Exploring Alternative Work Schedules for the Sheffield Village Fire Department

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

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

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ABSTRACT

With the changing economic forecast in today's economy, it is important that successful organizations periodically review their practices; one of the highest costs within a fire department's budget is staffing, and the scheduling of employees. However, no definitive research has been conducted within the Sheffield Village Fire Department to determine the most appropriate schedule.

The recommendations at the conclusion of this paper are based on a literature review and information collected from trade journals, applied research papers, Internet sources, local library research, personal interviews, and surveys. In this document, we will answer the following questions: (1) What are the different schedules employed in the fire service for full-time departments? (2) What is the preferred schedule of the members of the Sheffield Village Fire Department? (3) What are other schedules employed by area departments of similarly sized operations? (4) What are the costs/benefits and pros/cons of alternative shift schedules?

The results found in the information researched, revealed a variety of factors. We should point out that no one type of schedule is the best fit for every department, and evaluations based on contracts, workweek hours, manpower required, cost, incident volume, and the health and safety of employees should all be considered prior to arriving at any one conclusion.

In looking at the different configuration of shifts, we see that the 24/48 hour shift rotation currently used by the department shows no major deficiencies, and does not place a burden on the employees or department when compared to other shift rotations in this document. An additional cost saving could not be found to justify any of the alternative schedules studied in this research project.

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INTRODUCTION

Statement of the Problem

The current work schedule has become a focus of labor/management discussions. The current schedule used in the Sheffield Village Fire Department, which is a relatively new fire department (full-time paid department as of 2000), was adopted without fully researching alternative shift schedules that exist in the fire service.

Purpose of the Study

The purpose of this study is to research alternative work schedules that are currently used in the fire service and to recommend the applicable schedule to meet the needs of Sheffield Village. This research may be used as a report in guiding decisions management may face when considering proposed schedule changes. During the course of the research, we will consider the department's current scheduling practices to determine if in fact they are the best fit. Along with answering the following questions in this research paper, recommendations will be made to assist the department in choosing the best scheduling practices, with consideration to whether the department can gain benefits for employees, their families, and the department's obligation to its citizens by altering the current work schedule.

Research Questions

The following questions will be answered by this evaluative research:

1. What are the different schedules employed in the fire service for full-time departments?
2. What is the preferred schedule of the members of the Sheffield Village Fire Department?
3. What are other schedules employed by area departments with similarly sized operations?
4. What are the costs/benefits and pros/cons of alternative shift schedules?

BACKGROUND AND SIGNIFICANCE

The Sheffield Village Fire Department is located in Northeast Ohio in Lorain County. The Village of Sheffield is a growing community with 3,982 residents and a large commercial and light industry base (U.S. Census Bureau, 2010). An estimated 161,540 vehicles travel through the commercial and mercantile base daily as well as an interstate exchange (I-90) located in close proximity to the Lorain Community College campus (ODOT, 2014). These result in a significant daytime population increase. The total square mileage of The Village of Sheffield is 10.84 square miles. (U.S. Census Bureau, 2010).

The department is a combination fire department (a majority of full-time employees supplemented by part-time staff). Sheffield Village transitioned to a combination fire department in 2000. Currently, there are three shifts of five firefighters on duty, rotating 24 hours on duty followed by 48 hours off duty. The department utilizes part-time firefighters to fill in for open positions when a full-time employee takes time off. Management allows only one part-time employee to work per shift to maintain consistency in service, and only one full-time employee is allowed to be off at any given time. The summer months create significant requests for time off for vacations and accumulated time off. (ATO) (See Appendix 1 for a table with requests for time off).

The total compliment of the department, which is established by Sheffield Village ordinance, stands at 15 full-time employees and 1 chief (L-4275, IAFF, 2015). Along with the full-time compliment, the village also retains, on average, eight part-time firefighters. The command structure in the department consists of three separate 24-hour shifts, with one captain per shift, who is responsible for maintaining the shift and handling incidents as well as ancillary

jobs such as fire prevention and training. There are four additional firefighters assigned to the shift, including one lieutenant, who assumes the role of officer in charge during the absence of the captain. Department policy dictates that a ranking officer should be on duty at all times. The department has one full-time fire chief with a 40-hour schedule (8am until 4pm, 5 days per week). The department handles all fire and emergency medical services in the Village of Sheffield as well as honoring its various mutual aid agreements with surrounding communities. The department responded to 1679 incidents in 2014, with 87.24% being medical related (see Appendix 2 for a complete breakdown of all types of incidents). In a 10-year study of incident volume within the Sheffield Village Fire Department, we found that 704 runs were made in 2004. In 2014, 1679 runs were made. This is an increase in incidents of 13.8% on average every year. In the last four years, there has been a plateau, with an average increase in incidents of 2.5% per year (Appendix 3).

Sheffield Village Fire Fighters Local 4275 are an organized IAFF union and a member of the Ohio Association of Professional Fire Fighters (OAPFF) and the Lorain County AFL-CIO. The Village of Sheffield recognizes Local 4275 and affords them a binding collective bargaining agreement. However, Local 4275 are not recognized for collective bargaining under SERB rules: departments serving populations fewer than 5,000 residents are disqualified from collective bargaining rights under Ohio law (SERB, 2015). This population size (5,000) also serves as the threshold for being considered a city in Ohio. Nevertheless, the village government does recognize a contract with the union and has a negotiated collective bargaining procedure in place (see Appendix 4).

During the transition to a full-time department in 2000, the department hired relatively new firefighters who had not been employed full-time in the fire service previously, with the

exception of the fire chief and one captain, who were, at the time, employed full-time by a neighboring fire department. The average age in the department is 34.5 years old (see Appendix 5).

The union's current collective bargaining agreement allows for a yearly vacation period: after one year, 56 hours; after two years, 120 hours; after eight years, 168 hours; after 15 years, 240 hours; and after 20 years, 288 hours. The contract also affords ATO time, which is banked overtime that occurs every pay cycle due to hours worked over the negotiated contract workweek, which is 53 hours. ATO time is forwarded in full in hours at the beginning of the calendar year; this calculates out to 156 hours. The hours can be used at the employee's request throughout the year, with only one full-time member allowed to be off at any given time. The maximum amount of ATO time an employee can bank is 320 hours, at which time the department will assign time off to the employee.

The contract also allows accumulated sick time, without limit, at the rate of 3.1 hours for every 80 hours worked. Employees have the ability to make time trades with each other. This can create moderate disruption during shift changes due to regular time trades occurring between employees. A significant amount of trades also occurs for employees coming in early to shifts. (Specific numbers are not available because the department does not routinely record requests for holdovers and early arrivals between employees that are less than 1 hour in duration.)

As stated previously in this research paper, the members of the department work 24 hours on duty followed by 48 hours off duty, a schedule adopted when the department went full-time. The current fire chief initiated a brief discussion at that time with the union concerning what rotation the department should consider. This discussion quickly passed, most likely

because the department was experiencing a vast array of other issues during the transition to full-time.

The potential impact this study could have on the Sheffield Village Fire Department may include a change from its current 24/48 hour schedule to one that will address the issues of time off, sick time usage, and shift exchanges.

In this research paper, we will compare the various types of schedules that exist in the fire service, weighing the pros and cons versus our current 24/48 rotation. Recommendations for a possible schedule change will be offered. An evaluation will be made as to whether changes could actually have a significant positive impact on the employees' family and personal lives and increase their on-duty job satisfaction, which may lead to increased employee retention by the department.

The department's requirements for maintaining a safe and adequate response to the residents of Sheffield Village are also taken into consideration. Included in the discussion is the need to maintain our shift minimum staffing of four full-time firefighters on duty at all times.

