

A Study in Work Capacity: Is it Enough?

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ABSTRACT

In an effort to attain a protection class 2 insurance rating, the Spokane Valley Fire Department transferred 1650 additional existing building inspections to its Prevention Bureau. The problem was that the impact of adding 1650 existing building inspections to the workload had not been identified. The purpose of the applied research project was to identify the impact of adding 1650 existing building inspections to the workload and to further examine: (1) what the present workload of the Prevention Bureau by activity was; (2) how much additional workload was created by the 1650 existing building inspections; (3) what changes were needed to include the additional 1650 existing building inspections into the current workload capacity; and (4) what new workload capacity (time) was needed to complete the additional 1650 existing building inspections.

A descriptive research method was used to direct the study which included personal interviews, reviews of record management systems, reviews of personnel management software systems, and literature reviews. The information of which resulted in the following recommendations:

- a structural reorganization of the Prevention Bureau, which results in the direct supervision of the AFM's by the Deputy Fire Marshal;
- the narrowing of the scope of work of the Assistant Fire Marshals (AFM's);
- the replacement of one AFM with an engineer who will primarily be responsible for the H occupancy (high hazard) inspection program, with secondary duties of fire code permit inspections, water resources, and supplemental plan reviewer;
- and the addition of a public educator who will conduct a community risk assessment (CRA) and ensure that the outcome based public education programs are founded on the CRA.

TABLE OF CONTENTS

ABSTRACT..... 3

TABLE OF CONTENTS..... 4

INTRODUCTION 5

BACKGROUND AND SIGNIFICANCE..... 5

LITERATURE REVIEW 9

PROCEDURES..... 16

RESULTS 18

DISCUSSION..... 24

RECOMMENDATIONS..... 29

REFERENCES 37

APPENDIX A - Organizational Charts 39

APPENDIX B - Prevention Workload by Position 42

APPENDIX C - Engineer Job Description 44

APPENDIX D - Public Education Officer Job Description 49

INTRODUCTION

The Executive Development Course of the Executive Fire Officer Program at the National Fire Academy presented the author with the basis for this applied research project (ARP) contained herein; and further provided an opportunity to address a critical and current event within the Prevention Bureau of the Spokane Valley Fire Department.

The problem is that the impact of adding 1650 existing building inspections to the Spokane Valley Fire Department Prevention Bureau workload has not been identified. The purpose of this ARP is to identify the impact of adding 1650 existing building inspections to the Spokane Valley Fire Department Prevention Bureau workload. The ARP will further identify: what the present workload of the Prevention Bureau by activity is; how much additional workload was created by the 1650 existing building inspections; what changes will be needed to include the additional 1650 existing building inspections into the current workload capacity; and what new workload capacity (time), if any, would be needed to complete the additional 1650 existing building inspections.

A descriptive research method was used to direct the study with procedures including personal interviews, review of record management systems, review of personnel management software systems, and literature reviews.

BACKGROUND AND SIGNIFICANCE

The Spokane Valley Fire Department, herein referred to as the “Department,” is an all risk fire service district that serves the cities of Spokane Valley, Liberty Lake, Millwood, and other unincorporated areas of Spokane County. The Department is situated between the Idaho - Washington State line on its eastern boundary and the City of Spokane on its western boundary; encompassing a 77 square mile service area. The Department serves approximately 115,000 citizens with an operating budget of approximately \$30.8 million (Spokane Valley Fire

Department, 2014, p. 1). The Department is accredited with the Center for Public Safety Excellence.

The Department maintains a staffing of 183 total personnel within operations, administration, prevention, and support services divisions (165 uniformed, 18 civilian). There are eight total personnel assigned to the Prevention Bureau, including one fire marshal, one deputy fire marshal (DFM), one fire protection engineer (FPE), and five assistant fire marshals (AFM); all of whom report directly to the fire marshal. The most recent Department organizational chart is attached in Appendix A.

The Department currently enjoys an insurance protection class rating of three, but also has an established goal, listed in the Spokane Valley Fire Department (2011) Strategic Positioning Project, of attaining a protection class two by the year 2017 (p. 7). There are numerous categories that require attention within the grading schedule, most of which necessitate an increase in service level in several areas, including within the Prevention Bureau.

The Prevention Bureau is responsible for conducting existing building inspections, fire code permit inspections, quarterly H occupancy (high hazard) inspections, fire investigations, third party inspections, plan review, water resources, public information, fire hazard complaints, and public education. The staffing of the Prevention Bureau has doubled in the last ten years to accommodate the increase in workload including the addition of the FPE, specifically for plan review.

A major portion of the insurance rating particular to the Prevention Bureau involves existing building inspections; specifically, 400 of 650 points (Washington Survey and Rating Bureau, 2013, p. 27). Of the 4660 total existing building inspections within the jurisdiction, 1650 of them were assigned to the fire crews (Company Inspection Program), but were recently reassigned to the Prevention Bureau, initially with a proposed staffing increase of one additional

AFM. This additional staffing plan was later rescinded so that a community affairs officer (public information and marketing) could be hired. The fire marshal subsequently assigned the additional 1650 inspections to four of the five AFM's without a decrease in their individual workloads.

The impetus in reassigning the 1650 existing building inspections to the Prevention Bureau was a study of the insurance rating where the recommendation was made for company officers to begin a pre-incident planning program (PIPP) of over 2500 structures within the jurisdiction. The workload increase to the company officers was offset by the reassignment of the existing building inspections to the Prevention Bureau.

The assignment of additional work to the AFM's was met with extreme frustration and numerous complaints that the staff was not able to complete the work already assigned, mostly in the form of training; and that their work product was sure to decrease in quality. Additionally, two of the AFM's were actively seeking to return to the Operations Division of the organization. One AFM's desire to return was directly related to the addition of the inspection work and the wide ranging scope of work (personal communication, Stephen Neff, March 4, 2014).

The scope of work for the individual employees varied greatly with each individual. For the purpose of this document, and to maintain accuracy, the AFM's were numbered from one to five as their duties are described. AFM 1 conducted fire plan reviews, existing building inspections, fire investigations, fire hazard complaints, and fire code permit inspections. AFM 1 maintained currency training in the above categories along with certifications as a fire inspector, fire plan reviewer, fire investigator, and emergency medical technician (EMT). AFM 2 conducted existing building inspections, fire investigations, water resources (fire hydrant testing program and liaison to water and irrigation districts), dog handler for the accelerant detection K9 program, fire code permit inspections, map updates, and public education. AFM 2 maintained

currency training in all of the above listed categories with certifications as a fire inspector, fire investigator, K9 handler, and EMT. AFM 3 conducted existing building inspections, the quarterly high hazard inspection program, fire investigations, and fire code permit inspections. AFM 3 maintained training currency in the listed categories along with certifications as a fire inspector, fire investigator, and EMT. AFM 4 conducted existing building inspections, public education, and public information. AFM 4 maintained training currency in the varied categories with certifications as a fire inspector and public educator. AFM 5 conducted existing building inspections and was the secondary dog handler for the accelerant detection K9 program. AFM 5 maintained currency in both categories with certifications as a fire inspector and K9 handler. The FPE conducted plan reviews, monitors the third party inspection program, consulted in regard to industrial hygiene, and maintained proficiencies associated with licensed professional engineer requirements of Washington State.

This ARP was written within the guise of the National Fire Academy's Executive Development Course within two separate sections of content: "change management," with content objectives including a "change agent, in terms of the adaptive model," and "recognition of an adaptive problem" (Federal Emergency Management Agency, 2013, p. SM 5-2); and evaluating the work product of the Prevention Bureau in regard to "service quality" and the fourteen key principles for transforming business effectiveness (Federal Emergency Management Agency, 2013, p. SM 11-3).

The ARP was also composed in accordance with the U.S. Fire Administration's goals of reducing risk at the local level through prevention and mitigation and improving local planning and preparedness (United States Fire Administration, 2010, p. 14).

LITERATURE REVIEW

There were numerous documents found that were associated with workload capacities; however, few of the documents reference any credible standards, i.e. national, state, or local. The National Fire Protection Association (NFPA) (2014) currently has an unpublished manuscript for the adoption of NFPA 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations to the Public. This document will be used, in part, to evaluate current workload doctrine as there are no true applicable standards available on the duties and activities assigned to the Prevention Bureau. It appeared at the publication of this document that NFPA 1730 (a consensus document) would be published by 2015.

Two important facets within the literature review are discussed herein: workload capacity and scope of work. James Crawford (2011), author of *Fire Prevention Organization and Management*, discussed his concerns about scope of work within fire prevention bureaus and stated that “Expecting one person to adequately conduct a plan review of new construction, enforce the fire code, conduct public life safety and fire presentations, and investigate fires is unrealistic” (p. 246). Crawford (2011) further proffered that legal liabilities are created when employers draft a scope of work that is so extremely varied and that doing so could “ultimately doom prevention efforts” (p. 246).

Crawford (2011) classified fire prevention activities into three basic categories. These categories are well known by graduates of the numerous National Fire Academy courses that have proffered this as a way to organize activities so that the relationships between them can be more easily understood and managed; and for the purpose of this ARP, the workload of the Prevention Bureau was separated into these three distinct activity groups: Education, enforcement, and engineering.

