

Change It Up: The Impact of Alternative Staff Schedules

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CERTIFICATION STATEMENT

I do hereby certify that 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.

Signed _____
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Abstract

The problem is that the Madison Fire Department was unaware of what alternative staffing models exist or how a change to staff scheduling would affect the department. The purpose of this paper was to identify other types of staffing schedules for full time personnel and to explore their potential impact on the Madison Fire Department (MFD). Descriptive research was used to answer the following questions: (a) What types of scheduling models are used in the fire service? (b) What are the advantages associated with these different staffing models? (c) What are the disadvantages associated with these different staffing models? (d) What organizational changes need to be implemented in order to utilize these different staffing models? Research was completed by locating and evaluating printed and online material in the areas of journal articles, studies, and periodicals, department websites, and subject matter experts. This information was then evaluated and compiled during a literature review process. Original research was completed through multiple surveys, a questionnaire, interviews, and a data analysis project. This research and the review of literature provided results that answered each of the research questions and led to recommendations for the Madison Fire Department. These recommendations include a reevaluation of MFD's current staffing model and guidelines for implementing and evaluating other scheduling models during a trial period.

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Stress exacts a heavy burden on employees and employers. These physical effects on the employee can include heart attacks, strokes, ulcers, frequent illness, anxiety, and depression (Maxon, 1999). The economic effects include a cost to U.S. employers at an estimated \$300 billion per year (Lis, 2014) due to low productivity, turnover of employees, sick days, workman's compensation claims, and other medical insurance expenses (Maxon, 1999).

Firefighting was rated the third most stressful job in the United States for 2014. Only military personnel and military generals were listed as employees with jobs that were more stressful than firefighting (Kensing, 2014).

Firefighters' stress comes from work that is dangerous and pressure packed, the intensity of making decisions that determine if people live or die, witnessing loss of property and loss of life, and constantly worrying about their own personal safety. Firefighting is also not a nine to five type of job. Firefighters work long hours each week that require them to be up at night and lose sleep. They then also spend time at home attempting to recuperate from their time on shift. This can affect the balance between their job and their personal lives (Kokemuller, 2014).

Being deprived of vacation time can cause resentment towards coworkers and can also increase mistakes. You can improve concentration with small breaks, but long breaks will actually recharge job performance (Thompson, 2012).

The Madison Fire Department operates in a rapidly growing community. Continued growth has placed increased demands on full time staff. These demands have resulted in a decrease in morale and productivity. Department members have suggested a change to full time staff scheduling as a way of overcoming these issues. The problem is that the Madison Fire

Department is unaware of what alternative staffing models exist or how a change to staff scheduling would affect the department.

The purpose of this paper is to identify other types of staffing schedules for full time personnel and to explore their potential impact on the Madison Fire Department (MFD). Descriptive research will be used to answer the following questions: (a) What types of scheduling models are used in the fire service? (b) What are the advantages associated with these different staffing models? (c) What are the disadvantages associated with these different staffing models? (d) What organizational changes need to be implemented in order to utilize these different staffing models?

Background and Significance

The MFD is located in the city of Rexburg which is situated in Madison County, Idaho. The county is 473 square miles and has a population of nearly 37,500 (United States Census Bureau, 2014). Rexburg is a hub for travelers to heading nearby vacation destinations such as Island Park, Yellowstone National Park, and Jackson Hole. Brigham Young University – Idaho is also located in Rexburg. The university currently has a student population of 15,625 students (BYUI, 2014).

The MFD provides all of Madison County with fire and emergency medical services (EMS) protection. EMS is provided at the Critical Care Paramedic (CCP) level. Mutual aid is also provided to multiple surrounding jurisdictions and counties. In addition to local incident response, the MFD is an active participant in wildland firefighting in the western United States. During the months of May through September, department personnel and apparatus are deployed on assignments to assist the Forest Service and Bureau of Land Management with wildland fires.

The MFD is a combination department that serves the community through three stations. Station #1 is manned by full time employees while Station #2 and Station #3 are unmanned. Station #1 is responsible for responding to all incidents and relies on the paid-on-call staff to assist as they are able. There are 12 full-time line employees, 60 paid-call employees, and five full time administrative staff.

The demands for services continue to grow in Madison County. In 2013, the City of Rexburg issued \$200 million in building permits, the largest ever. Also, the department's EMS runs have steadily increased, every year, since 2000. Conversely, the department has also seen an average decrease in paid-on-call response to incidents over the last several years and the full time staffing has remained the same (Child, Davis, & Walker, 2014).

In 2013, the department responded to 2, 277 EMS and Fire incidents locally and were deployed on 16 wildfires regionally (Madison Fire Department, 2014). Full time line personnel also perform outreach activities in the community, public education, assist with initial and ongoing fire and EMS training of paid-on-call personnel, provide leadership for paid-on-call staff, perform pump testing of engines, do annual hose testing for all apparatus, maintain EMS supplies, assist in overseeing field training of new hires, assist in writing protocols and standard operating guidelines, maintain the buildings, and perform minor maintenance on vehicles and apparatus.

Full time line personnel perform these jobs while working a rotating shift of 24 hours on with 48 hours off and utilizing a three platoon (or shift) system. Overtime is allowed so long as the full time employees do not exceed more than 48 hours worked in a 72 hour period. Most full time employees do work multiple overtime shifts, every month, to assist in maintaining adequate

staffing levels for emergency response. These same employees also work on their days off in order to complete the various departmental projects they are involved in.

As little as five years ago, the department enjoyed a very high participation and satisfaction rate. A firefighter memorial was erected at this time, department members were participating in fundraisers, a color guard and bagpipe band was formed, most department members were coming out to department functions, and there was excitement about spending an entire career working for the MFD.

Today, projects are delayed in their completion, fundraiser participation is at its lowest despite an increase in incentives, the color guard and bagpipe band struggle to fill their ranks, department functions are poorly attended, and employee satisfaction is also low. Employees state they are too busy to assist, they work too much already, and that they have been away from home too much.

Also, three long time employees have left or have given their notice that they are leaving. This constitutes one fourth of our entire line staff giving notice within the last year. In part, they have cited a desire to work a job with a different schedule and at a less demanding pace. This type of employee turnover has never happened before in the history of the MFD.

The department's mission statement is, "To maintain a state of readiness in: our people, our equipment, in operational accuracy, and in administration" (Child, Davis, & Walker, 2014, p. 1). To have experienced members of our staff leave hinders our ability to accurately follow this plan. Having members who appear to be reaching their maximum limits in participation also impedes our ability to reach departmental goals.

The chief officers and captains have been aware of these issues and their increasing frequency over the last year. Attempts have been made to increase full time manning of the

station but so far they have been unsuccessful. Other, more generalized and common attempts at increasing morale have been tried but have not produced the desired results. While a specific solution to the issue is not yet known, research into this topic is being performed as a possible answer. Many staff members have pointed to their work schedule as a significant area of concern. They believe a different work schedule can help restore some balance between their work and personal lives and thus increase their ability to be productive and to enjoy work at a greater level.

Practicing adaptive leadership through diagnosing and then acting within the organization is a goal of the Executive Leadership class for which this paper is being written. Information gathered through this process will specifically assist with diagnosing any problems, if present, with MFD's current staffing model and then provide options for how the department can act.

Improving the fire and emergency services' professional status and capability for response to and recovery from hazards can be achieved, locally, through the results of this paper. These are the United States Fire Administration's operational goals and, with differing verbiage, the goals of the Madison Fire Department as well. A firefighter who is stressed and unproductive has a difficult time acting in a professional manner. They also make mistakes during incidents.

With these specific goals in mind, with the increase in stress being placed on MFD full time firefighters, and with the lack of other options, the MFD needs information that will assist in understanding if a change to the current staff scheduling model is warranted. More specifically, the department needs to know what other scheduling models could be used while also comparing their benefits and drawbacks. This information will allow the department to

assess the full implications of this type of policy change and make an informed decision in the future.

Literature Review

The texture of a firefighter's life, can, in great extent, be determined and defined by the schedule they work. Their schedule determines where they live, when they see their family, and the time they have available for other, and varied, personal pursuits (Cosh, 2010).

Introducing change into fire departments can be troublesome because the service is steep in tradition as well as in doing things the way they have always been done before. It took years for fire departments to start using SCBAs and it even took a long time to realize that diesel exhaust permeating fire stations was a bad idea. Although they, and we, sometimes think they are invincible, paramedics and firefighters are not immune to the stresses that affect the rest of the world. If there is a benefit to changing work schedules, then it should be recognized and implemented (Swinhart, 2007).

The fire service staffs stations and provides day to day coverage based on the number of platoons the department chooses to utilize (ShiftCal, 2013). Most firefighters, though, will work 56 hours in a week. Their shifts are either 24 or 48 hours and then they have multiple days off afterwards. Some fire departments utilize a shift that is less than 24 hours, such as 12 hour shifts, but these not very common. The most popular shift rotation is a cycle of working 24 hours and then having 48 hours off (Vitalie, 2009).

There are a couple variations to the 24 hour shift model. One is a 24 hour on 48 hour off rotation while the second is a repeating pattern schedule (ShiftCal, 2013).

The 24 hour on 48 hour off shift rotation is straightforward:

- This type of schedule requires three platoons.

- Each cycle is a three day period.
- Platoon A works the first 24 hour period, Platoon B works the second 24 hour period, and Platoon C works the final 24 hour period.
- Each platoon receives two days off after their 24 hours on duty.
- This cycle repeats itself indefinitely (Business Management Systems, 2012).

Many fire departments utilize this type of schedule. Some of these include: Brevard County Fire Department in Florida, North Charleston Fire Department in South Carolina, Paducah Fire Department in Kentucky, Tri-State Fire Department in Illinois, and Phoenix Fire Department in Arizona (ShiftCal, 2013).

The repeating pattern type schedule is a more complicated:

- This type of schedule requires three platoons.
- Firefighters will alternate working 24 hours and having 24 hours off for several days and then have several days off.
- An example is a 3's and 4's rotation.
 - A firefighter will alternate between days worked and days off until they have worked three days. The firefighter works these three days over a five day period. This is called a set.
 - After working a set, they then get four straight days off. The days off, during the set, do not count towards the equation.
 - This schedule can be represented with the following example:
 - XOXOXOOOO, where X = days worked and O = days off.
 - Three X's followed by four straight O's is the same as saying a 3's and 4's rotation.

- This type of rotation is often called the Kelly Shift Schedule (Business Management Solutions, 2012)

Santa Clara County Fire Department in California, Amarillo Fire Department in Texas, Charlottesville Fire Department in Virginia, and Fargo Fire Department in North Dakota are examples of departments that use the Kelly Shift Schedule (ShiftCal, 2013).

The longest shift rotation is the 48/96. This scheduling model is new, relatively speaking, but has been gaining popularity nationwide (Briggs, 2012). This model is easy to understand:

- This type of schedule requires three platoons.
- Each cycle is a six day period.
- Platoon A works the first 48 hour period, Platoon B works the second 48 hour period, and Platoon C works the final 48 hour period.
- Each platoon receives 96 hours off after their two days on duty.
- This cycle repeats itself indefinitely (Business Management Solutions, 2012).

City of Flagstaff Fire Department in Arizona, Boise Fire Department in Idaho, Sacramento Metro Fire in California, Provo Fire Department in Utah, and the City of Cranston Fire Department in Rhode Island are just some of the departments that use this staff scheduling model (Briggs, 2012).

Business Management Solutions (2012), Hatrak (2014, and UFLAC (2007) state that the Kelly, the 24/48, and the 48/96 shift schedules are similar in that they utilize a three platoon system, have 56 hour work weeks, and have 121 shifts worked per year. They also offer the following comparisons in the mechanics behind each of these three schedules:

- Days in each work cycle.
 - Kelly Shift Schedule: 9 days
 - 24/48: 3 days
 - 48/96: 6 days
- FLSA Period.
 - Kelly Shift Schedule: 27 days
 - 24/48: 27 days
 - 48/96: 18 days
- Four consecutive days off.
 - Kelly Shift Schedule: 40 times each year
 - 24/48: 0 times each year
 - 48/96: 60 times each year
- Mornings at home (not travelling either to or from work).
 - Kelly Shift Schedule: 120 each year
 - 24/48: 120 each year
 - 48/96: 180 each year
- Full weekend off (both Saturday and Sunday).
 - Kelly Shift Schedule: 17 times each year
 - 24/48: 17 times each year
 - 48/96: 26 times each year
- Work the full weekend (both Saturday and Sunday).
 - Kelly Shift Schedule: 0 times each year
 - 24/48: 0 times each year

- 48/96: 9 times each year
- Number of times commuting to work.
 - Kelly Shift Schedule: 120 times each year
 - 24/48: 120 times each year
 - 48/96: 60 times each year
- Available overtime or trade shifts that would not result in a 48 hour shift.
 - Kelly Shift Schedule: 40 shifts per year
 - 24/48: 0 shifts per year
 - 48/96: 60 shifts per year
- Maximum number of days off when taking one day of vacation.
 - Kelly Shift Schedule: 6 days
 - 24/48: 5 days
 - 48/96: 5 days
- Maximum number of days off when taking two days of vacation.
 - Kelly Shift Schedule: 7 days
 - 24/48: 8 days
 - 48/96: 10 days
- Days available to work a 24 hour overtime shift.
 - Kelly Shift Schedule: 81 days each year
 - 24/48: 121 days each year
 - 48/96: 121 days each year

Every scheduling option carries both advantages and disadvantages to their use. To truly understand a system, you must have a comparative analysis between each option (Koen, 2005).

Quality of work, quality of life, and organizational issues are three key categories to be examined and used as an aid in these comparisons (UFLAC, 2007).

The first key category, quality of work, can be affected by a firefighter's alertness and fatigue levels. Koen (2005) states the pattern of work and rest in the seven days preceding the shift, as well as the work to rest ratio of a shift, is vital in determining if employees are receiving enough sleep. A work to rest ratio of 3:4 is the minimum needed. Koen (2005) says that both the 48/96 and the 24/48 have a work to rest ratio (1:2) that is better than what is recommended. The Kelly shift also has a work to rest ratio of 1:2 (Business Management Solutions, 2012). The employees' needed sleep and rest cycles are adequately supported by these schedules (Koen, 2005).

Another consideration, according to Koen (2005) is the frequency of sleep disruptions. Having insufficient deep sleep or restorative sleep is also known as sleep deprivation. Sleep deprivation can cause slowed reactions, decreased vigilance, and impairment in reasoning. Firefighters who are awakened, on average, once (between the hours of 10:00 pm and 6:00 am) will be in a mild state of sleep deprivation at the end of their first 24 hour shift. If a firefighter averages two calls, during the night, they will become moderately sleep deprived. Lastly, if a firefighter averages three or more night calls then they will be severely sleep deprived at the end of a 24 hour shift (Koen, 2005).

Mild and moderate sleep deprivation can be overcome through restorative sleep. If firefighters are able to get restorative sleep, through napping, during the second day of a 48 hour shift, then the 48/96 can be utilized without significant risk. If firefighters are not able to receive that restorative sleep, then a 48/96 should not be a consideration. Neither the 24/48 or the Kelly Shift Schedule require restorative sleep as part of an employee's on duty time (Koen, 2005).

The Los Angeles firefighter study (2007) says that short term fatigue and long term fatigue also need to be considered. Short term fatigue is defined as consecutive hours without a sufficient sleep. Long term fatigue is fatigue that accumulates and lasts over weeks, months, or longer. More consecutive days off allows for the reduction of long term fatigue.

Sleep debt is the difference between the amount of sleep a person gets and the amount they actually need. Sleep debt can be overcome by adding one or two hours of extra sleep, each night, after the sleep deficit occurred until the debt is paid back (Webster, 2008). The 48/96 and the Kelly Shift Schedule allow for consecutive days off enough to combat long term fatigue and pay back any sleep deficit (Hatrak, 2014). The 24/48 schedule does not because it only allows for one night, out of every three, not dedicated to coming off shift or getting ready to go on shift (Business Management Systems, 2012).

Besides reducing long term fatigue through multiple and consecutive days off, being able to reduce fatigue prior to going off duty is needed. This same study (UFLAC, 2007) said firefighters, who have experienced both the 48/96 and the Kelly Shift Schedule, rate their levels of fatigue on the last day of the Kelly shift as comparable to, or higher than, the second day of the 48/96.

Hawkes (2006) suggests that those who work the 48/96 are actually less fatigued. Her study showed that employees slept more after moving to the 48/96 than when they worked the Kelly Shift Schedule. This was due to the finding that employees don't sleep as much or as well the night before going to work. The 48/96 has less of these nights than the 24/48 and the Kelly Shift Schedule.

Quality work also comes from employees that are productive. Hatrak (2014) states the 48/96 is more productive than the 24/48 or Kelly Shift Schedule because employees can

accomplish work, projects, trainings, and meetings over two consecutive days rather than waiting several days in between. Communication is also better because shift transitions are fewer and so information does not get lost as easy.

Hatrak (2014) also points out that there is less duplication of work: shopping can be done once for both shift days, reduced food costs due to better utilization of leftover food, deep cleaning of personal areas can occur just once every two shifts, and some equipment checks only need to be done once per two days. This increased productivity allows for more time to complete other department activities such as training and maintenance.

