

Determining the Cost Benefit of a Volunteer Live-In Residency Program

Eric T. Heath

Southington Fire Department, Southington, CT

**Certification Statement**

I hereby certify that this paper constitutes my own product, that where language of others is set forth, quotation marks so indicate, and that the appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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A handwritten signature in black ink is written over a horizontal line. The signature is stylized and appears to be a cursive name, possibly starting with 'J' and 'H'.

### **Abstract**

The Southington Fire Department is a mostly volunteer combination style fire department. The department is not immune to the challenges facing other volunteer and combination departments, primarily staffing. The problem was that the availability of volunteers could affect deploying sufficient staffing. The purpose of this study was to determine what, if any, cost benefit could be realized with establishing a volunteer live-in policy. Descriptive methodology was used to guide the following research questions: (a) What are the costs of implementing a volunteer residency program? (b) What are the benefits of a volunteer residency program? (c) Are there alternatives to a residency program that would provide staffing without hiring additional personnel? A review of pertinent literature or documentation regarding live-in programs was conducted. Both internal and external surveys were developed to determine the perspective of any potential operational and budgetary effects of a program. Interviews were conducted with area fire chiefs operating similar programs and with a town attorney to address legal concerns or considerations. The results concluded in identifying basic cost benefits realized from volunteer residency programs. It was further determined that those benefits, while not necessarily unique, impacted each department differently in terms of operations and administration. It was recommended that a more comprehensive cost versus benefit analysis be conducted to determine the impact of a program as it applies specifically to the Southington Fire Department.

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### **Determining the Cost Benefit of a Volunteer Live-In Residency Program**

The Southington Fire Department operates a combination style fire department comprised of 32 career personnel (line and staff) and 82 volunteer members (Southington Fire Department, 2017a). The department is the primary agency for: (a) fire suppression, (b) technical rescue, (c) hazardous materials incidents, and (d) disaster mitigation response. Staff personnel are also responsible for daily administration as well as: (a) fire prevention, (b) inspection, and (c) investigation duties. It is also the liaison agency to the local emergency management department for the Community Emergency Response Team (CERT). The 82 volunteer members are inclusive of fire police, exterior only status firefighters, and probationary members. Since 2010, the Southington Fire Department has averaged a retention and attrition rate of 1:1 of volunteer members; for every one member joining one member is lost due to retirement, relocation, and job change (S. DiBattista, personal communication, June 14, 2017). Furthermore, there has been no additional career staff added since 2007.

Calls for service have remained fairly consistent, between 2100-2500 annually. However, the guaranteed consistency of a volunteer response has not kept pace with the call volume. This is most evident during the daytime hours between 0600 and 1800 (Southington Fire Department, 2017a). Options have been looked at with regard to career staffing models and volunteer duty shifts from previous administrations with no changes taking affect. The problem is the availability of volunteers could affect deploying sufficient staffing. The purpose of this research paper was to determine the cost-benefit of such a program for the Southington Fire Department. Descriptive methodology was used to guide the following research questions: (a) What are the costs of implementing a volunteer residency program? (b) What are the benefits of a volunteer

residency program? (c) Are there alternatives to a residency program that would provide staffing without hiring additional career personnel?

### **Background and Significance**

The Town of Southington is comprised of the villages of Marion, Plantsville, Milldale, and Southington. The Southington Fire Department is a combination department of one career company and four volunteer companies operating out of four firehouses. The career company is staffed at fire headquarters in the center of the town, along with a volunteer company. The remaining firehouses are a strictly volunteer since 2000 when daytime career staffing was removed from the southernmost firehouse (T. Donnelly, personal communication, June 30, 2017). The department covers 37 square miles of residential, commercial, and light industrial properties. It is also responsible for 22 miles of interstate encompassing I-84 and I-691. These are major state arteries, with daily traffic in the Southington area eclipsing 120,000 vehicles. Total population is in excess of 43,000 in over 15,000 households. This is not inclusive of the daytime workforce population or seasonal increases with commercial, industrial, and other properties in excess of 1000 units (B. Lastra, personal communication, July 24, 2017). Seasonal increases can range upwards of 40,000 per day in the summer when Lake Compounce is open. Southington has dual role and responsibility for the park with the City of Bristol, which is the oldest continually operated theme park in the United States.

The department has a combined staffing level of 114 personnel, including both line and staff. Volunteer staffing is reported at 82 members. However, in order to get the true number of available interior qualified volunteer firefighters, certain members needed to be removed from the count. These members would be nine probationary firefighters, ten fire police, seven leaves of absences, and three exterior only firefighters. This reduces our operational personnel to 85.

Additionally, 22 members have limited availability making less than 60% of available calls (Southington Fire Department, 2017b). Since January of 2010, 83 members have left the department. The reduction in available volunteer firefighters directly impacts operational efficiency as it relates to response times.

This problem has impacted the organization and has been recognized by the administration of the department for a long time. In 2012 the department was awarded a Staffing for Adequate Fire and Emergency Response (SAFER) grant from the Federal Emergency Management Agency (FEMA) totaling over \$720,000 (Welcome to the Assistance to Firefighters Grant Program, 2012). This grant was earmarked to provide funds for four positions for two years to man the department's southernmost station. The Town Council rejected excepting the grant (Glidden, 2012). Continual efforts have been made by the administration to add career staffing to the budget in order to staff an additional station. As recent as the 2018 fiscal year budget year, the request was submitted to hire three additional firefighters and denied. One method to address the staffing issue would be dedicated station duty crews, staffed by volunteer members.

In 2013 the Town of Southington contracted with the Center for Public Safety Management, a division of the International City/County Management Association (ICMA) (2013) to "complete a comprehensive analysis of the town's fire services" (International City/County Management Association, p. 5). The report identified 31 recommendations to be implemented by the fire department. Item 21 strongly recommended the establishment volunteer duty crews to enhance staffing and response (ICMA, 2013). At the time of the report the administration attempted to work with members of the volunteer force to establish this program. However, roadblocks were uncovered that primarily focused on the structure of the shifts, the

willingness of the volunteers, and the desire for financial compensation for covering duty shifts. As recent as March 2017 the idea resurfaced, but was not implemented due to opinion from the State of Connecticut Department of Labor (DOL) and how the shifts could violate provisions of the Fair Labor Standards Act (FLSA). Primarily, requiring members to staff a set number of shifts or hours give the fire department direction and control. Direction and control establishes an employer-employee relationship which would violate their bona fide volunteer status (D. Senkow, personal communication, March 17, 2017). Payment for such services could also violate this status and create an employment relationship according to FLSA (Dodge & Mullarkey, 2006). One potential option is to offer a reasonable benefit, in this case housing, for maintaining duty shifts.

The research relates to the Executive Fire Officer Program's Executive Development course, specifically chapter six describing the first two stages of innovation and creativity. Those stages are recognizing a problem and gathering information (United States Fire Administration [USFA], 2016). Additionally, this project was linked with goal two and goal three of the USFA's 2014-2018 strategic plan for response preparedness (United States Fire Administration [USFA], 2014).

### **Literature Review**

A literature review was conducted using reference materials available from the Learning Resource Center at the National Fire Academy. Additional resources included Executive Fire Officer papers, articles, trade journals, and USFA publications. There was minimal amount information in terms of consensus or national standards that addressed a volunteer live-in residency program.

