I have been asked to comment and offer an opinion on the matter of the Owen Sound Professional Fire Fighters Association proposal to increase staff from 26 to 28 firefighters; and to comment and offer an opinion on the Corporation of the City of Owen Sound’s proposal to reduce the minimum on duty firefighter staffing from 5 firefighters to 4 firefighters.

I have reviewed the following documents and resources in my review.

KCB - Fire Services Assessment, Final Report for the Corporation of the City of Owen Sound, July 23, 2018


OFMEM Comprehensive Fire Safety Effectiveness Model

OFMEM Fire Ground Effectiveness Sub-Model

OFMEM Fire Risk Sub-Model


Ontario Occupational Health and Safety Act - Ontario Fire Service Section 21 Advisory Committee Guidelines and Guidance Notes
Owen Sound Fire and Emergency Services Standard Operating Guidelines/Procedures

SOG # 1 - 24 - Emergency Vehicle Placement

SOG # 2 - 02 - Buddy System

SOG # 6 - 02 - Best practise for fire responses and initial fireground operations

SOG # 6 - 04 - 2nd alarm upgrading

SOP # 6 - 34 - Fireground Safety

SOP # 6 - 37 - Two In / Two Out

SOP # 6 - 51 - Staffing and Operations

SOP # 6 - 52 - High Rise (Includes-Multi Level Structures & Senior / Nursing Homes)

SOP # 6 - 53 - Ship Board Fire Fighting

SOP # 6 - 56 - Specialized Rescue / Response - Bomb Threat

Fire Services in Ontario - A Perspective

Municipal fire services in the Province of Ontario are governed by the provisions of the Fire Protection and Prevention Act, 1997 (FPPA). The FPPA consolidated most of the provincial legislation governing the full gamut of fire related activities and regulation in Ontario.
The FPPA specifically sets out the responsibilities for municipalities and mandates every municipality to establish a program that includes public education with respect to fire safety and certain components of fire prevention. The Fire Marshal for Ontario has determined that minimum compliance with the mandatory fire prevention and public education requirements must include:

- a simplified risk assessment
- a smoke alarm program with home escape planning
- distribution of public education materials
- inspections upon complaint or request

The FPPA further mandates that a municipality shall provide other fire protection services as it determines may be necessary according to its needs and circumstances. A municipality has two choices on the method employed to discharge these responsibilities. It may either:

- appoint a community fire safety officer or a community fire safety team;
  or
- establish a fire department

Where a municipality chooses to address the mandated responsibilities by establishing a fire department, a further mandate is engaged which requires the municipality to provide fire suppression services, and in doing so has eliminated that service option from the sole determination of the municipality.

The FPPA goes on to empower the Fire Marshal with the ability to monitor and review the fire protection services provided by the municipality to ensure compliance with its responsibilities under the legislation. Where a municipality is not meeting its responsibilities, and it is the opinion of the Fire Marshal that a threat to public safety exists, the Fire Marshal is empowered to make recommendations to the municipality. Where the recommendations are not acted upon by the municipality the Fire Marshal may recommend to the Minister that a regulation be struck to remedy the threat to public safety.
While the provision for making a specific regulation has never been applied, it underscores the serious nature of complying with the mandatory provisions of the legislation and ensuring adequate fire suppression service to the community.

Returning to the minimum requirements related to public education and fire prevention activities, it must be understood that these minimums were set out to apply to every municipality in Ontario, regardless of size. The mandate to provide “other fire protection services” according to needs and circumstances is based upon the reality that municipalities of different size and complexity present different levels of risk which require different levels of service.

A municipality’s needs are established by the municipal profile including population, building stock, geographic location, density, level of commercial and industrial activity, residential occupancy profile, etc. A municipality’s circumstances, it is submitted, refers to its ability to fund activities through the tax base, to attract, train and retain qualified individuals to provide services, its water supply and distribution system, its roads and transportation routes and systems, etc.