The Los Angeles firefighter study (UFLAC, 2007) report administrators, of departments who utilize the 48/96, have noticed an increase in employee productivity, better continuity and communication amongst shifts, enhanced follow through on projects, decreased duplication of work, and happier employees with higher overall morale.

Miller (2013) says there are advantages and disadvantages to any scheduling model. By working both the 48/96 and the 24/48, the Scottsbluff Fire Department has found benefits to both. The 24/48 offered two days off after each day worked which resulted in less potential for short term fatigue. They also cited being away from home for shorter durations as a positive for the 24/48 schedule. From an operations and employee satisfaction standpoint, though, the department says there is no comparison to the 48/96 schedule. This schedule allowed for fewer shift transitions which improved communications and operational continuity, a realization of a 62% sick leave reduction, an increase in productivity and better project follow through, and employees who are well rested and excited to come to work.

According to Koen (2005), the second key category, the quality of time off, is directly related to family well being and a high quality of life for firefighters. In order to have quality off time, three elements of an employee's days off need consideration:

First is the number of uninterrupted hours available to be an entirely present and active family member. According to firefighters (Hatrak, 2014), the 24/48 only allows for one out of every three evenings to interact with their family without worrying about preparing for the next day of work. In contrast, the 48/96 allows for three evenings out of every six for worry free family interaction (Koen, 2005). The Kelly shift schedule would present a similar problem as the 24/48 in the number of evenings unencumbered by getting ready for work the next day (Business Management Solutions, 2012).

The same can be said for mornings, at home, where the firefighter is not coming off shift or leaving for work. This gives the family more quality time together and the firefighter can help the spouse prepare children for school (UFLAC, 2007). The 48/96 allows for 15 of these mornings each month, the 24/48 allows for 10, and the Kelly Shift Schedule allows for 9 (Poole, 2012).

Second is the frequency and amount of weekends off. Where spouses work weekday jobs and children attend school, weekends have become very significant for families (Koen, 2005). As evidenced by Business Management Solutions (2012), Hatrak 2014, and UFLAC (2007), the 48/96 offers more full weekends off (26) than does the 24/48 (17) or the Kelly Shift Schedule (17).

Third is the amount of time spent away from spouse, home, and family. Families who depend on their firefighter spouse for child care or care of dependent family members may have

a harder time accommodating a 48 hour on duty time than others. The 48 hour shift could cause an increase in distress for both the family and the firefighter (Koen, 2005).

Organizational issues, the final key category to consider, can be affected by the scheduling model a department chooses to use. Koen (2005) and Widmar (2003) agree that one of these organizational issues is managing fatigue levels during a 48 hour shift. The second day, of a 48 hour shift, should include a 20 to 30 minute restorative nap or a 90 minute to two hour full completion sleep for firefighters that received two calls during the previous night. Widmar (2003) also suggests rotating crews throughout the work shift to help balance the work load and decrease firefighter fatigue. The Kelly Shift Schedule and the 24/48 would not routinely require these types of organizational policies.

Personnel communications also become issues with employees that take extended time off. The 48/96 and the Kelly Shift Schedule allows this (Business Management Solutions, 2012). When employees work the weekends, but not the weekdays, there is a significant time period when administration does not see or interact with the employee. Organizational policies should be in place to maintain communication through email, cell phones, and forms of communication other than face to face (UFLAC, 2007).

Pay cycles have to be adjusted for each type of schedule. While the 24/48, the Kelly Shift Schedule, and the 48/96 are all 56 hour work weeks, the Fair Labor Standards Act (FLSA) requires that each platoon accrues the same amount of work days during a period. For that reason, the Kelly Shift Schedule and the 24/48 FLSA periods are 27 days while the 48/96 FLSA period is commonly administered in an 18 or 24 day period (Business Management Systems, 2012; UFLAC, 2007).

While overtime accrual would be the same regardless of which scheduling model was used, a department's payroll system would need to be adjusted to match the selected FLSA payroll period (UFLAC, 2007).

Holidays can be affected by the scheduling model selected. Occasionally, with the 48/96, a firefighter may be required to work both Christmas Eve and Christmas Day. A policy would need to be in place to address this. Other departments have made adjustments by reassigning the shift scheduled to work on December 23rd to work on December 24th. The shift that was originally working the 24th now works the 23rd. It should be noted that this is a very rare occurrence with the 48/96. This type of policy is not required with the 24/48 or the Kelly Shift Schedule (Business Management Systems, 2012; UFLAC, 2007).

When expanding the 24/48 schedule over multiple years, as presented by (Business Management Systems, 2012), leap year will affect this schedule in a similar manner. The 24/48 causes shift to work multiple holidays, including Christmas, for two years in a row. Also, this same shift will see this pattern repeat every four years.

There may be other policies or procedures that could be affected by changing staffing models, but they are department specific. Most policies can be applied without modification. However, a trial period can be utilized to identify and work through any specific issues that arise (UFLAC, 2007).

There is much research available relating to the most common types of fire department staff scheduling models, their benefits and drawbacks, and the impacts they may have on the firefighter and the organization the firefighter works for. With the 24/48, the Kelly Shift Schedule, and the 48/96, many fire departments across the country have been able to find what they believe is a balance between the needs of the organization and the needs of the employee.

However, it is clear that adapting this information appropriately, specifically to an organization such as the Madison Fire Department, will be the key to determining whether or not a change in scheduling models will be successful.

Procedures

The problem that the Madison Fire Department does not know what alternative staffing models are available, or how transitioning to a different staffing model would affect the department, was the impetus behind this research project. Using that statement as a basis, the purpose of the project was developed so as to address the problem. Research questions were drafted so that focus could be placed in the appropriate areas as the research was conducted.

Current literature was collected through the utilization of the Learning Resource Center (LRC) at the National Fire Academy (NFA) in July and August of 2013. Additionally, internet searches utilizing Google, Google Scholar, and Bing were performed using keywords that included, but were not limited to, Firefighter Shift Schedules, 24 Hour Shift Rotations, 24/48 Firefighter Schedule, 48/96 Firefighter Schedule, Kelly Shift Schedule, Fire Department Shift Calendars, Advantages of Firefighter Shift Schedules, Disadvantages of Firefighter Shift Schedules, and Organizational Implications of Fire Department Shift Schedules.

The internet searches led the author to be able to procure journal articles, studies, and periodicals on the selected topic. Numerous blogs and blog entries were also found for this topic, but the author chose not to use these sources as they represented personal opinions and the purpose of the literature review was to identify and utilize factual information.

Further internet searches were made for various fire department web sites that contained information referenced by other web pages, journal articles, and studies previously found during

the information collection process. This information gave perspective to how departments were administering their current staff scheduling model.

Original research and information gathering was completed through the distribution of several targeted surveys, a questionnaire, personal interviews, and a data analysis of full time call back responses.

The surveys were sent out to numerous other Executive Fire Officer students (who represent the fire service nationwide), to the Chief Officers of the MFD (who represent management and leadership locally), to the full time employees of the MFD (who represent the local line personnel), and to the spouses of MFD's full time personnel (who represent the local employees' family interests).

The Fire Service Shift Schedule Survey (Appendix A) was sent out to 82 firefighters from across the United States. It was sent via email on April 14, 2014, and an online program, at surveymonkey.com, was used to administer the survey. Of the 82 surveys that were sent out, 39 were sent back. Of these 39, four were disqualified due to an author imposed limitation of only exploring staff scheduling models that utilized a three platoon system. A qualitative approach (open ended questions) was taken to write six questions. This approach was used because the author wanted to rely on the respondents' opinions, knowledge, and experiences to answer the questions. Whereas it was desirable for the literature review to be factual, these types of responses were welcomed to give the research a greater depth. The overall purpose of the survey was to answer each of this paper's questions but with the specific emphasis on finding out how departments nationwide were approaching this issue.

The MFD Chief Survey (Appendix B) was sent out on April 22, 2014, to all three chief officers at the Madison Fire Department using email and the online surveymonkey.com program.

Using the same qualitative approach, the author crafted questions to determine how the administration felt about the varying shift schedules used nationwide. It was also desirable to determine where the mindset of administration was in regards to undergoing a change to the current staffing schedule. Additionally the survey asked for the chief officers to use a quantitative scale to rate how they felt about various scheduling arrangements.

The MFD Full-Time Scheduling Survey (Appendix C) was sent to all 12 of the full time line personnel, at Madison Fire Department, on April 22, 2014. The same methodology as the other surveys was used to develop the list of questions for this survey. Its' importance was finding out the current mindset of these employees into how they felt about the current staffing model and if any of the other staffing models was of interest to them. Having them look at several possibilities and then go through the exercise of determining their level of satisfaction with each scheduling configuration reveals their overall thought processes in regards to scheduling in general. A quantitative rating scale was also used throughout this survey to gauge interest levels in the differing schedules.

The MFD Spouse Survey (Appendix D) was sent on April 14, 2014, to the spouses of each full time line employee at the Madison Fire Department. The qualitative approach guided these questions in order to retrieve opinions about how the schedule affects an employee's home and personal life. Having this point of view was beneficial in understanding some of the opinions expressed in the Full-Time Scheduling Survey and can be beneficial to advise chief officers of how the work schedules will be perceived by an employee's spouse. Spouses were also asked quantitative questions to determine their scheduling preferences.

The IFFD, or Idaho Falls Fire Department, Questionnaire (Appendix E) was conducted via email on April 28, 2014, and was sent to the EMS Chief (Scott Long), of a neighboring fire

agency, whose department had recently switched from a Kelly Shift Schedule to a 48/96 schedule. The questionnaire was completed on April 28, 2014. The purpose behind the questionnaire was to gain better insight as to why a department chooses to change and also how they would deal with changing to new staffing models. Also, given the close proximity of this department to the MFD, this information can be of great value when making recommendations to MFD administration.

The personal interviews took place on April 30, 2014, with four personnel from the MFD: Mikel Walker (Appendix F), the EMS Chief; Trevin Ricks (Appendix G), a line Paramedic/Firefighter who has only worked a 24/48 schedule during his career; Korth Petersen (Appendix H), a line Paramedic/Firefighter who recently worked for two different agencies that employed the 48/96 schedule; and Gary Landon (Appendix I), a line Paramedic/Firefighter who worked for another agency that utilized the Kelly Shift schedule.

The interviewees were made aware that the purpose of the interview was to gain greater clarification to answers received from the literature review, the surveys, and the questionnaire. They were also made aware that the reason behind the interviews was not to gain support for any particular point of view but to continue to gather information. The interviews were conducted in a conversational style and took place, one on one, in a private setting at the Madison Fire Department.

Lastly, the Call-Back Data Analysis Report (Appendix J) was conducted on April 24, 2014, as a way of clarifying concerns about full time employee call back responses. These concerns were given in the MFD Chief survey. The purpose of this analysis was to determine a baseline of how MFD's full time employees are currently responding to call back incidents.

This analysis was performed by accessing employee response records, for 2013, through the department's reporting software, Firehouse, and through response numbers from payroll information. These payroll response figures were provided by the department's Administrative Services Manager and only included the number of off duty incidents responded to. No other payroll information was accessed or provided as part of this analysis. The analysis was completed in the following way and with the following information (Madison Fire Department, 2014; Child, Davis, & Walker, 2014):

- MFD has 12 full time line personnel who work the 24/48 shift schedule.
- The total number of call back incidents and each employee's call back response numbers were calculated for the months of January through December of 2013.
 - Call back incidents, at the MFD, are considered to be any fire incident and any call for station manning after two or more ambulances are out on calls for service.
 - There were 602 call back incidents for 2013.
- Each employee was randomly assigned a number to preserve their privacy.
- The employees with the overall highest and overall lowest response rates were eliminated from the analysis.
 - This was done to create a clearer picture of how an average full time employee responds to call back incidents.
 - This left 10 eligible employees.
- The total number of times employees answered call back requests was totaled and then averaged per eligible employee.
 - This total was 133 for 2013.

- $133/10 = 13.3$ or an eligible employee averages 13 call back responses per year.
- The total number of call back responses an employee was eligible to respond to was then calculated.
 - An employee already works one-third of every year. That means two-thirds of the time they are available to respond for call back incidents.
 - The total call back incidents were multiplied by two-thirds to create the total number of eligible call back incidents.
 - $602 \times 2/3 = 401$ eligible call back incidents.
- A response percentage was then calculated by dividing the eligible employee call back average by the eligible call back incidents.
 - $13 / 401 = 0.033$ or three percent.

The aforementioned measures were used to answer the paper's research questions.

Specifically, each question was answered, procedurally, in the following manner:

The first research question asked, "What types of scheduling models are used in the fire service?" The purpose of this question was not to determine every staffing model available, but, instead, to see what is common amongst fire departments nationwide. Is it a proven model that is being utilized by many other departments? Is it a model that departments are trending towards or trending away from? The literature review and the Fire Service Shift Schedule survey were focused on finding the relevant information to this question.

"What are the advantages associated with these different staffing models?" was the second question where research was focused. If a particular model was being used, what made this schedule preferable? Are there benefits to employees? What about benefits for employers?

The review of literature, the Fire Service Shift Schedule survey, and the surveys administered to MFD Chiefs, full time employees, and spouses focused on this question. The personal interviews also clarified responses and gave further detail in this area.

The third research question was, “What are the disadvantages associated with these different staffing models?” Why does a particular staffing model not work? Is there a reason that administrators or line personnel wouldn’t like a particular schedule? Besides the literature review, all of the author’s original research instruments (surveys, interviews, questionnaire, and data analysis) gathered information regarding these disadvantages.

The last question was, “What organizational changes need to be implemented in order to utilize these different staffing models?” What needs to change in order to implement the schedule? Does knowing these changes affect if or how the schedule is implemented? What about a trial period in order to better understand a schedule’s implications? Review of available literature and the author’s surveys were the primary sources of information on this topic. Some information was also gleaned from the interviews and the questionnaire.

Several limitations were present with the research process. First, because most of the survey questions were open ended questions, very little quantitative data was collected. The survey results, therefore, are based on personal biases, personal experiences, and opinions. While some objective data may have strengthened the research, the actual feelings of the participants were the main goal of the author.

Another limitation was that the author did not collect department demographic information from The Fire Service Shift Schedule survey’s respondents. Knowing the size of the department and the number of incidents an employee may respond to during their on duty time

could have been helpful in determining if a particular scheduling model would work with MFD's call volume.

The Fire Service Shift Schedule survey also had the limitation of only utilizing survey responses where departments used a three platoon system. This was put in place because the MFD currently uses a three platoon system. It was not feasible that another shift configuration would be acceptable due to personnel and budgetary constraints already in place for the department. Therefore, any survey response that came back outside of these guidelines was not accepted. There were four such surveys that were excluded for this reason.

A final limitation was that follow up questions could not be administered to respondents of The Fire Service Shift Schedule survey. Asking for clarification of answers was also impossible. This limitation was due to the way the survey was distributed and collected as the survey program used would not allow for this.

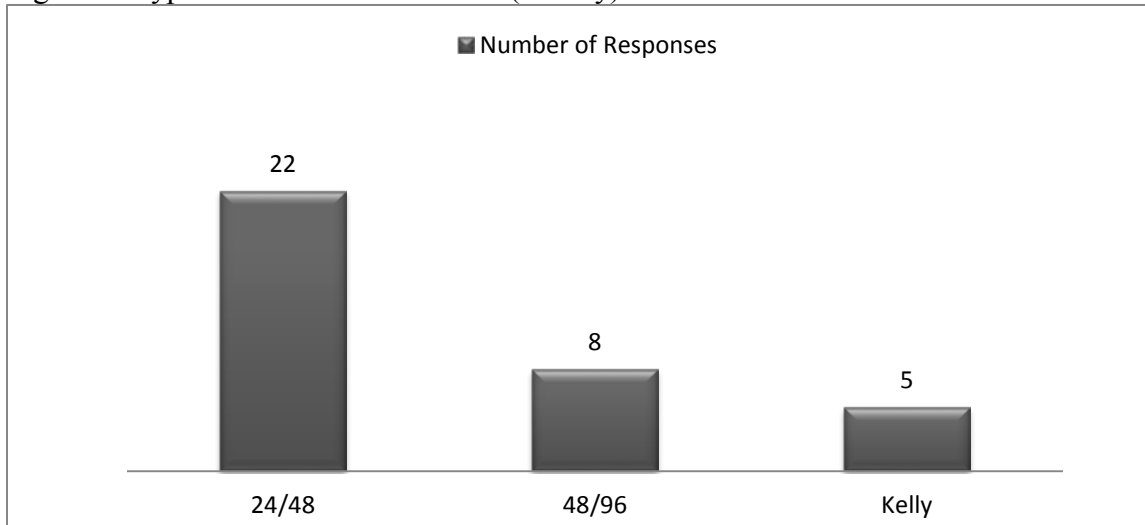
Results

This project's findings come as a result of a review of the available literature on the topic and the author's original research. Both were used to answer the research questions and a summary of those results are presented here. However, due to the significant amounts of information available from the surveys, the questionnaire, and the interviews, all of the data is not offered in this section. Data specifics can be referenced in the appendices where the totality of this information has been included.

This paper's initial question was to determine what shift schedules other fire departments were using. The most common staff scheduling models, with the three platoon system, being used by respondents to the Fire Service Shift Schedule survey are the 24/48, the 48/96, and the

Kelly Shift Schedule. According to Figure 1, the 24/48 is the most common schedule followed by the 48/96 and then the Kelly Shift Schedule.