The glaring reality that cannot be overlooked is the declining numbers of volunteer firefighters. In a recent NFPA article, the number of volunteer firefighters per 1000 people fell to just over six and one half between 2009 and 2015 (Verzoni, 2017, p.32). Over a 27 year time frame volunteer firefighters nationwide declined by 15 percent while trying to address a 300 percent increase in call volume (Bodin, 2017, p.32). Decreasing numbers of volunteers reduces staffing levels and increases responses times. In their 2007 report the National Volunteer Fire Council (NVFC) and the USFA identified that departments can no longer rely on traditional methods such as counting "...on the children of current members...Nor can they count on a continuous stream of community people..." (USFA, 2007, p. 1). The challenge becomes how to make recruiting and retaining volunteers, especially younger volunteers more effective. Incentivizing with stipends, pay per call, or other benefits has long been applied to this process. An additional incentive would be to provide housing for members in exchange for staffing a station during given times. Firefighters in stations ready to respond increase the effectiveness and customer service delivery of the fire department. They are the backbone of the organization. Organization readiness is a priority.

The concept of a volunteer live-in or residency program is not new, in either the fire service or other professions. Most recognizable may be in the medical field. In a 2010 article Pasek and Stephens (2010) describe the return on investment as it related to their profession. They recognize that the "major benefit of a residency program is the long-term benefit to the resident, profession..." (p. 1952). They continue further to illustrate benefits such as administrative tasks performed by the residents as well as benefitting financially by substituting resident labor for full time employees (Pasek & Stephens, 2010). In another article focused on medicine they reference a similar trend being seen in the fire service, in terms of an environment

of staffing shortages (nurses in this case) and financial instability (Trepanier, Early, Ulrich, & Cherry, 2012). Their research is similar to the fire service as they expand on their cost benefit analysis by measuring the return on investment as it relates to turnover (retention) and labor costs (career personnel) (Trepanier et al., 2012). The medical profession approach differs in structure and execution but the benefits realized can be attained in a similar fashion for the fire department. There are departments nationwide that utilize their members or a student population to support staffing levels. Three departments in Connecticut; (a) Blue Hills, (b) Allingtown, and (c) Manchester Eighth Utilities District utilize either current volunteers or student populations with varying operational structures. All three departments have been operating their programs in excess of 30 years.

The Eagan Fire Department in Minnesota began a volunteer live-in program in 2007 (Scott, 2008). Scott, the chief of the department and author of the article noted several key benefits the department received from the program. He identified that the program has (a) assisted in improving response times, (b) assisted with administrative duties, (c) fire prevention duties, and (d) served as a retention and recruitment tool (Scott, 2008). In Indiana, PA students from the Indiana University of Pennsylvania are part of a bunk-in program receiving free living accommodations “in exchange, they are on call from 10 p.m. to 6 a.m....” (Pickles, 2014, p. 13). The department has realized a decrease in response times, and the students save over \$2500.00 in housing costs as well as gaining valuable experience from responding to incidents (Pickles, 2014). Steed (2013) participated in a live-in program while in college and states “...many departments have not even considered this a way to improve membership, staffing, and response times” ( p. 12). Providing room and/or board for live-in personnel is a value-added benefit in

exchange for the individuals service and is enhanced by what Steed refers to as the community receiving “a more efficient level of service” (Steed, 2013, p. 12).

In a 2013 news post on the University of New Haven’s webpage, Wayne Sandford who is on faculty at the University was quoted regarding the benefit of the student intern or residency program stating “The students get to learn what the job is like in and out of the fire station”. Further in the media post he cites the benefit received by the department “through increased fire coverage and public education programs” (Grava, 2013, para. 11).

The tangible benefits of such programs are; (a) decreased response time, (b) guaranteed staffing, (c) training, and (d) assistance with administrative duties can be seen. Furthermore, the potential effect on recruitment and retention for struggling departments could be a recognized benefit. However, the intangible benefits such as morale and camaraderie are harder to quantify. A primary benefit that should be measured is any financial savings that could be realized. This is referred to as cost avoidance or “the amount of money a community would have to spend on fully career services but avoids spending because of the use of volunteers” (Windisch, 2008a, p. 154).

Addressing the financial aspect also requires looking at such a program from the view point of community risk reduction. In a 2016 article Donohue (2016) identified risk reduction strategies as “...cost effective methods of addressing the response gap and improving community safety” (p. 4). He goes further into addressing service gaps, in this case staffing and response times, utilizing a process “...to use current personnel and equipment...essentially creating a no- or low-cost solution to address the deficiency” (Donahue, 2016, p. 4). Utilizing current volunteer members would eliminate the need to hire additional personnel. Incentivizing volunteers will “...ultimately cost less than maintaining career staff...” (Janke, 2010, p. 15).

Volunteers provide a significant economic benefit to communities. The USFA identifies that “The erosion of the volunteer fire service...has economic and social effects...as towns are forced to hire career firefighters...” (USFA, 2007, p. 22). The United State Fire Administration (USFA) and the National Volunteer Fire Council (NVFC) recognized the decline in volunteer firefighters nationwide. The report identified conditions contributing to the decline as (a) increase of age, (b) time commitment, and (c) training requirements. One noteworthy item was the cost of housing, which may inhibit volunteers from residing in a specific community. An option provided in a 2007 report by the USFA was the “...need to explore volunteer fire station residing/in-station programs...” (USFA 2007, p. 22). Utilizing current department volunteers would provide significant savings in lieu of hiring career personnel. In 2016, the hourly estimate for a volunteers worth was valued at \$24.14 per hour (The value of volunteer time, 2016). Using this hourly figure, the potential savings to staff an apparatus with three volunteer members for twenty-fours a day, as opposed to the cost of hiring career staff, could equate to \$634,399.20 for a full year.

Costs associated with such a program have been identified as; (a) infrastructure improvements, (b) training, and (c) protective gear and equipment. In a 1999 Executive Fire Officer (EFO) paper, Clymer (1999) identified that a building addition would be needed in order to support the program, costing upwards of \$260,000 (p. 39). Additional costs identified by Clymer included over \$38,000 in furniture and equipment. (p. 45). Steed (2013) identified other potential costs in the need to provide proper accommodations for female participants, program development, and the need to appoint a live-in program manager (p. 16). Some of these items are mirrored in the medical profession identified as “...(a) varying direct and indirect costs, (b) costs of program development, (c) preceptors, and (d) educators” (Trepanier et al., 2012, p. 209).

Training and equipment are also costs that would be borne by the department and program. It is estimated that initial training and personal protective equipment for an entry-level volunteer is \$5,000.00. Utilizing current volunteer members, student members trained to National Fire Protection Association (NFPA) 1001, or remunerating that cost as regular members join would help spread those costs out. Overall, as identified by Bliss in his 2010 EFO paper, the cost of providing housing for volunteers is less than one-fifth of the cost of career personnel (p. 11). Retention of volunteer members is a priority, as “a trained firefighter is always difficult to replace” (Furey, 2007, para. 18).

Any establishment of a program and evaluation would need to “...explore the distribution of a program’s costs and benefits” (Nice, 2002, p. 81). If the cost benefit is not realized, then alternative staffing methods need to be researched to address the need, without hiring additional personnel. The 2014 edition of NFPA 1720 identifies that “Fire suppression operations shall be organized to ensure...capability includes sufficient personnel” (*NFPA 1720*, 2014, p. 6) and that “The fire department shall identify minimum staffing to ensure...members are available...” (*NFPA 1720*, 2014, p. 7).

Daytime staffing issues for volunteer departments are prevalent enough that departments are forced to transition to combination or paid departments, or to employ models that include “mandatory volunteer staffing” (Haase, 2008, p. 3). Determining the proper level of staffing and deployment methodology can be conceived many ways, with the authority having jurisdiction having ultimate responsibility. However, a formal risk analysis should be conducted as outlined in the *Fire Chief’s Handbook*. The five recommended steps involved identify the fire protection of the community, the risk to the community as a whole, the ability to respond to identified risks, identifying the unprotected risk, and developing strategies (Bennett & Forsman, 2003).