The expectations in the legislation for the level of fire protection services is not the same for a small rural community with no high-rise buildings and a large, bustling urban centre with multiple high-rise and other complex buildings with high occupancy loads, with high and increasing population density, with multiple institutions housing at risk occupants and with significant traffic gridlock issues. The legislation anticipates that a municipality will meet its responsibilities for public fire safety.

Fire prevention and public education are the first focus of the legislation for the simple reason that the best method of fire safety is to prevent a fire from ever occurring. Equally important is to know what to do in the event of a fire. Both of these service areas are affected by the size and complexity of the building housing occupants. Fire suppression needs and services are affected by the same of size and complexity of the building occupancies in a community.
Fire incidents are dynamic events that are time sensitive for both effective intervention and ultimate consequence. It is critical for success to match up the necessary tools and equipment with the appropriate, well trained human resources operating in an efficient, safe, organized and well co-ordinated fashion. To achieve this requires the ability to understand the critical tasks that need to be performed for successful intervention operations at each and every risk type within the community. The Center for Public Safety Excellence / Commission on Fire Service Accreditation International (CPSE/CFAI) is a collaborative organization originally formed by the International Association of Fire Chiefs (IAFC) and the International City Management Association (ICMA) to promote excellence in fire and emergency services and assist them in improving and enhancing service to their communities. In their publication “Standards of Cover, 5th Edition”, they set out a statement that describes the relationship between time and resources most aptly:

“If resources arrive too late or lack sufficient capabilities, the emergency will continue to escalate, drawing more of the agency’s resources into a losing battle. What emergency response companies must do, if they are to save lives and limit property damage, is arrive within a short period of time with sufficient resources to do the job. To control an emergency before it has reached its maximum intensity requires geographic dispersion of technical assets and cost-effective clustering of service delivery points for maximum effectiveness against the greatest number and types of risk. ...........

..............................A high-risk occupancy requires timely arrival of fire companies for several reasons. More resources are required to rescue people trapped in a high-risk building with a high occupancy load than in a low-risk building with a low occupancy load. More resources are required to control fires in large, heavily loaded structures than are needed for fires in small buildings with limited contents.”

Once there is an appropriate station and apparatus location and deployment model in place matched to the risks, the strategy and tactics for operations fall to the incident commander operating in a controlled
organizational model of incident command or incident management. The incident command system employed by fire services across North America is based upon the principles of “division of labour”, “unity of command”, and “span of control”. The command system provides for the strategic deployment of resources to tactical objectives in a planned fire attack. All of the pieces must be in place to ensure safe, successful operations.

A review of Line of Duty Death Fatality Reports for firefighters in the United States compiled by the National Institute for Occupational Safety and Health (NIOSH) identified the top 25 factors contributing to the circumstances related to the deaths. The top are:

- Command System, Organization Transfer of Command - staffing issues related to transfer of command
- Rapid Intervention Team - proper assignment and staffing
- Ventilation - often not done properly or not done at all because of staffing issues
- Staffing Inadequate or Delayed - offensive attacks are people intensive

Successful and safe intervention, and, successful and safe incident command require the appropriate numbers of staff and equipment for the performance of critical tasks.

Levels of service in the minds of the citizens and visitors in any community, in the absence of specific and directed communications, are at an expectation level. Very often, that expectation level will be based upon news reports on fires in the community or in other Ontario or Canadian communities. In Owen Sound, there are undoubtedly expectations that the level of fire service response will match the requirements of the level of risk for the occupancy in the event of a fire. Where that is not the case, or, where there are changes in the level of service that can have an adverse affect on the ability of a fire service to safely perform the critical tasks, including rescue, or which force a fire service to switch from offensive to defensive attack mode for particular risks, it is absolutely necessary to
communicate those facts to the community, and particularly, to the occupants of a building. That can be done by public education and posted communications advising that “defend in place” is no longer an option, for example. By virtue of the legislation and the service provided, a duty of care has been established and the expectations of the public are based upon the articulation of service levels relative to that duty of care and by the past practice related to that level of service or by communication about the level of service, or conversely, by the lack of communication about the level of service. Liability issues can arise if there is not clear articulation of the impact and consequence of changes in the level of service and some direction to alternative measures.