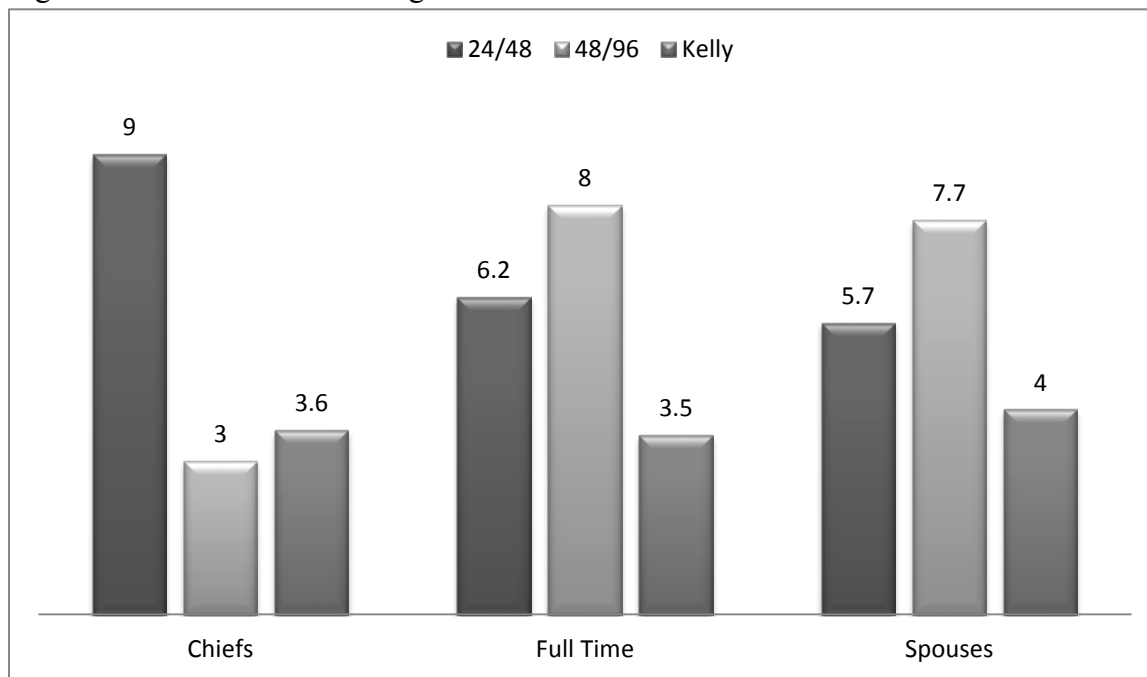
Figure 1: Type of Shift Schedule Used (Survey)



Surveys to Madison Fire Department Chiefs, staff, and spouses show a clear difference of opinion as to which scheduling model they would prefer. They rated their preferences based on a scale of one to ten, with ten meaning they would be very satisfied, five meaning they would be neither satisfied nor dissatisfied, and a score of one meaning they would be very dissatisfied.

Figure 2 represents the average level of satisfaction for each response group. This figure shows that Chief Officers would prefer that the MFD stay with its current schedule of 24/48 and reveals little desire in transitioning to a 48/96 as they rate it as their lowest scheduling preference. Employees and their spouses, conversely, rate the 48/96 as their preferred scheduling model. They then rate the current schedule (24/48) as their second preference. The Kelly Shift Schedule is least preferred amongst MFD full time employees and their spouses.

Figure 2: MFD Shift Scheduling Preferences



Identifying advantages associated with different staffing models was the focus of the paper's second question. Taking one scheduling model at a time, the advantages of the 24/48 schedule can be delineated as follows:

The Fire Service Shift Schedule survey respondents rated adequate rest as an advantage of this shift schedule. Table 1 indicates that most respondents also thought that this type of schedule was very predictable and easy to follow. Additional survey responses are listed in the table.

Table 1: Advantages of 24/48 (Fire Service Survey)

Comments	# Responses
The shift is predictable and easy to follow	10
It provides adequate rest between shifts	7
It is well balanced in its benefits to staff and administration	4
Great for maximizing personnel and coverage	3
Limits exposure to longer shifts	2
More productive	1

The MFD Chief survey listed multiple advantages to the 24/48:

- The employee can put their whole effort into the job for one day and not be worn out at the end of their shift.
- Employees have two days to be at home, accomplish things in their personal lives, and then return to work refreshed.
- It's an easy schedule to follow and keep track of the days an employee is supposed to work.
- Employees stay in town and do not leave and therefore are available to backfill the station when the need arises.
- It is a good schedule for taking vacations and trading days with other employees.
- There are plenty of opportunities to pick up overtime shifts.
- This schedule keeps an employee from working too many days in a row.

The MFD Full Time Survey did not list any advantages for the 24/48. The full time employees said this was the only schedule they knew. Their spouses also said this was all they knew but one MFD Spouse Survey respondent did say this schedule was good because it kept the employee from being gone from family for too long.

One of the advantages of the 48/96 schedule, as defined by Fire Service Shift Schedule Survey respondents, is the reduced number of times crews are changed out. This can minimize the potential for employees having to holdover if they become committed to incidents at shift change. This reduction also allows for fewer commutes to and from work.

Productivity is another advantage given by survey respondents. The 48/96 gives the ability for personnel and crews to finish projects they couldn't complete during their first 24 hour shift.

These survey participants point out the advantages of the four days off. With four days off the crews are well rested and ready for work even if they completed an overtime shift during their scheduled off time. They say, that even with overtime shifts on days off, crews are better rested than with the 24/48 schedule. Also, every time an employee comes off shift, they are always scheduled for four consecutive days at home.

Lastly, there are more complete weekends at home with the 48/96 schedule. This survey points out that this is a benefit, especially if you have a spouse who works.

The MFD Chief Survey did not list any advantages to using the 48/96 shift schedule. The MFD Full Time Survey and the MFD Spouse Survey listed many benefits. Because their responses were similar, their answers are listed together in Table 2.

Table 2: Advantages of 48/96 (MFD Full Time and MFD Spouse Survey)

Comments	# Responses
Allows for more family time	9
Provides better recovery time	5
Allows for four consecutive days off	4
Schedule makes it more likely to backfill station	3
Increases productivity at home	3
Weekends off and easier to plan vacations	3
Increases productivity at work	2
Allows for picking up of overtime shifts	1
Easy schedule to follow	1

Long (personal communication, April 28, 2014) says he sees no advantage, from the 48/96, for the department or for the taxpayers. However, his employees benefit from more time off, especially during the weekends, and have less commutes.

Petersen (personal communication, April 30, 2014) delineates numerous advantages when working a 48/96. The 48/96 allows the employee to be better in all aspects of their life. Better and more productive for home and family, better and more productive at work, and better

and more productive personally. Because the employee is more rested and more balanced, the employer will see greater benefits.

The long, four day break between scheduled sets is an advantage of the Kelly Shift Schedule according to the Fire Service Shift Schedule survey. Four of the respondents listed this on their surveys. Also listed as advantages were that the Kelly Shift Schedule maximized manpower (1 response), it was safer (1 response), and having one day off between each scheduled workday (1 response).

The MFD Chief survey did not list any advantages to working a Kelly Shift Schedule. The MFD Full Time survey only listed the block of four days off as a positive (6 respondents). The MFD Spouse survey also listed the four days off as advantageous and the ability to plan vacations because of this block of time off (3 responses).

Landon (personal communication, April 30, 2014) says the biggest advantage to the Kelly Shift Schedule is the four days off to recover from work. It allows you to rest both physically and mentally from your job. He says, without reservation, his spouse also saw this as advantageous—especially when compared to the 24/48 schedule. This model allows for you to really spend quality time with your family. You can also go on vacation without having to cut it short or think about going back to work immediately.

The third question being addressed by this project was to identify what disadvantages are associated with the various staff scheduling models. The three different scheduling models will again be addressed one at a time.

The Fire Service Schedule survey had some who believed there were no disadvantages to the 24/48 while others did list some. Fatigue and not having enough time off were the major problems this group identified. Table 3 shows all of this group's responses.

Table 3: Disadvantages of 24/48 (Fire Service Survey)

Comments	# Responses
No disadvantages	7
Not enough time to recover	5
Fatigue	3
Causes overtime issues because it causes long shifts	2
Lack of balance among shifts working holidays	1
Not good for busy departments	1
Difficult when covering sick time	1
Doesn't allow for coverage based on peak time	1
Inhibits consistency among crews	1

The MFD Chief survey listed some disadvantages to working the 24/48 shift schedule:

- Shift coverage can be difficult due to the number of people who are available to cover. However, this is a problem with any of the shift models.
- Call backs due to larger incidents is an issue because employees won't come back into the department. This is due to simply not wanting to come in, staff says they are too tired to come in, or because they say it takes time away from their families.
- Employees wanting to work too many days in a row.
- Productivity is a concern because a project just gets started and then the shift ends. The project sits until that employee comes back on duty. This leads to some projects taking longer to complete.

The responses were pretty even from the MFD Full Time survey. A general opinion, however, was that the tight turn-around time, for the 24/48, created difficulties at work and at home. MFD Full Time Survey responses are listed in Table 4.

Table 4: Disadvantages of 24/48 (MFD Full Time Survey)

Comments	# Responses
No disadvantages	2
Not enough time to recover	2
Short time makes it hard to get things done	2
Time off is restricted	2
Always coming or going	2
No breaks	2

The MFD Spouse Survey had similar responses to the full time employees. Spouses said this schedule left very little time, in between shifts, to recover and spend the needed family time. Their responses are provided in Table 5.

Table 5: Disadvantages of 24/48 (MFD Spouse Survey)

Comments	# Responses
Not enough time to recover	4
Not enough family time	3
No disadvantages	3
Hard to plan or take vacations	2
Always at work on days off	1

Petersen (personal communication, April 30, 2014) says the 24/48 leaves you very little time to get things done at home or to take personal time. If an employee decides to travel anywhere, you only have two days to do it. That means one day is spent travelling there and the other day is spent travelling home. He also points out the 24/48 schedule is harder because you are always doing station duties on your off days.

There are disadvantages to the 48/96 schedule. Those Fire Service Schedule survey respondents that work 48/96 schedules listed each of these items as their concerns with this schedule:

- Showing up for work is not as much fun as before.
- It is up to the officer to decide if you get rest on the second day of your set.
- An employee may have to work the second day of a set with little rest.

- Sometimes you don't see employees for up to 10 days. This is a long time without contact with shift members.
- Only see two-thirds of employees every other day as compared to every day with the 24/48.

MFD Chiefs have three major concerns with the 48/96. First is fatigue on the second day of shift. If employees are busy the night before, working the next day could be unsafe due to the employee being tired. Second is coverage for vacation or sick days. Because the Madison Fire Department only allows an employee to work 48 hours in a 72 hour period, the MFD Chiefs believe shift coverage would be problematic. Their third concern is backfill of the station during major incidents. They believe that if an employee had four days off in a row then they would be leaving town more frequently. This would leave fewer employees available to fill in when needed.

MFD full time employees generally did not see any disadvantages to the 48/96. The concerns that were raised were that 48 hours is a long shift. Because of this, procedures outlining how to deal with fatigue would need to be addressed. One employee did state that vacation coverage may be an issue with this schedule.

Three of the MFD Spouse surveys said that 48 hours is a long time to be on shift but that they felt like they could get used to it and may be worth it because of the trade-off of having their spouse home for four days. One respondent said they were unsure if they would like the 48/96.

Long (personal communication, April 28, 2014) says fatigue, especially for those assigned to the ambulance, is a drawback of the 48/96. He also says there are problems with trades amongst employees. Lastly, he says that the 48 can cause problems when an employee is away from family for two days.

Petersen (personal communication, April 30, 2014) said the only disadvantage to a 48/96 schedule was that an employee may be slightly fatigued on the second day if they were unable to get enough rest.

The Fire Service Schedule survey had five respondents who were working with a Kelly Shift Schedule. Their answers to the question of what they perceived were disadvantages to the Kelly Shift Schedule were each different. Table 6 is a breakdown of their responses.

Table 6: Disadvantages of Kelly Shift Schedule (Fire Service Survey)

Respondent	Disadvantage
#1	None
#2	Long work cycle. Long set of work days.
#3	It is hard to recuperate after being up all night and then have to return to work 24 hours later.
#4	Administrative assignments take a long time to complete. Department wide training has to be done numerous times in order to include all employees.
#5	You get “beat up” if you run a lot of calls.

Being able to do trades and cover vacation is limited to only one of three shifts, the schedule is complicated and makes it harder for the employee to know when they have to work, and the issue that four days off would limit employees’ availability for call backs were the three issues identified as disadvantages to the Kelly Shift Schedule by the MFD Chiefs.

There were varied responses from MFD Full Time employees as to the disadvantages of the Kelly Shift Schedule. Always coming from or going to work was a significant issue.

Another issue was the inability to recuperate from long shifts. Table 7 shows the responses from MFD full time members.

Table 7: Disadvantages of Kelly Shift Schedule (MFD Full Time Survey)

Comments	# Responses
Always coming from or going to work / Feel like you're always at work	4
Not enough time to recuperate / Increased fatigue	4
Work too many Saturdays in a row	1
Decreased opportunity for overtime shifts	1
Four days off may dissasociate employees from department	1

MFD spouses had similar concerns about the Kelly Shift Schedule. Their answers are listed in Table 8.

Table 8: Disadvantages of Kelly Shift Schedule (MFD Spouse Survey)

Comments	# Responses
Difficult schedule to understand and plan around	3
Always coming from or going to work / Feel like you're always at work	2
Not enough time to recuperate / Increased fatigue	2
I don't like this idea	1
No disadvantages to this schedule	1

Landon (personal communication, April 30, 2014) stated the Kelly Shift Schedule can make for a long set. The last day of your set can be tiring, especially if your set is busy. He also said he sometimes felt burned out at the end of his set of work days, but the four days off allowed for recuperation.

The final question being addressed by this project was to identify any organizational changes that would need to be implemented in order to utilize these different staffing models.

Organizational controls, for the 24/48 schedule, implemented by others (Fire Service Schedule Survey) are listed in Table 9. Most have a maximum hours worked policy. Several departments allow a maximum of 48 hours in a row while others permit anywhere from 72 hours up to 96 hours in a row. Departments also used Kelly Days (days off with pay) to help make this schedule work. In addition, some departments said there were no special policies needed for the

24/48 schedule, one department does not allow any overtime, and one department said they only allow one full time firefighter, per shift, to take time off each day.

Table 9: Organizational Changes Required for 24/48 (Fire Service Survey)

Comments	# Responses
Policy for maximum hours worked	9
No special policies required	7
Provide Kelly Days for staff	4
A policy for minimum manning standards	1
Only allow one firefighter, per shift, off each day	1
Overtime is not allowed unless called back for large events	1

Fire Service Schedule survey respondents have the following controls in place for departments that work a 48/96 shift schedule (each survey response is listed):

- Crews can sleep in the second morning of a set if they were up at night.
- Company officer can determine rest time for crews.
- Cannot work more than 120 consecutive hours. Must have at least 24 hours before and after working 120 consecutive hours.
- A policy for communication and a policy limiting consecutive working hours at 72. Can work more hours with authorization.

Long's department (personal communication, April 28, 2014) allows station officers to let personnel sleep in after busy nights. Additionally, they can move personnel to stations with less call volume. His department also limits on duty time to 60 consecutive hours.

Petersen (personal communication, April 30, 2014) said his departments gave employees discretionary down time and rest time. This was regulated by the shift Captain and applied to personnel who were up the previous night.

Landon (personal communication, April 30, 2014) suggest that Captains would have to be able to allow crews to rest. He also suggests rotating through different ambulance crews for

each day of the set. His last recommendation is to have strict quitting times to allow for on shift personal time.

According to the Fire Service Schedule survey, two of the departments do not have any specific organizational policies in place to make the Kelly Shift Schedule work. Three departments, however, have mandatory time off requirements. One department limits their personnel to 72 consecutive hours, one department has a 96 consecutive hour limit (with 24 hours mandatory off), and one department did not list the number of hours they limit their employees to. One department does allow leniency to their policy. If there are a significant number of personnel out of town on fires, then all time limits are removed until the department returns to normal staffing.

When Landon (personal communication, April 30, 2014) worked the Kelly Shift Schedule, his department had the following organizational policies in place:

- Employees could not work more than 36 hours straight without receiving a 12 hour break.
- Overtime shifts were only offered in 12 hour increments.
- Safety rest periods were allowed for crews that were working and had also worked the night previous.

With the evaluation of all of this material, some additional insight was needed in order to clarify some of the results. The Call-Back Data Analysis Report was used to clarify the issue of full time employees not being available for backfill of the MFD, for incidents, if other scheduling models were used. The MFD Chief survey delineated this was a concern about moving away from the 24/48. Appendix J can be referenced for breakdown of all responses, by MFD full time employees, during incidents eligible for call back. However, the report shows

that, under the current scheduling model, full time employees are only responding to an average of three percent of all requests for call back.

Each Chief Officer and every full time employee said they would be willing to undergo a trial period for a new schedule. Which schedule to trial and how the trial period should be carried out was not unanimous, but the majority of responses agreed the only way to determine how it worked was to try it. This was thought to be a good way to see if promised benefits were real or if perceived concerns were valid. Long (personal communication, April 28, 2014) said his department is undergoing an evaluation period and, after one year, a referendum vote will be held on whether or not to stay with the schedule.