Developing and implementing strategies is the vital step in resource deployment. One strategy is to redeploy "...personnel to match call volume..." (Donahue, 2016, para. 9). Demand based modeling for staffing a fire department may not be the most advantageous solution. Adequate staffing is necessary in the mitigation of emergencies. Several agencies have addressed this in texts, recommendations, standards, and manuals. The NFPA, USFA, International City/County Management Association (ICMA), and the International Association of Fire Chiefs (IAFC) all site the manpower needed (Wilson, 2009). Mutual aid and/or regional response staffing are other considerations.

The application of a regional response model would help reduce or eliminate "...duplicating resources and services. This saves both times and money..." (Windisch & Crosby, 2008, p. 135). This concept faces its own challenges where no county based services are provided and therefore decision makers "...have no vision of a county-based structure that might support the easing of volunteer staffing challenges" (Rinaldi & DeLuca, 2017, p. 41). The authors describe the county based plan as strategically placing personnel and resources "...according to a master plan to supplement volunteer staff..." (Rinaldi & DeLuca, 2017, p. 41). Regional response operations provide the "necessary resources to several fire departments in a cost effective manner" and "also creates safer operations and better overall service delivery" (Haase, 2008, p. 7).

Mutual aid and automatic aid agreements are another option to address staffing issues for neighboring departments. Automatic aid agreements, usually agreed upon by the governing entities are a way to control costs. It provides resources upon initial dispatch with the purpose of these agreements "...to dispatch the closest unit...regardless of the jurisdiction..." (Young, 2012, p. 121). Mutual aid differs in that the resources and personnel are requested by an

adjoining jurisdiction at or during the time of the incident. Locke (2004) of the Hartford, Vermont fire department researched automatic aid to address staffing in his 2004 Executive Fire Officer paper. His results indicated that "...the creation and implementation of an automatic aid agreement...would be beneficial...would benefit all areas of the community..." (p. 20). However, relying solely on mutual aid is directly affected by "...if the companies are available" (Wilson, 2009, para. 1)

The literature review found limited standardized information regarding specific cost benefits of a volunteer live-in program other than those experienced by individual departments. There were no formalized national standards or published best practices. The challenges of staffing and options available maintained prevalence throughout the research. The fire department or authority having jurisdiction needs to determine the proper staffing strategy. This strategy should be based the mission, goals, and objectives of the agency as well as the involvement of the members.

### **Procedures**

Data was collected utilizing descriptive research methodology as a guide. This method was chosen to determine the cost benefit of establishing a volunteer live-in residency program. Four different procedures were used.

The first procedure was an internal survey instrument. The internal survey (Appendix A) was disseminated to 124 members and stakeholders of the Southington Fire Department through Survey Monkey.. Membership included volunteer and career personnel, as well as members of the Board of Fire Commissioners. The internal survey consisted of six questions. This survey collected 58 responses for a return of approximately 47%. The department email distribution list was used to disseminate the survey and was considered current.

The second procedure consisted of an external survey (Appendix B) disseminated on the State of Connecticut list service. The list service is a statewide information sharing network run through the Connecticut Fire Prevention and Control Commission (CFPC). This as well as submission via the International Association of Fire Chief's (IAFC) Knowledge Net led to a sample of 5,400. The purpose of this survey was to determine what other departments have experience in either operating a similar program or reason for assessing a need for a volunteer residency program. This survey consisted of ten questions. This survey collected only 77 responses or just over one percent..

The third procedure involved personal interview with chiefs from three departments in the State of Connecticut who operate live-in programs. The interviews were conducted with Chief Robert Farmer (R. Farmer, personal communication, June 2, 2017) from the Blue Hills Fire Department in Bloomfield, CT, Chief Donald Moore (D. Moore, personal communication, July 28, 2017) from the Manchester Eighth Utilities District in Manchester, CT, and Chief Michael Esposito (M. Esposito, personal communication, July 21, 2017) from the Allington Fire Department in West Haven, CT. The Blue Hills Fire Department and the Manchester Eighth Utilities District operate strictly with current volunteer membership. The Allington Fire Department utilizes a student population. Interview questions were open ended and were directed at the cost benefit of the program as well as operational and administrative issues. The specific interview questions and responses can be found in Appendices C, D, and E.

The fourth procedure was an interview with Mark Sciota (M. Sciota, personal communication, August 23, 2017) the Southington town attorney. This interview was conducted to discuss any legal concerns of such a program in terms of liability, insurance, collective bargaining, and labor law issues. Interview questions and responses can be found in Appendix F.

There were several limitations identified with the internal survey. Although all members have expressed concerns regarding staffing levels, the major limitation of this survey was the potential of personal bias of the individual responding. Volunteers could view this as an administrative mandate on their members, burdening them with an additional requirement. Career members could view this as an attempt to stifle continued requests for additional full-time personnel. A second limitation was based on the percentage of responses from the utilized email distribution list; however no member of the department has updated their contact information as recent as six months.

The most significant limitation of the second survey was the response collected and the sample size used. The survey results indicate that many respondents skipped questions, further limiting the data. The last 3 questions were validation measures to determine if responses were from like departments. However, the limited responses collected offer a significant challenge to determine reliability. Both surveys presented another limitation as neither offered a question to respond to regarding the third research question on alternative staffing models

## **Results**

Descriptive research methodology was used to gather data to answer three research questions. The first research question asked: What are the costs of implementing a volunteer residency program?

The literature review provided limited information regarding the cost of implementing a program. The largest identified cost was to be that of building station additions, buying furniture, or adding infrastructure improvements (Bliss, 2010). Additional costs found through the literature review would be the cost of program development, and the potential for hiring or paying for a program manager if current staff were unable to take on the project (Steed, 2013).

The internal survey data identified the biggest challenge or cost of such a volunteer residency program to be infrastructure in terms of stations and facilities was the most prevalent with over 34% of the respondents selecting this option. Those that responded to the external survey, 36.54% identified that infrastructure and membership interests were the largest contributing factors to not beginning a program. On its own, infrastructure improvements accounted for 80% of the respondents answers as being the biggest cost consideration. In the interview questions with three fire departments the respondents identified that operational costs are minimal in terms of building maintenance and utilities and are indirectly off-set by the guarantee of staffing. In an interview with Chief Michael Esposito (M. Esposito, personal communication, July 21, 2017) he stated that ancillary costs are absorbed in a \$2000.00 room and board fee per semester.

Additionally, the interview with the town attorney items were discussed in terms of cost related to legal considerations. These are focused primarily in stipends or payments, and how it would affect the employee-employer relationship. Paying a stipend for shift coverage would increase cost to the department but would stay in line with department of labor guidelines. Providing an hourly rate could violate FLSA unless they were made employees. In making them employees, it could involve labor negotiations as the fire union is the sole representative for paid uniformed positions. In terms of other ancillary costs, volunteers are already covered under the town's workers compensation and insurance policies while performing their duties so this would be negligible.

The second question asked: What are the benefits of a volunteer residency program? Through the literature review benefits were identified as; (a) decreased response times, (b) guaranteed staffing, and (c) the impact on recruitment and retention. Other tangible benefits

included those live-in members taking on the responsibility for (a) administrative tasks, (b) maintenance, and (c) other general duties.

The internal survey provided similar results, with exception to recruitment and retention. A majority of the respondents, 34 of them were volunteer members comprising 58.62% of the survey. Career members, 19 completed the survey allotted for 32.76%, and all Board of Fire Commissioners, five in total, responded for the remaining 8.62%. A majority of the responses, over 65% felt that a live in program would not help recruitment and retention, with an equal amount believing such a program was an option with current membership. However, over 58% identified they could see a benefit in offering volunteers a place to live for staffing shifts. The large benefit identified was the integration of career and volunteer personnel at 41%. Deployment and response times were the second largest benefit at just over 23% with recruitment and retention third at over 21%. The last ranking benefit identified was unusual with only 8 respondents identifying staffing as the most advantageous benefit.

