)	45%	Other Locations (n=50)	43%	Other Locations (n=47)	23%				
Totals	Volunteer (687)	100%	Both (203)	100%	Career (514)	100%				

### Current Rank within the Fire Service

The majority of respondents for each of the groups hold the rank of Firefighter (Volunteer n=299 (44%); Both n=101 (50%); Career n=197 (38%); All n=597 (43%)). Half of the respondents in the Both group hold the rank of Firefighter. The findings also indicate that on a percentage basis within each group, nearly twice as many Career firefighters (n=177 (34%)) are Company Officers compared to the percentages in the Volunteer (n=126 (18%)) and Both groups (n=36 (18%)). The opposite is true for Chiefs, where the Volunteer (n=114 (17%)) and Both (n=27 (13%)) percentages are more than double the percentages for the Career group (n=27 (5%)) – even though the total number of respondents are equal for the Career and Both groups. Overall, 10% (Other n=146) of the respondents are not a Chief, Chief Officer, Company Officer, or Firefighter.

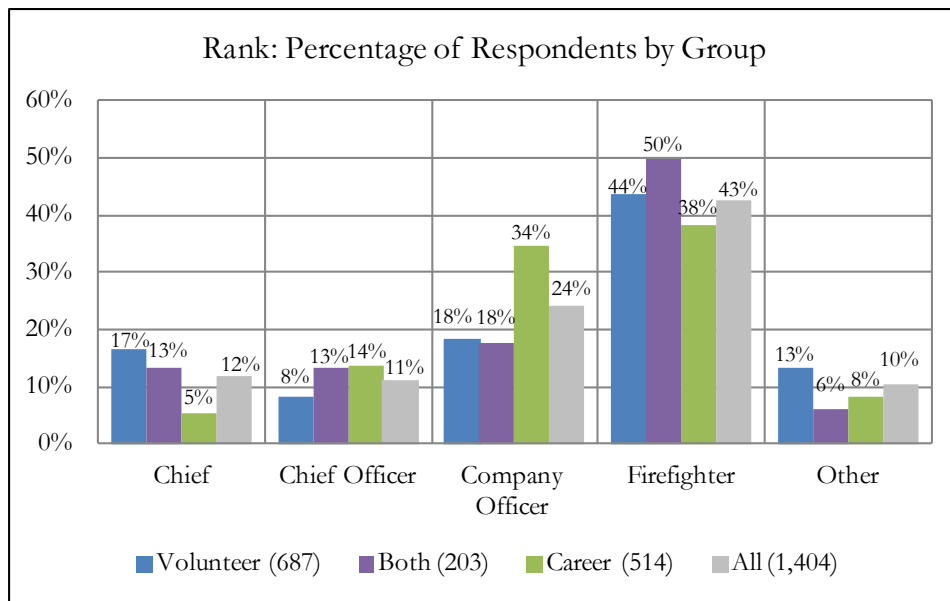


Figure 3: Current Rank within the Fire Service

### Reasons for Joining - Learning about Opportunities within the Fire Service

The leading responses by respondents in each group for “Learning about the Fire Service” are Family or Friend Referral (51%), Word of Mouth (WOM) (29%), and Firefighter Referral (48%) (Table 4 and Figure 4).

- Referrals (EMS n=60 (3%); Family or Friend n=681 (31%), Firefighter n=306 (14%), and Word of Mouth (WOM) n=395 (18%)) account for 66% of the total number of responses.
- Sixty-four percent of the Volunteer (n=683) and Career (n=217) responses and 74% of the Both (n=542) responses are referrals (Average 66% for all groups).

**Table 4: Reasons for Joining - Referral Responses and Overall Survey Percentages**

Reasons For Joining - Referrals	Volunteer	Both	Career	Total	%
EMS Referral	28	6	26	60	3%
Family or Friend Referral	323	118	240	681	31%
Firefighter Referral	146	48	112	306	14%
Word of Mouth (WOM)	186	45	164	395	18%
Totals	683	217	542	1442	66%
Percentage (%) of Responses per Group	64%	74%	64%	66%	
Total responses for question (n=2,200)					

The fourth leading response is Fire Station/Open House with 12% of the total number of respondents (n=157; Volunteer n=81; Both n=30; Career n=46). With the exceptions of Website/Email/Internet Search, Community Events, and Explain “Other,” fewer than 5% of the overall respondents chose the remaining selections. Five percent of the Volunteer respondents (n=32) chose not to answer this question. None of the respondents chose “Twitter” as a reason for joining the fire service. Overall, similar to Phase I where Friend or Family Referral and Personal Contact with a Firefighter were the leading reasons to join the fire service, the leading responses relating to referrals account for nearly two-thirds of the total number of responses (n=2,200) in Phase II.

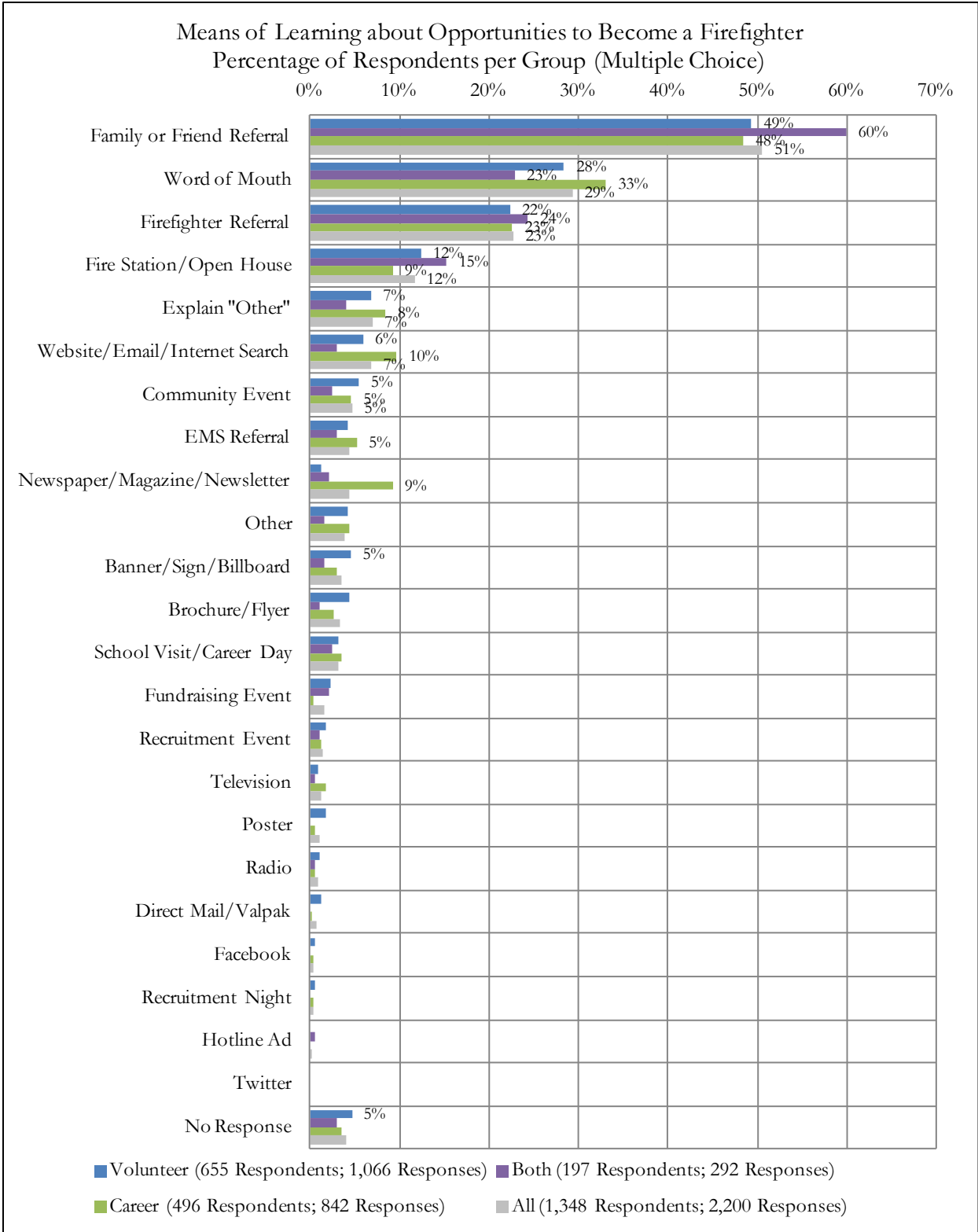
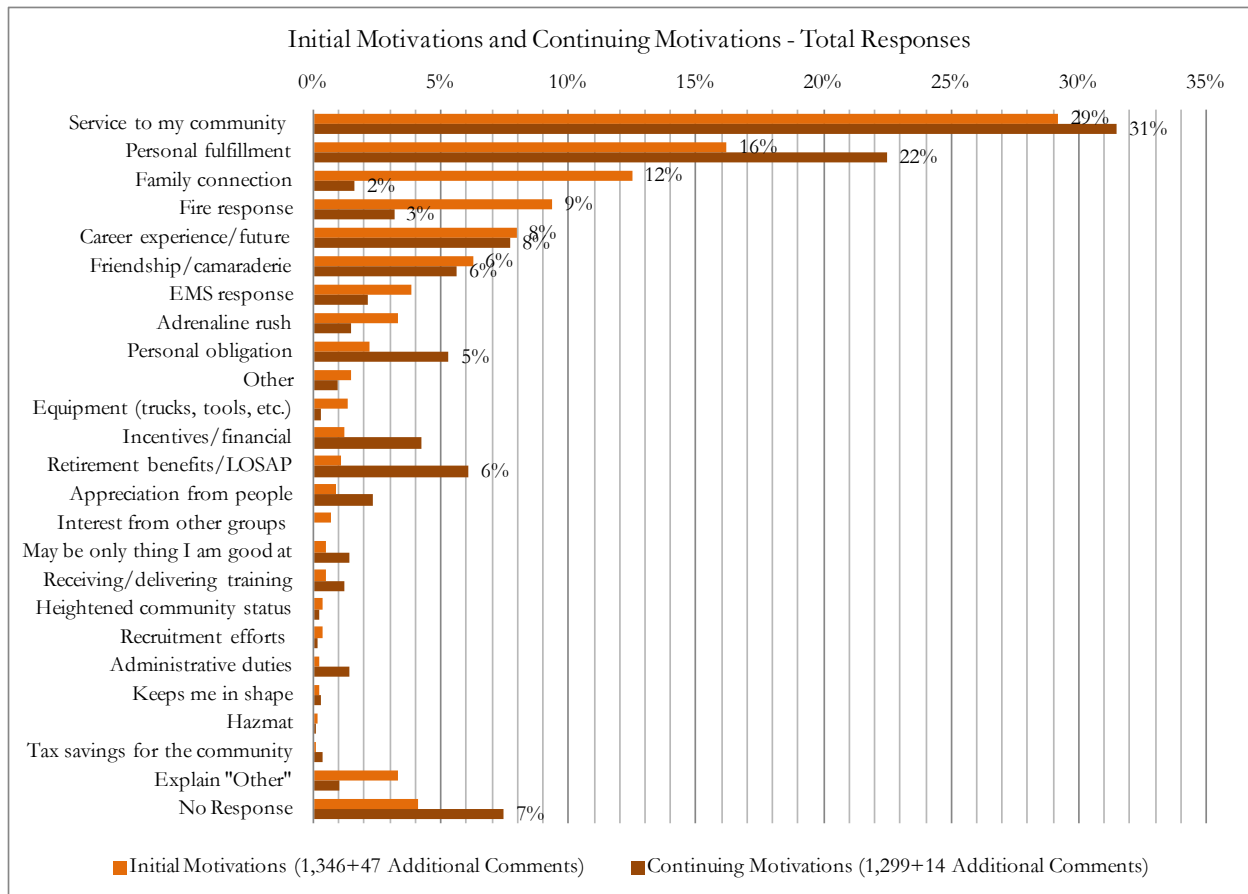


Figure 4: Reasons for Joining or Learning about the Fire Service – Percentage of Respondents per Group

### Initial Primary Motivations and Primary Motivations for Continuing to Serve

Officials include two questions relating to motivations in the survey. The goal is to determine the levels of motivations at the beginning with joining the fire service and later with continuing to serve within a department. Changes over time are also relevant. To compare the overall responses, Figure 5 enumerates the totals for each question. Since these two questions have similar response structures and graphing the results together can easily detect differences throughout time, the tally and graphics for this section include a combination of the responses at the group level in one graphic (Figure 6). In a comparison for change, Table 5 lists the responses that remain unchanged, and Table 6 specifies the differences between motivations throughout service.



**Figure 5: Initial Motivations and Continuing Motivations - Total Responses**

Generally, the responses between initial and subsequent assessments of firefighter motivations are quite similar – usually within 3% of each other. Service to my Community (n=393 Initial; n=409 Continuing) and Personal Fulfillment (n=218 Initial; n=292 Continuing) lead both categories, but Family Connection (n=168 Initial; n=21 Continuing) and Career Experience (n=107 Initial; n=100 Continuing) place third in their respective groups. Apart from these responses, only two differences between the assessments are greater than a 3% change. Fire Response (n=126 Initial; n=41 Continuing) decreases by 6% with time, while Retirement Benefits (n=15 Initial; n=79 Continuing) increase by 5%.



Initial and Continuing Motivations to Join and Continue in the Fire Service  
 Percentage of Respondents by Group

\*All Respondents May Enter an Additional Explanation for Their Response

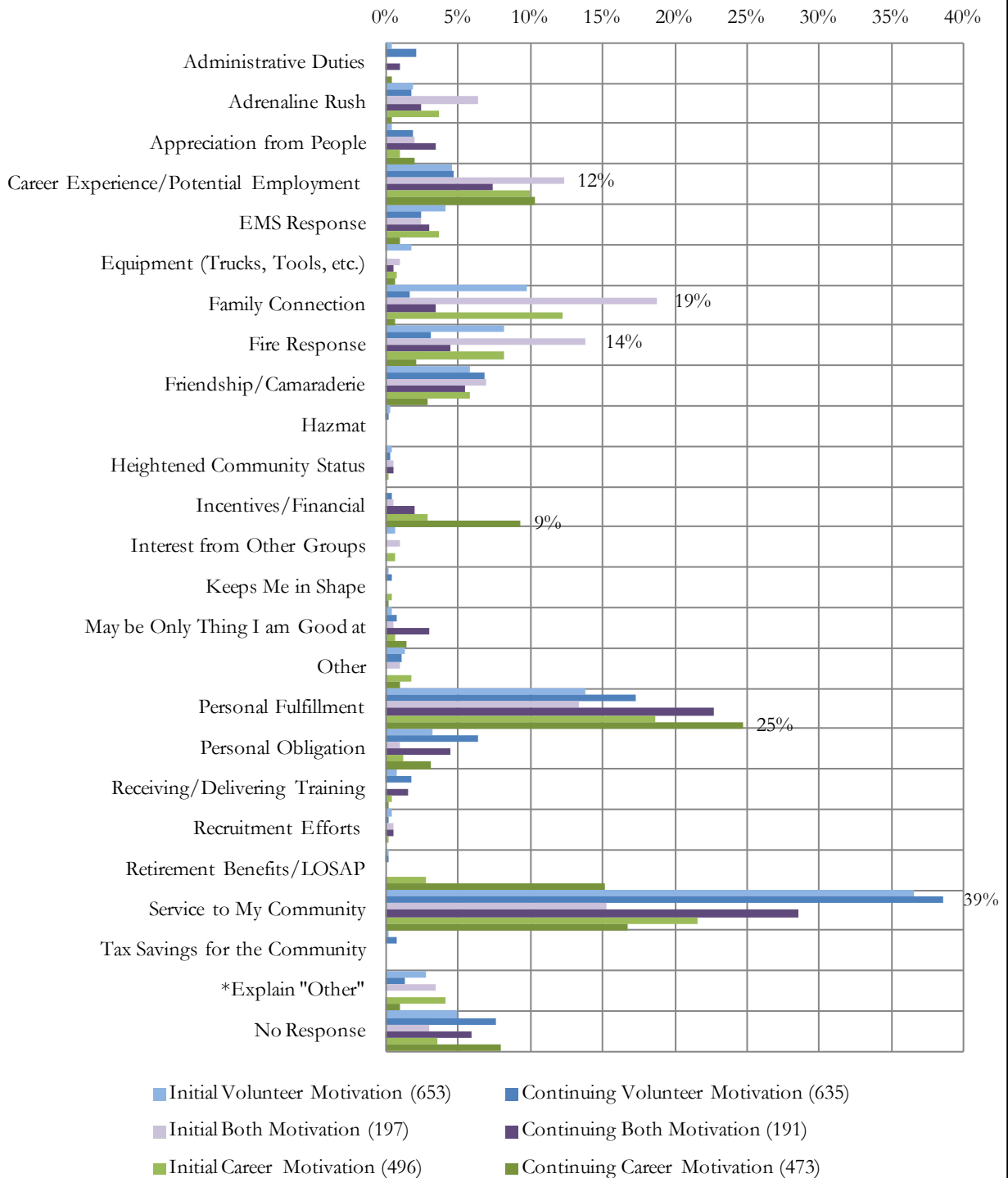


Figure 6: Motivations

At the group level, most of the primary motivating factors remain consistent throughout time as the respondent serves within the departments. An example is Career Experience where the motivations (Initial - Volunteer n=31 (5%); Both n=25 (12%); Career n=51 (10%)) (Continuing - Volunteer n=32 (5%); Both (n=15 (7%); Career n=53 (10%)) remain nearly unchanged - with the exception of the Both group for whom Career Experience becomes less relevant as a motivational factor through time. The responses for Family Connection and Fire Response also become less relevant as motivating factors through time. For both of the motivations, the decreases are notable. Family Connection begins at higher levels, but drop to negligible ones (Initial - Volunteer n=67 (10%); Both n=38 (19%); Career n=63 (12%)) (Continuing - Volunteer n=11 (2%); Both n=7 (3%); Career n=3 (1%)). Fire Response follows a similar pattern with less of a change through time (Initial - Volunteer n=56 (8%); Both n=28 (14%); Career n=42 (8%)) (Continuing - Volunteer n=21 (3%); Both n=9 (4%); Career n=11 (2%)). Conversely, Personal fulfillment and Personal Obligation improve as motivating factors through time. Personal fulfillment (Initial - Volunteer n=95 (14%); Both n=27 (13%); Career n=96 (19%)) (Continuing - Volunteer n=119 (17%); Both n=46 (23%); Career n=127 (25%)) increases are notable. Although Personal Obligation responses begin at near negligible levels (Both – below minimal levels for sample size), the category does show an increase as a motivating factor through service in the departments. (Initial - Volunteer n=22 (3%); Both n=2 (1%); Career n=6 (1%)) (Continuing - Volunteer n=44 (6%); Both n=9 (4%); Career n=16 (3%)).

Evaluating the responses at the individual level can also glean additional information on motivational changes. Splitting the responses into two groups – similar and different – between motivations can also glean important information. According to the findings, only two responses remain motivating factor greater than 50% of the time – Retirement Benefits and Service to my Community (Table 5). Overall, 38% of the initial motivations continue to motivate firefighters through their careers.

Throughout time, the majority of the motivations will change for firefighters. In this survey, the respondents indicate a 62% change rate, but this number may be masking some key changes. Table 6 enumerates all of the changes from the initial ones. The totals on the right column are losses from the initial motivational count, while the totals in the bottom row are the gains from other respondents changing their motivations into a category. 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, “Service to my Community” loses 158 respondents, but gains 174, which is not as simple as a mere gain of 16 responses. The leading categories with losses include Service to my community, Family Connection, Personal Fulfillment, Fire Response, and Career Experiences. On the contrary, Personal Fulfillment, Service to my Community, Retirement, Career Experience, and Friendship all gain motivational responses from other respondents.