Further clarifying how they felt about changing shifts, Ricks and Walker offered additional insight into their mindset:

Ricks (personal communication, April 30, 2014) said he has no desire to change from MFD's current schedule because 48 hours is too long a time to be gone from his family. Curiosity may cause him to try another shift schedule and, if the majority of department members wanted to change, he would not be opposed.

Walker (personal communication, April 30, 2014) said the current MFD schedule is comfortable and that there isn't another schedule that is better. However, he would change to a different schedule if vacation coverage became problematic for employees, if on shift productivity dropped, or if there was another schedule that offered benefits to both the employee and the department. Lastly, he commented that, if the majority of the department wanted to change to another schedule, he would consider it but only as long as there were no changes to the current service level being offered by the department.

The last set of clarifying information again came from Walker (personal communication, April 30, 2014) and Ricks (personal communication, April 30, 2014). They were also asked how they felt each scheduling option ranked (one, two, or three) based on which schedule they preferred, which schedule they thought was most conducive to full time staff responding to requests for backfill, and which schedule they thought was best for full time staff to use their vacation, sick time, and trades. Their results are documented in Figure 3, Figure 4, and Figure 5 respectively.

Figure 3: Most Preferred Schedule

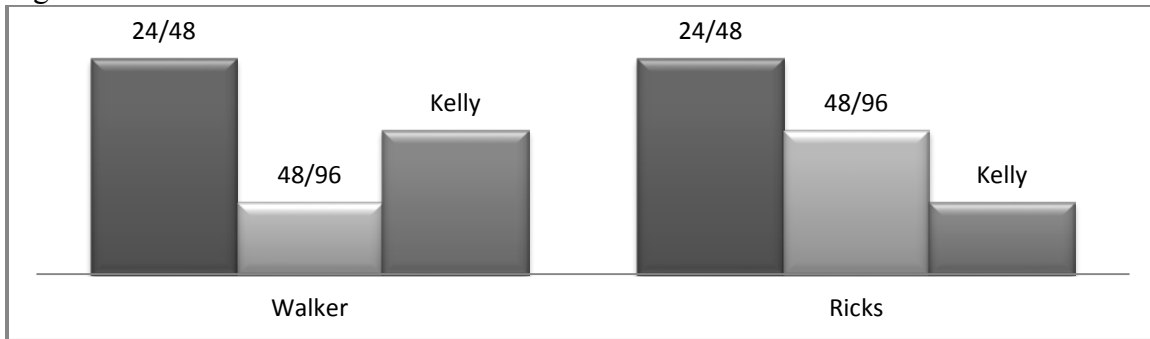


Figure 4: Schedule Most Conducive to Backfill

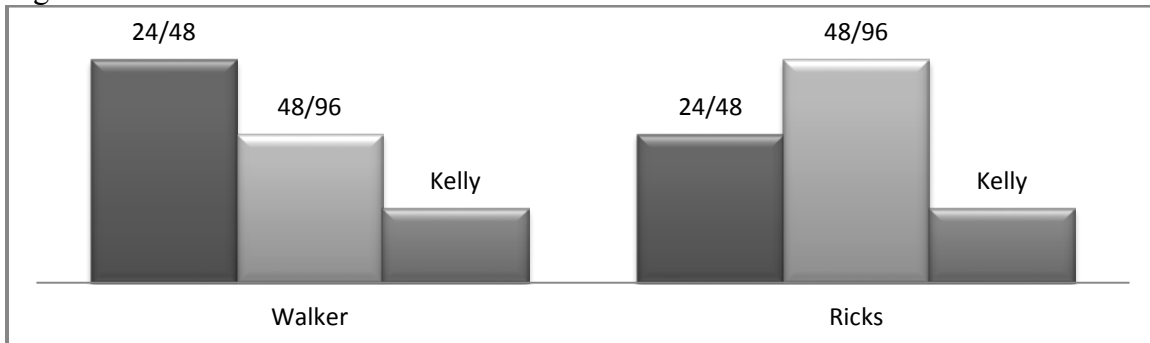
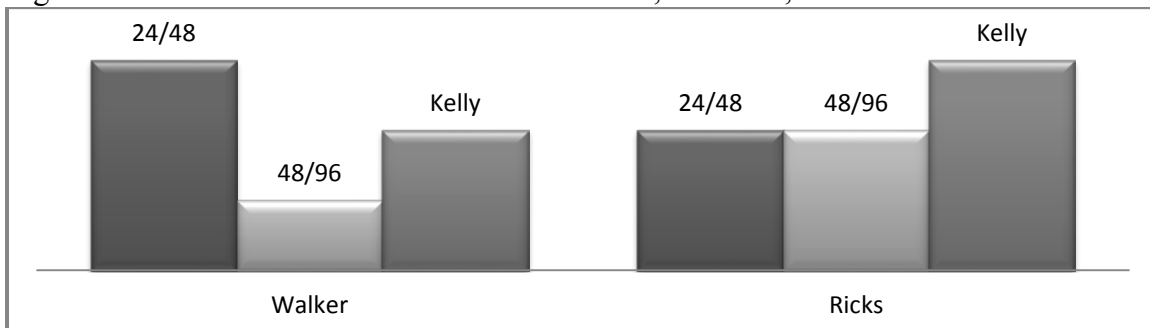


Figure 5: Schedule Most Conducive to Sick Leave, Vacation, Trades



As a final result, Ricks (personal communication, April 30, 2014) referenced MFD's current schedule and said, "Every day of our existence you are either at work, you were at work yesterday, or you are going to work tomorrow."

Discussion

This research was motivated by numerous interactions the author had with employees of the Madison Fire Department. Over time, these employees have expressed their desires to find a balance between their work and personal lives. In addition to employees who have left the department, current employees have struggled with how their personal motivation, productivity, and morale have decreased as it relates to their jobs with the MFD. Many of these employees have suggested that a change in work schedule might help balance their lives and allow them to achieve the higher levels of job satisfaction they had previously been experiencing.

A review of available literature, along with the author's own research, has provided ample information to describe the status of MFD's current scheduling plan as well as other available scheduling plans nationwide. The following discussion will compare and contrast the information gathered and any implications there may be for the MFD.

Paramedics and firefighters are not immune to stress and the schedule a firefighter works can have a great impact on their life (Cosh, 2010; Swinhart, 2007). The impact on the family, of the current 24/48 MFD schedule, can be summed up through the following response from the MFD Spouse Survey:

Even though the guys are only working 24 hours, they end up being there for a good portion of the next day as well. Not only that, but most of the time they come home tired and they sleep for a good portion of the next day. With all other obligations many of them have, it is hard to get in very much family time. (Response 2, para. 1)

Using a three platoon system, the different scheduling models available are the 24/48, the 48/96, and the Kelly Shift Schedule. The most popular of these is the 24/48 schedule (Business Management Solutions, 2012; Briggs, 2012; ShiftCal, 2013; Vitalie, 2009). Survey responses and personal communications with Long (April 28, 2013), Landon (April 30, 2014), and Petersen (April 30, 2014) confirm the literature findings.

Each of these schedules has both advantages and disadvantages. Analyzing each option, in regards to how they affect quality of work and quality of life, can help make effective comparisons (Koen, 2005; UFLAC, 2007).

It is clear, from the review of literature, that the 24/48 schedule allows employees to negate the effects of short term fatigue, reduces the amount of consecutive time employees are gone from home, and eliminates the need to have crew rotations and rest time automatically built into the organizational plan (Koen, 2005; Miller, 2013; Widmar, 2003).

Chief Officers also like this schedule because it offers the employee two consecutive days at home while also providing for adequate backfill of the station. They also like this schedule because they believe it makes other organizational issues easy such as being able to easily follow the schedule, covering vacations and trades, and handling overtime (MFD Chief Survey).

The Call-Back Data Analysis Report provides conflicting data with regards to the importance of the MFD staying with the 24/48 shift schedule as a way of promoting full time staff responding to call back requests. According to this report, with the current scheduling model, the average full time employee only provides backfill on three percent of these requests.

The 24/48 also contributes to long term fatigue and sleep deficit (Webster, 2008). Employees of this schedule point out that any restorative sleep has to occur at home, which

inhibits quality family time and productivity. They also cite the tight shift turn-around times cause problems at home, time off is restricted, and that employees are always working for the department on their days off (MFD Full Time Survey; Fire Service Survey; Petersen, personal communication, April 30, 2014; MFD Spouse Survey).

Literature backs up these statements. Only one out of every three mornings and nights is spent with family, unencumbered by going to or coming from work. The 24/48 also offers the fewest number of full weekends off. This makes life difficult for firefighter spouses and families who run on Monday through Friday schedules (Business Management Systems, 2012; Hatrak, 2014; FLAC, 2007).

Employees have a desire to distance themselves from these issues and perhaps try the 48/96 as evidenced by their survey responses (MFD Full Time Survey). Their spouses' answers aligned with this desire as well (MFD Spouse Survey). Meanwhile, Chief Officers have no desire to leave the 24/48 schedule. Their survey results show they favor this schedule above the Kelly Shift Schedule, their second choice, and the 48/96, their last choice.

The 48/96 schedule is not without its disadvantages. Forty-eight hours is a long time to be away from a spouse and family (Koen, 2005; Long, personal communication, April 28, 2014; Ricks, personal communication, April 30, 2014; MFD Spouse Survey). The two day shift will require that rest periods are built into organizational plans, that some rotating of crews may have to happen, and policies enhancing communication could be needed (Koen, 2005; UFLAC, 2007; Widmar, 2003). Long, Landon, and Petersen also agree that these organization safeguards need to be put into place for the 48/96 to be effective. MFD Chief Officers (Survey) believe the 48/96 shift is unsafe because of fatigue on the second day.

Hawkes (2006) says that 48/96 employees are actually less fatigued overall than other employees. Survey responses (Fire Service; Full Time), Petersen and Ricks (personal communications, April 30, 2014) and literature all promotes the organizational benefits of a 48/96 schedule, which are: employees are more productive, there is less duplication of work, more opportunities for training, more chances for administrative projects, decreases in sick leave usage, and better communication between shifts.

The personal benefits of a 48/96 are also documented through literature (Hatrak, 2014; Miller, 2013; UFLAC, 2007) and through the author's research (Long, personal communication, April 28, 2014; Petersen, personal communication, April 30, 2014; Fire Service Survey; MFD Full Time Survey; MFD Spouse Survey). These benefits include the most unencumbered mornings and evenings than any other schedule, the decreased number of commutes to work, more quality family time, better recovery time, increased productivity at home, better schedule for backfilling of station, and easy to cover vacation, sick leave, and employee trades.

The Kelly Shift Schedule appears to be a middle ground option when compared to the 24/48 and the 48/96. It offers the benefits of not working more than one day in a row, thus reducing short term fatigue and increasing safety, while also allowing for a bulk number of consecutive days off. This allows for more quality family time and better control of long term fatigue (Business Management Solutions, 2012; Landon, personal communication, April 30, 2014; Fire Service Survey). Additionally, it allows for less encumbered mornings and evenings than the 24/48 and it is easy to plan vacation time (Koen, 2005; Fire Service Survey; Widmar, 2003).

Landon (personal communication) says another downfall of this schedule is the long work cycle that makes it hard to recuperate between shifts. Also, the fact that you are always

coming or going to work, a lot of your weekends are not free, it is the least conducive schedule for backfilling of the station, it is not as good for vacations and trades, and it can reduce work productivity are disadvantages to the Kelly Shift Schedule (Business Management Solutions, 2012; MFD Chief Survey; Fire Service Survey; MFD Full Time Survey; Hatrak, 2014; Ricks, personal communication, April 30, 2014; MFD Spouse Survey; UFLAC, 2007).

Finally, all of the Chief Officers and full time employees affirmed that they would be willing to undergo a trial period, in some fashion, for a new schedule. With a determined schedule and an agreed upon trial period, a true evaluation could take place and a final vote could be taken (MFD Chief Survey; MFD Full Time Survey; Long, personal communication, April 28, 2014).

When all of the literature is reviewed and data has been analyzed, there are several clear conclusions to be drawn:

First, there are three workable shift scheduling models that could be utilized at the Madison Fire Department. While each carries its own set of advantages, they also come with disadvantages to their use (Koen, 2005).

Second, this knowledge does not change any real or perceived deficiencies associated with MFD's current schedule. Assimilating this information and then determining how to apply it will be the task of the administrative personnel of the Madison Fire Department.

Third, there is a clear difference of opinion, among MFD Chief Officers, full time employees, and employee spouses, as to what makes an ideal shift schedule. This was demonstrated through their survey responses (MFD Chief Survey; MFD Full Time Survey; MFD Spouse Survey). Even if there is no change to the current staffing model, efforts need to be made to bridge these gaps and provide for better understanding among these three groups.

Lastly, if a change is made to MFD's staffing schedule, the data supports the importance of recognizing the schedule's implications and impact on the department, the employee, and the employee's family. Doing so will allow these groups to put into place the proper controls that will allow the schedule to have long term success (Koen, 2005; UFLAC, 2007).

Recommendations

The impetus behind this project was the increasing demands being placed on full time personnel, the decrease in productivity, and the desire of employees to examine other scheduling models as a way of enhancing their morale. The purpose of the research was to collect data and, using descriptive research, provide the Madison Fire Department, its employees, and their spouses with a clear understanding of how the current 24/48 schedule is perceived and what scheduling options are available.

Based on the review of literature, the data collected through research, and the synthesis of this information, the following recommendations are made:

1. Madison Fire Department's Chief Officers and Captains should review and discuss the information presented in this paper. Specifically discussed should be areas where employees and management differed in their ideas about how schedules should work.
2. Make a determination of what can be done to overcome these gaps in consensus as it relates to the current staffing model. If these issues can be overcome, a change in schedule may not be necessary.
3. If the current scheduling model does not allow for accord, evaluation should be done of how the 48/96 and the Kelly Shift Schedule could be applied to the MFD.

4. After determining which schedule to use, a trial period should be introduced.

This trial period should have a set amount of time attached to it and benchmarks for evaluation. These benchmarks could be anything: fatigue levels, measured productivity, call back responses from full time members, or ease of covering vacations and trades.

5. Other organizational considerations, advantages, and disadvantages should also be brought up and addressed during the trial period. There may be other policies or procedures that could be affected by changing staffing models. The trial period can be utilized to identify and work through any specific issues that arise.
6. At the end of the trial period, a vote should be held to determine if the schedule remains in place or not. Employees and administration would have to again reach unanimity for the schedule to be effective over the long term.

In conclusion, future readers and researchers can find significant data to explore if they want other information about this topic. In addition to the data discussed during this paper, readers and researchers should further evaluate other departments who employ these various staffing models. There are many who have undergone, or who are contemplating undergoing, changes to their staffing models. Retrieving additional information from them would be beneficial to any researcher. As we know, change in the fire department can sometimes be hard. Utilize the facts available to you to determine if this change is one worth making.

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Appendix A

Fire Service Shift Schedule Survey from April 14, 2014

Sent via email to 82 recipients

Fellow EFO Students,

I am completing my final paper for my Executive Fire Officer Program. I am hoping each of you will take 5 minutes and complete the short survey I have attached a link for. The purpose of my paper is to explore alternative staffing models for my fire department. I am interested in the staffing model you are using as well as any other models you may have heard of.

Thank you very much for helping me out and for your timely response!

You can access the survey by clicking on the link below:

<https://www.surveymonkey.com/s/3FC8FFQ>



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OUR GOAL, OUR MISSION, OUR PURPOSE

To Maintain a State of Readiness in:

Our People, Our Equipment, In Operational Accuracy, and In Administration

OUR CORE VALUES

Integrity, Honor, Pride, and Courage

The purpose of this survey is to find out what types of shift scheduling / shift rotation options are currently being used in the fire service. Information gathered will be used to determine whether any of these options could be used, in the future, at the Madison Fire Department.

1. What type of shift schedule / shift rotation does your department currently use? (For Example: 24 hours on 24 hours off, 48 hours on 96 hours off, 24 on 24 off 24 on 24 off 24 on 96 off, and etc...)
2. How many shifts / platoons does your department have? (For example: A shift, B Shift, and C shift or A,B,C, and D shifts)
3. What do you feel are some advantages of this type of shift schedule?
4. What do you feel are some disadvantages of this type of shift schedule?
5. What specific organizational controls have to be in place in order for this shift schedule to work? (For example: mandatory rest hours, overtime requirements, etc...)
6. What other types of shift staffing schedules / shift rotations are you aware of?

Fire Service Shift Schedule Survey Response #1

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 6:19:50 PM
- Last Modified: Monday, April 14, 2014 6:22:23 PM
- Time Spent: 00:02:33
- IP Address: 166.147.119.31

Q1: 24/48

Q2: A,B,C

Q3: Traditional

Q4: Not enough recovery time sometimes.

Q5: None

Q6: 48/72, California 4 & 6, 3 shift (one on one off) followed by 4 days (best).

Fire Service Shift Schedule Survey Response #2

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 6:46:35 PM
- Last Modified: Monday, April 14, 2014 6:50:44 PM
- Time Spent: 00:04:09
- IP Address: 63.246.57.202

Q1: 24 on 48 off.

Q2: 3 - A, B, and C shift.

Q3: Standard schedule for training with other department.

Q4: None

Q5: None

Q6: 24 on 72 off.