The customers of the fire service are the public - both citizens and visitors - who occupy the buildings in the community or who are engaged in activities in the community at any time 24 hours per day, 365 days per year. Changes that in any way affect or could affect their safety must be communicated to them clearly and directly.

The Ontario government has acted lately to introduce regulations to the Fire Protection and Prevention Act mandating fire inspections and fire drills in vulnerable occupancies (care occupancy, care and treatment occupancy or retirement home; and mandating municipalities to conduct risk assessments as well as providing reports to the Council and to the Fire Marshal in respect of information relating to incident responses.

**Owen Sound**

The KCB Report provides a good description of current operations for the Owen Sound Fire and Emergency Services on pages 11 though to the top of page 14. The Report also provides a synopsis of some of the applicable sections of NFPA 1710, along with some commentary on specific sections on pages 17 through 20. The Report further summarizes and comments upon the provisions of the Ontario Ministry of Labour Section 21 Guidance Notes, the U.S. Occupational Safety and Health Administration requirements and the Owen Sound Fire and Emergency Services SOG # 6-37, all of which deal with Rapid Intervention and the concept of 2 in / 2 out and the “Buddy System” for interior operations.
The 26 firefighters assigned to firefighting duties work a 4 platoon, 42 hour work week. There are 6 firefighters assigned to each of the 4 platoons and and 2 “floater” firefighters assigned across platoons as needed to fill in for long term or unforeseen absences.

The collective agreement sets out the following:

“ARTICLE XXII STAFFING CLAUSE

22.01 In consideration of the safety and well being of the Fire Fighters in the performance of their duties, the Corporation shall schedule on duty at all times a minimum of 5 full time Fire Fighters consisting of one (1) Captain and a minimum of four (4) full time Fire Fighters and any employee hired before January 7, 1996 shall be guaranteed employment with the Owen Sound Fire and Emergency Services DePartment. “

An addendum letter of understanding to the collective agreement sets out the following:

“1. That there will be a staff complement of 26 Fire Fighters and 1 Fire Prevention Officer, 1 Fire Prevention Inspector and I Training Officer excluding the Chief and Deputy Chief.

2. That the Association will guarantee the Employer to have 5 full time Fire Fighters from their membership to be on standby at all times, 24 hours a day, each day of the year and further, that a list of Fire Fighters that are on standby will be posted in the Fire Hall, and one listing to be posted in the Deputy Fire Chiefs office. The stand-by work shift will coincide with the work schedule as outlined in the latest Agreement signed between the Employer and the Association.

3. The Fire Fighters on standby will be called in at the discretion of the Fire Chief.

4. It is the responsibility of the Association to make any necessary adjustment in regards to names on the standby list, as long as the guarantee outlined in number 2 is maintained.
5. Failure of a Fire Fighter to respond to a call in a reasonable amount of time, or in a condition fit to fight the fire as determined by the Chief, will result in discipline action which can take the form of a warning, loss of pay, suspension, or dismissal, depending on the severity of the situation which will be determined by the Chief.

6. The Employer will pay $15.00 (effective first pay in Oct. / 03) per man per day shown on the standby list prepared by the Association and the payment will be every 2nd pay through the normal Employer's payroll procedures.”

The initial response to a reported fire is P5 (Pumper 5) staffed by a Captain, a firefighter driver/operator and one firefighter, A4 (Aerial 4) staffed by one firefighter driver/operator and A3 (Aerial 3) staffed by one firefighter driver/operator. The Captain on P5 has the authority to initiate an upgrade to 2nd alarm based upon the information provided at the time of dispatch or based upon additional information received on response or observations made upon arrival at the scene of the incident. A 2nd alarm is automatic for a working structure fire.

A 2nd alarm response calls in the 5 firefighters on standby to report to the incident scene. One of the vehicles at the incident scene carries their PPE and SCBAs. These firefighters sign in to confirm their arrival and report to the Incident Commander for assignment to tasks.