**Table 5: Similarities between Motivational Responses (Initial and Continuing - same)**

Similarities Motivational Responses	Initial Motivation Responses	Same Continuing Motivation Responses	Percentage Unchanged	Percentage Changed See Table 6
Administrative Duties	3	1	33%	67%
Adrenaline Rush	45	5	11%	89%
Appredation from People	12	5	42%	58%
Career experience	107	33	31%	69%
EMS Response	52	17	33%	67%
Equipment (trucks, tools, etc)	18	2	11%	89%
Family Connection	168	14	8%	92%
Fire Response	126	25	20%	80%
Friendship/Camaraderie	84	13	15%	85%
Hazmat	2	1	50%	50%
Heightened Community Status	5	0	0%	100%
Incentives/Financial	16	4	25%	75%
Interest from Other Groups	9	0	0%	100%
Keeps me in Shape	3	1	33%	67%
May be Only Thing I am Good at	7	2	29%	71%
Other	20	1	5%	95%
Personal Fulfillment	218	98	45%	55%
Personal Obligation	30	13	43%	57%
Receiving/Delivering Training	7	2	29%	71%
Recruitment Efforts	5	0	0%	100%
Retirement Benefits/LOSAP	15	9	60%	40%
Service to my Community	393	235	60%	40%
Tax Savings for the Community	1	0	0%	100%
No Response (Blank)	58	58	100%	0%
Total	1404	539	38%	62%
Red Text - Top-five Initial Motivations				
Highlighted Text - Greater than 50% Unchanged				

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

Motivational Changes: Differences between Initial Motivations (y-rows) and Continuing Motivations (x-columns) with Service																										
Continuing Motivations Count	18	19	30	100	28	4	21	41	73	1	3	55	0	4	18	12	292	69	16	2	79	409	5	105	1404	
Initial Motivations Count	Administrative duties	Adrenaline rush	Appreciation from people	Career experience	EMS response	Equipment (trucks, tools, etc.)	Family connection	Fire response	Friendship/camaraderie	Hazmat	Heightened community status	Incentives/financial	Interest from other groups	Keeps me in shape	May be only thing I am good at	Other	Personal fulfillment	Personal obligation	Receiving/delivering training	Recruitment efforts	Retirement benefits/ (LOSAP)	Service to my community	Tax savings for the community	No Response (Blank)	Total (Losses from Initial)	
3	Administrative duties	1					1		1																2	
45	Adrenaline rush	1	5		2	1	1	1	7			3			1		9	2	1		2	7			2	40
12	Appreciation from people			5	2												4	1								7
107	Career experience	1	4	3	33	1	1	4	6			11			2		15	5	1		5	13		2	74	
52	EMS response			2	2	17		1	3			5			1		11	1	1		1	4	1	2	35	
18	Equipment (trucks, tools, etc.)	2			1	2			1			1					5	2							16	
168	Family connection	4	1	1	11	1	1	14	4	9	2	5			3	2	46	7			5	42	1	9	154	
126	Fire response		1	5	3	4	1	25	4		1	3			4		25	7	1		7	31	1	3	101	
84	Friendship/camaraderie		1	4	5			2	2	13			3			1	21	3	1		2	20		6	71	
2	Hazmat									1													1		1	
5	Heightened community status							2			0						1	1	1						5	
16	Incentives/financial		1						1			4				1	1	1	1		5	2			12	
9	Interest from other groups			1					1				0				5						2		9	
3	Keeps me in shape								1					1				1							2	
7	May be only thing I am good at								1		1				2						1			2	5	
20	Other		1		2				2							1	4	1			1	7	1		19	
218	Personal fulfillment	2	2	2	14	3		1	9			6			2	3	98	16	2		20	31		7	120	
30	Personal obligation	1			2				1			1					5	13			1	5	1		17	
7	Receiving/delivering training				1							1						1	2				2		5	
5	Recruitment efforts														1						0	1	2	1	5	
15	Retirement benefits/ (LOSAP)				1			1				2					1					9		1	6	
393	Service to my community	6	3	7	21	1	2		13			9	3	2	4	4	41	9	5	1	19	235	1	11	158	
1	Tax savings for the community																						1	0	1	
58	No Response (Blank)																								58	0
1404	Total (Gains from Initial)	17	14	25	67	11	2	7	16	60	0	3	51	0	3	16	11	194	56	14	2	70	174	5	47	865

Center Diagonal - Results Unchanged from Initial Motivation and Primary Motivation to Continue (n=539; 38%) (539 unchanged + 865 changed = 1404)

Red Text: Changes greater than 10 respondents

Highlighting: Top-five Initial Motivations with Change (y - rows), Continuing Motivations with Change (x - columns), and Changes

## Years in Service

For the “Years in Service” question, officials changed the response type to a numerical entry - as opposed to a categorical one from Phase I. Because of the change in structure, the graphics can visualize each entry separately or categorize them into groups. The tally includes a submission from all of the firefighters taking the survey.

As expected, the largest number of respondents has less than 10 years in service (All n=399 (28%) (Figure 7). The Volunteer group (Volunteer n=250 (36%)) outnumbers the Both (Both n=49 (24%)) and Career groups (Career n=100 (19%)) and has 5 times as many Both respondents and 2.5 times as many Career firefighters with results in the survey. However, as time passes, the Volunteer group trends lower, but the Both and Career groups increase then decreases with 30 or more years in service. This trending generally matches the uncategorized graphic of “Years in Service” (Figure 8).

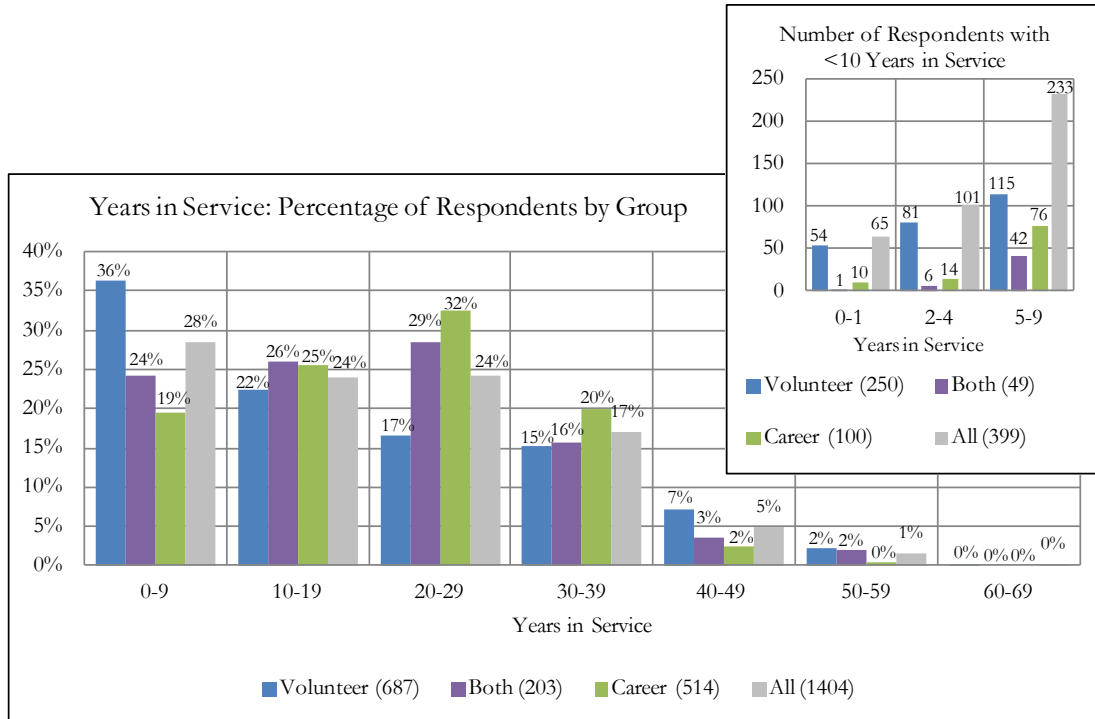


Figure 7: Years in Service - Categorized by Group (Insert: Number of Respondents <10 in Service)

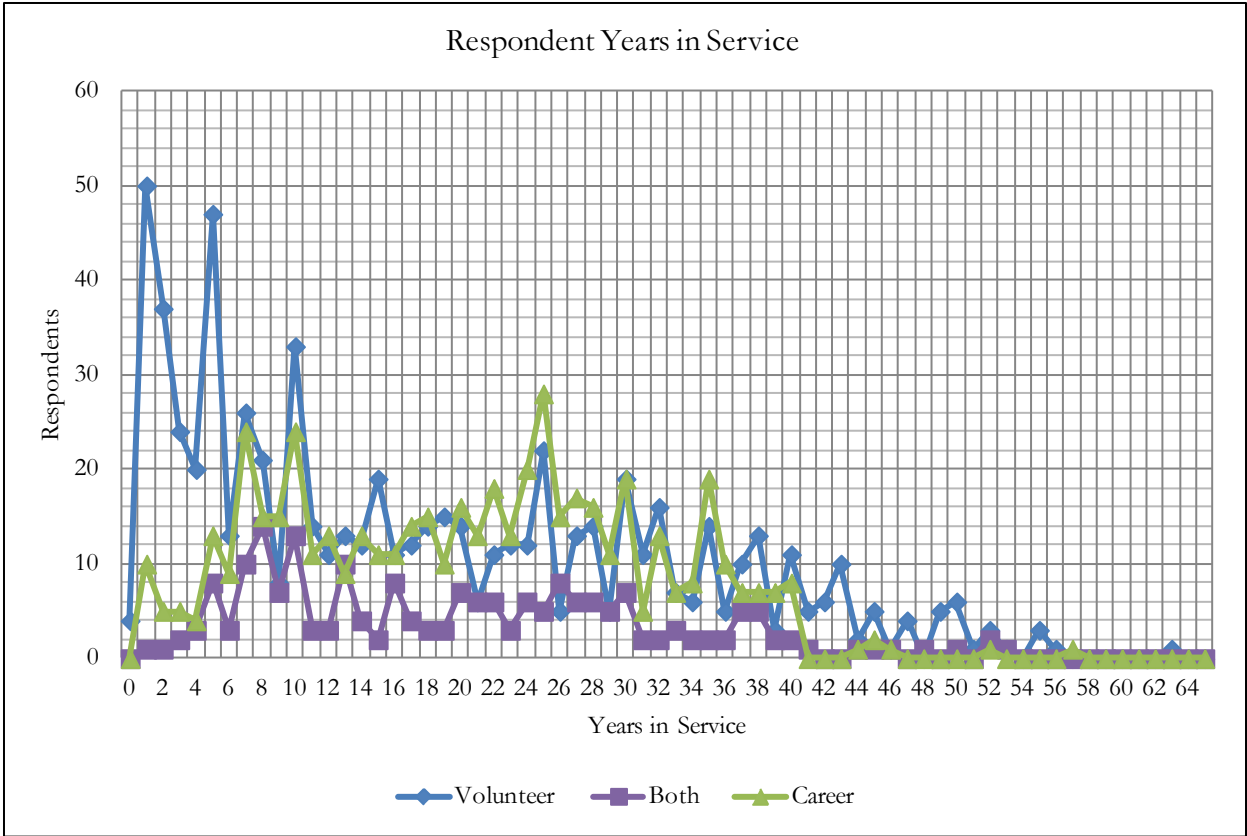
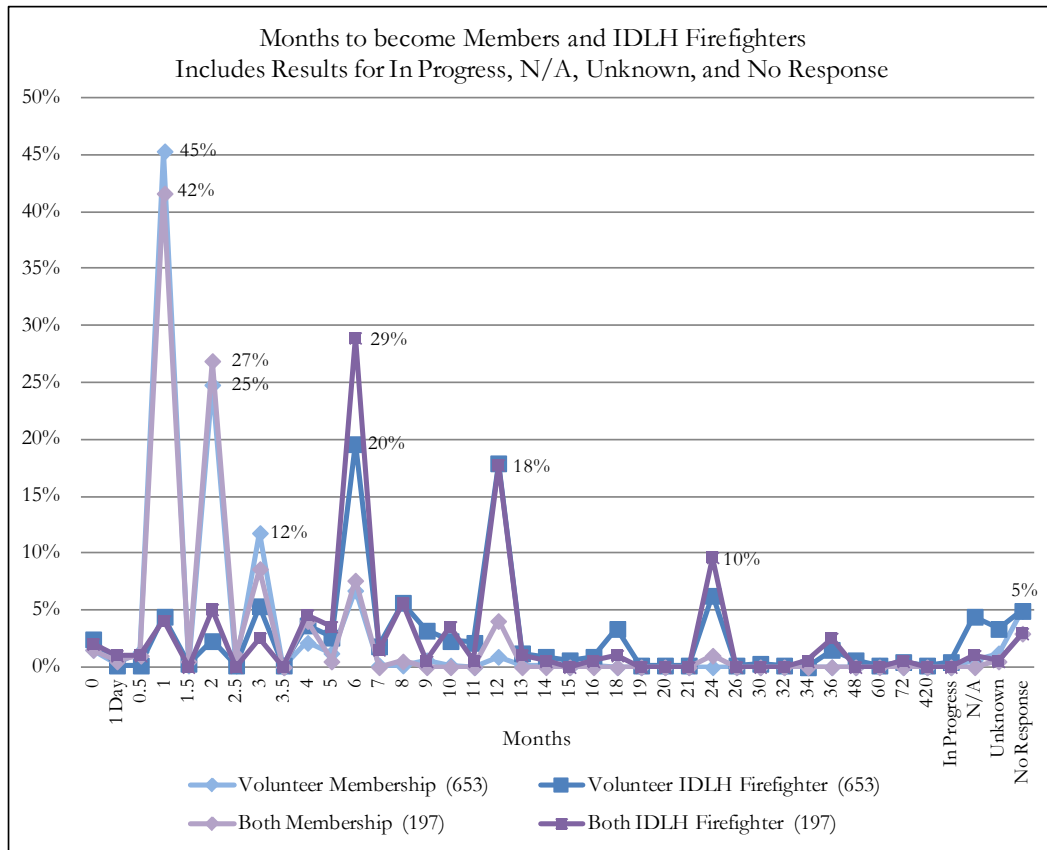


Figure 8: Years in Service

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. The questions do not apply to Career firefighters, but the results include separate responses from the Volunteer and Both groups. Each of these groups has “In Progress,” “Not Applicable,” and “Unknown” categories. Because the responses are not all numeric, some interpretation of the results into these categories is necessary (Figure 9).



**Figure 9: Months to Membership and IDLH Firefighter**

The majority of Volunteer/Both respondents become members within the first few months after filling out an application. In three months or less, 85% of the Volunteer respondents became members (Volunteer n=558), and 82% of the respondents in the Both group completed the process for membership. At six-month intervals for the first year, memberships increase. By twelve months, 98% of the Volunteer (Volunteer n=637) and Both (Both n=194) group respondents become members.

Months to become an IDLH firefighter takes longer and fewer members achieve the designation prior to 6 months of service. The greatest numbers of members become IDLH firefighters at six months (Volunteer n=128 (20%); Both n=57 (29%)). Eight percent of the Volunteer group (Volunteer n=54) is either “In Progress,” “N/A,” or “Unknown” compared to 2% of the Both respondents (Both n=3) in the same categories. By the end of one year, the majority of respondents are IDLH firefighters (Volunteer n=486 (74%); Both n=162 (82%)), but the totals are less than the members within the same time period.

### Minimum Certifications

For minimum certifications, 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 CPR with 73% and 72% of the overall respondents, respectively (Firefighter I - All n=971 (16% of responses) and CPR - All n=985 (16% of responses)). At the group level, fewer Career firefighters (61% of respondents) (Firefighter I - Volunteer n=515 (20% group responses); Both n=169 (22% group responses); Career n=301 (11% group responses) require Firefighter I as a minimal certification. However, more than twice as many Career firefighters indicate that Firefighter II (Volunteer (38%); Both (30%); Career (75%)) and EMT-B (Volunteer (14%); Both (20%); Career (70%)) are minimal required certifications.

About half of the respondents have Hazmat Awareness (All n=687), Firefighter II (All n=684), and Hazmat Operations as minimal certifications (All n=661). EMT-I, EMT-P, First Responder, None, Other, and Explain “Other” account for fewer than 5% each of the total 6,156 responses in the survey. See the percentages of respondents by group in Figure 10 (>5% include labels).

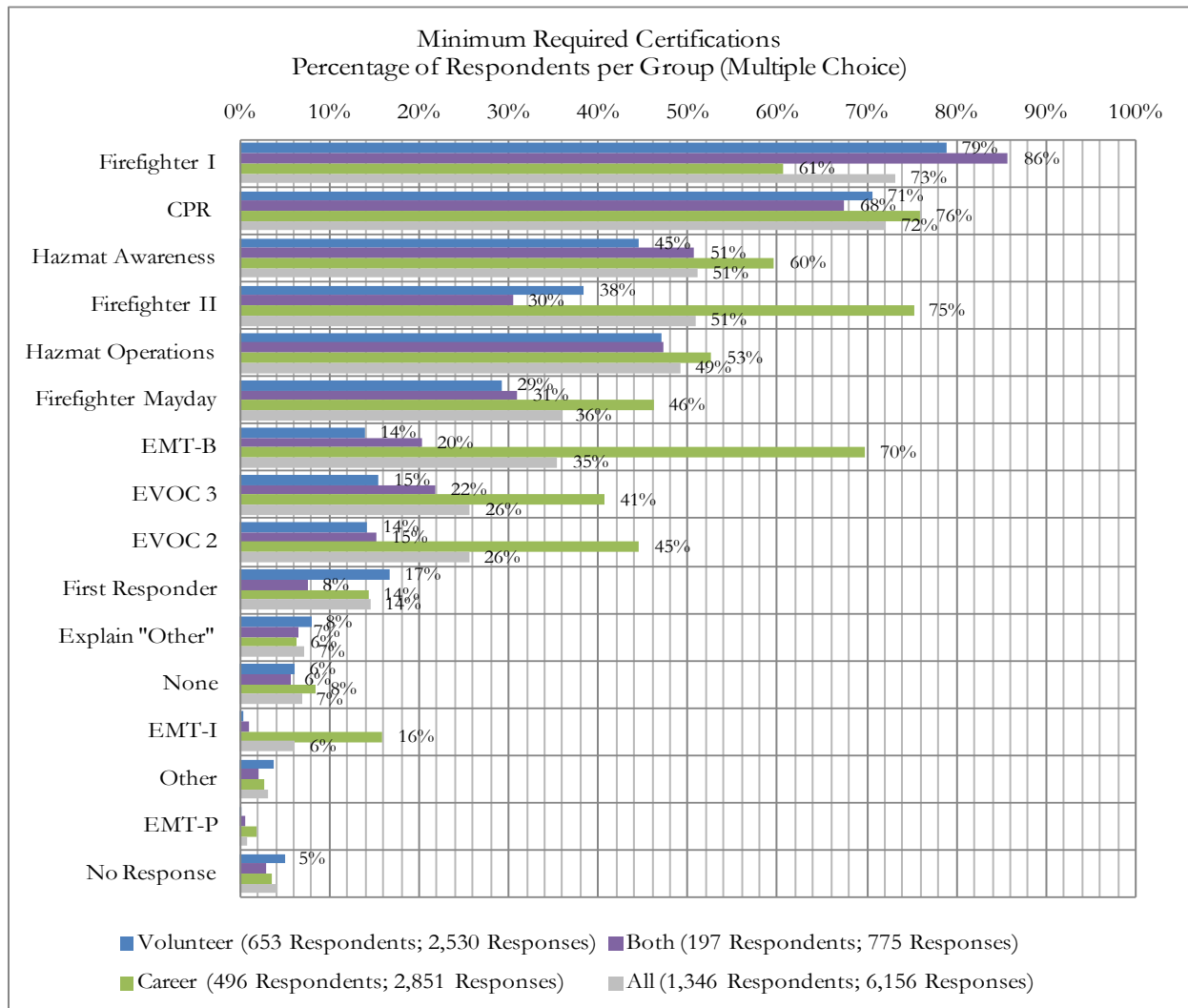


Figure 10: Minimum Certifications by Group



## Personal Firefighter Information

This survey requests that the respondents answer three personal questions relating to ZIP Code, Occupation, and 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 list for a response. Only the Volunteer/Both groups have this question on their list. All of the firefighters have a numerical response question about their age. This format is a structural change from Phase I, where respondents chose from a group. The final tally for these three questions includes a response from all of the firefighters in the appropriate groups.

### Primary Residence ZIP Codes

The 1,404 survey respondents list 665 unique ZIP Codes for their primary residences (Average 2.1 respondents/ZIP Code). To avoid disclosing the identity of many respondents, Table 7 only lists ZIP Codes with 4 or more respondents (Listed - Volunteer n=62; Both n=39; Career n=35; Total n=136 (10%)). Although other counts are higher, within the groups on a percentage basis, the only ZIP Code with more than 2% of its respondents is 23168 (Both - Toano n= 9 (4%)). Only two of the leading ZIP Codes have respondents in two groups (22193 Dale City/Woodbridge and 22554 Stafford). Due to the diversity of responses, more than 82% of the respondents in each group and 90% of the overall respondents live in ZIP Codes that are NOT on this list (Volunteer n=625; Both n=164; Career n=479; Total n=1,268 (90%)).