LITERATURE REVIEW

The purpose of this literature review is to look at alternative work schedules that are used in the fire service. Included in this literature review is information on work/rest cycles, sleep pattern disruption on circadian rhythms, and formulas used to show estimates of employees needed to cover contractual work hours

Davis and Aguirre (2009) found that of the many variations of known shift schedules, there is no one "golden schedule" that surpasses all others. The optimal schedule for an organization is the one that balances operational requirements, employee preferences, and human considerations. The authors also pointed out that organizations should reevaluate their schedules on a regular basis to account for changes in organizational requirements as well as changing workforce demographics.

Depending on local conditions, professional firefighters are typically required to work from 40 to 56 hours a week (IAFF, 2014). Although there are no absolute rules governing how shifts operate, the two most prevalent shifts are 24-hour tours (24/48, 48/96, and the 56-hour shift, commonly known as the California swing). The next most prevalent are the split shifts (12/12, 10/14) (see Appendix 6 for samples of these variations). These five variants are the most common, according to the IAFF (2014). For the purposes of the study, we will concentrate our focus around these shifts.

In a report by (Frazier, 1999) the IAFF stated that 24-hour shifts are still the most commonly used among paid firefighters, accounting for 67.66% of all shifts. The second most frequently used shift schedule is the 10/14 shift, which accounts for 28.65%. The IAFF research document also stated that the 42-hour workweek is the most popular among fire departments

(used 29.4% of the time) while the 56-hour workweek, which was once the most popular schedule, now ranks second (28.34%).

Using an 8-hour shift to satisfy 24-hour staffing requirements allows the number of hours to be reduced to 40 per week. Little use of this 8-hour model was found in the fire service. Although other industries have successfully utilized this model, it has found little practical application in the fire service due to the increased amount of workfore that must be hired compared to the 24-hour model.

In order to calculate staffing for any of the desired shifts, the starting point is the number of hours that are required for coverage per year (Wieczorek, 2010). With a minimum manning of five employees, as in the case of Sheffield Village, and as there are 24 hours in a day and 365 days in a year, there is a base requirement for coverage of 43,800 hours.

The next calculation is how many hours per year (ideally) the department will get from each position. A 12-hour shift normally provides 42 hours of work per week, or 2,184 hours per year. A typical 8-hour day shift provides 2,080 hours per year. Each of those shifts is usually staffed with a four-platoon system to allow time off for employees. Allowing for other safety issues or contractual obligations, the 24-hour shift with a 56-hour workweek (allowable by the FLSA) affords 2,912 hours on the job and is normally accomplished with three platoons versus four for the other staffing models.

Critical to determining the number of staff needed without overtime is calculating the hours that are *not* worked. In other words, how many hours will be given off for holidays (if any)? How many hours will be given off for vacation and sick time? In this part of the calculation, contracts should specify hours, not days, especially when moving from an 8-hour shift to a 12- or 24-hour shift. The reason is that if leave time is awarded in days and then

converted to another time period, the amount of time off given to employees may be automatically tripled. Another pitfall is that employees working 24-hour shifts like to negotiate "Kelley days," as in Sheffield Village's case, which we refer to as "ATO" time. These are days off given in incremental pieces, which lower the actual hours worked from 56 per week to something less. This becomes a problem because of the 40 hours, half are spent sleeping, so actual hours worked may be 20 or less.

The hours *not* worked should be subtracted from the total hours scheduled, and the result then divided into the hours that are needed. The result is the staffing required for coverage. Dividing that number by the shifts equals the number of personnel per shift.

It is important to remember that a 24-hour schedule normally uses three squads versus four, and so overall staffing is reduced. Using the formula given, and allowing 10 vacation day equivalents for 8-, 12-, and 24-hour shifts, all three shifts need about 5.5 persons per squad to maintain a minimum of 5 on duty at all times. However, the 8-hour and 12-hour scenarios would require a total of 21.2 to 21.8 overall employees while the 24-hour shift (without any Kelley days) would require only 16.4.

Frazier (1999) observed that the 10/14 shift schedule is becoming more popular and can address productivity, effiency, and long-shift fatigue. In his research, he stated that retired Fire Chief Charlie Rule (1997) suggests that the 24-hour shift should be abandoned in favor of the 10-hour day/14-hour night shift. (In the Sheffield Village Fire Department, this is how part-time firefighter shifts are filled when replacing a full-time employee who is off duty). Rule (1997) suggests a 24-hour off period at the end of the day cycle prior to commencing the night cycle. The off-duty cycle depends on the overall cycle (i.e., 12, 9, or 6 days) that is selected. This 10/14 shift cycle can be used with a three-shift platoon, without adding a fourth platoon, provided a 56-

hour workweek is used. For example, if a nine-day rotation is utilized, three-day shifts/three-night shifts are followed by three 24 hour days off. In order to reduce hours worked below 56, as in Sheffield Village's case, the rotation of a fourth platoon would need to be added.

Although the 10/14 schedule can be accomplished with three equally staffed shifts, negative effects on circadian systems become evident for night and rotating shift workers (Luca, Bellia, Bellia, Luca, & Clandra, 2014). These effects range from depression to sleep-related accidents and absenteeism.

After reviewing a study on The neurobiology of circadian, wakefulness–sleep, and feeding systems interact to infuence energy homeostasis. Sleep and circadian disruptions are reported to be associated with increased risk of diabetes and obesity, yet the roles of energy balance hormones in these associations are largely unknown (June Nguyen, 2010).

According to Wisconsin-based sleep researcher Dr. Linda Glazner, the 24-hour rotation does not fundamentally disrupt human circadian rhythms, the 24-hour biological cycle that governs living things (Careless & King, 2010). Glazner has compared the impact of 10–14- and 24-hour shifts on firefighters in Toronto, California, and New Jersey. Her research has convinced many fire departments to move to the 24-hour rotation. "A healthy person's circadian rhythms, which can be measured electronically, look like a 'sine wave'," says Glazner. "The circadian rhythms of someone who works the 24-hour rotation conforms to this shape. The circadian rhythms of a 10–14 hour worker do not." Glazner agrees that 24-hour workers have to sleep heavily the day after a shift to catch up on rest. But, she says the scientific evidence is clear: "Twenty-four hour workers do not suffer the sleep disruptions – and potentially the health problems associated with them – that 10-14 hour workers do."

In an applied research paper titled “Cost effective work schedules for small-town fire departments,” it is stated that the average workweek for career fire departments is 40 to 56 hours per week, and those working an average of 50 hours or more a week tend to use a 24-hour on-duty schedule (Davis, 2000). This is the case within the Sheffield Village Fire Department, which utilizes a contractual 53-hour workweek. Departments working 48 or fewer hours tend to use a day and night shift, with the most popular being a 10-hour day and a 14-hour night. Some administrators have looked at 8-hour shifts and a 40-hour workweek, similar to that used by the police. This option is not usually viable due to the fact it requires a 40% increase in current staff size in a department that already employs a 24-hour on-duty shift schedule.

Davis (2000) pointed out that a 12/12 split shift can offer benefits in terms of overtime savings compared to a 24-hour shift because less hours need to be paid if an employee calls off, but it is further pointed out that a 10/14 shift would be more benifical than a 12/12 shift due to lower employee fatigue. Some EMS departments, such as the City of Cleveland EMS, have experimented with a 12-hour shift schedule to address issues related to stress (Frazier, 1999). However, a study conducted with their department to determine whether a reduction in stress resulted from the change to a 12-hour shift showed no such declining levels of stress (Cydulka, 1994).

(Wieczorek, 2010) There are several things to keep in mind when looking at a move from 24-hour shifts to 12-hour shifts. A 24-hour shift is predicated on the ability of firefighters to rest or sleep while on duty, and in exchange, the workweek is lengthened to as much as 56 hours of “straight pay” before overtime results. A 12-hour shift results in no rest time, but leads to a question: What do you do with the added hours? The 12-hour shift allows staffing to be adjusted to meet demand, but is this allowed within the framework of the existing contract? Departments

that have minimum manning and staffing may see no savings because of the inability to adjust the numbers of personnel on duty. A 24-hour shift utilizes (normally) three squads or platoons while a 12-hour shift requires four.