The education section contains the public education component and the public information component of the Department. Although work associated with public information is currently assigned to the Prevention Bureau, it will not be assessed within this document other than from a historical perspective for workload capacity as the Department will be reassigning that work to the community affairs officer, which is outside the purview of the Prevention Bureau.

With the varied level of services and programs offered by prevention bureaus and fire marshal offices across the United States, it is a difficult measure to calculate both the number of programs that a department should offer and the amount of time that a public fire educator should dedicate to an individual program. The National Fire Protection Administration (2014) NFPA 1730 indicated that a community risk assessment (CRA) be conducted to establish a community risk reduction (CRR) plan from which “Educational programs shall be developed based on the CRR plan established” (p. 9.8.1); and further indicated that educational programs be outcome based and measured against the CRA.

Fire departments in Washington State attain their community protection class (insurance rating) from the Washington Survey and Rating Bureau (WSRB). In 2013, the WSRB adopted a grading schedule that indicated minimum deficiency points (0) would be applied to fire departments that provide ten public fire educational programs to school aged children, i.e. juvenile firesetter intervention, daycare programs, middle school science programs, etc; and further indicated that five adult fire education programs should be offered or deficiency points would be applied (Washington Survey and Rating Bureau, 2013, pp. 28-29). The WSRB did not indicate how many public fire and life educators would be required to successfully manage as many programs, nor how much time should be spent or contacts made within the individual programs.

A personal interview was conducted with WSRB's Fire Protection Systems & Services Manager Robert Ferrell concerning staffing issues for public education, and he indicated that WSRB currently has no valid way to estimate the number of educators required; and further indicated that the current evaluation does not consider whether the programs are outcome based (Robert Ferrell, personal communication, April 3, 2014).

The Insurance Services Office Incorporated (ISO) is an organization that conducts community insurance rating assessments similar to the WSRB; although the ISO conducts their assessments in 45 of the 50 United States. A review of the Insurance Services Office Incorporated (2012) Fire Suppression Rating Schedule indicated similar circumstance, whereby numerous programs are required; however, the outcome of those programs is not evaluated (p. 59). The staffing of public educators is likewise not evaluated; ergo no competent workload analysis can be applied using this document.

Tridata (2008), in a service delivery study of Portland Fire and Rescue (PF&R), recommended that "at least one full-time public fire and injury educator is needed per 100,000 in population" (p. 203). The Tridata (2008) authors also contend that this recommendation was not formulated within any normative standard, but was referenced only as a "general rule of thumb we have developed over time" (p. 203). Further commendations were made to PF&R for their fire company participation in the numerous in-station and out-of-station public education programs.

The engineering section of the Department's Prevention Bureau was responsible for plan review, third party inspection program, water resources (fire hydrant and water and irrigation district liaison), and the quarterly high hazard occupancy inspection program.

Plan review is an extremely important step in the construction of a project that, if not conducted by an appropriately trained staff, can have catastrophic financial and life safety

consequences for businesses, citizens, and the community at large. The Washington Survey and Rating Bureau (2013) recommended that staffing levels should be sufficient to ensure “comprehensive plan review” and further indicated a 20% deficiency of a 50 point maximum category if the plan review was not comprehensive (p. 26). The document again does not indicate what an appropriate staffing level should be, and therefore a workload capacity cannot be derived using this particular document other than anecdotally.

The Insurance Services Office Incorporated (2012) contained a subsection pertaining to plan review and simply indicated that essentially all plans from commercial occupancies be “reviewed for compliance with adopted fire prevention codes” (p. 57). The document does not contain a staffing matrix, nor does it establish an average amount of time per review from which to evaluate an actual workload.

Ron Darden (2004), of the University of Tennessee’s Municipal Technical Advisory Service, conducted research and published a report for the City of Knoxville, Tennessee, in regard to plan review and inspections for the building department, which included fire service work in some subcategories. In the area of plan review, the study found that the eight plan reviewers had conducted 1340 plan reviews per year with an average of 0.78 reviews per day, per reviewer (p. 18). The study further compared the City of Knoxville to three other municipalities and presented a spreadsheet that indicated that Knoxville plan reviewers averaged 168 reviews per reviewer; and further indicated that the cities of High Point, Cary, and Greensboro, North Carolina, averaged 1498, 1013, and 421 reviews per reviewer, respectively (p. 22).

Darden (2004) went on to make recommendations for each particular category. For the category of plan review, Darden had six recommendations, the last of which suggested to “Reduce the time required for plan reviews to an acceptable standard” (p. 19), but he fails to

introduce the “acceptable” standard. Anecdotally, however, one can deduce that an average of 0.78 reviews per day is remarkably low in this work category.

The enforcement section of the Prevention Bureau contains the existing building inspection program, fire code permit inspection, and investigations. The Washington Survey and Rating Bureau (2013) indicated that “Staffing levels must be sufficient to ensure comprehensive inspections” (p. 27). Unlike the plan review section, the document indicated that “A maximum of 10 inspections per day per inspector will be used in reviewing staffing levels” (p. 27); however, one is left to assume that this value is based on an eight hour work day. If the conversion factor should be 0.8, i.e. 8 hours divided by 10 inspections, then one fire inspector should complete 12.5 inspections per 10 hour work day.

In the PF&R study, Tridata (2008) indicated that inspectors, not utilizing electronic recording devices, should conduct between five to seven inspections per 10 hour workday (p. 202). Tridata (2008) authors again base their workday average estimate on their “experience” and not on any national, state, or local standards or recommendations (p. 202).

Although the operations assessment of the City of Knoxville, Division of Plans Review and Inspection specifically excluded fire inspectors within several areas of the review, Darden (2004) established that a range of 8.82 to 15 inspections per day per inspector existed for the four municipalities represented in the report; the average of the four municipalities was 11 inspections per day per inspector (p. 22). Further, Darden (2004) represented that “On the basis reported figures, a workload of 10 to 16 general building inspections per day seems reasonable” (p. 17); although like most of the documents reviewed within this research, this “reasonable” standard was proffered without citing an actual standard or even a consensus document.

Fire investigation, as a program, is an integral part of the enforcement branch of any full service prevention bureau. Fire cause and origin statistics should be maintained from which to

develop public fire education programs that would target where and why fires are starting within a given jurisdiction.

The Washington Survey and Rating Bureau (2013) indicated that “fire investigations must be done by experienced, certified personnel to determine the cause and origin of all fires” (p. 29). The document further applied deficiency points, up to 20% in the fire investigation category, to investigators that are not commissioned law enforcement officers or whose staffs are insufficient to “ensure adequate response” (p. 29).

Like the WSRB grading schedule, the Insurance Services Office Incorporated (2012) indicated that the staffing level should be enough to fulfill the obligation of the task i.e. conduct investigations of all fires within the jurisdiction (p. 61). The authors further indicated that fire investigators should be certified, but did not mention or dictate whether a peace officer commission was recommended.

Tridata (2008) indicated that a workload capacity for fire investigators should be between 100 and 150 investigations per investigator per year (p. 204); and further indicated that a comparison should be made between the hours spent on an investigation and whether the defendants were successfully prosecuted. Among the numerous “best practices” cited within the Tridata (2008) analysis, the authors also indicated that, pertaining to investigations, “best practice includes certifying fire investigators as peace officers” (p. 205).

Crawford (2011) discussed fire investigation as a program and suggested that when criminal acts were detected and a criminal investigation was required, “the scope of the investigation process usually increases dramatically” (p. 94). In chapter 5, Crawford discussed peace officer commissions for fire investigators as an option, but also referred to the need for a robust relationship with police and prosecutors when the investigation “goes beyond cause determination” (p. 98).

In their review of the Huntington Fire Department fire investigation program, McGrath Consulting Group, Inc (2011) noted that, due to budget constraints and staffing cuts, fire investigations were no longer conducted. The authors further point out that, although shift fire investigators with peace officer credentials were once a fundamental component of the prevention bureau, they now “recommend that the Fire Department continue to conduct minimal fire investigations as to the cause and origin...” (p. 249).

Few documents exist that would proffer staffing levels for individual communities. Many indicated that the value of fire prevention programs be proved by data, and then be evaluated economically by the affected community as to what level of service is required of the fire prevention bureau. In regard to staffing, National Fire Protection Administration (2014) NFPA 1730 generically indicated that “The resources and personnel required to provide the level of service(s) outlined in 4.1.1 shall be determined by the FPO or by the AHJ” (p. 4.7.1).

In an effort to establish the number of personnel needed given a known amount of work hours, NFPA 1201 Standard for Providing Fire and Emergency Services to the Public (2010) was reviewed. This document will likely be superseded by NFPA 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations to the Public when the document is adopted.

NFPA 1201 (2010) utilized a model that established the number of needed personnel by instituting a five step process that guides the reader to “identify the services and duties that are performed within the scope of the organization...;” “to quantify the time necessary to develop, deliver, and evaluate various services and duties...;” and then to “convert the demand for services to annual personnel hours required for each program” (p. 1201-10). The document then further advises to factor in the various personal leaves taken by employees including holidays, vacation, training, sick leave, etc. Another component within step 4 was the application of a

category called “Times uncertainty factor” (p. 1201-11). This category was expressed as a percentage then added to the various personal leaves previously established.