Data collected from the external survey showed a majority of the respondents, 74.36% were from combination and volunteer departments. Additionally, 35.90% identified a department size between 51-100 personnel. These two results validate that respondents were similar in make-up as the Southington Fire Department. The exception to this would be the population served, with almost 25% serving a population 10000-20000. However, the biggest advantage was found to be guaranteed staffing at just over 46% with reduced response times second at just fewer than 39%.

Chief Farmer of the Blue Hills Fire Department (R. Farmer, personal communication, June 2, 2017) stated that they realized a benefit of reduced response times and increased staffing on apparatus when live-in members are presents. An added revenue benefit is seen with a

minimal monthly rent paid by the participants. Chief Donald Moore of the Manchester Eighth Utilities District (D. Moore, personal communication, July 28, 2017) stated that shared common quarters promote integration within the department. In an interview with Chief Michael Esposito (M. Esposito, personal communication, July 21, 2017) he states that the program is beneficial as it compliments career staffing, students typically have training from their home departments, and the participants assist with station maintenance.

The third question asked: Are there alternatives to a residency program that would provide staffing without hiring additional career personnel? The literature review did provide ample information in the context of alternative staffing. Alternative staffing measures identified included the use of (a) mutual aid, (b) automatic aid, and (c) demand based staffing models (Young, 2012). Mutual aid and automatic aid were also regarded as options in applied research projects written by Janke (Janke, 2010) and Locke (Locke, 2004). Regional or county based systems were also identified staffing options (Rinaldi & DeLuca, 2017, p. 41). Both survey instruments and the personnel interviews focused only on cost and benefit, and did not address alternative staffing models.

In summary, costs associated with infrastructure improvements were seen in all of that data that was analyzed. These costs vary and can range from simple furniture purchases to station redesign in order to support the program and provide accommodation for participants. Similarly, the results identified that the largest benefit that could be realized would be a guaranteed staffing level with reduced response times, all while not incurring the cost of additional personnel. Interviews and research reveal that although there are several programs throughout the United States, and each department operated their individual programs uniquely.

### Discussion

The results of this research as addressed by the literature review provided limited or inconclusive detail on the cost benefit of such a program. The reader should take into consideration the limitations of both the available literature as well as the procedures used. Tangible costs and benefits were found to be unique to each department and author. Bliss (2010) identified this as well stating that as departments approach such programs, each approach varies and in turn "...so do the costs, benefits, and risks" (p. 3). Staffing levels and needs are also unique to each department, and recommendations by national organizations are specifically that, recommendations. Young (2012) indicated that an effective firefighter force is left up to the individual organizations (p. 113). NFPA 1720 (2014) leaves adequate staffing up to the authority having jurisdiction, as well as identifying how many and in what time frame a firefighting force should be assembled to begin operations ( p. 7). According to Wilson (2009) specific recommendations are dependent on assignment or apparatus type but do not address implementation or execution outside of those recommendations. According to Windisch and Crosby (2008) the issues facing the implementation of such a program was both the changing demographic of the communities and "volunteers being priced out of the community" ( p. 127). The National Volunteer Fire Council and the United States Fire Administration (2007) also identified that the cost of housing, amongst other factors, is a major concern in terms of the volunteer decline, so therefore offering housing in exchange for staffing a station or apparatus would appear to be a viable solution.

The cost of infrastructure as identified through the literature review, surveys, and interviews would, for this researcher's department, not be as extensive as identified by Clymer (1999). The volunteer station to be utilized is already equipped with semi-private sleeping

quarters and personal item storage. This is accomplished through already existing fold-down beds with lockers and separated with partitions. Additionally, there are separate bathroom facilities for females which were identified as a possible consideration by Steed (2013). If fully private accommodations are necessary, three current offices can be reconfigured at minimal cost by relocating those beds and outfitting with additional furniture.

The overall benefit of guaranteed staffing of an additional apparatus and the reduction in response times is apparent from the research. Currently, the only way to address this consistently would be to redeploy the minimal on-duty career staff. Utilizing volunteers provides significant cost savings and there is no basis for a challenge by the fire union as referenced in the collective bargaining unit in management rights (Town of Southington, 2016, p. 23). In a July 2017 manpower study, Battalion Chief Glenn Dube identified what were the most vulnerable time frames affecting the department's volunteer response (G. Dube, personal communication, August 9, 2017). The results of this study can be found in Appendix G. The limitation to this study is that manpower numbers are calculated at the end of the incident.

The implication of the results identified that any staffing model or change would need to be managed across all levels of an organization. Those changes need to take into account the impact on all budgetary considerations including; (a) buildings, (b) apparatus, and (c) personnel. Incorporating all stakeholders in the discussion would be vital in developing policy and procedures while maintain open communications. Janke (2010) identified that systems that employ staffing schedules are practical and can have a good outcome for an organization (p. 15).

### **Recommendations**

The following recommendations are based on the results of the study. The first recommendation was that the Southington Fire Department should conduct a feasibility study,

focused on an evaluative analysis, to determine the cost benefit of establishing a volunteer live-in program as it relates to addressing staffing needs. The second recommendation was that the study should incorporate a cross section of department members.

Due to the limited literary resources or national standards for such programs, future researchers need to look beyond traditional methods. Recommendations for future researchers would be to expand upon the research done with area departments. Identifying departments with successful programs would assist in determining best practices and policies that could provide the necessary foundation to develop a program. Additionally, those departments may be able to assist in determining the necessary impact on infrastructure and station readiness.

A comprehensive needs assessment would need to be undertaken to fully define costs as it relates to station facilities, infrastructure, and communications. These were the biggest cost factors identified by the research. Further evaluation would be needed in terms of apparatus location and deployment strategies to identify the impact on response times and effect service delivery. If the cost benefit analysis proves to be in the department's interest then program development should follow.

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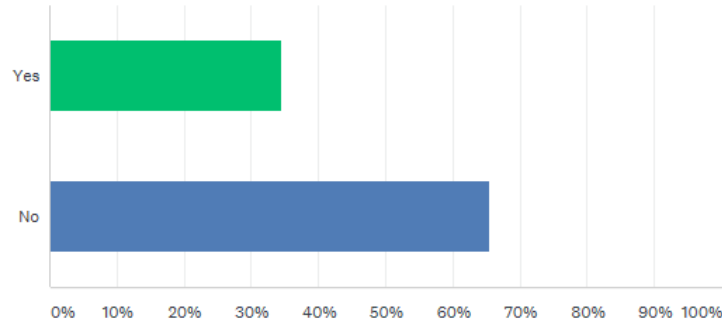
### Appendix A—Internal Survey

Q1

Customize Export

Do you think a live-in residency program for volunteers will help with recruitment and retention?

Answered: 58 Skipped: 0



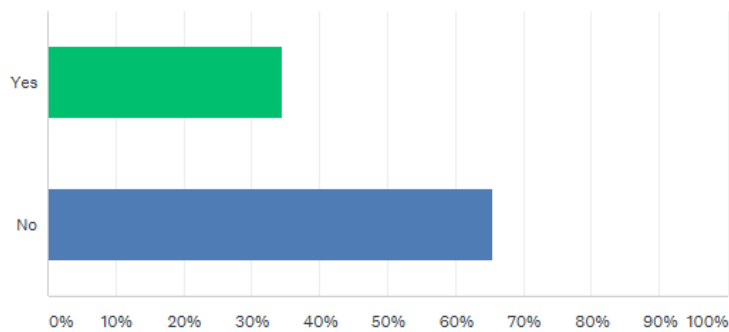
ANSWER CHOICES	RESPONSES
Yes	34.48% 20
No	65.52% 38
TOTAL	58

Q2

Customize Export

Do you believe a live-in residency program is an option with current membership?