**Table 7: Primary Residence Locations and ZIP Codes**

Leading ZIP Codes of Respondents						
Listed ZIP Codes are 2% of each Group's Total Respondents (Exception 23168 Toano (4%))						
	Volunteer (296 ZIPs)		Both (126 ZIPs)		Career (243 ZIPs)	
1	20164	Sterling	23168	Toano	23188	Williamsburg
2	20132	Purcellville	22630	Riverton	23185	Williamsburg
3	22192	Prince William*	23139	Powhatan	20147	Ashburn
4	22193	Dale City*	22193	Dale City*	22554	Stafford
5	22485	King George**	22407	Fredericksburg		
6			22554	Stafford		
7			22611	Mt. Weather		
8			23072	Glass/Hayes		
Others	291 ZIPs	90%	118 ZIPs	82%	239 ZIPs	92%
Totals	Volunteer (687)		Both (203)		Career (514)	
	*Includes Woodbridge					
	** Includes Owens and Shiloh					

Occupation (Volunteer and Both Only)

The top-three Volunteer Primary Occupations are Retired (n=52 (8%)), Fire Service (n=39 (6%)), and Management (n=39 (6%)) (Figure 11). The remainder of the options (n=30) account for 5% or less (each) of the total respondents in the Volunteer group. As expected, the majority of the firefighters that are Both (Career and Volunteer) list Fire Service (n=180 (89%)), EMS (n=8 (4%)), and Retired (n=5 (2%)) as their Primary Occupations. The results include all of the respondents from the Volunteer and Both groups, but none of the Career firefighters (assume Fire Service as occupation).

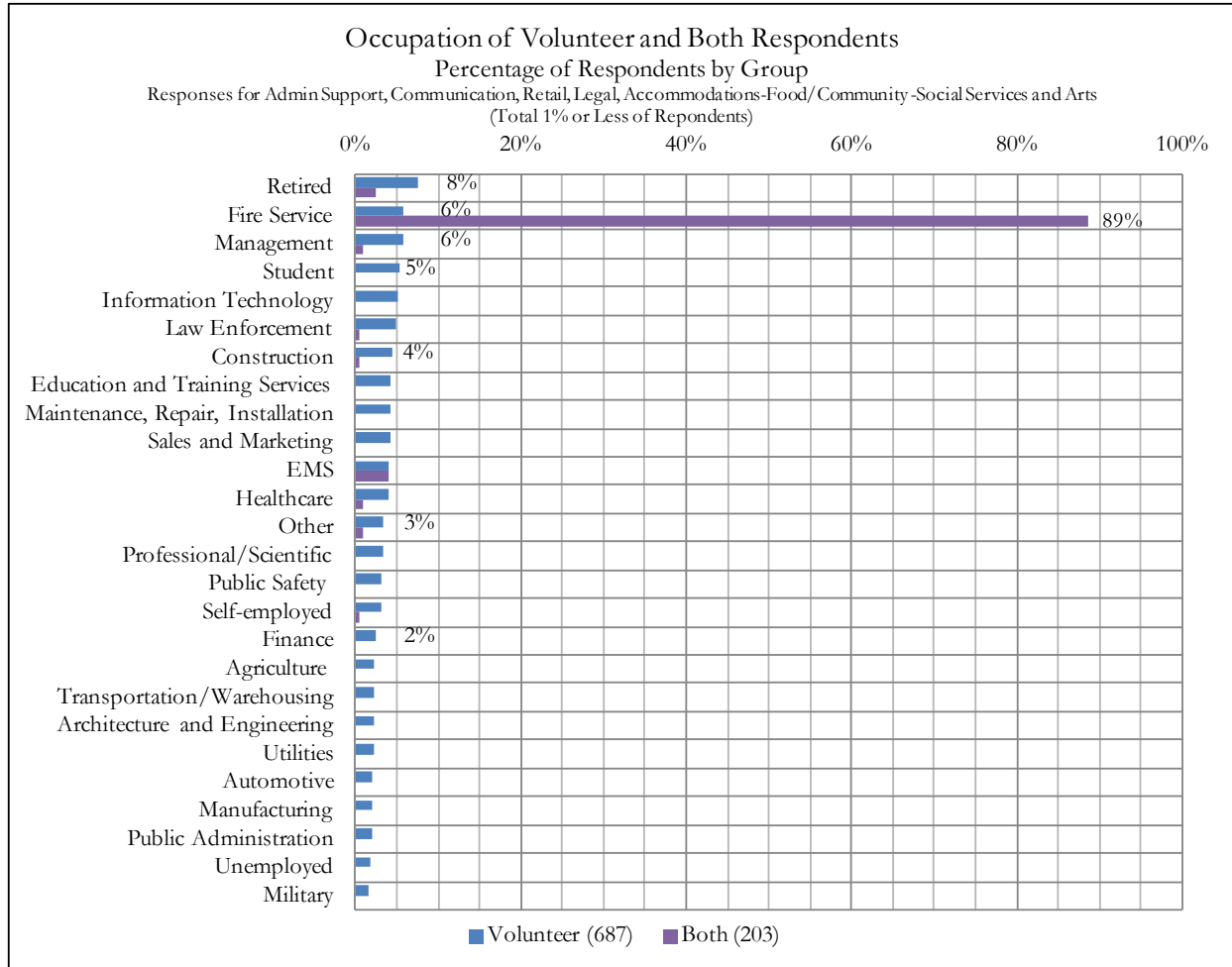
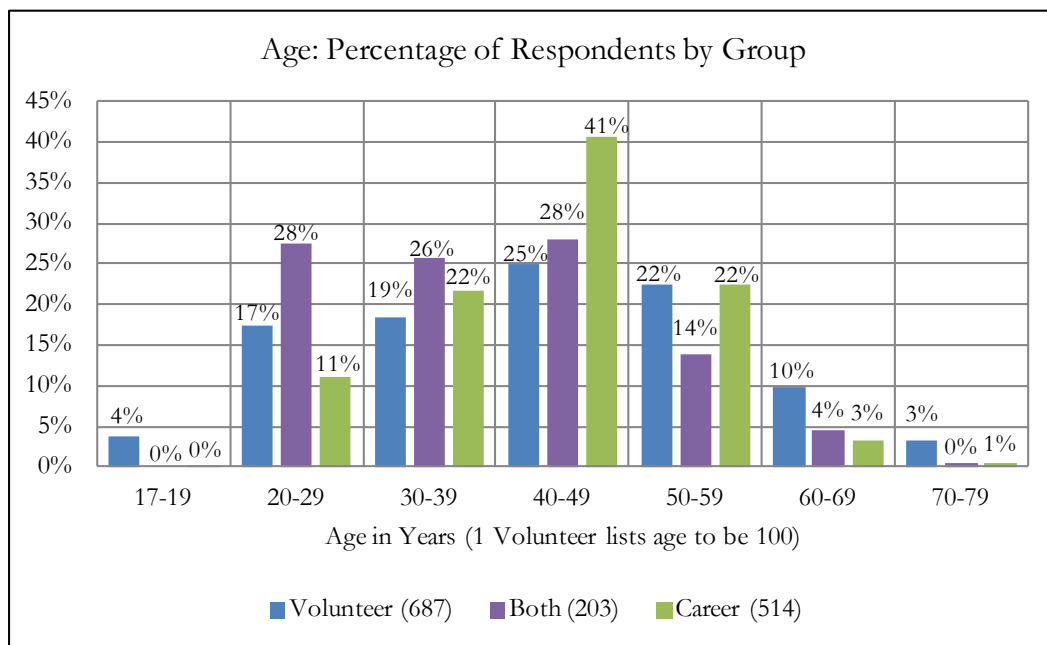


Figure 11: Occupation

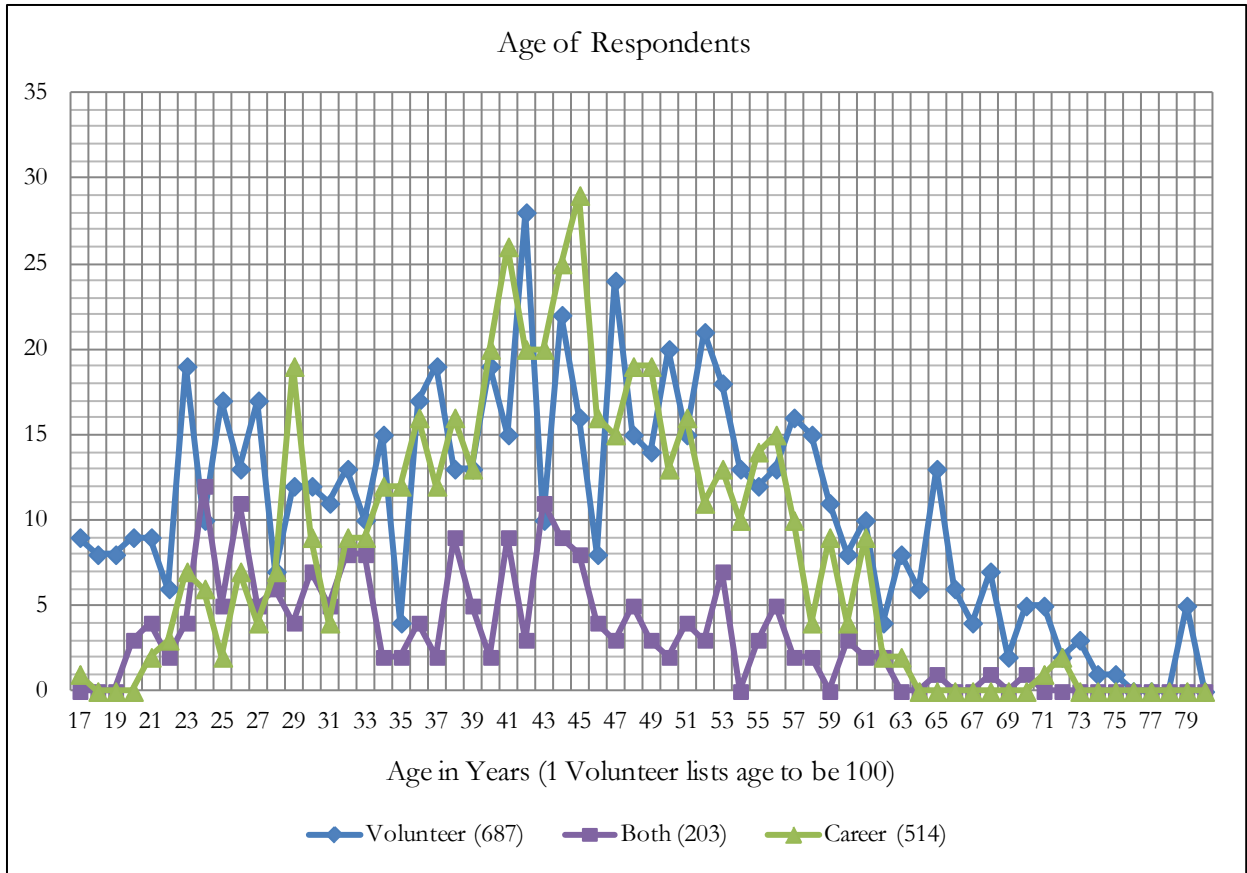
## Age of Firefighters

For this question, each respondent lists his or her age in a numerical response). With gathering numerical responses, as opposed to categorical ones, the analyst can vary the groupings as needed. With one exception where a Volunteer lists their age to be 100, but has only 1 year of service, none of the complications from Phase I with unusual age entries (0 or 99 years) appear in Phase II. However, subtracting the number of service years from the age of firefighters indicates that three of the respondents have starting ages with negative values – so either the ages or the service years are incorrect for these entries.

Generally, with the exception of the Both group for 20-29 year olds (28%) where the group is more than twice the percentage of Career firefighters (11%), the groups appear to follow a bell-shaped curve for age distribution. The majority of each group's respondents are 40-49 years of age. Four percent or less of the respondents is in the outer ranges of 17-19 or 70-79 years of age (Figure 12). Figure 13 shows the ages of all of the respondents. Note the similarities between the Volunteer and Both groups and the differences between these groups and the Career firefighters for respondents in their early twenties (Career values – lower in this age range).



**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 retention within the fire service.

### Recruitment Options

To determine the most effective recruitment tools, officials gave the respondents the option to select one or more choices from a list of 22 selections. The respondents favor ten of these options (Figure 14), and the responses account for at least 20% of the total number of overall respondents. The others, which account for less than 20% of the total overall respondents, may prove to be effective for individual departments or specific events (Figure 15).

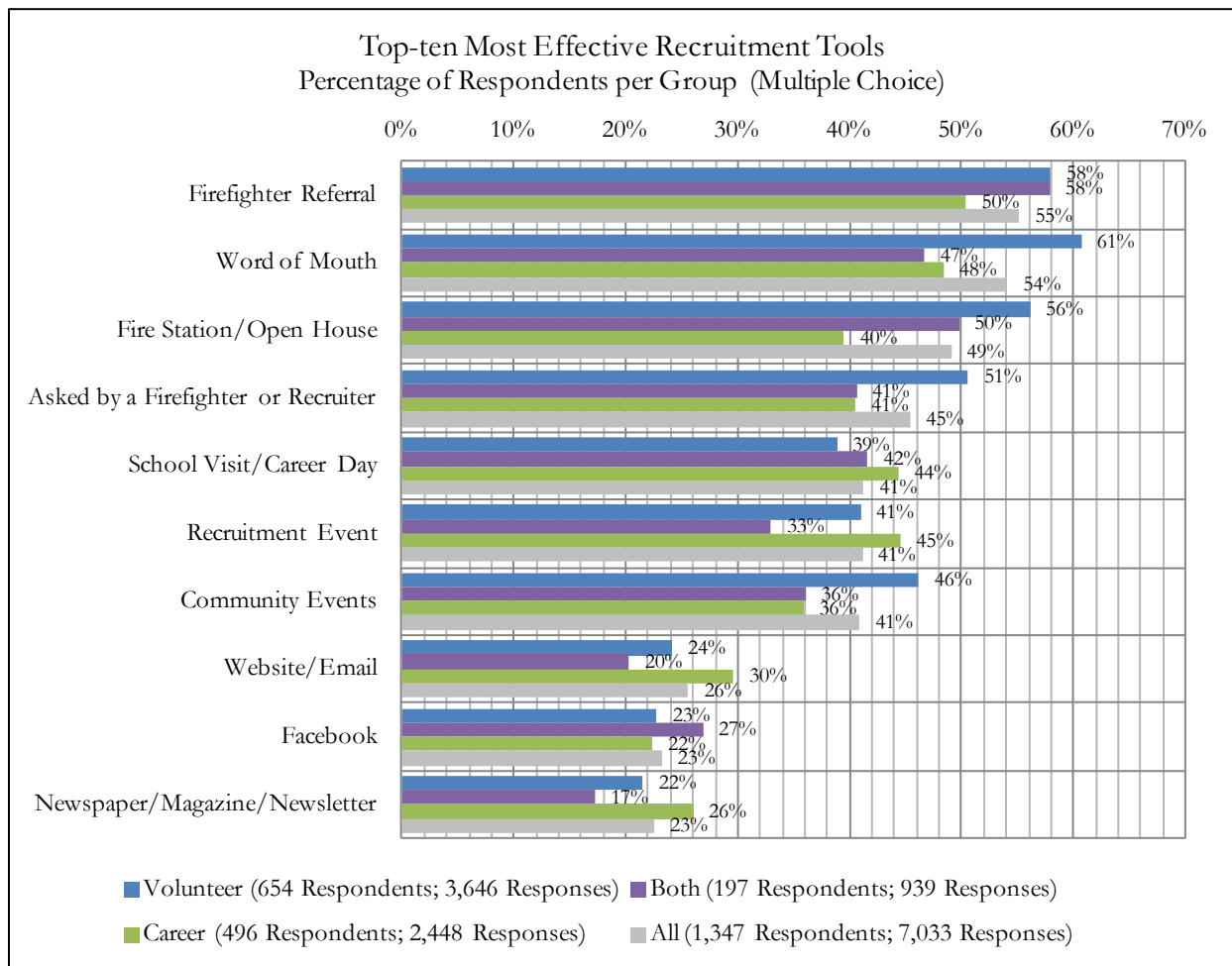
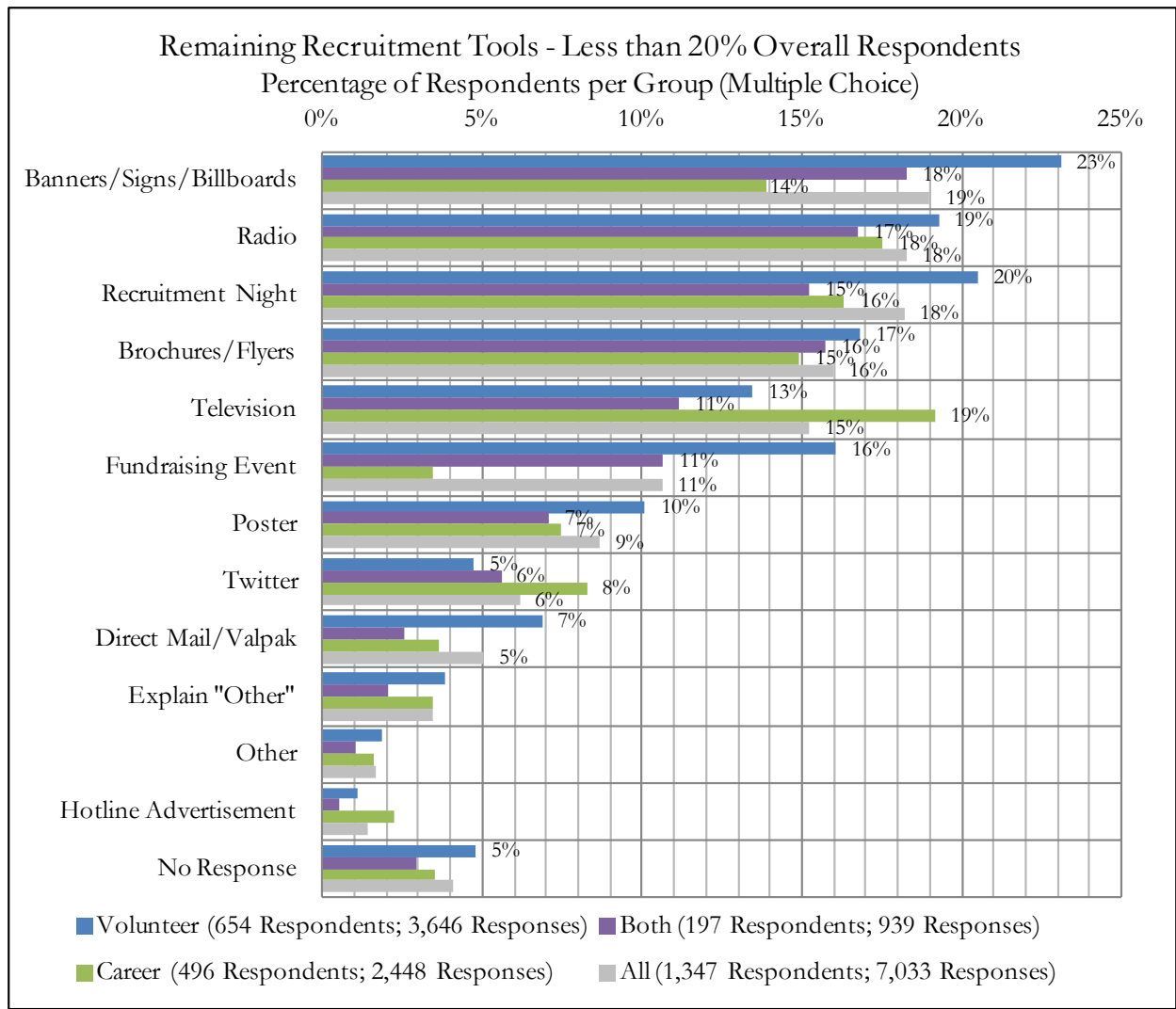


Figure 14: Top-ten Most Effective Recruitment Options (See Figure 15 below)



**Figure 15: Most Effective Recruitment Tools with Less than 5% of the Total Responses (See Figure 14 Above)**

The top-three choices by overall respondents are Firefighter Referral (55%), Word of Mouth (54%), and Fire Station/Open House (49%). As a third-ranking choice, Volunteer/Both Groups list Fire Station/Open House (Volunteer n=367 (56%); Both n=98 (50%); Career n=196 (40%). However, Career firefighters prefer a School Visit/Career Day (Volunteer n=254 (39%); Both n=82 (42%); Career n=220 (44%) compared to a Fire Station/Open House for an effective recruitment tool. Although less popular than other choices, three of the top-ten choices Website/Email, Facebook, and Newspaper/Magazine/Newsletter are popular with specific groups.