NFPA 1201 (2010) then indicated that the final step of this process established the total personnel required by a “division of the unassigned personnel hours by the adjustment factor will determine the amount of personnel (persons/year) required” (p. 1201-11). The step then advised the reader to consider rounding up or down of fractional values based on prospective overtime, or the potential for reserve work hour capacities.

PROCEDURES

A descriptive research method was utilized to direct this study and included the collection of data using the Department’s record management system, Flexible Data Management (FDM), and the City of Spokane Valley Building Department’s record management system, SmartGov. Numerous personal interviews of affected employees were also conducted in an effort to obtain accurate work productivity not captured in the record management systems.

On the question of what is the present workload of the Spokane Valley Fire Department Prevention Bureau by activity, an exhaustive search of record management system FDM was conducted to obtain the number of existing building inspections, fire code permit inspections, plan reviews associated with fire permits, investigations, public education events, and third party inspections performed between January 1, 2013, to December 31, 2013, in total and by individual. An exhaustive search of SmartGov was then conducted to establish the number of plan reviews associated with building permits performed between January 1, 2013, to December 31, 2013. This data search addressed the question of how much additional workload will be created with the addition of the 1650 existing building inspections.

As much of the work within the Prevention Bureau was not captured in record management systems, personal interviews were conducted to establish work hours for activities

such as water resources (fire hydrant inspection and testing program), care and training of the accelerant detection K9, and other inspections and plan reviews not currently captured electronically. The research of work hours by the affected employees was limited by their memory, notes, and information contained in their personal calendars. Thus, there was time provided between interviews which allowed employees to conduct their own research into their respective work hours.

AFM 1, Stephen Neff, was interviewed on March 4, April 8, and 15, 2014, in regard to work hours performed in the areas of plan review, fire code permit inspections, existing building inspections, and fire investigations. AFM 2, Richard Freier, was interviewed on March 4, April 15, and 24, 2014, in regard to work hours performed in the area of K9 care and training, fire investigations, water resources, and public education. AFM 3, Gregory Bennett, was interviewed on March 4, and April 17, 2014, in regard to work hours performed in the areas of H occupancy quarterly inspections, existing building inspections, and fire investigations. AFM 4, William Clifford, was interviewed on March 6, April 8, and 10, 2014, in regard to work hours performed in the area of existing building inspections, public education, public information, and fire code permit inspections. AFM 5, Terry Thompson, was interviewed on April 16, 2014, in regard to work hours performed in the area of existing building inspections and K9 care and training. FPE, Traci Harvey, was interviewed on April 14, 16, 17, and May 1, 2014, in regard to work performed in the area of plan review. All of the employee interviews were conducted in person.

Utilizing the personnel management software system Telestaff, the various categories for work hours were obtained for each employee, including scheduled shifts, training, sick leave, vacation, administrative leave, bereavement leave, holidays, and physicals for the year 2013. Average hours for sick leave use, vacation, and other time off categories were also calculated and utilized to evaluate the workload against the current organizational structure in an effort to

evaluate what changes will be needed to include the additional 1650 existing building inspections into the current workload capacity.

Personal interviews were also conducted with responsible persons employed in prevention bureaus of regional fire departments including: Fire Marshal Lisa Jones of the Spokane Fire Department; Fire Captain Dan Walsh of Spokane County Fire Protection District #9; and Division Chief Marty Long of Spokane County Fire Protection District #8. Particular attention was paid to existing building and quarterly H occupancy inspections.

A collection of organizational charts utilized by fire service agencies that perform similar prevention bureau work was collected and evaluated as to work activity and function. The review of organizational structures can be extremely subjective, or simply oriented for personal preference; however, the goal was to obtain functional organizational charts by activity category that also maintains an appropriate supervisory span of control (maximum 7, nominal 5). The question of what changes would be needed to include the additional 1650 existing building inspections into the current workload capacity was addressed within this study with the awareness that a reorganization of the Prevention Bureau organizational structure was compulsory.

RESULTS

The record management systems FDM and SmartGov produced data that addressed, in part, what the present workload of the Spokane Valley Fire Department Prevention Bureau by activity; present meaning January 1, 2013, to December 31, 2013. Multiple spreadsheets were developed to track the data by individual employee, by leave type, and by work activity.

The spreadsheet titled Prevention Workload by Position, attached as Appendix B, was created through numerous employee interviews and gave a somewhat anecdotal employee perspective of how individuals spent their work time separated by activity and reflected as a

percentage. This spreadsheet was later used to assist in ascertaining the actual work hours not collected in record management systems, but was scrutinized several times by both the employees and the author as to its accuracy. The value of this process was realized not only in the recognition of the employees as program managers, but it also identified and subsequently documented the various other duties and liaison assignments in which they were involved.

Data was then collected from FDM that established the number of H occupancy (H), existing building (EB), and fire code permit (FC) inspections documented and how many were completed by each inspector. Those values are reflected in Table 1.

Table 1
2013 Inspection work hours

	H Inspections	EB Inspections	FC Inspections	Time per inspection	Sub-total hours
AFM 1	0	0	104	3	312
AFM 2	0	19	0	0.7	13.3
AFM 3	209	0	0	4	836
AFM 4	0	0	25	3	75
AFM 5	0	3157	0	0.33	1052
CO	0	1628	0	0.7	1139.6
Total	209	4804	129		3427.9

Note. CO indicates Company Officers

It was discovered, during the course of the investigative study, that only one quarter of the fire code permit inspections were captured in FDM; so to more accurately reflect the number of inspections, the time factor of 3 was multiplied by the number of fire code permit inspections conducted to ascertain the number of actual work hours. Subsequent to interviewing AFM 5, it was estimated that he spent 20 minutes per existing building inspection (a multiplier of 0.33).

Data was then collected from both FDM and SmartGov record management systems in regard to the various plan reviews conducted by the FPE. Tables 2 and 3 were created to chart the number of permits, reviews, and the average time spent on each individual review.

Table 2

Building Permits and plan review work product

Building Permit Review Types	# of permits	Reviews	Avg time/review	Total Time (hours)
Additions	10	20	1	20
New Residential	4	8	3	24
New Commercial	19	38	1.5	57
Pre-Application	21	42	2.5	105
Change of Occupancy	2	4	1	4
Technical Inspection	118	143	1	143
Portable Classrooms	6	12	3	36
Engineering Grading	5	10	0.5	5
Total =	185	277	Total time=	394

Table 3

Fire Permits and plan review work product

Fire Permit Review Types	# of permits	Reviews	Avg time/review	Total Time (hours)
Plats/BLA's		95	1.50	142.5
Sprinkler	72	89	2.50	222.5
Fire Alarm	57	68	1.50	102
Hood Systems / Paint Booths	60	60	1.50	90
Fire Permits		176		
Total =	189	312	Total time=	557

Note. BLA indicates Boundary Line Adjustment

The goal of the tabled data (above) was to establish the number of hours per review that could be used, not only to determine the 2013 workload, but to further be utilized for a proposed reorganization of the workload. An additional 165 hours for various meetings, not reflected in Table 1, was added to the review hours for Fire Permits (557) and review hours for Building Permits (394); the sum of which is 1116 hours. The sum of the hours was then divided by the number of reviews, which established the hours per review; and represented mathematically as $1116 \div 589 = 1.9$ hours per plan review.

AFM 2 and 4 also had substantial hours in the work category of public education.

Various educational programs were identified including Junior Fire Marshal, Fire Safety House, fire extinguisher training for businesses, career fairs, mock vehicle crashes, middle school science classes with the accelerant detection K9, elementary school science fairs, and fire safety

talks at service clubs, businesses, and assisted living facilities. It was identified through data collected in FDM that AFM 2 worked 166 hours and AFM 4 worked 436 hours in the public education category; and for the purposes of comparing to reviewed literature in the category of public education, the Prevention Bureau participated in seven youth education programs and two adult education programs.

There were 4 total personnel assigned to conduct fire investigations, including AFM's 1, 2, 3, and the DFM. Generally, it was estimated that the AFM's spent 10 hours per investigation resulting in 370 hours for AFM 1, 540 hours for AFM 2, and 220 hours for AFM 3. The DFM is assigned the duties of lead fire investigator and, as such, reviewed reports and conducted the longer term investigations that included numerous search warrants and multi-agency investigations. It was estimated that the DFM spent 670 hours in this work category.

AFM 2 and 5 were responsible for the care, training, and feeding of the accelerant detection K9. AFM 2 was the primary dog handler and spent 220 hours of on-duty time, and AFM 5 spent 39 hours of on-duty time in the care and training of the K9.

AFM 4 was assigned the duties of public information and public education. Through interviews and review of FDM for incidents of which he responded in the year 2013, it was estimated that AFM 4 conducted 424 work hours associated with the public information work category; this included weekly and response related press releases, communicating training and other types of information, and maintenance of relationships with journalists and other media representatives.

With the use of the personnel management software system Telestaff, the following work hours by activity for each employee assigned to the Prevention Bureau were identified. The total available hours did not include the various leaves (administrative, sick, bereavement, holidays,

and vacation) taken by each employee. Table 4 below includes only work categories where there was more than one employee assigned.