Fire Service Shift Schedule Survey Response #3

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 6:24:27 PM
- Last Modified: Monday, April 14, 2014 6:57:48 PM
- Time Spent: 00:33:21
- IP Address: 70.194.141.99

Q1: 24 on. 48 off.

Q2: 3 shifts (A, B, C)

Q3: Predictability. Limited exposure to a 72 hour shift.

Q4: One of the shifts has more exposure to working holidays (leap year increases that exposure).
Off time limited to 48 hours (one busy shift, running after midnight, sleep the next day...
Personal obligations/hobbies may suffer.

Q5: Maximum work hours (48 hours) Trade policies

Q6: California 48 on 72 off

Fire Service Shift Schedule Survey Response #4

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 7:00:59 PM
- Last Modified: Monday, April 14, 2014 7:09:47 PM
- Time Spent: 00:08:48
- IP Address: 70.210.137.161

Q1: 24/48 & 45 hr day crew. The 45 hr work four days one week and five the next.

Q2: A, B, & C

Q3: We run 1800 calls a year, the combination schedule above allows for constant cover and availability for second out calls during the day.

Q4: The 45 hr guys don't make overtime on the extra 5 hrs so we get paid every two weeks for 90 hrs. Overtime is based off of working over a 10 hr shift for these folks.

Q5: Just the standard for the 24 hr shift and the day time gets paid for lunch.

Q6: All you listed above plus a few others like day cover and a combination of working a few days then off and on.

Fire Service Shift Schedule Survey Response #5

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 7:37:57 PM
- Last Modified: Monday, April 14, 2014 7:40:31 PM
- Time Spent: 00:02:34
- IP Address: 75.138.248.198

Q1: 24 on, 48 off

Q2: 3 shifts: A, B, C

Q3: Maximize staffing levels evenly without requiring additional personnel.

Q4: None.

Q5: Limiting works hours to comply with max allowable hours per cycle; OT

Q6: 48 on, 96 off

Fire Service Shift Schedule Survey Response #6

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 7:52:31 PM
- Last Modified: Monday, April 14, 2014 7:54:33 PM
- Time Spent: 00:02:02
- IP Address: 99.99.212.208

Q1: 24 on 24 off 24 on 24 off 24 on 4 days off

Q2: a,b,c

Q3: Good coverage with manpower we have

Q4: We run a lot of calls and it beats you up

Q5: mandatory time off between shifts before working again

Q6: 12hr day 12hr day 12hr night 12hr night 4 days off

Fire Service Shift Schedule Survey Response #7

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 7:56:17 PM
- Last Modified: Monday, April 14, 2014 8:01:09 PM
- Time Spent: 00:04:52
- IP Address: 74.194.215.40

Q1: 24 on 48 off

Q2: 3 Shifts

Q3: Well balanced

Q4: none

Q5: None

Q6: 48/96, 24/24/24/24/24/96

Fire Service Shift Schedule Survey Response #8

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 8:03:10 PM
- Last Modified: Monday, April 14, 2014 8:07:53 PM
- Time Spent: 00:04:43
- IP Address: 97.120.210.99

Q1: 24 on 48 off

Q2: A,B,C

Q3: Limits span of control. Easy to manage with 3 shift officers and training schedule.

Q4: 3 different ways to do things, in fighting and lack of cooperation between crews.

Q5: Overtime controls, limit number of days one can work and get rest. 4 shifts in a row maximum.

Q6: 48 on 96 off. 24 on 24 off for 3 shifts then 96 off. 24 on 24 off for 4 shifts then alternate 96 and 144 off.

Fire Service Shift Schedule Survey Response #9

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 8:12:28 PM
- Last Modified: Monday, April 14, 2014 8:14:04 PM
- Time Spent: 00:01:36
- IP Address: 70.193.68.157

Q1: 24 \ 48

Q2: 3

Q3: traditional easy to follow

Q4: overtime issues

Q5: Kelly days

Q6: many they all have pros and cons the best is usually the one that the organization is most used to.

Fire Service Shift Schedule Survey Response #10

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 8:17:13 PM
- Last Modified: Monday, April 14, 2014 8:24:51 PM
- Time Spent: 00:07:38
- IP Address: 173.8.217.9

Q1: 24/ 48

Q2: A, B, C

Q3: 24 hr coverage.

Q4: Is not adequate for peak alarm surges which are typically during daytime.

Q5: We try to keep minimum staffing which does cost overtime.

Q6: 4/10, 4/12, 48/96, Mod-Detroit, A, B, C, D

Fire Service Shift Schedule Survey Response #11

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 10:26:12 PM
- Last Modified: Monday, April 14, 2014 10:28:49 PM
- Time Spent: 00:02:37
- IP Address: 98.246.192.52

Q1: 24 on 48 off

Q2: 3 - A,B,C

Q3: Provides adequate rest between shifts for busy companies

Q4: Having to design training modules around shift work takes longer to deliver

Q5: Not allowed to work more than 72-hours in a row without 12-hours off.

Q6: 48/96, 10/14's

Fire Service Shift Schedule Survey Response #12

- Collector: Web Link (Web Link)
- Started: Monday, April 14, 2014 11:00:29 PM
- Last Modified: Monday, April 14, 2014 11:02:00 PM
- Time Spent: 00:01:31
- IP Address: 163.251.208.2

Q1: 24 on 24 off

Q2: A-shift, B-shift

Q3: None

Q4: Hardly any time off

Q5: O/T to continue with minimum daily staffing when necessary

Q6: 24/48

Fire Service Shift Schedule Survey Response #13

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 2:55:51 AM
- Last Modified: Tuesday, April 15, 2014 2:59:19 AM
- Time Spent: 00:03:28
- IP Address: 66.161.212.226

Q1: 24/48

Q2: 3

Q3: Consistency and uniformity of personnel.

Q4: A 24 hour shift raises the specter of sleep deprivation for those on the Medic Units.

Q5: Cannot work more than 48 consecutive hours. Station Officer has flexibility in assignment of personnel.

Q6: 24/72, 48/96, 10/14, & 12 hour shifts.

Fire Service Shift Schedule Survey Response #14

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 5:42:05 AM
- Last Modified: Tuesday, April 15, 2014 5:51:10 AM
- Time Spent: 00:09:05
- IP Address: 209.213.169.140

Q1: 24 hours on 48 hours off

Q2: 3: A Shift, B Shift, C Shift

Q3: less personnel required than a 4 platoon system, with a longer work week. We also take advantage of the FLSA 1/2 time provision.

Q4: I've had some discussions with other Chiefs who feel this schedule works better with an afternoon start time, rather than a morning start time. The biggest challenge with a 24 hour shift is getting personnel to understand that if they call in sick, but feel better after 8, 10, 12 hours, etc., that they need to return to work.

Q5: No special controls, other than making personnel realize that they are on Department time for the entire 24 hours. They are not entitled to "down time" after 1700 hours.

Q6: 48/96, 24/72, 10's/14's day/night 4 platoon system

Fire Service Shift Schedule Survey Response #15

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 6:01:59 AM
- Last Modified: Tuesday, April 15, 2014 6:10:45 AM
- Time Spent: 00:08:46
- IP Address: 174.225.242.22

Q1: 24 on, 48 off

Q2: 3 - A, B, C

Q3: The 48 hours between shifts allows members to be rested before returning to work.

Q4: Potential for fatigue during the 24 hours on duty if emergency calls prevent members from sleeping during the night.

Q5: Contractual down time - allotted meal times, specified hours for rest at night

Q6: 48-96, 10 hr/14 hr split days but not sure how many shifts this takes or how many days in a row members work

Fire Service Shift Schedule Survey Response #16

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 7:03:18 AM
- Last Modified: Tuesday, April 15, 2014 7:19:11 AM
- Time Spent: 00:15:53
- IP Address: 75.150.230.2

Q1: Full time career staffing: 24/48 Part-time FF supplemental staffing: 12-hours Power Shift Staffing: 8-hour (1000-1800)

Q2: 3

Q3: Career staffing is mainstay of organization with part-time FF used to supplement crew size or provide replacements to full time firefighters off on leave time. The 12-hour rotation (0700-1900/1900-0700) works extremely well to cover the shifts and reduce overtime. The power shift is covered by part-time personnel used to staff a jump company consisting of a Tower Ladder and Ambulance.

Q4: None

Q5: Maximum consecutive hours worked policy. Collective bargaining agreements for both full time and part-time unions.

Q6: 10 hour day tour/14 hour night tour

Fire Service Shift Schedule Survey Response #17

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 7:53:04 AM
- Last Modified: Tuesday, April 15, 2014 7:57:52 AM
- Time Spent: 00:04:48
- IP Address: 192.248.248.66

Q1: 4/6 Kelly

Q2: 3. A, B, C

Q3: better rest between shifts and you feel refreshed when you come back from a break

Q4: NONE

Q5: All of our restrictions are entered in TeleStaff for control of work hours. Max of 96 consecutive hours then 24 hours off are required. Unless there are a lot of personnel out of town on fires, then the time limits are removed until the personnel return.

Q6: 48/96, 4/4 Kelly, 4/6 Kelly

Fire Service Shift Schedule Survey Response #18

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 8:17:22 AM
- Last Modified: Tuesday, April 15, 2014 8:26:52 AM
- Time Spent: 00:09:30
- IP Address: 209.210.22.1

Q1: 24/48

Q2: Four: A, B, C on 24/48 and Day shift on 4/10 Monday through Friday

Q3: Economy for the District, and time off for the firefighter

Q4: Lack of sleep when you are on a busy Company working 24/48

Q5: We have limits on the number of consecutive OT shifts one can work

Q6: 48/96 by a neighboring agency. We are evaluating that schedule, maybe for the next contract

Fire Service Shift Schedule Survey Response #19

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 8:50:54 AM
- Last Modified: Tuesday, April 15, 2014 8:53:19 AM
- Time Spent: 00:02:25
- IP Address: 208.71.202.193

Q1: 24 on, 48 off

Q2: A,B,C

Q3: 10 working days a month

Q4: Not being able to recover fully before your next shift when you have a very difficult shift or overtime shift.

Q5: None

Q6: Administration 40 hour work week

Fire Service Shift Schedule Survey Response #20

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 9:56:58 AM
- Last Modified: Tuesday, April 15, 2014 10:04:06 AM
- Time Spent: 00:07:08
- IP Address: 209.237.84.194

Q1: 48/96

Q2: 3 - A,B,C

Q3: The ability/flexibility in working on projects that may not be completed within a 24 hour shift. Shift members are rested and ready to work when they report for duty after having 96 hours off, or 72 if they've worked an OT shift. Which is much better than working 48/24's.

Q4: Long periods of time without contact with the shift members. We are a small organization and we rely heavily on shift captains, at times we may not see them for up to 10 days.

Q5: Communication and 72 hour limits without prior authorization.

Q6: 24/48's, 10/14's, 8-5 days, 45 hour,

Fire Service Shift Schedule Survey Response #21

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 12:21:59 PM
- Last Modified: Tuesday, April 15, 2014 12:31:25 PM
- Time Spent: 00:09:26
- IP Address: 97.90.180.178

Q1: 24 on & 24 off for four shifts. After the fourth shift an alternating 4 or 6 day break.

Q2: 3

Q3: Plenty of time off. Crews are rested. They operate more efficiently and safely.

Q4: Long wait times for completion of administrative assignments. Department-wide training requires many sessions to include all personnel.

Q5: None.

Q6: We have in the past had personnel on a 40 hour week to staff a two-man squad.

Fire Service Shift Schedule Survey Response #22

- Collector: Web Link (Web Link)
- Started: Tuesday, April 15, 2014 2:26:26 PM
- Last Modified: Tuesday, April 15, 2014 2:29:21 PM
- Time Spent: 00:02:55
- IP Address: 69.66.209.28

Q1: 24 on, 48 off

Q2: 3 shifts

Q3: limited shifts longer than 24 hrs (only time trades allow you to work more than 24 hrs consecutively) this helps to eliminate burn-out

Q4: limited opportunities for extended periods of time off (e.g. 96 hrs off regularly)

Q5: overtime is not allowed unless it is a callback due to a large event

Q6: multiple variations

Fire Service Shift Schedule Survey Response #23

- Collector: Web Link (Web Link)
- Started: Wednesday, April 16, 2014 6:00:23 AM
- Last Modified: Wednesday, April 16, 2014 6:07:18 AM
- Time Spent: 00:06:55
- IP Address: 216.196.228.50

Q1: Our full time staff works 24 / 48 and our part time firefighters work 12 hour shifts. Our part time folks are able to work a regular rotation of 24 hour shifts every third day or every sixth day as well.

Q2: Three platoon system

Q3: Less people needed to cover around the clock services

Q4: I don't feel there are disadvantages

Q5: Full time personnel are eligible for Kelly Days, one shift every six weeks. Full time personnel work a 52 hour work week.

Q6: My last department worked 48/96, work two days off four. The advantage is that there are only 5 shifts per month. So if you had to travel to get to work, this saves money and time for the firefighter. The disadvantage is that the second day could be hard if the first day was busy with calls. You might not get much out of a guy that was up after 24 hours. They are also eligible for Kelly days.

Fire Service Shift Schedule Survey Response #24

- Collector: Web Link (Web Link)
- Started: Wednesday, April 16, 2014 6:30:08 AM
- Last Modified: Wednesday, April 16, 2014 6:33:42 AM
- Time Spent: 00:03:34
- IP Address: 97.89.39.30

Q1: 24 on 24 off. After every 3rd shift worked there is a 4 day break.

Q2: A, B, C

Q3: the day off between and the 4 day break

Q4: hard to recoup after being up all night and return to work 24 hrs later.

Q5: we are based on a 56 hr. week. therefore we have automatic overtime. unless you use sick time or vacation time. then you lose the OT for that pay period.

Q6: most you mentioned at the top.

Fire Service Shift Schedule Survey Response #25

- Collector: Web Link (Web Link)
- Started: Wednesday, April 16, 2014 6:41:07 AM
- Last Modified: Wednesday, April 16, 2014 6:55:52 AM
- Time Spent: 00:14:45
- IP Address: 140.211.8.16

Q1: 24/48

Q2: A,B, and C

Q3: It is comfortable, easy to predict and project,

Q4: When you have a busy station or department, 24 hours can cause serious fatigue problems. Almost all other professions have studied long hours and found that mistakes increase significantly after 12 hours. If we are performing advanced medical care and transport, this may be a more serious issue. Throw in vacations and overtime to fill those vacancies, you are now potentially compounding the problem. From a management side, this schedule requires the department to pay FLSA OT.

Q5: Our department allows a max of 48 hours for normal conditions, and leaves the decision up to the Chief for extraordinary conditions during floods, earthquakes, windstorms, etc.

Q6: One schedule we are considering - which is not very popular with the crews - is 10's and 14's. This has the potential to decrease the fatigue issue as well as increasing productivity in areas of fire and life safety inspections and training hours. The downside is that it is 10's and 14's. Child care issues potentially become more difficult to address. The other option the union has looked at is 48/96's and some sort of modified Detroit system - I think it is similar to your last example above (24 on, 24 off three or four cycles with an alternating 4 or 5 days off at the end)

Fire Service Shift Schedule Survey Response #26

- Collector: Web Link (Web Link)
- Started: Wednesday, April 16, 2014 5:27:13 PM
- Last Modified: Wednesday, April 16, 2014 5:33:17 PM
- Time Spent: 00:06:04
- IP Address: 72.35.193.246

Q1: 24 on / 48 off

Q2: 3 shifts A,B,C

Q3: I believe that it is a safer shift than some of the others due to the time on shift, shifts like the 48/96 could cause issues with the long hours and short sleep, or production issues on the second 24.

Q4: Can't think of any

Q5: we only allow one firefighter per shift time off each day.

Q6: 48/96 - modified Detroit - 12hr shifts

Fire Service Shift Schedule Survey Response #27

- Collector: Web Link (Web Link)
- Started: Friday, April 18, 2014 5:51:09 AM
- Last Modified: Friday, April 18, 2014 5:58:32 AM
- Time Spent: 00:07:23
- IP Address: 68.53.73.169

Q1: 24 on - 48 off

Q2: A, B, and C

Q3: It is the only shift work that our department has ever used

Q4: Not sure

Q5: Over time requirements and Kelley day requirement

Q6: The EMS Division works four 12 hour days and four 12 hour nights with four days off.

Fire Service Shift Schedule Survey Response #28

- Collector: Web Link (Web Link)
- Started: Thursday, April 17, 2014 8:47:00 AM
- Last Modified: Friday, April 18, 2014 1:42:51 PM
- Time Spent: Over a day
- IP Address: 64.95.198.104

Q1: Our Department works a 48/96. To go a step further, the five cities in our Los Angeles County operational area are all 48/96 and the shifts are aligned.

Q2: We have a three shift schedule. Each shift is 24 hours 0800 to 0800.

Q3: The whole state of California is on a 24-hour shift schedule. This helps coordinate management of the wildland fire deployments. Also, having one crew relief time reduces the holdovers of personnel committed on emergency incidents at shift change. Also the cost of living

is unaffordable to our people. Many live a fair distance away and this reduces the number of commutes.

Q4: With the 48/96 schedule versus a 24-hour schedule, I only have 2/3s of my work force (shift change) every other day. On a 24-hour shift it's every day. We have not seen a drop in productivity, fatigues, or increase in sick leave usage.