Answered: 58 Skipped: 0



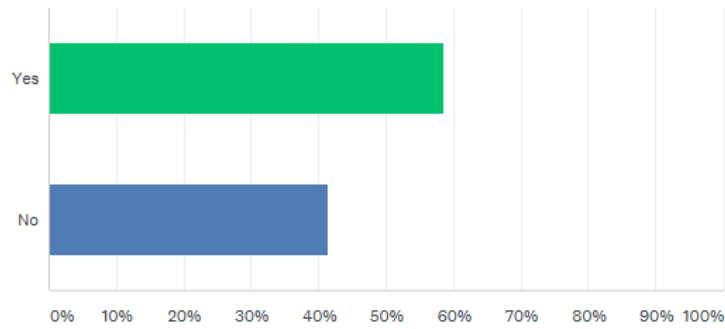
ANSWER CHOICES	RESPONSES
Yes	34.48% 20
No	65.52% 38
TOTAL	58

Q3

Customize Export

Do you see a benefit in offering volunteers a place to live for covering duty shifts?

Answered: 58 Skipped: 0



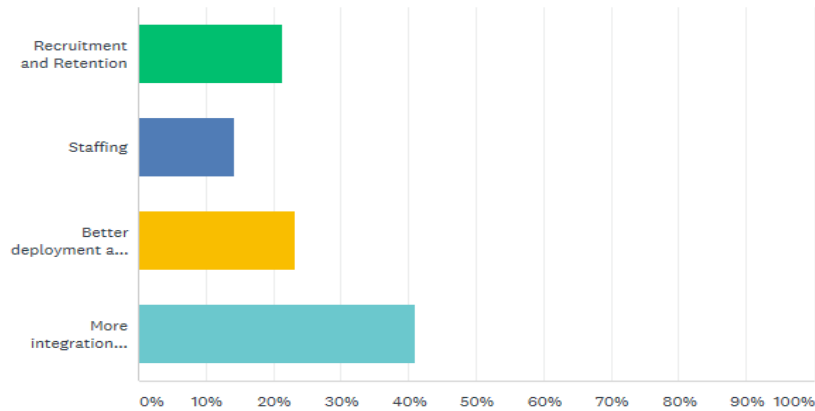
ANSWER CHOICES	RESPONSES
Yes	58.62% 34
No	41.38% 24
<b>TOTAL</b>	<b>58</b>

Q4

Customize Export

Which benefit would be the most advantageous to the department?

Answered: 56 Skipped: 2



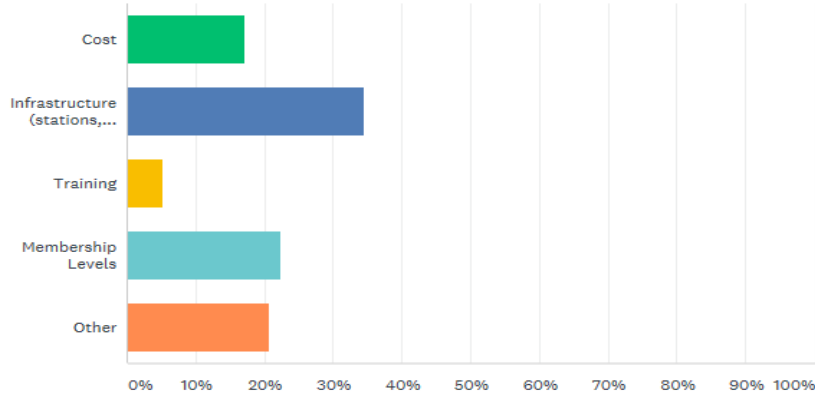
ANSWER CHOICES	RESPONSES
Recruitment and Retention	21.43% 12
Staffing	14.29% 8
Better deployment and response times	23.21% 13
More integration with career and volunteer members	41.07% 23
<b>TOTAL</b>	<b>56</b>

Q5

Customize Export

What would be the biggest challenge to implementing a live-in residency program?

Answered: 58 Skipped: 0



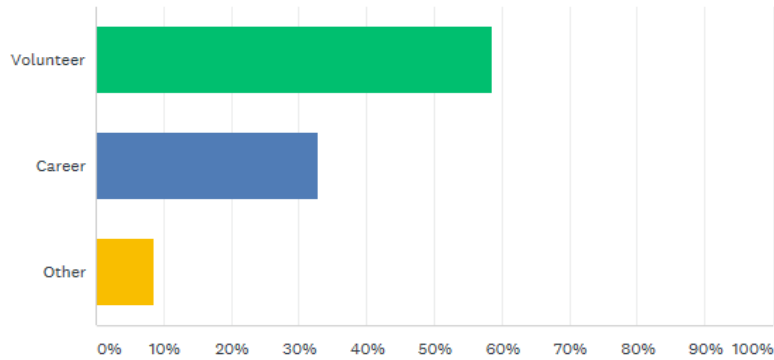
ANSWER CHOICES	RESPONSES	
Cost	17.24%	10
Infrastructure (stations, facilities)	34.48%	20
Training	5.17%	3
Membership Levels	22.41%	13
Other	20.69%	12
<b>TOTAL</b>		<b>58</b>

Q6

Customize Export

What is your current status with the department?

Answered: 58 Skipped: 0



ANSWER CHOICES	RESPONSES	
Volunteer	58.62%	34
Career	32.76%	19
Other	8.62%	5
<b>TOTAL</b>		<b>58</b>

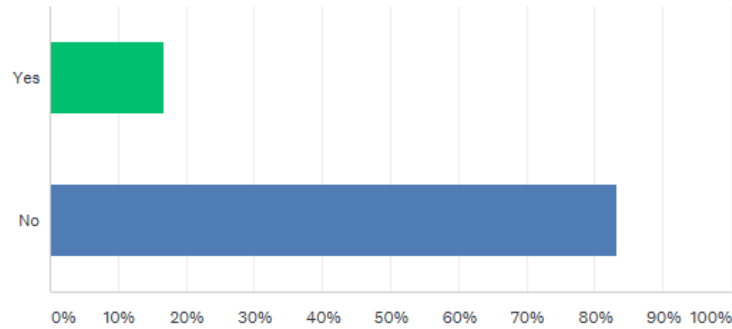
### Appendix B—External Survey

Q1

Customize Export

Do you currently have a volunteer live-in program?

Answered: 78 Skipped: -1



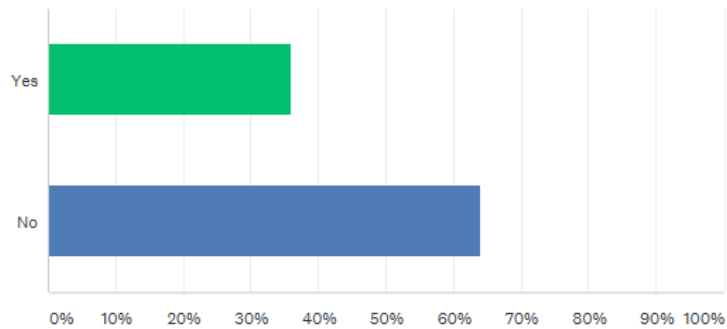
ANSWER CHOICES	RESPONSES	
Yes	16.67%	13
No	83.33%	65
<b>TOTAL</b>		<b>78</b>

Q2

Customize Export

If the answer above is No, have you considered such a program?