Table 4
Work hours by activity

	Training	Inspections	Investigations	Public Education	K9 Care	Wellness	Work not captured	Subtotal by employee
AFM 1	220	312	370	0	0	170	148	1220
AFM 2	72	13.3	540	166	220	0	0	1011.3
AFM 3	194	836	220	0	0	126	60	1436
AFM 4	80	75	0	436	0	86	280	957
AFM 5	107	1052	0	0	39	170	48	1416
FPE	44	48	0	0	0	0	275	367
DFM	52	0	670	0	0	86	410	1218
Total	769	2288.3	1800	602	259	638	1525.5	7883.7

The work category of “work not captured” listed in Table 4 included meetings, inspections not captured in record management systems, general telephone calls from the public, plan reviews not captured in record management systems, courtroom testimony, testimony preparation, crime laboratory testing, and supervisory time for the DFM. These hours were established by conducting numerous interviews with the affected employees and a review of personal calendars, notes, and phone message forms. The FPE maintained the most accurate telephone message forms at 1320 telephone calls returned; and if the average of the telephone calls was calculated at 5 minutes, it resulted in 110 work hours.

Additional work conducted by individual employees where only one employee was identified as having worked within the category are listed in Table 5 and include: plan review, public information, water resources, and third party inspections. The category of “time uncertain” was established based on recommendations from NFPA 1201. The number of hours assigned to this category was 230 hours, which is approximately 10% of the total shift schedule, including personal leaves.

Table 5
Total employee hours 2013

	Sum of hours from Table 4	Water Resources	Time Uncertain	Plan Review	Public Information	Subtotal	Telestaff Schedule	Unaccounted hours
AFM 1	1220	0	230	0	0	1450	1710.5	260.5
AFM 2	1011.3	200	230	0	0	1441.3	1493.5	52.2
AFM 3	1436	0	230	0	0	1666	1699	33
AFM 4	957	0	230	0	424	1611	1751.5	140.5
AFM 5	1416	0	230	0	0	1646	1700	54
FPE	367	0	230	1116	0	1713	1783	70
DFM	1218	0	230	0	0	1448	1538	90
Total						10975.3		700.2

The process of ascertaining the work hours performed by the various employees included transferring the work hours into full time employees (FTE's). This process divided the sum of the 2013 total work hours established through each work category (10975.3 hours) by the average of the scheduled shift work hours obtained from Telestaff (1670 hours); mathematically represented as $10975.3 \div 1670 = 6.57$. This equation confirmed 6.57 FTE's out of the 7 FTE's available in the Prevention Bureau for 2013 work product. The remaining 0.43 FTE's is the 700.2 hours associated with the work category "Unaccounted hours." The hours within this category could not be substantiated by record management systems, but may include participation in other Department programs including Pipe and Drum Corps, Honor Guard, and various meetings associated with union negotiations; and, specifically for AFM 1, the informal job training of plan reviews.

With the probability that work within the Prevention Bureau was going to be reassigned within the employee group, and to establish an average of scheduled shift work hours, the following averages were calculated: Average total work hours including personal leaves = 2033.4; average total work hours not including the personal leaves = 1667.9 hours; average sick leave = 59.85; average vacation = 197.57 hours; average holiday = 96 hours; average training = 109.86 hours.

In regard to what new workload capacity, i.e. time, would be needed to complete the additional 1650 existing building inspections, the multiplication factor of 0.7 was used resulting

in identifying that 1155 hours of additional work was assigned to the Prevention Bureau, and subsequently to the four AFM's. The additional work was then divided by the average number of total work hours, not including the various personal leaves, or 1155/1700, resulting in 0.68 FTE, which established the additional workload created by the 1650 existing building inspections previously assigned to 33 company officers.

Considering organizational charts of prevention bureaus with similar work activities, the fire departments of the City of Spokane, City of Renton, City of Kent, and South King Fire and Rescue were included in the study; and also based, in part, on similar assessed evaluations and populations. The Prevention Bureau activities of the listed departments were analyzed and found to be substantially similar, although, none of the departments required peace officer credentials for fire investigators. The organizational charts were then reviewed finding that none of them had anything other than vertical reporting, i.e. all employees reported directly to the fire marshal. It was also found that many of the prevention bureaus were at the maximum capacity for span of control. The organizational charts are listed attached in Appendix A.

DISCUSSION

The research and subsequent isolation of work hours by employee based on activity established not only the number work hours categorically, but further identified the strengths and weaknesses of the record management systems and their ability to capture hours of work, numbers of inspections, and the number of plan reviews conducted by the employees.

This realization of inadequate information obtained within data analysis was also observed in a number of published documents, including the Tridata (2008) study concerning PF&R that indicated that the data collected was not sufficient to formulate an opinion as to workload. Several categories of work, including, but not limited to water resources, public information, and third party inspections, and the subsequent calculation of work hours were

established by anecdotal evidence produced during numerous interviews of the responsible employees.

The substantiation of 6.57 of the 7 available FTE's, within the results section of this document, was considered a success knowing that much of the data was collected anecdotally. The research revealed that only about one in four fire code permit inspections were being documented; and that numerous special occupancy inspections, in the category of existing building inspections, were not being documented i.e. event inspections at the Spokane County Fairgrounds. It also revealed that searching the records management system FDM for plan reviews was not possible with the pre-established search methods.

Crawford (2011) indicated that the work activity of the Prevention Bureau be distributed into three categories: education, enforcement, and engineering. Research found that work activities within the Prevention Bureau were assigned haphazardly among the available personnel, i.e. AFM 2 is responsible for water resources, public education, fire investigations, existing building inspections, and K9 care and training. Crawford (2011) further stated that "Expecting one person to adequately conduct a plan review of new construction, enforce the fire code, conduct public life safety and fire presentations, and investigate fires is unrealistic" (p. 246). The practice of assigning work indiscriminately to employees without regard for their training was found to be the standard practice dating back to the inception of the Prevention Bureau (1980). This method, while appropriate when the Prevention Bureau consisted of two to three employees, is now viewed as disorganized and is ill-advised by both Crawford (2011) and Tridata (2008).

The debate among fire chiefs and senior fire service staff within the region, including the Spokane Valley Fire Department, on whether fire investigators should have police commissions has been a topic of discussion for many years. The discovery that police commissioned fire

investigators was deemed a “best practice” by Tridata (2008); and that the Washington Survey and Rating Bureau (2013) indicated a 20% deficiency for the investigation category for investigators that are not commissioned law enforcement officers served as further justification for the credentialing program (p. 29).

Tridata (2008) indicated that a workload capacity for fire investigators should be between 100 and 150 investigations per investigator per year (p. 204). The Washington Survey and Rating Bureau (2013) indicated that departments whose staffs are insufficient to “ensure adequate response” would receive a 20% deficiency. Fire investigations within the jurisdiction have averaged 144 from 2009 through 2013, with a 2012 high of 170 investigations; which would indicate at least one FTE for the fire investigation program. However, the Prevention Bureau provides 24/7 investigation services in an on call rotation; and, as such, would not be able to rely on a single fire investigator. Currently four employees rotate the on call allocation, so that each employee is on call every fourth week. This rotation does cause issues when an employee is off work on a long term illness or injury, or when an employee leaves the Prevention Bureau leaving three employees to conduct on call rotation every third week, while awaiting the fourth newly added employee to be trained in fire investigations.

The safety of employees assigned to fire investigations is a significant priority for the Department. As such, it was observed that, because of a City of Spokane policy change, Spokane Police Records no longer communicated criminal histories of suspects detained or others interviewed by fire investigators at fire scenes or elsewhere. This issue of safety can and should be addressed with the use of mobile computers with internet access.

Although several of the Prevention Bureau work activities were found to be successful, weaknesses were also discovered during this process. National Fire Protection Administration (2014) NFPA 1730 indicated that a community risk assessment (CRA) should be conducted and

from which “Educational programs shall be developed based on the CRR plan established” (p. 9.8.1); and that educational programs should be outcome based and measured against the CRA. The link between annual fire investigation statistics and education programs was not established during the course of the study, and the impact of the education program was not linked back to the same statistics.

The results of the research indicated that the Prevention Bureau participates in seven youth and two adult education programs, which falls three youth and three adult education programs short of the Washington Survey and Rating Bureau (2013) recommendations (pp. 28-29). The work created by the participation in the educational programs resulted in a combined 602 hours, which is 0.35 of an FTE. Tridata (2008) recommended that “at least one full-time public fire and injury educator is needed per 100,000 in population” (p. 203); the population of the jurisdiction served by the Prevention Bureau exceeds 115,000 citizens.

Although the Washington Survey and Rating Bureau (2013) lack a staffing recommendation or workload recommendation concerning plan review and fire investigations, they do recommend that “A maximum of 10 inspections per day per inspector will be used in reviewing staffing levels” (p. 27). Applying this maximum number of inspections to an 8 hour shift, the multiplication factor of 0.8 is established to obtain FTE’s for this work category. As the Prevention Bureau was assigned an additional 1650 existing building inspections, previously conducted by company officers, it can be immediately calculated that the 1650 existing building inspections would generate 1320 hours of work; and from the research, 1700 hours was used to indicate one FTE; thus, an additional 0.78 of an FTE would be needed to fulfill the added obligation without regard to workload reassignment.