## Retention Strategies

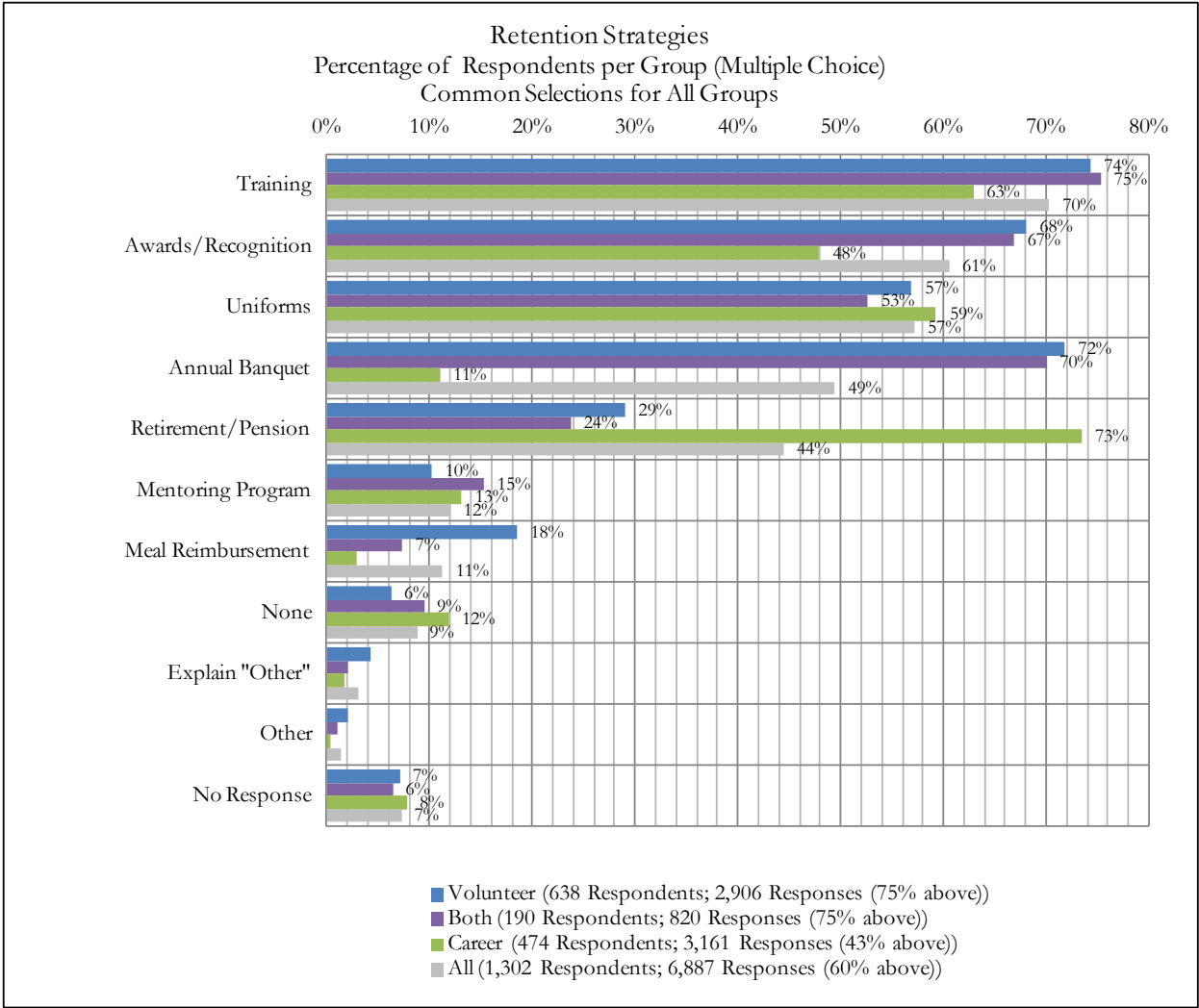
Although each group has nearly the same number of selections for the Retention Strategies question, the options vary for the Volunteer/Both and the Career Groups. Because of this difference, comparing the groups to each other becomes challenging. Ideally, each group would have the same number and selection of choices, but as expected, the benefits differ with full-time employment for the Career group compared to the and job rewards (perks) that help the part-timers in the Volunteer/Both groups; therefore, relevant options for selection will differ (Table 8).

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

Retention Strategies - Group (Volunteer/Both, Career) and All		
Volunteer/Both	Career	All
Continuing Education/Tuition	Advancement Opportunities	Annual Banquet
Mileage Reimbursement	Continuing Education	Awards/Recognition
Pay per Call	EMS Training	Meal Reimbursement
Property Tax Credit	Firefighter Career Program	Mentoring
Store Discounts	Healthcare Benefits	Retirement /Pension
	Officer Career Program	Training
	Tuition Reimbursement	Uniforms
		None
		Other
		Explain "Other"

Figure 16 and Figure 17 include the selections that are common for all groups and individual groups, respectively. Generally, Volunteer/Both groups consistently select options within 5% of each other, and the top-three selections are Training (Volunteer n=474 (74%); Both n=143 (75%)), Annual Banquet (Volunteer n=458 (72%); Both n=133 (70%)), and Awards/Recognition (Volunteer n=434 (68%); Both n=127 (67%)). For the Career group, the top selections differ with Retirement/Pension (Career n=348 (73%)), and EMS Training (Recertification) (Career n=302 (64%)) as leading contenders with Healthcare (Career n=300 (63%)) and Training (Career n=298 (63%)) tied for third. For the Career firefighters, the Continuing Education and Tuition Reimbursement selections are split compared to the Volunteer/Both groups, which have the two combined into one selection.

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 (72%); Both (70%); Career (11%)). As expected, Retirement/Pension also differs with respondents on a group level (Volunteer (29%); Both (24%); Career (73%)). Overall, the firefighters made 6,887 selections for this Retention Strategies question.



**Figure 16: Retention Strategies – Common to All Groups**



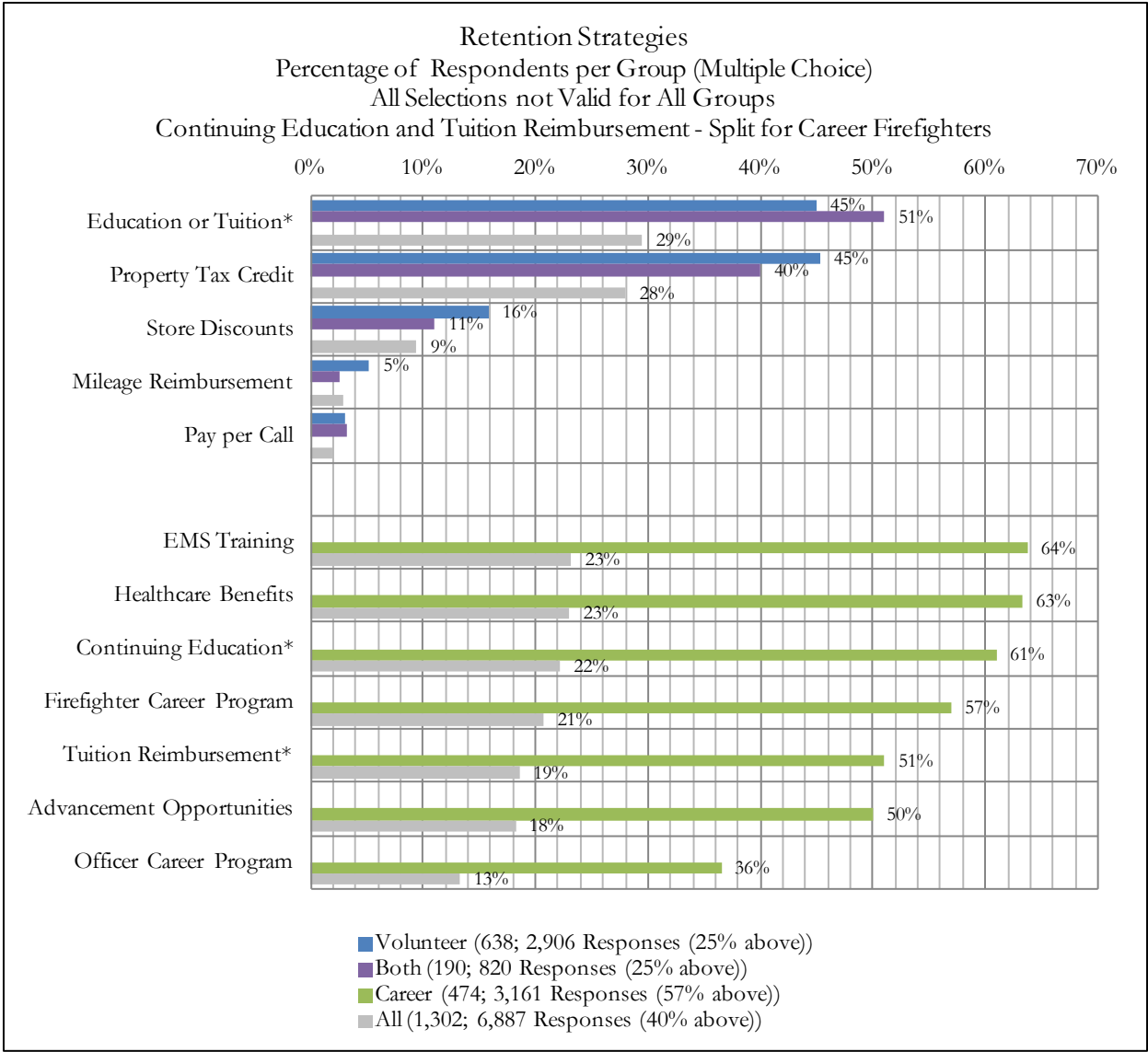


Figure 17: Retention Strategies - Questions for Individual Groups

### Retention Effectiveness

Similar to the Retention Strategies question, the options 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. The categorization of options follows the benefits list in Table 9.

**Table 9: Retention Strategies Effectiveness – Selections for Group, Common, and Split**

Retention Strategy Effectiveness Selection Options - Group (Volunteer/Both, Career), All, and Split			
Volunteer/Both	Career	All	Split
Store Discounts	Firefighter Career Program	Annual Banquet	Education/Tuition (Vol/Both)
Mileage	Officer Career Program	Awards/Recognition	Continuing Education (Career)
Pay per Call	EMS Training	Retirement / (LOSAP)	Tuition Reimbursement (Career)
Property Tax Credit	Healthcare Benefits	Meals	
	Advancement Opportunities	Mentoring	
		Training	
		Uniforms	

With each response, the firefighter rates the effectiveness of the retention strategy on a scale that has four options - “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. All of the firefighters who completed the survey chose to answer this question (Figure 18).

The leading response for the Volunteer/Both groups is Training (Volunteer n=260 (38%); Both n=77 (38%)) – the only response by the majority of respondents in each group with the highest rating of “Very Effective.” For the “Effective” rating, the groups also have common top-two retention strategies - Awards and Recognition (Volunteer n=269 (39%); Both n=85 (42%)) and Education and Tuition (Volunteer n=245 (36%); Both n=91 (45%)). However, the groups differ in their third-highest response as the majority of the Volunteer group prefers Uniforms (Volunteer n=249 (36%); Both n=67 (33%)), and the majority of the Both group prefers Property Tax Credit (Volunteer n=232 (34%); Both n=81 (40%)). At the opposite end of the ratings spectrum, the groups also differ with “Not Effective” retention strategies. The majority of the Volunteer group finds Pay per Call to be “Not Effective” (Volunteer n=199 (29%); Both n=55 (27%)), while the Both group finds Meal (Volunteer n=168 (24%); Both n=70 (34%)) and Mileage (Volunteer n=189 (28%); Both n=66 (33%)) Reimbursements to be “Not Effective.”

For the Career group, the leading retention strategies contender differs with more than half of the respondents listing Retirement Benefits/LOSAP (Career n=288 (56%)) as a “Very Effective” retention strategy. Healthcare Benefits (Career n=248 (48%)) and Opportunities for Advancement (Career n=196 (38%)) are also strong retention strategies within the Career group. Conversely, the majority of Career

firefighters find that the Annual Banquet (Career n=252 (49%)) and Meal Reimbursement (Career n=233 (45%)) are “Not Effective” retention strategies.

In addition, comparing and contrasting the Volunteer/Both and Career groups helps to generalize some key findings. For selections specific to their groups, the Career firefighters rate their responses as an “Effective” or a higher rating, while the Volunteer/Both groups rates their responses as an “Effective” or a lower rating. Overall, the Volunteer/Both groups do not rate their specific retention strategy options as strongly as the Career firefighters. Although the groups also differ on their responses for the Annual Banquet, which is consistent with the responses for the previous question, in general, the groups have similarities. For the options that are common to the three groups, all of the firefighters find that Continuing Education/Tuition, Retirement Benefits, and Training are all-around strong contenders for effective retention strategies.

In the survey-wide tally of the effectiveness of the seventeen retention strategies, the majority of respondents for each option chose three to be “Very Effective” (Retirement or LOSAP n=512 (36%); Healthcare Benefits n=248 (48%); Advancement Opportunities n=196 (38%)). These options match the top-three selections for the Career firefighters, but the Volunteer and Both groups could only select Retirement from these choices. Although the Volunteer and Both groups comprise 63% of the total survey respondents (n=890), with the Retirement choice, which is the only one with the highest rating that is available to all groups, less than half of the respondents in the “Very Effective” rating are from the Volunteer/Both groups (16% of the total 36%). Therefore, the majority of the respondents in the “Very Effective” rating are from the Career firefighters.

Overall, the majority of the respondents for each choice find that nine of them are “Effective” retention strategies ( $9/17 = 53\%$ ;  $n=5,874/17,876 = 33\%$ ) (Table 10) (Awards/Recognition, Education/Tuition, Mentoring Program, Property Tax Credit, Training, Uniforms, Firefighter Career Program, Officer Career Program, and EMS Training). Three of the selections are “Somewhat Effective” (Annual Banquet, Store Discounts, and Mileage Reimbursement) and two are “Not Effective” (Meal Reimbursement and Pay per Call). However, as stated above, not every group has an opportunity to respond to every selection.

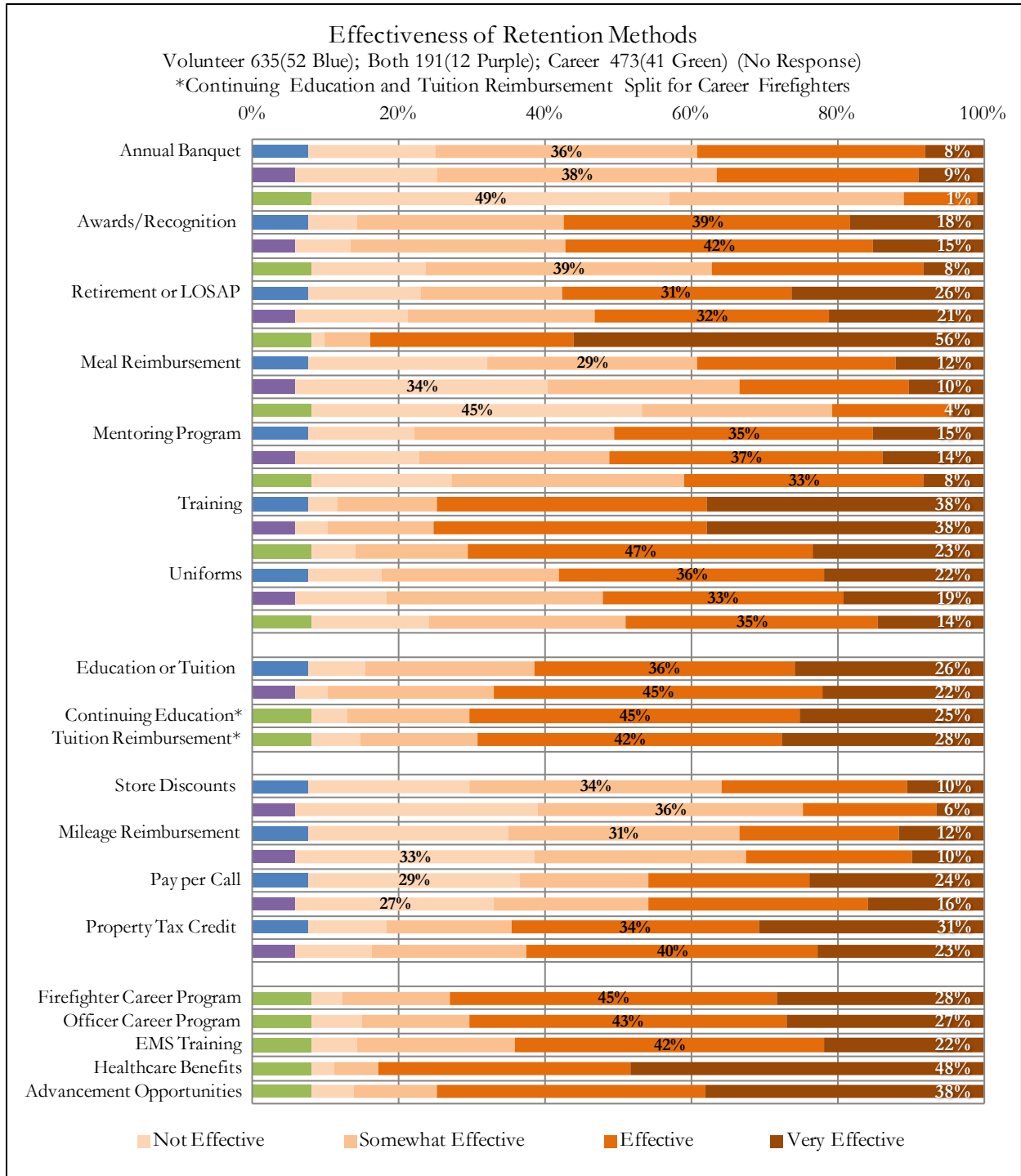


Figure 18: Retention Strategy Effectiveness

**Table 10: Overall Study: Retention Strategy Effectiveness**

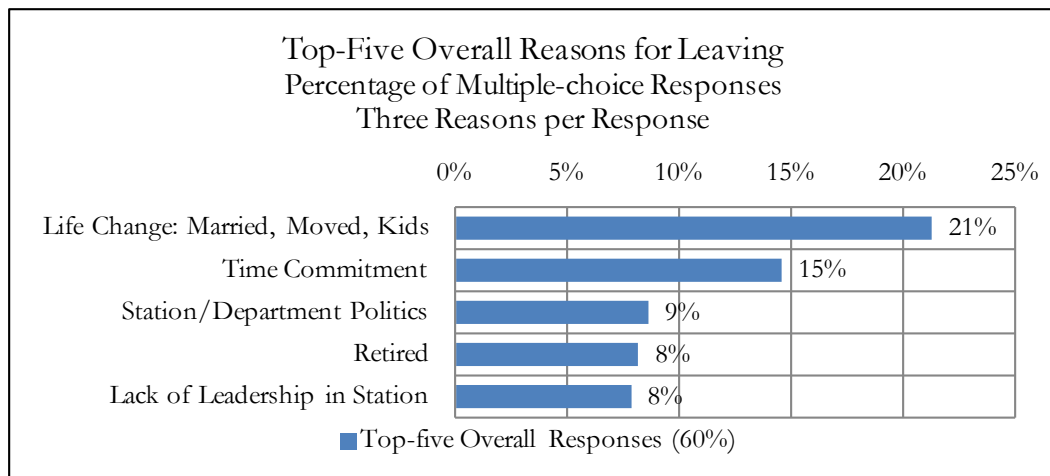
Overall Study: Retention Strategy Effectiveness													
Retention Strategy	Groups	No Response		Not Effective		Somewhat Effective		Effective		Very Effective		Total Responses	
Annual Banquet	All	105	7%	410	29%	490	35%	321	23%	78	6%	100%	1404
Awards/Recognition	All	105	7%	141	10%	457	33%	502	36%	199	14%	100%	1404
Education/Tuition	Split/Career	146	8%	123	6%	372	19%	783	41%	494	26%	100%	1918
Store Discounts	Vol/Both	64	7%	219	25%	310	35%	212	24%	85	10%	100%	890
Retirement or LOSAP	All	105	7%	146	10%	216	15%	425	30%	512	36%	100%	1404
Meal Reimbursement	All	105	7%	471	34%	385	27%	317	23%	126	9%	100%	1404
Mentoring Program	All	105	7%	233	17%	404	29%	488	35%	174	12%	100%	1404
Mileage Reimbursement	Vol/Both	64	7%	255	29%	275	31%	196	22%	100	11%	100%	890
Pay per Call	Vol/Both	64	7%	254	29%	163	18%	213	24%	196	22%	100%	890
Property Tax Credit	Vol/Both	64	7%	94	11%	161	18%	313	35%	258	29%	100%	890
Training	All	105	7%	67	5%	202	14%	573	41%	457	33%	100%	1404
Uniforms	All	105	7%	177	13%	365	26%	494	35%	263	19%	100%	1404
Firefighter Career Program	Career	41	8%	22	4%	76	15%	229	45%	146	28%	100%	514
Officer Career Program	Career	41	8%	36	7%	75	15%	223	43%	139	27%	100%	514
EMS Training	Career	41	8%	32	6%	111	22%	218	42%	112	22%	100%	514
Healthcare Benefits	Career	41	8%	16	3%	31	6%	178	35%	248	48%	100%	514
Advancement Opportunities	Career	41	8%	30	6%	58	11%	189	37%	196	38%	100%	514
Totals	All	1342	8%	2726	15%	4151	23%	5874	33%	3783	21%	100%	17876

## Reasons for Leaving

One of the survey questions tallied the impressions from firefighters about their beliefs regarding why others had chosen 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 to increase the total number of responses). The top-five selections, which account for 60% of the responses (not respondents), dominate these reasons (Figure 19). Overall, the other options (n=17) explain less than 5% each of the remaining choices, but at the group level with respondents, a few of the results vary.