Davis (2000) also reported, in a 1996 report from Maurno, on an informal poll of Boston-area firefighters and officers which indicated that 24-hour shifts increase morale on shift, and this effect carries over into emergency calls.

Another advantage of a 24-hour shift is the possibility of fewer sick days being used because working only two or three days a week allows firefighters to handle personal matters when off duty. With the 24-hour shift, firefighters have the flexibilty of second jobs as well as more family time. There are, however, two obvious disadvantages of a 24-hour shift: a high call volume can cause fatigue, and the extra duty time worked causes the employer to pay more overtime compared to a split shift schedule.

(Koen, 2005) In a research paper titled “24/48 vs. 48/96 work shedules: A comparative analysis,” it is pointed out that human fatigue must be considered as an overall patteren in the seven-day period preceding the shift. A minimum 3:4 work to rest ratio is required to ensure the proper amount of rest and sleep in order to prevent cumulative sleep debt. “both” the 24/48 and 48/96 schedules have a 1:2 ratio, which is better than the minium required. Thus, both schedule strutctures support the needed sleep requirements.

(Koen, 2005) also points to a second factor to consider is the frequency of sleep disruptions in an average night on duty. Firefighters who average one call during their nighttime sleep period are considered to have mild sleep deprivaton, depending on how easily they return to sleep and their total sleep length that night. Firefighters who average two calls during the night are considered to have moderate sleep deprivation, where cognitive problems can begin to

surface. Having a second 24-hour on-duty shift without an on-shift napping period could place the firefighters at great risk. If a sufficient rest period can occur, than a 48/96-hour schedule can be utilized without high risk. Firefighters that average three or more night calls during their shifts will be severely sleep deprived and should not consider a second consecutive 24-hour shift (U.S. Department of Labor, 2015).

According to the FLSA (Section 3(y)), there is no limit to the amount of nonexempt work an employee who is employed in fire protection activities may perform, so long as the employee meets certain listed criteria:

> FLSA provides that employees engaged in fire protection or law enforcement may be paid overtime on a "work period" basis. A "work period" may be from seven consecutive days to 28 consecutive days in length. For work periods of at least 7 but less than 28 days, overtime pay is required when the number of hours worked exceeds the number of hours that bears the same relationship to 212 (fire) or 171 (police) as the number of days in the work period bears to 28. For example, fire protection personnel are due overtime under such a plan after 106 hours worked during a 14-day work period, while law enforcement personnel must receive overtime after 86 hours worked during a 14-day work period.

The current work schedule established by Sheffield Village is a 7-day work period. By contract (L-4275, IAFF, 2015), Sheffield Village firefighters work a 53-hour workweek.

In a journal article, Galinsky, Sakkai, and Wigton (2011) reported that American employees feel there are not enough hours in a day. The authors referred to this as a "time famine," and respondents in the article reported that schedules that allow for better management of work and personal or family life were extremely important when they considered new jobs.

Galinsky (2011) also reported that when employers are looking at cost-effective methods for retention in their organizations, a schedule that fits today's society may reduce the loss of employees to competing employers.

Christensen, Scheider, and Butler (2011) observed that more that half of all school-aged children under the age of 18 now live in households with two employed parents. They reported that the demands of work collide with parents' basic responsibilities within their children's lives. This is most notable in jobs where rigid schedules governing when and where to work is to be done conflict not only with equally rigid school schedules but also with children's needs, both predictable and unpredictable. They also reported that a "typical school day rarely coincides with a typical workday."

Olson (2006) conducted a research project regarding strategic staffing for his fire department. After extensive data analysis including risk identification, travel times, run location, nature, day of the week, time of day, and population, Olson found that an increase in staffing of 10 additional full-time was required to meet the demands of the changing demographics in the fire district. More importantly, Olson was able to pinpoint certain locations that needed improvement as well as peak load times that would benefit from additional staffing. He found that for his area, an additional four personnel working 0800 to 2000 Monday to Saturday would greatly affect the level of service being provided to the community. Not addressed in his research project were possible avenues that would allow for meeting additional budget requirements of the increase in staff.

Mustafa (2009) performed a peak-load evaluation for his department, Seminole County Fire Department. They operate a part-time peak-load transport unit that is available during increased call volume periods. He found the need for the evaluation because the system had been in place since 2007 and a review had never been performed to evaluate the impact on unit deployment. The study assessed alternative peak-load staffing models used elsewhere and recognized times and days when

there was a need for increased staffing. He based his findings on dispatch records and department run data. After the analysis was performed, the current model be used was evaluated for effectiveness. Mustafa's results showed the existing plan was working well and decreasing the departments need to rely on mutual aid responses. Through his evaluation, he also found a gap in service where mutual aid was still being utilized. He then made recommendations, which were supported, to implement an addition peak-load.

In summary, the review found both positive and negative effects on various work schedules employed throughout the fire service. Overtime cost savings and increased productivity where cited in order to propose recommendations for the Sheffield Village Fire Department. However, there were no definitive answers found in the review as to which is the best schedule to use in any individual agency. During the review, our current schedule was cited as a prominent schedule used in the fire service. Also discussed in the review were the utilization of traditional fire schedules blended with part time employees to offset costs.

This combination fire department structure is a practice gaining momentum in the fire service and is currently utilized in the Sheffield Village Fire Department.

PROCEDURES

Internal survey forms were sent to the employees of the Sheffield Village Fire Department. Externally, Survey forms were also sent to 20 surrounding agencies. Included in these agencies were part time, day only staffed departments, as well as full time departments that share similar 24-hour shift structures. The surveyed departments staffed positions ranging from three to twelve employees on duty at any given time. Sheffield Village falls in the middle of the survey staffing five employees in a 24-hour shift. Fourteen of the 20 surrounding agencies responded to the survey questions, providing a good indication as to the type of schedules being used across the fire service in our area, which includes career, combination, and volunteer departments.

The recommendations at the conclusion of this paper are based on a literature review and information collected from trade journals, applied research papers, Internet sources, local library research, and surveys. A clear effort was made to evaluate the researched shift rotations to determine whether in fact the organizations employee requirements would be better met by utilizing the researched shift rotations.

The research in this paper was analyzed using multiple surveys in conjunction with a literature review from various periodicals, examining fire service practices and opinions currently being used in the fire service. Question one in this paper will be answered using information obtained from the literature review.

Research questions two and three will be answered using two individual surveys. Survey 1, which will be distributed to the members of the Sheffield Village Fire Department, will be blind, meaning no information on the ages or names of individuals will be collected during the

survey. Survey 2 will be distributed to 20 neighboring fire departments in the area. A majority of the departments surveyed share similarities with the Sheffield Village Fire Department, including contractual workweek hours, and number of employees staffed per shift.

Research question 4 can be answered using the current fire departments annual budget of $1,479,526.63 as a fixed starting point. Included in the study, used to answer question 4, are various schedules employed thought out the fire service. Some of these examples will show, in the results section, to increase the Sheffield Village Fire Departments budget to $1,763,526.63.

Limitations

During the process of evaluating shift schedules, we found that many different types of schedules existed. Through our research, we identified the five basic shift types that are most commonly used (IAFF, 2014). Within the most commonly used shift rotations, variations do occur, and because of the odd variations that occur in a small number of departments, we will be limited to the five basic types of shifts defined in the Definition of Terms below.

Definition of Terms

Shift:

A division of fire department personnel into working groups that can then be assigned to a rotating shift assignment.

Day shift:

A shift that falls mostly during daytime hours. Starting and end times can vary, for example, 08:00 to 20:00 hours or 07:00 to 19:00 hours on a 12-hour shift. A ten-hour shift typically runs from 08:00 to 18:00 hours.

Night shift:

This shift falls mostly during nighttime hours, for example, 19:00 to 07:00 hrs.