AFM 5’s declaration that “if I had 40 minutes to conduct an inspection, I would be in the rafters... If I had that kind of time, I could do a much better job” (Terry Thompson, personal

communication, April 16, 2014) is a benchmark of one of the fourteen key principles for service quality in the Federal Emergency Management Agency (2013) Executive Development Student Manual: “E. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs” (SM 11-3). The financial benefits of the prevention of fire in commercial occupancies is difficult, if not impossible to measure, when a single fire can result in anywhere from zero to several million dollars in fire damage and associated loss. The impact to the community can also result in loss of employment, tax revenue, and community blight.

The success of Prevention Bureau programs and the comparison of the programs to similar agencies were not previously presented within this study. Mehaffey (2014) indicated, in *Fire in the Valley: 2013 Investigations*, that the fire investigation clearance rate for the Prevention Bureau in 2013 was 43.48%, which is over twice the 2012 national average of 20.6% (p. 3); and when compared to fire agencies with similar fire investigation resources, like results are also found. It should also be noted that all four available investigators within the Prevention Bureau hold several certifications for fire investigations.

When a comparison of existing building inspections to regional departments was made, it was found that, while the Spokane Valley Fire Department inspects 100% of its businesses, fire departments within the region vary greatly. Spokane County Fire Protection District #8 (FD #8) Division Chief Marty Long indicated that he inspects all of their 150 businesses annually, but does not conduct quarterly H occupancy inspections (Marty Long, personal communication, May 7, 2014). Spokane County Fire District #9 Fire Captain Dan Walsh indicated that he and two others inspect their existing businesses on a three year rotation, and similar to FD #8, they do not conduct quarterly H occupancy inspections (Dan Walsh, personal communication, May 7, 2014). The City of Spokane Fire Department (SFD) Fire Marshal Lisa Jones indicated that although

they have not conducted systematic existing business inspections in nearly 20 years because of a lack of staffing, SFD does conduct fire code permit inspections, complaint driven business inspections, underground storage tanks, large propane tanks, and operational permits, which include annual H occupancy and assembly permit inspections (Lisa Jones, personal communication, May 14, 2014).

It was also found that the Spokane Valley Fire Department was the only fire department that conducted quarterly inspections of H, or high hazard, occupancies within the region. The quarterly H occupancy program is valued at 80 points in Table 7 of the Washington Survey and Rating Bureau (2013) Protection Class Rating Schedule (p. 27).

The organizational structures of prevention bureaus with similar activities, listed in Appendix A, were similar to vertical reporting that the Spokane Valley Fire Department's Prevention Bureau currently employs. The current span of control was not exceeding the maximum recommendation of seven; however, if a reorganization of the workload were to ensue then the organizational structure would require a further review.

RECOMMENDATIONS

The research contained herein supports several changes within the Prevention Bureau, organizationally. Each of the following recommendations either maintains or increases the level of service within the specific work activity. A financial analysis was conducted and is included at the conclusion of the recommendations section.

With the recognition that plan reviews are within the record management system FDM, but not searchable, it is recommended that the database be reviewed by the Information Systems Division and appropriate staff to create a search method that allows both the users and the supervisors to review, by type and by volume, the number of plan reviews conducted by the reviewers. It is also recommended that a method be established to enter or track the time spent on

an individual plan review, so that the permit fees may be adjusted for the specific type of review being conducted.

It was also identified that many existing building inspections for events at assemblies, like the Spokane County Fairgrounds, and fire code permit inspections were not being captured in FDM. It is recommended to immediately begin documenting any and all fire code permit and existing building inspections and entering them into FDM. This will ensure the tracking of nearly the entire work product conducted by employees with responsibilities within this work category.

Now that the Prevention Bureau is conducting all of the inspections within the jurisdiction, it is recommended to purchase and deploy mobile technology in the form of tablet style computers that contain the record management systems, so that employees responsible for this work can enter the data directly into FDM or SmartGov, creating a more efficient and effective inspection method. The electronic devices should have mobile access to the internet and the record management systems so that real time data can be recorded and updated. This mobile internet access would also allow fire investigators to access police records for criminal histories of suspects and other individuals. An estimation of costs associated with this recommendation is included at the conclusion of the recommendation section.

A structural reorganization of the Prevention Bureau is recommended. There are several significant changes that are displayed within the organizational chart listed in figure 1, below. The work and the employees of the Prevention Bureau should be separated into three categories: Education, enforcement, and engineering. The words in parentheses indicate the direct supervisor of the three categories, i.e. *Education Group (FM)* indicates that the Fire Marshal will directly supervise the employee(s) in that category or group; *Enforcement Group (DFM)* indicates that the Deputy Fire Marshal will directly supervise the employee in that group, etc.

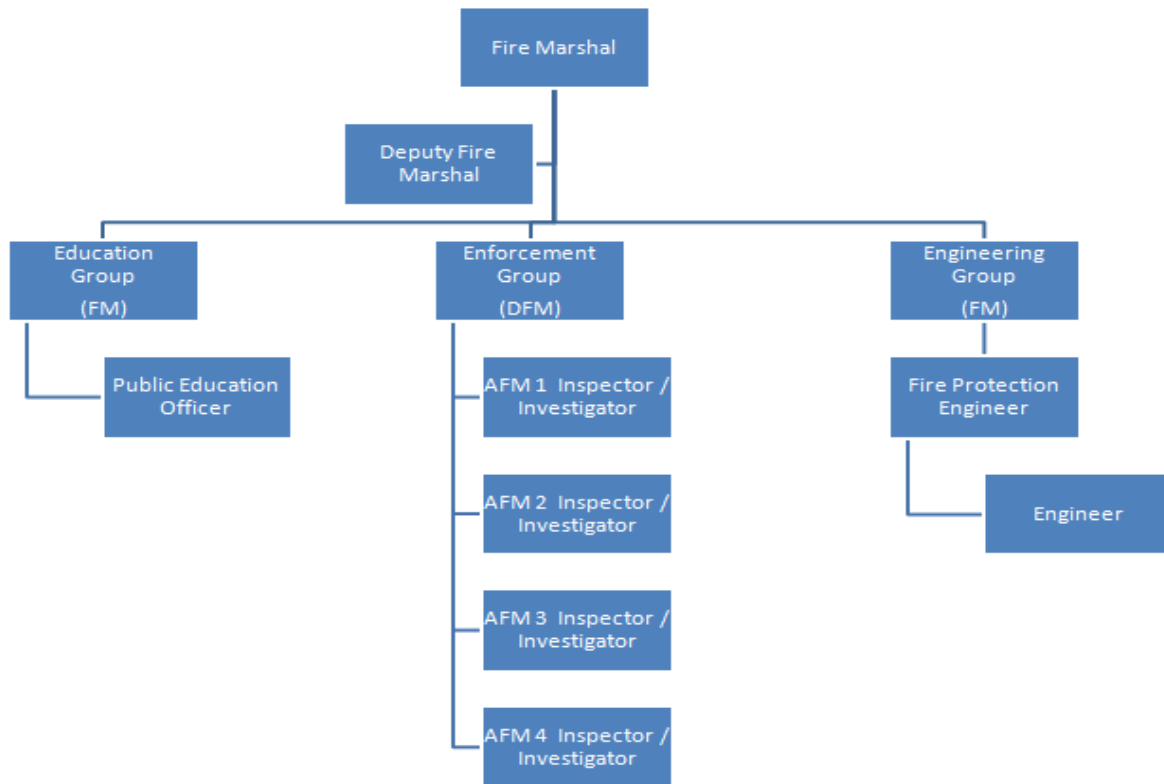


Figure 1. Proposed Spokane Valley Fire Department Prevention Bureau Organizational Chart.

Under this proposed organizational structure, the DFM will directly supervise the AFM's, and, by job description, will further:

- act as the fire marshal in his/her absence;
- continue to conduct long term and complex fire investigations requiring search warrants, multi-agency coordination, etc.;
- develop, implement, and maintain all training for Prevention Bureau staff;
- analyze workloads, processes, and functions within the Prevention Bureau;
- review fire reports from AFM's and company officers for completeness to ensure a comprehensive work product;
- supervise and monitor existing building inspection and fire hazard complaint programs in regard to quality control and volume;
- and ensure the professional development of the AFM's.

One AFM should be replaced, through attrition, with an engineer who specializes in chemicals or hazardous materials. The engineer will be responsible for the H occupancy (high hazard) inspection program and will further be a subject matter expert in the field of industrial hygiene. There will be two minor duties assigned to the engineer as well including water resources and relief plan reviewer, which will better enable the Prevention Bureau to accommodate for vacation and sick leave of the FPE. A job description for the position of engineer has been prepared and is attached in Appendix D.

The engineer will work under the supervision of the FPE, which will allow them to complete the work requirements associated with becoming a licensed professional engineer, if they so desire. The engineer will not be encumbered by training in other areas of work, i.e. fire investigations, EMT, etc. A minimum of a Baccalaureate degree in engineering (civil, mechanical, environmental, chemical, etc.), mechanical engineering technology, chemistry, or related field from an accredited college or university will be required.

There are five universities in Eastern Washington and Northern Idaho that have engineering programs, including Eastern Washington University, Central Washington University, Washington State University, University of Idaho, and Gonzaga University. The Department should participate in career fairs at all of the universities to engage the students in applying for the engineer position, as well as utilizing other marketing methods.