Q5: we have a 120 consecutive hour rule. Firefighters must have a 24 intervening break before or after working 120 consecutive hours.

Q6: Look at the police models.

Fire Service Shift Schedule Survey Response #29

- Collector: Web Link (Web Link)
- Started: Saturday, April 19, 2014 6:13:08 PM
- Last Modified: Saturday, April 19, 2014 6:17:25 PM
- Time Spent: 00:04:17
- IP Address: 70.197.5.242

Q1: Five 24 hour shifts with one day off between each, then six days off.

Q2: Three

Q3: The long break before extensive work cycle.

Q4: Long work cycle/set of work days.

Q5: Employees cannot work more than 72 hours straight.

Q6: 48/96. Also similar to ours but 5 work day cycle followed by 4 days off.

Fire Service Shift Schedule Survey Response #30

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 9:01:40 AM
- Last Modified: Tuesday, April 22, 2014 9:04:45 AM
- Time Spent: 00:03:05
- IP Address: 69.29.52.41

Q1: 24 on/48 off (A, B, C)

Q2: 3

Q3: Ample time off from work, only need 3 shifts instead of 4(reduce cost)

Q4: For our department its fine. For a busier dept 24 hours may be too long.

Q5: Kelly Days every 13th shift.

Q6: 24 on/72 off

Fire Service Shift Schedule Survey Response # 31

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 8:05:29 PM
- Last Modified: Wednesday, April 23, 2014 8:09:27 PM
- Time Spent: 00:03:58
- IP Address: 96.18.163.61

Q1: 48/96

Q2: ABC

Q3: Long distance living, every time coming off shift is 4 days off

Q4: If you get hammered all night with calls you have another 24 hrs to perform your duties with little rest.

Q5: This shift is so new to us there are still controls being figured out, so far AB crews can sleep in a little longer in the morning if they are up all night

Q6: Kelly schedule, 1 on 2 off

Fire Service Shift Schedule Survey Response #32

- Collector: Web Link (Web Link)
- Started: Thursday, April 24, 2014 2:56:48 PM
- Last Modified: Thursday, April 24, 2014 3:07:01 PM
- Time Spent: 00:10:13
- IP Address: 71.209.12.179

Q1: 48 on 96 off

Q2: A,B,C

Q3: You can work a part time job easily. 17 more complete weekends a year off which is nice if your spouse works.

Q4: Coming to work isn't as much fun, more of drudgery than before. It is up to your officer if you get a break the next day if you get hammered the first night.

Q5: we got an e-mail from the EMS chief that basically said "if you get tired take a rest" We don't have anything for mandatory rest hours right now. It is up to the company officer. Most of them are pretty good about it.

Q6: 1 on 2 off, Modified Kelly -on,off,on,off,on,4 off that is what we used to work

Appendix B

MFD Chief Survey from April 22, 2014

Sent via email to 3 recipients

Chiefs,

I am completing my final paper for the Executive Fire Officer class. I have chosen alternative staffing schedules as my topic. Below I am attaching a link to a survey that I hope you will take.

Also, time is of the essence. I would appreciate a quick response.

Thanks!

Troyce

<https://www.surveymonkey.com/s/F9WBSL2>



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OUR GOAL, OUR MISSION, OUR PURPOSE

To Maintain a State of Readiness in:

Our People, Our Equipment, In Operational Accuracy, and In Administration

OUR CORE VALUES

Integrity, Honor, Pride, and Courage

The purpose of this survey is to determine your level of satisfaction with MFD's current scheduling model, gauge your interest in alternative staffing models, and determine if you have any suggestions for current or future staffing models.

1. On a scale of 1-10, please rate your satisfaction with MFD's current 24 on 48 off staffing schedule (10 is high satisfaction, 5 is neither satisfied nor dissatisfied, and 1 is not satisfied). For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-4>

Please give an explanation as to why you chose the rating you did.

2. Some fire departments use a "Repeating Pattern Schedule" for their employees.

An example is you work a 3/4. This means you work 24 on 24 off 24 on 24 off 24 on 96 off or XOXOXOOOO. An employee works 9 out of 27 days with this type of shift schedule. Please go to <http://www.shiftcal.com/grandledge/glaf2014-annual.pdf> for an example of this type of shift schedule being used in another fire department. For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-2>

On a scale of 1-10, please rate what your level of satisfaction would be with the "Repeating Pattern Schedule" (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied). Please give an explanation as to why you chose the rating you did.

3. Some fire departments use a 48/96 for their employees. This means you work 48 hours on and have 96 hours off or XXOOOO. An employee still works the same number of shifts per year and gets the same amount of "built in" overtime per month. A "bump" day is inserted so one shift never has to work both Christmas

Eve and Christmas day. This also rotates the shifts each year so one shift is not stuck with the "leap year" holiday shift two years in a row. Please go to http://www.shiftcal.com/cal_img/eagleriver.png for an example of this type of shift schedule being used in another fire department. For more information, please go to: <http://community.bmscentral.com/learnss/ZC/c3tf24-3>

On a scale of 1-10, please rate what your level of satisfaction would be with the 48/96 shift schedule (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied).

4. Would you be interested in having a trial period for any of the shifts listed in this survey? If so, how would you recommend the trial period be administered?
5. Do you have any suggestions for a schedule that has not been considered (either one currently in the fire service or one that you have come up with)? If so, please explain it in detail.
6. Administratively, what are some concerns you have with MFDs current staff scheduling model?
7. Administratively, what are some of the benefits of MFD's current staff scheduling model?
8. What concerns, administratively, do you foresee if MFD were to change to a new staff scheduling model.

MFD Chief Survey Response #1

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 2:07:23 PM
- Last Modified: Tuesday, April 22, 2014 2:50:07 PM
- Time Spent: 00:42:44
- IP Address: 192.225.178.50

Q1: 10 I feel this gives the firefighter the opportunity to put his whole effort to the job at hand and not feel worn out from a previous days shift. It still gives the firefighter two days off between shifts to accomplish other things, i.e. extra jobs, honey dos or time with the family. There is plenty of time for the firefighter to be rested up for their next shift.

Q2: 5 It is a little more complicated which requires the firefighter to keep track of when he needs to come in.

Q3: 4 This type of shift coverage to me seems to be less desirable as a firefighter that had a busy first 24 hours shift could not be at his best game the next day being unsafe.

Q4: A trial period would be good to see if it would work and the people would like it. That could be a very big headache to manage. Captains and Chiefs would need to sit down and put the plan together and the rest of the crews would need to buy into the plan that was presented.

Q5: None

Q6: Shift coverage when an employee needs to take vacation or sick leave. This plays into effect with any of the models as we are limited on the number of people that can cover. Secondly would be call back for larger incidents. Some employees don't want to come back while others say they are too tired or it takes away from the time they spend with family. Some have said if they went to another model they would come back more. I don't believe that. If they don't come back now they won't later.

Q7: As previously stated, it gives the firefighter time to recover from the shift and helps them to be rested up and ready for the next shift. It is easy to schedule and the employee knows when he is to work without referring to the calendar.

Q8: That all buy in to it and that it is not forced on and a hardship because of a change.

MFD Chief Survey Response #2

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 1:56:00 PM
- Last Modified: Tuesday, April 22, 2014 3:29:44 PM
- Time Spent: 01:33:44
- IP Address: 192.225.178.50

Q1: 8 I believe the 24/48 works for our community and department. Because of our size of department (number of fulltime employees) other schedules in my mind become problematic. I put an eight only because I do not feel the employees are fully satisfied with the schedule--I would like other options, however, given our size, I am not sure we have other options.

Q2: 1 I believe the four day off would be problematic for your small department. Call back is a big issue and if employees have four days off straight, they would get other jobs or leave town more readily than the schedule we currently have.

Q3: 1 Same feeling as answer number two. In addition, an employee would only be able to work one fulltime shift (in trade or overtime) during the four day off period due to our rule of only working 48 hours before time off is required.

Q4: I am willing to consider anything, however, the employees need to have a general consensus that whatever schedule is tried is agreed generally agreed upon.

Q5: Family Friendly Schedule as present by Joseph Haeberle some time ago. The problem with that is the four day off problem.

Q6: I don't have any concerns; I think it works really well.

Q7: The current schedule works well for our small department--people are in town without secondary jobs and are able to respond to backfill if the need arises. The current schedule works for our circumstance--I wonder why we would want to change. Why is change needed? If it is not broken, why are we trying to fix it?

Q8: My biggest concern is backfill and shift coverage. Without a larger pool of employees to draw from, I believe it will be problematic. We currently have a requirement that a fulltime employee has to live within 15 minutes of a station. However, we have no requirement for backfill. I believe there might be a solution found on a new schedule if we make a yearly requirement for backfill. Research would have to be done on how many shift coverage shifts are done in a year, how many vacation covers are done in a year, how many trades etc. It would have to work on paper first before anything would be considered.

MFD Chief Survey Response #3

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 3:10:25 PM
- Last Modified: Tuesday, April 22, 2014 3:47:08 PM
- Time Spent: 00:36:43
- IP Address: 192.225.178.50

Q1: 9 I think the current 24 on 48 off is a good schedule for our department because it helps with uniformity. It's easy to plan and is a fairly easy schedule for employees to trade and to cover for vacations. It works well for a smaller department, such as MFD.

Q2: 6 I think the Repeating Pattern Schedule is not a bad schedule but it has its problems. Mainly in trades and scheduling vacations. It limits basically only one shift that can work vacations and trades. If we were a larger department, it would be easier to work this schedule.

Q3: 3 The 48 on 96 off schedule is not a good schedule for a small department such as MFD. It really limits the coverage for backfill and vacation coverage. Covering vacation days would be a nightmare, because of the rule that any single employee cannot work more than 48 hours in a 72 hour period. Also the problem of fatigue, on the second 24 of the 48. Backfill could be a problem. When someone is on their 96 off, they would have more of a tendency to leave town, limiting the amount of off duty employees to respond to backfill. Not a friendly schedule for a smaller department.

Q4: Maybe the XOXOXOOOO schedule. It would have to be closely monitored and employees would only be allowed to work a certain number of days in a row.

Q5: No

Q6: One concern is employees wanting to work too many days in a roll. You just get a project started and the shift is over and the project is put to rest until the next shift, so it takes longer for some things to get completed.

Q7: It is fairly easy to keep track of days worked in a roll. You know which shift is working when. More opportunity for employees to work extra shifts and stay within the guidelines of days worked in a roll. It seems to flow smoothly and is not confusing.

Q8: Getting everyone on the same page. Getting everyone's work pattern unified. Backfill would have to be worked out.

Appendix C

MFD Full-Time Scheduling Survey from April 22, 2014

Sent via email to 12 recipients

Hello current full-time employees of the Madison Fire Department,

I am completing my final paper for the Executive Fire Officer class. I have chosen alternative staffing schedules as my topic. Below I am attaching two links to surveys that I hope you will take. The first one is for you and the second one is for your spouse.

Also, time is of the essence. I would appreciate a quick response, if you can, from both you and your spouse.

Thanks!

Troyce

<https://www.surveymonkey.com/s/X3C776B>

For Employees

<https://www.surveymonkey.com/s/NQKLZWK>

For Spouses



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The purpose of this survey is to determine your level of satisfaction with MFD's current scheduling model, gauge your interest in alternative staffing models, and determine if you have any suggestions for current or future staffing models.

1. On a scale of 1-10, please rate your satisfaction with MFD's current 24 on 48 off staffing schedule (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied). For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-4>

Please give an explanation as to why you chose the rating you did.

2. Some fire departments use a "Repeating Pattern Schedule" for their employees. An example is you work a 3/4. This means you work 24 on 24 off 24 on 24 off 24 on 96 off or XOXOXOOOO. An employee works 9 out of 27 days with this type of shift schedule. Please go to <http://www.shiftcal.com/grandledge/glaf2014-annual.pdf> for an example of this type of shift schedule being used in another fire department. For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-2>

On a scale of 1-10, please rate what your level of satisfaction would be with the "Repeating Pattern Schedule" (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied). Please give an explanation as to why you chose the rating you did.

3. Some fire departments use a 48/96 for their employees. This means you work 48 hours on and have 96 hours off or XXOOOO. An employee still works the same

number of shifts per year and gets the same amount of "built in" overtime per month. A "bump" day is inserted so one shift never has to work both Christmas Eve and Christmas day. This also rotates the shifts each year so one shift is not stuck with the "leap year" holiday shift two years in a row.

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On a scale of 1-10, please rate what your level of satisfaction would be with the 48/96 shift schedule (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied). Please give an explanation as to why you chose the rating you did.

4. Would you be interested in having a trial period for any of the shifts listed in this survey? If so, how would you recommend the trial period be administered?
5. Do you have any suggestions for a schedule that has not been considered (either one currently in the fire service or one that you have come up with)? If so, please explain it in detail.

MFD Full-Time Scheduling Survey Response #1

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 1:06:31 PM
- Last Modified: Wednesday, April 23, 2014 2:02:16 PM
- Time Spent: 00:55:45
- IP Address: 192.225.178.50

Q1: 8 I enjoy the work but it is difficult to get things done in such a short period of time.

Q2: 1 I can't really have an opinion but it seems to me that the two single days off would not be enough time to recuperate after a long shift.

Q3: 10 the 48 hour shift would allow the employee to put more uninterrupted time into projects and assignments. The four days off would give the employee more time to recuperate from a long shift because the first day can be used just to catch up on sleep missed from the work set, then there are three days left to take care of home responsibilities and be on call for the department.

Q4: Take volunteers to work the trial shift and then allow them to work the shift around our current shift. This way one or two shifts could try the 48/96 and the other shift/s could maintain the current rotation for the trial period.

Q5: No

MFD Full-Time Scheduling Survey Response #2

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 1:14:58 PM
- Last Modified: Tuesday, April 22, 2014 1:21:00 PM
- Time Spent: 00:06:02
- IP Address: 69.20.165.240

Q1: 5- Having worked the schedule long enough, I have become accustomed to it.

Q2: 2- The feedback that I have heard from this type of schedule, is it leads to an increase in fatigue.

Q3: 8- Having not tried this type of shift, I do not have any personal experience with it. I have spoke with many that are currently working this rotation and enjoy it. I think that this type of rotation would allow an increase in off duty response. Having more time to recover would allow a great extent of involvement when off. Currently working a 48 hours shift does not allow time for recovery.

Q4: Yes. I would like to see a trial period for 6 months to one year. This will allow adequate time for adjustment to the new schedule.

Q5: None.

MFD Full-Time Scheduling Survey Response #3

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 2:15:29 PM
- Last Modified: Tuesday, April 22, 2014 2:38:53 PM
- Time Spent: 00:23:24
- IP Address: 159.118.139.121

Q1: 5. Haven't experienced another schedule configuration (e.g. 48/96) although taking over time makes it feel like you're at the station all the time.

Q2: 10. I could see a large benefit in this. 48 hrs is a long time away from family, this offers a way to put in a few busy days but then have a 4 day break. Taking overtime may be difficult though unless you were on your 4 day break. Also this may disassociate members of the department by having longer periods of time between interaction.

Q3: 5. 48 hrs seems like a long shift. Current rules/ expectations with how shifts operate would need to change to allow safety rest periods per call volume. Also "shift projects" may prove difficult to complete.

Q4: I think a majority of the department members would need to agree on (vote) for a specific schedule change, then put in to place for a pay period or two. The only way to see if something would be better is to try it out.

Q5: None

MFD Full-Time Scheduling Survey Response #4

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 4:43:22 PM
- Last Modified: Tuesday, April 22, 2014 4:54:06 PM
- Time Spent: 00:10:44
- IP Address: 173.198.169.124

Q1: 6. For the most part I am satisfied with this schedule. One day at work is nice as long as I don't have projects that need immediate attention. If I do, then I end up working at home or at the station on my days off anyway. My first day off is usually a catch up day from the stress of work. Interestingly enough, when I work a 48 hour shift I don't usually have problems the second day. It's almost like my body is in work mode when I am at work, but when I get home I crash. My two days off are spent this way: the first day I am recuperating from work and the second day I

am preparing to go back to work. So, in essence, I am giving part of my time to work every single day.

Q2: 3. I have no desire to do this schedule. The 4 days of off would be great but not at the cost of working every other day so much.

Q3: 8. I am really intrigued by this schedule. If I had two day in a row to accomplish work tasks and then have a large chunk of time off I think that would really help me be more productive at work and at home. I could see where being gone for 4 days might appear hard, but I think I would be more apt to come back into the department on my off days because I would be better rested and ready. Working overtime doesn't appear to be much of an issue because you can still work 2 days out of the 4 days you have off. We pretty much do that right now. We work 48 hours and then take 24 hours off and then work 48 hours again. It happens all the time.

Q4: Absolutely. So much happens on paper but the proof is in the pudding. Being able to actually try it out would show if concerns are valid or if promised benefits actually pan out. I think a minimum of 2-3 pay periods should be allotted for a trial period. This would give everyone time get over the shock and settle in.

Q5: None.

MFD Full-Time Scheduling Survey Response #5

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 7:25:14 PM
- Last Modified: Tuesday, April 22, 2014 7:46:37 PM
- Time Spent: 00:21:23
- IP Address: 192.225.178.50

Q1: 6- I feel it is an easy schedule to remember and plan ahead with, but it feels like you are always coming or going. It is a continual round with no break.