The top-five perceived reasons for others leaving the fire service according to the respondents include Life Changes (All n=840 (65%)), Time Commitment (All n=575 (44%)), Station Politics (All n=340 (26%)), Retirement (All n=323 (25%)) and Lack of Leadership (All n=309 (24%)) (Figure 20). Consistent with the Phase I results, the leading perceived reasons for leaving among Volunteers include Life Changes (Married, Moved, Kids) (Volunteer n=469 (74%)) and Time Commitment (Volunteer n=407 (64%)). Although Retirement is the leading reason for leaving for the Career group (Career n=248 (52%)), the selection of Life Changes is a close second (Career n=241 (51%)). Life Changes and Time Commitment lead the Both group as well (Both n=130 (68%) and n=97 (51%), respectively).

Generally, the percentage of differences is less than 10% between the Volunteer/Both groups; however, with three of the reasons, the disparities are worth mentioning. For Career firefighters, Time Commitment is less of a problem compared to Voluntary/Both groups (Volunteer n=407 (64%); Both n=97 (51%); Career n=71 (15%)). However, the group mentions Compensation Issues (Volunteer n=10 (2%); Both n=9 (5%); Career n=118 (25%)) more often than Station Politics (Career n=114 (24%)) – which is a leading reason for others leaving the service. Retirement is consistent between the Volunteer and Both groups (Volunteer n=55 (9%); Both n=20 (10%)), but higher for Career firefighters (Career n=248 (52%)). In total, the survey includes more than 3,900 (All n=3,952 (3,897 + 55 Explain “Other”)) responses from 1,299 respondents. Seven percent of the overall respondents chose not to answer this question (All n=105).



**Figure 19: Overall Top-five Reasons for Leaving the Fire Service**

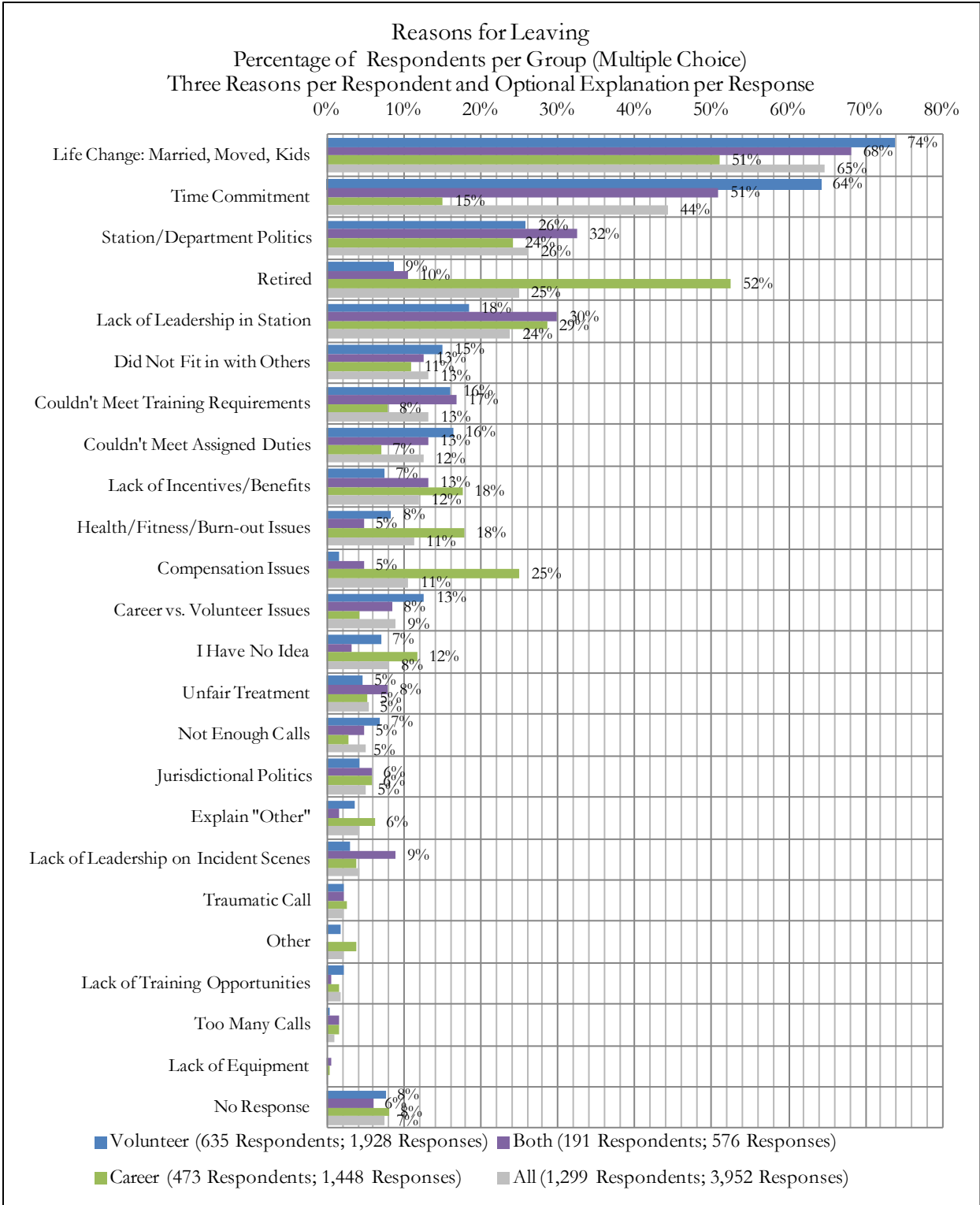


Figure 20: Reasons for Leaving

## Exit Interviews

The responses to the Exit Interview question denote the disparities among the groups (Figure 21). Nearly the same percentages of respondents for Career firefighters indicate the option for having an Exit Interviews (Career n=332 (65%)) compared to not having one in the Both group (Both n=136 (67%)). One-quarter of the Volunteer group (Volunteer n=170 (25%)) does not know if Exit Interviews are an option within their departments. Overall, the majority of respondents indicate that Exit Interviews are not an option in their departments (All n=572 (41%)).

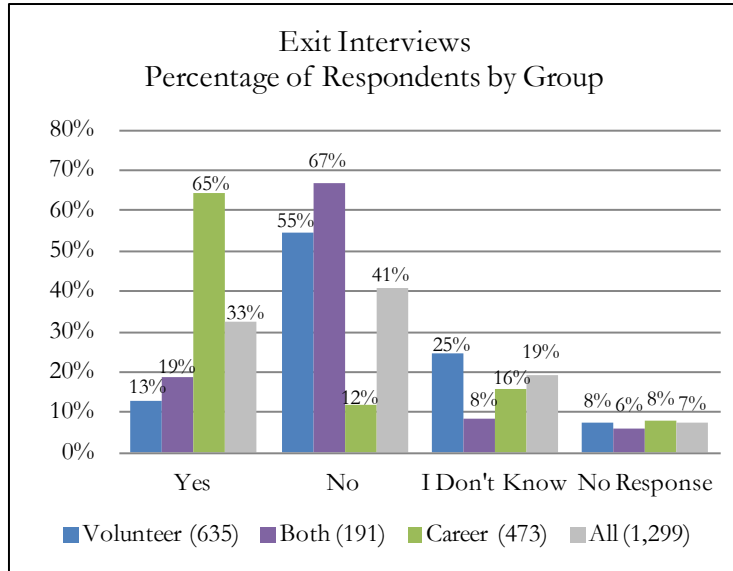


Figure 21: Exit Interviews



## Leadership Issues

The “Leadership Issue” question is the only one in the survey with a Yes/No format (Figure 22). According to the findings, fewer respondents in the Voluntary group (Volunteer n=276 (40); Both n=117 (58%); Career n=334 (65%)) compared to their counterparts indicate issues with leadership; however, given the format of a strictly Yes/No format and no other option for clarification, this does not indicate a complete lack of leadership issues within the group. Although the Career firefighters are not in the largest group, the “Yes” responses outnumber the total for the largest Volunteer group. Nearly 60% of the Both group see an issue with leadership as well. Conversely, the Volunteer group is split more evenly on the issue with 40% indicating it is a concern, while 52% do not consider it a problem. Overall, even though this question has a simple structure, 8% of the respondents did not answer the question (All n=118).

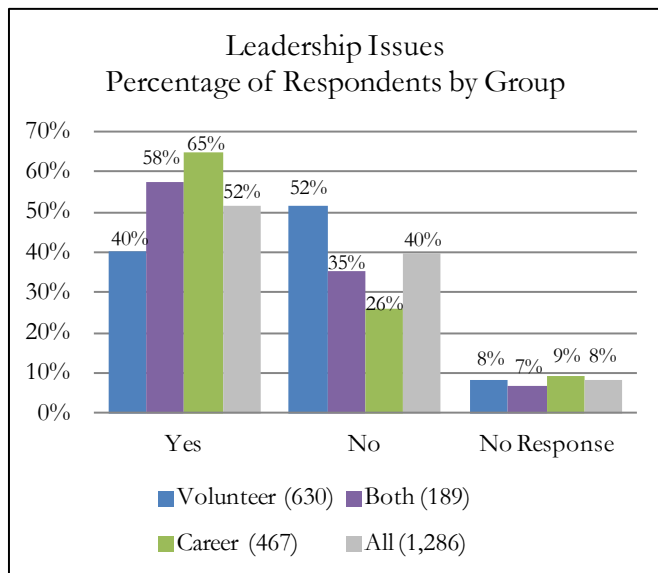
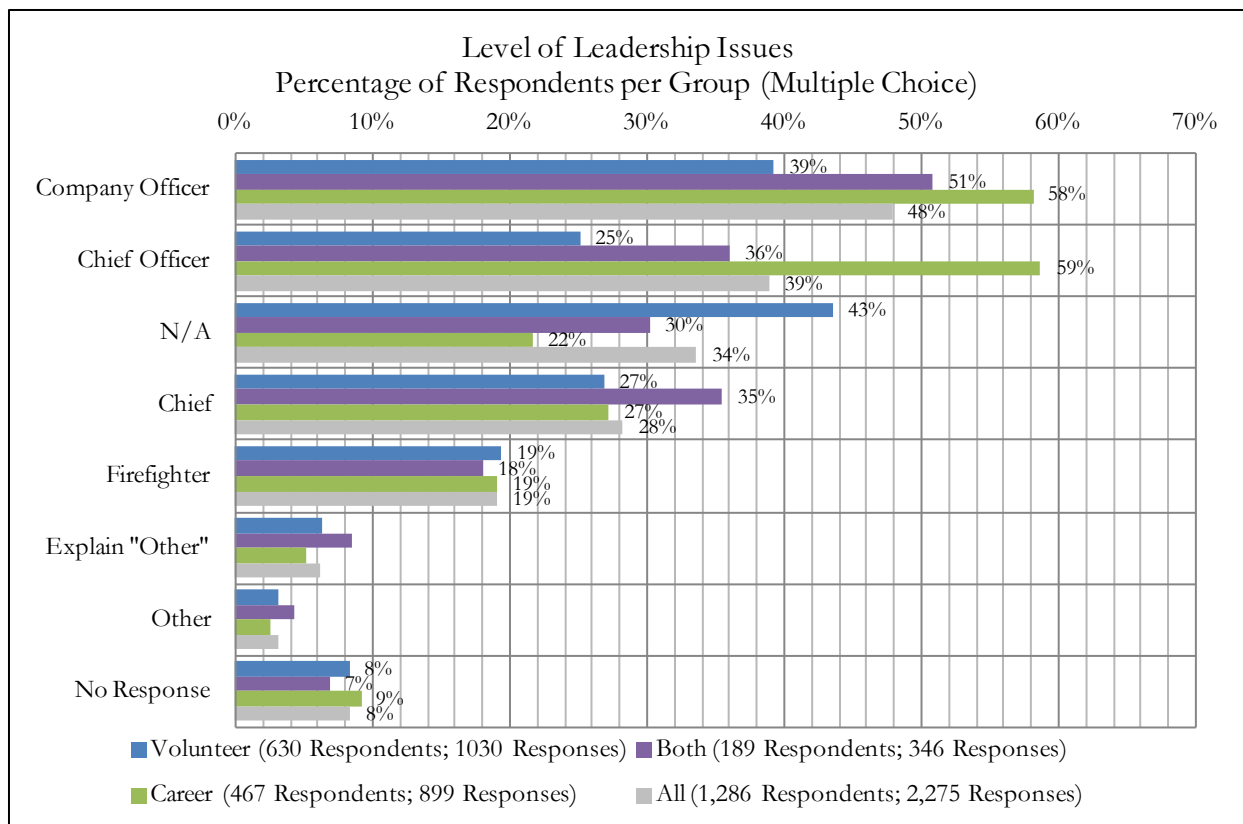


Figure 22: Leadership Issues

## Levels of Leadership Issues

For the level of Leadership issues, the respondents have a selection of seven choices (Figure 23). Overall, the majority of respondents indicate issues at the Company Officer, Chief Officer, N/A (not applicable) and Chief levels. Nearly identical numbers of Career firefighters find difficulties at the Company Officer and Chief Officer levels (n=272 (58%); n=274 (59%), respectively). Within the Volunteer group, 43% of the respondents indicate that a response to this question is N/A (largest response rate within the group). Although this is a multiple-choice question, overall, the respondents (All groups) average fewer than two responses per firefighter (All = 1.8 responses/firefighter).

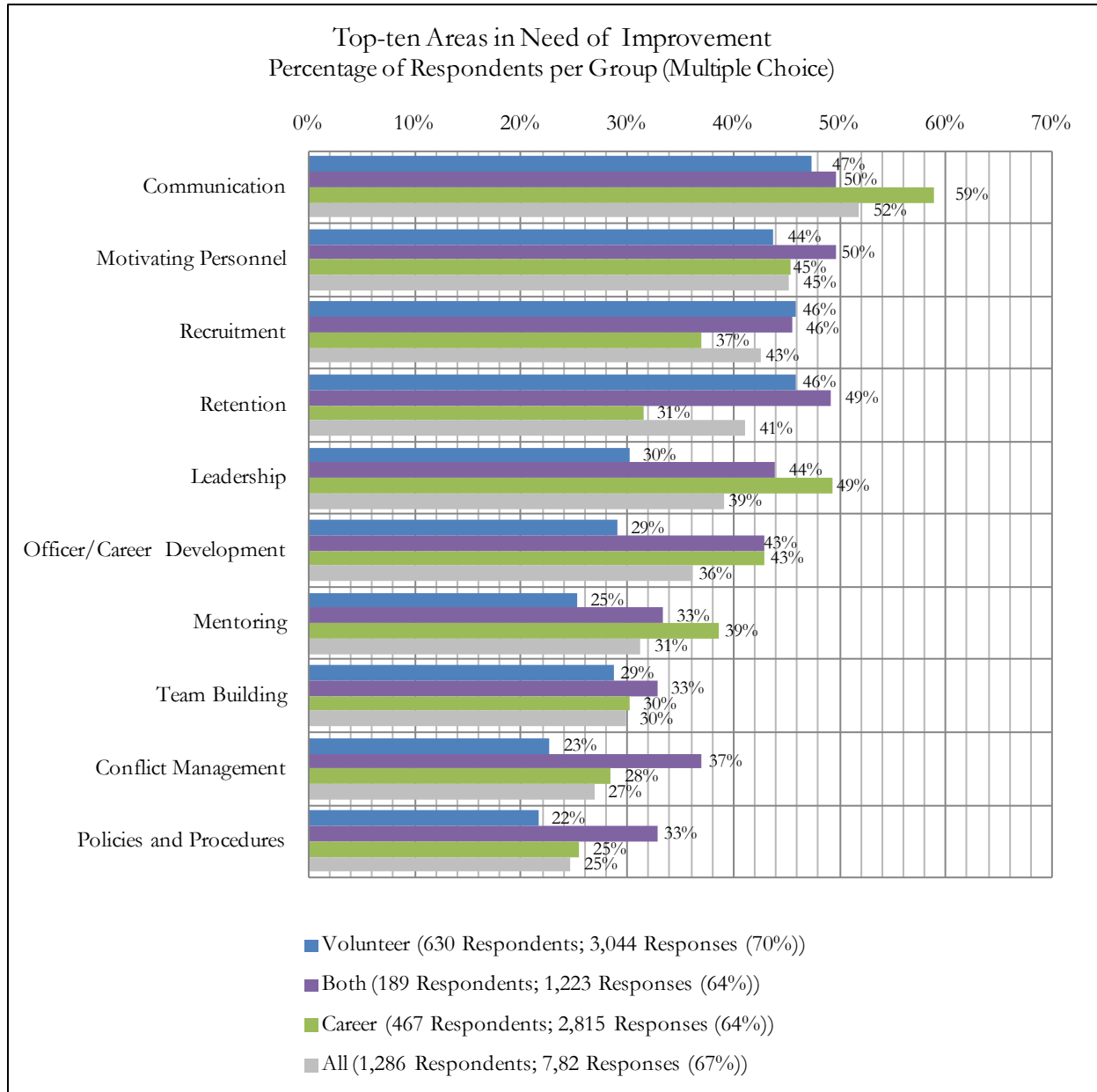


**Figure 23: Levels of Leadership Issues**

The general trend that Volunteers appear less concerned with leadership issues (but still concerned) is consistent with the findings from the Phase I survey, where the “All Volunteer” group had the lowest response rate (28.8% compared to ~35% overall). When comparing the results from another survey conducted by the Volunteer & Combination Officers section of the IAFC\* to this one, the importance of this issue becomes apparent. In that survey, officers (n=979) listed the reasons given by volunteer or paid-on call members who had left the department. Only 8% of the respondents to the survey stated that “Department Leadership” was an expressed reason for leaving. These results coincide with the 8% of the overall responses in the survey under review here (All n=309; 3952 responses). Although the questions are significantly different in that one asked about expressed reasons and the other asked about beliefs, the difference between officers and the general firefighter population was nonetheless considerable in Phase I, but is comparable with the Phase II results. \*(<http://www.zoomerang.com/Shared/SharedResultsSurveyResultsPage.aspx?ID=L24PVLVM3WQD>)

### Areas in Need of Improvement

Officials list 24 selections as “Areas in Need of Improvement” in the survey. From this list, the findings indicate that 25% of the overall respondent firefighters chose ten of these options more often than the rest. Due to the large number of selection options, Figure 24 includes the top-ten choices and Figure 25 lists the remaining ones.