This replacement of the AFM to an engineer results in the four remaining AFM's conducting existing building inspections, fire hazard complaints, and fire investigations. This narrowing of the scope of work for the AFM's will allow them to better specialize in their fields of work; and will further present fixed duties to employees seeking to promote into the Prevention Bureau. The AFM's will conduct 1200 existing building inspections and fire hazard complaints each; approximately 35 fire investigations each; which results in about 200 hours

(approximately 10% of total available work hours) in the category of time uncertain for participation in instructing or presenting public education programs, or in technical committees, i.e. International Association of Arson Investigators board members.

In regard to fire investigations, the on call rotation will be further bolstered to require that the four trained AFM's will conduct an on call rotation that consists of each member being on call every fourth week, as it is currently; however, the DFM will be available to be on call when conflicts arise for issues such as personal leaves, i.e. sick leave, vacation, etc.; and will further be assigned as the fourth investigator on call if one of the AFM's leaves the Prevention Bureau or suffers a long term illness or injury. This allows the on call rotation and the work schedule for the three remaining AFM's to be unaffected. The DFM will simply change their schedule to match that of the conflicted or leaving AFM, while awaiting the newly promoted fourth AFM to be trained in origin and cause determination.

Another significant recommendation is to employ a public educator that will not be encumbered by any other duty, i.e. fire investigations, fire inspections, EMT training, etc. The public educator will, as recommended by National Fire Protection Administration (2014) NFPA 1730, conduct a community risk assessment (CRA) to establish a community risk reduction (CRR) plan from which "Educational programs shall be developed based on the CRR plan established" (p. 9.8.1); and will further ensure that educational programs be outcome based and measured against the CRA. The public educator will be responsible for the coordination, implementation, and monitoring of all public education programs offered by the Department. A job description for the position of public education officer has been prepared and is attached in Appendix E.

Table 6, below, contains the proposed distribution of work hours by position for seven members of the Prevention Bureau, including the positions of AFM, FPE, engineer, and

public educator. This method of calculating FTE’s was derived from the estimation of projected work hours within each work category divided by the total annual work hours (1670). The FTE’s represented under the specific categories indicate the number of employees needed to conduct the work within that category, i.e. 2.01 FTE under the category of EBI indicates that the 3360 work hours in the category of existing building inspections are equivalent to just over two full time employees; or mathematically represented as $3360 \div 1670 = 2.01$ FTE’s.

The category of “total annual” work hours by employee of 1670 include the following categories and work hours that were obtained as the average of the employee work hours from 2013, but are not individually represented in table 6: Training for AFM’s - 130 hours; training for FPE/Engineer/Public Educator - 110 hours; sick leave - 60 hours; wellness - 90 hours; and time uncertain - 200 hours. These categories calculate to 3300 work hours, which further represent 1.98 FTE’s collectively; or mathematically represented as $3300 \div 1670 = 1.98$ FTE’s.

Table 6
Proposed Workload in hours per year

Position	Total Annual	EBI	FCPI	HOI	Plan Review	FI	Water Resources	3rd Party Inspect.	Public Ed.
AFM 1	1670	840				350			
AFM 2	1670	840				350			
AFM 3	1670	840				350			
AFM 4	1670	840				350			
FPE	1670		20	50	1060		40	40	
Engineer	1670		280	640	140		150		
Public Educator	1670								1210
Total demand	11690	3360	300	690	1200	1400	190	40	1210
FTE=	7	2.01	0.179	0.41	0.72	0.84	0.113	0.024	0.724

Note. EBI indicates existing building inspections; FCPI indicates fire code permit inspections; HOI indicates H occupancy inspections; FI indicates fire investigations; FTE indicates full time equivalents.

The NFPA 1201 Standard for Providing Fire and Emergency Services to the Public (2010) method of calculating FTE’s is represented in Table 7. The total annual hours used were derived from the 2013 average from the personnel management system Telestaff. This method of

calculating FTE's was considerably more general and did not include all of the personal leaves, i.e. administrative leave and bereavement leave.

Table 7
NFPA 1201 method of calculating FTE's

Category	Hours
Vacation	200
Holidays	96
Sick leave	60
Training	130
Time Uncertain (10%)	203
Sum of unavailable hours	689
Annual hours	2033
Total available hours (annual hours - sum of unavailable hours)	1344
Total demand	9020
Total full time employees needed (total demand ÷ total available)	6.71

The final directive made by NFPA 1210, in regard to establishing FTE's needed, was to evaluate whether to round the fractional value up or down based on prospective overtime, or the potential for reserve work hour capacities. If this method were utilized to establish FTE's, then the recommendation was to round 6.71 to 7 FTE's.

The financial impact of the personnel recommendations includes several cost saving actions listed as follows: the replacement of the AFM with an engineer will substantiate a \$30,866 per year savings from the AFM that is most likely to retire in January, 2015, and utilizing the current pay scale of the FPE for the engineer position; the sunset of the K9 program in August, 2015, will secure a \$12,000 per year savings; the cancellation of the fire hydrant purchasing program will produce a \$20,000 per year savings; which results in \$62,866 of total cost saving measures per year.

The following expenditures are associated with the above recommendations: increased compensation for the position of FPE of \$14,157 per year, which brings the position more in line with similar degree required supervisory positions in the Department; the hiring of a public educator estimated at \$64,800 + 28% (medical, pension, etc.), totaling \$82,944 per year. The

annual recurring cost of the personnel recommendations, which includes the replacement of an AFM with an engineer and the addition of a public educator (cost saving measures - expenditures), is an estimated total annual expenditure increase of \$34,235 per year. Incidental costs such as vehicle maintenance and employee training of the public educator were not included.

Capital costs associated with the above recommendations include a vehicle and a computer for the public educator estimated at \$25,000 and \$1,500, respectively; six additional computer tablets for the DFM, four AFM's, and the engineer estimated at \$1,500 each, totaling \$9,000; all of which total a onetime capital expenditure of \$35,500.

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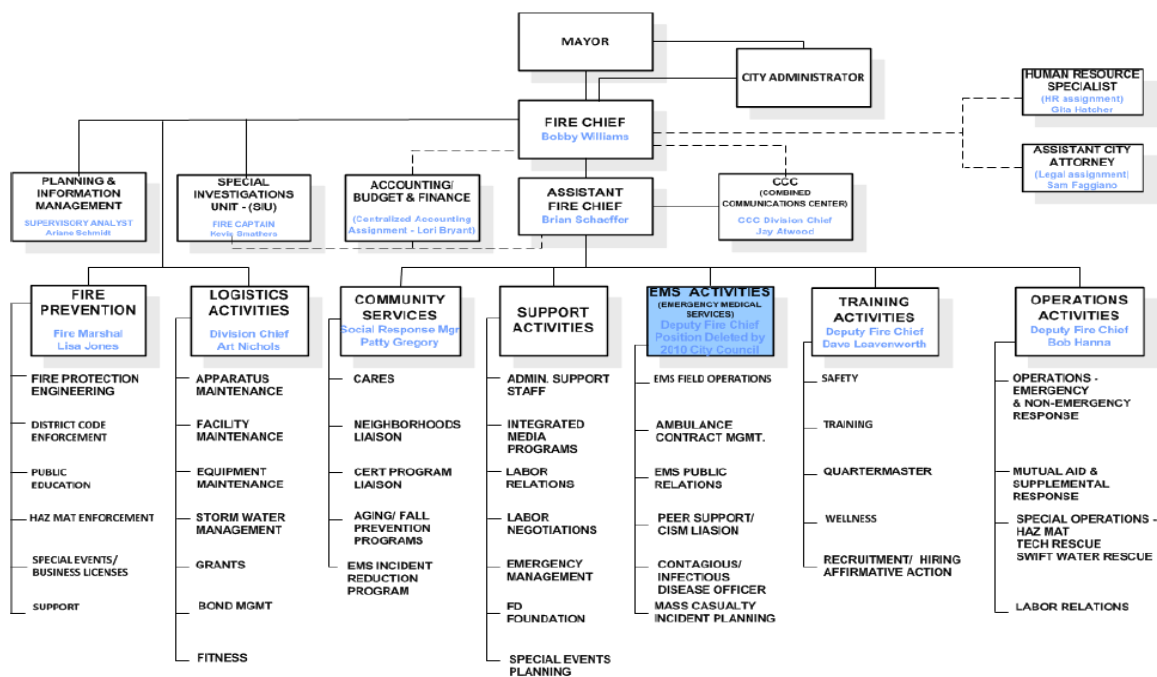
APPENDIX A - Organizational Charts