Q2: 9- I have worked this kind of schedule and really liked it. You can get busy sometimes really busy but you always have a long break to look forward to. With the 24/48, you don't get that break unless you dip into your Vacation or Comp Time every time. During that 96 off, you get true R&R. The added bonus with this schedule is if you incorporate a "K-Day" or "Kelly Day", you get a nice break and still like going to work.

Q3: 8- This schedule could be real nice, but it, in my mind, has to run a certain way meaning the day-to-day stuff. If it just became two days of projects and calls, that would be a 4 for me. If it was used for good training and after a busy day and/or night, the Capts. would take care of their crews and not be micromanaged by chief officers, then it could work well. A down side would be two busy back to back days. In this case the first out crew would have to change every shift.

Q4: I would definitely be interested in a trail run because I feel that is the only way you can really know how it will work for us. I also feel that it would open eyes to benefits and/or trials we never thought of. I feel that a significant amount of time should be given to it to see how it plays out in many situations. But we really can't say we know until it is tried.

Q5: Just to add a "K-Day" or "Kelly-Day" to the 3/4 schedule. It is a paid day (paid at straight time) off every 22 shifts.

MFD Full-Time Scheduling Survey Response #6

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 7:50:37 PM
- Last Modified: Tuesday, April 22, 2014 7:54:42 PM
- Time Spent: 00:04:05
- IP Address: 97.121.16.221

Q1: 10 I have no complaints as this is all I really know

Q2: 1 I wouldn't like it as it would seem you really would be always coming and going

Q3: 5 I would be willing to try this

Q4: Sure it would have to be planned out in well advance and you would have to have 100% acceptance.

Q5: No

MFD Full-Time Scheduling Survey Response #7

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 11:57:24 AM
- Last Modified: Wednesday, April 23, 2014 12:05:16 PM
- Time Spent: 00:07:52
- IP Address: 192.225.178.50

Q1: 9 - I am currently happy with the schedule we run, but would I am always open to look at a schedule that may make our schedules better.

Q2: 2-3 , This type of a schedule just doesn't appeal to me. I like having a day to recuperate and then at least one day to get things done on the home front.

Q3: 9 - of all the schedules out there to look at this one appeals to me the most. Although it would take some massaging the way we currently run to allow some freedom on the second day if you were up all night running calls in the first 24 hour period.

Q4: I would love to try the 48/96. I think you would have to do a complete department trial for a minimum of 6 months, maybe even 8 months.

Q5: none

MFD Full-Time Scheduling Survey Response #8

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 11:21:48 AM
- Last Modified: Wednesday, April 23, 2014 12:12:26 PM
- Time Spent: 00:50:38
- IP Address: 192.225.178.50

Q1: I give it a 1, With this schedule I feel my time off is restricted. I don't have enough time to get things done at home and if I work a extra shift that only leave me 1 day off.

Q2: I give it a 2, this gives me more days off to get things done. however this does make it so that I work 3 Saturdays in row

Q3: I give it a 10. I have worked this schedule before and it gives me the best time off.

Q4: 1 year

Q5: no

MFD Full-Time Scheduling Survey Response #9

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 1:46:09 PM
- Last Modified: Wednesday, April 23, 2014 1:58:44 PM
- Time Spent: 00:12:35
- IP Address: 67.128.145.13

Q1: 5 - never worked anything else.

Q2: 3 - the 4 off would be cool, but the other 5 on/off would be difficult. Almost like not being home at all because it takes about 1 day to recover from some shifts.

Q3: 10 - I currently work another job after my fire job and so I frequently do 48 hour shifts. These are not that bad, even if up in the night as long as one is able to rest as needed. Plus having 4 days off would allow me to feel like I was actually at home more because instead of 1 day after recovering I'd have 3 days at home. I think it'd be great.

Q4: Yes, the 48/96 schedule. I'd like to see a test period of 3 months and to see that begun during the busiest time of the year vs. the slowest time. This is so both the line guys and the administration can see how the new schedule impacts everything from fatigue levels, to non-

emergency duties completion, to response back to the station during times of need for back fill/additional help. I would also suggest NOT having the spouse of the employee be involved in any sort of survey by the chief officers. Let the employee state how, if at all, the new schedule is impacting their families.

Q5: From you I once learned of a schedule that requires a 4th shift and in the end provides the employee with a week off at a time after having worked about 1/2 a week of days and then about 1/2 a week of nights. Sounds cool - costs more - so probably never happen.

MFD Full-Time Scheduling Survey Response #10

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 1:06:31 PM
- Last Modified: Wednesday, April 23, 2014 2:02:16 PM
- Time Spent: 00:55:45
- IP Address: 192.225.178.50

Q1: 7. My problem with current staffing has to do with the fact that I am ever gone in the evening. This is a problem that could not be fixed with any model. I know I have chosen an occupation where that is standard so I am OK with it. No other staffing model that I'm aware of addresses this concern. Other than that, I have no problems with 24/48

Q2: 2/10. I don't like the idea of every morning during your set you are either going to work or coming home from work. The four consecutive days off would be nice but it would feel like you were working more often. When I go to bed the night before I come to work, it feels almost like I have already started in a way. For 6 consecutive days you are involved with work. (either coming or going)

Q3: 7/10. I recognize the benefits of the four days off and I think I would like that. However, 48 consecutive hours away from home is a very long time. I also think the logistics would be difficult to figure out relating to trades and vacation. For example: The argument is made that we could have a 10 day vacation if we take two shifts off. if I have 6 paid vacation days a year, I can only take 3 of those types of vacations a year. If I only take one of those days off, I can do that 6 times in a year but that only gives me 5 days off which is what we already have but the 5 days is less flexible because it must include the four days I already have off. I'll explain further. Most of the vacations I take are family reunion type things which have set dates. The likelihood of these falling on my four days off would be low, in fact it seems more likely (I'm not sure) that I would have to use two vacation days instead of just one leaving me with days off before and after my 4 or 5 day trip that I might as well be working. (10 day vacations are rare, 4 or 5 day vacations are more common. Having said that, I think it could be worked out and there are other advantages that I am sure I am overlooking.

Q4: Yes. I think we should discuss having 3 or 6 interested people pilot a rotation among themselves for 6 months. I recognize this would completely disrupt any shift continuity for a while but it would take our discussions from theoretical to reality. Enough Talk. I am speaking under the assumption that at least a couple people (Chris) are totally against it. Maybe I am wrong. If this is not the case, maybe all 12 of us could try it for a few months. 48/96 seems like the best one to try.

Q5: No.

Appendix D

MFD Spouse Survey from April 22, 2014

Sent via email to 12 recipients

Hello current full-time employees of the Madison Fire Department,

I am completing my final paper for the Executive Fire Officer class. I have chosen alternative staffing schedules as my topic. Below I am attaching two links to surveys that I hope you will take. The first one is for you and the second one is for your spouse.

Also, time is of the essence. I would appreciate a quick response, if you can, from both you and your spouse.

Thanks!

Troyce

<https://www.surveymonkey.com/s/X3C776B>

For Employees

<https://www.surveymonkey.com/s/NQKLZWK>

For Spouses



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To Maintain a State of Readiness in:

Our People, Our Equipment, In Operational Accuracy, and In Administration

OUR CORE VALUES

Integrity, Honor, Pride, and Courage

The purpose of this survey is to determine your level of satisfaction with MFD's current scheduling model, gauge your interest in alternative staffing models, and determine if you have any suggestions for current or future staffing models.

1. On a scale of 1-10, please rate your satisfaction with MFD's current 24 on 48 off staffing schedule (10 is high satisfaction, 5 is neither satisfied nor dissatisfied, and 1 is not satisfied). For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-4>

Please give an explanation as to why you chose the rating you did.

2. Some fire departments use a "Repeating Pattern Schedule" for their employees. An example is you work a 3/4. This means you work 24 on 24 off 24 on 24 off 24 on 96 off or XOXOXOOOO. An employee works 9 out of 27 days with this type of shift schedule. Please go to <http://www.shiftcal.com/grandledge/glaf2014-annual.pdf> for an example of this type of shift schedule being used in another fire department. For more information, please go to:

<http://community.bmscentral.com/learnss/ZC/c3tf24-2>

On a scale of 1-10, please rate what your level of satisfaction would be with the "Repeating Pattern Schedule" (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied). Please give an explanation as to why you chose the rating you did.

3. Some fire departments use a 48/96 for their employees. This means you work 48 hours on and have 96 hours off or XXOOOO. An employee still works the same number of shifts per year and gets the same amount of "built in" overtime per month. A "bump" day is inserted so one shift never has to work both Christmas

Eve and Christmas day. This also rotates the shifts each year so one shift is not stuck with the "leap year" holiday shift two years in a row. Please go to

http://www.shiftcal.com/cal_img/eagleriver.png for an example of this type of shift schedule being used in another fire department. For more information, please go to: <http://community.bmscentral.com/learnss/ZC/c3tf24-3>

On a scale of 1-10, please rate what your level of satisfaction would be with the 48/96 shift schedule (10 is high satisfaction, 5 is neither satisfied or dissatisfied, and 1 is not satisfied).

4. Do you have any suggestions for a schedule that has not been considered (either one currently in the fire service or one that you have come up with)? If so, please explain it in detail.
5. When your spouse comes off shift are they unusually tired as compared to days off at home? If so, how long does it take for them to recuperate from their time on duty?
6. Is the current start and end time for shifts acceptable (i.e. shift starts at 07:30 and ends at 07:30 the next day)? If not, what would you change it to?
7. Please comment on any other schedule related issue that you feel has not been addressed by this survey.

MFD Spouse Survey Response #1

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 12:59:57 PM
- Last Modified: Tuesday, April 22, 2014 1:09:16 PM
- Time Spent: 00:09:19
- IP Address: 97.121.16.221

Q1: 9 I know this way and have come to like it.

Q2: 2 this way if my husband is tired and needs rejuvenation time his day off is shot. Even though he would have more days in a row off the weeks he would work would be hard on the family.

Q3: 7 2 days would be hard to be on shift but 4 days off is great! If ever covering for someone not sure how it would work if he had to be on 3 or 4 days. Too much time away from family.

Q4: None

Q5: Yes. Usually if he can rest it is all morning before he wants to start day.

Q6: Yes fine

Q7: None

MFD Spouse Survey Response #2

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 12:57:04 PM
- Last Modified: Tuesday, April 22, 2014 1:10:12 PM
- Time Spent: 00:13:08
- IP Address: 69.20.165.240

Q1: Probably about a 4. This is the only work rotation I have ever experienced so I don't really know anything different. I don't really like it because, even though the guys are only working 24 hours, they end up being there for a good portion of the next day as well. Not only that, but most of the time they come home tired and they sleep for a good part of the next day. With all other obligations many of them have, it is hard to get in very much family time. It also makes it very difficult to take any sort of family vacation without the guys having to take a couple of shifts off and miss work.

Q2: I don't think I would like this rotation. It does not provide any time for anything other than the guys working, coming home tired, sleeping all day, and going back to work the next day.

Q3: 8. This one sounds like a good one. I think it would satisfy the guys working all the necessary time but it also has an extra day where they can recover from working 2 days and it also gives them 2 days to spend with their family. It also gives a little more leeway for taking a family vacation. I think this option would be easier on the guys and on the families.

Q4: I don't have any other ideas.

Q5: When he gets home he is really tired. He has no desire to go anywhere or do anything because he is so tired. Not only that, he also spends the whole first day he is off sleeping. This only leaves one day to do things as a family.

Q6: The start and end time do not bother me. I would rather he start earlier in the morning as opposed to later.

Q7: Don't think so.

MFD Spouse Survey Response #3

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 7:46:02 PM
- Last Modified: Tuesday, April 22, 2014 8:01:38 PM
- Time Spent: 00:15:36
- IP Address: 63.155.62.4

Q1: 8- It doesn't seem too long to be away from family.

Q2: I think I would like to try it before I rate it. It seems like you'd miss a lot of stuff one week but the next week you wouldn't miss anything. I don't know if I'd like it.

Q3: 5-I am also unsure if I would like this schedule .

Q4: No

Q5: Yes, but they fight it until the afternoon and then it catches up to him and he takes a nap. It usually depends on how busy the night was.

Q6: Yes, I don't think I would change the time.

Q7: Great info!

MFD Spouse Survey Response #4

- Collector: Web Link (Web Link)
- Started: Tuesday, April 22, 2014 9:16:46 PM
- Last Modified: Tuesday, April 22, 2014 9:38:27 PM
- Time Spent: 00:21:41
- IP Address: 65.117.74.33

Q1: 5 - my spouse has had several different types of schedules. This one is generally fine for day to day things but is more difficult to plan for vacations.

Q2: 5 - this schedule would allow for better vacation planning, but would be frustrating keeping track of days on and off for scheduling appointments or other things.

Q3: 9 - this has been my favorite schedule my spouse has ever worked. It is much easier to plan vacations without losing pay and is easy to keep track of schedules. It also helps in productivity at home.

Q4: No.

Q5: Obviously it depends on the amount work that had to be performed in the night hours. If it has been a busy shift, then yes, my spouse is more tired. However, it doesn't necessarily slow him down. Recuperation time is minimal.

Q6: Yes. That seems to be an appropriate time for shift change.

Q7: No remarks.

MFD Spouse Survey Response #5

- Collector: Web Link (Web Link)
- Started: Wednesday, April 23, 2014 8:05:35 AM
- Last Modified: Wednesday, April 23, 2014 9:25:51 AM
- Time Spent: 01:20:16
- IP Address: 69.20.156.199

Q1: 5. However I think I would like the 48 on 96 off.

Q2: During those days on, you wouldn't get a chance to recover.

Q3: 10. More family time. Get more done.

Q4: Nope.

Q5: If he has been up most the night he is usually exhausted for the first day off. It takes one day off to recuperate. Then there is only one day left before he goes back to work.

Q6: I know when I don't want it. Not in the middle of the day or too early to do scripture study and prayer with the family.

Q7: I think switching up the guys shifts every so often would make the department come closer together as a department. Instead of having the underline animosity that comes with keeping the shifts stagnant.

MFD Spouse Survey Response #6

- Collector: Web Link (Web Link)
- Started: Thursday, April 24, 2014 9:25:55 PM
- Last Modified: Thursday, April 24, 2014 9:32:45 PM
- Time Spent: 00:06:50
- IP Address: 74.82.157.109

Q1: 9 - I'm fine with the way it works.

Q2: 1 - I don't like this idea.

Q3: 8 - the four days off in a row would be nice.

Q4: No

Q5: Some shifts he comes home tired if they have been up running calls. But most of the time he's not too bad.

Q6: I think it's just fine.

Q7: No comment

MFD Spouse Survey Response #7

- Collector: Web Link (Web Link)
- Started: Thursday, April 24, 2014 11:28:22 PM
- Last Modified: Thursday, April 24, 2014 11:55:30 PM
- Time Spent: 00:27:08
- IP Address: 70.208.19.173

Q1: 2 on a scale of 1-10. 24 on - gone all day. First 24 off - catch up on rest and with family. Second 24 off - work second job and cram "life" into one day.

Q2: 9 on a scale of 1-10. Have personal experience with this schedule and really liked it. Busy, rest, busy, rest, busy and 4 days to spend time with family, work second job, and get all the "other" things done you need to. Also you can plan vacations and things around your 4 days off and won't need to take as much vacation time.

Q3: 8 on a scale of 1-10. Still have 4 days off to wind down, work, and be with family. The 48 hours might be a long time to work straight.

Q4: No

Q5: Yes, depending on how busy they were over night. But recuperate an hour or two later.

Q6: Yes

Q7: None

MFD Spouse Survey Response #8

- Collector: Web Link (Web Link)
- Started: Friday, April 25, 2014 11:05:47 AM
- Last Modified: Friday, April 25, 2014 11:21:12 AM
- Time Spent: 00:15:25
- IP Address: 173.198.169.124

Q1: 5 The 24/48 has been in place for many years, and ideally in the beginning it allowed employees to work a second job. It was rare that calls came out at night and at the time it was really manageable. Today the number of calls, especially at night, and other tasks has increased greatly but the schedule doesn't quite fit. The 48 hours off usually means one full day of recovery after a 24 hour shift, so there is only 1 day that can be used for other pursuits.

Q2: 7 I like the idea of 4 days off in a row. Right now if we want to go somewhere for the weekend, my husband has to take a day off either at the beginning or the end-we usually end up going overnight and cutting a visit short. Four days off in a row would allow one day of recovery plus three full days for other things. I would be worried about the pace of this schedule though-it would feel like you never leave until the big break. Work, sleep, work, sleep, work, sleep, and then fun.

Q3: 9 I really like the idea of this shift schedule. My husband often already works a 48 hour shift and usually needs the same recovery time-one full day-as he would in a 24 hour shift, but this would then allow us 3 full days afterwards for our own things. We could easily go away for the weekend without trading or taking vacation.

Q4: No, I think these are all fine schedules.

Q5: Yes, much. It's usually a full day-most of the morning and afternoon are spent sleeping or being unproductive. There is also a lot of time that my husband spends answering calls and texts about department business that doesn't allow for him to actually have a "day off".

Q6: I think either half an hour to an hour earlier or later each day would be ideal. At the moment our family is going at about 6:30 to 7 each morning until 7:30 or 8, so with this time frame my

husband leaves right in the middle of family time to go on shift and comes home after the kids leave when he's off shift. So he essentially misses two mornings at home with our kids. Also, the shift change is at 7:30, but most of the guys are getting there at 7:15 to get started.