24/48:

This refers to a schedule that requires employees to work a 24-hour period followed by 48 consecutive hours off duty. Varying starting times are used in different organizations.

48/96:

This refers to a shift rotation that requires employees to work 48 consecutive hours followed by 96 consecutive hours off duty.

California Swing:

The California swing can have a varied rotation, as follows: 24 hours on duty, 24 hours off duty, 24 hours on duty, 24 hours off duty, 24 hours on duty, and then 96 hours off duty. As with the other schedules, the California swing perpetually rotates.

Split 12/12:

This schedule rotates as follows: 12-hour day shifts, 12-hour night off duty, 12-hour day shifts, 12-hour night off, 12-hour day off duty, and then a 12-hour night shift, 12-hour day shift off duty, 12-hour night shift on duty, and then 96 consecutive hours off, after which time the schedule repeats itself. This rotation requires four separate shifts of employees as opposed to the

24/48, 48/96, and 56-hour schedules mentioned above, which only require the hiring of three separate shifts of employees.

Split 10/14:

This shift is similar to the split 12/12 shift schedule. The difference is that there are 10- and 14-hour splits as opposed to even 12-hour splits. The shift rotates as follows: 10-hour day shift followed by 14 hours off duty, 10-hour day shift, 14 hours off duty, 10 hours off duty, 14-hour night shift, 10-hour day shift off duty, 14-hour night shift, and then 48 consecutive hours off duty, after which time the schedule repeats itself. This rotation can be accomplished with three separate shifts of employees when using a 56-hour workweek.

RESULTS

The results of the survey and literature review provided some answers to the research questions that were listed at the beginning of the study. Each question and findings are discussed.

Question 1. *What are the different schedules employed in the fire service for full-time departments?*

As found in the literature review there are many variants of shift schedules. The majority of fire departments work a 24-hour schedule of some type including, but not limited to the 24/48, "California Swing", 10/14 split (3 platoon) and 48/96 for example. Other reduced workweek schedules, contracts typically negotiated below 48 hours in a workweek, tend to use 12-hour shifts and 10/14 split (4 platoon) shifts. Limited information was found in the fire service pertaining to departments using an 8-hour shift model. The one reason cited for limited use of the 8-hour shift was the need for increased hiring of employees. Within all these schedules, one can find variations due to contractual reduction days, as for example ATO days in Sheffield Village's case. The rules regulating fire service hours are contained in the FLSA and dictate the criteria such as when overtime compensation should be paid; however, there is nothing restricting the amount of hours worked during any individual shift rotation. It is worthy to note in a study conducted by Davis and Aguirre (2009), that there is no "golden schedule" that surpasses all others.

Question 2. *What is the preferred schedule of the members of the Sheffield Village Fire Department?*

After a survey of the employees, five of the current 15 employees indicated that they were interested in working their current 24/48 rotation. Five of the current 15 employees indicated they were interested in working a 48/96 rotation. One employee was interested in the 10/14 split, and four were interested in the California swing shift. No clear majority preferred one particular shift rotation; however, an overall majority indicated that other shifts besides the current 24/48 were of interest. In addition, it is interesting to note that no employees indicated major issues with the current shift rotation, which was a survey question. If we look at the survey closer, we can see that one out of five employees indicated that they were only interested in the current 24/48 and were not interested in the department researching and presenting different shift alternatives (refer to Appendix 7 for full results).

Question 3. *What are other schedules employed by area departments with similarly sized operations?*

In a survey, listed in (appendix 8), other area fire departments, including like size departments which share the same economic climate and staffing as Sheffield Village, indicated that the majority of fire departments in the survey area where full-time 24 hour coverage (85.7%). Looking further at the survey we see that the majority of the departments working a 24/48 schedule was (71.4%), interestingly this percentage number was also consistent with IAFF findings reported in the literature review of 67.66% of departments working a 24/48 shift

nationally. This was followed by the second most prevalent being the “california swing” type of shift which accounted for 21.4% of the departments in the survey.

All of the departments surveyed have a workweek schedule similar to the one used in Sheffield Village: between 48 and 53 hours, with the exception of one part time department that covered on station staffed positions for 12 hours out of the day. This workweek of between 48 and 53 hours is typical of the two prevalent shifts worked in the survey, which are the 24/48 and “california swing”. This finding also coincides with information discovered in the literature review on the most common shifts worked with negotiated workweeks 48 hours and above. Also noted in the survey was that none of the departments have changed their work schedules in the last 10 years.

No use of the 48/96 hour schedule was found in our survey area; nationally we find this schedule most prevalent in the western states of the country (Appendix 9). In our survey area of regional fire departments, we found no use of the 10/14 split shift.

Question 4. *What are the costs/benefits and pros/cons of alternative shift schedules?*

The cost of changing a shift rotation is often viewed, as time equals money. In other words, some shift rotations require hiring additional employees. If the intention behind changing a shift rotation is to reduce the amount of hours employees work, then a cost increase could occur due to hiring additional employees and paying their salaries. For example, moving from the current shift rotation to a 12/12 or 10/14 split shift (4 platoons) would result in a cost increase in the overall budget. In Sheffield Village’s situation, this would require increasing the current $1,479,526.63 annual budget to a $1,763,526.63 budget, an increase of $284,000.00 in wages (J.

Young, Personal Interview, December 1, 2015). Utilizing one of the above-mentioned split shifts could result in a reduction in overtime costs, since far fewer hours have to be covered when filling a 14-, 12-, or 10-hour shift compared to having to fill a 24-hour shift. However, considering the average annual overtime of $38,116 per year within Sheffield (Young, 2015), that would not be the case in reality. Sheffield Villages controlled overtime costs are due to its blended workforce of part time employees. Which does not justify moving the department to a shift rotation that would require hiring an additional platoon of workers at ($284,000.00). In a 24-hour shift it costs $599.99 to pay overtime for a full time employee vs. $454.80, which is the cost to pay the part time employee, as well as stated earlier in the research, that the maximum employees on the department is set by Village ordinance.

On the other hand, but not as calculated in Sheffield Villages case, some larger departments have projected savings in overtime ($36 million in Washington, D.C.) by moving from a 24-hour shift to a 12-hour shift (EfficientGov, 2013). It should be cautioned, however, that the specific contractual language in an individual department might inhibit such cost savings. Thus, a department's configuration must be examined closely to conclude potential cost savings. Departments the size of Sheffield Village may in fact see a 40% increase in costs due to having to hire a fourth platoon (5 employees) in order to work a 12 hour shift, as well as reducing contractual hours from 53 to 48.

Comparing the costs of other shifts to our current 24/48 we find no annual increased financial cost associated with changing to a "california swing", 10/14 split (three platoon), or a 48/96 within the Sheffield Village Fire Department. However, we also find no realized cost savings to the annual budget by moving to these shifts either. The reason for this is that these shifts can be filled with the same amount of employees working the same amount of hours as is

being utilized in the present. In addition, the negotiated workweek, as well as contractual time would not have to be altered within Sheffield Village to work these rotations.

DISCUSSION

After evaluating the information in this research, paper and examining all the factors related to the various shift schedules in the fire service, we have found no major deficiencies in Sheffield Village's current 24/48 hour schedule. We at times see some authors passionately arguing one type of schedule vs. another, but no overall definitive research suggests any one-schedule fits any department best. Some cost savings in overtime, as calculated; an estimate of around $14,000 may be realized from our current annual spending of $38,116 in overtime using the 10/14 split shift utilizing the three-shift rotation. Remembering only 10 or 14 hours of overtime would need coverage instead of 24 hours. We must point out, however, that the limited cost savings do not outweigh the negative effects that a constant day/night rotation might have on the employees, which is pointed out by references such as (Careless & King, 2010). This shows it is healthier for employees to move away from a 10/14 split to a 24 hour tour.