Answered: 64 Skipped: 13



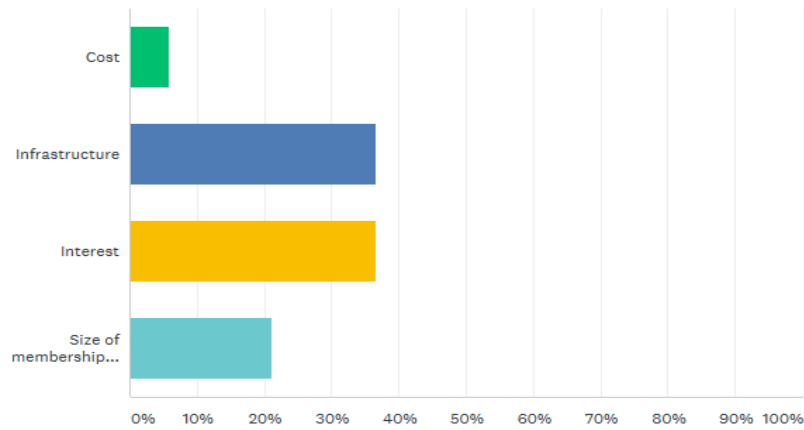
ANSWER CHOICES	RESPONSES	
Yes	35.94%	23
No	64.06%	41
<b>TOTAL</b>		<b>64</b>

Q3

Customize Export

If the answer above is no, what was the determining factor in the decision?

Answered: 52 Skipped: 25



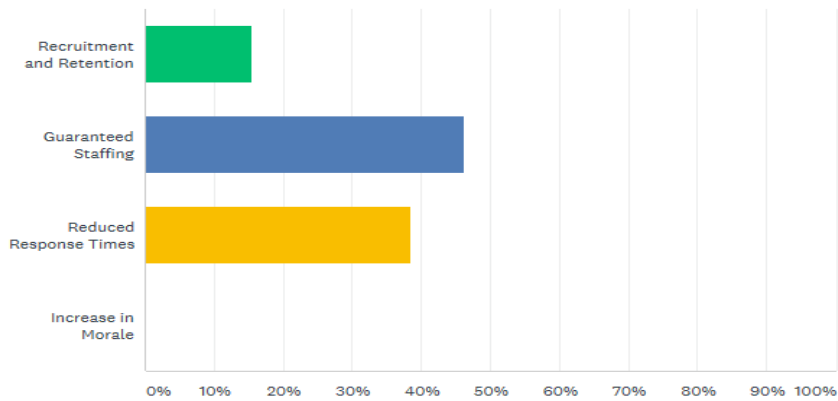
ANSWER CHOICES	RESPONSES
Cost	5.77% 3
Infrastructure	36.54% 19
Interest	36.54% 19
Size of membership (availability of personnel)	21.15% 11
<b>TOTAL</b>	<b>52</b>

Q4

Customize Export

If yes to question 1, what is the largest benefit received by the department?

Answered: 13 Skipped: 64



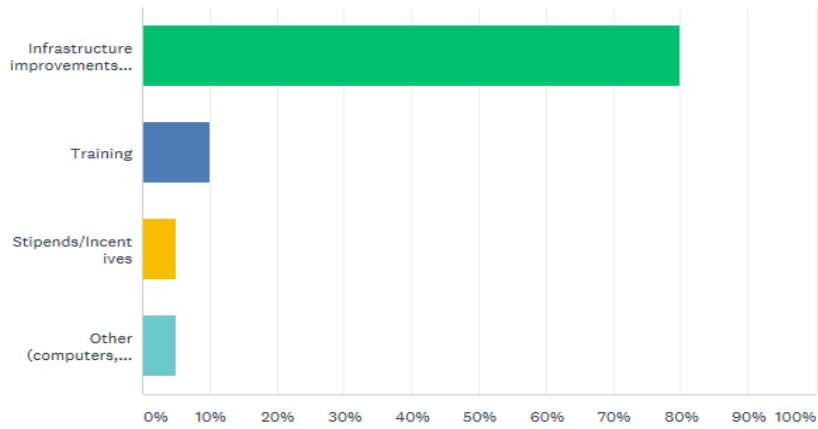
ANSWER CHOICES	RESPONSES
Recruitment and Retention	15.38% 2
Guaranteed Staffing	46.15% 6
Reduced Response Times	38.46% 5
Increase in Morale	0.00% 0
<b>TOTAL</b>	<b>13</b>

Q5

Customize Export

What were/are the biggest cost considerations?

Answered: 40 Skipped: 37



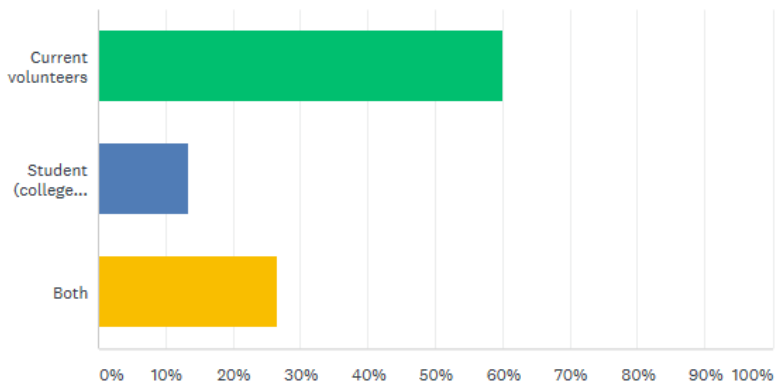
ANSWER CHOICES	RESPONSES
Infrastructure improvements (stations, facilities)	80.00% 32
Training	10.00% 4
Stipends/Incentives	5.00% 2
Other (computers, internet, cable TV, etc.)	5.00% 2
<b>TOTAL</b>	<b>40</b>

Q6

Customize Export

Who participates in your live-in program?

Answered: 15 Skipped: 62



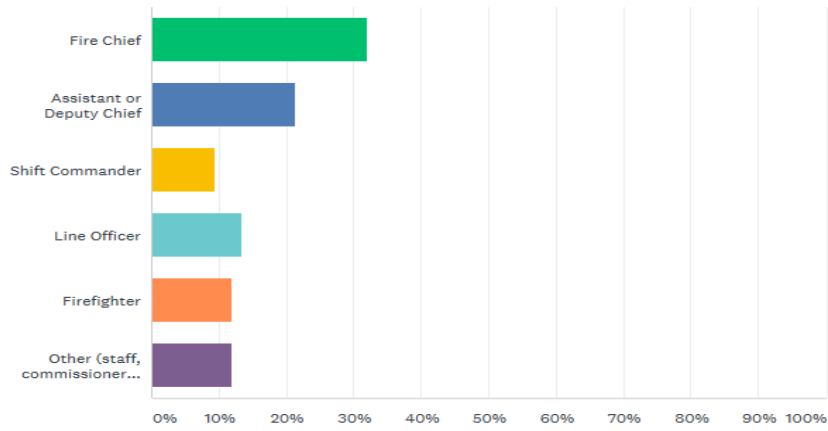
ANSWER CHOICES	RESPONSES
Current volunteers	60.00% 9
Student (college program)	13.33% 2
Both	26.67% 4
<b>TOTAL</b>	<b>15</b>

Q7

Customize Export

What is your position in your department?