Q7: All around the schedule has worked fairly well for a long time but with the increase in responsibilities and workload a bigger break in between work days would be ideal for a real chance to de-stress.

MFD Spouse Survey Response #9

- Collector: Web Link (Web Link)
- Started: Saturday, April 26, 2014 3:42:56 PM
- Last Modified: Saturday, April 26, 2014 3:56:44 PM
- Time Spent: 00:13:48
- IP Address: 159.118.139.121

Q1: 5 - As far as shift work goes it's all we've really known so we've made it work for our family.

Q2: 3 - I just feel like this would be hard to work around and plan around.

Q3: 6 - this might be a little better since his shift has been stuck with the leap year shift two years in a row. 48 hours with him gone can feel like a LONG TIME though. I'm sure we could get use to it.

Q4: Monday through Friday 9-5??

Q5: It depends on how busy the night was. When he does come home tired it usually takes a day to "catch up"

Q6: It works fine for us.

Q7: NA

Appendix E

IFFD Questionnaire from April 28, 2014

Sent via email to 1 recipient

Chief Long,

Thank you for taking the time to complete this questionnaire. My purpose in contacting you is to gather information about your department's change from the Kelly Shift Schedule to the 48/96.

I am currently working on an applied research project for my Executive Fire Officer course through the National Fire Academy. My topic is Alternative Staff Scheduling Models. I have been researching the advantages, disadvantages, and organizational implications of the 24/48 Schedule, the Kelly Shift Schedule, and the 48/96 Schedule.

Would you please type in your answers directly below the question and then return this file to me? Thank you very much for your time and help!



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Captain

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OUR CORE VALUES

Integrity, Honor, Pride, and Courage

1. Please briefly describe your department: the number of staff, the number of shifts or platoons (i.e. A, B, and C), and number of incidents you respond to each year.
 - (1)Chief, (4) Division Chiefs, (3) Three Platoons (31) personnel each
 - Total Engine Dispatches 3,682
 - Rescue/Emergency Medical 2,373
 - Fire Calls 286
 - False Alarms 392
 - Hazardous Conditions 95
 - Hazardous Material 75
 - Mutual Aid 0
 - All Other Responses 461
 - Medical Emergencies 7,426
2. How long did you utilize the Kelly Shift Schedule?
 - Since 1969
3. How did you first find out about the 48/96 Schedule?
 - From Firefighters returning from training in Boise.
4. How was the decision reached to change from the Kelly Shift Schedule to the 48/96 Schedule?
 - Meetings with staff and union
5. Is this change permanent or only through a trial period?
 - (1)One year trial, referendum vote this fall
6. If this change is on a trial basis, how long is your trial period?
 - (1) One year
7. If this change is on a trial basis, how will the decision be made on whether you stay with the 48/96 or if you will return to the Kelly Shift Schedule?
 - Referendum vote by Union, decision made by Staff after evaluation of impact on overtime, sick leave, accidents etc.
8. As an administrator, what do you see as the major advantage(s) to changing over to the 48/96?
 - Personally I see no advantage to the Department or the taxpayers, but I am willing to remain objective during the trial period.
9. As an administrator, what do you see as the major disadvantage(s) to changing over to the 48/96?
 - Fatigue, especially for the personnel assigned to EMS response.
10. What do you think the major advantage(s) is/are for the employees switching to the 48/96 Schedule?

- More time off especially weekend, ($\frac{1}{2}$) half the commute for the personnel living out of town.
11. What do you think the major disadvantage(s) is/are for the employees switching to the 48/96 Schedule?
- Difficulty with trading, and problems associated with being away from family for 48 hours straight.
12. What organizational changes has your department had to implement in order for the 48/96 Schedule to work (i.e. hours worked limits, rest periods on duty, overtime and call-back policies, and etc...)?
- More freedom for Station officers to allow personnel to sleep in after busy nights, and the ability to move personnel to stations with less call volume. Limit time on duty to 60 hours.
13. Do you have any knowledge of, or experience with, the 24/48 Schedule?
- No direct experience, limited knowledge
14. If so, how do you think it compares, from an administrators perspective, to the Kelly Shift Schedule and the 48/96 Schedule?
- N/A
15. How would you rate your scheduling model preference (1 = the most desirable and 3 = the least desirable)?
- 24/48 Schedule ____3____
 - Kelly Shift Schedule ____1____
 - 48/96 Schedule ____2____

Appendix F

Personal interview with Chief Mikel Walker on April 30, 2014

1. Why don't you want to change shift schedules?
 - I am comfortable with the schedule we have.
 - There isn't anything, out there, that is better than what we have.
2. What would make you want to change shift schedules?
 - If the employees started having trouble taking vacation.
 - If there started to be a decrease in productivity while on shift.
 - If there was something better that would benefit both the department and the employee.
3. If a majority of the department wanted to change, would you be in opposition?
 - I would consider it as long as the level of service we provided did not change.
4. Rate the following schedules 1-3, 1 being most preferred and 3 being least preferred:
 - 24/48 Schedule _____1_____
 - Kelly Shift Schedule _____2_____
 - 48/96 Schedule _____3_____
5. Which schedule do you think is most conducive to full time staff responding to requests for backfill? Rate 1-3, 1 being most conducive and 3 being least conducive.
 - 24/48 Schedule _____1_____
 - Kelly Shift Schedule _____3_____
 - 48/96 Schedule _____2_____
6. Which schedule do you think is most conducive to full time staff using vacation, sick leave, and trades? Rate 1-3, 1 being most conducive and 3 being least conducive.
 - 24/48 Schedule _____1_____
 - Kelly Shift Schedule _____2_____
 - 48/96 Schedule _____3_____
7. Anything else you want to share about shift schedules?
 - No.

Appendix G

Personal interview with Trevin Ricks on April 30, 2014

1. Why don't you want to change shift schedules?
 - 48 hours is too long to be gone from family.
2. What would make you want to change shift schedules?
 - Maybe curiosity about another shift.
3. If a majority of the department wanted to change, would you be in opposition?
 - No. I would not be opposed.
4. Rate the following schedules 1-3, 1 being most preferred and 3 being least preferred:
 - 24/48 Schedule ____1____
 - Kelly Shift Schedule ____3____
 - 48/96 Schedule ____2____
5. Which schedule do you think is most conducive to full time staff responding to requests for backfill? Rate 1-3, 1 being most conducive and 3 being least conducive.
 - 24/48 Schedule ____2____
 - Kelly Shift Schedule ____3____
 - 48/96 Schedule ____1____
6. Which schedule do you think is most conducive to full time staff using vacation, sick leave, and trades? Rate 1-3, 1 being most conducive and 3 being least conducive.
 - 24/48 Schedule ____2____
 - Kelly Shift Schedule ____1____
 - 48/96 Schedule ____2____
7. Anything else you want to share about shift schedules?
 - Every day of our existence you are either at work, you were at work yesterday, or you are going to work tomorrow.

Appendix H

48/96 Shift Schedule Interview with Korth Petersen on April 30, 2014

1. Please briefly describe your department: Name of your department, the number of staff, the number of shifts or platoons (i.e. A, B, and C), and number of incidents you respond to each year.
 - Eagle Mountain Fire Department which was part of the United Fire Authority (UFA) in Salt Lake City, Utah and for the US Government Army Base at Dugway in Utah.
 - Both places used the 48/96 and both places used the three platoon system.
 - At the UFA you could get up to 15 calls per 24 hour shift and at the Dugway you were assigned 12 hour standby rotations in addition to responding to about six hundred 911 calls per year.
2. How long did you utilize the 48/96 Shift Schedule?
 - I worked at the UFA for about one and a half years and I worked at the Dugway for about one year.
 - The UFA has been working the 48/96 for a lot of years. The Dugway switched to the 48/96 while I was there. They wanted to reduce the number of times you had to drive back and forth to work.
3. As an employee, what do you see as the major advantage(s) to working the 48/96 Schedule?
 - The number of days you have to get stuff done at home.
 - The current 24/48 schedule really only gives you one day to do that.
 - Projects, both at home and at work, can be started and then finished. They don't have to be left undone. You don't have to come back later and waste time re-starting projects.
 - You can use your four days off to take a vacation without worrying about hurrying to get back to work.
 - The 24/48 makes you use one vacation day to drive to wherever you are going and then the next vacation day is spent coming back so you can be ready to go back to work.
 - The 48/96 allows you to travel one day, have a vacation for two days, and then travel back on the fourth day.
 - The 48/96 saves the department money.
 - Employees are more productive.
 - You don't duplicate as much work.
 - You are not using the same amount of supplies for your daily duties because you complete things one out of every two days instead of doing it every day with every shift.
 - You can sleep in, a little, on your second day on duty and still be well rested and productive despite the appearance that you are just sleeping. This is because you get the bulk of your chores and station duties done on the first day of work.

- Knowing I had four days off, after shift, kept me happy and productive while I was on duty.
 - You are ready to come back to work after a set of days off. You are more excited to get back to work after so many days off.
4. As an employee, what do you see as the major disadvantage(s) to the 48/96 Shift Schedule?
- You may be a little tired on your second day if you don't get enough rest.
5. What organizational changes did your department have in place for the 48/96 Shift Schedule to work (i.e. hours worked limits, rest periods on duty, overtime and call-back policies, and etc...)?
- Discretionary down time, rest time, provided by the Captain of the shift for personnel who were up the previous night.
6. Do you have any knowledge of, or experience with, the 24/48 Schedule or the Kelly schedule?
- The 24/48 because that's what we do now.
7. If so, how do you think it compares, from an employee's perspective, to the 24/48 and the Kelly Schedule?
- The 24/48 is a lot harder because you don't have a lot of rest time because you are always doing off shift stuff for the department: picking up an extra shift, coming in for classes, and department projects.
8. How would you rate your scheduling model preference (1 = the most desirable and 3 = the least desirable)?
- 24/48 Schedule _____ 3 _____
 - Kelly Shift Schedule _____ 2 _____
 - 48/96 Schedule _____ 1 _____
9. Please describe a typical 48/96 rotation (your set) and how your fatigue levels were each day, your excitement for coming to work each day, and your level of productivity each day.
- First day I was excited to come to work
 - Second day we would sleep in a little before starting the next day.
 - I never felt overworked either day.
 - I felt the first day my productivity level was high and my second day's productivity level was medium.
10. Please explain your level of fatigue, your family participation levels, and how much work impacted your days off.
- My fatigue level was low on day one and high when I left shift the second day.
 - My fatigue levels, on my first day off, were about the same they are now.
 - My participation levels in family were very high on my off days.

- In Utah, work did not impact my off days like work here does.
11. What else do you think is important to consider about this shift scheduling option?
- This department could easily switch to a 48/96 and administration would not see any change in productivity at all.
 - The employees would see greater benefits if we went to a 48/96.
 - I would be more likely to come in, for backfill, if we were on the 48/96. Right now I don't feel like I have enough time off as it is, so my preference is to not come in right now. Right now I feel like I am always at the department and I think that is a problem with our current schedule. If I had some time at home to relax then I would feel more willing to come back into work on my days off.

Appendix I

Kelly Shift Schedule Interview with Gary Landon on April 30, 2014

1. Please briefly describe your department: Name of your department, the number of staff, the number of shifts or platoons (i.e. A, B, and C), and number of incidents you respond to each year.
 - Idaho Falls Fire Dept;
 - Staff was 1 Chief and 4 Division Chiefs;
 - Three shifts (Platoons) A,B,C;
 - 8500 to 9500 total calls;
 - 7500 to 8000 EMS, 1500 to 2000 Fire;
2. How long did you utilize the Kelly Shift Schedule?
 - I worked it personally for 3 years; the department had done it for a long time before that.
3. As an employee, what do you see as the major advantage(s) to working the Kelly Shift Schedule?
 - Primarily it is the four days off to fully recover from work;
 - Save vacation day usage due to the four days off;
 - The Kelly Day every 22 shifts again helps save vacation usage and gives opportunities for long breaks thus keeping moral up and still looking forward to working.
4. As an employee, what do you see as the major disadvantage(s) to the Kelly Shift Schedule?
 - It can make for a long “set”(5 days, 3 shift days). If it is a busy set the last day can be long and tiring.
5. What organizational changes did your department have in place for the Kelly Shift Schedule to work (i.e. hours worked limits, rest periods on duty, overtime and call-back policies, and etc...)?
 - You were not allowed to work more than 36 hours in a row without a 12 hour break.
 - Overtimes shifts were only offered at 12 hour increments (day or night-0800 to 2000 or 2000 to 0800). (We were also paid double-time but I don’t know if that is a required part of it.)
 - We still had mandatory call backs for large incidents or when we had all resources on calls and certain Captains would allow “Safety Rest Periods” if crews were on the night before and were up all night.
6. Do you have any knowledge of, or experience with, the 24/48 Schedule or the 48/96 schedule?
 - Yes I have also worked the 24/48 schedule full time and some knowledge of the 48/96.

7. If so, how do you think it compares, from an employee's perspective, to the 24/48 and the 48/96 Schedule?
 - I think the Kelly schedule is better than the 24/48 because it feels like you actually get rested physically and a break mentally.
 - As far as the 48/96, I have some reservations. I like the 96 off time, but I feel that it the day-to-day things of the shift have to be managed/approached a certain way. Captains have to be able to manage their shift as they deem appropriate and crews have to be able to rest for example a different ambulance crew each day of the 48, let crews get training and workout times in and quitting time is strict at 17h00 or 1730 for personal time.
8. How would you rate your scheduling model preference (1 = the most desirable and 3 = the least desirable)?
 - 24/48 Schedule ____ 3/2 ____
 - Kelly Shift Schedule ____ 1 ____
 - 48/96 Schedule ____ 2/3 ____
9. Please describe a typical rotation (your set) and how your fatigue levels were each day, your excitement for coming to work each day, and your level of productivity each day.
 - A typical rotation was for me as a Paramedic differed depending on the Station I was at (and the Captain). Often I was on the ambulance the entire set unless I was in a rotation with two/three other Medics (either one day on the AB, one on the Rescue, and one on the Tailboard/Engine or two shifts on the ambulance and one on the Tailboard/Engine). So you come in at 08h00 and check trucks, then clean or duties or projects, train until 16h00 when you work-out and personal time at 17h00. Then up at 0630 for stations radio check, morning chores and the off at 08h00 for 24 hours then back for the same thing for three shifts then 96 off.
 - Honestly I feel like overall it was better vs. the 24/48. Some days it was hard to come back after a long break but sometimes it was really nice to get back to work. Sometimes 08h00 the morning of your last day couldn't come fast enough but I feel like productivity was not hurt or lowered and it made it nicer and maybe a little more willing to come in or cover an extra shift during your 96 off.
10. Please explain your level of fatigue, your family participation levels, and how much work impacted your days off.
 - Some sets were definitely tiring and you were burnt out waiting for the 96 off. But you had the 96 to recover and hang out with the family and really spend time with them and you can really even go away and do something and not have to cut it short. You can get away and not have to think of work for at least two days.
11. What else do you think is important to consider about this shift scheduling option?
 - My wife says she hands down prefers the Kelly Schedule vs. the 24/48. It worked very well for me and my family.
 - The "Kelly Day" was set at every 22nd shift you worked. It was a paid day off-paid at "straight-time."

- We also would be paid FALSA time too. My understanding is more limited on this aspect of it but I do believe it was due to the schedule and hours worked in the 28 day period that sometimes, maybe every two or three pay checks would have FALSA time paid. This was also after overtime shifts, trades, mandatory Paramedic Meetings (training w/ Medical Director) and Transport Pager days. This was never really over \$150, usually \$40 to \$100.
- Trades were allowed. They had to be 12 hours during your set and could be 12 or 24 hours on your 96 off.

Appendix J

Call-Back Data Analysis Report

Full Time Line Employee Call Back Responses January – December 2013

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Employee 1	17	10	10	11	15	5	4	6	14	11	2	16	121 <i>High</i>
Employee 2	1	1	2	1	1	3	1	0	0	0	0	0	10
Employee 3	2	0	0	1	1	1	0	1	0	0	0	0	6
Employee 4	2	2	0	0	0	0	0	0	0	0	0	0	4
Employee 5	0	0	0	3	2	1	1	0	0	2	0	0	9
Employee 6	0	1	1	0	1	0	1	1	0	0	0	0	5
Employee 7	1	0	0	0	1	1	0	0	0	0	0	0	3 <i>Low</i>
Employee 8	4	2	0	0	2	5	3	1	1	0	1	1	20
Employee 9	0	1	2	0	1	2	3	2	2	1	8	0	22
Employee 10	0	0	1	0	4	7	6	4	2	0	1	1	26
Employee 11	1	1	4	2	0	0	4	1	1	2	2	3	21
Employee 12	0	0	1	0	3	1	1	0	1	2	1	0	10
<i>Total</i>													257
Total Eligible Responses													133

- Employees #1 and # 7 excluded (high and low) when determining average response
- Ten employees eligible for analysis
- Total # of call back incidents based on employee availability: $602 \times 2/3 = 401$
- The total number of times eligible employees answered call back requests = 133
- Averaged per eligible employee: $133/10 = 13.3$
- A response percentage was calculated: $13.3 / 401 = 0.033$ or 3%.