The department controls overtime costs associated with filling shift vacancies, which occur due to contractual time off given to employees. This is because part time employees are scheduled to work the vacancies in shifts, which is more cost effective than paying overtime. For example, in a 24-hour shift it would cost $599.99 to pay overtime for a full time employee vs. $454.80, which is the cost to pay the part time employee. However, there are two factors to consider with the use of part time firefighters in Sheffield Village.

The first factor is that the qualified hiring pool for part time employees is at times reduced. This is due to the hiring policies within the Sheffield Village Fire Department, which requires part time employees obtain the same certification requirements as full time employees, (240-hour fire/State of Ohio paramedic).

The second consideration is that part time employees tend to be transitional employees in the organization and often leave the department after testing and obtaining full time employment within other jurisdictions. Although Sheffield Village has no restrictions that disallow its part time fire fighters to work for outside agencies, it is seldom the case they stay employed with Sheffield Village after being hired full time elsewhere, as found when a personal interview was conducted with Captain Bryan Huge of the Sheffield Village Fire Department. (Huge, 2015)

The use of part time firefighters for peek staffing is gaining popularity in the fire service as way to reduce staffing costs. As found in an Ohio Fire Executive Officer paper written by Lt. Casey Curtis, where he concluded that for their operations they would supplement the full time staff of the Granville Township Fire Department with two 12-hour shift part time employees during the week from 0800-2000 hrs. (Casey Curtis, 2011)

It seems that a 24-hour schedule is the most productive and cost efficient for the Sheffield Village Fire Department. The type of 24-hour schedule that the employees wanted to work had varied responses, as recorded in the survey sent out to members of the department (Appendix 7). No clear majority preferred one particular shift rotation; however, an overall majority indicated that other shifts besides the current 24/48 were of interest. In addition, it is interesting to note that no employees indicated major issues with the current shift rotation. This data was gathered though a series of questions ranging from how the current shift effected their home lives; to how a spouse or partner felt about the current shift they worked.

Literature in this paper also questions the safety and efficiency when looking at various schedules such as the California swing, 10/14 split, 12 hour, and 48/96 shift rotations. Some benefits for departments with large incident volume were pointed out, but the cost and health benefits involved does not overall indicate anything worthwhile.

When looking at the 48/96 hour shift, we see a perceived advantage, with a 50% reduced commute time per year for employees and the benefit of one extra calendar day off when ATO time or vacation time is used in even multiples, compared to the current 24/48 schedule. It must also be noted that even though the Sheffield Village Fire Department is currently well below the average of three incidents per night, which is acceptable when working a 48-hour shift, the steadily increasing trend in run volume may make this schedule unacceptable in the future.

The California swing is a viable option for balancing a non-48-hour shift, compared with the 48/96 schedule, with a four-shift cycle off. The only negative issue with this shift structure would be that an overtime shift on the day after a 24-hour on-duty shift could result in a shortened rest/work cycle followed by the next consecutive 24-hour shift as compared to other rotations.

A 12/12 split shift would create a situation where the department would need to hire an additional shift (fourth shift) of five firefighters. This situation has two major hurdles; first, the maximum number of employees, which is set by ordinance, would need to be changed, and second, the budget would have to be increased to accommodate the additional employees, at a projected additional cost of approximately $284,000.

Eight-hour shifts were found to be in little use within the fire service, and do not present a viable option to the Sheffield Village Fire Department due to the projected increase of 40% in cost of wages, compared to the current 24/48 hour shift and 53-hour workweek.

RECOMMENDATIONS

After carefully considering the information contained in this research paper, I would recommend the following actions be considered:

It is not recommend moving the employees from the current 24/48 schedule. The current schedule seems to balance the workload placed on the employees with the department's functional needs. In terms of economic benefits, we find that the department would realize no major cost savings because of a schedule change.

Future re-evaluations of the schedule should continue due to the trending incident volume increases (13.8%) per year on average. These incident volume increases, if continued will cause the need for additional staffing increases in the future.

As noted earlier in the research we see that the department is a combination fire department, and utilizes part-time firefighters on shift, which has resulted in controlling overtime costs to $38,116.00 annually.

I suggest continued use, and an expanded role, for part-time employees on a PRN and scheduled basis in order to keep up with future scheduling demands. A further breakdown finds that Sheffield Village shows fiscal responsibility by blending a 24/48 schedule for full time employees, and the use of part time employees, which worked a total of 4,240 hours in 2015 ($80,351.00). This is a significant cost savings as compared to the $105,515.00 dollars that Sheffield Village would have spent without the use of part time employees.