A 3rd alarm response is a call out for all additional off duty firefighters to report to the station, pick up their PPE and respond to the scene. Once on scene, the will report to the Accountability sector for assignment by the Incident Commander.

As one can see, the initial response team of 5 firefighters (6 if there are no vacations or lieu days) are all that are available to engage in the critical tasks required in the event of a working fire. They are limited in what they are able to do and the safety of the firefighters and the occupants is impacted by the lack of firefighters available for the critical tasks.

While not in regulation form, there are guidelines, standards and studies outlining the numbers of firefighters required to safely engage in the critical
tasks involved in fire suppression activities at different occupancy types, as well as the critical tasks required to be performed.

**NFPA 1710** sets out the critical tasks to be performed for response to a single family 2 story residence with no basement:

1. Incident Command
2. Support for handlines
3. Search and Rescue
4. Ground ladders
2. IRIC (Initial Rapid Intervention Crew)

14. Total

1. Aerial Operator - If Utilized
15. Total
OFMEM Comprehensive Fire Safety Effectiveness Model

OFMEM Fire Ground Effectiveness Sub-Model sets out the critical tasks for a single family 1.5 story dwelling for fire suppression OR rescue operations:

1. **Establish Water Supply**
2. **Search and Rescue**
2. **Back Up Handline**
1 (2)* **Exposures - Water Supply Person Assists When Supply Secured**
2. **Ventilation**

10. **Total**

Sequential Tasks - Confinement of Fire by Rescue Back Up Team Once Rescue Is Complete

Extinguishment - Salvage and Overhaul - Other Staff Assigned When Earlier Tasks Completed

**NFPA 1710** sets out the additional tasks and resources required for more complex occupancies:

- Strip Mall or Commercial Plaza - 27/28 Firefighters
- 3 Story Garden Style Apartment Building - 27/28 Firefighters
High Rise Building - 42/43 Fire Fighters

**OFMEM Fire Ground Effectiveness Sub-Model** indicates that additional resources may be required in escalating fires in single family residences, as well as fires in larger structures such as industrial or institutional occupancies, high rise, etc.


This document provides a Critical Task Matrix for guidance on the numbers of firefighters required based upon the tasks required to be performed.

A single family dwelling would fall into the “Moderate Risk” columns on the form.

The Critical Task Matrix lines up comparably to NFPA 1710 in terms of tasks and the numbers of firefighters required.
<table>
<thead>
<tr>
<th>Critical Task Matrix (Form 300A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fireground Critical Tasks</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Incident Command*</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Pump Operator</td>
</tr>
<tr>
<td>Attack Line (Confine &amp; Extinguish)</td>
</tr>
<tr>
<td>Additional Pump Operator(s)</td>
</tr>
<tr>
<td>Additional Attack Line (Confine &amp; Extinguish) + Backup</td>
</tr>
<tr>
<td>Search &amp; Rescue</td>
</tr>
<tr>
<td>Initial Rapid Intervention Team (IRIT)</td>
</tr>
<tr>
<td>Ventilation</td>
</tr>
<tr>
<td>Water Supply – pressurized</td>
</tr>
<tr>
<td>Water Supply – non-pressurized</td>
</tr>
<tr>
<td>Forcible Entry Team</td>
</tr>
<tr>
<td>Utilities</td>
</tr>
<tr>
<td>Laddering (Ground Ladders)</td>
</tr>
<tr>
<td>Laddering (Aerial or elevating device operator)</td>
</tr>
<tr>
<td>Exposure Protection</td>
</tr>
<tr>
<td>Incident Safety Officer</td>
</tr>
<tr>
<td>Accountability</td>
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<tr>
<td>Entry Control</td>
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<tr>
<td>Rehabilitation</td>
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<tr>
<td>Salvage</td>
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<tr>
<td>Lighting</td>
</tr>
<tr>
<td>Directing Occupants</td>
</tr>
<tr>
<td>Scribe</td>
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<tr>
<td>Sector Officers</td>
</tr>
<tr>
<td>Air Management (air refilling station, etc.)</td>
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<td></td>
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</tbody>
</table>