Spokane Valley Fire Department

2014 Organizational Chart

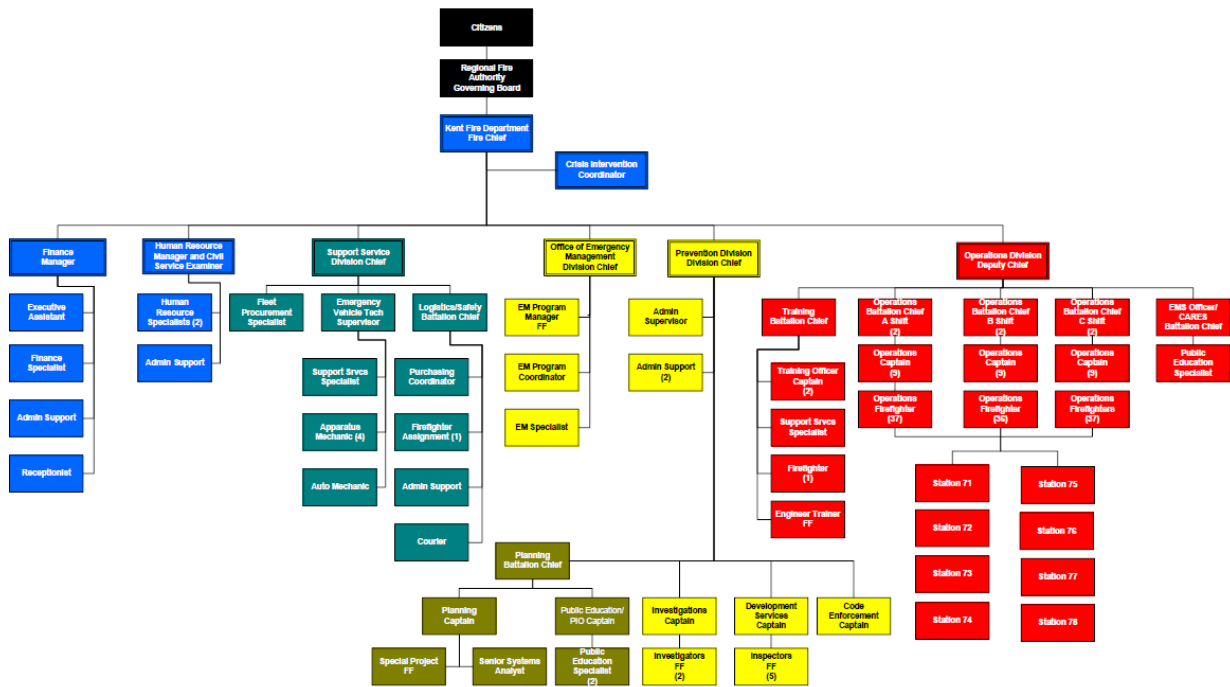


SPOKANE FIRE DEPARTMENT ORGANIZATIONAL STRUCTURE

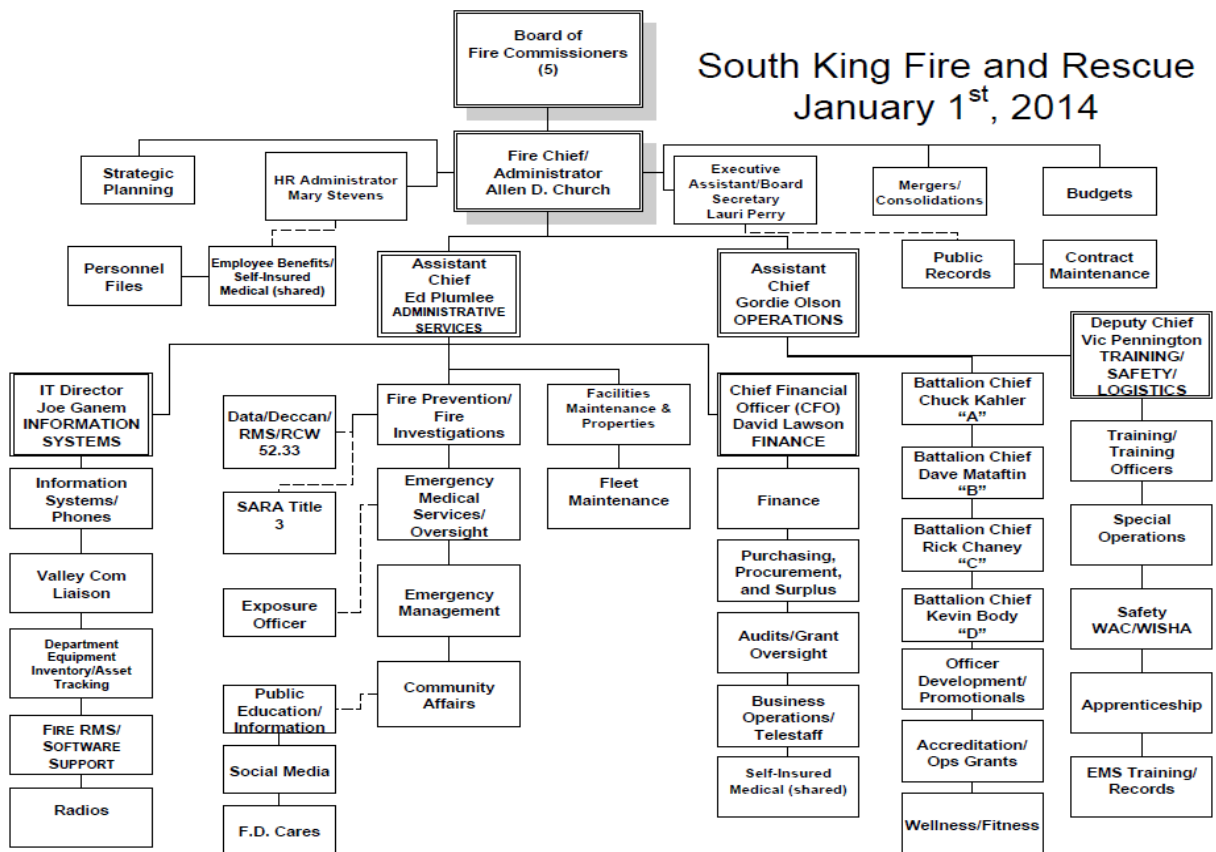


FOR 2013

KENT FIRE DEPARTMENT REGIONAL FIRE AUTHORITY
ORGANIZATIONAL CHART



South King Fire and Rescue
January 1st, 2014



APPENDIX B - Prevention Workload by Position

Position	Duties		% of time
DFM:	Program Management:	Fire Investigations	60%
Certified Fire Investigator	Supervisory:	Fire Investigators, Inspectors, FPE	15%
Certified Fire Inspector	Duties:	WSRB	15%
		Property Room Manager	10%
		Division Training	
		Background Investigations	
		Professional conduct investigations	
		TAC officer (WSP ACCESS)	
		Special Projects	
	Liaison Assignments:	Joint Terrorism Task Force	
		NW Organized Crime Group	
		Fusion Liaison Officer	
		Bureau of ATF	
		Law Enforcement (SCSO, LLPD, SVPD)	
		Spokane County Prosecutor's Office	
AFM 1:	Program Management:	Fire Code Permit inspections	60%
Certified Fire inspector	Duties:	Fire Investigations	20%
Certified Fire Plans Reviewer		Plan review with FPE	10%
		Hazardous Materials inspections	10%
		Pre-plan meetings	
		Fire Hazard complaints	
AFM 2:	Program Management:	Water systems/fire hydrants	25%
Certified Fire Investigator	Duties:	Fire Investigations	35%
Certified Fire Inspector		Mako care	10%
Certified K9 Handler		Public Education w/ Mako	15%
		Fire permit inspections	15%
		Short/Long Plats	
		Map Updates (roads, bridges, etc)	
	Liaison Assignments:	Water/Irrigation Districts	
		International Association Arson Investigators	
AFM 3:	Program Management:	Hazardous Materials Inspections (quarterly)	60%
Certified Fire Investigator	Duties:	Fire Investigations	30%
Certified Fire Inspector		Fire permit inspections	10%
	Liaison Assignments:	Fusion Liaison Officer	
		Honor Guard Commander	
AFM 4:	Program Management:	Public Information	30%
Certified Fire Inspector		Public Education	60%
Certified Public Fire Educator	Duties:	Fire permit inspections	10%
Certified Public Info Officer		Juvenile Fire setter program	

Certified Juvenile Fire Setter Intervention Specialist		Fire hazard complaints	
		Special inspections - Fair Grounds, etc	
	Liaison Assignments:	Inland Empire Public Fire Ed.	
		National Information Officers Assoc.	
		SAFE Kids Coalition	
AFM 5:	Program management:	Fire Inspections (existing buildings)	90%
Certified Fire Inspector	Duties:	Fire permit inspections	10%
Certified K9 handler		Fire Hazard complaints	
		Specialty occupancy inspections - Fair Grounds	
		Secondary Dog handler	
		Public Education w/ Mako	
FPE:	Program Management:	Plan review	70%
Licensed PE	Duties:	Reviews 3rd party inspection reports	10%
		Short/Long Plats	10%
		Fire Code Permit Inspections	10%
		Water systems/hydrants	
		New construction maps	
		Pre-plan meetings	
	Liaison Assignments:	Fire and Life Safety Code Council	

APPENDIX C - Engineer Job Description

Nature of Work

Under moderate supervision provided by the Fire Protection Engineer (FPE), the Engineer will manage the High Hazard Inspection program that focuses on hazardous materials, fire code compliance, and other industrial hygiene issues; and will further conduct inspections pertaining to the same. The Engineer will also manage the Water Resources function of the Fire Department, including the fire hydrant inspection and testing program, and work with the numerous independent water purveyors in an effort to increase the overall service to the public.