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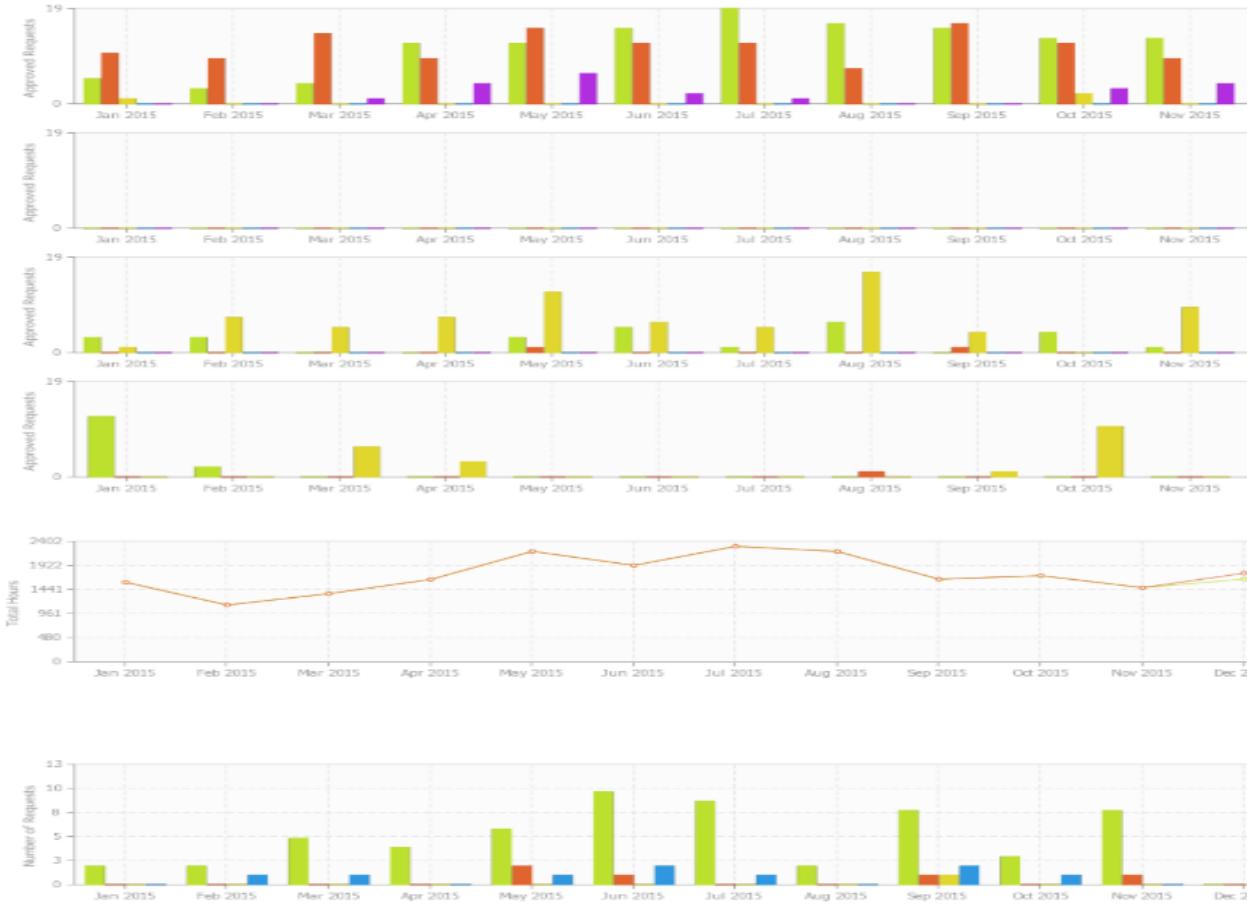
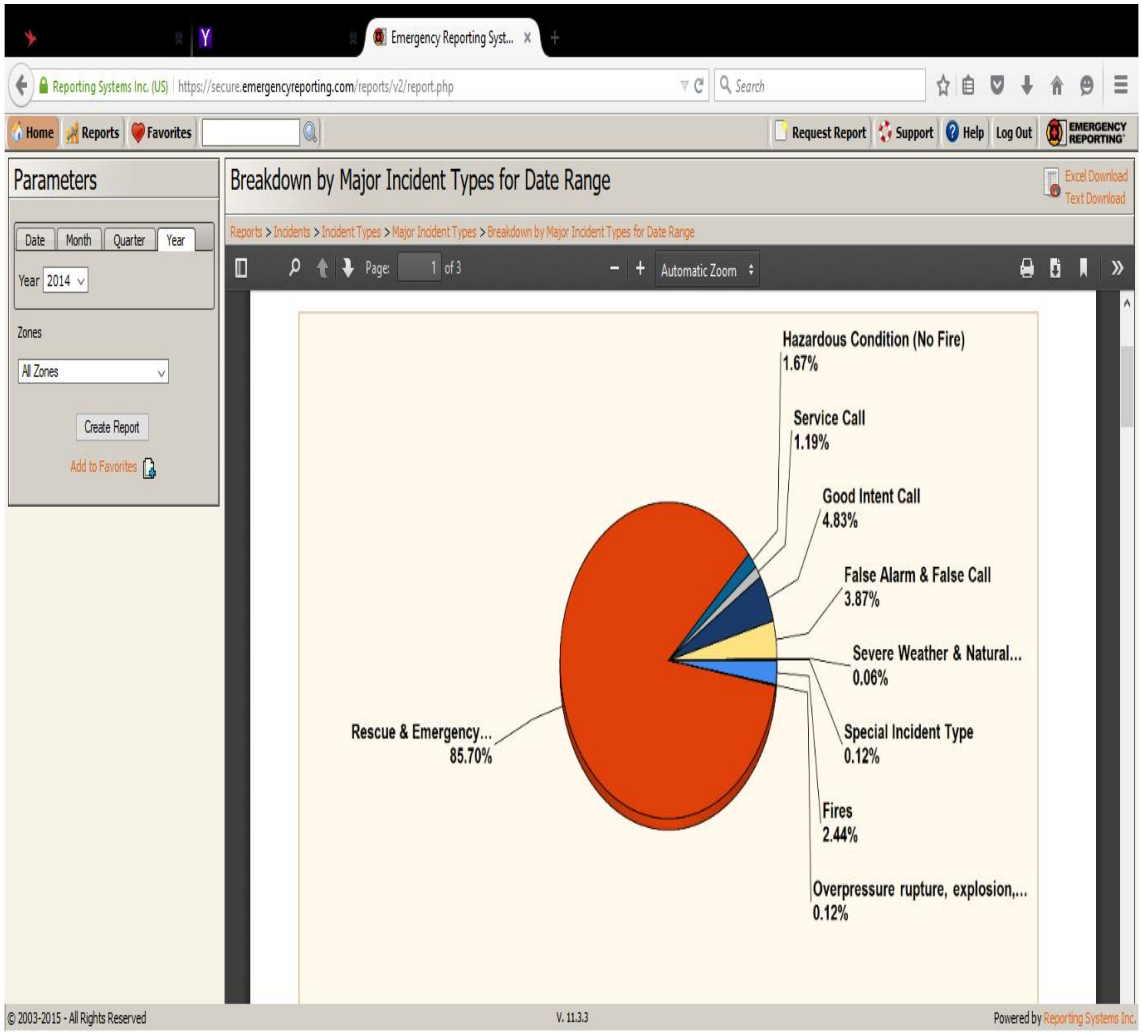
APPENDIX 1 – TIME OFF REPORT



APPENDIX 2 – SVFD MAJOR INCIDENT TYPES



APPENDIX 3 – NIFIRS

Ohio.gov | Department of Commerce

Commerce - NFIRS/OFIRS Administration

OFIRS INCIDENTS REPORTED BY YEAR AND MONTH

UPDATED DAILY

If you have any questions, please contact:

Ohio Department of Commerce / Division of State Fire Marshal
Fire Prevention
8895 E Main St, Reynoldsburg OH 43068
email: OFIRS@com.state.oh.us
(614) 752-7115 / (614) 644-1442 (FAX) / (888) 243-0305 TOLL FREE

FDID	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR TOTAL
47029	2004	58	54	55	48	60	71	54	60	65	66	47	66	704
47029	2005	70	65	63	58	64	65	61	78	52	76	43	51	746
47029	2006	59	68	59	55	58	71	60	72	61	44	47	62	716
47029	2007	58	60	62	49	61	56	60	85	58	76	51	59	735
47029	2008	53	68	54	69	47	81	56	70	72	85	55	62	772
47029	2009	63	49	60	58	69	69	57	66	61	61	42	73	728
47029	2010	70	56	62	63	65	59	55	59	53	66	52	57	717
47029	2011	127	117	174	105	128	129	99	148	140	98	120	144	1529
47029	2012	155	106	118	143	107	148	167	158	128	155	119	126	1630
47029	2013	146	140	129	132	145	144	132	143	111	123	91	147	1583
47029	2014	148	116	131	113	139	175	153	131	137	139	145	152	1679
47029	2015	135	117	148	123	135	151	192	133	165	172	131	141	1746

APPENDIX 4 – COLLECTIVE BARGANING

ARTICLE 11B — NEGOTIATION PROCEDURE

Section 1: Negotiations are to begin no less than sixty (60) days before the expiration of the any existing Agreement. During the negotiation process, if the parties reach an impasse that continues for at least thirty (30) days following the expiration of the existing Agreement, either party may request, in writing, an arbitrator from the Federal Mediation and Conciliation Service ("FMCS") to assist the parties in reaching an agreement. The party making the request shall serve the other party with a copy of the written request within three (3) calendar days of the date the request is made to FMCS. If the Village is making the arbitration request, a copy of the written request is to be served by certified mail or hand delivery to the Union at IAFF Local 4275, 4340 Colorado Avenue, Sheffield Village, Ohio 44054. If the Union is making the arbitration request, a copy of the written request is to be served by certified mail or hand delivery to the Mayor/Safety Service Director/Safety Service Director.

Section 2: Within ten (10) business days of requesting FMCS arbitration, the parties shall mutually select an impartial arbitrator, or select an arbitrator from a list of seven (7) impartial arbitrators provided by FMCS using the strike method. After the arbitrator is selected, the hearing will take place as quickly as possible, but not later than sixty (60) days after the selection of the arbitrator. The Village and the Union shall equally share the cost of the services rendered by the arbitrator. The Village and Union shall pay the costs associated with their respective witnesses and presentations.

Section 3: The arbitrator shall only have jurisdiction over the unresolved issues and matters mutually agreed upon by the Village and the Union. The hearing shall be private and shall be conducted pursuant to FMCS's current rules of labor arbitration. Not later than three (3) business days before the arbitration hearing, the Village and the Union shall serve on the arbitrator and the opposing party, a written report summarizing the unresolved issues and any other matter submitted for arbitration, the party's final offer on the issues and the rationale for the position. If, after submission of the parties' reports discussions between the parties result in a change of final offer, a party may submit a revised written final offer to the other party through the arbitrator. No change in offers shall be permitted after testimony and evidence is heard on the particular issue involved.