**Figure 24: Top-ten Areas in Need of Improvement**

Communication, Motivating Personnel, and Recruitment are the leaders in areas that need improvement with 52%, 45%, and 43% of the overall respondents, respectively. Leadership, which is a topic for further discussion, ranks fifth with 39% of the overall respondents. On a group basis, almost all of the results are within 15% of each other. The greatest differences between the groups are the response rates for Leadership and Retention where the rates are 49% for the Career group compared to the 30% for the Volunteer group and 49% for the Both group compared to 31% for the Career group, respectively. Overall, this question has the most responses (n=7,082) with 5.5 selections/firefighter.

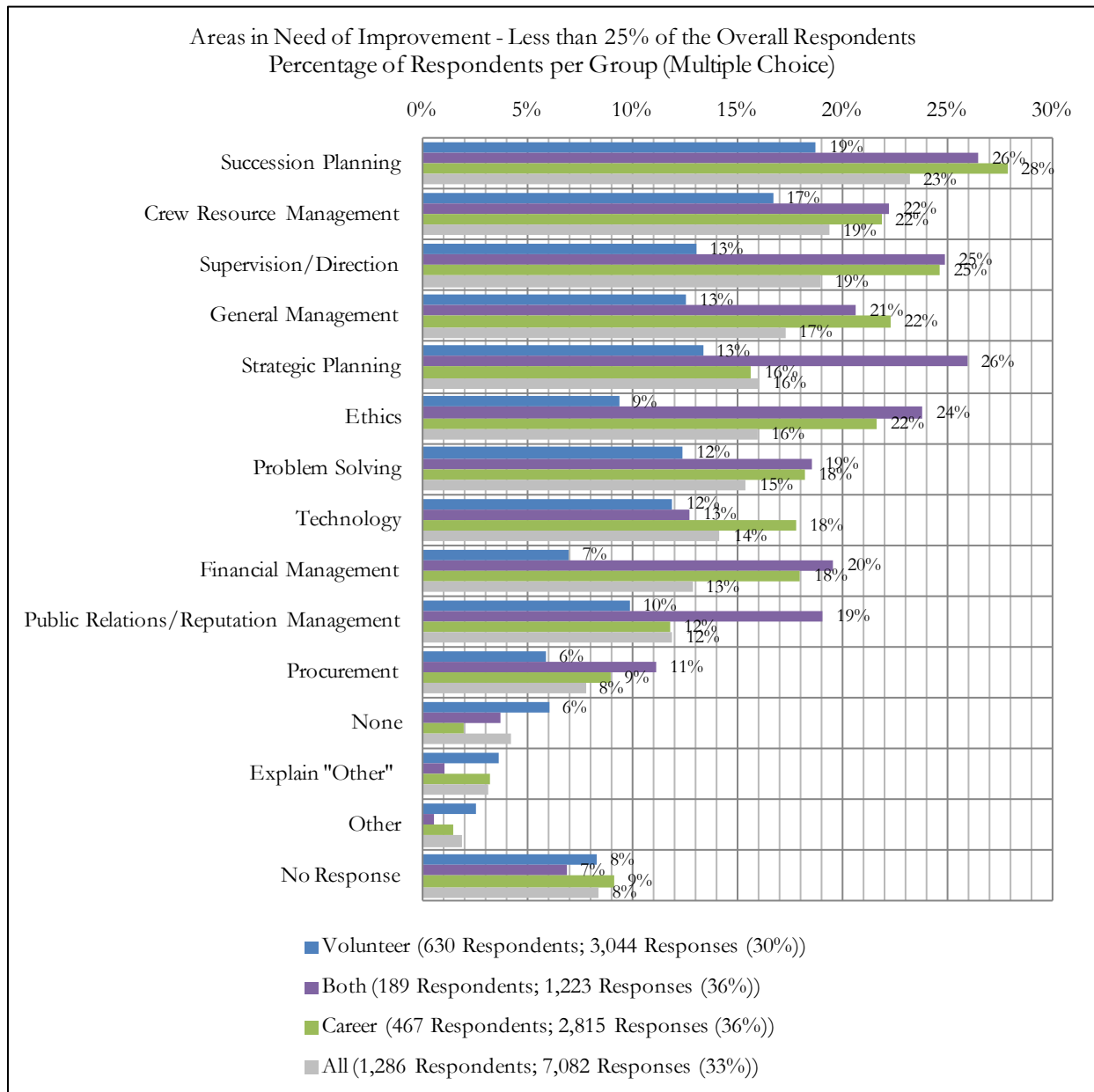
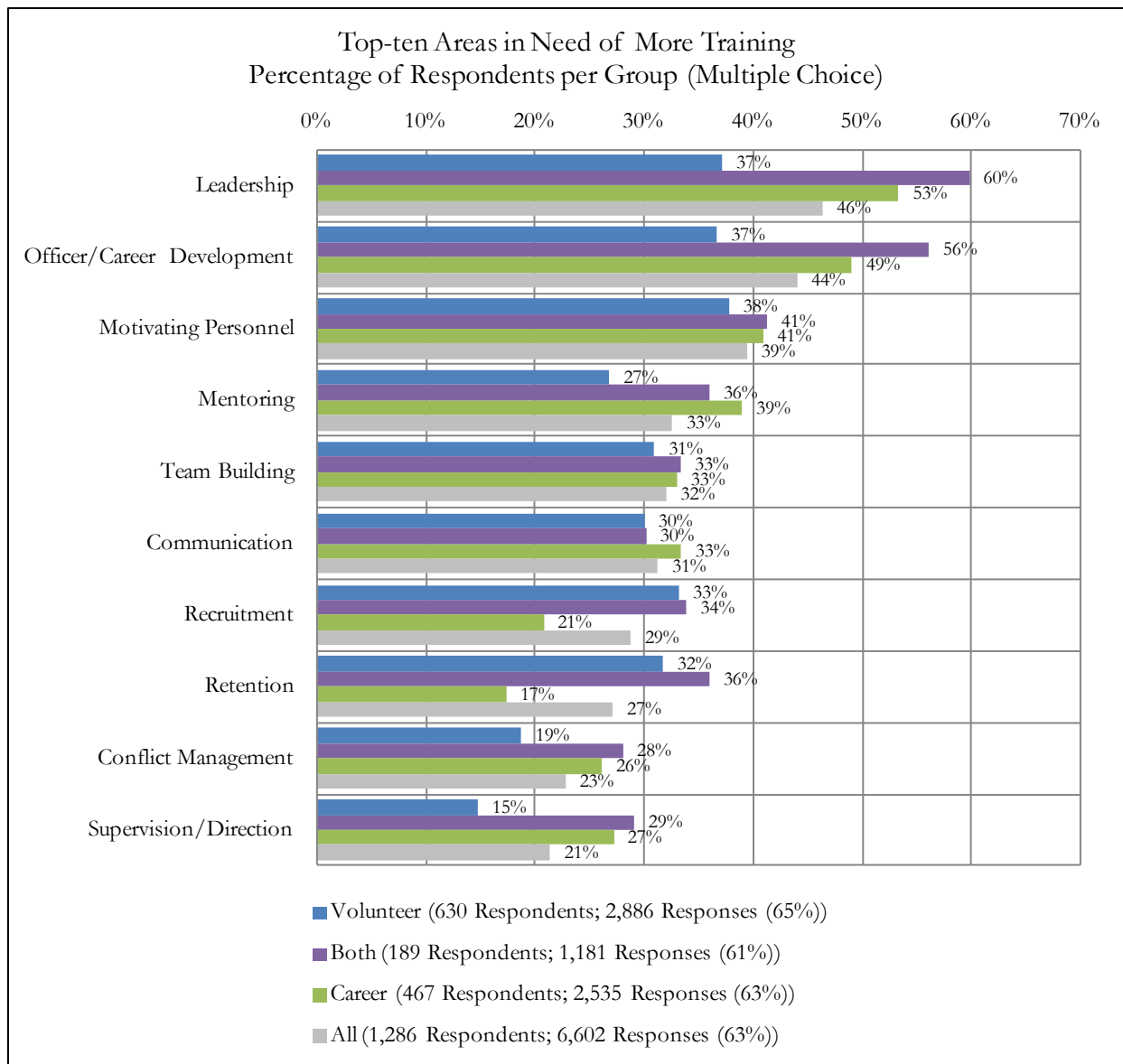


Figure 25: Areas in Need of Improvement (<25% of Overall Respondents)

### Areas in Need of Additional Training

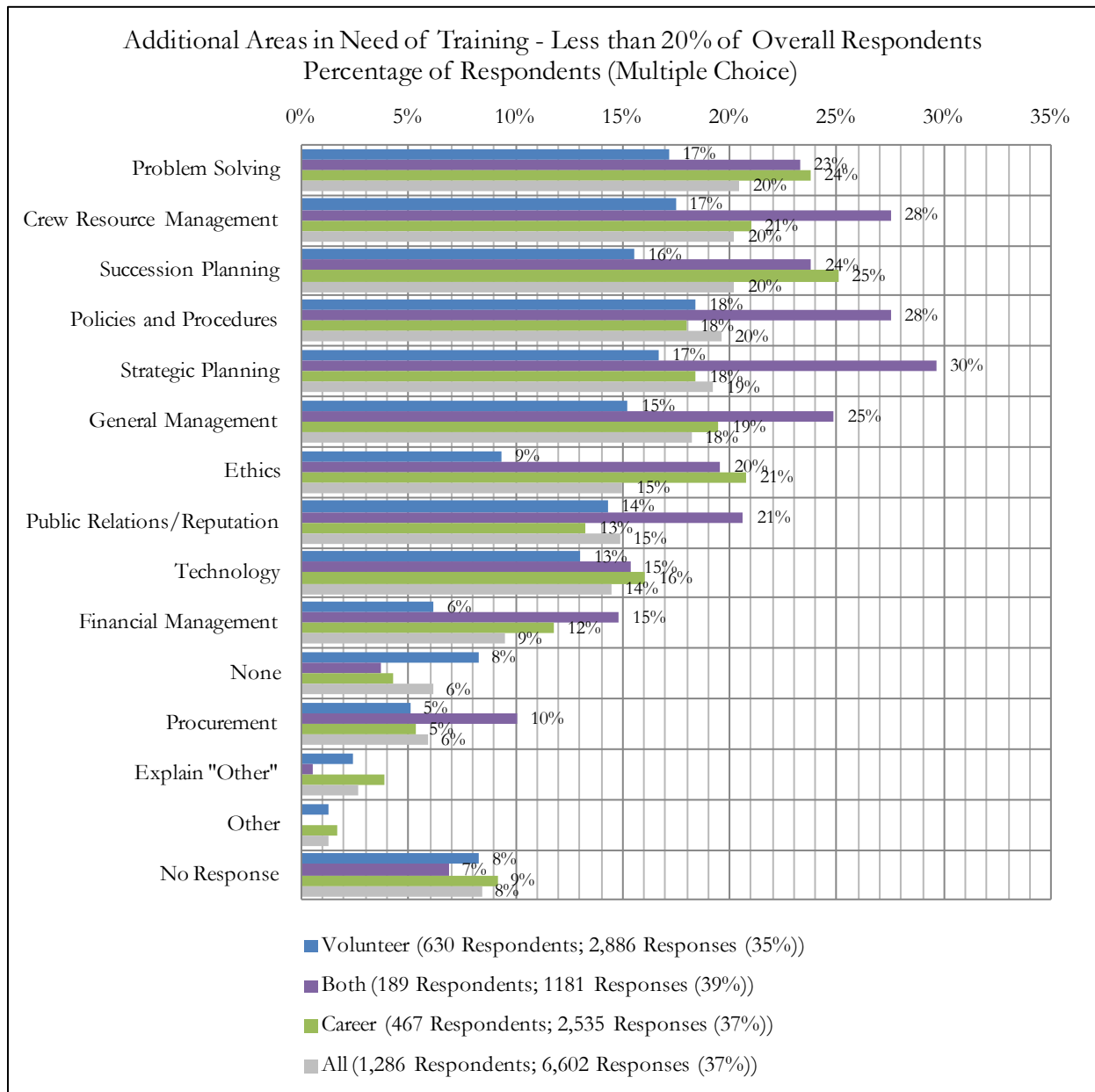
Due to the large number of selection options for this question, which are identical to the previous one, this section also splits the results into two graphics. The first graphic includes the top-ten “Areas in Need of Additional Training” (Figure 26) and the second one (Figure 27) includes the remaining selections. The leading responses include the ones with greater than 20% of the respondents. This question has fewer results than “Improvement Areas” (n=6,602), but the response rate is still greater than 5 responses/firefighter (n=5.1).



**Figure 26: Leading Areas in Need of Training (>5% of Responses)**

The top-three “Areas in Need of Additional Training” include Leadership (46%), Officer/Career Development (44%), and Motivating Personnel (39%). The fact that firefighters list “Leadership” as the

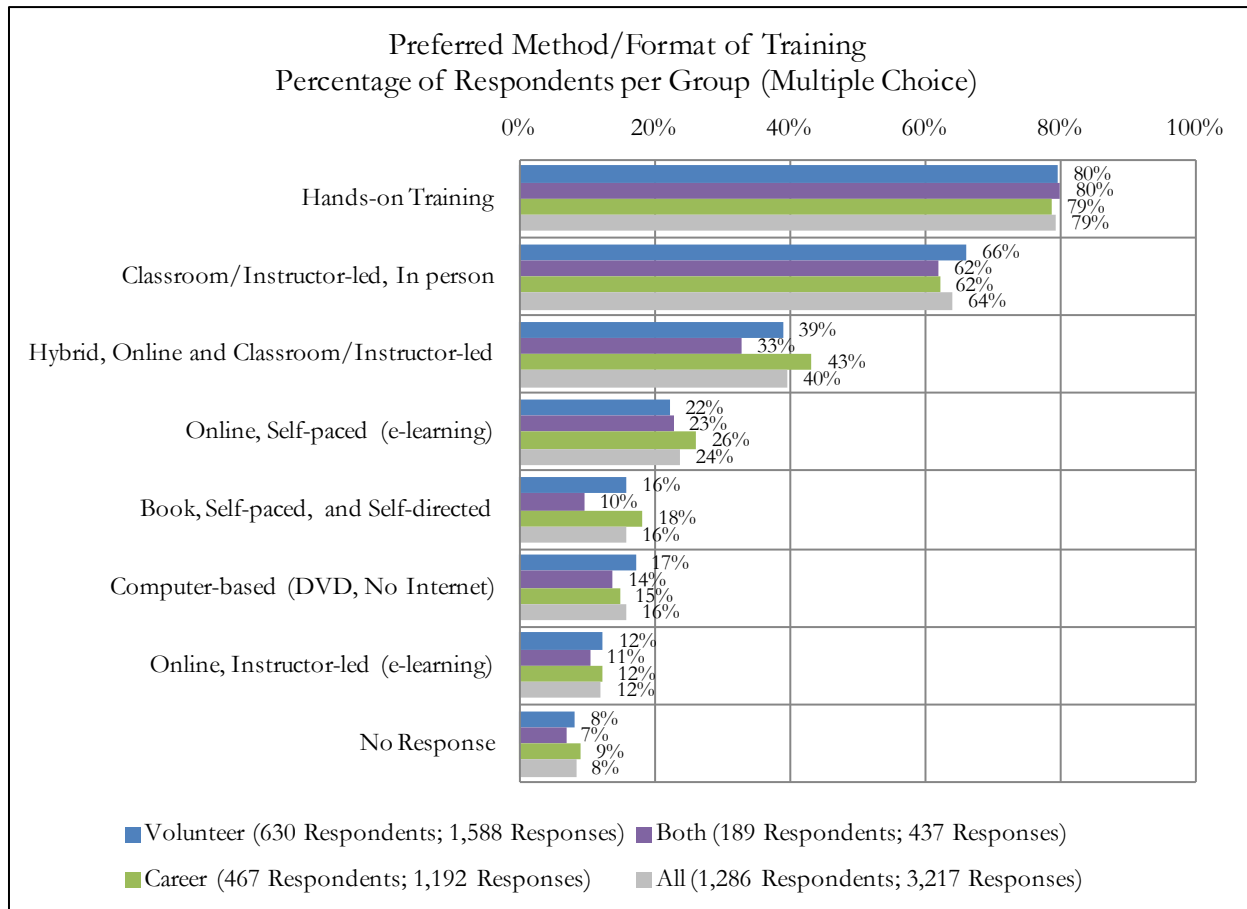
leading “Area in Need of Training” also warrants additional analysis of the topic within this study. Similar to the previous question, 8% of the respondents chose not to answer this question.



**Figure 27: Areas in Need of Training (<20% of Overall Respondents)**

## Preferred Training Methods

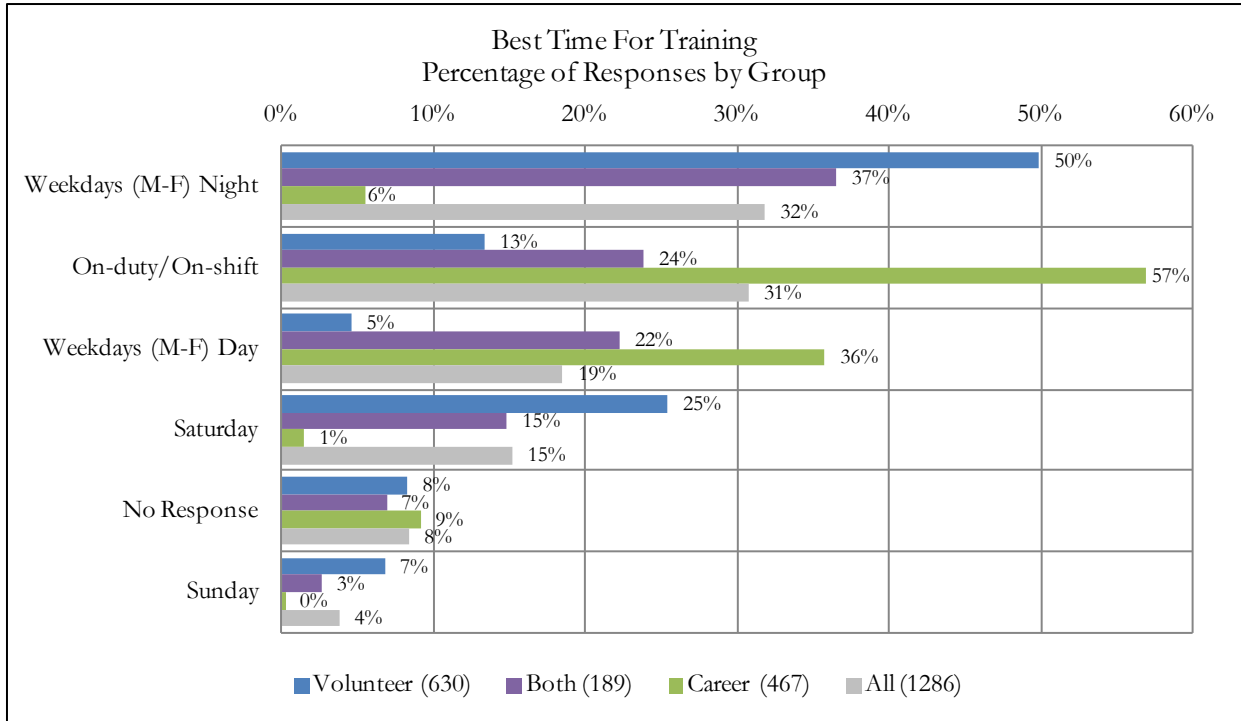
In this survey, respondents have seven choices for preferred method or format of training (Figure 28). Respondents have the option to pick more than one choice. Nearly 80% of the firefighters (1,019 respondents out of 1,286 total respondents) and all of the groups chose Hands-on Training as the top method/format for training. Both choices with classroom instruction are also popular - In person, Classroom/Instructor-led and Hybrid, Online and Classroom/Instructor-led.



**Figure 28: Preferred Training Methods**

### Favored Training Times

Officials chose five possible responses for the “Favored Training Times” question. From the findings, it is evident that the each group prefers different training times. Half of the Volunteer group prefers Weekdays (M-F) Night for training. The Both group also favors this choice, but to a lesser extent. Because the group is a mixture of volunteer and career firefighters, the respondents also prefer On-duty/On-shift and Weekdays (M-F) Day, which coincides with the Career firefighters. Nearly 60% of the Career firefighters approve of an On-duty/On-shift training compared to 13% of Volunteer respondents.



**Figure 29: 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 11) shows the cross-tabulation of the variables “Years in Service” and “Effectiveness of Awards and Recognition.”