**Other or Additional Response Considerations**

<table>
<thead>
<tr>
<th>Logistics Officer</th>
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<tbody>
<tr>
<td>Administrative and/or Finance Officer</td>
</tr>
<tr>
<td>Planning Officer</td>
</tr>
<tr>
<td>Evacuations (large scale)</td>
</tr>
<tr>
<td>Communications (dispatch)</td>
</tr>
<tr>
<td>Public Information Officer</td>
</tr>
<tr>
<td>Overhaul</td>
</tr>
<tr>
<td>Additional Firefighters</td>
</tr>
</tbody>
</table>

**Summary**

<table>
<thead>
<tr>
<th>Incident Response Range</th>
<th>Total Fire Department including External Fire Call Incident Response Range (+, --, within)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 13 16 43 36 83 49 108</td>
<td>4 13 16 43 36 83 49 108</td>
</tr>
</tbody>
</table>

**Notes:**

- LERL = Lower Effective Response Level & UERL = Upper Effective Response Level. [together form the critical staffing range]
- This tool provides a range of staffing requirements only. Actual numbers may vary depending on the fire risk that exists in the municipality. Tasks performed on fireground based on decisions made by Incident Commander.
- Planning moderate, high and extreme risk occupancies/locations will further validate staffing requirements.
- Simultaneous events will require further consideration due to additional personnel requirements beyond the scope of this matrix.
- Incident Command will assume responsibilities of the incident safety officer, accountability and entry control when no person has been assigned.
NIST (National Institute of Standards and Technology, U.S. Department of Commerce) Report on High Rise Fireground Field Experiments, 2013 compared effectiveness, efficiency and thereby safety in crew sizes of 3, 4, 5 and 6 firefighters performing operational tasks in high rise scenarios. It found that in an analysis of 14 critical tasks 4 person crews took 9 minutes longer than 5 person crews and 11 minutes longer than 6 person crews.

RIT (Rapid Intervention Team)

The purpose of a RIT is to be ready and available to quickly enter a structure to rescue a firefighter or firefighters who may have become lost or trapped. A RIT is required anytime that there are firefighters engaged in interior operations at a structure fire. Members of the RIT may be engaged in other activities but not any activity that would require them to be using their SCBA. The Incident Commander cannot be designated as part of the RIT according to Fire Fighters Guidance Note # 6 - 11 issued by the Ontario Fire Service Section 21 Advisory Committee.

Assembling the appropriate numbers of firefighters on an incident scene to safely and effectively intervene is crucial to the safety of the occupants of a building as well as to the firefighters engaging in operations. The window for rescue and intervention is closing. In tests conducted by Underwriters Laboratories on the time to flashover for a room furnished with legacy furnishings compared to a room with modern furnishings revealed drastic results. Flashover occurred in 3 minutes and 40 seconds in the modern room compared to 29 minutes and 25 seconds in the legacy room. When this is coupled with issues faced where there are unprotected pre-engineered building components, safety is compromised for both occupants and responding firefighters with every second of delay. It is critical that the first arriving response units have the capability to safely engage in operations without delay. The UL New Science Fire Safety Journal indicates:
“UL’s research scientists and engineers have conducted a number of innovative tests and evaluated their results, and have identified that the modern home fire is a “perfect storm” of conditions and outcomes: larger homes + open house geometries + increased fuel loads + new construction materials = faster fire propagation, shorter time to flashover, rapid changes in fire dynamics, shorter escape times and shorter structural collapse times.”

Currently in Owen Sound, that means that the critical intervention is left to the first on duty response crew. That is either 5 or 6 firefighters including a Captain. 5 firefighters allows for 2 firefighters to enter while 2 firefighters remain outside ready to respond if the firefighters inside become lost or trapped. 5 firefighters allows for the pump operator to remain at the pump monitoring the water supply. 5 firefighters requires the Captain to either be inside as mobile command or outside as part of the “back up team” according to SOG # 2-02. A RIT will be assigned upon the arrival of the 2nd alarm firefighters.