Section 4: Within sixty (60) calendar days after hearing the evidence and testimony submitted by the parties, the arbitrator shall resolve the issue between the parties by entering a written award by selecting either of the parties' final offers. In resolving the issue and preparing the written reward the arbitrator shall consider the following:

1. The testimony and evidence presented;

2. Past collective bargaining agreements, if any, between the parties;

3. Comparison of the issues submitted to binding arbitration relative to the Employees in the bargaining unit involved with those issues related to other public employers of similar size and in the same geographic region of the state, doing comparable work, giving consideration to factors peculiar to the area and classification involved;

4. Comparability of treatment between the Employees in the bargaining unit in question and the Village's Employees doing work comparable to that performed by the bargaining unit Employees, concerning the issues submitted to binding arbitration;

5. The interests and welfare of the public, the ability of the Employer to finance and administer the issues proposed, and the effect of the adjustments on the normal standard of the public service;

6. The lawful authority of the Village;

7. The stipulations of the parties; and

8. Such other factors, not confined to those listed in this Section, which are normally or traditionally taken into consideration in the determination of the issues submitted to binding arbitration through voluntary resolution procedures in public service or private employment.

Section 5: Within sixty (60) calendar days of the closing of the hearing, the arbitrator shall make written findings of fact and promulgate a written opinion and award upon the issues presented to him/her, and upon the record made before him/her, and shall mail or otherwise deliver a true copy thereof to the parties.

Section 6: The award for the arbitration is final, conclusive and binding on the Village and the Union, and it is a mandate to both parties to take the necessary steps to implement the award, unless the parties mutually agree to amend or modify the award or the award is subjected to judicial review as provided in Ohio Revised Code Chapter 2711 due to procurement by corruption, fraud or undue means, or arbitrator corruption or misconduct. For purposes of this Agreement, the "arbitrator corruption or misconduct" referred to in the previous sentence shall mean refusal to postpone a hearing upon sufficient cause shown, refusal to hear evidence pertinent and material to the controversy, evident material miscalculation of figures, evident material mistake in the description of any person, thing or property referred to in the award, and/or the award is relating to matters not submitted to the arbitrator.

APPENDIX 5 – EMPLOYEE AGE

To: Fire Employees

Fm: Captain Davis

Re: Research paper

I am requesting you submit your current age for a OFE research paper I am working on. If you have any questions please feel free to contact me thanks.

Greg Davis

Gilles	42	Strah	36
Davis G.	40	Rudkin	45
Huge	37	Emling	32
Davis C.	46	Lewis	37
Clark	43	Young	32
McCallie	34	Blair	26
Boesken	47	Nealen	32
Campbell	44	Smith	30
Brutout	30	Golay	27
Scheutzow	25	Walter	25
Holtzman	31	Yandell	28
Westlake	26		

APPENDIX 6 – SAMPLE SHIFT SCHEDUELS

24/48

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
				1 A	2 B	3 C
4 A	5 B	6 C	7 A	8 b	9 C	10 A
11 B	12 C	13 A	14 B	15 C	16 A	17 B
18 C	19 A	20 B	21 C	22 A	23	24
25 A	26	27	28 A	29	30	31 A

Calif. Swing

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
				1 A	2 B	3 A
4 B	5 C	6 B	7 C	8 A	9 C	10 A
11 B	12 A	13 B	14 C	15 B	16 C	17 A
18 C	19 A	20 B	21 A	22 B	23 C	24 B
25 C	26 A	27 C	28 A	29 B	30 A	31 B

48/96

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
				1 A	2 A	3 B
4 B	5 C	6 C	7 A	8 A	9 B	10 B
11 C	12 C	13 A	14 A	15 B	16 B	17 C
18 C	19 A	20 A	21 B	22 B	23 C	24 C
25 A	26 A	27 B	28 B	29 C	30 C	31 A

10/14 Split (3 Platoons)

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
				1 A Day	2 A Day	3 A DAY
4 C Day	5 C Day	6 C Day	7 B Day	8 B Day	9 B Day	10 A Day
11 A Day	12 A Day	13 C Day	14 C Day	15 C Day	16 B Day	17 B Day
18 B Day	19 A Day	20 A Day	21 A Day	22 C Day	23 C Day	24 C Day
25 B Day	26 B Day	27 B Day	28 A Day	29 A Day	30 A Day	31 C Day

APPENDIX 7 – SURVEY RESULTS

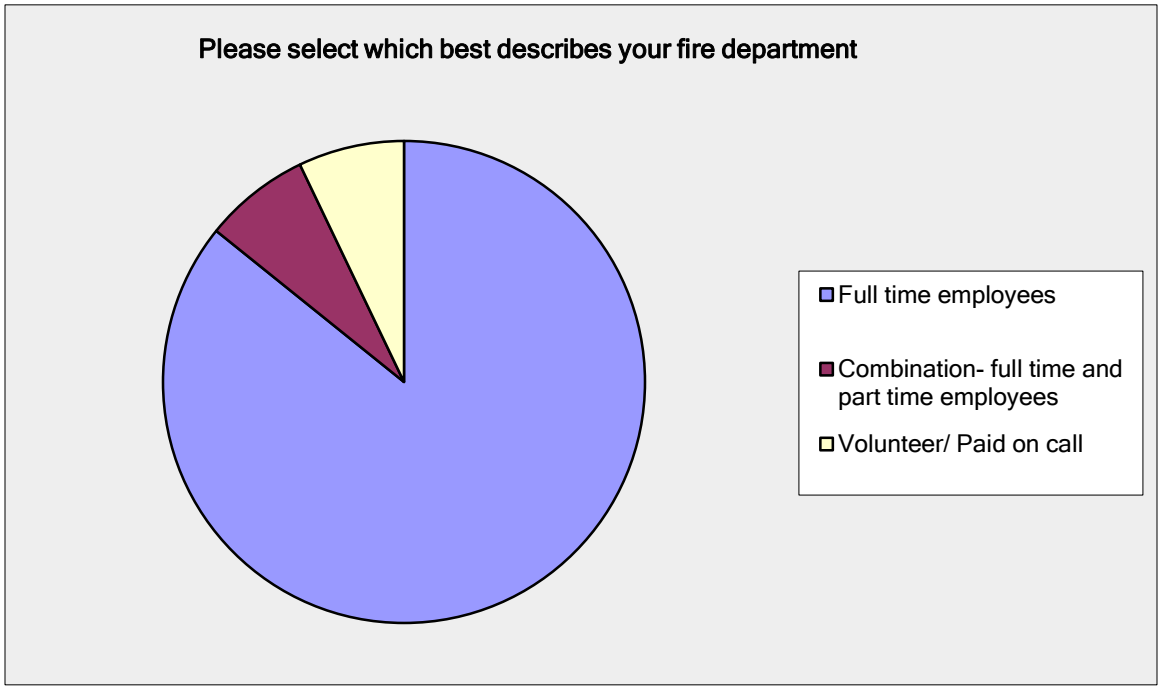
1. In general, how much does your shift system interfere with the sorts of things that you would like to do in your leisure time (e.g., sports activities, hobbies, etc.)? Not at all 1 2 3 4 5 Very much	Survey Number 1 | 2 | 3 | 4 | 5 4 | 6 | 1 | 2 | 1 Results	Majority indicated (2) Not much. Overall majority towards "not at all" side of scale.
2. In general, how much does your shift system interfere with the household tasks you have to do in your time off work (e.g., grocery shopping, looking after children, etc.)? Not at all 1 2 3 4 5 Very much	Survey Number 1 | 2 | 3 | 4 | 5 4 | 5 | 3 | 1 | 1 Results	Majority indicated (2) Not much. Overall majority towards "not at all" side of scale.
3. In general, how much does your shift system interfere with the non-household things you have to do in your time off work (e.g., going to doctor, going to the bank, etc.)? Not at all 1 2 3 4 5 Very much	Survey Number 1 | 2 | 3 | 4 | 5 7 | 3 | 2 | 1 | 1 Results	Majority indicated (1) Not much. Overall majority towards "not at all" side of scale.
4. Do you feel overall that the advantages of your current shift system outweigh the disadvantages? (Definitely not) (Probably not) (Maybe) (Probably yes) (Definitely yes)	Def. Not 0 Prob. Not 2 Maybe 4 Prob. Yes 4 Def. Yes 4	Majority answered to the yes side, indicating the advantages outweigh the disadvantages.
5. How does your spouse/partner feel about you working your current shift? (Extremely Supportive) (Quite Supportive) (Extremely Unsupportive) (Indifferent)	Ex. Sup 6 Quite. Sup 3 Ex. Unsup 1 Indifferent 4	Majority of employees indicated their spouses support the current shift schedule.
6. Does your spouse or significant other work outside the household? (A) Yes (C) N/A (B) No	Yes 11 No 1 N/A 2	Majority indicated a spouse or significant other working outside of household.
7. Do you work a "B" job on your time off between shifts? (A) Yes	Yes 9 No 3	Majority indicated working a second job when off duty.