**Table 11: Cross-tabulation Table with "Years in Service" and "Effectiveness: Awards and Recognition"**

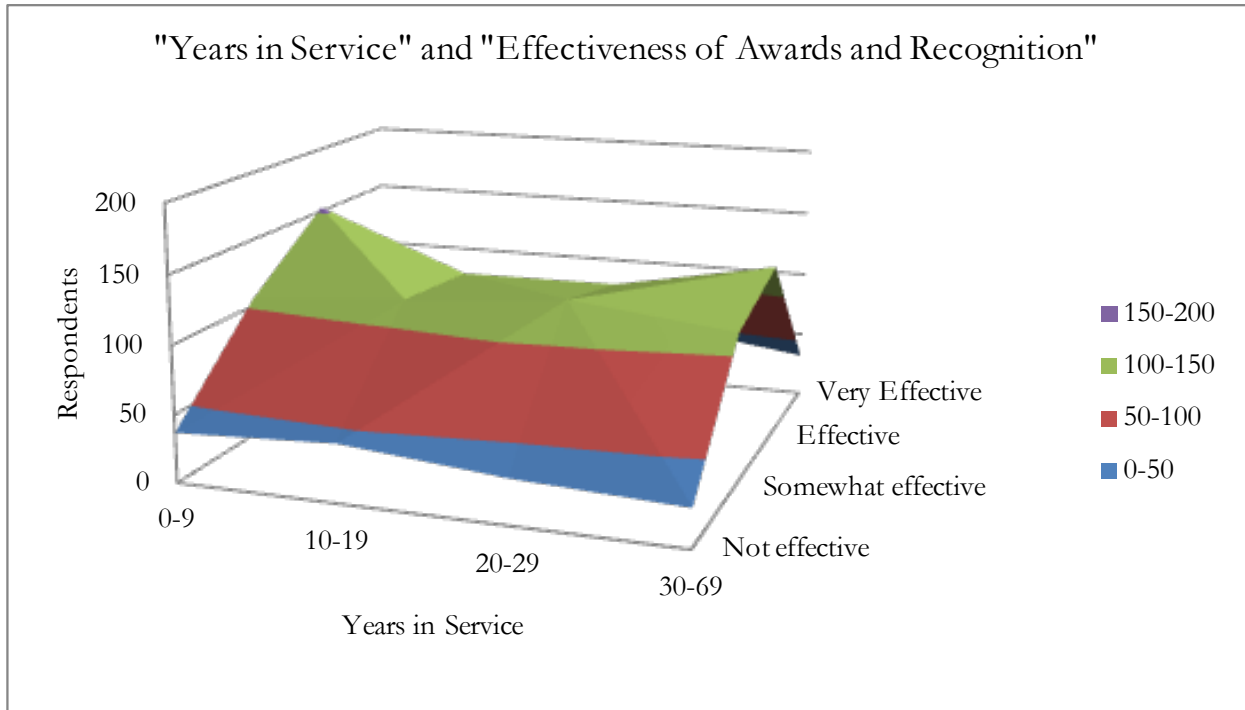
Years in Service	Effectiveness: Awards and Recognition				Grand Total
	Not effective	Somewhat effective	Effective	Very Effective	
0-9	37	105	153	74	399
10-19	43	115	108	45	338
20-29	33	125	109	48	339
30-69	28	112	132	32	328
Grand Total	141	457	502	199	1404

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 one-quarter of the total number of responses, so the groups are nearly equal in size (28%, 24%, 24%, and 23%, with increasing service years). Second, the majority of the respondents find Awards and Recognition to be an “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 (33%, 23%, 24%, and 16%, with increasing years in service).

While these relationships may not be extraordinarily strong, and while the correlation between these variables may not represent a causal relationship, the relationship exists nonetheless. In this case, an interpretation of these results could mean that one may be able to encourage retention. Actively targeting persons who are in their earlier years in service for awards and recognition, setting milestones with recognition for accomplishments earlier in a firefighter’s career, or awarding tenured firefighters more often to show the strategy can become a “Very Effective” one are several alternative responses.

With the following cross-tabulation (Figure 30), 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 0-9 years in service (remember to check the categories for comparable sample sizes when interpreting “counts” of grouped responses).



**Figure 30: Three-dimensional Cross-tabulation for "Years in Service" and "Effectiveness of Awards and Recognition"**

### 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 1,404 responses are less than 10% ( $n=2,650$ ) of the total number of firefighters in Virginia – approximately 26,500 in 2010.

In order to determine the extent of determining 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 “Effectiveness of Awards and Recognition”
- Alternative hypothesis  $\rightarrow N_a$  = The responses to “Years in Service” are not independent of the responses to “Effectiveness of Awards and Recognition”

- 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 “Effectiveness of Awards and Recognition,” 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 11), the calculation of the expected value for the 1<sup>st</sup> row and 4<sup>th</sup> column cell (with an observed frequency of 37) would be calculated as:

$$E_{1,4} = \frac{(399 * 141)}{1404} = 40$$

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

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

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 0.002. This means that a value of this statistic, as extreme as the value found in this case, only occurs 2 times in 1,000 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 about 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 “Starting Ages,” “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 “Starting Age”**

One aspect of retaining firefighters is longevity within the fire service. Generally, for greater longevity of a workforce, hiring begins at an early age – preferably as early as legally possible. Although the legal age for employment may have changed within the careers of some firefighters in this survey, for the most part, sixteen is the beginning of an employment career, and some departments have junior programs where recruits can begin before turning 18 years of age.

To delve deeper into the capability of improving retention by increasing career longevity, the first correlation analysis begins by examining the starting age of firefighters within this survey. Although starting age is not a numerical question within the survey, the age can be derived from subtracting the years in service from the age of the respondent. With a few exceptions (3), where the calculated age of the respondents at the beginning of their careers is a negative number, the only other exclusion is a respondent with a reported age of 100 with one year in service (99 for a starting age). This is technically possible, but without independent verification, excluding the entry is the best decision.

Table 13 lists the possible ages of the respondents, but this table is a “difference” table. It includes the differences between the actual values and the expected values in the correlation matrix. The analysis only shows this table to conceal the number of individual respondents in each of the categories - to avoid detection of individuals within the survey. Several of the possibilities have one respondent at a specific starting age. Usually, the analyst excludes categories with fewer than five responses, but this table includes them to show the unexpected entries at some ages. On this difference table, the values that are higher than expected, given the total respondents within the survey, are marked in shades of red and the ones with values that are lower than expected are marked in shades of blue. The variation in shading connotes the difference in the value from the expected one.

The findings in Table 13 indicate two significant differences (low p-value of 0.0005) between firefighters’ “Years in Service” and “Starting Age.” First, within the survey population, fewer numbers of teenagers are beginning employment within the fire service. For respondents with a starting age between 16 and 19 years of age (possible junior program recruits), there are fewer than expected numbers of firefighters in the early years in service (0-9 years) and greater numbers than expected in the tenured group (30-69 years). For example, there are 20 fewer 18-year olds in the 0-9 service year group and 22 more than expected 18-year olds in the 30-69 service year group. Although this is the trend at the early employment years, the converse is true at later starting ages. Second, a less pronounced finding is that the starting age of firefighters with fewer years in service is later than their counterparts who have more tenure in the fire service. For example, more than expected numbers of firefighters with 0-9 years in service have a starting age at 34 years old. With later starting dates, such as a 34 year-old starting 17 years after another with a starting age at 17 - career longevity is probably diminishing in the long term.

To reiterate this point, Table 12 enumerates the groups according to starting ages. Within the group of tenured firefighters, none of the respondents has a starting age over 40 years of age. Conversely, 15% (n=58) of the respondents with less than 10 years of experience and 7% (n=24) of the group that has 10 to 19 years of experience also started at 40 years old or later. Only 1% (n=2) of the firefighters with 20 or more years of experience (n=664) started within this same age range.

Conversely, twice as many respondents in the tenured group started before the age of 16 (n=42) compared to the most recently hired group with less than 10 years of experience (n=20). Thirty-four percent (n=118) of the firefighters in all of the groups started before the age of 16, but the group with the largest percentage of pre-16-year olds is the most tenured group (n=42 (13%)).

**Table 12: “Years in Service” by “Starting Age” Group**

Years in Service	Starting Age Groups							Totals
	10-15	16-19	20-24	25-29	30-39	40-49	50-69	
0-9	20	102	83	58	77	39	19	398
10-19	23	100	72	48	71	16	8	338
20-29	33	153	77	50	24	2	0	339
30-69	42	167	64	35	17	0	0	325
Totals	118	522	296	191	189	57	27	1400
Excludes four respondents (three with negative values; another starting at age 99)								



## “Years in Service” and “Learning about the Fire Service”

Although many factors may influence the longevity of firefighters’ careers, one of the earliest aspects to measure and capture in a survey with firefighters is the reasons for joining or “Learning about the Fire Service.” In Phase I, an overwhelming number of responses support the influence of “Friend or Family Member Referral” and “Personal Contact with a Firefighter” as reasons, and in Phase II, referrals and WOM account for 66% of the reasons for “Learning about the Fire Service,” but one question remains to be answered. Has the method of recruiting new members changed over time? Although this testing does not determine the causal effect in this case, analyzing the correlation between “Years in Service” and “Reasons for Joining” may pinpoint some changes in recruitment methods over time.

**Table 15: Correlation Matrix – “Years in Service” and Top-ten Responses for “Learning about the Fire Service” (Reasons to Join)**

Top-ten Responses "Learning about the Fire Service"											38	
Years in Service Observed (Actual) Values	Family or Friend Referral	Word of Mouth	Firefighter Referral	Fire station/Open House	Website/E-mail/Internet Search	Community Event	EMS Referral	Newspaper/Magazine/Newsletter	Banner/Sign/Billboard	Brochure/Flyer	Grand Total	34
	0-9	170	96	89	44	66	19	22	11	24	24	565
10-19	157	112	76	37	24	12	13	18	12	10	471	14
20-29	188	74	63	43	2	13	18	17	9	4	431	11
30-69	166	113	78	33	1	20	7	12	3	6	439	12
Grand Total	681	395	306	157	93	64	60	58	48	44	1906	10
"Learning" Expected Values											9	
0-9	202	117	91	47	28	19	18	17	14	13	565	8
10-19	168	98	76	39	23	16	15	14	12	11	471	7
20-29	154	89	69	36	21	14	14	13	11	10	431	6
30-69	157	91	70	36	21	15	14	13	11	10	439	5
Grand Total	681	395	306	157	93	64	60	58	48	44	1906	4
"Learning" Differences Observed (Actual) - Expected Values											3	
0-9	-32	-21	-2	-3	38	0	4	-6	10	11	0	2
10-19	-11	14	0	-2	1	-4	-2	4	0	-1	0	1
20-29	34	-15	-6	7	-19	-1	4	4	-2	-6	0	0
30-69	9	22	8	-3	-20	5	-7	-1	-8	-4	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0
Shades of Red - Higher than expected values											1	
Shades of Blue - Lower than expected values											0	
Highlighting - Differences due to rounding											-1	



From the results in Table 15, which show the correlations between “Years in Service” and “Learning about the Fire Service,” it appears that there are clear differences in reasons for joining for firefighters with various years in service. The Chi-squared statistic is extremely strong in this case with a p-value of  $2.8 \times 10^{-21}$ .

Firefighters with more years in service indicate higher than expected values for referrals (friend, family, firefighter, and WOM) and Community Events. The findings also indicate a transition to other reasons because the firefighters with 10-19 years of experience still have the influence of referrals (WOM), but fewer values that are less than expected with the other options. With the newer group (0-9 years in service) – referrals have less of an influence and Website/Email/Internet Search and Banner/Sign/Billboards and Brochures/Flyers have a greater influence in getting recruits in the door. Surprisingly, the findings indicate that in recent years, referrals and WOM have less of an influence and Website/Email/Internet Search has a greater influence on firefighters with fewer than 10 years in service.

### “Years in Service” and “Areas in Need of Improvement”

Other factors that may have an influence on recruiting and retaining firefighters are their opinions of “Areas in Need of Improvement.” Although the Chi-squared statistic is weaker in this case with a p-value of 0.02, the correlations do give some insights into various opinions of improvements based on service years. As Table 16 indicates, “Areas in Need of Improvement” varies throughout firefighters’ careers.

**Table 16: Correlation Matrix - “Years in Service” and “Areas in Need of Improvement”**

"Years in Service" and "Areas in Need of Improvement"																								
	Communication	Motivating Personnel	Recruitment	Retention	Leadership	Officer/Career Development	Mentoring	Team Building	Conflict Management	Policies and Procedures	Succession Planning	Crew Resource Management	Supervision/Direction	General Management	Strategic Planning	Ethics	Problem Solving	Technology	Financial Management	Public Relations/Reputation MGT	Procurement	None	Other	Grand Total
0-9	178	142	143	146	123	123	105	106	90	81	66	75	55	56	49	54	49	49	48	45	23	30	11	1847
10-19	181	157	131	135	128	128	106	107	85	93	67	62	65	55	53	44	43	51	40	42	24	8	2	1807
20-29	171	135	140	107	139	125	99	77	87	67	81	64	65	55	53	60	50	50	44	34	32	10	4	1749
30-69	137	148	134	141	113	88	92	94	84	76	84	48	59	56	51	47	56	32	33	32	21	6	7	1639
Grand Total	667	582	548	529	503	464	402	384	346	317	298	249	244	222	206	205	198	182	165	153	100	54	24	7042
Areas in Need of Improvement: Differences (Actual Values - Expected Values)																								
0-9	3	-11	-1	7	-9	1	0	5	-1	-2	-12	10	-9	-2	-5	0	-3	1	5	5	-3	16	5	0
10-19	10	8	-10	-1	-1	9	3	8	-4	12	-9	-2	2	-2	0	-9	-8	4	-2	3	-2	-6	-4	0
20-29	5	-10	4	-24	14	10	-1	-18	1	-12	7	2	4	0	2	9	1	5	3	-4	7	-3	-2	0
30-69	-18	13	6	18	-4	-20	-2	5	3	2	15	-10	2	4	3	-1	10	-10	-5	-4	-2	-7	1	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



More than expected numbers of firefighters with fewer years of experience indicate “None” for “Areas in Need of Improvement.” For this group, “Crew Resource Management,” which also has higher than expected numbers of firefighters giving this response, is also a consideration for improvement. Fewer than expected numbers of firefighters indicate issues with “Succession Planning,” “Motivating Personnel,” “Leadership,” and “Supervision/Direction.”

Within the 10-19-year group, higher than expected numbers of firefighters see “Policies and Procedures” and “Communication” as issues, but fewer list “Recruitment” as a factor in need of improvement. The 20-29-year group also has higher than expected numbers of firefighters who see “Leadership” as an “Area in Need of Improvement.” However, the 20-29-year group differs from their more tenured counterparts on “Motivating Personnel,” but more importantly, the groups differ on “Retention.” Fewer than expected numbers of firefighters in the 20-29-year group see this as an issue compared to the 30-69-year group, which lists higher than the expected numbers of results for this category.

Contrary to firefighters with less than 10 years in service, tenured firefighters also have higher than expected values in “Succession Planning,” (30-69-year group) “Motivating Personnel,” (30-69-year group) and “Leadership,” (20-29-year group). Within the most tenured group, fewer than expected numbers of firefighters have issues with “Officer/Career Development,” “Crew Resource Management,” and “Technology.” The group is the only one that does not have higher than expected numbers of firefighters who see “Communication” as an issue that needs improvement. Overall, one would expect a certain level of need for improvements across all of the groups, but clearly specific categories depend on the tenure of the firefighters.

### **“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 the Fire Service. However, this correlation analysis includes all of the groups, but because of this structural format, the Chi-squared statistic is extremely strong in this case with a p-value of  $8.6 \times 10^{-36}$ . According to the results in Table 17, the 20-29 and 10-19-year groups have more than expected numbers of firefighters in the Fire Service, while the 0-9-year group has fewer than expected. The responses for “Student,” “Healthcare,” “EMS,” and “Unemployed” have higher than expected numbers of firefighters in the latter group. As expected, the most tenured group has higher than expected number of firefighters with a “Retired” response. Other than fewer numbers of firefighters in the 0-9-year group that are in the Fire Service, this information corroborates the findings in other sections.

**Table 17: Correlation Matrix - "Years in Service" and "Primary Occupation"**

		"Years in Service" and "Primary Occupation"																																				
Actual Values	Administrative/Support	Agriculture	Architecture and Engineering	Automotive	Communications	Construction	Education and Training services	Emergency Medical Service (EMS)	Extra*	Finance	Fire Service	Healthcare	Information Technology	Law Enforcement	Legal	Maintenance, Repair, Installation	Management	Manufacturing	Military	Other	Professional/Scientific	Public Administration	Public Safety	Retail Trade	Retired	Sales and Marketing	Self-employed	Student	Transportation/Warehousing	Unemployed	Utilities	Grand Total						
0-9	4	3	6	6	4	13	12	17	7	6	149	17	11	8	4	6	12	5	8	9	5	5	3	5	5	6	9	35	3	11	5	399						
10-19	3	3	4	4	3	9	7	11	1	3	190	3	15	7	1	13	8	1	2	5	4	2	9	2	5	4	5	1	5	2	6	338						
20-29	1	4	3	0	1	5	2	4	1	4	228	7	5	13	1	8	9	4	0	3	12	0	3	0	3	7	6	0	5	0	0	339						
30-69	3	6	2	4	2	4	8	4	1	4	166	3	4	6	1	2	12	4	1	8	2	7	7	1	44	12	3	0	3	0	4	328						
Grand Total	11	16	15	14	10	31	29	36	10	17	733	30	35	34	7	29	41	14	11	25	23	14	22	8	57	29	23	36	16	13	15	1404						
		Primary Occupation and Years in Service: Differences (Actual - Expected)																																				
0-9	1	-2	2	2	1	4	4	7	4	1	-59	8	1	-2	2	-2	0	1	5	2	-2	1	-3	3	-11	-2	2	25	-2	7	1	0						
10-19	0	-1	0	1	1	2	0	2	-1	-1	14	-4	7	-1	-1	6	-2	-2	-1	-1	-2	-1	4	0	-9	-3	-1	-8	1	-1	2	0						
20-29	-2	0	-1	-3	-1	-2	-5	-5	-1	0	51	0	-3	5	-1	1	-1	1	-3	-3	6	-3	-2	-2	-11	0	0	-9	1	-3	-4	0						
30-69	0	2	-2	1	0	-3	1	-4	-1	0	-5	-4	-4	-2	-1	-5	2	1	-2	2	-3	4	2	-1	31	5	-2	-8	-1	-3	0	0						
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
		*Extra Category: Combination of Accommodations/Food Service, Arts, and Community and Social Services (Total n=10; five or fewer per occupation)																																				
		-59	-11	-9	-8	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	14	25	31	51	Zero Values: Due to Rounding (yellow)														

**“Years in Service” and “Motivations”**

Examining motivations, particularly ones that change over time, has complications. Table 14 (landscape graphic on Page 55) shows how complicated analyzing “Motivations” can be in this survey. Because a few of the categories did not have more than five responses (minimal sample size), the analysis includes an “Extra” category with multiple variables. The “Initial Motivation” responses include Administration (and others) in the “Extra” category, and the “Continuing Motivation” responses include “Equipment (and the same categories of others) in the “Extra” category. The Chi-squared statistic is strong in this case with a p-value of 1.8\*10<sup>-7</sup>. Since Table 14 is complicated to understand, this explanation will be brief. See the “Motivations” in the Descriptive Analysis section for more information.

For brevity, the explanation includes a discussion of “Career Experience,” “EMS Response,” “Family Connection,” “Fire Response,” “Personal Fulfillment,” “Retirement Benefits,” and “Service to my Community.” Initially, firefighters in the 0-9-year group have higher than expected results in “Personal Fulfillment,” and “Career Experience,” “EMS Response,” and “Service to my Community,” but this changes with employment to higher values for “Career Experience,” “Adrenaline Rush,” and “Friendship/Camaraderie.” Initially, “Family Connection,” and “Fire Response,” have lower than expected results, but this changes with employment to lower than expected values for “Retirement Benefits,” and “Service to my Community.”

Firefighters with 10-19-years of experience initially have higher than expected numbers of firefighters with a “Personal Fulfillment” response, but this changes with employment. Within the 20-29-year group, the firefighters initially favor a “Family Connection.” However, the options of “Personal Fulfillment,” and “Service to my Community,” have fewer than expected numbers of firefighters with these initial responses.