Answered: 75 Skipped: 2



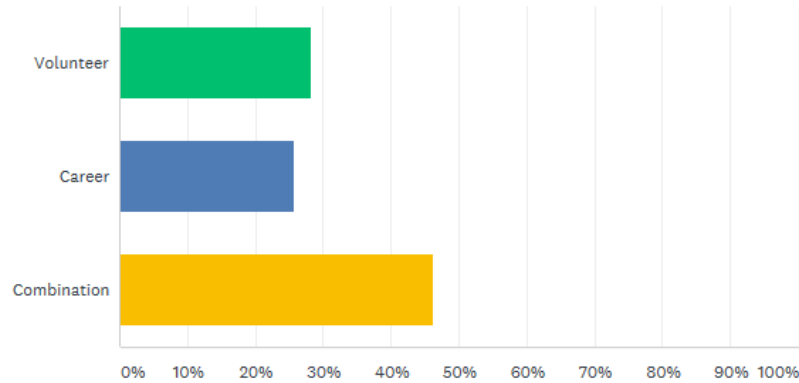
ANSWER CHOICES	RESPONSES
Fire Chief	32.00% 24
Assistant or Deputy Chief	21.33% 16
Shift Commander	9.33% 7
Line Officer	13.33% 10
Firefighter	12.00% 9
Other (staff, commissioner, fire marshal)	12.00% 9
<b>TOTAL</b>	<b>75</b>

Q8

Customize Export

What type of department do you represent?

Answered: 78 Skipped: -1



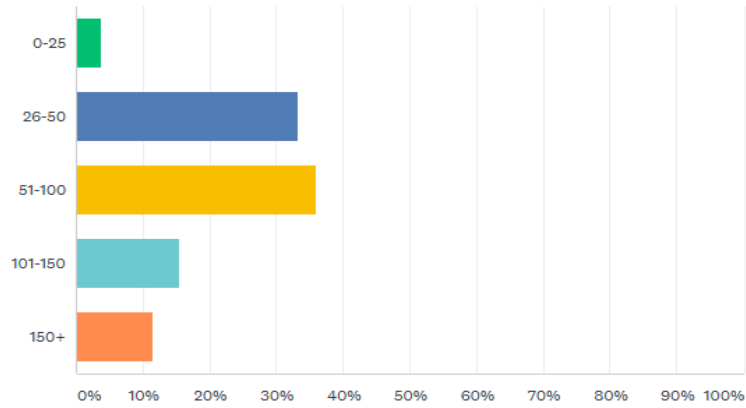
ANSWER CHOICES	RESPONSES
Volunteer	28.21% 22
Career	25.64% 20
Combination	46.15% 36
<b>TOTAL</b>	<b>78</b>

Q9

Customize Export

What is the size of your department?

Answered: 78 Skipped: -1



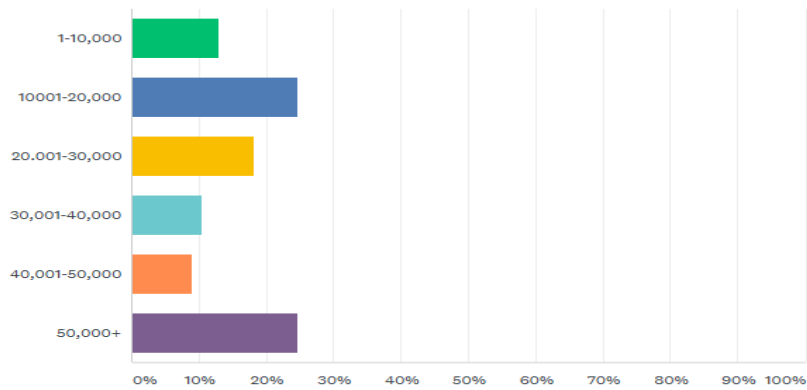
ANSWER CHOICES	RESPONSES
0-25	3.85% 3
26-50	33.33% 26
51-100	35.90% 28
101-150	15.38% 12
150+	11.54% 9
<b>TOTAL</b>	<b>78</b>

Q10

Customize Export

What population do you serve?

Answered: 77 Skipped: 0



ANSWER CHOICES	RESPONSES
1-10,000	12.99% 10
10001-20,000	24.68% 19
20,001-30,000	18.18% 14
30,001-40,000	10.39% 8
40,001-50,000	9.09% 7
50,000+	24.68% 19
<b>TOTAL</b>	<b>77</b>

**Appendix C—Manchester 8<sup>th</sup> FD**

Executive Fire Officer Research Interview Questions/Responses with Chief Don Moore,  
Manchester Eighth Utilities District, Manchester CT.

1) How long has the program been operating?

- Our “night-crew” program has been in existence since the late 1970s without any open periods.

2) Any resistance when program was started?

- To my knowledge there has never been any resistance or animosity towards the program.

3) Current status of the program?

- This program has been consistently active since it started. At times, is what saves us during the overnight hours for staffing when volunteer members are in demand.

4) How many members participate? Is there a waiting list?

- There are a total of 12 sleeping areas, 6 at HQ and 6 at Station 3. Currently HQ is at capacity and Station 3 has 4 available spaces.

5) Do you strictly utilize volunteers or do you have student population?

- At this point in time we only utilize current volunteer members. We have been toying with the idea of seeking student members.

6) Please detail what benefits you realize from the program (training, response times, crew sizes, operational efficiencies, other)

- Since we only use current members we know what their capabilities are. The major benefit to the department is the first apparatus is out the door in minutes allowing other volunteers to respond to the station for additional apparatus. Additionally, we all know the shortage of volunteers. This crew affords the leadership knowledge that a truck is getting out the door.

7) What costs were initially realized by the department (set-up, legal, infrastructure improvements, other)

8) What costs are ongoing and what amenities are provided (utilities, cable, internet)?

- There is one area in each firehouse segregated for the night-crew. In this room, each night-crew member gets an individually divided sleeping area, a closet for personal effects, and a shared bath and shower room for night-crew only. All other amenities are shared with all members to promote integration.
- The ongoing costs are minimal. The price of paint, carpet and utilities and bedding is more than a fair trade to have the night-crew

9) Are the members participating provided any stipends or additional benefits?

- No other stipends or additional benefits are offered.

10) Are the members participating responsible for any costs (rent, amenities, etc.)?

- There are no financial obligations to the night crew member, they live rent free but they must respond to all calls during the overnight.
- 11) What are the member responsibilities (scheduled shifts, times, training, maintenance, other)?
- 12) Anything else you would like to add in terms of cost/benefit of the program? Any specific challenges faced over the life of the program?

**Appendix D—Allingtown FD**

Executive Fire Officer Research Interview Questions/Responses with Chief Michael Esposito,  
Allingtown Fire Department, West Haven, CT.

1) How long has the program been operating?

- It started over 30 years ago when we had 2 manned stations. The Minor Park Station had 2 men and we had 2 live in bunkies from UNH. In 2000, all responses were consolidated into Minor Park and the program shifted to the Admiral Street Firehouse. We had 2 to 4 students living in the firehouse. In 2008, the volunteer department AVFA, in cooperation with UNH and the career department developed what is now the live in –internship.

2) Any resistance when program was started?

- The usual grapevine that volunteers are going to take our jobs away.

3) Current status of the program?

- Active with 4 committed to the fall semester, and possibly a 5th.

4) How many members participate? Is there a waiting list?

- About 25 to 30, mostly students. At this time there is no list, we can accommodate up to six with separate quarters for females.

5) Do you strictly utilize volunteers or do you have student population?

- We have come to rely on the student population as the demand on training increases, the number of members decrease. With some of the students, they have some training

from their hometown department prior to walking in the door. The downside is that we lose them on breaks and when they graduate so we have to constantly recruit.

6) Please detail what benefits you realize from the program (training, response times, crew sizes, operational efficiencies, other)

- They complement the career department by increasing manpower. Having the live in program at Admiral St. Station ensures there are people in the building most of the time and keeps an eye on things. They assist in the daily housework chores and assist the chiefs and business manager. 2 members can ride with the career department at Minor Park with the Captain's permission.