(B) No (C) Occasionally	Occas. 2	
8. Do you feel tired on most days you return to shift? (Almost never) (Rarely) (Sometimes) (Frequently) (Always)	Almost Never 1 Rarely 4 Sometimes 8 Frequently 1 Always 0	Majority indicated that they sometimes felt tired on most days they returned to work.
9. Do you feel tired on days off from your shift? (Almost never) (Rarely) (Sometimes) (Frequently) (Always)	Almost Never 0 Rarely 4 Sometimes 8 Frequently 2 Always 0	Majority indicated that they sometimes to rarely felt tired on days off from work.
10. In general, do you feel you can get time off requests you submit? (Almost never) (Rarely) (Sometimes) (Frequently) (Always)	Almost Never 0 Rarely 0 Sometimes 4 Frequently 9 Always 2	Majority felt they frequently were able to get time off when requested.
11. Do you use contract "time off" to meet family obligations (not including use for leisure or family vacations? (Almost never) (Rarely) (Sometimes) (Frequently) (Always)	Almost Never 0 Rarely 2 Sometimes 10 Frequently 1 Always 1	Majority indicated they sometimes used contract time off to meet family obligations as opposed to leisure or vacations.
12. Would you say that you are available for most overtime that is offered to you? (Almost never) (Rarely) (Sometimes) (Frequently) (Always)	Almost Never 1 Rarely 3 Sometimes 5 Frequently 4 Always 1	Majority answered sometimes to rarely as far as their ability to work overtime.
13. Would it be of interest to you for the department to research and present alternative work schedules that exist in the fire service? (A) Yes (B) No	Yes 9 No 5	Majority indicated they wanted the department to research and present alternate schedules in the fire service.
14. Have you ever felt the need to use sick time because contractual time off was unavailable? (A) Yes (B) No (C) Choose not to answer	Yes 2 No 11 No ans. 1	Majority indicated they did not feel the need to use sick time due to contractual time off being unavailable.

15. Attached (Appendix 1) you will find a sample of various fire schedules. Please look at them and indicate below which schedule interests you the most. (You are not choosing a new schedule to work in this question.) (A) Current 24/48 we work (B) 48/96 (C) 10/14 split shift (D) California swing shift (E) Other_____	24/48	5	No majority; however, there is a clear indication that other shifts besides our current 24/28 have interest. One employee chose to indicate he was interested in two different shifts.
	48/96	5	
	10/14 Split	1	
	Calif. Swing	4	
	Other		

APPENDIX 8 – EXTERNAL SURVEY

Please select which best describes your fire department		
Answer Options	**Response Percent**	**Response Count**
Full time employees	85.7%	12
Combination “full time” and “part time” employees	7.1%	1
Volunteer/paid on call	7.1%	1
answered question		14
skipped question		0



Please select the following shift your firefighters work (not including 40-hour staff positions)		
Answer Options	**Response Percent**	**Response Count**
24/48 (On 24 Hrs./Off 48 Hrs.)	71.4%	10
Modified Swing Shift/"Calif. Swing" (On 24, Off 24, On 24, Off 24, On 24, Off 96)	21.4%	3
48/96 (On 48Hrs./ Off 96 Hrs.)	0.0%	0
12-Hour Shift	7.1%	1
14/10 Split Shift	0.0%	0
8-Hour Shift.	0.0%	0
Other (please specify)		0

answered question	14
skipped question	0

Please indicate your employees contracted work hours (Ex. 56-hour workweek)	
Answer Options	Response Count
	14
answered question	14
skipped question	0

Number	Response Text	Categories
1	no contract	
2	50	
3	53	
4	48	
5	50.4	
6	50	
7	51	
8	50.4	
9	51	
10	50	
11	48	
12	48	
13	49.8 per week, 99.6 bi-weekly	
14	52	

Has your department changed its shift schedule in the last 10 years?		
Answer Options	Response Percent	Response Count
Yes	0.0%	0
No	100.0%	14
answered question		14
skipped question		0

APPENDIX 9 – DEPARTMENTS ON 48/96

Fire Departments On a 48/96 Rotation	Year Started	Size/Manpower	Call Volume/YR	Previous Schedule
City of Peoria Arizona		145	12700	24-48
Tillamook Hospital Ambulance	early 1990s	24	3,000	24-48
King County Fire District 27, Fall City, WA	Jan 1 2008	9	775	Modified Detroit XOXOXOOOO
City of Flagstaff Fire Dept.	July, 2007	84	10,000	Modified Kelly XOXOOXOXOOOO
Summit Fire Department	4/15/2007	40	1200	Modified Kelly XOXOOXOXOOOO
Sacramento Metro Fire, California	1-Jan-08	600	68,300	XOXOXOOOO
City of Sacramento, Ca	3/06/2007	600	66,284	Modified Kelly xoxooxoxoooo
City of Lake Havasu AZ	Jan 10 2007	70	6200	24-48
City of SeaTac Fire Department, Washington	1-Jan-06	46	4300	3/4 XOXOXOOOO
Fort Mojave Mesa Fire District	1/1/2007	30	1,700	3/4 XOXOXOOOO (Kelly)
City of Boise, Idaho	Jan-08	250	24,000	24-48
Scotts Valley Fire District	10/1/2006	21	1500	3/4 XOXOXOOOO
South Park Ambulance District	Mar-04	12	800	
City of Layton, Utah	Jan-07	49	4,800	3/4 XOXOXOOOO
City of Rocklin, California	July 8 2006	28	4000	3/4 XOXOXOOOO
City of Montebello		63	3000	3/4 XOXOXOOOO
Eagle River Fire Protection District	January of 2005	40	2400	
Idyllwild Fire Protection District, Idyllwild, California	7/1/2006	16 paid call /6 Fu	800	XOXOXOOOO
Unified Fire Authority of Greater Salt Lake	1-Jan-06	Stations: 20	25,000	XOXOXOOOO
West Metro Fire Rescue, Jefferson County, Colorado	1/1/2006	Stations: 15	21,916	XOXOXOOOO
Burton Fire District, Beaufort, South Carolina	1/1/2006	42	2700	24-48
Loveland Symmes Fire Department, Loveland Ohio	48/96 for 7 years	39	3,500	24-48
City of Stockton Fire Department	1/6/2006	287	50,000	24-48
Fort Irwin Army Base	5 years on 48-96	Stations: 3		
City of Taft Fire Department, Kern County, CA	1992	6	999	X O X O X O X OOOO
City of Selma, California	In 2nd year	21	3700	24-48
City of Provo, Utah	2005	75	8700	24-48
Santa Barbara City Fire	April '05	85-90	6,800-7,000	Kelly X-0-X-0-X-0-0-0-0
Montecito Fire Protection District		40	1100	4/6 kelly XOXOXOXOOOOOO
City of Eugene, Oregon		150	18,000	24-48