Additional duties will include assisting the FPE with performing specialized professional plan examination work in connection with reviewing plans and specifications of proposed buildings and structures; site development for conformance with building and fire codes and accepted engineering practices; and building and life safety system inspections. Duties require analyzing facts to determine the proper course of action. Work may occasionally be sedentary in nature requiring sustained periods of concentration; but may also require frequent outside contacts of a policy and enforcement nature requiring a high degree of tact, judgment, and technical competence performed under varying weather conditions. Employee may be required to respond to emergency incidents to provide advice and recommendations affecting employee and public safety.

Examples of duties and expectations (to include but not limited to):

- ◆ Conducts field inspections of proposed developments and existing buildings associated with hazardous materials and other industrial hygiene compliance issues.
- ◆ Manages the fire hydrant testing program which includes conducting fire hydrant testing and the assigning of testing work to fire crews and Assistant Fire Marshals.

- ◆ Reviews, inspects, and approves plans and specifications of proposed buildings, structures, and site developments.
- ◆ Performs engineering calculations and evaluates layout and design proposals to ensure compliance with established policies, standards, procedures, and codes.
- ◆ Participates in the issuance of building permits and authorizes the issuance of fire department permits.
- ◆ Provides instruction, advice, and guidance to associates on the proper methods of reviewing industrial hygiene compliance for structures and businesses.
- ◆ Provides counsel and advice to architects, engineers, developers, property owners, and contractors regarding interpretation and conformity with codes and regulations.
- ◆ Submits reports and recommendations on building conditions and interpretation of code requirements necessary for construction projects.
- ◆ Advises and assists private and public organizations for the purpose of safeguarding life and property against fire, explosion, and related hazards.
- ◆ Makes studies of industrial, mercantile, and public buildings, and other property before construction, considering such factors as fire resistance of construction, occupancies and storage array of contents in buildings, water supplies and delivery, and egress requirements.
- ◆ Reviews materials or equipment, such as building components protection, fire-detection equipment, fire alarm systems, and fire extinguishing devices and systems, and advises on location, handling, installation, and maintenance.
- ◆ May participate in local, state, and national code development processes. May review research studies and witness tests of fire retardants and fire safety of materials and devices.

- ◆ Assists other divisions and departments on matters related to interpretation and enforcement of fire and building codes pertaining to industrial hygiene and hazardous materials.
- ◆ Operates an automobile, may use drafting equipment, CAD and fire modeling software.
- ◆ Performs related work as required.
- ◆ Has responsibility for interpreting ordinances and codes as set forth by departmental policy and other regulations.

Supervision:

Works under the direct supervision of the Fire Protection Engineer and general supervision of the Fire Marshal.

Required occupational qualifications:

To be eligible to apply for this position the applicant must meet the following required occupational qualifications prior to the close of applications and then maintain them;

- ◆ Must have proof of eligibility for employment in the United States.
- ◆ Must be 18 years of age prior to the closing of applications.
- ◆ Must have a high school diploma or equivalent.
- ◆ Must have a valid state driver's license.
- ◆ Must be able to communicate the English language clearly and concisely, both orally and in writing.
- ◆ Must be a non-user of any tobacco products during employment hours if employed after January 2004.
- ◆ Must be a non-user of any tobacco products if employed after 1-1-2008.

Educational Requirements:

- ◆ A minimum of a Baccalaureate degree in engineering (civil, mechanical, environmental, chemical, etc.), mechanical engineering technology, chemistry, or related field from an accredited college or university is required.

Requirements of work:

- ◆ Ability to review, inspect, and interpret hazardous materials management engineering plans, and specifications; and evaluate findings and make recommendations for the elimination or control of hazardous conditions.
- ◆ Ability to apply practical knowledge and experience in order to resolve problems and conflicts related to assigned projects.
- ◆ Ability to establish and maintain effective public and working relations.
- ◆ Skill in making and constructively criticizing difficult engineering computations, estimates, plans, designs, specifications, and codes.

Supplementary Skills / Certifications (recommended):

- ◆ Knowledge of public health and hazardous substances management engineering principles, practices, and administrative procedures; State and Federal laws pertaining to public health and hazardous substances management; hazardous substances management facilities design and construction.
- ◆ Knowledge of modern construction methods and materials as applied to building construction, including the principles, techniques, and design of fixed fire protection and life safety systems.
- ◆ International Code Council (ICC) certifications in the categories of Fire, Code Enforcement, Commercial Inspector, or Plans Examiner are recommended but not required.

Physical Requirements:

- ◆ Ability to see, with or without corrective lenses, well enough to read fine print.
- ◆ Ability to hear, with or without a hearing aid, and speak well enough to converse on the telephone.
- ◆ Ability to climb one flight of stairs.
- ◆ Enough body mobility to walk and stoop.
- ◆ Enough manual dexterity to write and use a computer keyboard.
- ◆ Enough strength to lift and carry 10 lb. boxes of paper.
- ◆ Enough stamina to perform duties for up to four hours at a time with only one 15-minute break.

Adopted by the Board of Fire Commissioners on June 1, 2014.

Commission Chairman

APPENDIX D - Public Education Officer Job Description

Nature of Work

Under moderate supervision provided by the Fire Marshal, the public educator will develop, promote, coordinate, and conduct activities and programs which will educate or train the community and private industry concerning fire, life safety, injury prevention, and other dimensions of fire department activities. Employee will act independently in devising methods and procedures within the limits of fire department policy. Carelessness or lack of judgment may cause embarrassment to the jurisdiction and diminish public attitude toward the fire service.

Work is light in nature, involves frequent contact with the public, and may require irregular work hours. This is a non-combatant position, with no requirement for performance of fire suppression or emergency medical activities.

Examples of duties and expectations (to include but not limited to):

- ◆ Develops, modifies, and implements education programs to reflect identified needs.
- ◆ Interacts with the community and private sector administrators in the need for fire, safety, and injury prevention programs.
- ◆ Coordinates implementation of safety programs with school district administrators.
- ◆ Makes presentations to citizen groups, businesses, and schools. Includes leading discussions, showing slides and movies, and answering questions on fire and injury prevention and fire science.
- ◆ May interact with the media as the Department's public information and publicity representative at regular work station and emergency incidents.
- ◆ Analyzes fire department statistics to determine deficiencies / needs and focus of education programs.

- ◆ Evaluates the needs of special groups and develops appropriate programs to address those needs, to include health and safety issues and attitudes among the elderly, handicapped, very young, and emotionally disturbed.
- ◆ Develops and maintains a library of fire and injury prevention materials, including books, pamphlets, periodicals, films, and audio / visual materials.
- ◆ Prepares education display boards and schedules, delivers, and sets up for display.
- ◆ Coordinates the interview / referral process for children subsequent to fireplay / fire setting. Works with Prevention Bureau personnel, social workers, counselors, and juvenile justice agents as needed. Operates an automobile and standard office machines and computers.
- ◆ Performs related work as required.

Supervision:

Works under the direct supervision of the Fire Marshal.

Required occupational qualifications:

To be eligible to apply for this position the applicant must meet the following required occupational qualifications prior to the close of applications and then maintain them;

- ◆ Must have proof of eligibility for employment in the United States.
- ◆ Must be 18 years of age prior to the closing of applications.
- ◆ Must have a high school diploma or equivalent.
- ◆ Must have a valid state driver's license.
- ◆ Must be able to communicate the English language clearly and concisely, both orally and in writing.
- ◆ Must be a non-user of any tobacco products during employment hours if employed after January 2004.

- ◆ Must be a non-user of any tobacco products if employed after 1-1-2008.

Educational and other Requirements:

- ◆ Baccalaureate degree in education, communications, adult education, early childhood education, marketing, social work, or related field from an accredited college or university; or 10 years of public education experience; or a proportionate combination of education and experience is required.
- ◆ A minimum of two years of increasingly responsible experience as an instructor/educator with experience in planning and delivering education programs, classes, or presentations; or any combination of relevant education and experience which would demonstrate the individual's knowledge, skill, and ability to perform the listed duties.
- ◆ Familiarity with the fire service is desirable.

Requirements of work:

- ◆ Ability to learn the geography and demographics of the jurisdiction.
- ◆ Knowledge of fire department operations and the ability to convey that knowledge to individuals and groups.
- ◆ Ability to prepare fire department material for the print and broadcast media and participate in its presentation.
- ◆ Ability to express self well in writing and verbally; ability to speak in groups.
- ◆ Ability to learn applicable department rules and regulations.
- ◆ Willingness to actively pursue additional training to maximize needed job skills and to maintain state of the art knowledge through continuing education at training schools, seminars, conferences, and study of written materials.
- ◆ Willingness to work irregular hours.
- ◆ Ability to use a variety of audio / visual equipment.

- ◆ Ability to gather and interpret statistical data for use in program development.
- ◆ Must attain Public Fire and Life Safety Educator I within one year of employment.

Physical Requirements:

- ◆ Ability to see, with or without corrective lenses, well enough to read fine print.
- ◆ Ability to hear, with or without a hearing aid, and speak well enough to converse on the telephone.
- ◆ Ability to climb one flight of stairs.
- ◆ Enough body mobility to walk and stoop.
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