The most tenured firefighters (30-69-year group) have higher than expected values for “Service to my Community,” and “Fire Response,” but with continuing service, “Personal Fulfillment,” and “Administrative Duties” have higher than expected results compare to the ones for “Fire Response.” The finding of “Administrative Duties” with higher than expected results for tenured firefighters corroborates the finding in Phase I. With continuing service, as expected, firefighters in this group have lower than expected results for “Career Experience.”

### **“ Years in Service” and “ Top-twelve Reasons for Others Leaving the Fire Service”**

Although it is not a direct “Leadership” question, a correlation matrix between “Reasons Others Have Left the Service” and “Years in Service” (Table 18) relates to issues that are similar to leadership – discussed in the subsequent section. Selection options for this question include “Station Politics” and “Did Not Fit In.” For this analysis, the leading reasons others have left does not include 11 of the selection options (n=507 (13%)). However, none of these options totals more than 3% of the responses. With the top-twelve selection for testing, the Chi-squared statistic is strong in this case with a p-value of  $3.7 \times 10^{-5}$ .

For the firefighters who have the least seniority (0-9-year group), “Station Politics” and “Did Not Fit In” have higher than expected results. One would think that these options relate to “Leadership Issues,” but the results are contrary to this assumption. For this group, lower than expected numbers of firefighters chose “Lack of Leadership.” One would also expect the possibly “younger” group to have “Life Changes” as a reason why others left the service, but this is also contrary to the findings. Fewer than expected numbers of firefighters indicate this is a reason for others leaving the service. “Retirement,” and “Compensations Issues” also have fewer responses than expected, but this is an “anticipated” finding.

Several of the findings completely switch after 10 years in service. “Lack of Leadership,” “Compensation Issues,” and “Lack of Incentives” are at the forefront for this group. “Time Commitment” and “Couldn’t Meet Training” have fewer responses than expected. Within the 20-29-year group, fewer than expected firefighters chose “Station Politics,” but “Lack of Incentives” is still an issue with this group.

Firefighters with the most tenure indicate that “Time Commitment” and “Couldn’t Meet Training” become issues and are reasons why others left the fire service. Fewer than expected numbers of firefighters in this group indicate that “Station Politics” and “Lack of Incentives” are reasons for others leaving. Overall, according to this group’s results, eight of the twelve reasons why others have left are polar opposites of the results for the group with the least seniority.

**Table 18: Correlation Matrix – “Years in Service” and “Top-twelve Reasons Others Left the Fire Service”**

Top-twelve Reasons Others Left the Fire Service													
Actual Values	Life Change	Time Commitment	Station Politics	Retired	Lack of Leadership	Did Not Fit In	Couldn't Meet Training	Couldn't Meet Duties	Lack of Incentives	Health/Fitness/Burn out	Compensation Issues	Careers vs. Volunteers	Grand Total
0-9	223	155	124	77	73	63	43	53	39	40	25	39	954
10-19	202	114	79	81	88	36	29	40	46	32	45	22	814
20-29	213	143	71	83	81	39	46	35	47	42	35	22	857
30-69	202	163	66	82	67	33	53	34	23	32	32	33	820
Grand Total	840	575	340	323	309	171	171	162	155	146	137	116	3445
Three Reasons Others Left the Fire Service: Differences (Actual -Expected)													
0-9	-10	-4	30	-12	-13	16	-4	8	-4	0	-13	7	0
10-19	4	-22	-1	5	15	-4	-11	2	9	-2	13	-5	0
20-29	4	0	-14	3	4	-4	3	-5	8	6	1	-7	0
30-69	2	26	-15	5	-7	-8	12	-5	-14	-3	-1	5	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Excludes remaining 11 choices (Explain "Other" also) n=507 (13%)													



### Additional Testing

Other factors relating to similar issues, such as “Areas in Need of Training,” (p-value of 0.16) “Recruitment Methods,” (p-value of 0.19) and “Retention Strategies” (p-value of 0.06) 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

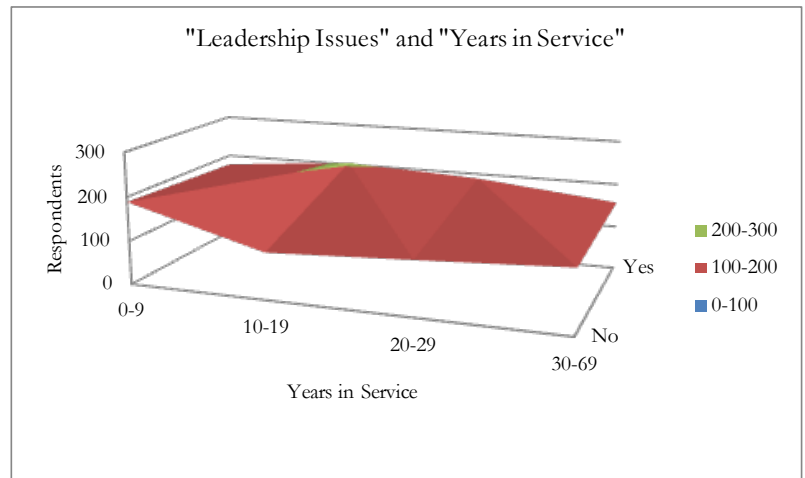
One of the survey questions directly addresses “Leadership Issues,” but correlation matrices can help to show additional relationships beyond the initial responses with the topic question. This section briefly examines the relationships between “Leadership Issues” and “Years in Service,” “Rank,” “Status Type,” and “Exit Interviews” Some of these relationships are stronger, but all of them have Chi-squared statistics with significant p-values.

### “Leadership Issues” and “Years in Service”

The results in Table 19 and Figure 31, a correlation matrix and 3-d graphic with “Leadership Issues” and “Years in Service,” corroborate with previous findings in earlier discussions. Firefighters early and late in their careers have lower than expected values for issues with “Leadership,” but these values are nearly identical for each category in the 0-9 service year group – indicating that nearly half of the respondents in this group have issues with leadership. Conversely, the findings indicate that higher than expected numbers of firefighters in the two groups who are in the middle of their careers (10-29 years) have concerns with “Leadership.” The Chi-squared statistic is strong in this case with a p-value of  $1.8 \times 10^{-5}$ .

**Table 19: Correlation Matrix - "Leadership Issues" and "Years in Service"**

Actual Values	Leadership Issues		
Years in Service	No	Yes	Grand Total
0-9	189	177	366
10-19	106	204	310
20-29	123	189	312
30-69	141	157	298
Grand Total	559	727	1286
Differences	Leadership Issues		
Years in Service	No	Yes	Grand Total
0-9	30	-30	0
10-19	-29	29	0
20-29	-13	13	0
30-69	11	-11	0
Grand Total	0	0	0
<b>Red Text - Higher than Expected Results</b>			
<b>Blue Text - Lower than Expected Results</b>			



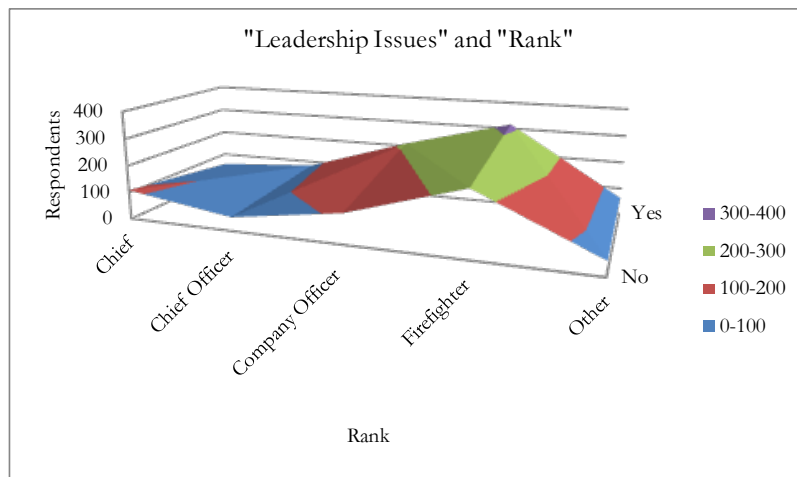
**Figure 31: "Leadership Issues" and "Years in Service" 3-d Graphic**

## “Leadership Issues” and “Rank”

An examination of the relationship between “Leadership Issues” and “Rank” (Table 20 and Figure 32) indicates differences among the ranks. Higher than expected values for “Chiefs” and to a lesser extent, “Other” with a “No” response indicates that these groups do not have concerns with “Leadership Issues.” The remainder of the groups (“Chief Officer,” Company Officer, and Firefighters) have higher than expected numbers of firefighters with “Yes” responses - confirming “Leadership Issues.” “Company Officers” have the greatest number of firefighters above the expected values. The Chi-squared statistic is strong with a p-value of  $1.2 \times 10^{-9}$ .

**Table 20: Correlation Matrix - "Leadership Issues" and "Rank"**

Actual Values	Leadership Issues		
Rank	No	Yes	Grand Total
Chief	109	55	164
Chief Officer	51	83	134
Company Officer	111	210	321
Firefighter	236	316	552
Other	52	63	115
Grand Total	559	727	1286
Differences	Leadership Issues		
Rank	No	Yes	Grand Total
Chief	38	-38	0
Chief Officer	-7	7	0
Company Officer	-29	29	0
Firefighter	-4	4	0
Other	2	-2	0
Grand Total	0	0	0
Red Text - Higher than Expected Results			
Blue Text - Lower than Expected Results			



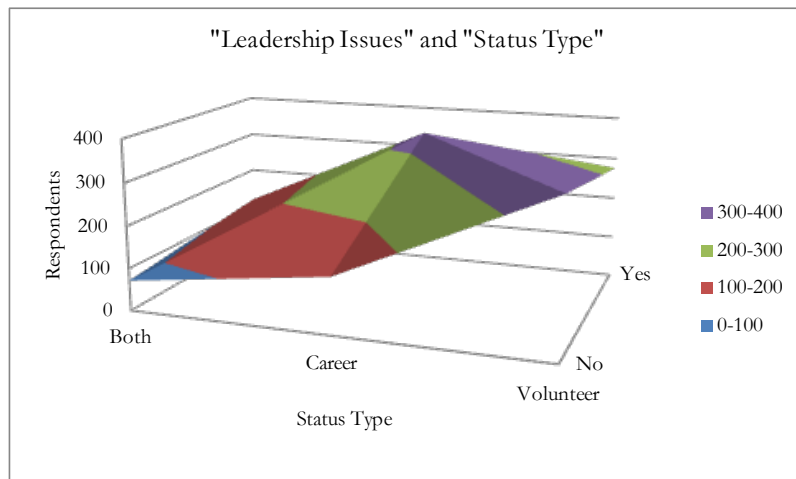
**Figure 32: Correlation Matrix - "Leadership Issues" and "Rank"**

## “Leadership Issues” and “Status Type”

Table 21 and Figure 33 corroborate previously stated information that there is a relationship between “Leadership Issues” and “Status Type.” Although this is redundant, it confirms that lower than expected numbers of Volunteer firefighters have issues with “Leadership.” However, 44% of the Volunteer respondents indicate an issue with leadership. Conversely, the Career firefighters and to a lesser extent the Both group have higher than expected “Yes” responses. The Chi-squared statistic is extremely strong in this case with a p-value of  $1.7 \times 10^{-19}$ .

**Table 21: Correlation Matrix - "Leadership Issues" and "Status Type"**

Actual Values	Leadership Issues		
Type	No	Yes	Grand Total
Both	72	117	189
Career	133	334	467
Volunteer	354	276	630
Grand Total	559	727	1286
Differences	Leadership Issues		
Type	No	Yes	Grand Total
Both	-10	10	0
Career	-70	70	0
Volunteer	80	-80	0
Grand Total	0	0	0
Red Text - Higher than Expected Results			
Blue Text - Lower than Expected Results			



**Figure 33: Correlation Matrix - "Leadership Issues" and "Status Type"**

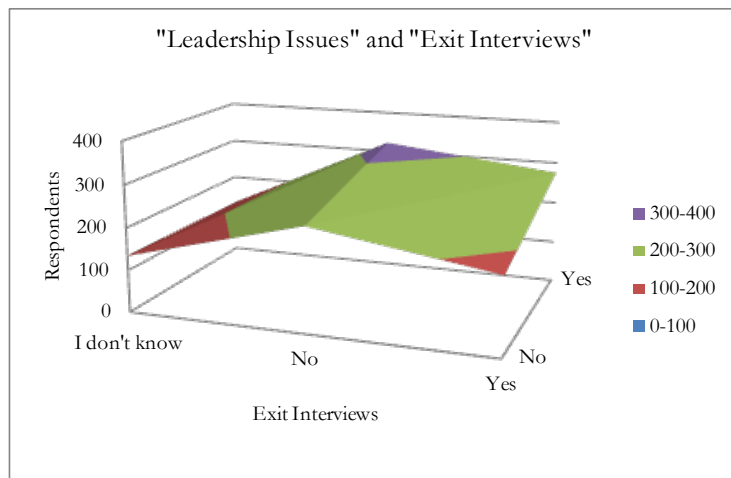


## “Leadership Issues” and “Exit Interviews”

Interpretation of the relationship between “Leadership Issues” and “Exit Interviews” is a bit “tricky” due to the format of the questions – both are Yes/No questions, but the “Exit Interview” question adds an “I Don’t Know” response in the options (Table 22 and Figure 34). The analysis includes this information because it is an unexpected result. Higher than expected numbers of firefighters who answered the “Exit Interviews” question with either a “Yes” or “No” response have issues with “Leadership,” but the differences are greater with firefighters who have a “Yes” response. The “I Don’t Know” group who do not know if exit interviews are available in their departments have greater numbers of firefighters who do not have issues (“No” response) with “Leadership.” As expected, the Chi-squared statistic is weak in this case with a p-value of 0.01.

**Table 22: Correlation Matrix - "Leadership Issues" and "Exit Interviews"**

Actual Values	Leadership Issues		
Exit Interviews	No	Yes	Grand Total
I don't know	135	130	265
No	244	322	566
Yes	180	275	455
Grand Total	559	727	1286
Expected Values	Leadership Issues		
Exit Interviews	No	Yes	Grand Total
I don't know	20	-20	0
No	-2	2	0
Yes	-18	18	0
Grand Total	0	0	0
Red Text - Higher than Expected Results			
Blue Text - Lower than Expected Results			



**Figure 34: Correlation Matrix - "Leadership Issues" and "Exit Interviews"**

## Correlations Summary

Within this study, six correlations indicate differences between firefighters at the beginning, middle, and end of their tenures as firefighters. Each of the correlations between “Years in Service” and “Starting Age” (derived), “Areas in Need of Improvement,” “Primary Occupation,” “Motivations,” and “Reasons for Others Leaving the Fire Service” demonstrate the changes that affect firefighters throughout their careers. In addition, four correlations with “Leadership Issues” and “Years in Service,” “Rank,” “Status Type,” and “Exit Interviews,” 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.

With “Starting Age,” the results vary with firefighter tenure. Fewer numbers of teenagers are beginning employed within the fire service. For the 16 to 19-year cohort, there are fewer than expected numbers of firefighters in the early years in service (0-9 years) and greater numbers than expected in the tenured group (30-69 years). In addition, the starting age of firefighters with fewer years in service is later than their counterparts who have more tenure in the fire service. Overall, thirty-four percent (n=118) of the firefighters in all of the groups started before the age of 16, but the group with the largest percentage of pre-16-year olds is the most tenured group (n=42 (13%)). With later starting dates, career longevity is probably diminishing in the long term.

For “Learning about the Fire Service,” within the newer group of firefighters (0-9 years in service), referrals have less of an influence and Website/Email/Internet Search and Banner/Sign/Billboards and Brochures/Flyers have a greater influence in getting recruits in the door. In the middle cohorts, firefighters with 10-30 years in service show a transition phase between their counterpart groups. Firefighters with more years in service indicate higher than expected values for traditional referrals (friend, family, firefighter, and WOM) and Community Events.

Overall, one would expect a certain level of need for improvements across all of the groups, but the findings indicate that specific categories depend on the tenure of the firefighters. More than expected numbers of firefighters with fewer years of experience indicate “None” or “Crew Resource Management” for improvement, while fewer than expected numbers in the group indicate issues with “Succession Planning,” “Motivating Personnel,” “Leadership,” and “Supervision/Direction.” Within the 10-19-year group, higher than expected numbers of firefighters see “Policies and Procedures” and “Communication” as issues, but fewer list “Recruitment” as a factor in need of improvement. The 20-29-year group differs from their more tenured counterparts on “Motivating Personnel,” and “Retention,” and the group has higher than expected numbers of firefighters who see “Leadership” as an “Area in Need of Improvement.” Contrary to other firefighters, tenured firefighters have higher than expected values in “Succession Planning,” “Motivating Personnel,” and “Retention.” Within this group, fewer than expected numbers of firefighters have issues with “Officer/Career Development,” “Crew Resource Management,” and “Technology.” Overall, the group is the only one that does not have higher than expected numbers of firefighters who see “Communication” as an issue that needs improvement.

Although “Primary Occupation” only includes results for the Volunteer/Both groups, the correlation analysis analyzes the entire study population (all groups – with Fire Service as the occupation of the Career group). Within the study, the 0-9-year group has fewer than expected numbers of firefighters in the fire service, and higher than expected numbers in the “Student,” “Healthcare,” “EMS,” and “Unemployed” categories. Conversely, the 10-29-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.

Even though interpretation of the “Motivations” is complex, the correlation analysis indicates findings that differ with firefighter longevity within the fire service. Initially, firefighters in the 0-9-year group have higher than expected results in “Personal Fulfillment,” and “Career Experience,” “EMS Response,” and “Service to

my Community,” but this changes with employment to higher values for “Career Experience,” “Adrenaline Rush,” and “Friendship/Camaraderie.” Firefighters with 10-19-years of experience initially have higher than expected numbers with a “Personal Fulfillment” response, but this changes with employment. Within the 20-29-year group, the firefighters initially favor a “Family Connection,” but have fewer than expected numbers with the options of “Personal Fulfillment,” and “Service to my Community.” The most tenured firefighters (30-69-year group) have higher than expected values for “Service to my Community,” and “Fire Response,” but with continuing service, “Personal Fulfillment,” and “Administrative Duties” have higher than expected results – which corroborates the finding in Phase I. As expected, “Career Experience” diminishes with continuing service.

The “Reasons for Others Leaving the Fire Service” shows the greatest differences between the groups according to tenure. For the firefighters who have the least seniority (0-9-year group), “Station Politics” and “Did Not Fit In” have higher than expected results, and “Lack of Leadership,” “Retirement,” and “Compensations Issues” have fewer than expected values. Surprisingly, fewer than expected numbers of firefighters indicate “Life Changes,” as a reason for others leaving the fire service. After 10 years in service, “Lack of Leadership,” “Compensation Issues,” and “Lack of Incentives” are important, but “Time Commitment” and “Couldn’t Meet Training” have fewer responses than expected for this cohort. Within the 20-29-year group, “Lack of Incentives” is still an issue with this group, but fewer than expected numbers of firefighters select “Station Politics.” For firefighters with the most tenure, “Time Commitment” and “Couldn’t Meet Training” become issues for others leaving; however, fewer than expected numbers of firefighters in this group indicate that “Station Politics” and “Lack of Incentives” are reasons for others leaving. Overall, the groups with the least and most seniority have polar opposite results with eight of the twelve reasons why others have left the fire service.

For “Leadership Issues,” firefighters early and late in their careers have lower than expected values for issues with “Leadership.” However, nearly half of the respondents in the 0-9-year group indicate that they have issues with “Leadership.” Conversely, the findings indicate that higher than expected numbers of firefighters in the 10-29-year groups with more tenure have concerns with “Leadership.” Among the ranks of firefighters with a “No” response to “Leadership Issues,” higher than expected values for “Chiefs” and “Other” indicates that these groups do not have concerns with these issues. Conversely, “Chief Officer,” Company Officer, and Firefighters have higher than expected numbers of firefighters with “Leadership Issues.” The findings also indicate that lower than expected numbers of Volunteer firefighters have issues with “Leadership.” However, 44% of the Volunteer respondents indicate that this is a relevant issue. Lastly, the “I Don’t Know” group, who do not know if exit interviews are available in their departments, have greater numbers of firefighters who do not have issues (“No” response) with “Leadership.”

## **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” by “Starting Age” Group
- "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 “Areas in Need of Improvement"
- "Years in Service" and "Primary Occupation"

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 VFCA 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.