7) What costs were initially realized by the department (set-up, legal, infrastructure improvements, other)?

- The department absorbed all the costs associated with setting up the building including furnishing the rooms.

8) What costs are ongoing and what amenities are provided (utilities, cable, and internet)?

- All utilities are included in the cost of the semester.

9) Are the members participating provided any stipends or additional benefits?

- Not at this time.

10) Are the members participating responsible for any costs (rent, amenities, etc)?

- Cost per semester is currently \$2000. People staying over the summer pay \$200. per month. Live-ins are responsible for their own food and personal items. If they break it, they pay for it.

11) What are the member responsibilities (scheduled shifts, times, training, maintenance, other)?

- To respond to all alarms whenever possible. They take care of the general maintenance of the building as directed by the Chief. Training is offered on weekends and everyone is encouraged to train with the career department whenever possible. Overnight crews man the station whenever a driver is available, but they seem to be in short supply these days.

12) Anything else you would like to add in terms of cost/benefit of the program? Any specific challenges faced over the life of the program?

- It has been beneficial to the department and the participants as well as being profitable for both the career and volunteer departments. As the training requirements for firefighters increase, retention of members becomes an issue that affects all fire departments.

**Appendix E—Blue Hills FD**

Executive Fire Officer Research Interview Questions/Responses with Chief Robert Farmer, Blue Hills Fire Department, Bloomfield, CT.

1) How long has the program been operating?

- We have had a live in program at Blue Hills Fire Department for about 45 to 50 years if not longer. We started the program at our Station 3 with 4 firefighters, and then the department expanded to our Station 4 where we placed 3 firefighters.

2) Any resistance when program was started?

- From what I have been told there was no resistance at all when the program was started. The Fire District was in favor of it.

3) Current status of the program?

- Today we have four firefighters at Station 3 and two at Station 4.

4) How many members participate? Is there a waiting list?

- At this present time we do not have a waiting list, but in past years we have had one.

5) Do you strictly utilize volunteers or do you have student population?

- We strictly utilize volunteer firefighters. We do not have a big student population. One of the things that I was thinking about is sending a letter to the University of

Hartford to see if any students who are volunteer firefighters in their community would like to possibly volunteer for our department and participate in the live in program.

6) Please detail what benefits you realize from the program (training, response times, crew sizes, operational efficiencies, other)?

- The benefits are many. At night we get an engine company on the road right away having four firefighters at our station 3 and two at our station 4. We have had some issues with drivers during the off hours and during weekends. We have a policy that you must be certified to the level of firefighter 1 and hazardous materials operational level or above to participate in the live in program.

7) What costs were initially realized by the department (set-up, legal, infrastructure improvements, other)?

- There were no real set up fees for our program. When we constructed a new Station 3 six years ago we made sure we had space for 5 dorms.

8) What costs are ongoing and what amenities are provided (utilities, cable, internet)?

- We pay for all fire department amenities except for their personnel cable. Are the members participating provided any stipends or additional benefits?

- Yes the firefighters that participate do receive a stipend for the calls that they respond to and the training they attend.

9) Are the members participating responsible for any costs (rent, amenities, etc)?

- The Firefighters at station 3 pay a monthly rental fee of \$400.00

- Firefighters at Station 4 pay a rental fee of \$200.00

10) What are the member responsibilities (scheduled shifts, times, training, maintenance, other)?

- The participating members are required to respond to 60% of the fire calls for the year. If they do not they could be subject to removal from the program. All firefighters sign a lease agreement with the Board of Fire Commissioners.

11) Anything else you would like to add in terms of cost/benefit of the program? Any specific challenges faced over the life of the program?

**Appendix F—Town Attorney**

Executive Fire Officer Research Interview Questions/Responses with Mark Sciota, Southington

Town Attorney.

- 1) What legal considerations might there be with have a volunteer residency program?
  - It would be more of a consideration as it relates to the fire department's rules and regulations. Policies and procedures would need to be in place and enforced.
- 2) Is there any direct liability on the department or the town?
  - Volunteers are already covered under the town's insurance and workers compensation during the course of their duties, so no further issues should arise.
- 3) What, if any employment law or labor issues may arise?
  - The department would have to be cautious with regard to maintaining compliance with FLSA, especially considering recent events. Paying them hourly would require them to be employees. As employees there may be conflict with the firefighters union.

**Appendix G—Southington July Manpower Study**

**Southington Fire Department  
July 2017**

Weekdays 06:00 - 1800

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
HQ	40	2.5			58%
1	40	2.3	0.08	0	63%
2	38	5.4	0.3	2.2	8%
3	38	2.6	0.3	0.5	50%
5	39	0.5	0.1	0.3	100%
Average FF on Scene - 4                      Average FF station standby - 9.1					
Co#1 - 20% time NO Firefighter response (8x)					
Co# 5 - 55% time NO Firefighter response (22x)					

Weekdays 18:00 - 00:00

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
HQ	21	2			61%
1	20	7	0.3	0.05	0%
2	13	9.1	0.5	2.6	0%
3	5	5.6	1.4	0.6	0%
5	10	1.7	1	0.3	70%
Average FF on scene - 7.5                      Average FF station standby - 10.1					

Weekdays 00:00 - 06:00

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
HQ	3	1.7			67%
1	3	2	0	0	66%
2	3	4.7	0.3	3	0%
3	0				
5	0				
Average FF on scene - 3.3                      Average FF station standby - 5.3					

**Southington Fire Department  
July 2017**

Weekend 06:00 - 18:00

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
<b>HQ</b>	15	2.9			47%
<b>1</b>	15	4.2	0	0	13%
<b>2</b>	9	7	0.2	2.9	0%
<b>3</b>	2	2.5	0	0.5	50%
<b>5</b>	5	1	0	0	100%
Average FF on scene - 2.7                  Average FF station standby - 8.5					
Town wide NO coverage - 7% (all available firefighters were on scene)					

Weekend 18:00 - 00:00

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
<b>HQ</b>	18	1.2			89%
<b>1</b>	14	4.9	0.1	0	7%
<b>2</b>	14	7.3	0.5	2	0%
<b>3</b>	8	4.6	0.1	0.8	0%
<b>5</b>	5	1.4	0	0.2	100%
Average FF on scene - 9.3                  Average FF station standby - 5.9					
Town wide NO coverage - 16% (all available firefighters were on scene)					

Weekend 00:00 - 06:00

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
<b>HQ</b>	11	1.2			91%
<b>1</b>	11	3.5	0.1	0	27%
<b>2</b>	4	5.5	0	2	0%
<b>3</b>	2	4.5	0.5	0.5	0%
<b>5</b>	3	0	0	0.7	100%
Average FF on scene - 5.5                  Average FF station standby - 2.3					
Town wide no coverage - 82% (all available firefighters were on scene)					

**Southington Fire Department  
July 2017**

Weekdays 18:00 - 00:00 (Monday only)

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
<b>HQ</b>	10	2			60%
<b>1</b>	9	8.6	0.6	0	0%
<b>2</b>	6	12.5	0.7	2.8	0%
<b>3</b>	2	7.5	1.5	0.3	0%
<b>5</b>	5	2	1	0	60%
Average FF on scene - 9.6                  Average FF station standby - 11.4					

Weekdays 18:00 - 00:00 (excluding Monday)

Co#	Calls	Firefighters	Probationary FF	Fire Police	"No Response"
<b>HQ</b>	11	2			63%
<b>1</b>	11	5.7	0.1	0	0%
<b>2</b>	7	7.6	0.4	2.4	0%
<b>3</b>	3	4.3	1.3	0.7	0%
<b>5</b>	5	1.4	1	0.6	80%
Average FF on scene - 5.5                  Average FF station standby - 9					