The proposal by the Association to increase the complement from 26 to 28 would also increase the amount of time that there would be a crew of 6 firefighters on duty for the initial response. With 6 firefighters responding, there would be an entry team of 2 firefighters; a “back up team” of 2 firefighters; a pump operator and a Captain/Incident Commander. The result would be a safer environment for the first responding crew and the ability to perform the critical tasks more safely and effectively while awaiting the arrival of the 2nd alarm firefighters.

A crew of 6 firefighters would allow for the deployment of an intact 4 member pumper company/crew on the majority of responses. That intact crew could perform more required tasks simultaneously rather than sequentially, allowing for a quicker fire attack thereby reducing the risk to firefighters and occupants. The NIST study on the effectiveness of crew sizes in high rise operations made the following observation:

“An analysis of 14 “critical tasks” - those undertaken when potential risks to building occupants and firefighters are greatest - found that three-member crews took almost 12 minutes longer than crews of
four, 21 minutes longer than crews of five, and 23 minutes longer than crews of six to complete all tasks”

It should be pointed out that the NIST study used intact per vehicle crews.

The only time that Owen Sound has near the numbers of firefighters recommended by any standard is when a 3rd alarm is activated and the additional firefighters are assembled on scene. The initial on duty response numbers in Owen Sound are paramount for maximizing the efforts for the safety of occupants and firefighters. Every firefighter counts!

Corporate Proposal

The Corporation is proposing to reduce the minimum staffing from 5 firefighters including a Captain to 4 firefighters including a Captain in the letter of understanding addendum to the Collective Agreement.

For all of the reasons outlined in the foregoing paragraphs, that action would put the firefighters at greater risk than they already are.

The following quotes are taken from the KCB Report commissioned by the Corporation of the City of Owen Sound:

Recommendation

“Consider reducing the minimum on-duty staffing from five (5) Fire Fighters to four (4) - Will require a reduction in response capability as well as a change to the provision for minimum staffing levels contained in the current Collective Agreement.”

Comment on NFPA 1710

“5.2.4.1.1(2) provides for the minimum water flow capability. From a staffing perspective, the important point is that an operator must maintain the water flow. In other words, the pump operator must stay with the pumper to monitor water flow and cannot be assigned to other duties, such as rescue or IRIC, referred to as Rapid Intervention Team (RIT) in Ontario.”
“Before a rescue and/or interior fire fighting can be performed, a minimum of 5 personnel must be on the scene; 1-pump operator + 2- interior Fire Fighters + 2-members assigned as an IRIC.”

Comment on OSFES SOGs

“In Summary, to OSFES SOG standards

• Fire Fighters must not work alone in a dangerous atmosphere
• At least four (4) Fire Fighters must be assembled before a team enters a hazardous atmosphere, except in imminent life threatening situations
• The operator may act as one of the four (4) assembled to affect a rescue
• SOG # 6-37 does allow for exceptions under special circumstances

Note - KCB recommends that the pump operator not be assigned to a rapid intervention team. A monitored water supply is essential to interior operations and the pumper must be staffed at all times.”

KCB Comments - Page 24

“If the Collective Agreement is changed and the practice of having a minimum of five (5) Fire Fighters on duty is reduced to four (4), the OSFES will have to alter their there [sic] on-scene practices. They will have to wait until a fifth (5th) Fire Fighter arrives on scene before affecting interior activities.”

Re Volunteer Fire Fighter Model

“The City of Owen Sound, though small in land area, has an urban core largely made up of older building stock. The proximity of the buildings to one another in the core leads to a potential of rapid fire spread when response times are delayed.”
Conclusion

In my opinion, increasing the complement from 26 to 28 Fire Fighters would provide an increased level of safety for the on duty responding Fire Fighters by having the availability of 6 Fire Fighters for most shifts (reduced by vacation, lieu days, sickness)

In my opinion, the reduction from 5 on duty Fire Fighters to 4 on duty Fire Fighters would have a negative impact on the safety of the Fire Fighters on the initial response.